
Multi-Jurisdictional Hazard Mitigation Plan

St. Lawrence County

Office of Emergency Services

Prepared For

St. Lawrence County

Office of Emergency Services

Building #8

48 Court Street

Canton, New York 13617

Revision 2

Updated September 2022

St. Lawrence County, New York

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1.0 INTRODUCTION

1.1 Background

What is a Hazard?

A hazard is defined by the Federal Emergency Management Agency (FEMA) as an event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural losses, damage to the environment, interruption of business, or other types of harm or loss. A hazard can be natural, technological or human-caused. Natural hazards occur from the earth's natural processes. Human-caused or technological hazards are the result of intentional or unintentional events that are caused by humans or by materials created by humans (FEMA, 2017).

What is Hazard Mitigation?

Hazard mitigation is broadly defined by FEMA as a method for reducing or alleviating property loss, reducing damage to the environment, and reducing the number and severity of injuries that occur from hazard events through long and short-term strategies. Responsibility for implementing mitigation measures runs community wide from individuals to industries, private business and all levels of government (FEMA, 2017).

Hazard Mitigation and the Other Phases of Emergency Management

Hazard mitigation is often considered just one of four phases of emergency management after a disaster event occurs. The other phases include preparedness, response and recovery. Each of these phases relate to and rely upon each other, as illustrated below. The overarching goal of all of these emergency management phases is the prevention or minimizing of loss of life and property in disaster situations.



FEMA and Hazard Mitigation

FEMA provides assistance through the Robert T. Stafford Disaster Relief and Emergency Assistance Act to local governments that are recovering from a hazard event. The Federal Disaster Mitigation Act of 2000 (DMA 2000) recognized the importance and cost-effectiveness of mitigation in specifying that local governments must have a FEMA approved natural hazard mitigation plan to be eligible for mitigation project funding.

DMA 2000 encourages and rewards local and state pre-disaster planning, promotes conservation and sustainability, and seeks to integrate state and local planning with an overall goal of strengthening statewide hazard mitigation planning. As of November 1st, 2004, all local governments were required to have a FEMA approved hazard mitigation plan to receive funding through the Hazard Mitigation Grant Program (HMGP) for specified mitigation projects. Specifically, a hazard mitigation plan is required for local governments for the following FEMA funding programs:

- Hazard Mitigation Grant Program (HMGP) project grant
- Building Resilient Infrastructure and Communities (BRIC) project grant
- Flood Mitigation Assistance (FMA) project grant
- Rehabilitation of High Hazard Potential Dam (HHPD) Grant Program

To meet the federal requirements of the Disaster Mitigation Act of 2000, St. Lawrence County completed a Multi-Jurisdictional Hazard Mitigation Plan (HMP) that was approved by FEMA in 2015. The County was awarded a Pre-Disaster Hazard Mitigation Grant from FEMA in 2019 to update their 2015 HMP.

1.2 Purpose

This Multi-Jurisdictional Hazard Mitigation Plan presents an update to the County's original 2015 HMP, and will allow the County to remain eligible for future mitigation funding. The purpose of this plan is to document the natural hazards that affect St. Lawrence County and outline practical mitigation strategies that can be implemented to reduce the effects of such hazard events. The County and each jurisdiction identified and ranked the hazards to which their community is most vulnerable. In addition, the HMP also includes an assessment of the risks and vulnerabilities associated with each hazard and details mitigation strategies to moderate those vulnerabilities and decrease the risks. At a minimum, the identified mitigation measures were required to be technically feasible, cost-effective, and environmentally sound.

The St. Lawrence County Office of Emergency Services (OES) is the coordinating agency for all emergency management activities. This office is responsible for life safety, property, and environmental protection from all natural and technological hazards that may occur within the County. The development of a County hazard mitigation plan provides the following benefits:

- Increased understanding of the natural hazards the County faces;
- Development of more sustainable and disaster-resistant communities;
- Partnerships that support planning and mitigation efforts;
- Reduced long-term impacts to structures and human health; and
- Eligibility for Federal funds for pre-disaster mitigation planning (DMA 2000).
- Comments or questions concerning this document should be addressed to:

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Building #8, 48 Court Street

Canton, New York 13617

Phone Number: 315-379-2240

Website: <https://stlawco.org/Departments/EmergencyServices>

1.3 Planning Participants

There are 32 towns, 10 villages, and one city located within St. Lawrence County. Table 1.1 (Appendix A) includes an alphabetical list of jurisdictions within the County as well as the representatives for each jurisdiction for the HMP update. All jurisdictions were invited and encouraged to participate in this plan update, and all 43 jurisdictions met the criteria for participation. Participation criteria were established by the Mitigation Planning Committee as the first step in the planning process. The criteria that had to be met in order for a jurisdiction to be included as a participating member of the County's hazard mitigation plan are summarized below in Section 1.4. A summary of each jurisdiction's participation status is provided in Table 1.2 (Appendix A). Jurisdictional annexes, which describe the specific mitigation goals of the County and each municipality in detail, are provided in Appendix B.

Figure 1.1 shows the boundaries of all jurisdictions within St. Lawrence County. During the 2015 HMP effort, the County split jurisdictions geographically into three working groups to facilitate participation. During the HMP update process, jurisdiction outreach was completed on an individual basis to foster meaningful discussions for each participant. Each jurisdiction met with the County's consultant team to review and update their municipality's data from 2015, and to discuss new information and

mitigation strategies to be included in the HMP update. Detailed information regarding project meetings and participants is provided in Appendix C, Meeting Summary.

1.4 Hazard Mitigation Planning Process

All participating jurisdictions met the following criteria in order to be considered plan participants and support the plan update process:

- Indicate their intent to participate via participation form submission or direct communication to the County and/or consultant team
- Met with the consultant team to:
 - Review and update 2015 HMP data
 - Assess natural hazards and determine which have the greatest possibility of impacting the jurisdiction;
 - Provide a status update on 2015 mitigation actions;
 - Develop at least two specific pre-disaster mitigation actions for inclusion in the HMP update;
 - Complete a cost-benefit analysis of proposed mitigation actions; and
- Reviewed all information presented in their jurisdictional annex.

Participating jurisdictions will receive a copy of the link to the draft HMP on the County website so they may share it with their constituents by posting it on their website or social media pages, if available. Participating jurisdictions will also pass a resolution to adopt the final HMP update, once approved by FEMA. The County's 2015 HMP analyzed two categories of hazards (natural and technological or human caused) during the risk assessment process. The HMP update focuses on natural hazards. The Mitigation Planning Committee elected to exclude technological and human-caused hazards from the scope of the HMP update, since mitigation projects related to such hazards are not eligible for mitigation grant funding through FEMA. The mitigation actions proposed by the County and individual jurisdictions were developed specifically to mitigate natural hazards. There are certainly noted concerns and mitigation planning needs regarding technological and human-caused hazards (particularly related to the COVID-19 pandemic); however, the Committee decided that mitigation planning regarding non-natural hazard events would be most efficiently covered under separate planning efforts.

2.0 ST. LAWRENCE COUNTY PROFILE

2.1 Geographic Location

St. Lawrence County is located in northern New York State along the Canadian border. The Adirondack Mountains lie to the southeast, the Thousand Islands Region to the southwest, and the St. Lawrence River to the northwest. St. Lawrence County is the largest County in New York State, accounting for approximately 5% of the total area of the state. Approximately one-third of the County is located within the Adirondack Park. The terrain in the St. Lawrence Valley varies from flat to gently sloping. The terrain in the Adirondack Foothills and Mountains is generally hilly and mountainous, with higher elevations here than in the rest of the County. Topography in this area ranges from 600 feet to over 2,000 feet above sea level. The highest point in the County, Mount Matumbla, is located in the Adirondack Mountains with an elevation of 2,688 feet above sea level. The lowest point in the County is in the St. Lawrence Valley at 158 feet above sea level (St. Lawrence County, 2021).

The St. Lawrence County seat is located in the Town of Canton, the geographic center of the County. The County has 43 municipalities including 32 towns, 10 villages, and one city. The Villages of Hermon and Morristown were dissolved in 2016 and 2019, respectively. St. Lawrence County has a total area of 2,680 square miles (U.S. Census Bureau, 2021). Figure 2.1 illustrates the topographic relief of St. Lawrence County. The Town of Colton is the largest Town in the County, encompassing 242 square miles, which is 9% of the total area of the County. The Town of Rossie is the smallest Town with a total area of 38 square miles (1.4% of the total County area).

For a detailed historical overview of St. Lawrence County, please refer to the County's original 2015 HMP, available online at:

<https://stlawco.org/sites/default/files/Planning/HazardMitigation.pdf>

2.2 Climate Characteristics

New York State has a humid continental climate, with warm summers and cold winters (NYSDEC, 2021b). Figures 2.2, 2.3, and 2.4 (Appendix A) show average January temperatures, average July temperatures, and average annual precipitation throughout New York State. Temperatures average 70°F in July and 18°F in January. Rainfall averages 32 inches annually, with 8-16 inches of rain during the growing season (generally early May through the end of September). The County averages 66 inches of snow during the winter (St. Lawrence County, 2021b).

2.3 Land Use

Land use within St. Lawrence County is mixed. The majority of properties are classified as agricultural, residential, commercial, or vacant land. Figure 2.5 (Appendix A) depicts the land cover across the entire county, as provided by the National Land Cover Dataset (NLCD) (Homer et al., 2015). Agricultural land is prevalent in the northern portion of the County. Figure 2.6 (Appendix A) shows properties that are part of St. Lawrence County Agricultural Districts 1 and 2. Agricultural districts protect farmland from non-farm development and potential restrictions on agricultural operations. The southern half of the County is dominated by forested land (much of which lies in the Adirondack Park).

The City of Ogdensburg and Villages of Gouverneur, Canton, Massena, and Potsdam have the highest population densities in the County. The Towns in the southeastern portion of the county that are wholly or partially located in the Adirondack Park are largely undeveloped and sparsely populated. Housing vacancy rates are calculated during U.S. Census years as a potential indicator of distressed regions. A housing unit is considered occupied if it is the normal place of residence of the person or persons living in it, including if said person(s) are temporarily absent. A vacant housing unit is classified as such if no one is living in it on a permanent basis, excluding temporary absence. According to the 2020 Census, St. Lawrence County has a vacancy rate of 20%. This rate increased by approximately 1.5% from a rate of 18.5% in 2000 (U.S. Census Bureau, 2021). Vacancy rates by jurisdiction are reported in Table 2.1 (Appendix A).

Most jurisdictions within St. Lawrence County have adopted comprehensive plans, other land use plans, and/or zoning regulations that help guide development and land use characteristics within each municipality. The types of land use regulations implemented by each jurisdiction are summarized in the jurisdictional annexes (Appendix B).

2.4 Population Trends

The population of St. Lawrence County was 108,505 according to the 2020 Census. This reflects a decrease of 3,439 people when compared to the County's total population reported by the 2010 U.S. Census (111,944). Table 2.2 (Appendix A) summarizes population trends for St. Lawrence County from 2010 to 2020. Table 2.3, below, summarizes demographics for St. Lawrence County compared with the same statistics for New York State.

Table 2.3 – St. Lawrence County Demographics <i>(U.S. Census Bureau, 2020)</i>		
Statistic	St. Lawrence County	New York State
Total Population	108,505	20,201,249
Female (%)*	49.0%	51.4%
Male (%)*	51.0%	48.6%
Population Diversity		
White	55.16%	89.89%
Black/African American	14.78%	2.83%
American Indian and Alaska Native	0.74%	1.10%
Asian	9.57%	1.02%
Native Hawaiian and Other Pacific Islander	0.05%	0.03%
Some Other Race	10.94%	0.93%
Two or More Races	8.75%	4.21%
<i>*Denotes statistics obtained from 2019 American Community Survey. All other statistics obtained from 2020 Census.</i>		

2.5 Economic Characteristics

The unemployment rate in St. Lawrence County was approximately 5.7% as of June 2021 (NYSDOL, 2021b). The County's unemployment rate has steadily decreased since its peak of 15.4% in April 2020, which was the beginning of the COVID-19 pandemic. The April 2020 unemployment rate was the highest rate reported in the County in over 30 years. The County's current unemployment rate is lower than that of New York State, which was 7.3% as of June 2021 (NYSDOL, 2021b). Table 2.4, below, provides an overview of economic characteristics for St. Lawrence County compared to those of New York State based on the U.S. Census Bureau's 2015-2019 American Community Survey data.

Table 2.4 – Economic Characteristics of St. Lawrence County <i>(U.S. Census Bureau, 2019)</i>		
Statistic	St. Lawrence County (2015-2019 Estimates)	New York State (2015-2019 Estimates)
Labor Force (total # of people 16 years or older)	42,818	9,300,315
Mean Travel Time to Work (minutes)	33.6	20.8
Median Household Income	\$65,160	\$101,945
Median Family Income	\$76,194	\$119,540
Mean Per Capita Income	\$25,378	\$39,326
Individuals Below Poverty Line (percent of total population)	17.9%	14.1%

Employment in St. Lawrence County is dominated by the service industry, as indicated in Table 2.5 (Appendix A). Most residents (88.7%) work within the County, as summarized in Table 2.6, below. Major employers in St. Lawrence County include ALCOA (an aluminum manufacturing plant) and multiple educational institutions and healthcare facilities (see Table 2.7, below). St. Lawrence County is also a major employer.

Table 2.6 – Places of Work in St. Lawrence County <i>(U.S. Census Bureau, 2019)</i>	
Place of Work	Total
Works in State of Residence	99.3%
Works in County of Residence	88.7%
Works Outside County of Residence	10.7%
Works Outside State of Residence	0.7%

Table 2.7 – Top Employers in St. Lawrence County (St. Lawrence County, 2021)	
Employer	Location
ALCOA	Town of Massena
Clarkson University	Village of Potsdam
St. Lawrence-Lewis BOCES	Village of Canton
Claxton-Hepburn Medical Center	City of Ogdensburg
Canton-Potsdam Hospital	Village of Potsdam
St. Lawrence County	Village of Canton
United Helpers Organization	Multiple locations throughout County
St. Lawrence University	Village of Canton
The Arc Jefferson-St. Lawrence	Village of Canton
SUNY Potsdam	Village of Potsdam

2.6 Transportation

Major transportation infrastructure in St. Lawrence County is illustrated in Figure 2.7 (Appendix A). In St. Lawrence County, roadway, air and limited rail transportation options are available. The major transportation corridors in the County include U.S. Route 11, State Route 3, and State Route 37. All three routes bisect the County from southwest to northeast. U.S. Route 11 stretches from Jefferson County to Franklin County, passing through the Towns of Rossie, Gouverneur, De Kalb, Canton, Potsdam, Stockholm, Brasher, and Lawrence. State Route 37 is located in the northern part of the County, and passes through the Towns of Hammond, Morristown, Oswegatchie, Lisbon, Waddington, Louisville, Massena, and the City of Ogdensburg. State Route 3 lies in the southern part of the County, from the border with Lewis County to the border with Franklin County, and passes through the Towns of Pitcairn, Fine, Clifton, Colton, and Pierceland. There are two main routes to Canada from St. Lawrence County: State Route 812 in the City of Ogdensburg via the Ogdensburg – Prescott International Bridge, and State Route 37 in the Town of Massena via the Seaway International Bridge at the Three Nations Crossing.

The St. Lawrence County Department of Highways maintains approximately 573 miles of County roads and 190 bridges (13 bridges are currently closed). In addition, the Department of Highways is responsible for snow removal on County roadways and portions of State roadways, as well as roadside mowing. The main County highway facility is located in the Village of Canton, with maintenance facilities in the Towns of Madrid, Potsdam, and Russell. Each of the existing maintenance facilities are located at

the respective Town highway department facilities. The County is currently in the process of constructing new maintenance facilities in the Town of Lisbon and Russell, and is planning to construct a third new facility in the Town of Potsdam (St. Lawrence County, 2021).

St. Lawrence County is home to the Port of Ogdensburg, which is owned and operated by the Ogdensburg Bridge & Port Authority. It is the only port on the Great Lakes designated as a Port of National Defense. The Port of Ogdensburg has deep-draft berthing (27') and can provide large sea vessels access to the Great Lakes and international ports. The Port of Ogdensburg is closer to Northern Europe compared to most other U.S. Ports, and is used for the import and export of a wide variety of cargo (Ogdensburg Bridge & Port Authority, 2021).

St. Lawrence County has two rail services, CSX and Vermont Rail Systems, as well as a short line rail owned by the St. Lawrence County Industrial Development Agency (IDA). There is currently no passenger rail service in St. Lawrence County. CSX and Vermont Rail Systems provide commercial non-passenger rail services. Vermont Rail System has 22 miles of shoreline track that runs from Norfolk to Norwood and on to Ogdensburg. Four stations are located along this route at the Port of Ogdensburg, Hoosier Magnetic, Norfolk Paper Company, and the engine house in Norfolk. The St. Lawrence IDA shoreline rail connects the southern part of the County to the CSX main line at Carthage, New York.

There are six airports and two heliports in St. Lawrence County, including Massena International-Richards Field and the Ogdensburg International Airport, which are the only two international airports in St. Lawrence County. Table 2.8 (below) lists active airport and heliport facilities within the County.

Table 2.8 Airport and Heliport Facilities Located Within St. Lawrence County (Federal Aviation Administration, 2021)					
Name	Location	ICAO ID No.*	IATA ID No.*	Ownership	Runway(s)
Hendricks Field	Town of Gouverneur	NK16	NK16	Private	1 (turf)
Hurlbut Field	Town of Canton	NY07	NY07	Private	1 (turf)
Adirondack Helicopters Heliport	Town of Gouverneur	62NY	62NY	Private	1 (turf)
Massena International-Richards Field	Town of Massena	KMSS	MSS	Public (Town of Massena)	2 (asphalt)
Thomas E. Perdue Heliport	Town of Massena	NK75	NK75	Public (Town of Massena)	1 (asphalt)
Thibert Field	Town of Morristown	68NK	68NK	Private	1 (turf)
Potsdam Municipal Airport/ Damon Field	Town of Potsdam	KPTD	PTD	Public (Village of Potsdam)	1 (asphalt)
Ogdensburg International Airport	City of Ogdensburg	KOGS	OGS	Public (City of Ogdensburg)	1 (asphalt)
*ICAO = International Civil Aviation Organization *IATA = International Air Transport Association					

2.7 Climate Change

According to the 2014 NYS ClimAID Report, St. Lawrence County is located in Region 7 (Indian Lake) of NYS. By the 2050s, the mean annual temperature in this region is projected to rise by an average of 3.7 to 7.4 °F, and annual precipitation is expected to increase by 2 to 15%. (Horton et al., 2014). St. Lawrence County continues to plan for the impacts of climate change. Five jurisdictions in St. Lawrence County are registered or certified Climate-Smart Communities, including The Town and Village of Potsdam (both Bronze Certified), Village of Canton, Village of Norwood, and City of Ogdensburg (registered but not yet certified). The NYS Climate Smart Community program focuses on shifting toward clean, renewable energy sources and implementing climate-smart land use policies and projects that make communities more resilient to climate change, among other climate change-related actions. St. Lawrence County is also actively participating in the NYS Coastal Lakeshore Economy and Resiliency (CLEAR) Initiative, which is targeting shoreline resiliency efforts along the St. Lawrence River. Specifically, the program aims to assist shoreline communities in managing shoreline development

and land use to reduce future damages from high water levels. More information on the CLEAR Initiative in St. Lawrence County can be accessed at:

<https://www.northcountryclear.com/>.

2.8 Critical Community Facilities

The critical facilities within St. Lawrence County were identified by the Mitigation Planning Committee and by representatives of each jurisdiction. Critical facilities within each municipality are listed in each jurisdictional annex (Appendix B). Critical facilities identified by St. Lawrence County, including hospitals, police and fire departments, emergency medical services, and schools, and major utility providers are listed in Table 2.9 (Appendix A). Utility services within St. Lawrence County are described in more detail below.

An analysis was completed to determine whether any critical facilities identified by the County and each jurisdiction were located within 100-year or 500-year floodplains. Floodplain mapping in St. Lawrence County consists of the original FEMA FIRMs that were developed in the late 1970s through the early 1990s. Twelve jurisdictions in St. Lawrence County remain unmapped by FEMA and therefore have no floodplain mapping available. FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4. The digital floodplain data generated from HAZUS was used to determine whether the critical facilities identified by the County and each jurisdiction are located within 100-year or 500-year floodplain. This information is summarized in Table 2.9 (Appendix A) and in Table 5 of each jurisdictional annex (Appendix B). Updated floodplain mapping from FEMA, once available, will be used to update the flood hazard risk assessment and other hazard analyses, particularly to provide information for jurisdictions that are currently not mapped by FEMA.

Electricity

National Grid and the Massena Electric Department are the two suppliers of electricity within St. Lawrence County. The Massena Electric Department is the only municipal-owned utility in the County, and provides electricity to Massena and portions of the Towns of Louisville, Brasher, Norfolk, and Stockholm (Massena Electric, 2021). The remainder of the County is serviced by National Grid (St. Lawrence County, 2021). Power is also generated by numerous hydropower facilities throughout the County. The

Robert Moses-Robert H. Saunders Power Dam (Moses-Saunders Dam) in Massena is owned by New York Power Authority (NYPA). The U.S. side of the dam has a generating capacity of 912 megawatts (IJC, 2020). Brookfield Renewable operates 27 generating stations in St. Lawrence County with a combined total generating capacity of approximately 228.6 megawatts (Brookfield Renewable Energy Partners L.P., 2012; Natural Resources Canada, 2021).

Oil and Gas

Liberty Utilities (formerly St. Lawrence Gas) supplies natural gas to the northern portion of St. Lawrence County. Liberty Utilities’ service area includes the Towns of Oswegatchie, Lisbon, Gouverneur, Fowler, De Kalb, Canton, Potsdam, Madrid, Waddington, Louisville, Norfolk, Stockholm, Lawrence, Brasher, and Massena and the City of Ogdensburg (Liberty Utilities, 2021).

Solid Waste Facilities

St. Lawrence County operates four transfer stations and three closed landfills. The transfer stations are located in the Town of Massena, City of Ogdensburg, Village of Gouverneur, and Hamlet of Star Lake. Additionally, there is a transfer station owned by Casella located in the Town of Parishville. Closed landfills are located in Massena, Ogdensburg, and Canton. All municipal solid waste from the County is hauled to the Development Authority of the North Country landfill in Rodman, NY. Recyclables are hauled to FCR Recycling in Stanley, NY which is owned by Casella (St. Lawrence County, 2021).

Water Supply

Freshwater resources are abundant in St. Lawrence County. Springs, lakes and rivers are abundant in St. Lawrence County and are utilized by the County’s industries, as well as many municipalities, as drinking water sources. The groundwater supply is sufficient throughout the County, and private wells are used in areas that are not served by municipal water (St. Lawrence County, 2021). The following municipalities operate municipal water systems or are served by water systems that are operated by adjacent municipalities (25 total):

- City of Ogdensburg
- Town of Brasher
- Town of Clifton
- Town of Colton
- Town of De Kalb
- Town of Lisbon
- Town of Louisville
- Town of Madrid
- Town of Massena
- Town of Morristown
- Village of Canton
- Village of Gouverneur
- Village of Heuvelton
- Village of Massena
- Village of Norwood

- Town of Edwards
- Town of Fine
- Town of Gouverneur
- Town of Hermon
- Town of Norfolk
- Town of Parishville
- Town of Piercefield
- Town of Potsdam
- Village of Potsdam
- Village of Waddington

Wastewater Treatment

Over half of the municipalities in the County (28 total) have sanitary sewer collection systems and/or operate wastewater treatment facilities (some municipalities have collection systems that convey sewage to treatment plants in a nearby jurisdiction). Residents who are not served by a municipal wastewater treatment system rely on private septic systems. The following municipalities have wastewater treatment facilities:

- City of Ogdensburg
- Town of Brasher
- Town of Canton
- Town of Clifton
- Town of Colton
- Town of DeKalb
- Town of Edwards
- Town of Fine
- Town of Gouverneur
- Town of Hammond
- Town of Hermon
- Town of Lawrence
- Town of Lisbon
- Town of Madrid
- Town of Massena
- Town of Morristown
- Town of Norfolk
- Town of Potsdam
- Town of Stockholm
- Village of Canton
- Village of Gouverneur
- Village of Hammond
- Village of Heuvelton
- Village of Massena
- Village of Norwood
- Village of Potsdam
- Village of Rensselaer Falls
- Village of Waddington

Telephone and Internet Communications

The major telephone and/or internet service providers in St. Lawrence County are Verizon, Spectrum, Citizens Telephone Company, Nicholville Telephone Company, Citizens Telephone Company, Slic Network Solutions, and Westelcom. Cell phone coverage in the County has improved over time and continues to do so. There are currently approximately 130 4G cell towers throughout the County, and 5G towers are starting to be built in more populated areas (Beckstead, 2021). There are still some areas of the County that have spotty or no cell service.

2.9 St. Lawrence County Office of Emergency Services

The St. Lawrence County Office of Emergency Services (OES) serves as the disaster services and emergency preparedness center for the County. The OES office is located in the Village of Canton. The OES operates under four bureaus: Communications, Fire, Emergency Medical Services (EMS), and Emergency Management. The Bureau of Communications operates the 911 Public Safety Answering Point and County Communications Center, and is responsible for communication infrastructure. The Bureau of Fire provides training for local fire departments and assists in responding to major incidents. The Bureau of EMS provides training for local first responders and assists in responding to major incidents. The Bureau of Emergency Management ensures that the County is prepared for various disaster events that may occur, and is responsible for disaster response, recovery, and mitigation efforts (St. Lawrence County, 2021). The OES website is available at:

<https://stlawco.org/Departments/EmergencyServices>

3.0 PLANNING PROCESS

3.1 Resources, Planning Mechanisms, and Capabilities

The HMP update was developed in accordance with the guidelines presented in the Local Mitigation Planning Handbook (FEMA, 2013) and the current New York State Hazard Mitigation Planning Standards Guide (NYS DHSES, 2017). In addition to these state and federal resources, other documents reviewed during the St. Lawrence County HMP update process included the original St. Lawrence County Hazard Mitigation Plan (2015), St. Lawrence County's most recent County Emergency Preparedness Assessments (CEPA) Report (2018), the St. Lawrence River Shoreline Resiliency Study (2019), St. Lawrence River Watershed Revitalization Plan (2020), jurisdictions' comprehensive plans and local regulations, and various other resources. A full list of references used during the compilation of this plan update is provided in Section 10.0, Works Cited. Event specific information and details came largely from the Mitigation Planning Committee and jurisdiction representatives.

The HMP will serve as an important resource for developing and updating various plans and procedures throughout the County. This plan should be incorporated into, considered during, and referenced by future updates and efforts at the County and municipal levels concerning the existing County plans, policies, ordinances, programs, studies, reports, and staff included in Table 3.1 (Appendix A). The information presented for the County in Table 3.1 is also summarized for each municipality in the jurisdictional annexes (Appendix B).

3.2 Mitigation Planning Committee

A Mitigation Planning Committee was established to facilitate the HMP update process and to make decisions throughout the planning process. The Mitigation Planning Committee members and their affiliations are as follows:

- Matthew Denner – Director, St. Lawrence County Office of Emergency Services
- Jason Pfothauer – Director, St. Lawrence County Planning Office
- Heidi Ames – Grants Manager, St. Lawrence County Planning Office
- Donald Chambers – Superintendent, St. Lawrence County Highway Department
- Ian Hazen – Deputy Superintendent, St. Lawrence County Highway Department
- John Condino – Senior Project Manager, Barton & Loguidice, D.P.C.
- Johanna Duffy – Senior Managing Environmental Scientist, Barton & Loguidice, D.P.C.
- Grete Day – Staff Environmental Scientist, Barton & Loguidice, D.P.C.

Details regarding all meetings held throughout the planning process, including attendee lists, are provided in Appendix C, Meeting Summary.

3.3 Jurisdiction Participation

As noted in Section 1.3, all 43 jurisdictions in the County met the participation criteria for the present HMP update.

Participating jurisdictions met individually with the consultant team to complete their information updates and provide new information required to be included in their jurisdiction's annex for the HMP update (Appendix B). A sample HMP adoption resolution is presented in Appendix D.

3.4 Stakeholder Participation

A list of stakeholders identified for the HMP update is provided in Table 3.2 (Appendix A). All stakeholder contacts were invited to attend the stakeholder and public information meeting series held on June 8, 2021. Table 3.2 indicates whether or not stakeholders attended the meeting and whether they provided additional input for the HMP update. A second stakeholder and public information meeting was held to solicit comments on the draft HMP update on February 2, 2022. Stakeholder contacts were also provided a link to the draft HMP update. Stakeholder outreach documentation is provided in Appendix E.

3.5 Public Participation

A stakeholder and public information meeting was held during the initial plan development stage in June 2021. Two sessions were held over Zoom (the same information was presented at both sessions). Members of the public were invited to attend this meeting, and a press release was published on the County website and in local news outlets with details. Jurisdictions were encouraged to discuss the HMP update process at their local board meetings. The HMP was discussed at several local board meetings, including the Village of Richville, Town of Russell, and Town of Waddington. The HMP process was also discussed at the February 8, 2021 St. Lawrence County Legislature Operations Committee Meeting. County and local meeting minutes referencing the HMP update are provided in Appendix F. This list is not exhaustive and should not be construed as being a complete collection of meetings or occasions where the local jurisdictions internally discussed the HMP update and planning process. The draft plan was posted on the St. Lawrence County Planning Department's website for public review. A second stakeholder and public information meeting was held on February 2, 2022 to solicit comments on the draft plan and make attendees aware of

the document's structure and the information solicitation process and overall conclusions. Two sessions were held over Zoom, and members of the public were invited to attend.

4.0 RISK ASSESSMENT

St. Lawrence County is vulnerable to numerous natural hazards. The County conducted a County Emergency Preparedness Assessment (CEPA) analysis in 2018, which was facilitated by the NYS Division of Homeland Security and Emergency Services (NYS DHSES). During the CEPA update, the County ranked a number of natural and technological hazards. The 2018 CEPA was used to inform natural hazard selection and ranking for the HMP update. Details regarding the natural hazards considered during the CEPA analysis are provided below.

4.1 St. Lawrence County 2018 CEPA Results

St. Lawrence County conducted a County Emergency Preparedness Assessment (CEPA) on January 18, 2018. This event updated the County's previous CEPA that was conducted in 2015. Aside from St. Lawrence County personnel, representatives from many other State and regional organizations and agencies participated in the CEPA review. CEPA is a program that was developed by NYS DHSES to analyze hazard risks and County capabilities during emergency and disaster events. The hazard analysis completed during the CEPA was used to inform the County's risk and vulnerability assessment for the HMP update.

A number of natural hazards were evaluated during the 2018 CEPA update. The CEPA update also considered multiple technological or human-caused hazards, but these hazards were not considered further for the HMP update. The group analyzed all hazards determined to potentially affect St. Lawrence County. The CEPA rated each hazard based on the group's assessment for each hazard related to the likelihood and consequence potential of each hazard. The selected hazards were categorized as follows:

Score of 15 or greater = High Hazard

Score of 7 to 14 = Moderate Hazard

Score of 6 or below = Low Hazard

From the 28 hazards analyzed as part of the CEPA, ten natural hazards were chosen for profiling in the HMP update. One additional natural hazard (animal disease/foreign animal disease) was included in the 2018 CEPA, however, this hazard was not selected for profiling in the HMP update because it did not align well with any of FEMA's natural hazard categories. These hazards are presented in Table 4.1 below, along with their associated CEPA likelihood of occurrence categories. The Mitigation Planning Committee also chose to profile ice jam and infestation in the HMP update, though these hazards were not included in the CEPA analysis.

Table 4.1 – St. Lawrence County Hazard Selection for HMP Update <i>(St. Lawrence County, 2021)</i>	
Hazard	CEPA Likelihood Category (2018)
Ice Storm	High
Severe Thunderstorm, Wind, Hail, or Tornado	High
Severe Winter Snowstorms	Very High
Earthquake	Medium
Flood	Medium
Wildfire	Medium
Coastal Storm	Low
Extreme Temperatures	High
Drought	Low
Landslide	Very Low
Ice Jam	N/A- not included in CEPA
Infestation	N/A- not included in CEPA

Based on the knowledge of CEPA participants, historical County data, and discussions that occurred amongst the group, the hazards were assessed and ranked based on their likelihood of occurrence and level of consequences. Each hazard is assigned to one of five categories (very high, high, medium, low, or very low) for both likelihood of occurrence and consequence of occurrence. For the 10 natural hazards profiled in this HMP update, that were also included in the CEPA, their likelihood of occurrence/consequence of occurrence category is listed above in Table 4.1. Descriptions of these risk assessment categories referenced for the CEPA update are summarized in Table 4.2, below.

Table 4.2 – CEPA Hazard Risk Assessment Categories <i>(St. Lawrence County, NYS DHSES, January 2018)</i>	
Hazard Likelihood	
Very High	Hazard is expected to occur without question based on historical precedence or current intelligence reporting.
High	Hazard is likely to occur based on historical precedence or current intelligence reporting.
Medium	Hazard could occur, but generally does not occur with regular frequency.
Low	Hazard could occur, but very unlikely.
Very Low	Hazard is not expected to occur.

4.2 Presidential Disaster Declarations

The President of the United States is able to make an emergency and/or major disaster declaration under the Stafford Act. After a natural disaster event that has caused a severe amount of damage beyond the State and local government response capabilities, the Governor of the impacted State can request a major disaster declaration from the President. The request from the Governor must include: an estimate of the amount and severity of damage to public and private sectors, a description of the State and local efforts and resources used to respond to the disaster, a preliminary estimate of the type and amount of Stafford Act assistance needed, and certification that the State and local governments will comply with all applicable cost sharing requirements. Counties typically have to meet a per capita threshold of damage that is set by the Federal government to be eligible for assistance. Major disaster declaration assistance generally provides three types of aid: Individual Assistance, Public Assistance, or Hazard Mitigation Assistance. Most declarations will provide either Individual or Public Assistance along with Hazard Mitigation Assistance. St. Lawrence County has been included in 14 Presidential Disaster declarations since 1972 (FEMA, 2021b). Details of these events are provided in Table 4.3 (Appendix A).

4.3 Hazard Identification and Ranking for HMP Update

The hazards to be profiled in the HMP update were selected by the Mitigation Planning Committee. The County's 2015 HMP, 2018 CEPA Report, and the NYS 2019 HMP (DHSES, 2019) were reviewed during the hazard selection process. The County used New York State's Hazard Identification and Risk Assessment (HIRA-NY) program to rank hazards for the 2015 HMP. The Mitigation Planning Committee completed a new hazard ranking process for the HMP update.

The County's 2015 HMP profiled both natural and technological/human-caused hazards. Only natural hazards were profiled for the 2021 HMP update, as summarized in Table 4.1, above. Low-risk hazards were not included for further analysis. The Mitigation Planning Committee completed an updated hazard analysis in 2021 to rank the hazards selected for profiling in the HMP update. The criteria used to complete this analysis are summarized in Table 4.4, and the 2021 hazard analysis results are summarized in Table 4.5, both below. Table 4.6 (Appendix A) provides a comparison of the hazard rankings for the HMP update alongside the 2015 HMP and 2018 CEPA hazard analyses.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare (once every 5 or more years)	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent (once every 2 to 5 years)	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular (one or more times per year)	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injuries)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/ Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Ice Jam	2	2	2	1	Moderate	6
Flood	2	2	1	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	3	1	2	Moderate	10
Landslide	1	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.4 FEMA HAZUS Analysis

HAZUS Overview

HAZUS is a nationally standardized, open source, GIS-based risk modeling software developed by the Federal Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The HAZUS program is a multi-hazard loss estimation model capable of identifying areas which are vulnerable to a variety of natural hazards

including floods, hurricanes, and earthquakes. HAZUS can quantify and map risk vulnerability information including physical damages, economic losses, and social impacts, and is a useful tool in hazard mitigation, recovery, preparedness, and response planning. HAZUS was utilized to assess what areas, infrastructure, and populations are most vulnerable to selected natural hazards using the flood, hurricane, and earthquake modeling tools.

A HAZUS study region was developed for St. Lawrence County, which consisted of approximately 2,762 square miles and included 7,009 census blocks. The region contains over 42,000 households with a total population of 111,944 according to the 2010 Census Bureau data utilized by the model. The model's building stock inventory estimates a total of 49,431 buildings in the region with a total replacement value of over \$11.6 million, excluding building contents. Approximately 93% of the buildings and 78% of the building value included in the study area's building inventory are associated with residential housing. No additional user defined infrastructure inventory data was added to the model.

Flood Model

The HAZUS flood model was set up using United States Geological Survey Digital Elevation Model (DEM) coverage for the study area, the extent and source of which are determined within HAZUS' model setup resources. Due to the geographic setting of the study region and the lack of coastal areas, the model was set up for riverine flood hazard analysis only. The study region's stream network was determined using the model's automated stream network development routine which utilized a user defined drainage area of 25 square miles for stream density determination. The DEM coverage and developed stream network were processed by the model for riverine hydrologic analysis and floodplain extents. Following establishment of the study region's hydrology and floodplains, the model was run to determine physical, economic, and social impacts of flood events for the 100- and 500-year return periods. HAZUS analysis was run on the County level, and model output represents County-wide damages, economic losses, and social impacts. Summaries of damage and economic losses for buildings, as well as debris generation estimates and estimates of displaced populations, are discussed in Section 5.7. HAZUS flood model result output summary reports are provided in Appendix G.

Earthquake Model

The HAZUS loss estimation methodology utilized by the earthquake model provides a framework for evaluating risk and potential economic, physical and social losses

anticipated from modeled historic or user defined earthquake events. Due to a lack of historic earthquake data included in the model inventory for the study region, a probabilistic earthquake hazard was evaluated using HAZUS probabilistic ground motion and soil amplification data associated with a user-defined, probabilistic seismic hazard for various return periods ranging from the 100-year to the 2,500-year event. HAZUS probabilistic earthquake scenarios utilize a user-defined magnitude driving the probabilistic event. The event magnitude defined for the scenario does not impact the ground motion observed by the model, however this data provides the framework for the anticipated earthquake duration. In order to evaluate the most realistic results for the study region which does not experience frequent, large magnitude seismic events, the minimum magnitude of 5.0 was selected for the model.

In addition to the probabilistic scenario created for the study region, an annualized loss model was completed using the default assumption of a magnitude 7.0 event to estimate average annualized losses for the region's building inventory and population. Summaries of damage and economic losses resulting from the probabilistic and annualized loss scenarios for the study region's building inventory, as well as debris generation estimates and estimates of displaced populations, are discussed in Section 5.9. HAZUS earthquake model result output summary reports are provided in Appendix G.

Hurricane Model

The HAZUS hurricane loss estimation model estimates potential economic and social losses resulting from hurricane winds. The hurricane modeling function allows for evaluation of historic events which impacted the study region that are included in the model's storm inventory (i.e., deterministic scenario), as well as probabilistic scenarios which consider wind impacts from thousands of potential storm tracks and intensities typical of the region. In order to evaluate the largest range of data for the study region, a probabilistic scenario was run and evaluated for the 10-, 100-, and 1,000-year return periods. The HAZUS hurricane model was most relevant to severe thunderstorms and windstorms for St. Lawrence County, and a summary of the model output for the selected scenario is discussed in Section 5.1. HAZUS hurricane model result output summary reports are provided in Appendix G.

5.0 HAZARD PROFILES

The natural hazards that were selected for profiling in the HMP update are further detailed below. The following sections include a description of the hazard, geographic extent and frequency within St. Lawrence County, historical occurrences and damage estimates, and the probability of future hazard events. Hazards are discussed in the order that they were categorized by the County, from highest to lowest.

Hazard event information was compiled from local records and publicly available data from the 2019 NYS Hazard Mitigation Plan, National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC), U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL), and the U.S. Geological Survey (USGS) Earthquake Catalog. The NCDC data incorporates damage estimates for many events. The NCDC damage estimates are subject to the NCDC disclaimer that while the National Weather Service makes an effort to use the best available information to document the occurrence of storms and other significant weather data, some information may be unverified. The National Weather Service (NWS) estimates damage costs using all available data, but property and crop damages listed for individual storms are considered broad estimates and total damages are often higher than those reported by the NCDC.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

Hazard Description

Severe storms as defined by HIRA-NY include severe thunderstorms (with associated severe wind events such as derechos, gustnados, and downbursts), hailstorms, and windstorms. For clarity, thunderstorms, windstorms, hail, and tornado are addressed separately in the following sections.

Thunderstorms

The NWS defines a severe thunderstorm storm as a storm with a tornado, surface hail $\frac{3}{4}$ " or greater, or wind gusts 50 knots (58 mph) or greater, or all three. Severe thunderstorms can cause damage from wind, hail, heavy rainfall, and/or lightning strikes. The NWS estimates that over 100,000 thunderstorms occur each year throughout the U.S. mainland, 10% of which are classified as severe. Thunderstorms can produce deadly and damaging tornadoes, hailstorms, intense downburst and microburst winds, lightning, and flash floods. Downburst winds are strong, concentrated, straight-line winds created by falling rain and sinking air that can reach speeds of 125 mph. Wind gusts or downbursts can be described as microbursts or macrobursts (NOAA NWS, 2019). Microbursts extend 2.5 miles or less

and generally last between 5 and 15 minutes, and can generate winds up to 168 mph. Macrobusts extend greater than 2.5 miles and last between 5 and 30 minutes. These events can cause winds up to 134 mph.

Lightning is generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. A derecho is a widespread and long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms, and a gustnado is a short-lived, ground-based vortex that develops on a gust front associated with either showers or thunderstorms (NOAA NWS, 2021c).

Windstorms

Extreme windstorm events are associated with tropical cyclones, winter cyclones, and severe thunderstorms that generate straight-line winds. Winds vary from zero at ground level to 200 mph in the upper atmospheric jet stream at 6 to 8 miles above the earth's surface. Large-scale extreme wind phenomena are experienced over every region of the United States and its territories. Figure 5.1 (Appendix A) shows wind zones of the United States; St. Lawrence County is located in Zone II, which is rated to handle maximum wind speeds of 160 mph. High winds are characterized using the Beaufort Wind Scale (Table 5.1, Appendix A).

High wind events in St. Lawrence County typically have velocities between 50 and 55 knots. Wind velocities between 48-55 knots have a force of 10 (storm) on the Beaufort Scale (Edwards, 2021). Wind forces of 11 (violent storm, 56-63 knots), or 12 (hurricane, 64 knots or greater) have occurred in the past eleven years, but are not common in St. Lawrence County. Windstorms are synoptically driven, associated with the interaction between a strong mid-latitude cyclone (low pressure) and a strong mid-latitude anti-cyclone (high pressure). They have a duration of several hours to 12 hours.

Hailstorms

Hailstorms are often associated with severe thunderstorms. Hailstorms are characterized by balls or irregularly shaped lumps of ice greater than 0.75" in diameter that fall with rain. Peak periods for hailstorms are late spring and early summer, the time of year when the jet stream migrates northward across the U.S. Hailstorms can cause extensive crop damage, particularly to herbaceous and long-stemmed crops. Severe hailstorms can also cause damage to buildings, automobiles, and aircraft, but rarely cause fatalities or serious injury. Hailstorms are

categorized on the TORRO Hailstorm Intensity Scale (TORRO, 2019), which is provided in Table 5.2 (Appendix A).

Tornado

Tornados are described as local atmospheric storms, generally of short duration, formed by winds rotating at very high speeds, usually in a counter-clockwise direction. The vortex of the tornado can be up to several hundred yards wide and is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity or funnel. Tornado wind speeds can reach up to 300 mph.

The magnitudes of tornados are measured using the Enhanced Fujita Tornado Damage Scale or Enhanced F-scale (Table 5.3, Appendix A). This system uses a set of wind estimates based on damage, and the estimates vary with height and exposure (NOAA NWS, 2021b).

Geographic Extent and Frequency

St. Lawrence County is highly vulnerable to severe thunderstorms, winds, hail, or tornados, as documented in their updated hazard analysis (Section 4.3). Specific details regarding extent and frequency for each type of severe storm event considered are provided below.

Thunderstorms

Severe thunderstorms generally affect several locations in the County at once, and could occur anywhere. The County is highly vulnerable to severe thunderstorms based on this hazard's moderate extent (several locations are affected at once), moderate onset (hours of warning), moderate potential for property damage/injuries, and regular frequency (one or more events per year).

Windstorms

Severe windstorms could occur anywhere in St. Lawrence County. The County is highly vulnerable to severe windstorms based on this hazard's moderate extent (several locations are affected at once), moderate onset (hours of warning), moderate potential for property damage/injuries, and regular frequency (one or more events per year).

Hailstorms

All areas of St. Lawrence County are susceptible to hailstorms. The County is highly vulnerable to hailstorms based on this hazard's moderate extent (several locations are affected at once), moderate onset (hours of warning), moderate potential for property damage/injuries, and regular frequency (one or more events per year). The most damaging hailstorms that have occurred in St. Lawrence County over that past eleven years produced hail that was 2 inches in diameter, which corresponds with category H5 on the TORRO Scale. Hailstorms occur about once per year in St. Lawrence County (NYS DHSES, 2019).

Tornado

Tornados could occur anywhere in St. Lawrence County. The County is highly vulnerable to tornados based on this hazard's moderate extent (several locations are affected at once), fast onset (no warning), severe potential for property damage/injuries, and rare frequency (once every five or more years). Historically, tornadoes have occurred about once every seven years in St. Lawrence County. Tornados have occurred multiple times at several locations within St. Lawrence County between 1950 and 2021 and could potentially occur anywhere within the County. Figure 5.2 shows St. Lawrence County Historic Tornado Tracks (Appendix A). Tornados occur sporadically throughout New York State.

Historical Hazard Occurrences and Damage Estimates

Thunderstorms and Windstorms

Severe thunderstorm events have been documented in numerous locations across St. Lawrence County. The NCDRC reported 138 thunderstorm wind events, two lightning events, and two funnel cloud events in St. Lawrence County from January 2010 through October 2021, which are summarized in Table 5.4 and shown in Figure 5.3 (Appendix A). Total reported damages from these reported events were nearly two million dollars (\$1,942,000). Thunderstorm windstorm reports made up the majority of the damages totaling \$1,940,000, while lightning from thunderstorms cost a total of \$2,000 in damages across the County.

A severe storm on July 17, 2012 caused significant roof damages, downed trees, and power outages affecting more than 11,000 customers in the Town and Village of Potsdam. The Towns of Hopkinton, Colton, Pierrepont, and Russell were also affected by this event. Estimated wind speeds from this storm ranged from 60-70 knots. There were no injuries or fatalities reported as a result of this storm event.

However, the Town and Village of Potsdam both declared a State of Emergency. On July 18, 2012 Governor Cuomo issued a State of Emergency for the entire County to assist with recovery efforts. Total damage estimates for this event were \$185,000. Another recent severe storm occurred on May 1, 2017 in the Towns of Pitcairn, Russell, and Fine. Estimated winds speeds reached 70 knots resulting in damages to numerous trees and power lines, and roof damage throughout the Town. Total damage estimates for this event were \$125,000. The most recent severe storm reported by NCDC occurred on July 20, 2021, and affected multiple municipalities in the County, including the Towns of Lisbon, Potsdam, Waddington, Canton, Colton, Stockholm, and Villages of Norwood and Heuvelton. The event involved winds up to 50-55 knots and caused tree and utility line damage. Total damage estimates for this event were \$97,000.

Depending on the size and location of a severe storm, damages in St. Lawrence County typically range from thousands to several hundred thousand dollars. It is noted that damage estimates from NCDC related to severe storms and other hazards are often underreported and/or underestimated, and actual losses from severe thunderstorms and windstorms are likely greater than reported. Storms that occur between late spring and early fall have a greater probability of causing crop damage; however, there were no reports of crop damage by NCDC.

St. Lawrence County has been included in two federal disaster declarations for hurricanes, Hurricane Sandy (10/27/2012) and Hurricane Katrina (8/29/2005) (Table 4.3, Appendix A). St. Lawrence County received public assistance for emergency protective measures only for both events. St. Lawrence County does not directly experience hurricanes due to its inland location, but the County can be affected by inland precipitation and winds that originate from these events.

HAZUS Hurricane Model Results

The HAZUS hurricane model for St. Lawrence County best fit with the severe windstorm hazard rather than coastal storm, because the model only factors in coastal storm surge for coastal areas. An evaluation of estimated hurricane losses generated by the model run for the study region did not reveal any significant damages or casualties for any of the evaluated return periods. The expected building damage count identified for the 1,000-year return period was 69 total buildings, which accounts for less than 0.2% of the study region's building inventory, none of which had damages classified as severe. No essential facilities evaluated by the model were anticipated to be damaged by the 1,000-year hurricane event. Additionally, no persons were anticipated to be displaced or require temporary

shelter as a result of any of the evaluated hurricane return periods. The model estimated no notable debris generation for the 10-year and 100-year return periods, however a total of 107 tons of tree debris are estimated to be generated from winds associated with the 1,000-year event. No tonnage of building debris is anticipated to be generated from the evaluated return period. HAZUS hurricane model result output summary reports are provided in Appendix G.

Hailstorms

Hailstorm events have been documented in numerous locations across St. Lawrence County between January 2010 and October 2021. Storm data from NCDRC reported 29 hailstorm events in St. Lawrence County from January 2010 through October 2021 (Table 5.4, Appendix A). Total known damages from these reported events were \$55,000; however, actual damages are likely greater.

One significant hailstorm occurred on September 11, 2013 in the Towns of Louisville and Lawrence, and the City of Ogdensburg. Golf ball sized hail (1.5 to 1.75" in diameter) was reported and caused minor damage to vehicles. Total damage estimates for this event were \$30,000. Another recent severe hailstorm occurred on July 21, 2010 in the Village and Town of Potsdam, Town of Hopkinton, and the City of Ogdensburg. Hail up to an estimated 1.75 inches was reported, and caused an estimated \$25,000 of damages in Potsdam.

Tornados

St. Lawrence County, and the majority of New York State, are not within a high-risk area for tornado events. The NCDRC reported ten separate tornado events in St. Lawrence County between 1950 and 2021. The most recent tornados occurred on June 9, 2004 in the Towns of Gouverneur and Hammond. These tornados cause about \$25,000 in damages in each location. Details of historic tornado events in the County are provided in Table 5.5 (Appendix A). A tornado hit the Hamlet of Somerville (Town of Rossie) on August 15, 1986, and resulted in one fatality and three injuries, with damage estimates of \$250,000.

Potential damages from tornado events can vary greatly across the County. Tornados in rural areas with a sparse population may have fewer impacts than a tornado event in the City of Ogdensburg or more populated Villages. The NCDRC storm events database estimated a total of \$878,000 in tornado-related damages across the County since 1950.

Probability of Future Events and Relation to Climate Change

The County's vulnerability to a severe thunderstorm, wind, hail, or tornado event remains high. The New York State Energy and Research Development Authority's (NYSERDA) ClimAID report states that temperatures will continue to rise over the next several decades. As a result, weather patterns are projected to increase in severity. Annual average precipitation in St. Lawrence County is predicted to increase 2-15% by the 2050s, and 3-17% by the 2080s (Horton et al., 2014). The greatest amount of change is expected to impact northern New York State. Due to projected increases in precipitation and increases in yearly average temperatures, severe storm events are anticipated to increase in frequency and intensity. The potential impact of climate change on the frequency and severity of tornados is unclear, as these events are very sporadic and hard to predict in New York State (NYS DHSES, 2019).

5.2 Ice Storm

Hazard Description

Ice storms include freezing rain that accumulates in a substantial glaze layer of ice resulting in serious disruptions of normal transportation and possible downed power lines. The NWS defines ice storms as damaging accumulations of ice that occur during freezing rain events. Significant accumulations of ice can pull down trees and utility lines, resulting in the loss of power and communications. These accumulations of ice make walking and driving extremely dangerous. During the June 8, 2021 stakeholder meeting, NWS meteorologists indicated that ice storms in the County generally involve ½ to 1" of ice accumulation (Whittier, 2021). The County is primarily concerned with ice storms that generate ½" or more of ice accumulation.

Geographic Extent and Frequency

Ice storms can occur anywhere in St. Lawrence County. The County is highly vulnerable to ice storms based on this hazard's large extent (a large portion of the County is affected at once), slow onset (days of warning), severe potential for property damage/injuries, and moderate frequency (once every two to five years). The St. Lawrence River Valley (north and northwest of the U.S. Route 11 corridor) is more susceptible to ice storms due to increased winds (specifically 10 to 15 knot cold-replenishing winds) (Whittier, 2021).

Ice storms typically come with several days warning and can last two to three days. Historical data indicates ice storms have occurred anywhere from three times a year to once every seven years in the region. The NWS indicated that on average, ice storms

occur 1 to 2 times per year in St. Lawrence County (Whittier, 2021). The intensity of ice storms is measured using the Sperry-Piltz Ice Accumulation Index (Table 5.6, Appendix A). Ice storms in St. Lawrence County typically correspond with an ice damage index of 2 on this scale; however, there are occurrences of worse damages in the County. In addition, ice storms often correspond with severe winter storms, which can be characterized using the Regional Snowfall Index (NOAA, 2021c) and rate of snowfall per duration of time. The Regional Snowfall Index is provided in Table 5.7 (Appendix A).

Historical Hazard Occurrences and Damage Estimates

Ice storms can cause moderate damage to private property and severe structural damage to public facilities. Serious injury or death can occur, but not in large numbers. The NWS forecasted ice thickness for ice storms refers to accumulation on a horizontal flat surface. This value must be converted to mean radial ice accumulation to be more applicable to ice loads that could form on tree branches or utility lines. Mean radial ice accumulation is equivalent to the horizontal flat surface multiplied by 0.4. The design loading for overhead utility lines is calculated based on the National Electrical Safety Code Loading Districts (NYS is located in the heavy loading district, equating to ½" of ice) multiplied by a standard construction grade value (NARUC, 2018). In St. Lawrence County, ice storms generally pose more of a concern for tree damage rather than direct damage to utility lines.

The NCDRC reports seven ice storms that have occurred between 1998 and 2021 in St. Lawrence County, and property damage estimates were included for each event (Table 5.8). The most recent ice storm in the County occurred on January 12, 2020. Over this time period, up to 0.75" of ice accumulated in areas across the County. The storm was anticipated to result in numerous power outages, and downed trees, but the storm moved faster and further south than predicted (WWNY TV-7, 2020). Damage estimates reported by the NCDRC for this storm were \$25,000, but actual damages may have been greater.

The most notable ice storm that has occurred in St. Lawrence County is the Ice Storm of 1998. This storm started on January 5, 1998, and lasted for about five days. This event involved a buildup of five smaller successive ice storms over the five-day period. During these storms, up to four inches of ice accumulation was reported. The storm occurred over a narrow band from northern New York State extending north into Quebec, and east to western Maine. St. Lawrence County was included in a Federal Disaster Declaration (DR-1196) that was issued for this storm event. The heavy ice accumulation that resulted from this storm downed trees, damaged power and telephone lines, and resulted in power outages that lasted up to a month in some areas within St. Lawrence

County. Emergency shelters were opened throughout the County to assist the public. Total damages reported in St. Lawrence County by the NCDC for this event were \$3 million.

The extent of damage that could be caused by an ice storm is directly related to how widespread of an area is affected and the duration of icing. A severe ice storm has the potential to damage a significant amount of critical infrastructure within St. Lawrence County, resulting in the need to open emergency shelters and make emergency utility repairs. During the June 2021 stakeholder meeting, the NWS indicated that warnings were issued for ice storms between 2018 and 2021, and the reported utility damages were far less than expected (Whittier, 2021). This may have been due to damages that were left unreported, or perhaps utility companies are taking more proactive measures to clear tree limbs before storm events. Fallen trees and power lines could cause structural failures for homes, businesses, and public buildings.

Probability of Future Events and Association with Climate Change

The entire County remains susceptible to ice storms. While St. Lawrence County has had only one federally declared disaster due to an ice storm, the potential of another ice storm occurring within the County remains high.

Climate change will cause a rise in temperatures and total annual precipitation over the next several decades. The impact of climate change on the frequency and severity of ice storms is unpredictable for the northern part of New York State (including St. Lawrence County), while the southern part of the state may experience fewer ice storms (Rosenzweig et al., 2011, Horton et al. 2014).

5.3 Severe Winter Storm

Hazard Description

A severe winter storm is described as a storm system that develops in late fall to early spring and deposits snow, sleet, or freezing rain, with a significant impact on transportation systems and public safety. According to the HIRA-NY definitions of hazards, a severe winter storm can be categorized by the following conditions:

- Heavy snow: at least 6 inches in 12 hours or Lake Effect Snows;
- Blizzard: low temperatures, winds 35 mph or greater, and sufficient falling and/or blowing snow in the air to frequently reduce visibility to ¼ mile or Lake Effect Snows for a duration of at least three hours; or

- Severe blizzard: temperatures near or below 10°F, winds exceeding 45 mph, and visibility reduced by snow to near zero for at least 3 hours.

Severe winter storms can be characterized using the Regional Snowfall Index (Table 5.7, Appendix A). Snowstorms in St. Lawrence County typically result in 8-18 inches of snow accumulation or more per day. The RSI is calculated based on the amount of snowfall, extent of the storm, and population affected, and categorizes storms in five categories ranging from Notable to Extreme. Winter storms affecting the County that register on the RSI most often fall in Category 1 (Notable). Several snowstorms in St. Lawrence County since 2010 have reached Category 2 (Significant) or 3 (Major) (Table 5.9, Appendix A).

Geographic Extent and Frequency

Severe winter storms can occur anywhere in St. Lawrence County. The County is highly vulnerable to severe winter storms based on this hazard's large extent (a large portion of the County is affected at once), slow onset (days of warning), moderate potential for property damage/injuries, and regular frequency (one or more times per year). Severe winter storms historically have occurred about 16 times per year in St. Lawrence County. A single storm can also move from one area to another and back again, making the exact location of impact nearly impossible to predict. Severe winter storms have the ability to immobilize an entire portion of the County, severely limiting the ability of emergency agencies to respond to local emergencies. St. Lawrence County is susceptible to lake effect snow events, which often result in high precipitation totals and/or temporary whiteout conditions.

Historical Hazard Occurrences and Damage Estimates

The severity of winter storm events in St. Lawrence County varies greatly, ranging from minimal damage to blizzards that result in a federal disaster declarations. St. Lawrence County has been included in five severe winter storm-related disaster declarations (Table 4.3, Appendix A), the most recent of which occurred on November 17, 2014 (DR-4204-NY). This storm dropped between two and three feet of snow across St. Lawrence County and contributed to flooding events. The NCDC reports 163 winter storm events that have occurred between January 2010 and October 2021 in St. Lawrence County. Property damage estimates were included for most, but not all events. Total damages from severe winter storms reported by the NCDC from January 2010 through October 2021 totaled \$1,282,000. Each reported storm caused an average of about \$8,000 in damages. NCDC Winter Storm records between 2010 and 2021 are provided in Table 5.9, Appendix A.

Probability of Future Events and Association with Climate Change

The County's vulnerability to severe winter storms remains high. Increases in average temperature associated with climate change are expected to result in more moisture in the atmosphere, resulting in heavier than normal precipitation. Warmer temperatures may also decrease the ice coverage on the Great Lakes, which would create conditions conducive to greater evaporation of moisture, increasing the probability for extreme snowfall.

5.4 Coastal Storm (Nor'easter)

Hazard Description

A nor'easter is a storm along the East Coast of North America generated by winds coming from the northeast. These storms may occur at any time of year but are most frequent and most violent between September and April. Nor'easters usually develop in the latitudes between Georgia and New Jersey, within 100 miles east or west of the East Coast. These storms progress generally northeastward and typically attain maximum intensity near New England and the Maritime Provinces of Canada. They nearly always bring precipitation in the form of heavy rain or snow, as well as winds of gale force, rough seas, and, occasionally, coastal flooding to the affected regions.

Geographic Extent and Frequency

Nor'easters threaten the entire Atlantic Coast of the United States, and while coastal areas are most directly exposed to the damaging forces of such storm systems their impact is often felt far inland. Nor'easters can occur anywhere in St. Lawrence County. Despite being 250 to 300 miles inland, St. Lawrence County is moderately vulnerable to coastal storms based on this hazard's large extent (a large portion of the County is affected at once), slow onset (days of warning), moderate potential for property damage/injuries, and moderate frequency (once every two to five years).

Historical Hazard Occurrences and Damage Estimates

The NCDC does not differentiate nor'easters from other severe storms. The NCDC database contains no significant recorded damages for coastal storms have affected St. Lawrence County. A local record reported a nor'easter on February 3, 2021. The event involved up to 14 inches of snow cover across the County, covering roads, tress, and homes (Griffin, 2021). No damage estimates were reported for this event.

Probability of Future Events and Association with Climate Change

The County's vulnerability to nor'easters remains moderate. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change (Horton et al., 2014).

5.5 Extreme Temperatures

Hazard Description

Extreme temperature events are defined as extended periods of excessive cold or hot weather with a serious impact on human and/or animal populations. Prolonged extreme temperature events lasting for at least three days with a temperature colder than -10°F (cold wave) or hotter than 95°F (heat wave) were considered under this hazard. In extreme heat and high humidity, evaporation is slowed and the body must work harder to maintain a normal temperature. Extreme heat exposure may result in symptoms such as sunburn, dehydration, heat exhaustion, or heat stroke. The NWS Heat Index, a function of temperature and relative humidity, is used to predict the likelihood that someone could develop heat disorders. In extreme cold conditions, people can experience wind chill, frostbite, or hypothermia. Exposure to extreme temperatures for prolonged periods of time can result in death. The NWS Wind Chill Index is a function of temperature and wind velocity. The NWS Heat and Wind Chill Indices are included in Figures 5.4 and 5.5 (Appendix A).

Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.1% of the population in St. Lawrence County is under 5 years old, and 17.4% of the population is over 65 years old (Figure 5.6). This puts 22.5% of the population at higher risk for greater impacts to extreme temperatures based on age. Additionally, 17.6% of the County's population is below the poverty level. Extreme temperatures principally affect the health and safety of the human population, although they can also impact livestock, agricultural crops, and may also cause damage to infrastructure and property.

Geographic Extent and Frequency

Extreme temperature events can affect all of St. Lawrence County. The County is moderately vulnerable to extreme temperature events storms based on this hazard's large extent (a large portion of the County is affected at once), slow onset (days of

warning), moderate potential for property damage/injuries, and moderate frequency (once to multiple times per year).

Historical Hazard Occurrences and Damage Estimates

Heat Waves

NOAA NCDC extreme temperature records are summarized in Table 5.10 (Appendix A). The NCDC reports eleven records representing five separate heat waves between January 2010 and October 2021. The most significant recorded event took place between March 17 and 22, 2012. Record high temperatures for this time of year (mid 70s to low 80s °F) accounted for an estimated 25-40% loss in maple syrup production. This event resulted in an estimated total of \$750,000 of crop damages in the County related to maple syrup production.

In St. Lawrence County, extreme heat events are considered more impactful than extreme cold events. In general, buildings are constructed to retain heat. Heat waves leave vulnerable populations at risk, as there are not many cooling centers established in the County. Multiple cooling centers were opened in the County during a heat wave that occurred the second week of August 2021. Additionally, extreme heat days are becoming more frequent. On average, the Champlain Valley experiences about ten days exceeding 90 °F and 25 days exceeding 87 °F (both temperatures generate similar heat effects) (Whittier, 2021). In the past, most extreme heat events have occurred during the summer when school was not in session. However, extreme heat events are now occurring earlier and later than previous years, when school is still in session in the early summer or just beginning in the fall. This leads to increased concerns regarding impacts of heat waves on young children. Many schools do not have air conditioning, and as extreme heat events are starting to occur more often during the school year, younger students could be significantly impacted. A number of jurisdictions included cooling center-related mitigation actions to address this concern. Specific mitigation actions are summarized in each jurisdictional annex (Appendix B).

Cold Waves

Overall, the communities in St. Lawrence County are used to excessive cold temperatures and are quite resilient to potential impacts from these events. Six records reflecting two separate cold or wind chill events have been reported by the NCDC in St. Lawrence County between January 2010 and October 2021 (Table 5.10, Appendix A). The entire county was affected by these events, which occurred on January 7, 2015 and February 1-28, 2015. Three separate NCDC records were reported for each event, one each for the northern, southeastern, and southwestern portions of the County. The

January 7, 2015 event was caused by an Arctic cold front that pushed across northern New York State leading to dangerously cold wind chills between -20 and -70 °F, resulting in multiple school delays and closings. February 2015 was the coldest February on record in northern New York, and the coldest month since January 1994. Temperatures ranged from 13 to 17 °F below normal, with 15 to 20 or more days of temperatures below 0 °F and dangerous wind chills (-30 °F or lower) (NOAA NCDC, 2021a).

Probability of Future Events and Association with Climate Change

The County's vulnerability to extreme temperatures remains moderate. Extreme heat events are a growing concern for St. Lawrence County, and are likely to become more frequent in the future due to climate change. It is anticipated that extreme heat events will increase in frequency and duration, and that extreme cold events will decrease due to an average increase in overall temperature (Horton et al., 2014). Going forward, an increased use of air conditioning associated with the rise in extreme heat events will increase demands on local power grids, which should be considered by municipalities as well as utility providers during ongoing planning efforts.

5.6 Ice Jam

Hazard Description

An ice jam is described as a large accumulation of ice in rivers or streams that interrupts the normal flow of water and often leads to flooding and/or damage to nearby structures (NOAA NWS, 2021a). Ice jams can form when ice formation begins in the early winter (freeze-up jams), during the breakup of ice (break-up jams), or through a combination of both events (combination jams). Although a large amount of information associated with ice jam events has been collected since the early 1900's, documentation of the actual rate of occurrence of such events is not easily obtained. Ice jams are often short-lived and often affect only a localized reach of a waterbody.

Geographic Extent and Frequency

Ice jams could occur on any waterbody in St. Lawrence County, but are most common along the St. Regis River and impact the Brasher/Winthrop area. St. Lawrence County experiences both freeze-up and break-up jams. The County is moderately vulnerable to ice jams based on this hazard's moderate extent (several locations are affected at once), moderate onset (hours of warning), moderate potential for property damage/injuries, and rare frequency (once every five or more years).

Historical Hazard Occurrences and Damage Estimates

A query of the U.S. Army Corps of Engineers' (USACE) Cold Regions Research and Engineering Laboratory (CRREL) Ice Jam Database was completed to determine records of past ice jam events within St. Lawrence County.. In the past, ice jams have commonly occurred on the St. Regis River, Oswegatchie River, Raquette River, Grass River, Little River, Deer River, Elm Creek, Plum Brook, and Parkhurst Brook. They most often occur along the St. Regis River and affect the Brasher/Winthrop area. The USACE CRREL reported four ice jams between 2010 and 2021 by the CRREL database, the most recent records from 2014 (Table 5.11, Appendix A). The most recent recorded ice jam was in 2014 on the Oswegatchie River. The most significant historic occurrence of ice jam damage in St. Lawrence County occurred in the 1980s when an ice jam resulted in evacuations and severe damage to a wastewater treatment plant in the Town of Madrid. The Town of Brasher's wastewater treatment plant and a nearby campground have also been damaged by an ice jam. Ice jam damage has also been reported near Parishville on the West Branch of the St. Regis River. Additionally, ice jams along the St. Regis River in the Town of Colton had to be blasted apart in 2020. This event was not reported by the USACE CRREL database but was documented by local records.

Public infrastructure is especially vulnerable to damage from ice jams. The Wanakena Footbridge in the Town of Fine was severely damaged by an ice jam in January 2014. The footbridge is over 100 years old and is listed on the National Register of Historic Places. The cost of repairs and/or rehabilitation of this historic structure was hundreds of thousands of dollars. Although not reported by the USACE CRREL, an ice jam on the Oswegatchie River in the past few years resulted in flooding in the Village of Rensselaer Falls, and the fire department had to rescue some residents from their homes. The Town of Hammond experiences ice jams annually on Chippewa Bay, where ice has clogged culverts and caused localized flooding.

Probability of Future Events and Association with Climate Change

The County's vulnerability to ice jams remains moderate due to the large number of streams and major river systems located within St. Lawrence County and the cold winter temperatures in this region. Climate change may result in more frequent ice jams, particularly mid-winter breakup jams (Turcotte et al., 2020).

5.7 Flood

Hazard Description

Floods are natural events that occur when excess water from snowmelt, rainfall, or storm surges accumulates and overflows onto the banks and adjacent floodplains of waterbodies. While surface water flooding occurs in St. Lawrence County, most flooding issues throughout the County originate from beaver dams and inadequate stormwater drainage.

Several factors determine the severity of floods, including intensity and duration of rainfall, and topography of the watershed. A large amount of rainfall over a short time can result in flash flood conditions. Even a small amount of precipitation can result in flood events in locations where the soil is already saturated or in areas with large amounts of impervious surfaces (i.e., large parking lots, roadways, or areas of high-density development). Topography and land cover also contribute to the severity of flood events. Runoff tends to be greater in areas with steep slopes with limited vegetative cover. The frequency of flood inundation depends on the climate, soil, and slope of a particular area.

Geographic Extent and Frequency

The St. Lawrence River shoreline and the shorelines of other major waterbodies in the County are most susceptible. The County is moderately vulnerable to floods based on this hazard's moderate extent (several locations are affected at once), moderate onset (hours of warning), minor potential for property damage/injuries, and moderate frequency (once every two to five years). Floods generally have low damage and injury potential given the rural nature of the County. Flood warnings are issued by the National Weather Service, hydroelectric plants, highway department personnel and other programs. Floodwaters can inundate homes and businesses and disrupt utilities. Since digital flood insurance rate map data are not currently available for St. Lawrence County, HAZUS was used to model approximate 100-year and 500-year floodplains throughout the County, which are illustrated in Figure 5.7.

BCA Architects and Rootz, LLC completed a Shoreline Resiliency Study for the St. Lawrence River in 2019. This study assessed the vulnerability of shoreline ecosystems along the upper St. Lawrence River including the Towns of Hammond, Morristown, Oswegatchie, and Lisbon. A separate study was completed for the City of Ogdensburg. The goal of the County-wide study was to identify potential measures that could be taken to increase flood resiliency in these locations. As part of the study, a Floodplain Protection Overlay District indicating locations that are vulnerable to flooding

throughout the study area was identified. The proposed Floodplain Protection Overlay District generated by this study is generally limited to properties that are immediately adjacent to the St. Lawrence River shoreline. The Floodplain Protection Overlay District extends a bit further inland around Morristown Bay in the Town of Morristown, Red Mills and the Lisbon Beach in the Town of Lisbon, and Schermerhorn Landing, Chippewa Bay, Allen's Point, and Oak Point in the Town of Hammond.

This Overlay District layer was generated by overlapping data from multiple resources, including water level data, mapped wetlands, zoning information, existing infrastructure, land use data, FEMA letters of map amendments (LOMAs), flood damage reports, and other factors as detailed in the report (BCA Architects and Rootz, LLC, 2019). The full report detailing the Floodplain Protection Overlay District and recommended resiliency measures is available at the following link:

https://stlawco.org/sites/default/files/Planning/CommunityProjects/SLC%20REPORT%20DRAFT_FINAL_BCA_Rootz%2007.15.19.pdf

Although dam failure is not recognized as a natural hazard, high-hazard potential dams throughout the County were reviewed and considered when analyzing flood risks. The New York State Department of Environmental Conservation (NYSDEC) classifies dams based on the level of impact in the event of a failure. NYSDEC dam classification categories are summarized in Table 5.12 (Appendix A). Figure 5.8 (Appendix A) shows all intermediate and high-hazard potential dams (Class B or Class C dams) located in St. Lawrence County. Most of these dams are privately owned hydropower facilities. High-hazard potential dams are detailed in each jurisdiction's annex, if applicable (Appendix B).

Historical Hazard Occurrences and Damage Estimates

Flooding is New York State's most consistently damaging natural hazard, though St. Lawrence County experiences fewer documented floods than many other Counties in the State. St. Lawrence County was included in two federal disaster declarations for floods (Table 4.3, Appendix A). The first event (D-1095) occurred on January 24, 1996, and involved a severe storm that caused significant flooding across New York State, resulting in road closures, property damage, closed businesses, ten fatalities, and \$160 million dollars in eligible damages statewide. St. Lawrence County received multiple forms of public assistance because of this flooding declaration. The second flood disaster declaration (D-4348) occurred on May 2, 2017. A high water event on the St. Lawrence River was caused by a record amount of precipitation, and high inflows from Lake Erie and the Ottawa River Basin. Flooding and damage along the St. Lawrence River shoreline triggered a region wide emergency response. Additionally, a similar event

occurred in the spring of 2019 involving high water levels on the St. Lawrence River. A State of Emergency was declared on May 20, 2019 due to the high water. Numerous properties along the River were damaged, resulting in more than \$2 million in damages statewide. New York State pledged up to \$20 million to assist primary homeowners directly impacted by the 2019 flooding (NYS DHSES, 2020).

The NCDC flood records for St. Lawrence County from 2010 to 2021 are summarized in Table 5.13 and illustrated in Figure 5.9 (Appendix A). The events reported by NCDC resulted in a total of about \$5.55 million in property damage. In addition to the presidential declared disaster events, parts of St. Lawrence County experienced severe flooding during a three week event in May 2011 along the Raquette River. This event primarily affected the Town of Colton, though minor damage was also reported in the Town of Norfolk. Flooding along Plum Brook in late April and May 2011 caused about \$1 million in damages in the Towns of Norfolk and Louisville. Flooding along the St. Lawrence River on April 15, 2014 resulted in approximately \$4.1 million in damages in the northern part of the County. Flash flooding on July 24, 2017 in the Towns of Russell and Morristown caused \$105,000 in property damages. As of October 2021, a total of 81 flood loss claims have been reported through FEMA's National Flood Insurance Program, which reports a total of \$536,633 in damages since 1978.

Though floods occur in the County, the risk of flood damage in most jurisdictions is low. This is partially due to natural features and dams that help control water flow. Many major waterbodies in the County are controlled by dams, which helps to mitigate flooding. Minor seasonal flooding events are anticipated and are managed as they happen, according to standard protocols and within the context of other local municipal priorities. Many jurisdictions included flood-related mitigation actions targeting road or stormwater infrastructure improvements to address seasonal or precipitation-related flooding issues. Overall, a low population density and modest levels of public infrastructure throughout St. Lawrence County make even the worst flooding less of a concern compared to flooding that occurs in more urban areas.

HAZUS Flood Model Results

HAZUS estimates total economic annualized losses for buildings in St. Lawrence County to be \$252.5 million and \$280.5 million for the 100-year and 500-year flood return periods, respectively. The HAZUS loss estimates are much greater than damages that have been reported with historic severe flood events. Direct economic annualized losses estimated for the 100- and 500-year return periods are summarized below in Table 5.14, including capital stock losses of buildings and their contents, as well as associated income losses.

Table 5.14 – HAZUS Flood Model: Direct Economic Annualized Losses for Buildings								
Return Period	Capital Stock Losses (thousands of dollars)			Income Losses (thousands of dollars)				Total Loss
	Building Loss	Contents Loss	Inventory Loss	Relocation Loss	Capital Related Loss	Wages Losses	Rental Income Loss	
100-Year	55,932	57,741	803	15,370	13,840	101,900	6,938	\$252.5 million
500-Year	65,600	65,928	926	16,845	15,249	108,339	7,565	\$280.5 million

HAZUS estimates the total building damage count for the 100-year and 500-year flood return periods to be 259 and 290, respectively. These results suggest that less than 1% of buildings within the study region would be damaged as a result of a 100-year or 500-year flood event. Estimated number of damaged buildings for the 100- and 500-year return periods are summarized in Table 5.15, including what range of damage is anticipated for each building as a percentage of the building footprint.

Table 5.15 – HAZUS Flood Model: Building Damage Count								
Return Period	Count of Buildings (#) by Range of Damage (%)							
	<1	1-10	11-20	20-30	31-40	41-50	Substantial	TOTAL
100-Year	10	40	73	58	37	13	28	259
500-Year	12	34	86	60	46	17	35	290

HAZUS estimates the total area of building damage for the 100-year and 500-year flood return periods to be approximately 1.0 million square feet and 1.1 million square feet, respectively. The estimated area of building damages for the 100- and 500-year return periods are summarized in Table 5.16, including what square footage of damage is associated with each range of damage reported as a function of total individual building area.

Table 5.16 – HAZUS Flood Model: Building Damage by Square Footage (All values are in thousands of square feet)								
Return Period	Average Damage (ft ²) Within Each Damage Range (%)							
	<1	1-10	11-20	20-30	31-40	41-50	Substantial	TOTAL
100-Year	46	148	298	169	112	100	130	1,003
500-Year	51	142	323	200	120	126	163	1,125

HAZUS estimated the total debris generated from 100-year and 500-year flood events to be 21,026 tons and 25,890 tons, respectively. The estimated tonnage of debris generated from the 100-year and 500-year return periods are summarized in Table 5.17, including debris generated from building finishes, structures, and foundations.

Return Period	Debris Generated (Tons)			Total Debris
	Finishes	Structure	Foundation	
100-Year	6,278	7,848	6,900	21,026
500-Year	7,333	9,720	8,837	25,890

HAZUS estimates the total population displaced from a 100-year and 500-year flood event to be 1,764 and 2,003 persons, respectively. These results suggest that between 1% and 2% of the total study region population would be displaced as a result of a 100-year or 500-year flood event. Additionally, HAZUS results indicate that approximately 0.5% of the study region population would require shelter as a result of a 100-year or 500-year flood event. A summary of the estimated number of displaced persons and persons requiring shelter for each flood return period is provided in Table 5.18.

Return Period	Persons Seeking Shelter <i>(including percentage of total County population)</i>	Displaced Population <i>(including percentage of total County population)</i>
100-Year	556 (0.51%)	1,764 (1.63%)
500-Year	635 (0.59%)	2,003 (1.85%)

The HAZUS flood model result output summary reports are provided in Appendix G.

Probability of Future Events and Association with Climate Change

The County's vulnerability to flooding remains moderate. Climate change is likely to impact the severity and frequency of flooding in St. Lawrence County. With the anticipated increase in severe storms due to climate change, heavy precipitation and associated floods will likely become more common (Horton et al., 2014). The annual average amount of precipitation is projected to increase by up to 10% over the next 30 years. Due to this projected increase, the frequency and severity of flash flooding events in New York State are expected to rise (Rosenzweig et al., 2011). Increased precipitation during winter months could lead to more floods during that time of year, especially if the ground is frozen and less permeable. In addition, rising air and water

temperatures would cause ice and snow to melt more rapidly, leading to flooding during the winter and early spring months. Flooding is rated as a moderate risk in St. Lawrence County.

5.8 Drought

Hazard Description

A drought is defined as a prolonged period of limited precipitation affecting the supply and quality of water. Four types of droughts are recognized. Meteorological droughts are caused by a lack of precipitation that leads to dry conditions. Hydrological droughts are caused by changes in surface and groundwater supplies, and the effects of these events can persist for multiple years. Agricultural droughts relate to impacts to crops, forestry, and/or livestock caused by meteorological and hydrological droughts. Finally, socioeconomic droughts reflect water shortages that adversely impact the population at both small and large scales (NYS DHSES, 2019).

The U.S. Drought Monitor classifies droughts in five different categories based on severity, ranging from abnormally dry (D0) to exceptional droughts (D4) (Table 5.19, Appendix A). Droughts are most commonly characterized using the Palmer Drought Severity Index (also provided in Table 5.19, Appendix A).

Geographic Extent and Frequency

The County is moderately vulnerable to droughts based on this hazard's large extent (a large portion of the County is affected at once), slow onset (days of warning), moderate potential for property damage/injuries, and rare frequency (once every five or more years). Significant droughts causing emergency conditions have not occurred in St. Lawrence County. Droughts are more likely to adversely impact people who rely on private wells for their drinking water and to irrigate crops or water livestock. The rural portions of the County, particularly expansive agricultural areas and/or areas that lack access to public water would be most susceptible to drought impacts.

If a moderate drought were to occur, agricultural properties would likely experience the greatest impacts due to the extent of water use. According to the St. Lawrence County Agricultural Development Plan (2016), in 2016 there were 308,904 acres of farms covering 17% of the County's total area. There are approximately 3,200 farmland parcels in the County. The farms within St. Lawrence County are predominantly dairy farms. Vegetables and potatoes represent a small portion of total agricultural production within the County (St. Lawrence County Planning Office, 2016). The jurisdictions with the most agricultural properties in the County. About 15% of all

agricultural properties in the County (based on the County's 2020 tax parcel property classifications) are located in the Town of Lisbon. The Towns of Canton, De Kalb, and Oswegatchie each include between 6 and 8% of agricultural lands in the County. Farms that do not have local irrigation systems are more likely to experience negative effects from drought conditions.

Historical Hazard Occurrences and Damage Estimates

The NCDRC did not report any drought events for St. Lawrence County between 2010 and 2021. Historic drought conditions in St. Lawrence County reported by local records have typically resulted in impacts to private drinking water wells and agricultural operations. Although droughts can affect a large portion of the County, they typically result in minor, localized impacts.

Probability of Future Events and Association with Climate Change

The County's vulnerability to a drought remains moderate. There is no history in St. Lawrence County of a drought event causing emergency conditions. However, the frequency of droughts in New York State, particularly short-duration events occurring in the late summer months, is expected to increase in the future due to projected temperature increases associated with climate change (Horton et al, 2014).

5.9 Earthquake

Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along geologic faults. Major fault lines are located along the edges of Earth's tectonic plates, which do not underlie New York State. Seismic waves are produced from energy released from the fault or epicenter. The effects of an earthquake can be felt at distances far beyond its actual occurrence, though the effects are less severe as the distance increases. Earthquakes can generate ground motion and shaking, surface fault ruptures, and ground failure.

Geographic Extent and Frequency

An earthquake could take place anywhere in St. Lawrence County, and the County could also experience effects of earthquakes that occur outside of its jurisdictional limits. New York State was split into four seismic zones by the Multidisciplinary Center for Earthquake Engineering Research (MCEER), depending on the potential earthquake risk within New York State. Each zone is assigned a Peak Ground Acceleration Value (PGA)

which is used to determine the earthquake risk for each County in the State. The PGA Value measures the horizontal force of an earthquake in terms of percentage of gravity. The higher the value, the greater the earthquake risk in that area. As shown in Figure 5.10 (Appendix A), the PGA Values in St. Lawrence County range from 10-14%g to 20-30%g. A small part of the northeastern portion of the County overlaps the 30-40%g zone in NYS. The PGA value increases from west to east across the County. The PGA values associated with this figure are based on average soil conditions. Depending on the actual soil type at a location, the PGA value would either increase or decrease. The actual soil type can substantially increase the earthquake risk for a particular area.

Earthquakes that occur in St. Lawrence County are considered intraplate earthquakes. Intraplate earthquakes occur in areas of ancient zones of weakness formed over geologic history, which can persist within the earth's crust. Intraplate earthquakes allow seismic forces to be released, causing earthquakes to occur where there aren't any faults (Kafka, 2004). Earthquake events are measured by magnitude based on the modified Mercalli Scale (Table 5.20, Appendix A).

Historical Hazard Occurrences and Damage Estimates

The County is moderately vulnerable to earthquakes based on this hazard's moderate extent (several locations are affected at once), fast onset (no warning), low potential for property damage/injuries (based on previous events), and rare frequency (once every five or more years).

Historic earthquakes that have occurred within or near St. Lawrence County and associated event details are included in Table 5.21 in Appendix A. Two earthquakes have been reported in the County since 2010, and the epicenter of both events was located in Massena. These events occurred on November 28, 2015 (magnitude of 3.3) and July 14, 2021 (magnitude of 2.8). No significant damages were reported by either event. The most significant earthquake originating within St. Lawrence County occurred on September 5, 1944, near the Town of Massena. This 5.5 magnitude earthquake caused many chimneys to fall down around Massena, and other structural damages, resulting in approximately \$2 million in total damages. Multiple smaller earthquakes have originated in the northeast corner of St. Lawrence County, or near the County's border with Franklin County, to the east, but these events rarely cause noticeable damages.

HAZUS Earthquake Model Results

The HAZUS model estimates total building-related losses resulting from a specified earthquake event broken down into two categories: direct building losses and business interruption losses. Building-related losses estimated by the HAZUS model for the 100-

1,000-, 2,000-, and 2,500-year return periods are summarized in Table 5.22, below, including capital stock losses of buildings and their contents, as well as associated income losses resulting from business interruption.

Return Period	Capital Stock Losses	Income Losses	Total Loss
100-Year	\$4.989 million	\$2.163 million	\$7.15 million
1,000-Year	\$208.231 million	\$48.226 million	\$256.46 million
2,000-Year	\$454.574 million	\$104.783 million	\$559.36 million
2,500-Year	\$574.901 million	\$132.163 million	\$707.12 million

For transportation and utility system inventories, HAZUS estimates direct repair costs associated with various infrastructure components following a modeled earthquake event. Direct economic losses associated with transportation and utility system repair costs associated with the 100-, 1,000-, 2,000- and 2,500-year earthquake return periods are provided in Tables 5.23 and 5.24, below.

Return Period	Type of Transportation System				
	Highway	Railways	Bus	Port	Airport
100-Year	\$1,000	None	\$106,000	\$44,000	\$321,000
1000-Year	\$851,000	\$13,000	\$1.728 million	\$930,000	\$4.307 million
2,000-Year	\$2.958 million	\$123,000	\$2.814 million	\$1.564 million	\$6.788 million
2,500-Year	\$4.185 million	\$220,000	\$3.274 million	\$1.816 million	\$7.786 million

Return Period	Type of Utility System				
	Potable Water	Waste Water	Natural Gas	Electrical Power	Communication
100-Year	\$16,000	\$3.9 million	\$3,000	\$2.5 million	\$1,000
1000-Year	\$44,400	\$382.0 million	\$76,500	\$182.6 million	\$96,000
2,000-Year	\$1 million	\$768.9 million	\$178,000	\$350.9 million	\$197,000
2,500-Year	\$1.4 million	\$942.8 million	\$232,000	\$427.8 million	\$244,000

HAZUS estimates the number of households expected to be displaced by a modeled earthquake event, including the number of persons who would require temporary public shelter as a result of their displacement. The HAZUS results evaluated for the study region suggest that less than 0.5% of the total study region population would be

displaced or require shelter as a result of a 100-, 1,000-, 2,000-, 2,500-year earthquake events. A summary of the estimated number of displaced persons and persons requiring shelter for each earthquake- return period is provided in Table 5.25, below.

Return Period	Persons Seeking Shelter <i>(including percentage of total County population)</i>	Displaced Population <i>(including percentage of total County population)</i>
100-Year	3 (0.003%)	4 (0.004%)
1,000-Year	107 (0.99%)	158 (0.15%)
2,000-Year	275 (0.25%)	406 (0.37%)
2,500-Year	370 (0.37%)	546 (0.50%)

HAZUS estimates the total debris generated from the evaluated earthquake return periods to range from <0.01 million tons and 0.18 million tons of debris for the 100-year and 2,500-year event, respectively. The estimated quantity of debris in millions of tons generated from each evaluated return period are summarized in Table 5.26, below, including brick and wood debris, reinforced concrete and steel debris, and total debris.

Return Period	Debris Generated (Millions of Tons)			
	Brick/Wood	Reinforced Concrete/Steel	Total Debris	Truck Loads (25 tons/truck)
100-Year	0.00	0.00	0.00*	120
1,000-year	0.04	0.02	0.06	2,560
2,000-year	0.08	0.06	0.14	5,520
2,500-Year	0.10	0.08	0.18	7,040

**Total debris generated was under 0.01 million tons and was not reported by HAZUS.*

HAZUS earthquake model result output summary reports are provided in Appendix G.

Probability of Future Events and Association with Climate Change

The County's vulnerability to an earthquake remains moderate. St. Lawrence County lies within a seismically active area of New York State; therefore the potential exists for a significant earthquake event to affect the County. Earthquakes are driven by tectonic processes beneath the surface of the Earth and are not influenced by weather

conditions (Buis, 2019); therefore, the frequency and severity of earthquakes are not expected to be influenced by climate change.

5.10 Wildfire

Hazard Description

A wildfire is defined as an uncontrollable combustion of trees, brush, or grass involving a substantial land area which may have the potential for threatening human life and property. Dry conditions at various times of the year can increase the potential for wildfire events. Often, wildfires begin abruptly and spread quickly, creating a dense smoke that can fill the surrounding area for miles. Humans start four out of every five wildfires, typically due to debris burns, arson, or carelessness (NYSDEC, 2017).

Geographic Extent and Frequency

Wildfires have the potential to occur throughout St. Lawrence County, especially in rural areas outside of the Villages and City with substantial open fields, brush land, or forested land. The County is moderately vulnerable to wildfires based on this hazard's small extent (typically one location is affected at once), fast onset (no warning), low potential for property damage/injuries (based on previous events), and moderate frequency (once every two to five years). Few occurrences of large wildfires are documented within St. Lawrence County, and the County is not included in a seasonal significant wildfire watch area, as predicted by National Interagency Coordination Center (NICC). According to the Forest Ranger Division of NYSDEC, 95% of wildfires in New York State occurring between 1993 and 2017 have been caused by humans, while lightning is responsible for the remaining 5%. In New York State, debris burning accounts for 33% of all human-caused wildfires, incendiary fires account for 16%, campfires cause 16%, and children are responsible for 4%. Smoking, equipment, railroads and miscellaneous causes contribute to the remaining 25% of human-caused wildfires reported by New York State (NYSDEC, 2017).

Historical Hazard Occurrences and Damage Estimates

Six records of wildfires over 10 acres occurred in St. Lawrence County between 2003 and 2017 (Figure 5.11, Appendix A). No major wildfires (over 100,000 acres in size) have been reported within St. Lawrence County. These events have mostly occurred in fields or on undeveloped lands. Two wildfires occurred in the Town of Norfolk, one in the Town of Russell, one in the Town of Hopkinton, one in the Town of Parishville, and one in the Town of Potsdam. Figure 5.11 indicates that the southern part of the County (much of which is located in the Adirondack Park) experiences 0 to 0.3 wildfires per

square mile, while the northern two thirds of the County generally experiences 0.4-1.3 wildfires per square mile.

No records of structural damage or loss of life were uncovered in association with these reported wildfire occurrences. Changes in climate can shift the fire regime; however, the northeast United States is not recognized as a fire-prone region. Given the rural landscape of St. Lawrence County, a wildfire event is unlikely to cause extensive infrastructure or property damage.

Probability of Future Events and Association with Climate Change

The County's vulnerability to a wildfire remains moderate. Debris burning is common across the County, as well as camping and backpacking and these harmless fires often are the sources of wildfires. Additionally, the frequency and extent of wildfires is likely to increase with climate change due to an overall increase in temperatures (Rosenzweig et al., 2011).

5.11 Landslide

Hazard Description

Landslides are defined as the downward movement of a sloped land mass under the force of gravity. Landslides can involve rock, soil, artificial fill, or combinations of these materials. Landslides are activated by storms, earthquakes, volcanic eruptions, fires, freezing/thawing, and steepening of slopes by erosion or human modification.

Geographic Extent and Frequency

The County is moderately vulnerable to landslides based on this hazard's small extent (one location is affected at once), fast onset (no warning), low potential for property damage/injuries (based on previous events), and rare frequency (once every five or more years). Minor landslides occur several times a year in St. Lawrence County, but typically occur in low-populated areas that contain little to no private property or public infrastructure. When they do occur, they are commonly triggered by heavy rainfall events, and on slopes steepened by erosion. There are several areas mapped as high susceptible/low incidence for landslides in St. Lawrence County (Towns of Massena, Louisville, Waddington, Lisbon, and Oswegatchie), and several areas mapped as moderate susceptible/low incidence of landslides (Towns of Hammond, Morristown, Lisbon, and Oswegatchie). However, most of the County is designated as a low incidence (Figure 5.12, Appendix A).

Historical Hazard Occurrences and Damage Estimates

Landslides tend to affect one location at a time, but occur with no warning. Damage impacts and injuries are typically low, and significant landslide events rarely occur in the County. There have been multiple occurrences of minor landslides or slope settlement on County Route 11 in the Town of De Kalb, County Route 19 in the Town of Edwards, County Route 11 near Welch Road in the Town of Gouverneur, County Route 24 in the Town of Pierrepont, County Routes 3, 10, and 8 in the Town of Rossie, and along the Grass River in the Town of Louisville. In addition, the County has experienced localized embankment issues along the Raquette River on County Route 46 in the Town of Massena. All of these issues are actively occurring and are being addressed as needed. The County mitigated an embankment failure on County Route 40 in Massena over 20 years ago. There are also areas of significant erosion along the St. Lawrence River that could lead to landslide issues. The NCDRC does not report specific records of landslides occurring within St. Lawrence County. Specific damage estimates for landslides are not available; however, damages reaching hundreds of thousands of dollars or more could result from a single event depending on its severity.

Probability of Future Events and Association with Climate Change

The County's vulnerability to a landslide remains moderate. Areas along roads that pass through rock cuts or other steep slopes as well as the shorelines of major waterbodies remain vulnerable to landslides. Landslides may occur more frequently due to climate change in association with an increase in heavy rainfall events (Horton et al., 2014).

5.12 Infestation

Hazard Description

Infestation is defined as an excessive population of insects, plants, rodents, or other animals requiring control measures due to their potential to carry diseases, destroy crops, or harm the environment. Although multiple invasive species are present in St. Lawrence County, the focus species for the HMP update are the emerald ash borer (*Agrilus planipennis*) given recent confirmed observations in portions of the County and Eurasian watermilfoil (*Myriophyllum spicatum*) due to its prevalence in Black Lake and other waterbodies.

Geographic Extent and Frequency

Infestations could occur anywhere in St. Lawrence County. Depending on the type of infestation, the hazard can be widespread or localized. The County has a low overall

vulnerability for infestations based on this hazard's moderate extent (several locations are affected at once), slow onset (days or more of warning), low potential for property damage/injuries, and rare frequency (once every five or more years).

The emerald ash borer could affect any locations in the County with ash trees. Stands of ash trees along roadways are of primary concern. Emerald ash borer larvae feed on the inner bark of ash trees, which disrupts nutrient and water flow and ultimately kills the tree. Most trees die 2 to 4 years after becoming infected with emerald ash borer (NYSDEC, 2021a). The St. Lawrence County Soil & Water Conservation District (SWCD) completed an ash and hazard tree assessment along County road right-of-ways in 2019 (Appendix H). The SWCD identified a total of 11,856 ash trees along 571 miles of county roadways (averaging 5.5 ash trees per mile). Of the total, 3,144 trees were already dead or dying. To date, emerald ash borer has been documented in the northern part of the County including the Towns of Hammond, Morristown, Oswegatchie, Lisbon, Waddington, Louisville, Massena, and Brasher, and the City of Ogdensburg. It is expected that emerald ash borer will continue to spread at a rate of 0.5 to 3 miles per year (St. Lawrence County SWCD, 2019). A number of other municipalities in the County are implementing proactive management strategies, as described in the jurisdictional annexes (Appendix B).

Eurasian watermilfoil is an invasive aquatic plant that has been reported in Black Lake and the St. Lawrence River. This species grows to the water surface during the early part of the growing season and shades out native aquatic plant species, which alters the aquatic ecosystem and reduces recreational opportunities. Any open waterbodies within St. Lawrence County are susceptible to future infestations.

Historical Hazard Occurrences and Damage Estimates

The emerald ash borer is an invasive insect of increasing concern within New York State. Research indicates that it has been present in some areas in the County since the mid-1990s. The emerald ash borer was first confirmed in NYS on June 17, 2009, in Cattaraugus County and was confirmed in St. Lawrence County in 2017. New York State Department of Environmental Conservation (NYSDEC) data estimates that 7-15% of the total tree volume in northern St. Lawrence County is ash (NYSDEC, 2021a). Southern portions of the County are estimated to have between 0-6% ash populations (Figure 5.13). Destruction of ash trees would lead to increases in property, road, and infrastructure damages. Documented observations of emerald ash borer in St. Lawrence County as of December 2020 are shown in Figure 5.14.

The SWCD hazard tree report prioritized areas for ash tree removal, beginning with the northern edge of the County where emerald ash borer is already present. The SWCD summarized priority removals over a three year period (removing trees at a 2 mile buffer per year to keep up with emerald ash borer spread). The SWCD determined that an average of 2,176 trees would need to be removed per year, with an average cost of \$822,881 per year (about \$380 per tree).

Eurasian watermilfoil was initially documented in Black Lake in 1970. Black Lake is the largest lake in St. Lawrence County located in the Towns of Hammond, Morristown, Oswegatchie, Macomb, Rossie, and De Peyster. Land uses surrounding the Lake are primarily seasonal residences and commercial properties. Black Lake generates millions of dollars in tourism-related revenue each year, and the spread of Eurasian watermilfoil has noticeably degraded recreational use of the Lake (QEA, 2008). The Black Lake Invasive Weeds Committee worked with Quantitative Environmental Analysis, LLC to develop a Eurasian Watermilfoil Management Plan in 2008 (which is provided in Appendix H). It was estimated total removal would cost up to \$20 to 30 million. The NYSDEC has also developed an Aquatic Invasive Species Management Plan to protect waters in the Adirondacks (QEA, 2008).

With the expected increase in non-native species introductions in the County, an increase in damages can also be expected. Also, as climate change occurs, conditions will become more favorable for growth and reproductive cycles of these species. The best way to limit damage is to limit the spread of these pests through management and education.

Probability of Future Events and Association with Climate Change

The County's vulnerability to an infestation remains low. Given the steady increase of documented invasive species in the country, new invasive populations within the County are expected to continue. A 2011 study indicated that there is over a 30 percent chance that another damaging wood boring insect will be introduced into the U.S. within the next 10 years. Local government coordination with local property owners and utility providers will be critical in mitigating the risks associated with tree fall and debris management. Additional public education and outreach is needed to limit the spread and introduction of non-native species. Current climate change projections result in long-term temperature increases and changes in weather patterns that are likely to create a more favorable environment for some of the species outlined above. Monitoring is needed to effectively identify and manage these target species. This hazard is highly likely (75%-100%) to occur in St. Lawrence County within the next year. The County plans to continue public awareness and education campaigns to educate the

public about invasive species. This involves the ongoing efforts of the County's Environmental Management Council, working alongside the County SWCD and local utility companies to proactively manage ash tree populations and treat aquatic invasive species infestations such as Eurasian water milfoil. Public outreach is also important to reduce the spread of these species.

6.0 HAZARD VULNERABILITY

6.1 Identified Assets

Representatives from each jurisdiction updated their critical facility list, which is provided in each jurisdictional annex (Appendix B). Critical facilities for St. Lawrence County are listed in Table 2.8 (Appendix A). The County has a list of designated emergency shelter locations. The County works with the American Red Cross to coordinate emergency shelter operations. Established heating or cooling centers throughout the County are generally the same as Red Cross shelter locations. The County's shelter list is not publicly shared but it generally includes schools that have shower, bathroom, and kitchen facilities and food supplies. Emergency shelters for each jurisdiction and potential locations for temporary or permanent housing for displaced residents are discussed individually in each jurisdictional annex (Appendix B).

6.2 Damage Potential

The damage potential for housing within St. Lawrence County was estimated using housing characteristics and values reported by the U.S. Census Bureau. According to the 2019 American Community Survey, St. Lawrence County had 42,832 occupied housing units, of which, 73.2% were owner-occupied and 26.8% were renter-occupied. The housing vacancy rate in the County is 20%. Tables 6.1 to 6.3, below, indicate the types of housing units, age of structures, and housing unit values within St. Lawrence County.

Table 6.1 – Housing Types in St. Lawrence County <i>(2019 American Community Survey – U.S. Census Bureau)</i>	
Type of Housing	Percent of Total Occupied Housing Units in County
Single unit structures	72.5%
Multi-unit structures	16.2%
Mobile homes	11.2%
Boat, RV, van, etc.	0.1%

Table 6.2 – Age of Structures in St. Lawrence County (2019 American Community Survey – U.S. Census Bureau)	
Structure Built Date	Percent of Total Owner Occupied Housing Units in County
2000 or more recent	9.9%
1980-1999	20.6%
1960-1979	20.0%
1940-1959	17.9%
1939 or prior	31.6%

Table 6.3 – Housing Value Ranges in St. Lawrence County (2019 American Community Survey – U.S. Census Bureau)	
Value	Percent of Total Owner Occupied Housing Units in County
\$50,000 or less	15.5%
\$50,000 - \$99,000	98.6%
\$100,000 - \$149,000	18.6%
\$150,000 - \$199,000	11.4%
\$200,000 - \$299,000	8.7%
\$300,000 - \$499,000	4.6%
\$500,000 or greater	2.6%

According to Table 6.2, nearly half (49.5%) of the infrastructure in the County was constructed prior to 1960, and 31.6% of that total were built in 1939 or earlier. Older houses are typically more susceptible to impacts or damage from natural hazards, particularly floods (if the structure pre-dates floodplain development standards). Mobile homes (11.2% of homes within the County) are also particularly vulnerable to storm damages. In addition, approximately 20% of homes within the County are vacant. Vacant structures are not always well maintained, making them more susceptible to damage from storm events.

According to the 2019 American Community Survey, the estimated median value of an owner-occupied housing unit in St. Lawrence County is \$115,900. If 1% of the occupied houses in St. Lawrence County each sustained \$1,000 in minor damages from a storm event, this would total approximately \$428,000 in damages. The total assessed full market values of properties within the County by jurisdiction are listed in Table 6.4

(Appendix A). The ranges of potential damages, in dollars, to vulnerable structures and loss of life potential due to a variety of natural hazards are listed in Table 6.5, below.

Table 6.5 – Range of Potential Damages (\$) to Vulnerable Structures due to Natural Hazards		
Natural Hazard	Damage Potential	Loss of Life Potential
Severe Thunderstorm/Wind/ Hail/Tornado	\$0-\$1,000,000 each event	Moderate
Ice Storm	\$0-\$3,000,000 each event	Moderate
Severe Winter Storm	\$0-\$500,000 each event	Moderate
Coastal Storm	\$0-\$1,000,000 each event	Moderate
Extreme Temperatures	\$0-\$500,000 each event	Low
Ice Jam	\$0-\$1,000,000 each event	Low
Flood	\$0-\$4,000,000 each event	Moderate
Drought	\$0-\$500,000 each event	Low
Earthquake	\$0-\$6,000,000 each event	Low
Wildfire	\$0-\$100,000 each event	Low
Landslide	\$0-\$100,000 each event	Low
Infestation	\$0-\$15,000,000 each event	Low

6.3 Development Trends

6.3.1 Vulnerable Populations

People under the age of 5 or who are age 65 and older are considered to be in vulnerable age groups. The 2019 American Community Survey estimates that St. Lawrence County has a vulnerable age population of approximately 24,752 people, approximately 23% of the County's total population. Of this total, 4.9% are under 5 years old (0.8% decrease compared with the 2010 American Community Survey Census data) and 18.1% are 65 years of age or older (4.4% increase compared with the 2010 American Community Survey Census data).

In addition to those in vulnerable age groups, the poor are especially susceptible to disasters as they may not have access to resources needed to prepare for, respond to, and recover from these events. The 2019 American Community Survey estimates that 17.9% of people in St. Lawrence County have incomes below the poverty level, which has decreased by 1.5% since the 2015 Census (19.4%).

The Social Vulnerability Index (SoVI) is a metric developed by the University of South Carolina College of Arts & Sciences Hazards and Vulnerability Research Institute (HVRI). The index is used to compare the vulnerability of different geographic areas to natural hazard events. The SoVI is calculated based on multiple variables obtained from recent Census data. The average 2010-2014 SoVI value for Counties in NYS is -0.235. St. Lawrence County had a 2010-2014 SoVI value of 0.13, which is within the 52nd percentile nationwide, and amounts to average vulnerability. The SoVI map from the 2019 NYS HMP is provided in Figure 6.1. According to these data, the SoVI for census tracts in St. Lawrence County ranges from -2.49 in Census Tract 73501 (the eastern portion of the City of Ogdensburg) to 4.87 in Census Tract 73490 (which covers portions of the Town and Village of Massena) (NYS DHSES, 2019).

6.3.2 Housing Availability

The vast majority (72.5%) of occupied housing units in St. Lawrence County are owner-occupied. The median value of owner-occupied housing units in St. Lawrence County are approximately \$43,400 less than those in neighboring counties, on average.

6.3.3 Recent and Planned Development

Structural developments or redevelopments that have been completed since 2015 or are currently planned are summarized in each jurisdictional annex (Appendix B). Countywide, approximately 25 small-scale solar projects have been constructed since 2019, and more are planned for construction in the future. None of the solar project locations are located within known vulnerable locations for natural hazard events.

7.0 HAZARD MITIGATION AND ADAPTATION

7.1 Hazard Mitigation Goals and Objectives

St. Lawrence County developed the following goals and strategies based on the risk assessment results, general vulnerabilities, and overall capabilities of the County and jurisdictions. Goals are broad policy-type, long-term statements that represent global visions (FEMA 386-3, 2003). The goals and objectives identified by this process represent what the participants were hoping to achieve through the implementation of this hazard mitigation plan. Specific mitigation strategies were identified that support the goals and objectives of this plan. These strategies were adjusted based on hazard research, input from St. Lawrence County and jurisdiction representatives, and comments received during the public and stakeholder review process.

Each goal includes a list of objectives that further describe the specific strategies or implementation steps associated with that goal. Unlike goals, objectives are specific and measurable (FEMA, 2017). The objectives were based on generally grouping common mitigation strategy themes that were identified during working group meetings and County representative meetings. All goals identified from the risk assessment process are compatible with the goals of St. Lawrence County.

Goal 1: Continue Community Education about Hazard Mitigation and Disaster Preparedness

Objectives:

- a) Educate public on how to prevent impacts from hazard events.
- b) Educate public how to prepare for hazard events and the course of action to follow if hazard events occur.
- c) Alert community of emergency shelter locations and procedures that go into effect in advance of and during a hazard/disaster event.

Goal 2: Encourage Partnerships and Mutual Aid Agreements

Objectives:

- a) Consider opportunities for inter-municipal awareness of and cooperation during emergency and hazard events.
- b) Implement or maintain mutual aid agreements with specialty groups for hazard events.

Goal 3: Provide for Public Health and Safety

Objectives:

- a) Consider debris management planning, including proactively clearing roadways and waterways of debris and the implementation of a disaster debris management plan to be followed before, during, and after hazard events.
- b) Create an up-to-date inventory of emergency response equipment and supplies, and improve accessibility of these resources. Identify equipment gaps and supply needs.

Goal 4: Protect the Environment, Private Property, and Community Infrastructure

Objectives:

- a) Review existing municipal codes, setbacks, and review processes for improvements that could be made to better protect infrastructure and private assets.
- b) Enforce and promote smart development within each municipality and the County.
- c) Identify and improve public water supply and wastewater treatment facilities, as needed, to ensure continuity of operations during a hazard event.
- d) Identify critical facilities and emergency shelter locations that should have backup power generation capabilities.
- e) Identify measures to improve efficiency and continuity of emergency operations at critical facilities.
- f) Identify emergency shelters or other facilities that could be used as cooling centers.
- g) Evaluate opportunities to decrease flooding problems within the County and decrease property impacts.
- h) Improve stormwater drainage infrastructure.
- i) Improve deficient transportation infrastructure.

Goal 5: Improve Emergency Communications and Response Protocol

Objectives:

- a) Establish and maintain procedures to notify affected individuals – particularly the elderly, persons with special needs, and the Amish community – in advance of a potential hazard/disaster event.
- b) Improve public communications and alert systems in the County.
- c) Review and publish response plan protocols.

7.2 Mitigation Strategy

7.2.1 2015 Hazard Mitigation Plan Implementation

The County has implemented a number of actions that were identified in their 2015 HMP, and elected to revise and re-include selected 2015 actions that have not been implemented or fully completed to date. Details regarding the status of the County's mitigation actions from their 2015 HMP are listed in Table 7.1 (Appendix A). The status of mitigation actions identified by individual jurisdictions in the County's 2015 HMP are summarized in each jurisdictional annex (Appendix B).

7.2.2 Proposed County Mitigation Actions for HMP Update

Multiple mitigation actions were proposed by St. Lawrence County for the HMP update to reduce the impact of potential natural hazard events. The implementation of these specific mitigation actions will aid in achieving the goals and objectives listed in Section 7.1. The County's mitigation actions fall under the following six broad categories indicated by FEMA 386-3:

- **Prevention** – Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital government programs, open space preservation, and storm water management regulations.
- **Property Protection** – Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness** – Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- **Natural Resource Protection** – Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor

restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- **Emergency Services** – Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- **Structural Projects** – Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

The County proposed nine actions to be considered for the present HMP update, which are detailed in Table 7.2 (Appendix A). Four of these actions (SLC 2, SLC 4, SLC 6, and SLC 7) are ongoing actions from the 2015 HMP that were updated and re-included. Three of the County’s proposed actions (SLC 5, SLC 6, and SLC 9) are considered preparedness rather than mitigation; however, the County chose to include them in this plan because they are still priority projects that are relevant to hazard mitigation concerns. Each participating jurisdiction developed at least two individual mitigation actions that were specific to their needs, which are described in each jurisdictional annex (Appendix B).

7.2.3 Mitigation Action Prioritization

The mitigation actions proposed as part of the County HMP update were developed by the Mitigation Planning Committee, jurisdiction representatives, and representatives of other stakeholder agencies. General priority measures were instituted in order to prioritize the proposed mitigation actions that are included as part of this plan. The recognized priority levels are based on the current knowledge of what each action would entail, including their estimated costs, timeframes, and potential funding sources. Mitigation action prioritization will be reviewed and revised during the 5-year plan update intervals.

A cost-benefit evaluation matrix was used to review the benefits and costs associated with each mitigation action. Each proposed mitigation action was assigned a cost, benefit, or neutral rating for seven different categories: Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE). The STAPLEE concept employs a technique for identifying, evaluating, and prioritizing mitigation actions based on existing local conditions (FEMA, 2013). This method provides set factors with which to review the feasibility of implementing each proposed mitigation action. The results of the STAPLEE

evaluations were factored into each mitigation action’s priority determination, based on the level of benefits that each action provided. Table 7.3 below details the factors incorporated into the STAPLEE evaluation that was completed for each mitigation action. This analysis allowed plan participants to weigh the pros and cons of implementing the proposed mitigation actions included in this plan.

Table 7.3 – STAPLEE Evaluation Factors		
Evaluation Category		Evaluation Criteria
S	Social	Evaluated in terms of community acceptance. Does the action have social benefits?
T	Technical	Evaluated in terms of feasibility. Will the action help to reduce losses in the long-term with minimal secondary impacts? Does the action act as a partial or complete solution?
A	Administrative	Evaluated based on staffing, funding, and maintenance requirements. Do the participating jurisdictions have the personnel and capabilities to implement the action? Are additional resources required?
P	Political	Evaluated by political leadership and emergency management acceptance. Will the action receive political support?
L	Legal	Evaluated based on legal authority to undertake an action. Which unit of government is likely to undertake the action?
E	Economic	Evaluated according to funding availability and budget constraints. Where will funding for the action come from?
E	Environmental	Evaluated based on impacts to the environment. Would implementation of the action create negative consequences to environmental assets?

In addition, benefit and cost rankings were assigned to proposed mitigation actions and included in the STAPLEE criteria consideration tables as indicated in Table 7.4, below.

Table 7.4 – Benefit and Cost Rankings			
	Assessment Levels and Description		
	High	Medium	Low
<i>Benefits</i>	Action is anticipated to have an immediate impact on reduction of losses – both life and property.	A long-term impact on the reduction of loss of life is expected or an immediate impact on loss of property.	It is difficult to assess the benefits of an action due to its long-term timeframe.

Table 7.4 – Benefit and Cost Rankings			
	Assessment Levels and Description		
	High	Medium	Low
<i>Costs</i>	Existing funding sources are inadequate or are not identified to cover implementation of the action.	Funding exists, but will have to be reappropriated or budgeted over multiple years.	Funds to implement action are available in existing budget.

Actions recorded as having a benefit level equal to or higher than the cost level were viewed as cost-beneficial actions, and receiving a high priority ranking. This priority ranking process should be viewed as a preliminary analysis. As the implementation of mitigation strategies is progressed, the ranking system used during this evaluation will evolve based on input from participating jurisdictions, agency representatives, and other branches of state and federal government. Additional funding sources will be required for many of the proposed mitigation actions. Coordination with agencies such as NYS DHSES and FEMA will be necessary to secure funds for proposed mitigation actions, especially those with high costs and long-term implementation schedules.

After the STAPLEE and cost-benefit evaluations were completed, each action was prioritized. The results of the evaluation process for the County’s proposed mitigation actions are detailed in Table 7.5 (Appendix A). Individual mitigation actions for each jurisdiction were also evaluated using this method, and each jurisdiction’s STAPLEE table is included in their jurisdictional annex (Appendix B).

7.2.4 Mitigation and Adaptation Strategy Implementation

The proposed mitigation actions were developed based on local needs and priorities, as identified by the County, jurisdiction representatives, and stakeholder groups. The proposed actions were chosen based on their effectiveness in accomplishing one or more of the goals established as part of this hazard mitigation plan. After actions were suggested, they were analyzed to determine their feasibility, cost, and implementation timelines. The specific hazards mitigated, goals and objectives achieved, implementing agency, estimated costs, planning mechanisms, potential funding sources, and implementation timeframes for each action are detailed in Table 7.2 (Appendix A). The approximate costs considered for each mitigation action were

determined based on estimated price ranges. When specific cost estimates were not available, cost ranges were defined as follows:

- Low: below \$10,000.
- Medium: between \$10,000 and \$100,000.
- High: over \$100,000.

For some mitigation actions, the timeframe is presented as a range. This indicates that the action is currently being implemented or should be implemented as soon as possible and that it will continue throughout the life of the current mitigation plan. Often, long-term actions require updates, annual reviews, or extensive coordination and/or implementation that may take longer than five years to complete. Details of mitigation actions for individual jurisdictions are presented in each jurisdictional annex (Appendix B). Potential funding sources for mitigation actions are summarized in Table 7.6 (Appendix A).

8.0 NATIONAL FLOOD INSURANCE PROGRAM

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2021c).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2021c).

8.1 St. Lawrence County Floodplain Mapping

Floodplain mapping in St. Lawrence County consists of the original FEMA FIRMs that were developed in the late 1970s through the early 1990s (FEMA, 2021e). Twelve jurisdictions in St. Lawrence County remain unmapped by FEMA and therefore have no floodplain mapping available. Table 8.1 (Appendix A) summarizes FIRM availability and publication dates for municipalities within St. Lawrence County.

FEMA is currently conducting a Flood Insurance Study for St. Lawrence County, which will generate new FIRMs countywide, including digital floodplain data. All jurisdictions in St. Lawrence County are included in this study. The project involves a detailed flood study for the St. Lawrence River, Black Lake, Portaferry Lake, Five Falls Reservoir, and

portions of the Grass River, Oswegatchie River, Raquette River, St. Regis River, and West Branch St. Regis River. Approximate flood studies will be completed for all mapped streams within the County, the remaining portions of the rivers mentioned above, and the Little River, Dead Creek, Trout Brook, and North Branch Grass River. The detailed flood studies are generally limited to the more populated areas within the County. Data related to FEMA's ongoing flood study are available online at:

<https://www.arcgis.com/apps/webappviewer/index.html?id=3e95d76d33f545ad90abe78b97e52ed0>

8.2 St. Lawrence County National Flood Insurance Program (NFIP) Participation

All but one jurisdiction in St. Lawrence County participate in the NFIP. The Village of Hammond does not currently participate in the NFIP. The Village does not experience significant flooding issues, according to local records. Details regarding NFIP policies and coverage for each jurisdiction are summarized in Table 8.2 (Appendix A). NFIP claims and losses for each jurisdiction are summarized in Table 8.3 (Appendix A). None of the jurisdictions within St. Lawrence County participate in the Community Rating System (CRS) program. The CRS is a voluntary incentive program that recognizes and encourages floodplain management activities at the community level. As a result of CRS participation, flood insurance premium rates are discounted to reflect the reduced flood risk that results from community actions to meet the three goals of the CRS: reduce flood loss, facilitate accurate insurance ratings, and promote flood insurance awareness (FEMA, 2021a).

Most jurisdictions in the County have adopted floodplain regulations, as indicated in Table 1 in each jurisdictional annex (Appendix B). The Towns of De Kalb, Hermon, Lawrence, Lisbon, Louisville, Macomb, Madrid, Pierrepont, and Russell and Villages of Hammond and Richville have rescinded their former floodplain regulations because they are unmapped by FEMA's existing FIRMs. All jurisdictions in the County except the Village of Hammond participate in the NFIP. Most jurisdictions that participate in the NFIP have active policies and/or have properties with filed flood loss claims, and the communities along the shoreline of the St. Lawrence River have been impacted by recent high water levels. However, it is emphasized that most jurisdictions do not experience significant flood risks, as discussed in Section 5.7. Coupled with overall low risk, most of the property values in the County are relatively low, which makes it difficult for even serious events to cause enough damage to meet State or Federal thresholds for disaster declarations and funding assistance, as evidenced in the total claims and damages reported in Table 8.3.

8.3 NFIP Policy and Loss Statistics

NFIP policy data and loss statistics (as of October 16, 2021) were obtained from FEMA to determine the extent of participation, flood losses, and active flood insurance policies in St. Lawrence County. Tables 8.2 and 8.3 (Appendix A) summarize the number of active flood insurance policies in place and claims filed to date for each jurisdiction in St. Lawrence County. Specific information for each municipality is also summarized in each jurisdictional annex (Appendix B).

Table 8.2 summarizes the total number of active flood insurance policies and premium amounts for all jurisdictions in St. Lawrence County as of October 16, 2021. Policy data were not reported for the Town of Clare, though this community participates in the NFIP. No policy data are available for the Village of Hammond because they do not currently participate in the NFIP. Additionally, while FEMA still lists the Village of Hermon and Village of Morristown as NFIP participants, both Villages were dissolved. The policy and claims data reported for the Villages of Hermon and Morristown were combined with the Towns of Hermon and Morristown, respectively, in Tables 8.2 and 8.3. The Town of Morristown has the largest number of active policies (19) and the most total policy coverage (\$3,461,400).

Table 8.3 summarizes the number of flood loss claims filed to date in each jurisdiction and payments associated with losses from January 1, 1978 to October 16, 2021. NFIP Loss Statistics indicate that the Village of Gouverneur has experienced the most flood losses (16), while the Town of Louisville has sustained the most total damage (\$95,872.43). Nearly half of all municipalities in the County (20 total) have not reported any loss claims since this information started to be collected in 1978, including the Towns of Clifton, Colton, De Kalb, De Peyster, Edwards, Hermon, Hopkinton, Lawrence, Lisbon, Macomb, Norfolk, Parishville, Piercefield, Pierrepont, Pitcairn, Potsdam, and Waddington and Villages of Heuvelton, Potsdam, and Waddington. As mentioned above, the Village of Hammond does not participate in the NFIP and therefore has no claims data available.

8.4 Repetitive and Severe Repetitive Loss Statistics

According to FEMA, there are a total of five repetitive loss properties in St. Lawrence County as of October 16, 2021 (Table 8.4, Appendix A). All of these properties are single-family residential homes. Collectively, these properties have incurred a total of 14 flood losses with total payments of \$126,800.19, with an average payment of \$25,360.04 per loss. There are no severe repetitive loss properties in St. Lawrence County according to the 2021 data provided by FEMA.

9.0 PLAN MAINTENANCE

9.1 Plan Monitoring and Evaluation

The County staff on the Mitigation Planning Committee will be responsible for meeting annually to discuss the implementation of the mitigation plan and identify any necessary updates. It is recognized that with increased growth and the passing of time, there may be changes in County and jurisdiction representatives. Any representative changes will be indicated when the plan is revised. This meeting will be planned and facilitated by members of the St. Lawrence County Office of Emergency Services and/or Planning Department. The Committee may also meet to evaluate and revise the County's mitigation plan following a major disaster event. This would allow committee members to determine if the actions recommended in the plan are appropriate or to see if any changes are necessary based on the pattern of disaster damages. The Director of the County's Office of Emergency Services is responsible for approving all proposed additions and updates to the plan. The chief elected official of each jurisdiction will be invited to each annual update meeting.

One month prior to the annual HMP review meeting, a reminder will be distributed to the chief elected official of each jurisdiction. This reminder will engage representatives to think of how risks and hazards have changed within their jurisdiction or at the County level, whether the goals and objectives identified in the plan still address the current concerns of their jurisdiction and the County, and whether the status of any proposed mitigation actions have changed or whether additional actions should be included. The implementation of proposed mitigation actions is important to review in order to determine whether the plan is being executed correctly and to the optimal extent. Items that should be reviewed for each mitigation action include the current status of the action, the ultimate cost of the action, the success (if completed action), and the funding sources used for the action.

During the annual plan review meeting, the County and each jurisdiction will provide an update to the group of their review of the plan and the implementation details for the proposed mitigation actions that apply to their jurisdiction. Notes of the annual meeting will be kept and will include specific details associated with any proposed changes to the plan. During re-approval years (every five years), the revised plan will be submitted to FEMA for re-approval in accordance with the five year review schedule dictated in DMA 2000.

9.2 Plan Updating

The proposed hazard mitigation plan 5-year review schedule that will be completed as follows:

- The Mitigation Planning Committee will meet with jurisdiction representatives on an annual basis to discuss the implementation and specifics of the County mitigation plan. Meeting discussions will be documented, including proposed changes to the plan. An annual update checklist is provided in Appendix I, which will be referenced during these meetings. All discussion and proposed changes will be kept in Appendix I.
- When a 5-year update is required, the Mitigation Planning Committee will meet approximately 18 months prior to the plan’s expiration date to update and revise all elements of the plan and produce a final revised document.
- This updated plan will be presented to the boards of each participating jurisdiction in order for each jurisdiction to formally concur with and adopt the proposed changes.
- Once all participating jurisdictions have re-adopted the hazard mitigation plan, the revised plan will be submitted to FEMA for re-approval.

9.3 Incorporation into Existing Planning Mechanisms

Elements of the HMP will be considered as the County and municipality undertake future development and comprehensive planning efforts. The approved hazard mitigation plan will also serve as an important resource for developing and/or updating emergency operations plans and procedures throughout St. Lawrence County. The County’s HMP update will be incorporated into and referenced by future updates of existing plans, policies, ordinances, and programs listed in Table 3.1 (Appendix A). The County and each municipality will integrate the HMP into other available planning mechanisms. This table will be updated as needed each year. Table 9.1 summarizes how the HMP update will be incorporated into the existing and future planning mechanisms and opportunities at the County and jurisdiction level.

Table 9.1 – Planning Mechanism Incorporation	
Mechanism	How Plan Will be Incorporated
Emergency Planning	<ul style="list-style-type: none"> Plan will be added/referenced as an Appendix to the County’s Comprehensive Emergency Management Plan. Hazard risk assessment and vulnerability data included in the mitigation plan will be reviewed during emergency planning and Emergency Response/Evacuation Plan updates.
Annual Budget	<ul style="list-style-type: none"> Mitigation actions will be considered when setting the annual budgets for the County and all participating jurisdictions.
Plans and Programs	<ul style="list-style-type: none"> Hazard Mitigation Plan information will be considered by each participating jurisdiction during program and protection updates and revisions. Programs and plans will be compared to the Hazard Mitigation Plan to ensure that goals and objectives are consistent among all documents.
Grant Applications and other Funding Opportunities	<ul style="list-style-type: none"> Data and maps from the HMP will be used as supporting documentation in grant applications. Mitigation actions included in the Plan will be heavily considered during application submission and fund allocation.
Economic Development	<ul style="list-style-type: none"> Hazard vulnerability information will be reviewed and utilized during the siting of local development efforts within participating jurisdictions.
Capital Improvement Planning	<ul style="list-style-type: none"> Current and future projects will be reviewed for hazard vulnerability. Hazard resistant construction standards will be incorporated into the design and location of potential projects, as appropriate.

9.4 Public Involvement

The Mitigation Planning Committee will keep the public informed about hazard mitigation planning efforts, actions, and projects that occur within the County. To accomplish this goal, and in addition to the public involvement already incorporated into the completion and review of the HMP Update, the following opportunities for public involvement in this ongoing process will be made available:

- A link to the updated HMP will be provided on St. Lawrence County’s website;
- Public announcements of and invitations to annual Mitigation Planning Committee meetings and 5-year mitigation plan update events; and
- Completion of public outreach and mitigation education events throughout the County, especially in more vulnerable areas.

Public outreach efforts will be documented in future plan updates through the inclusion of samples, copies of notices, flyers, web announcements, and/or meeting minutes. If public response is lacking during subsequent update processes, additional public outreach methods will be considered and implemented. Coordination efforts between the St. Lawrence County Office of Emergency Services and jurisdiction representatives will continue to keep the plan current and useful. Public outreach options that may be implemented to increase participation include:

- Distribute targeted questionnaires to local municipal, community, and non-profit groups to solicit public feedback;
- Organize topic-specific meetings with key individuals and experts to discuss particular concerns and brainstorm solutions; and
- Hold educational programs during various community events to disseminate information and engage the public in discussions on mitigation planning and preparedness.

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Appendix A

Additional Figures and Tables

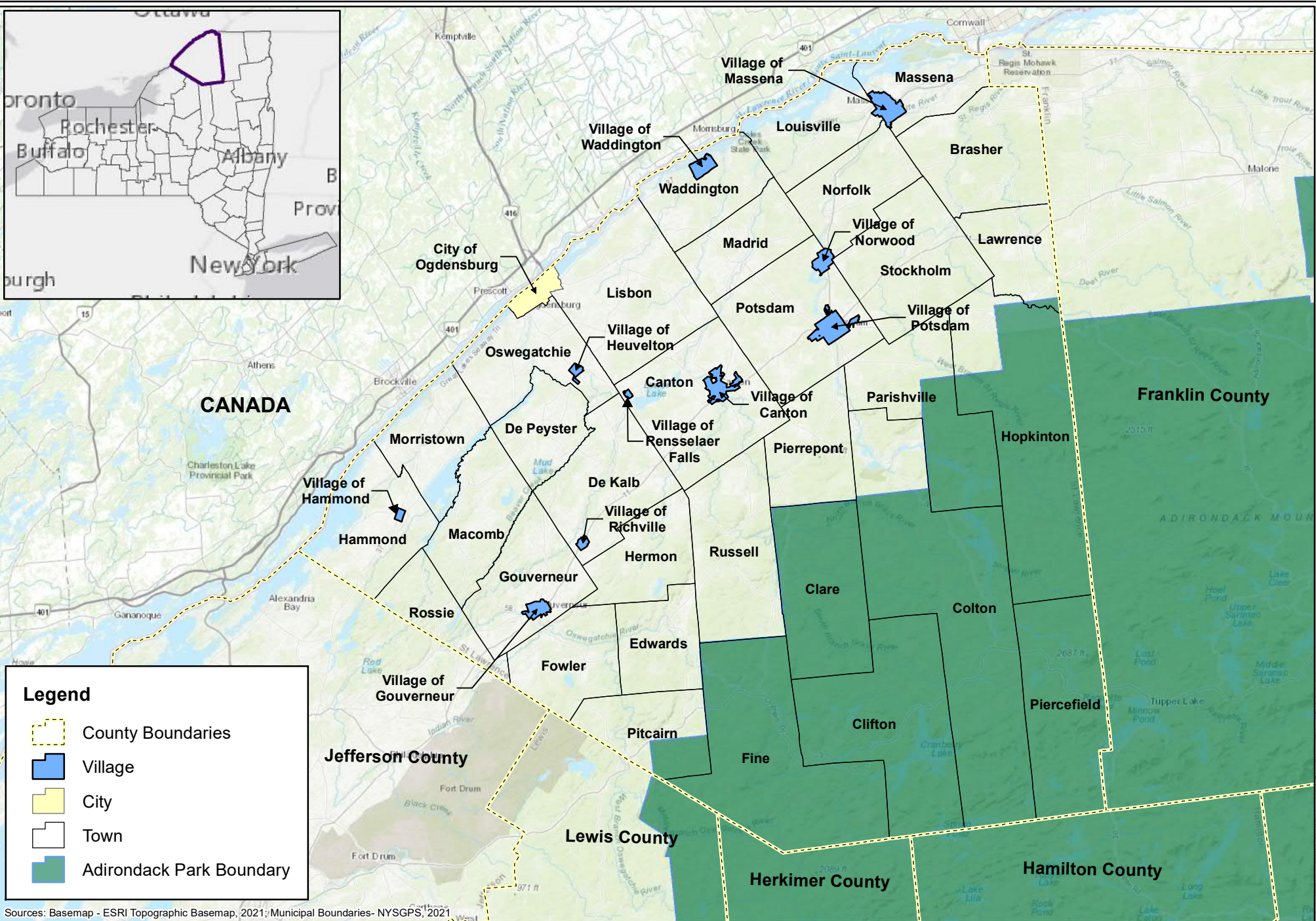
Table 1.1 - Jurisdiction List and Representatives

Jurisdiction	Primary Contact	Primary Contact Title	Secondary Contact	Secondary Contact Title
Brasher, Town	Mark Peets	Town Supervisor	Larry Hewlett	Highway Superintendent
Canton, Town	Mary Ann Ashley	Town Supervisor		
Canton, Village	Michael Dalton	Mayor	Marty Miller	Village Superintendent
Clare, Town	Francis Sharpstene	Town Supervisor		
Clifton, Town	Nancy Russell	Bookkeeper	Charles Hooven	Town Supervisor
Colton, Town	Darren Richards	Safety Officer	George Cayey	Town Supervisor
De Kalb, Town	John Frary	Town Supervisor	Wayne Holland	Highway Supervisor
De Peyster, Town	Richard Pray	Board Member		
Edwards, Town	Jan Lennox	Town Supervisor	Pat Davis	Town Clerk
Fine, Town	Jeremy Thompson	Deputy Town Supervisor	Mark Hall	Water Superintendent
Fowler, Town	Rick Newvine	Town Supervisor	Tami Gale	Town Clerk
Gouverneur, Town	David Spilman, Jr.	Town Supervisor	Diane Kelly	Bookkeeper
Gouverneur, Village	Ronald McDougall	Mayor	Barbara Finnie	Clerk
Hammond, Town	Ron Bertram	Town Supervisor	Leslie Bass	Secretary to Supervisor
Hammond, Village	Shelly Youngs	Mayor	Patti Belknap	Trustee
Hermon, Town	Michael Perry	Town Supervisor	Michael McQuade	Codes Officer
Heuvelton, Village	Barbara Lashua	Mayor	Tim Murray	DPW Supervisor
Hopkinton, Town	Susan Wood	Town Supervisor		
Lawrence, Town	Donald Villnave	Town Supervisor	Tracy Villnave	Town Clerk
Lisbon, Town	William D. Nelson	Town Supervisor	Alberta Hyde	Town Clerk
Louisville, Town	Gail Schneider	Board Member	Joanne Cameron	Town Clerk
Macomb, Town	Bret Martin	Board Member	Carson Gates	Road Crew Member
Madrid, Town	Tony Cooper	Town Supervisor	Zoe Hawkins	Town Clerk
Massena, Town	Patrick O'Brien	First Asst Chief, Massena VFD Inc	Jason Olson	Chief of Police
Massena, Village	Patrick O'Brien	First Asst Chief, Massena VFD Inc	Jason Olson	Chief of Police
Morristown, Town	Frank Putman	Town Supervisor	Chris Coffin	Deputy Supervisor
Norfolk, Town	Charles Pernice	Town Supervisor	Jill Molnar	Town Clerk
Norwood, Village	Tim Levison	Mayor	Nancy Berger	Village Clerk
Ogdensburg, City	Andrea Smith	Planning Director	Stephen Jellie	City Manager
Oswegatchie, Town	Alfred Nichols	Town Supervisor	Vicki Thornhill	Town Clerk
Parishville, Town	Rod Votra	Town Supervisor	Connie Maguire	Town Clerk
Piercefield, Town	Neil Pickering	Town Supervisor	Christielee Geiger	Town Clerk
Pierrepoint, Town	Jane Powers	Town Supervisor	Roger Murray	Deputy Supervisor
Pitcairn, Town	Clyde (Sam) Frank Jr.	Town Supervisor	Rebecca Moore	Town Clerk
Potsdam, Town	Jeff Murray	Code Enforcement	Mike McQuade	Code Enforcement
Potsdam, Village	Greg Thompson	Village Administrator	Fred Hanss	Planning Director
Rensselaer Falls, Village	Michael S. Hammond	Mayor	James Blackburn	Trustee
Richville, Village	Ella Mae (Blue Jay) Fenlong	Mayor	Shelley Prashaw	Village Clerk
Rossie, Town	Harry Turnbull	Town Supervisor	James Mandigo	Board Member
Russell, Town	Timothy White	Town Supervisor	Tess Eells	Town Clerk
Stockholm, Town	Clark Decker	Town Supervisor	Robin McClellan	Economic Development Chair
Waddington, Town	Alex Hammond	Town Supervisor	Carol Burns	Town Clerk
Waddington, Village	Michael Zagrobelny	Mayor	Pam Dalton	Village Clerk

Table 1.2 - Jurisdiction Participation Criteria

Jurisdiction	Submitted Participation Form or Otherwise Indicated Intent to Participate	Met with Consultant Team to Update 2015 Information to Meet Current Hazard Mitigation Planning Standards	Reviewed Jurisdictional Annex	Passed Resolution to Formally Adopt HMP Update*
Brasher, Town	X	X	X	
Canton, Town	X	X	X	
Canton, Village	X	X	X	
Clare, Town	X	X	X	
Clifton, Town	X	X	X	
Colton, Town	X	X	X	
De Kalb, Town	X	X	X	
De Peyster, Town	X	X	X	
Edwards, Town	X	X	X	
Fine, Town	X	X	X	
Fowler, Town	X	X	X	
Gouverneur, Town	X	X	X	
Gouverneur, Village	X	X	X	
Hammond, Town	X	X	X	
Hammond, Village	X	X	X	
Hermon, Town	X	X	X	
Heuvelton, Village	X	X	X	
Hopkinton, Town	X	X	X	
Lawrence, Town	X	X	X	
Lisbon, Town	X	X	X	
Louisville, Town	X	X	X	
Macomb, Town	X	X	X	
Madrid, Town	X	X	X	
Massena, Town	X	X	X	
Massena, Village	X	X	X	
Morristown, Town	X	X	X	
Norfolk, Town	X	X	X	
Norwood, Village	X	X	X	
Ogdensburg, City	X	X	X	
Oswegatchie, Town	X	X	X	
Parishville, Town	X	X	X	
Piercefield, Town	X	X	X	
Pierrepoint, Town	X	X	X	
Pitcairn, Town	X	X	X	
Potsdam, Town	X	X	X	
Potsdam, Village	X	X	X	
Rensselaer Falls, Village	X	X	X	
Richville, Village	X	X	X	
Rossie, Town	X	X	X	
Russell, Town	X	X	X	
Stockholm, Town	X	X	X	
Waddington, Town	X	X	X	
Waddington, Village	X	X	X	

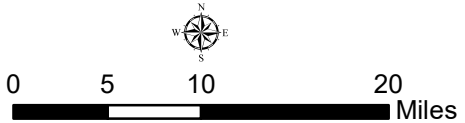
*Jurisdictions will pass resolutions to adopt the updated HMP after the final plan is approved by NYS DHSES and FEMA.



Legend

- County Boundaries
- Village
- City
- Town
- Adirondack Park Boundary

Sources: Basemap - ESRI Topographic Basemap, 2021; Municipal Boundaries- NYSGPS, 2021



St. Lawrence County
Hazard Mitigation Plan
Jurisdiction Boundaries
St. Lawrence County October 2021 New York

Figure
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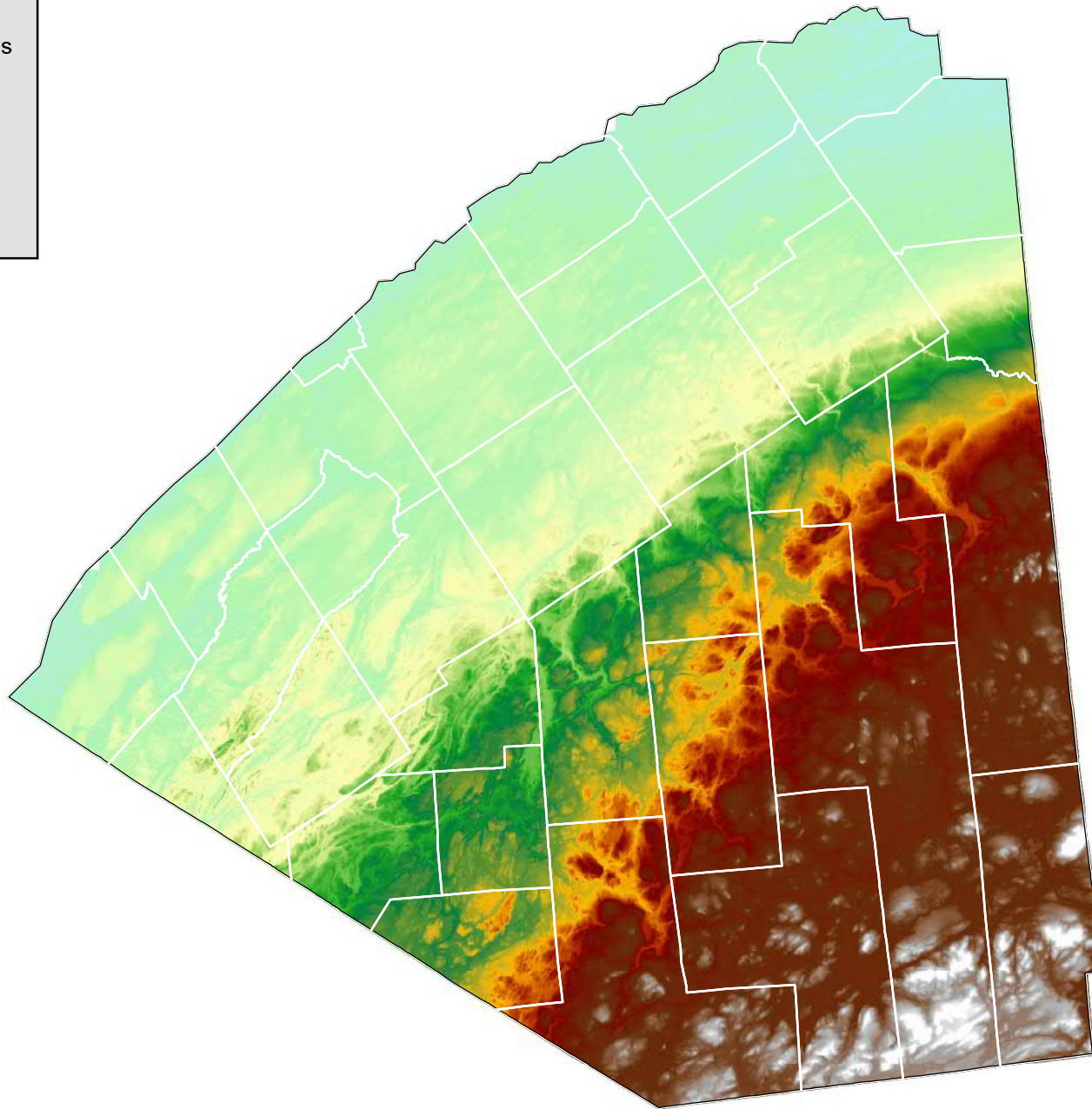
□ Municipal Boundaries

Elevation (feet)

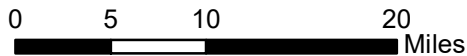
High : 2686 feet



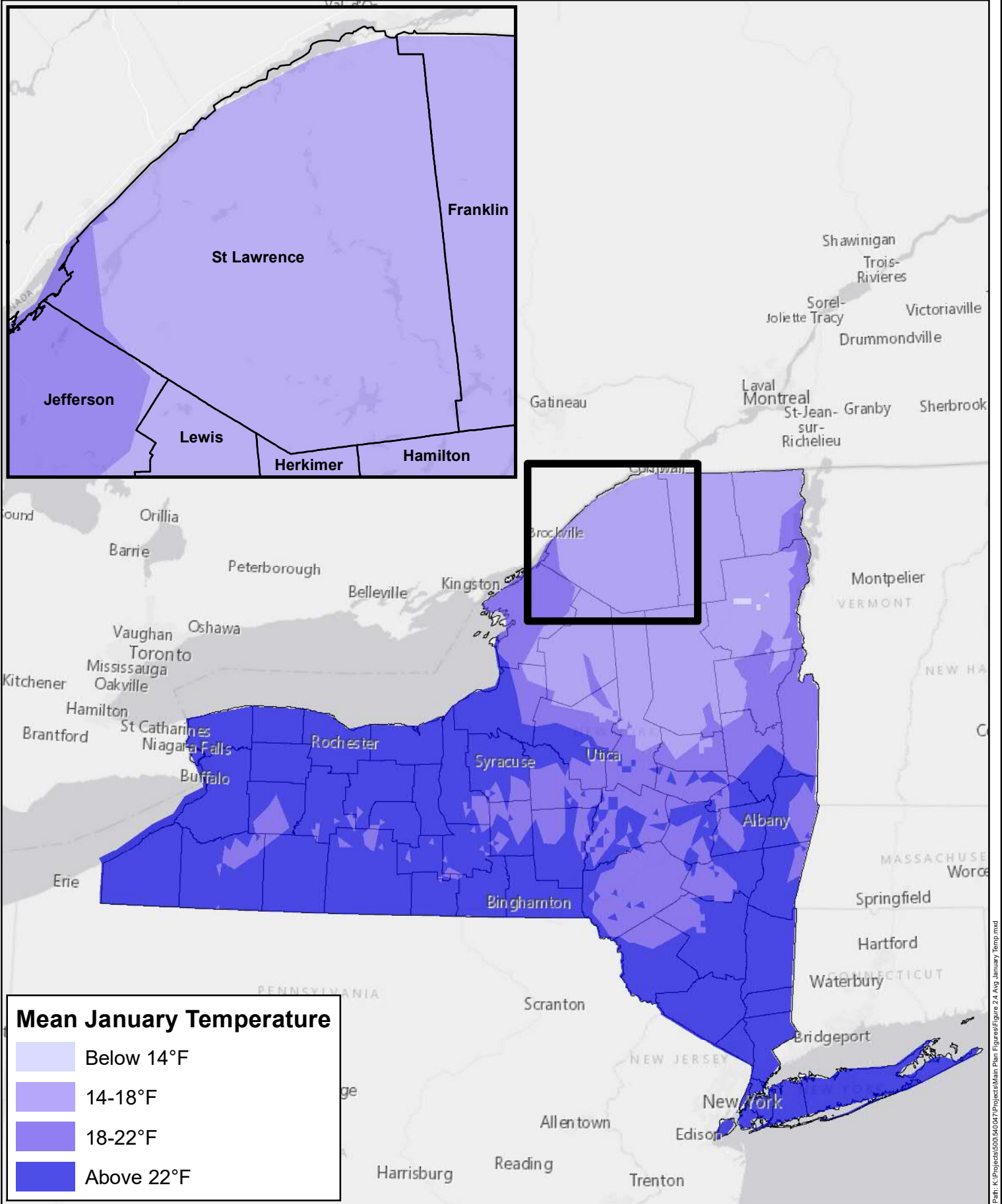
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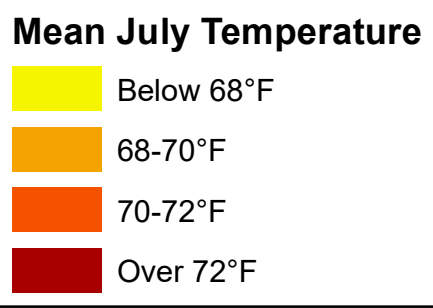
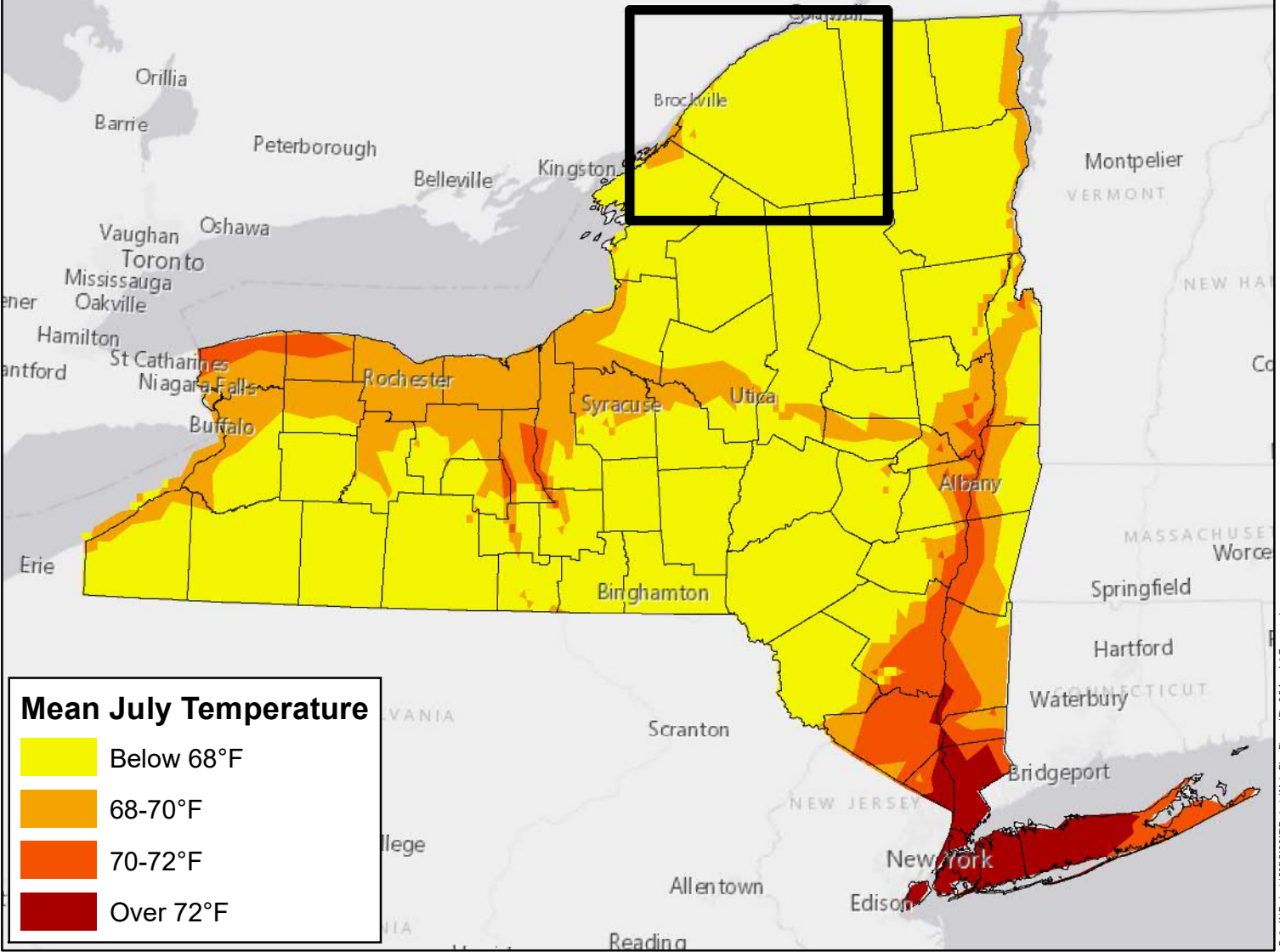
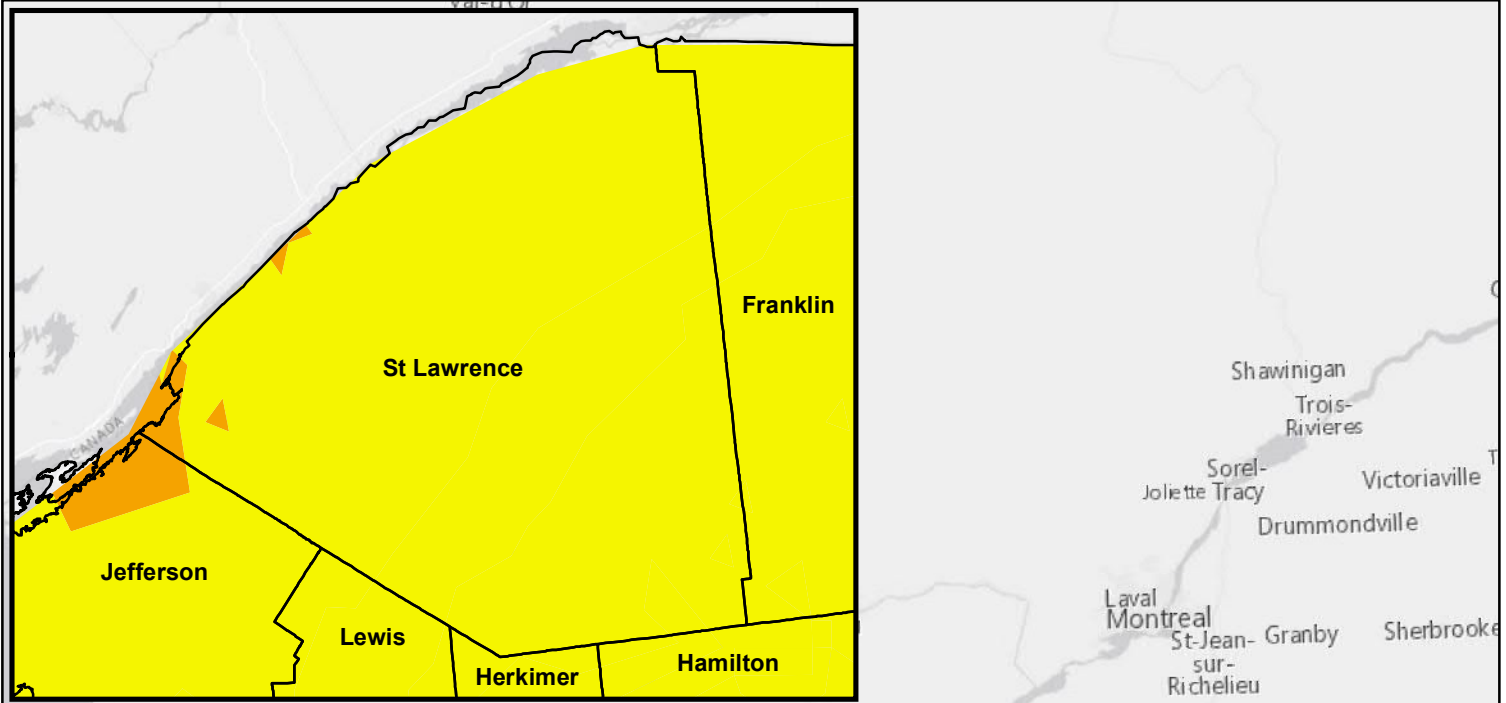


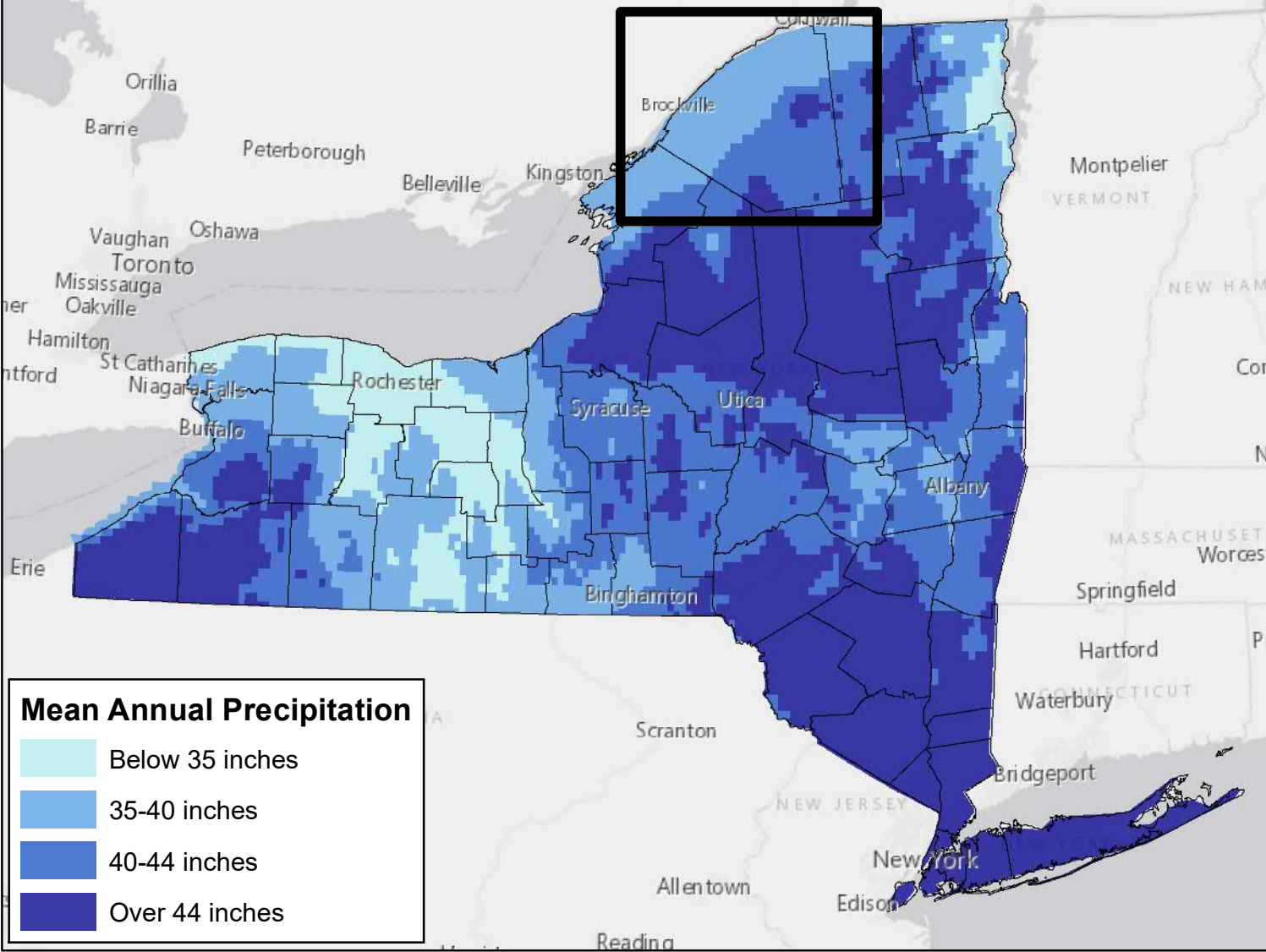
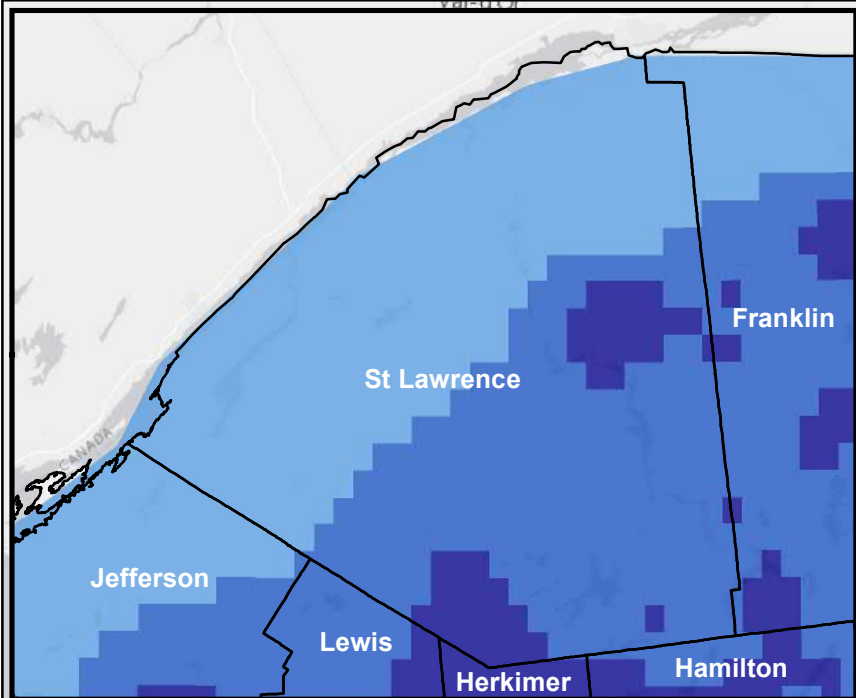
Sources: Municipal Boundaries- NYSGPO, 2021; Topography - USGS DEMs; Streams - NYSDEC, 2015



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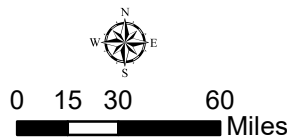






Mean Annual Precipitation

- Below 35 inches
- 35-40 inches
- 40-44 inches
- Over 44 inches



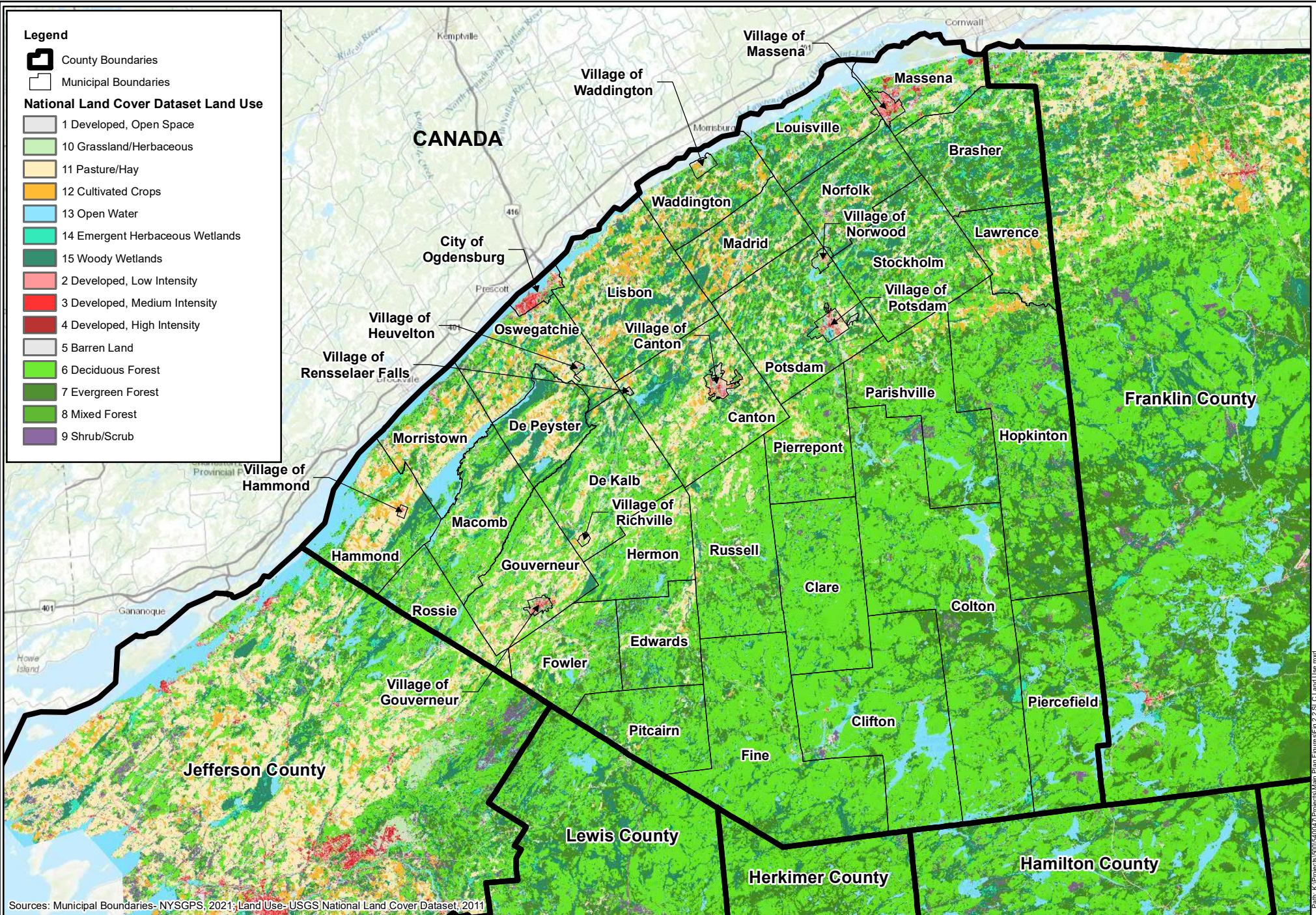
St. Lawrence County
 Hazard Mitigation Plan
**NYS 30-Year Normal
 Average Annual Precipitation**
 St. Lawrence County October 2021 New York

Figure
 2.4
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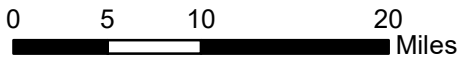
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Legend

-  County Boundaries
-  Municipal Boundaries
- National Land Cover Dataset Land Use**
-  1 Developed, Open Space
-  10 Grassland/Herbaceous
-  11 Pasture/Hay
-  12 Cultivated Crops
-  13 Open Water
-  14 Emergent Herbaceous Wetlands
-  15 Woody Wetlands
-  2 Developed, Low Intensity
-  3 Developed, Medium Intensity
-  4 Developed, High Intensity
-  5 Barren Land
-  6 Deciduous Forest
-  7 Evergreen Forest
-  8 Mixed Forest
-  9 Shrub/Scrub



Sources: Municipal Boundaries- NYSGPS, 2021; Land Use- USGS National Land Cover Dataset, 2011







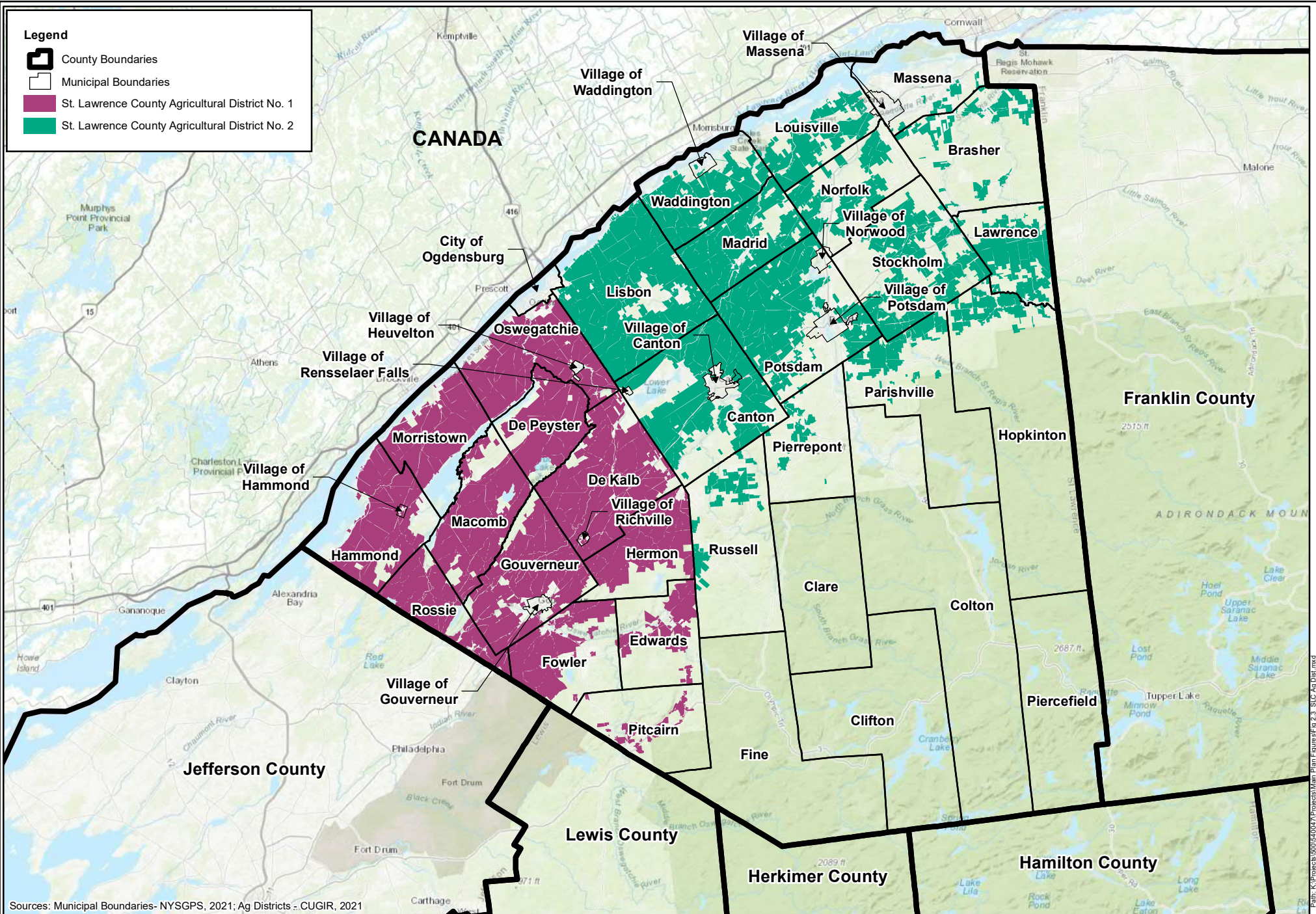
St. Lawrence County
 Hazard Mitigation Plan
Land Cover
 St. Lawrence County October 2021 New York

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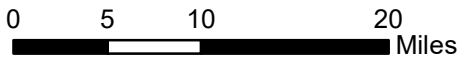
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Legend

-  County Boundaries
-  Municipal Boundaries
-  St. Lawrence County Agricultural District No. 1
-  St. Lawrence County Agricultural District No. 2



Sources: Municipal Boundaries- NYSGPS, 2021; Ag Districts - CUGIR, 2021



St. Lawrence County
Hazard Mitigation Plan
Agricultural Districts
St. Lawrence County October 2021 New York

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Table 2.1 – Housing Vacancy Rates by Jurisdiction
(U.S. Census Bureau, 2019 American Community Survey Census)

Jurisdiction(s)	Total Housing Units	Occupied Units	Vacant Units
Town of Brasher	1,295	1,125	170
Town of Canton	3,814	3,469	345
Village of Canton	1,766	1,612	154
Town of Clare	110	29	81
Town of Clifton	887	290	597
Town of Colton	1,403	623	780
Town of De Kalb	1,011	838	173
Town of De Peyster	370	285	85
Town of Edwards	591	458	133
Town of Fine	1,198	630	568
Town of Fowler	1,149	906	243
Town of Gouverneur	2,923	2,669	254
Village of Gouverneur	1,944	1,726	218
Town of Hammond	1,462	471	991
Village of Hammond	157	92	65
Town of Hermon	638	443	195
Village of Heuvelton	329	310	19
Town of Hopkinton	842	407	435
Town of Lawrence	726	682	44
Town of Lisbon	1,749	1,521	228
Town of Louisville	1,447	1,262	185
Town of Macomb	948	373	575
Town of Madrid	734	652	82
Town of Massena	5,869	5,540	329
Village of Massena	4,965	4,610	355
Town of Morristown	1,810	832	978
Town of Norfolk	2,130	2,014	116
Village of Norwood	797	727	70
City of Ogdensburg	4,401	4,062	339
Town of Oswegatchie	2,046	1,651	395
Town of Parishville	1,513	945	568
Town of Piercefield	431	94	337
Town of Pierrepont	1,140	915	225
Town of Pitcairn	491	329	162
Town of Potsdam	5,774	4,988	786
Village of Potsdam	2,651	2,187	464

Table 2.1 – Housing Vacancy Rates by Jurisdiction
 (U.S. Census Bureau, 2019 American Community Survey Census)

Jurisdiction(s)	Total Housing Units	Occupied Units	Vacant Units
Village of Rensselaer Falls	156	150	6
Village of Richville	115	105	10
Town of Rossie	524	312	212
Town of Russell	956	658	298
Town of Stockholm	1,658	1,550	108
Town of Waddington	1,154	910	244
Village of Waddington	489	421	68

Table 2.2 Population Trends in St. Lawrence County
(U.S. Census Bureau, 2021)

Jurisdiction	2010 Census Population	2020 Census Population	Percent Change
St. Lawrence County	111,944	108,505	-3.1%
Town of Brasher	2,512	2,627	4.6%
Town of Canton	10,995	11,638	5.8%
Village of Canton	6,314	7,155	13.3%
Town of Clare	105	100	-4.8%
Town of Clifton	751	675	-10.1%
Town of Colton	1,451	1,530	5.4%
Town of De Kalb	2,434	2,375	-2.4%
Town of De Peyster	998	1,023	2.5%
Town of Edwards	1,156	1,015	-12.2%
Town of Fine	1,512	1,304	-13.8%
Town of Fowler	2,202	2,142	-2.7%
Town of Gouverneur	7,085	6,551	-7.5%
Village of Gouverneur	3,949	3,526	-10.7%
Town of Hammond	1,191	1,258	5.6%
Village of Hammond	280	273	-2.5%
Town of Hermon	1,108	1,074	-3.1%
Village of Heuvelton	714	722	1.1%
Town of Hopkinton	1,077	1,105	2.6%
Town of Lawrence	1,826	1,715	-6.1%
Town of Lisbon	4,102	4,221	2.9%
Town of Louisville	3,145	3,050	-3.0%
Town of Macomb	906	912	0.7%
Town of Madrid	1,735	1,744	0.5%
Town of Massena	12,883	12,433	-3.5%
Village of Massena	10,936	10,151	-7.2%
Town of Morristown	1,974	2,082	5.5%
Town of Norfolk	4,668	4,453	-4.6%
Village of Norwood	1,657	1,552	-6.3%
City of Ogdensburg	11,128	10,064	-9.6%
Town of Oswegatchie	4,397	4,158	-5.4%
Town of Parishville	2,153	2,038	-5.3%
Town of Piercefield	310	282	-9.0%
Town of Pierrepont	2,589	2,523	-2.5%
Town of Pitcairn	846	790	-6.6%
Town of Potsdam	16,041	14,901	-7.1%
Village of Potsdam	9,428	8,312	-11.8%
Village of Rensselaer Falls	332	361	8.7%








Table 2.2 Population Trends in St. Lawrence County
(U.S. Census Bureau, 2021)

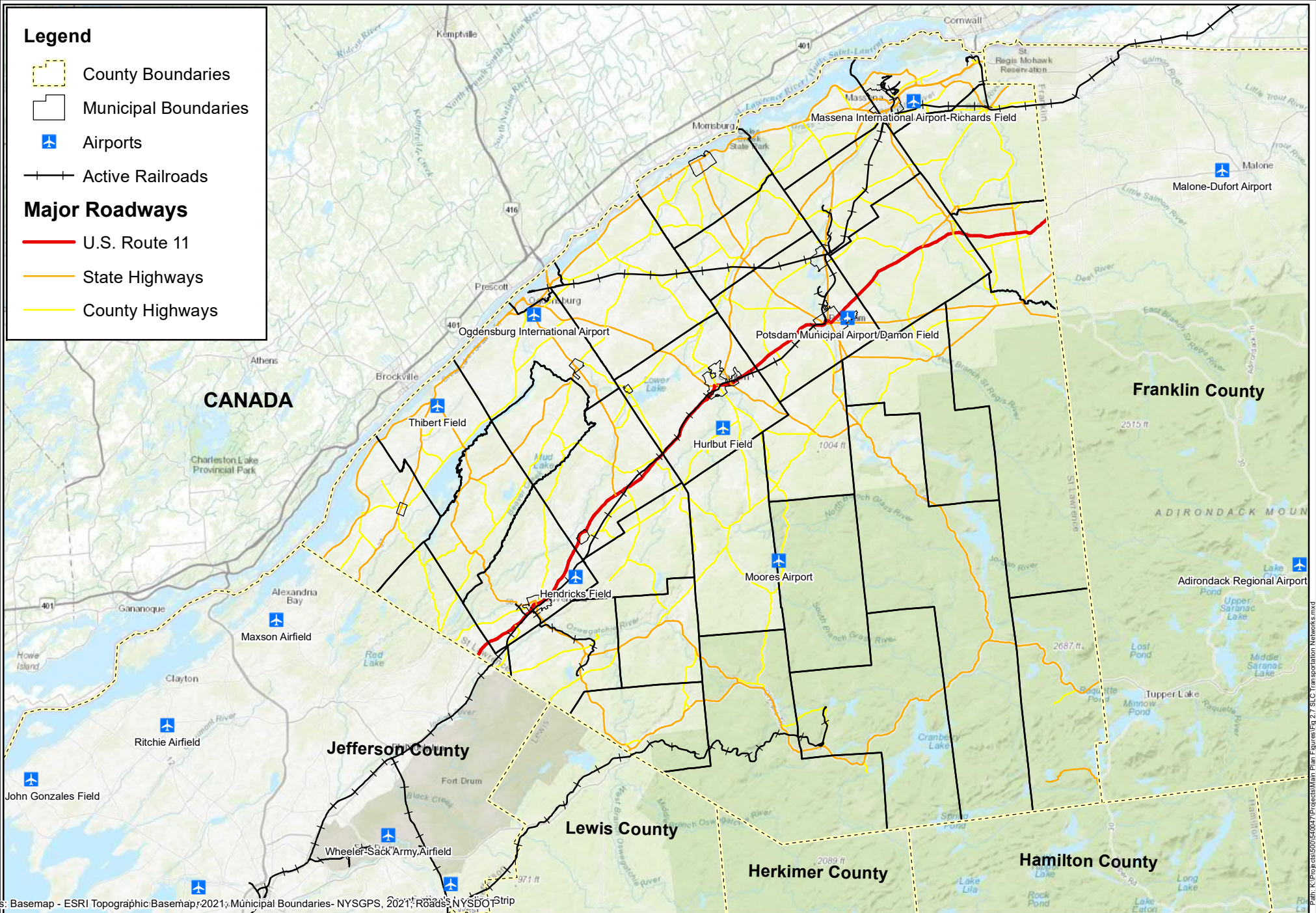
Jurisdiction	2010 Census Population	2020 Census Population	Percent Change
Village of Richville	323	234	-27.6%
Town of Rossie	877	799	-8.9%
Town of Russell	1,856	1,872	0.9%
Town of Stockholm	3,665	3,816	4.1%
Town of Waddington	2,266	2,235	-1.4%
Village of Waddington	972	937	-3.6%

Table 2.5 – Employment by Industry in St. Lawrence County
(NYS DOL, 2021)

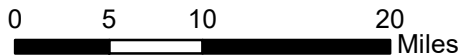
Industry	September 2021	September 2020	Percent Change
Total Nonfarm	37.3%	37.1%	0.5%
Total Private	26.1%	26%	0.4%
Goods Producing	4.0%	3.9%	2.6%
Natural Resources, Mining and Construction	1.7%	1.6%	6.3%
Manufacturing	2.3%	2.3%	0.0%
Service Providing	33.3%	33.2%	0.3%
Private Service Providing	22.1%	22.1%	0.0%
Trade, Transportation, and Utilities	5.6%	5.6%	0.0%
Information	0.4%	0.4%	0.0%
Financial Activities	0.8%	0.8%	0.0%
Professional and Business Services	2.4%	2.3%	4.3%
Education and Health Services	9.0%	9.1%	-1.1%
Leisure and Hospitality	2.6%	2.6%	0.0%
Other Services	1.3%	1.3%	0.0%
Government	11.2%	11.1%	0.9%

Legend

-  County Boundaries
-  Municipal Boundaries
-  Airports
-  Active Railroads
- Major Roadways**
-  U.S. Route 11
-  State Highways
-  County Highways



Sources: Basemap - ESRI Topographic Basemap, 2021; Municipal Boundaries - NYSGPS, 2021; Roads - NYSDO Strip



Path: K:\Info\540.047\MapDocs\Map Plan Figures\Fig 2.7 St. Lawrence Transportation Networks.mxd

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 2.9 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
St. Lawrence County Highway Department - Main Facility	County Services	44 Park St, Canton, NY 13617	Village of Canton	No
St. Lawrence County Highway Outpost Facility (at Town Highway Dept.)	County Services	19 Madrid Ave, Potsdam, NY 13676	Town of Potsdam	No
St. Lawrence County Highway Outpost Facility (at Town Highway Dept.)	County Services	3529 County Rd 14, Madrid, NY 13660	Town of Madrid	No
St. Lawrence County Highway Outpost Facility (in construction)	County Services	3896 County Route 24, Russell, NY 13684	Town of Russell	No
St. Lawrence County Highway Outpost Facility (in construction)	County Services	522 County Route 28A, Lisbon, NY 13658	Town of Lisbon	No
St. Lawrence County Offices	County Services	48 Court St, Canton, NY 13617	Village of Canton	No
St. Lawrence County Public Safety Complex (includes NYS Police)	County Services	49 Court St, Canton, NY 13617	Village of Canton	No
A.A. Kingston Middle School	Educational Facilities	29 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
Banford Elementary School	Educational Facilities	99 State St, Canton, NY 13617	Village of Canton	No
BOCES Northwest Technical Education Center	Educational Facilities	1000 Park St, Ogdensburg, NY 13669	City of Ogdensburg	No
BOCES Seaway Technical Education Center	Educational Facilities	7227 NY-56, Norwood, NY 13668	Town of Potsdam	No
BOCES Southwest Technical Education Center	Educational Facilities	3606 NY-58, Gouverneur, NY 13642	Town of Fowler	No
Clarkson University	Educational Facilities	8 Clarkson Ave, Potsdam, NY 13699	Village of Potsdam	No
Clifton-Fine Central School	Educational Facilities	11 Hall Ave, Star Lake, NY 13690	Town of Fine	No
Colton-Pierrepont Central School	Educational Facilities	4921 State Hwy 56, Colton, NY 13625	Town of Colton	No
Edwards-Knox Central School	Educational Facilities	2512 County Route 24, Hermon, NY 13652	Town of Russell	No
Gouverneur Elementary School	Educational Facilities	111 Gleason St, Gouverneur, NY 13642	Village of Gouverneur	No
Gouverneur High School	Educational Facilities	133 E Barney St, Gouverneur, NY 13642	Village of Gouverneur	No
Gouverneur Middle School	Educational Facilities	25 Wilson St, Gouverneur, NY 13642	Village of Gouverneur	No
Grant C. Madill Elementary School	Educational Facilities	800 Jefferson Ave, Ogdensburg, NY 13669	City of Ogdensburg	No
Hammond Central School	Educational Facilities	51 S Main St, Hammond, NY 13646	Village of Hammond	No
Hermon-DeKalb Central School	Educational Facilities	709 E Dekalb Rd, Dekalb Junction, NY 13630	Town of De Kalb	No
Heuvelton Central School	Educational Facilities	87 Washington St, Heuvelton, NY 13654	Village of Heuvelton	No
Hugh C. Williams Senior High School	Educational Facilities	99 State St, Canton, NY 13617	Village of Canton	No
J. Manley McKenney Middle School	Educational Facilities	99 State St, Canton, NY 13617	Village of Canton	No
J.W. Leary Junior High School	Educational Facilities	1 School St, Massena, NY 13662	Village of Massena	No
Jefferson Elementary School	Educational Facilities	75 Bailey Rd, Massena, NY 13662	Village of Massena	No
John F. Kennedy Elementary School	Educational Facilities	801-809 Park St, Ogdensburg, NY 13669	City of Ogdensburg	No
Lawrence Avenue Elementary	Educational Facilities	29 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
Lisbon Central School	Educational Facilities	6866 County Rt 10, Lisbon, NY 13658	Town of Lisbon	No
Madison Elementary School	Educational Facilities	25 Owl Ave, Massena, NY 13662	Village of Massena	No
Madrid-Waddington Central School	Educational Facilities	2582 State Hwy 345, Madrid, NY 13660	Town of Madrid	No
Massena Senior High School	Educational Facilities	84 Nightengale Ave, Massena, NY 13662	Village of Massena	No
Morristown Central School	Educational Facilities	408 Gouverneur St, Morristown, NY 13664	Town of Morristown	No
Nightengale Elementary School	Educational Facilities	84 Nightengale Ave, Massena, NY 13662	Village of Massena	No
Norwood-Norfolk Central School	Educational Facilities	7852 State Hwy 56, Norwood, NY 13668	Town of Norfolk	No
Ogdensburg Free Academy	Educational Facilities	1100 State St, Ogdensburg, NY 13669	City of Ogdensburg	No
Parishville-Hopkinton Central School	Educational Facilities	12 County Rt 47, Parishville, NY 13672	Town of Parishville	No
Potsdam High School	Educational Facilities	29 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
St. James School	Educational Facilities	20 S Gordon St, Gouverneur, NY 13642	Village of Gouverneur	No
St. Lawrence Elementary	Educational Facilities	1039 State Hwy 11C, Brasher Falls, NY 13613	Town of Brasher	No

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 2.9 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
St. Lawrence High School	Educational Facilities	1039 State Hwy 11C, Brasher Falls, NY 13613	Town of Lawrence	No
St. Lawrence Middle School	Educational Facilities	1039 State Hwy 11C, Brasher Falls, NY 13613	Town of Lawrence	No
St. Lawrence University	Educational Facilities	23 Romoda Dr, Canton, NY 13617	Village of Canton	No
St. Lawrence-Lewis BOCES	Educational Facilities	40 W Main St, Canton, NY 13617	Village of Canton	No
St. Marguerite D'Youville Academy	Educational Facilities	315 Gates St, Ogdensburg, NY 13669	City of Ogdensburg	No
SUNY Canton	Educational Facilities	34 Cornell Dr, Canton, NY 13617	Village of Canton	No
SUNY ESF Ranger School	Educational Facilities	257 Ranger School Rd, Wanakena, NY 13695	Town of Fine	No
SUNY Potsdam	Educational Facilities	44 Pierrepont Ave, Potsdam, NY 13676	Village of Potsdam	No
Trinity Catholic School	Educational Facilities	188 Main St, Massena, NY 13662	Village of Massena	No
ALCOA Plant West	EMS/Fire Department	State Route 131, Massena, NY 13662	Town of Massena	No
Basher-Winthrop Volunteer Fire Department	EMS/Fire Department	708 NY-11C, Winthrop, NY 13697	Town of Brasher	No
Brier Hill Fire Department	EMS/Fire Department	2680 NY-37, Brier Hill, NY 13614	Town of Morristown	No
Canton Fire Department	EMS/Fire Department	77 Riverside Dr., Canton, NY 13617	Town of Canton	100YR and 500YR
Canton Rescue Squad	EMS/Fire Department	77 Riverside Dr., Canton, NY 13617	Town of Canton	100YR and 500YR
Colton Volunteer Fire Department	EMS/Fire Department	80 Riverside Dr, Colton, NY 13625	Town of Colton	No
County Fire Training Facility	EMS/Fire Department	45 Blanchard Rd., Potsdam, NY 13676	Town of Potsdam	No
Cranberry Lake Volunteer Fire Department	EMS/Fire Department	7115 NY-3, Cranberry Lake, NY 12927	Town of Clifton	No
De Kalb Junction Volunteer Fire Department	EMS/Fire Department	4323 US-11, De Kalb Junction, NY 13630	Town of De Kalb	No
DeGrasse Clare & South Russell Volunteer Fire Department	EMS/Fire Department	2211 CR 27, Russell, NY 13684	Town of Russell	No
Edwards Volunteer Fire Department and Rescue Squad	EMS/Fire Department	115 New St., Edwards, NY 13635	Town of Edwards	No
Fine Volunteer Fire Department	EMS/Fire Department	582 Spring St, Fine, NY 13639	Town of Fine	No
Gouverneur Fire Department	EMS/Fire Department	1035 US-11, Gouverneur, NY 13642	Town of Gouverneur	No
Gouverneur Volunteer Rescue Squad	EMS/Fire Department	1024 US-11, Gouverneur, NY 13642	Town of Gouverneur	No
Hammond Fire & Rescue	EMS/Fire Department	300 Lake St, Hammond, NY 13646	Town of Hammond	No
Hannawa Falls Volunteer Fire Department	EMS/Fire Department	Mill St, Hannawa Falls, NY 13647	Town of Pierrepont	No
Helena Volunteer Fire Department	EMS/Fire Department	1175 SH 37C, PO Box 82, Helena, NY 13649	Town of Brasher	No
Hermon Volunteer Fire Department	EMS/Fire Department	1650 Co Rd 21, Hermon, NY 13652	Town of Hermon	No
Heuvelton Volunteer Fire Department	EMS/Fire Department	95 State St., Heuvelton, NY 13654	Village of Heuvelton	No
Hopkinton-Fort Jackson Fire Department	EMS/Fire Department	2876 SH 11B, Hopkinton, NY 12940	Town of Hopkinton	No
Lawrenceville Volunteer Fire Department	EMS/Fire Department	1081 CR 54, Lawrenceville, NY 12949	Town of Lawrenceville	No
Lisbon Volunteer Fire Corporation	EMS/Fire Department	1330 Woodbine Rd, Woodbine, MD 21797	Town of Lisbon	No
Louisville Volunteer Fire Department	EMS/Fire Department	14818 NY-37, Massena, NY 13662	Town of Louisville	No
Madrid Fire Department	EMS/Fire Department	10 Church St, Madrid, NY 13660	Town of Madrid	No
Madrid Rescue Squad	EMS/Fire Department	Depot St, Madrid, NY 13660	Town of Madrid	No
Massena Rescue Squad	EMS/Fire Department	341 E Orvis St, Massena, NY 13662	Town of Massena	No
Massena Volunteer Fire Department	EMS/Fire Department	34 Andrews St, Massena, NY 13662	Town of Massena	100YR
Morley Volunteer Fire Company	EMS/Fire Department	7220 CR 27, Canton, NY 13617	Town of Canton	No
Morristown Fire & Rescue Company #1	EMS/Fire Department	200 Morris St, Morristown, NY 13664	Town of Morristown	No
Newton Falls Volunteer Fire Department	EMS/Fire Department	955 County Rt. 60, Newton Falls, NY 13666	Town of Clifton	No
Nicholville Volunteer Fire Company	EMS/Fire Department	3341 NY-11B, Nicholville, NY 12965	Town of Lawrence	No
Norfolk Volunteer Fire Department	EMS/Fire Department	1 Furnace St, Norfolk, NY 13667	Town of Norfolk	100YR and 500YR

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 2.9 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
Norfolk Volunteer Rescue Squad	EMS/Fire Department	7 Sedwick St, Norfolk, NY 13667	Town of Norfolk	No
Norwood Volunteer Fire Department	EMS/Fire Department	Bernard Ave, Norwood, NY 13668	Village of Norwood	No
Ogdensburg Fire Department	EMS/Fire Department	718 Ford St., Ogdensburg, NY 13669	City of Ogdensburg	No
Ogdensburg Volunteer Rescue Squad	EMS/Fire Department	1223 Pickering St, Ogdensburg, NY 13669	City of Ogdensburg	No
Parishville Volunteer Fire Company	EMS/Fire Department	25 Rutman Rd, Parishville, NY 13672	Town of Parishville	No
Piercefield Volunteer Fire Company	EMS/Fire Department	34 Waller St, Piercefield, NY 12973	Town of Piercefield	No
Pierrepoint Volunteer Fire	EMS/Fire Department	62 Old County Rd., Canton, NY 13617	Town of Canton	No
Potsdam Fire Department	EMS/Fire Department	42 Main St, Potsdam, NY 13676	Town of Potsdam	No
Potsdam Volunteer Rescue Squad	EMS/Fire Department	29 Elm St, Potsdam, NY 13676	Town of Potsdam	No
Pyrites Volunteer Fire Department	EMS/Fire Department	Churchill St, Pyrites, NY 13677	Town of Canton	100YR
Rensselaer Falls Volunteer Fire & Rescue	EMS/Fire Department	424 Rensselaer St, Rensselaer Falls, NY 13680	Village of Rensselaer Falls	No
Russell Volunteer Fire Department	EMS/Fire Department	5 Pestle Street Rd, Russell, NY 13684	Town of Russell	No
Seaway Valley Ambulance Service	EMS/Fire Department	202 N Main St, Massena, NY 13662	Town of Massena	No
Star Lake Volunteer Fire Department	EMS/Fire Department	4078 NY-3, Star Lake, NY 13690	Town of Fine	No
Tri-Town Volunteer Rescue Squad	EMS/Fire Department	900 NY-11C, Brasher Falls, NY 13613	Town of Brasher	No
Waddington Rescue Squad	EMS/Fire Department	48 Maple St, Waddington, NY 13694	Town of Waddington	No
Waddington Volunteer Fire Department	EMS/Fire Department	51 Maple St, Waddington, NY 13694	Town of Waddington	No
West Potsdam Volunteer Fire Company	EMS/Fire Department	801 CR 34, Potsdam, NY 13676	Town of Potsdam	No
West Stockholm Volunteer Fire Department	EMS/Fire Department	143 Co Rd 57, West Stockholm, NY 13696	Town of Stockholm	No
U.S. Customs - Ogdensburg Port of Entry	Federal	104 Bridge Approach Rd, Ogdensburg, NY 13669	City of Ogdensburg	No
Canton-Potsdam Hospital	Hospital	50 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
Claxton-Hepburn Medical Center	Hospital	214 King St, Ogdensburg, NY 13669	City of Ogdensburg	No
Clifton-Fine Hospital	Hospital	1014 Oswegatchie Trail Rd, Star Lake, NY 13690	Town of Fine	No
Gouverneur Hospital	Hospital	77 W Barney St, Gouverneur, NY 13642	Village of Gouverneur	No
Massena Memorial Hospital	Hospital	1 Hospital Dr, Massena, NY 13662	Village of Massena	No
St. Lawrence Psychiatric Center	Hospital	1 Chimney Point Dr, Ogdensburg, NY 13669	City of Ogdensburg	No
Brasher Radio Tower (on Water Tower)	Radio Communications	-	Town of Brasher	-
Cranberry Lake Radio Tower (on Cell Tower)	Radio Communications	-	Town of Clifton	-
Hammond Radio Tower (on school)	Radio Communications	-	Town of Hammond	-
Kimball Hill Radio Tower (SLC ES Owned)	Radio Communications	-	Town of Canton	-
Massena Radio Tower (On Laurel Terrace Apts.)	Radio Communications	-	Village of Massena	-
Newton Falls Radio Tower (Water Tower)	Radio Communications	-	Town of Clifton	-
South Colton Radio Tower (WNPI Owned)	Radio Communications	-	Town of Colton	-
Star Lake Radio Tower (at Fire Dept building)	Radio Communications	-	Town of Fine	-
White Hill Radio Tower (BOCES owned)	Radio Communications	-	Town of Hopkinton	-
NYS DOCCS Riverview Correctional Facility	State Facility	1110 Tibbits Dr., Ogdensburg, NY 13669	City of Ogdensburg	No
NYSDEC Potsdam Office	State Facility	190 Outer Main Street, Suite 103, Potsdam, NY 13676	Village of Potsdam	No
Great Lakes St. Lawrence Seaway Development Corp.	Federal	180 Andrews St # 1, Massena, NY 13662	Village of Massena	No
Liberty Utilities	Utilities – Oil/Gas	33 Stearns St Suite 1, Massena, NY 13662	Village of Massena	No
Massena Electric Department	Utilities – Power	71 E Hatfield St, Massena, NY 13662	Village of Massena	No
National Grid	Utilities – Power	Multiple locations throughout County	Countywide	-

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 2.9 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
Casella Transfer Station	Utilities – Solid Waste	472 West Parishville Road, Potsdam, NY 13676	Town of Potsdam	No
Closed Landfill	Utilities – Solid Waste	1201 Champlain St, Ogdensburg, NY 13669	City of Ogdensburg	No
Closed Landfill	Utilities – Solid Waste	2395 County Rt 21, Hermon, NY 13652	Village of Canton	No
Closed Landfill	Utilities – Solid Waste	49 Dump Road, Massena, NY 13662	Town of Massena	No
Gouverneur Transfer Station	Utilities – Solid Waste	1831 US Highway 11, Gouverneur, NY 13642	Town of Gouverneur	No
Massena Transfer Station	Utilities – Solid Waste	49 Dump Road, Massena, NY 13662	Town of Massena	No
Ogdensburg Transfer Station	Utilities – Solid Waste	522 County Route 28A, Ogdensburg, NY 13669	City of Ogdensburg	No
Star Lake Transfer Station	Utilities – Solid Waste	4582 State Highway 3, Star Lake, NY 13690	Town of Fine	No
*Based on HAZUS-modeled 100-year and 500-year floodplains				

**Table 3.1 - Planning Mechanisms and Capabilities
St. Lawrence County**

Plans	
Comprehensive Plan	No
Capital Improvement Plan	No
Economic Development Plan	Yes
Comprehensive Emergency Management Plan	Yes
Continuity of Operations Plan	Yes
Transportation Plan	No
Stormwater Management Plan	No
Community Wildfire Protection	No
Other Plans	St. Lawrence River Shoreline Resiliency Study Comprehensive Land Use Plan Agricultural Development Plan Facility Management Plan
Development Approvals	
Building Code	Yes
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A
Fire department ISO rating	N/A
Site plan review requirements	No
Land Use Regulations	
Zoning ordinance	No
Subdivision ordinance	No
Floodplain ordinance	No
Natural hazard specific ordinance	No
Flood insurance rate maps	Yes
Acquisition of land for open space and public recreation	No
Administration	
Planning Commission	Yes
Mitigation Planning Committee	Yes
Maintenance programs to reduce risk	Yes
Mutual aid agreements	Yes
Staff	
Chief Building Official	No
Floodplain Administrator	No
Emergency Manager	Yes
Community Planner	Yes

**Table 3.1 - Planning Mechanisms and Capabilities
St. Lawrence County**

Civil Engineer	Yes
GIS Coordinator	No
Technical Abilities	
Warning systems/services	Yes
Hazard data and information	Yes
Grant writing	Yes
HAZUS analysis	No
Funding Resources	
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Storm water utility fee	No
Incur debt through general obligation bonds and/or special tax bonds	Yes
Incur debt through private activities	No
Community Development Block Grant	Yes
Other federal funding programs	Yes
State funding programs	Yes
Programs/Organizations	
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Environmental Management Council Emerald Ash Borer Taskforce County Animal Response Team
Ongoing public education or information program	Yes
Natural disaster or safety related school programs	Yes
Storm Ready certification	No
Firewise Communities certification	No
Public-private partnership initiatives addressing disaster-related issues	Yes

Table 3.2 - Stakeholder Participation

Agency	Contact(s)	Title or Department	Attended Stakeholder/Public Information Meeting (6/8/21)	Provided Other Feedback
Franklin County	Ricky Provost	Director, Emergency Services		
Hamilton County	Don Purdy	Emergency Manager		X
Herkimer County	John Raymond	Director, Emergency Services	X	
Jefferson County	Joseph D. Plummer	Director, Emergency Services		
Lewis County	Robert Mackenzie	Director of Fire and Emergency Management	X	
Saint Regis Mohawk Tribe	Darren Bonaparte	Tribal Historic Preservation Officer		
St. Lawrence County Administration	Ruth A. Doyle	County Administrator		
St. Lawrence County Legislature	Larry Denesha	Legislator, District 6	X	X
St. Lawrence County Planning Department	Jason Pfothenauer	Director	X	X
St. Lawrence County Highway Department	Donald R. Chambers	Superintendent of Highways	X	X
St. Lawrence County Office of Emergency Services	Matthew Denner	Director/Fire Coordinator	X	X
St. Lawrence County Soil & Water Conservation District	Raeanne Dulanski	Conservation District Manager		X
Clarkson University	Erica Arnold	Env Health & Safety/Emergency Management	X	
St. Lawrence University	William L. Fox	President		
St. Lawrence-Lewis BOCES	Thomas R. Burns	District Superintendent/EO		
SUNY Canton	Zvi Szafran, Ph.D.	President		
SUNY Potsdam	Kristin G. Esterberg, Ph.D.	President		
Claxton-Hepburn Medical Center	Richard Duvall	President and Chief Executive Officer		
Clifton-Fine Hospital	Dierdra Sorrell	Chief Executive Officer		
St. Lawrence Health System (Canton-Potsdam Hospital, Gouverneur Hospital, & Massena Hospital)	Eric Burch	Chief Operating Officer/Chief Executive Officer	X	
NOAA National Weather Service	Paul Sisson and Scott Whittier	Meteorologists	X	X
Adirondack Park Agency	Terry Martino	Executive Director		
Development Authority of the North Country	Frederick J. Carter, Sr.	Chairman		
NYSDEC Region 6	Gary McCulloch	Emergency Response	X	
NYS DHSES Region 3	Kevin Clapp	Planning Manager, Mitigation Programs	X	X
NYS DOT Region 7	Russ Currier		X	
U.S. Army Corps of Engineers	Steven Metivier	Chief, NY Permit Evaluation Section		
Brookfield Power	Michael Sutton	Senior Operations Manager	X	
Citizens Telephone Company	Donald A. Ceresoli	President/Chairman		
Liberty Utilities	Darren Wilson	Operations Manager	X	
Massena Electric Department	James Shaw	Chairman		
National Grid	Rich Burns	Manager		
NY Power Authority	John R. Koelmel	Chairman		
Slic Network Solutions	Brad Pattelli	President		
Westelcom	James Forcier	CEO		

Table 4.3 - Presidential Disaster Declarations including St. Lawrence County, 1954-Present
(FEMA, 2021)

Declaration Date	Start Date	End Date	Hazard Type	Event	Disaster Number	Public Assistance Category*	Individual Assistance for St. Lawrence County
3/20/2020	1/20/2020	Ongoing	Biological	Covid-19 Pandemic	4480	PA-B	Yes
3/13/2020	1/20/2020	Ongoing	Biological	Covid-19	3434	PA-B	No
11/14/2017	5/2/2017	8/6/2017	Flood	Flooding	4348	PA-A, PA-B, PA-C, PA-D, PA-E, PA-F, PA-G	No
12/22/2014	11/17/2014	11/26/2014	Snow	Severe Winter Storm, Snowstorm, And Flooding	4204	PA-A, PA-B, PA-C, PA-D, PA-E, PA-F, PA-G	No
10/28/2012	10/27/2012	11/8/2012	Hurricane	Hurricane Sandy	3351	PA-B	No
9/30/2005	8/29/2005	10/1/2005	Hurricane	Hurricane Katrina Evacuation	3262	PA-B	No
8/23/2003	8/14/2003	8/16/2003	Other	Power Outage	3186	PA-B	No
9/11/2001	9/11/2001	9/11/2001	Fire	Fires And Explosions	1391	PA-B	No
10/11/2000	5/22/2000	11/1/2000	Other	West Nile Virus	3155	PA-B	No
1/15/1999	1/1/1999	1/15/1999	Snow	Snow	3136	PA-A, PA-B	No
1/6/1998	1/5/1998	1/17/1998	Snow	Severe Storms And Flooding	1196	PA-A, PA-B, PA-C, PA-D, PA-E, PA-F, PA-G	Yes
1/24/1996	1/19/1996	1/30/1996	Flood	Severe Storms And Flooding	1095	PA-A, PA-B, PA-C, PA-D, PA-E, PA-F, PA-G	No
3/17/1993	3/13/1993	3/17/1993	Snow	Severe Blizzard	3107	PA-A, PA-B	No
3/21/1991	3/3/1990	3/4/1990	Snow	Severe Winter Storm	898	PA-A, PA-B, PA-C, PA-D, PA-E, PA-F, PA-G	No

*Public assistance funding categories are as follows:

Emergency Work

PA-A Debris removal

PA-B Emergency protective measures

Permanent Work

PA-C Roads and bridges

PA-D Water control facilities

PA-E Public buildings and contents

PA-F Public utilities

PA-G Parks, recreational, and other facilities

Table 4.6 - Hazard Ranking Comparison

Hazard	Hazard Category	2015 HMP Rank	2018 CEPA Rank	2021 HMP Update Rank	Affected by Climate Change
Severe Thunderstorm/ Wind/Tornado	Natural	4	2	1	X
Ice Storm	Natural	17	1	2	X
Severe Winter Storm	Natural	8	3	3	X
Coastal Storm	Natural	Not included	18	4	X
Extreme Temperatures	Natural	Not included	19	5	X
Ice Jam	Natural	13	Not included	6	X
Flood	Natural	10	13	7	X
Drought	Natural	24	26	8	X
Earthquake	Natural	18	6	9	X
Wildfire	Natural	16	15	10	X
Landslide	Natural	Not included	28	11	X
Infestation	Natural	3	Not included	12	X
Tornado	Natural	15	Not included	Not included	X
Animal Disease/Foreign Animal Disease	Natural	Not included	14	Not included	X
Blight	Natural	23	Not included	Not included	X
Radiological (Fixed Site)	Technological or Human Caused	Not included	23	Not included	
Terrorism	Technological or Human Caused	21	Not included	Not included	
Utility Failure	Technological or Human Caused	5	17	Not included	
Dam Failure	Technological or Human Caused	14	24	Not included	
Fire	Technological or Human Caused	2	11	Not included	
HAZMAT Fixed Site	Technological or Human Caused	12	9	Not included	
HAZMAT in Transit	Technological or Human Caused	1	5	Not included	
Pandemic	Technological or Human Caused	Not included	7	Not included	
Transportation Accident	Technological or Human Caused	6	10	Not included	
Water Supply Contamination	Technological or Human Caused	9	Not included	Not included	
Active Shooter	Technological or Human Caused	Not included	8	Not included	
Biological Agent Release	Technological or Human Caused	Not included	20	Not included	
Civil Unrest	Technological or Human Caused	22	Not included	Not included	
Cyber Attack	Technological or Human Caused	Not included	4	Not included	
Epidemic	Technological or Human Caused	19	Not included	Not included	
Explosion	Technological or Human Caused	20	Not included	Not included	

Table 4.6 - Hazard Ranking Comparison

Hazard	Hazard Category	2015 HMP Rank	2018 CEPA Rank	2021 HMP Update Rank	Affected by Climate Change
Food Contamination	Technological or Human Caused	Not included	16	Not included	
Improvised Explosive Device/Vehicle Born IED	Technological or Human Caused	Not included	21	Not included	
Improvised Nuclear Device	Technological or Human Caused	Not included	27	Not included	
Mine Collapse	Technological or Human Caused	25	Not included	Not included	
Oil Spill	Technological or Human Caused	11	Not included	Not included	
Radiological Dispersal Device	Technological or Human Caused	Not included	22	Not included	
Seaway Incident	Technological or Human Caused	Not included	12	Not included	
Structural Collapse	Technological or Human Caused	7	Not included	Not included	
Water/Sewer System Failure	Technological or Human Caused	Not included	25	Not included	

Figure 5.1 - Wind Zones in the U.S.

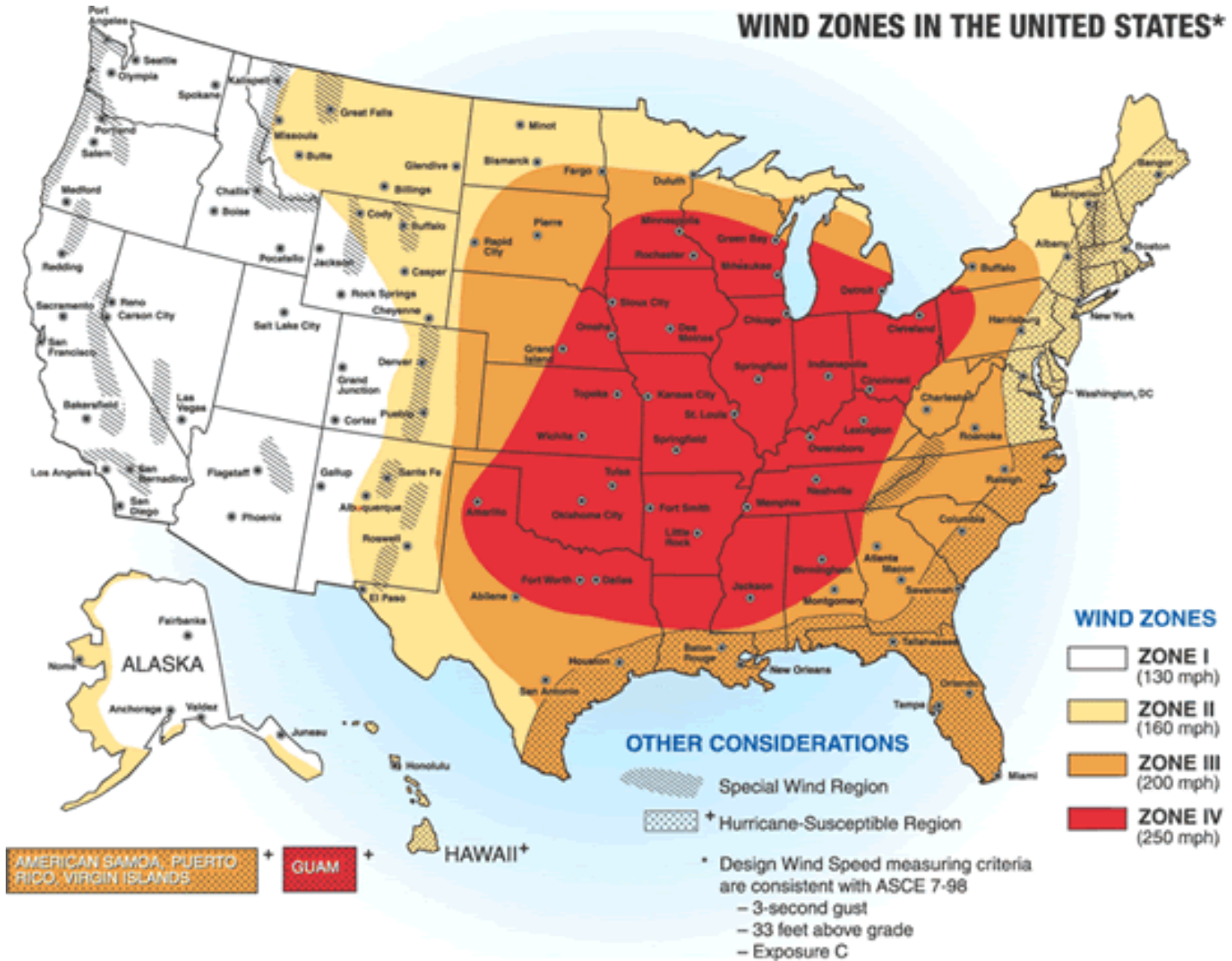


Table 5.1 – Beaufort Wind Scale

Force	Wind Speed	WMO	Appearance on Land
	(Knots)	Classification	
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	-
12	64+	Hurricane	-



Table 5.2 – TORRO Hailstorm Intensity Scale
(TORRO, 2019)

Intensity Category		Typical Hail Diameter (mm)	Probable Kinetic Energy, J-m ²	Typical Damage Impacts
H0	Hard Hail	5	0-20	No damage
H1	Potentially Damaging	5-15	>20	Slight general damage to plants, crops
H2	Significant	10-20	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60	-	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-75	-	Severe roof damage, risk of serious injuries
H8	Destructive	60-90	-	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100	-	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100	-	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Table 5.3 – Enhanced Fujita Scale
(NOAA, Storm Prediction Center, Enhanced F-Scale)

Fujita Scale		Derived EF Scale		Operational EF Scale		
F Number	Fastest ¼-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

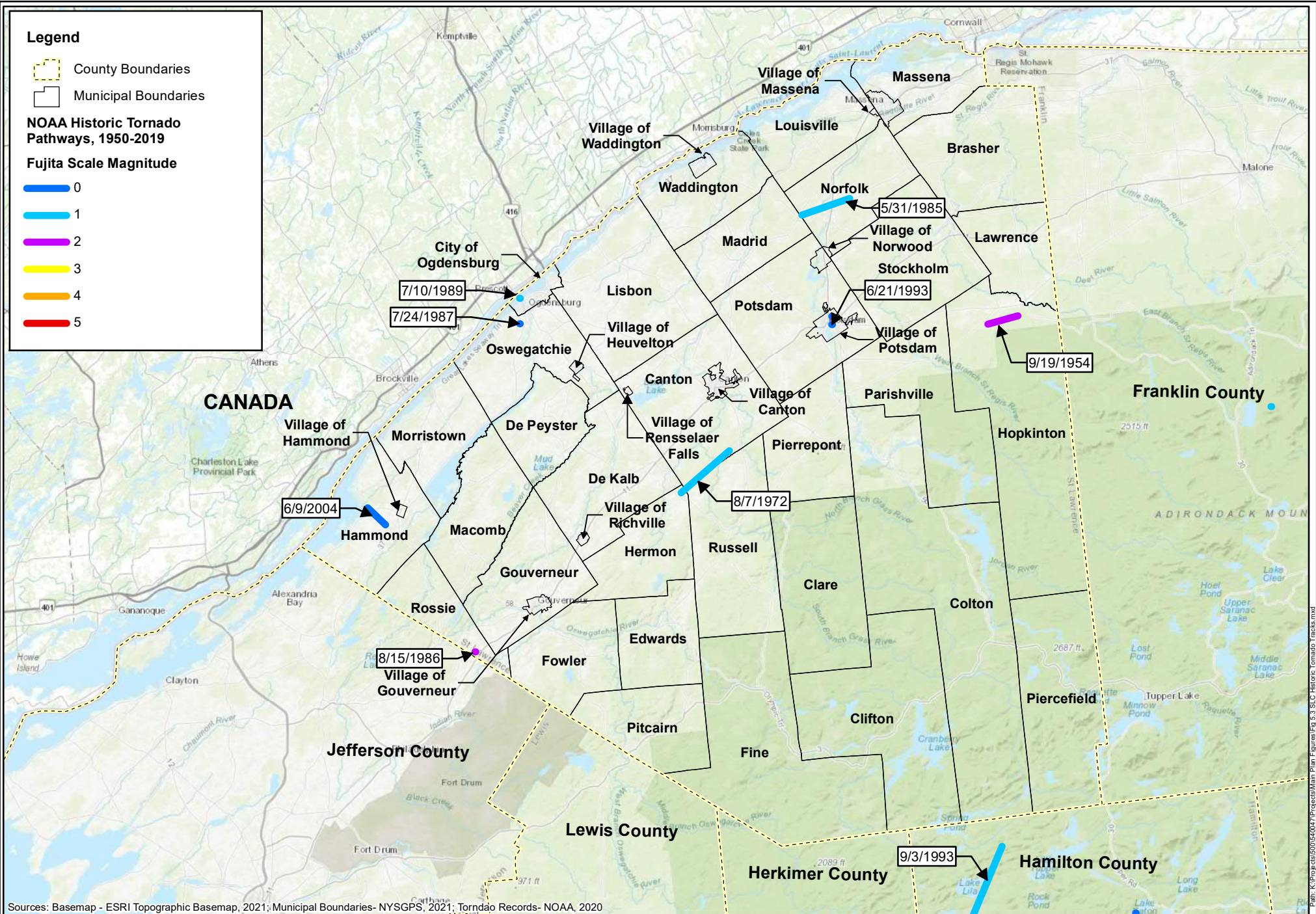
Legend

-  County Boundaries
-  Municipal Boundaries

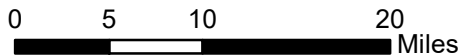
NOAA Historic Tornado Pathways, 1950-2019

Fujita Scale Magnitude

-  0
-  1
-  2
-  3
-  4
-  5



Sources: Basemap - ESRI Topographic Basemap, 2021; Municipal Boundaries- NYSGPS, 2021; Tornado Records- NOAA, 2020



Path: K:\Info\540\540\540\404\MapDocs\Map Plan Figures\Fig 5.2 NOAA Historic Tornado Paths.mxd

Table 5.4 - NCDC Severe Storm Event Records in St. Lawrence County, 2010-2021

Location	Date	Jurisdiction	Event Type	Magnitude	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Gouverneur	7/9/2010	Gouverneur, Village	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Ft Jackson	7/21/2010	Hopkinton, Town	Hail	1"	0	0	\$0.00	\$0.00
Ogdensburg	7/21/2010	Ogdensburg, City	Hail	1.25"	0	0	\$0.00	\$0.00
Potsdam	7/21/2010	Potsdam, Village	Hail	1.75"	0	0	\$25,000.00	\$25,000.00
Lisbon	7/21/2010	Lisbon, Town	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Ogdensburg	7/21/2010	Ogdensburg, City	Thunderstorm Wind	55 knots	0	0	\$50,000.00	\$0.00
Potsdam	7/21/2010	Potsdam, Village	Thunderstorm Wind	55 knots	0	0	\$50,000.00	\$0.00
Waddington	7/21/2010	Waddington, Town	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Ogdensburg	8/4/2010	Ogdensburg, City	Thunderstorm Wind	50 knots	0	0	\$50,000.00	\$0.00
Stockholm Center	8/22/2010	Stockholm, Town	Flood		0	0	\$40,000.00	\$0.00
Ogdensburg	9/30/2010	Oswegatchie, Town	Flood		0	0	\$150,000.00	\$0.00
Ogdensburg	10/1/2010	Oswegatchie, Town	Flood		0	0	\$150,000.00	\$0.00
Plumbrook	4/28/2011	Norfolk, Town	Flood		0	0	\$1,000,000.00	\$0.00
Plumbrook	5/1/2011	Norfolk, Town	Flood		0	0	\$0.00	\$0.00
Shawsville	5/26/2011	Edwards, Town	Hail	1"	0	0	\$0.00	\$0.00
Shawsville	5/26/2011	Edwards, Town	Thunderstorm Wind	52 knots	0	0	\$1,000.00	\$0.00
Canton	6/8/2011	Canton, Village	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Spragueville	6/8/2011	Fowler, Town	Thunderstorm Wind	55 knots	0	0	\$5,000.00	\$0.00
Natural Dam	6/8/2011	Gouverneur, Town	Thunderstorm Wind	55 knots	0	0	\$15,000.00	\$0.00
Potsdam	6/8/2011	Potsdam, Village	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Canton	7/17/2011	Canton, Village	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Flackville	7/17/2011	Lisbon, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Lisbon	7/17/2011	Lisbon, Town	Thunderstorm Wind	55 knots	0	0	\$10,000.00	\$0.00
Massena	7/17/2011	Massena, Village	Thunderstorm Wind	60 knots	0	0	\$25,000.00	\$0.00
Ogdensburg	7/17/2011	Ogdensburg, City	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Ogdensburg	7/17/2011	Ogdensburg, City	Thunderstorm Wind	60 knots	0	0	\$15,000.00	\$0.00
Parishville	7/17/2011	Parishville, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Potsdam	7/17/2011	Potsdam, Village	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Star Lake	7/26/2011	Clifton, Town	Hail	1"	0	0	\$0.00	\$0.00
Wanakena	7/26/2011	Fine, Town	Hail	0.75"	0	0	\$0.00	\$0.00
Canton	7/4/2012	Canton, Village	Hail	1.5"	0	0	\$0.00	\$0.00
Lisbon	7/4/2012	Lisbon, Town	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Russell	7/4/2012	Russell, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Cranberry Lake	7/17/2012	Clifton, Town	Hail	1"	0	0	\$0.00	\$0.00
Edwards	7/17/2012	Edwards, Town	Hail	1"	0	0	\$0.00	\$0.00
Edwards	7/17/2012	Edwards, Town	Hail	1"	0	0	\$0.00	\$0.00
Potsdam	7/17/2012	Potsdam, Town	Hail	0.88"	0	0	\$0.00	\$0.00
Winthrop	7/17/2012	Stockholm, Town	Hail	0.75"	0	0	\$0.00	\$0.00
Colton	7/17/2012	Colton, Town	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Ft Jackson	7/17/2012	Hopkinton, Town	Thunderstorm Wind	50 knots	0	0	\$25,000.00	\$0.00
Hannawa Falls	7/17/2012	Pierrepont, Town	Thunderstorm Wind	60 knots	0	0	\$25,000.00	\$0.00
Potsdam	7/17/2012	Potsdam, Town	Thunderstorm Wind	65 knots	0	0	\$100,000.00	\$0.00

Table 5.4 - NCDC Severe Storm Event Records in St. Lawrence County, 2010-2021

Location	Date	Jurisdiction	Event Type	Magnitude	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Russell	7/17/2012	Russell, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Heuvelton	7/23/2012	Heuvelton, Village	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Madrid	7/23/2012	Madrid, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Massena	7/23/2012	Massena, Village	Thunderstorm Wind	55 knots	0	0	\$15,000.00	\$0.00
Fine	8/5/2012	Fine, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Eddy	8/11/2012	Canton, Town	Hail	0.88"	0	0	\$0.00	\$0.00
Eddy	8/11/2012	Canton, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Ogdensburg	9/8/2012	Ogdensburg, City	Thunderstorm Wind	51 knots	0	0	\$10,000.00	\$0.00
Potsdam	9/8/2012	Potsdam, Village	Thunderstorm Wind	60 knots	0	0	\$35,000.00	\$0.00
Canton	5/21/2013	Canton, Village	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Canton	5/22/2013	Canton, Village	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Colton	5/22/2013	Colton, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Lisbon	5/22/2013	Lisbon, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Morristown	5/22/2013	Morristown, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Norfolk	5/22/2013	Norfolk, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Potsdam	5/22/2013	Potsdam, Village	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Waddington	6/1/2013	Waddington, Village	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Waddington	6/24/2013	Waddington, Village	Thunderstorm Wind	55 knots	0	0	\$10,000.00	\$0.00
Richards Field - Massena	7/10/2013	Massena, Town	Thunderstorm Wind	52 knots	0	0	\$0.00	\$0.00
Massena	7/10/2013	Massena, Village	Thunderstorm Wind	55 knots	0	0	\$50,000.00	\$0.00
Colton	7/18/2013	Colton, Town	Hail	0.75"	0	0	\$0.00	\$0.00
Colton	7/18/2013	Colton, Town	Thunderstorm Wind	50 knots	0	0	\$15,000.00	\$0.00
Lisbon	7/18/2013	Lisbon, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Edwardsville	7/18/2013	Morristown, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Pierrepont	7/18/2013	Pierrepont, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Morley	7/19/2013	Canton, Town	Thunderstorm Wind	55 knots	0	0	\$10,000.00	\$0.00
Canton	7/19/2013	Canton, Village	Thunderstorm Wind	50 knots	0	0	\$20,000.00	\$0.00
Heuvelton	7/19/2013	Heuvelton, Village	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Ogdensburg	7/19/2013	Ogdensburg, City	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Potsdam	7/19/2013	Potsdam, Village	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
North Lawrence	9/11/2013	Lawrence, Town	Hail	1.75"	0	0	\$10,000.00	\$0.00
Louisville	9/11/2013	Louisville, Town	Hail	1.75"	0	0	\$20,000.00	\$0.00
Ogdensburg	9/11/2013	Ogdensburg, City	Hail	1"	0	0	\$0.00	\$0.00
Morley	9/11/2013	Canton, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Spragueville	4/9/2014	Rossie, Town	Flood		0	0	\$10,000.00	\$0.00
North Corners	4/15/2014	Lisbon, Town	Flood		0	0	\$4,100,000.00	\$0.00
Grantville	7/8/2014	Norfolk, Town	Funnel Cloud		0	0	\$0.00	\$0.00
Canton	7/8/2014	Canton, Village	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Cranberry Lake	7/8/2014	Clifton, Town	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Gouverneur	7/8/2014	Gouverneur, Village	Thunderstorm Wind	55 knots	0	0	\$10,000.00	\$0.00
Eben	7/8/2014	Potsdam, Town	Thunderstorm Wind	60 knots	0	0	\$0.00	\$0.00
Potsdam	7/8/2014	Potsdam, Village	Thunderstorm Wind	60 knots	0	0	\$50,000.00	\$0.00

Table 5.4 - NCDC Severe Storm Event Records in St. Lawrence County, 2010-2021

Location	Date	Jurisdiction	Event Type	Magnitude	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Plumbrook	7/8/2014	Stockholm, Town	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Brasher Falls	8/18/2015	Brasher, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Potsdam	8/18/2015	Potsdam, Town	Thunderstorm Wind	50 knots	0	0	\$20,000.00	\$0.00
Potsdam	8/18/2015	Potsdam, Village	Thunderstorm Wind	55 knots	0	0	\$50,000.00	\$0.00
West Stockholm	8/18/2015	Stockholm, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Starlake	6/20/2016	Clifton, Town	Thunderstorm Wind	55 knots	0	0	\$10,000.00	\$0.00
Piercefield	6/20/2016	Piercefield, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Helena	6/28/2016	Brasher, Town	Hail	1"	0	0	\$0.00	\$0.00
Louisville	6/28/2016	Louisville, Town	Hail	0.75"	0	0	\$0.00	\$0.00
Massena	6/28/2016	Massena, Village	Hail	1"	0	0	\$0.00	\$0.00
Massena	6/28/2016	Massena, Village	Hail	1"	0	0	\$0.00	\$0.00
Waddington	6/28/2016	Waddington, Village	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Colton	7/9/2016	Colton, Town	Thunderstorm Wind	65 knots	0	0	\$60,000.00	\$0.00
Norfolk	7/9/2016	Norfolk, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Heuvelton	7/18/2016	Heuvelton, Village	Hail	0.75"	0	0	\$0.00	\$0.00
Potsdam	7/18/2016	Potsdam, Village	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Rensselaer Falls	7/18/2016	Rensselaer Falls, Village	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Hammond	9/10/2016	Hammond, Village	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Brier Hill	9/10/2016	Morristown, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Macomb	2/25/2017	Gouverneur, Town	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Eben	2/25/2017	Potsdam, Town	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Eben	2/25/2017	Potsdam, Town	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Fine	5/1/2017	Fine, Town	Thunderstorm Wind	60 knots	0	0	\$20,000.00	\$0.00
Pitcairn	5/1/2017	Pitcairn, Town	Thunderstorm Wind	70 knots	0	0	\$75,000.00	\$0.00
Russell	5/1/2017	Russell, Town	Thunderstorm Wind	55 knots	0	0	\$30,000.00	\$0.00
Waddington	6/24/2017	Waddington, Village	Thunderstorm Wind	70 knots	0	0	\$35,000.00	\$0.00
Canton	7/8/2017	Canton, Village	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Pierrepont	7/8/2017	Pierrepont, Town	Thunderstorm Wind	55 knots	0	0	\$15,000.00	\$0.00
Potsdam	7/8/2017	Potsdam, Village	Thunderstorm Wind	55 knots	0	0	\$25,000.00	\$0.00
Russell	7/8/2017	Russell, Town	Thunderstorm Wind	55 knots	0	0	\$10,000.00	\$0.00
Morristown	7/24/2017	Morristown, Town	Flash Flood		0	0	\$100,000.00	\$0.00
Russell	7/24/2017	Russell, Town	Flash Flood		0	0	\$5,000.00	\$0.00
Canton	8/4/2017	Canton, Village	Lightning		0	0	\$1,000.00	\$0.00
Potsdam	8/4/2017	Potsdam, Village	Lightning		0	0	\$1,000.00	\$0.00
Morley	8/4/2017	Canton, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
North Hammond	8/4/2017	Hammond, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Brier Hill	8/4/2017	Morristown, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Morristown	8/4/2017	Morristown, Town	Thunderstorm Wind	50 knots	0	0	\$0.00	\$0.00
Morristown	8/4/2017	Morristown, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Norfolk	8/4/2017	Norfolk, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Hannawa Falls	8/4/2017	Pierrepont, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Heuvelton	8/22/2017	De Peyster, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00







Table 5.4 - NCDC Severe Storm Event Records in St. Lawrence County, 2010-2021

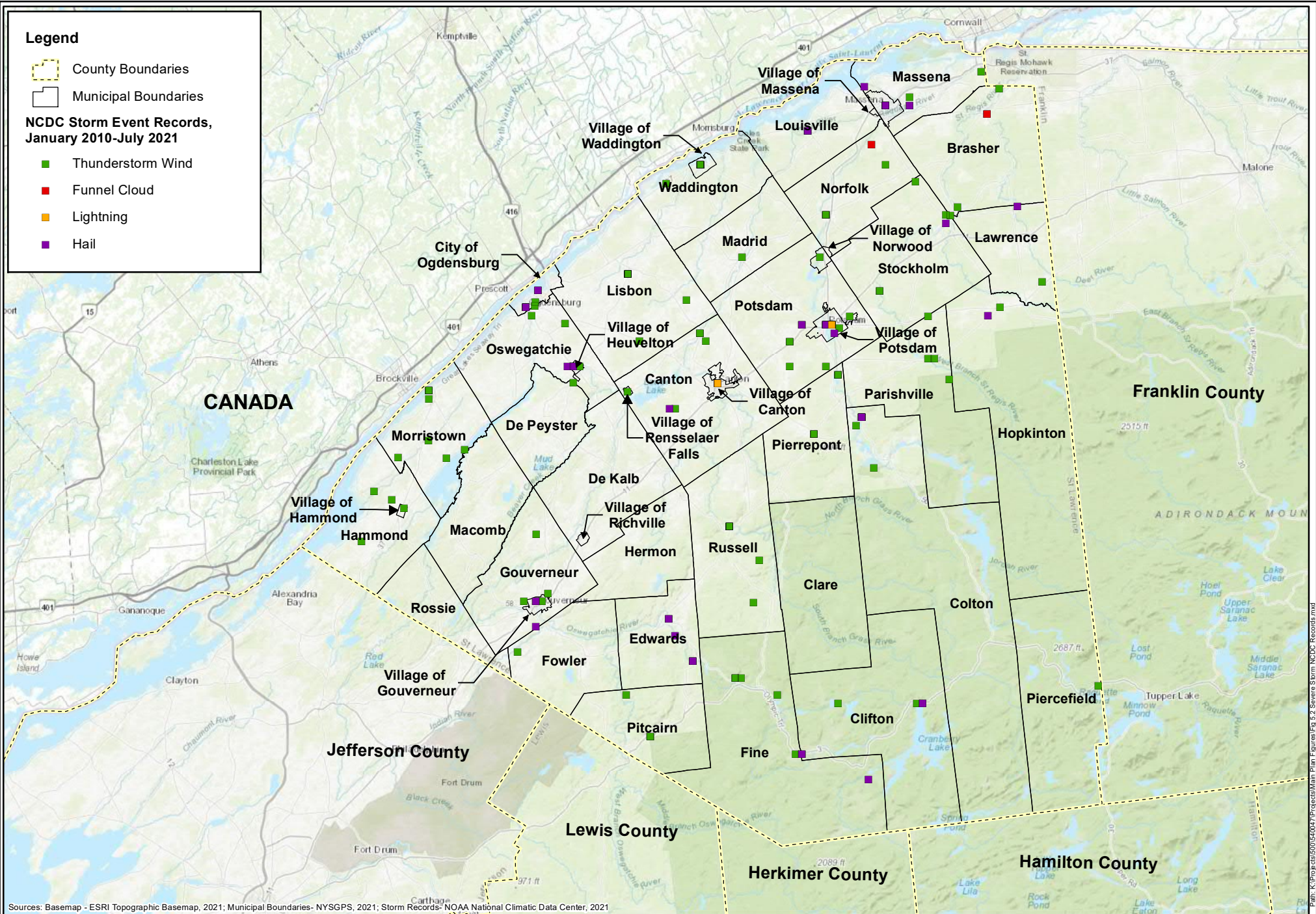
Location	Date	Jurisdiction	Event Type	Magnitude	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Fulleville Ironworks	8/22/2017	Pitcairn, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Potsdam	5/4/2018	Potsdam, Village	Hail	1.25"	0	0	\$0.00	\$0.00
Russell	5/4/2018	Russell, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Fine	6/13/2018	Fine, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Pitcairn	6/13/2018	Pitcairn, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Cranberry Lake	5/25/2019	Clifton, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Newton Falls	5/25/2019	Clifton, Town	Thunderstorm Wind	55 knots	0	0	\$5,000.00	\$0.00
South Hammond	6/29/2019	Hammond, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Potsdam	7/11/2019	Potsdam, Village	Hail	1"	0	0	\$0.00	\$0.00
Hannawa Falls	7/11/2019	Pierrepont, Town	Thunderstorm Wind	50 knots	0	0	\$20,000.00	\$0.00
Pierrepont	7/11/2019	Pierrepont, Town	Thunderstorm Wind	50 knots	0	0	\$15,000.00	\$0.00
Degrasse	7/11/2019	Russell, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
West Stockholm	7/11/2019	Stockholm, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Heuvelton	9/26/2019	Oswegatchie, Town	Hail	1.25"	0	0	\$0.00	\$0.00
Madrid	9/26/2019	Lisbon, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Richards Field - Massena	10/1/2019	Massena, Town	Hail	1"	0	0	\$0.00	\$0.00
Richards Field - Massena	10/1/2019	Massena, Town	Hail	2"	0	0	\$0.00	\$0.00
Edwards	3/20/2020	Edwards, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Starlake	3/20/2020	Fine, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Richards Field - Massena	3/20/2020	Massena, Town	Thunderstorm Wind	51 knots	0	0	\$0.00	\$0.00
Rooseveltown	3/20/2020	Massena, Town	Thunderstorm Wind	60 knots	0	0	\$5,000.00	\$0.00
Edwardsville	3/20/2020	Morristown, Town	Thunderstorm Wind	51 knots	0	0	\$0.00	\$0.00
Potsdam	3/20/2020	Potsdam, Village	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Hailesboro	3/29/2020	Gouverneur, Town	Hail	1"	0	0	\$0.00	\$0.00
Gouverneur	3/29/2020	Gouverneur, Village	Hail	0.75"	0	0	\$0.00	\$0.00
Nicholville	5/27/2020	Lawrence, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Lower Oswegatchie	6/27/2020	Fine, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Gouverneur	6/27/2020	Gouverneur, Town	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
North Hammond	6/28/2020	Hammond, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Colton	7/19/2020	Colton, Town	Thunderstorm Wind	50 knots	0	0	\$15,000.00	\$0.00
Converse	7/19/2020	Parishville, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Parishville	7/19/2020	Parishville, Town	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00
Hannawa Falls	8/2/2020	Potsdam, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Degrasse Moores Airport	8/2/2020	Russell, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Rooseveltown	10/10/2020	Brasher, Town	Thunderstorm Wind	55 knots	0	0	\$5,000.00	\$0.00
Grantville	10/10/2020	Norfolk, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Northrup Corners	11/15/2020	Oswegatchie, Town	Thunderstorm Wind	50 knots	0	0	\$25,000.00	\$0.00
Pickettville	3/26/2021	Parishville, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Shawsville	6/21/2021	Edwards, Town	Thunderstorm Wind	50 knots	0	0	\$20,000.00	\$0.00
Winthrop	7/13/2021	Brasher, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Morristown	7/13/2021	Morristown, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Ogdensburg Intl Airport	7/13/2021	Ogdensburg, City	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00

Table 5.4 - NCDC Severe Storm Event Records in St. Lawrence County, 2010-2021

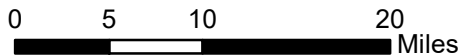
Location	Date	Jurisdiction	Event Type	Magnitude	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Potsdam	7/13/2021	Potsdam, Village	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Helena	7/20/2021	Brasher, Town	Funnel Cloud		0	0	\$0.00	\$0.00
Canton	7/20/2021	Canton, Village	Thunderstorm Wind	52 knots	0	0	\$10,000.00	\$0.00
South Colton	7/20/2021	Colton, Town	Thunderstorm Wind	50 knots	0	0	\$5,000.00	\$0.00
Heuvelton	7/20/2021	Heuvelton, Village	Thunderstorm Wind	52 knots	0	0	\$10,000.00	\$0.00
Lisbon	7/20/2021	Lisbon, Town	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Norwood	7/20/2021	Norwood, Village	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Ogdensburg Intl Airport	7/20/2021	Oswegatchie, Town	Thunderstorm Wind	55 knots	0	0	\$0.00	\$0.00
Ogdensburg Intl Airport	7/20/2021	Oswegatchie, Town	Thunderstorm Wind	55 knots	0	0	\$50,000.00	\$0.00
Potsdam	7/20/2021	Potsdam, Village	Thunderstorm Wind	55 knots	0	0	\$20,000.00	\$0.00
Winthrop	7/20/2021	Stockholm, Town	Thunderstorm Wind	50 knots	0	0	\$2,000.00	\$0.00
Waddington	7/20/2021	Waddington, Village	Thunderstorm Wind	50 knots	0	0	\$10,000.00	\$0.00

Legend

-  County Boundaries
-  Municipal Boundaries
- NCDC Storm Event Records, January 2010-July 2021**
-  Thunderstorm Wind
-  Funnel Cloud
-  Lightning
-  Hail



Sources: Basemap - ESRI Topographic Basemap, 2021; Municipal Boundaries- NYSGPS, 2021; Storm Records- NOAA National Climatic Data Center, 2021



Path: K:\Info\540.047\MapDocs\Map Plan Figures\Fig 5.3 Severe Storm NCDC Records.mxd

Table 5.5 – NCDC Tornado Events Recorded for St. Lawrence County, 1950 – 2021
(Tornado History Project, NCDC, Storm Events Search, 2020)

Location	Date	Event	Fujita Scale	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Parishville	9/19/1954	Tornado	F2	0	0	25.00K	0.00K
Potsdam	8/7/1972	Tornado	F1	0	0	25.00K	0.00K
Norfolk	5/31/1985	Tornado	F1	0	0	250.00K	0.00K
Somerville	8/15/1986	Tornado	F2	1	3	250.00K	0.00K
Ogdensburg	7/24/1987	Tornado	F0	0	0	250.00K	0.00K
Chippewa Bay	8/9/1988	Tornado	F0	0	0	3.00K	0.00K
Ogdensburg	7/10/1989	Tornado	F1	0	1	25.00K	0.00K
Potsdam	6/21/1993	Tornado	F0	0	0	Unknown	Unknown
Gouverneur	6/9/2004	Tornado	F0	0	0	25.00K	0.00K
Chippewa Bay	6/9/2004	Tornado	F0	0	0	25.00K	0.00K
Total: 10	--	--	--	1	4	878.00K	0.00K

Table 5.6 – Sperry-Piltz Ice Accumulation Index

The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Table 5.7 – Regional Snowfall Index
(NOAA, 2019)

Category	RSI Value	Description
1	1-3	Notable
2	3-6	Significant
3	6-10	Major
4	10-18	Crippling
5	Over 18	Extreme

Table 5.8 – NCDC Ice Storm Events in St. Lawrence County, 1996 –2021
 (NOAA, NCDC, Storm Events Search, 2021)

Location	Date	Event	Magnitude	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Northern	1/6/1998	Ice Storm	Up to 4" of ice	1	0	3.00M	0.00K
Northern	1/12/2012	Ice Storm	--	0	0	25.00K	0.00K
Southwestern	1/12/2012	Ice Storm	--	0	0	25.00K	0.00K
Northern	12/20/2013	Ice Storm	--	0	0	1.000M	0.00K
Southwestern	12/20/2013	Ice Storm	--	0	0	750.00K	0.00K
Southeastern	12/21/2013	Ice Storm	--	0	0	100.00K	0.00K
Northern	1/12/2020	Ice Storm	--	0	0	25.00K	0.00K
Totals: 7	--	--	--	1	0	\$4.925M	0.00

Table 5.9 – NCDC Winter Storm Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

Portion of County	Date	Event	Deaths (#)	Injuries (#)	Property Damage (\$)	Regional Snowfall Index (RSI) Value	RSI Category*
Southwestern	1/2/2010	Winter Weather	0	0	5.00K	N/A	-
Northern	1/2/2010	Winter Storm	0	0	10.00K	N/A	-
Southeastern	1/2/2010	Winter Weather	0	0	5.00K	N/A	-
Southeastern	1/27/2010	Lake-effect Snow	0	0	5.00K	N/A	-
Southwestern	1/27/2010	Lake-effect Snow	0	0	5.00K	N/A	-
Northern	4/27/2010	Winter Weather	0	0	5.00K	N/A	-
Southeastern	4/27/2010	Winter Storm	0	0	10.00K	N/A	-
Southeastern	12/6/2010	Winter Storm	0	0	5.00K	N/A	-
Northern	12/13/2010	Winter Weather	0	0	10.00K	N/A	-
Southwestern	12/13/2010	Winter Weather	0	0	5.00K	N/A	-
Southeastern	12/13/2010	Winter Weather	0	0	5.00K	N/A	-
Southeastern	1/9/2011	Winter Weather	0	0	2.00K	3.377	2
Northern	2/2/2011	Winter Storm	0	0	10.00K	1.779	1
Southwestern	2/2/2011	Winter Storm	0	0	5.00K	1.779	1
Southeastern	2/2/2011	Winter Storm	0	0	5.00K	1.779	1
Northern	2/5/2011	Winter Weather	0	0	5.00K	N/A	-
Southeastern	2/5/2011	Winter Storm	0	0	10.00K	N/A	-
Southwestern	2/5/2011	Winter Storm	0	0	10.00K	N/A	-
Northern	2/7/2011	Winter Weather	0	0	5.00K	N/A	-
Southwestern	2/7/2011	Winter Weather	0	0	5.00K	N/A	-
Southeastern	2/7/2011	Winter Weather	0	0	5.00K	N/A	-
Southwestern	2/9/2011	Lake-effect Snow	0	0	5.00K	N/A	-
Northern	2/25/2011	Winter Weather	0	0	5.00K	1.736	1
Southwestern	2/25/2011	Winter Weather	0	0	5.00K	1.736	1
Southeastern	2/25/2011	Winter Storm	0	0	5.00K	1.736	1
Northern	3/6/2011	Winter Weather	0	0	5.00K	N/A	-

Table 5.9 – NCDC Winter Storm Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

Portion of County	Date	Event	Deaths (#)	Injuries (#)	Property Damage (\$)	Regional Snowfall Index (RSI) Value	RSI Category*
Southeastern	3/6/2011	Winter Storm	0	0	5.00K	N/A	-
Southwestern	3/6/2011	Winter Weather	0	0	5.00K	N/A	-
Southeastern	11/22/2011	Winter Weather	0	0	5.00K	N/A	-
Southwestern	1/13/2012	Winter Storm	0	0	5.00K	N/A	-
Southeastern	1/13/2012	Winter Storm	0	0	5.00K	N/A	-
Northern	2/24/2012	Winter Weather	0	0	5.00K	N/A	-
Southeastern	2/24/2012	Winter Storm	0	0	5.00K	N/A	-
Southwestern	2/24/2012	Winter Weather	0	0	5.00K	N/A	-
Southeastern	12/21/2012	Winter Storm	0	0	5.00K	N/A	-
Southwestern	12/21/2012	Winter Storm	0	0	5.00K	N/A	-
Southwestern	12/26/2012	Winter Storm	0	0	15.00K	2.004	1
Southeastern	12/26/2012	Winter Storm	0	0	10.00K	2.004	1
Northern	12/26/2012	Winter Storm	0	0	15.00K	2.004	1
Southwestern	2/8/2013	Winter Storm	0	0	5.00K	9.212	3
Southeastern	2/8/2013	Winter Storm	0	0	5.00K	9.212	3
Northern	2/8/2013	Winter Storm	0	0	10.00K	9.212	3
Southwestern	3/18/2013	Winter Weather	0	0	5.00K	1.621	1
Southeastern	3/18/2013	Winter Weather	0	0	5.00K	1.621	1
Northern	3/18/2013	Winter Weather	0	0	5.00K	1.621	1
Southwestern	11/26/2013	Winter Storm	0	0	10.00K	N/A	-
Northern	11/26/2013	Winter Storm	0	0	10.00K	N/A	-
Northern	12/14/2013	Winter Storm	0	0	10.00K	2.678	1
Southwestern	12/14/2013	Winter Weather	0	0	5.00K	2.678	1
Southeastern	12/14/2013	Winter Weather	0	0	5.00K	2.678	1
Southeastern	2/5/2014	Heavy Snow	0	0	5.00K	N/A	-
Southwestern	2/5/2014	Heavy Snow	0	0	5.00K	N/A	-

Table 5.9 – NCDC Winter Storm Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

Portion of County	Date	Event	Deaths (#)	Injuries (#)	Property Damage (\$)	Regional Snowfall Index (RSI) Value	RSI Category*
Northern	2/5/2014	Winter Weather	0	0	5.00K	N/A	-
Northern	2/13/2014	Heavy Snow	0	0	10.00K	4.398	2
Southeastern	2/13/2014	Winter Weather	0	0	5.00K	4.398	2
Southwestern	2/13/2014	Winter Weather	0	0	5.00K	4.398	2
Southeastern	3/12/2014	Winter Storm	0	0	10.00K	N/A	-
Southwestern	3/12/2014	Winter Storm	0	0	15.00K	N/A	-
Northern	3/12/2014	Winter Storm	0	0	15.00K	N/A	-
Southwestern	3/29/2014	Winter Weather	0	0	5.00K	N/A	-
Northern	3/29/2014	Winter Storm	0	0	10.00K	N/A	-
Southeastern	3/29/2014	Winter Storm	0	0	5.00K	N/A	-
Southeastern	11/18/2014	Lake-effect Snow	0	0	100.00K	N/A	-
Southwestern	11/18/2014	Lake-effect Snow	0	0	25.00K	N/A	-
Southeastern	11/20/2014	Lake-effect Snow	0	0	20.00K	N/A	-
Southeastern	12/9/2014	Winter Storm	0	0	10.00K	1.881	1
Southeastern	12/9/2014	Winter Storm	0	0	10.00K	1.881	1
Northern	12/9/2014	Winter Storm	0	0	10.00K	1.881	1
Southwestern	12/31/2014	Lake-effect Snow	0	0	0	N/A	-
Southeastern	12/31/2014	Lake-effect Snow	0	0	0	N/A	-
Southeastern	1/1/2015	Lake-effect Snow	0	0	10.00K	N/A	-
Southwestern	1/1/2015	Lake-effect Snow	0	0	10.00K	N/A	-
Southwestern	1/6/2015	Lake-effect Snow	0	0	5.00K	N/A	-
Northern	1/29/2015	Winter Weather	0	0	5.00K	N/A	-
Southwestern	1/29/2015	Winter Weather	0	0	5.00K	N/A	-
Southeastern	1/29/2015	Winter Weather	0	0	5.00K	N/A	-
Southeastern	2/1/2015	Cold/Wind Chill	0	0	0	2.606	1
Northern	2/1/2015	Cold/Wind Chill	0	0	0	2.606	1

Table 5.9 – NCDC Winter Storm Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

Portion of County	Date	Event	Deaths (#)	Injuries (#)	Property Damage (\$)	Regional Snowfall Index (RSI) Value	RSI Category*
Southwestern	2/1/2015	Cold/Wind Chill	0	0	0	2.606	1
Southeastern	2/2/2015	Winter Storm	0	0	10.00K	2.606	1
Northern	2/2/2015	Winter Weather	0	0	5.00K	2.606	1
Southwestern	2/2/2015	Winter Storm	0	0	10.00K	2.606	1
Southeastern	12/28/2015	Winter Weather	0	0	0	N/A	-
Northern	12/28/2015	Winter Storm	0	0	0	N/A	-
Southwestern	12/28/2015	Winter Weather	0	0	0	N/A	-
Northern	2/16/2016	Winter Storm	0	0	10.00K	N/A	-
Southeastern	2/16/2016	Winter Weather	0	0	10.00K	N/A	-
Southwestern	2/16/2016	Winter Storm	0	0	10.00K	N/A	-
Southeastern	11/20/2016	Winter Storm	0	0	10.00K	2.154	1
Northern	11/20/2016	Winter Storm	0	0	10.00K	2.154	1
Southwestern	11/20/2016	Winter Storm	0	0	10.00K	2.154	1
Northern	2/12/2017	Winter Storm	0	0	10.00K	N/A	-
Southeastern	2/12/2017	Winter Storm	0	0	10.00K	N/A	-
Southwestern	2/12/2017	Winter Storm	0	0	10.00K	N/A	-
Southeastern	3/14/2017	Winter Storm	0	0	10.00K	10.658	4
Southwestern	3/14/2017	Winter Storm	0	0	10.00K	10.658	4
Northern	3/14/2017	Winter Storm	0	0	20.00K	10.658	4
Southeastern	12/7/2017	Lake-effect Snow	0	0	0	N/A	-
Northern	12/12/2017	Winter Storm	0	0	15.00K	N/A	-
Southwestern	12/12/2017	Winter Weather	0	0	10.00K	N/A	-
Southeastern	12/12/2017	Winter Weather	0	0	10.00K	N/A	-
Southwestern	12/22/2017	Winter Weather	0	0	10.00K	N/A	-
Southeastern	12/22/2017	Winter Weather	0	0	10.00K	N/A	-
Northern	12/22/2017	Winter Weather	0	0	10.00K	N/A	-

Table 5.9 – NCDC Winter Storm Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

Portion of County	Date	Event	Deaths (#)	Injuries (#)	Property Damage (\$)	Regional Snowfall Index (RSI) Value	RSI Category*
Southwestern	12/25/2017	Winter Storm	0	0	5.00K	N/A	-
Northern	12/25/2017	Winter Weather	0	0	0.00K	N/A	-
Southeastern	12/25/2017	Winter Weather	0	0	0.00K	N/A	-
Northern	1/12/2018	Winter Storm	0	0	10.00K	N/A	-
Southwestern	1/12/2018	Winter Storm	0	0	10.00K	N/A	-
Southeastern	1/12/2018	Winter Storm	0	0	10.00K	N/A	-
Southwestern	2/7/2018	Winter Weather	0	0	5.00K	N/A	-
Southeastern	2/7/2018	Winter Storm	0	0	10.00K	N/A	-
Northern	2/7/2018	Winter Weather	0	0	5.00K	N/A	-
Northern	3/7/2018	Winter Weather	0	0	0.00K	2.096	1
Southwestern	3/7/2018	Winter Weather	0	0	0.00K	2.096	1
Southeastern	3/7/2018	Winter Weather	0	0	0.00K	2.096	1
Southeastern	3/13/2018	Winter Storm	0	0	10.00K	4.335	2
Southwestern	3/13/2018	Winter Weather	0	0	5.00K	4.335	2
Northern	3/13/2018	Winter Weather	0	0	5.00K	4.335	2
Southwestern	11/15/2018	Winter Weather	0	0	5.00K	2.016	1
Northern	11/15/2018	Winter Weather	0	0	5.00K	2.016	1
Southeastern	11/15/2018	Winter Storm	0	0	10.00K	2.016	1
Northern	11/26/2018	Winter Weather	0	0	5.00K	N/A	-
Southwestern	11/26/2018	Winter Weather	0	0	5.00K	N/A	-
Southeastern	11/26/2018	Winter Weather	0	0	5.00K	N/A	-
Southeastern	1/8/2019	Winter Storm	0	0	10.00K	N/A	-
Northern	1/8/2019	Winter Weather	0	0	5.00K	N/A	-
Southwestern	1/8/2019	Winter Weather	0	0	5.00K	N/A	-
Northern	1/19/2019	Winter Storm	0	0	10.00K	2.831	1
Southwestern	1/19/2019	Winter Storm	0	0	10.00K	2.831	1

Table 5.9 – NCDC Winter Storm Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

Portion of County	Date	Event	Deaths (#)	Injuries (#)	Property Damage (\$)	Regional Snowfall Index (RSI) Value	RSI Category*
Southeastern	1/19/2019	Winter Storm	0	0	10.00K	2.831	1
Southeastern	2/12/2019	Winter Storm	0	0	10.00K	N/A	-
Southwestern	2/12/2019	Winter Storm	0	0	10.00K	N/A	-
Northern	2/12/2019	Winter Storm	0	0	10.00K	N/A	-
Southeastern	3/22/2019	Winter Storm	0	0	10.00K	N/A	-
Southwestern	3/22/2019	Winter Weather	0	0	5.00K	N/A	-
Northern	3/22/2019	Winter Weather	0	0	5.00K	N/A	-
Northern	11/11/2019	Winter Storm	0	0	10.00K	N/A	-
Southwestern	11/11/2019	Winter Storm	0	0	5.00K	N/A	-
Southeastern	11/11/2019	Winter Storm	0	0	5.00K	N/A	-
Southeastern	12/29/2019	Winter Weather	0	0	10.00K	N/A	-
Southwestern	12/29/2019	Winter Storm	0	0	25.00K	N/A	-
Northern	12/29/2019	Winter Storm	0	0	50.00K	N/A	-
Southwestern	1/12/2020	Winter Weather	0	0	10.00K	N/A	-
Northern	1/15/2020	Winter Weather	0	0	0.00K	N/A	-
Southeastern	1/15/2020	Winter Storm	0	0	0.00K	N/A	-
Southwestern	1/15/2020	Winter Weather	0	0	0.00K	N/A	-
Northern	1/18/2020	Winter Storm	0	0	5.00K	N/A	-
Southwestern	1/18/2020	Winter Weather	0	0	0.00K	N/A	-
Southeastern	1/18/2020	Winter Weather	0	0	0.00K	N/A	-
Northern	2/6/2020	Winter Storm	0	0	15.00K	N/A	-
Southwestern	2/6/2020	Winter Storm	0	0	15.00K	N/A	-
Southeastern	2/6/2020	Winter Storm	0	0	15.00K	N/A	-
Southeastern	2/27/2020	Lake-effect Snow	0	0	10.00K	N/A	-
Southeastern	12/26/2020	Lake-Effect Snow	0	0	0.00K	N/A	-
Northern	1/1/2021	Winter Weather	0	0	0.00K	N/A	-

Table 5.9 – NCDC Winter Storm Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

Portion of County	Date	Event	Deaths (#)	Injuries (#)	Property Damage (\$)	Regional Snowfall Index (RSI) Value	RSI Category*
Southwestern	1/15/2021	Winter Weather	0	0	0.00K	N/A	-
Northern	1/15/2021	Winter Weather	0	0	10.00K	N/A	-
Southeastern	1/15/2021	Winter Weather	0	0	10.00K	N/A	-
Southwestern	2/2/2021	Winter Weather	0	0	5.00K	6.188	3
Southeastern	2/2/2021	Winter Storm	0	0	10.00K	6.188	3
Northern	2/2/2021	Winter Storm	0	0	10.00K	6.188	3
Southeastern	2/16/2021	Winter Weather	0	0	0.00K	1.146	1
Southwestern	2/16/2021	Winter Weather	0	0	0.00K	1.146	1
Northern	4/21/2021	Winter Weather	0	0	0.00K	N/A	-
Southeastern	4/21/2021	Winter Weather	0	0	0.00K	N/A	-
Total: 165 Records	--	--	0	0	1.282M		

*RSI Category Descriptions (NOAA):
 1- Notable
 2- Significant
 3- Major

Figure 5.4 National Weather Service Heat Index

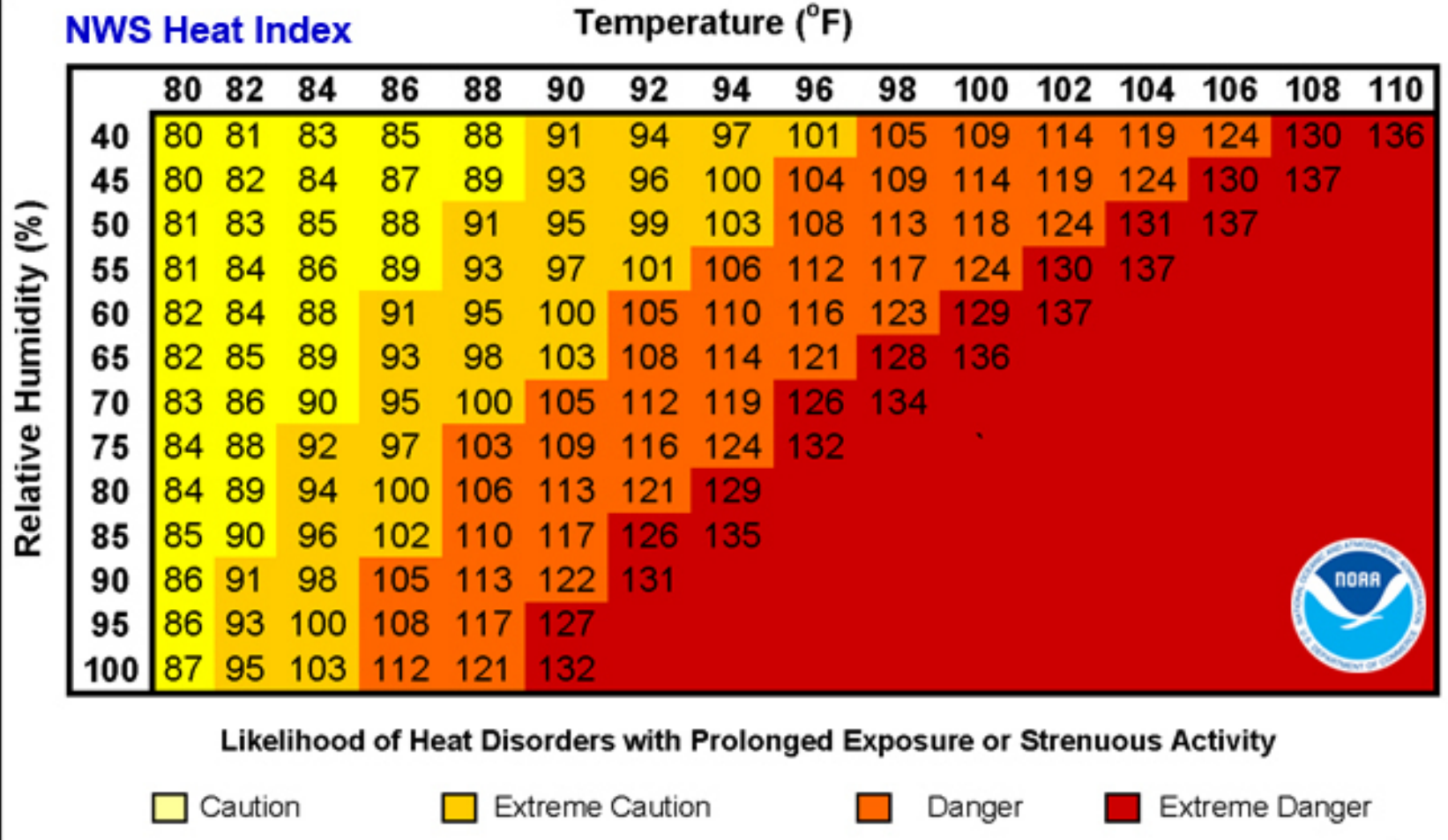


Figure 5.5 National Weather Service Wind Chill Index



Wind Chill Chart

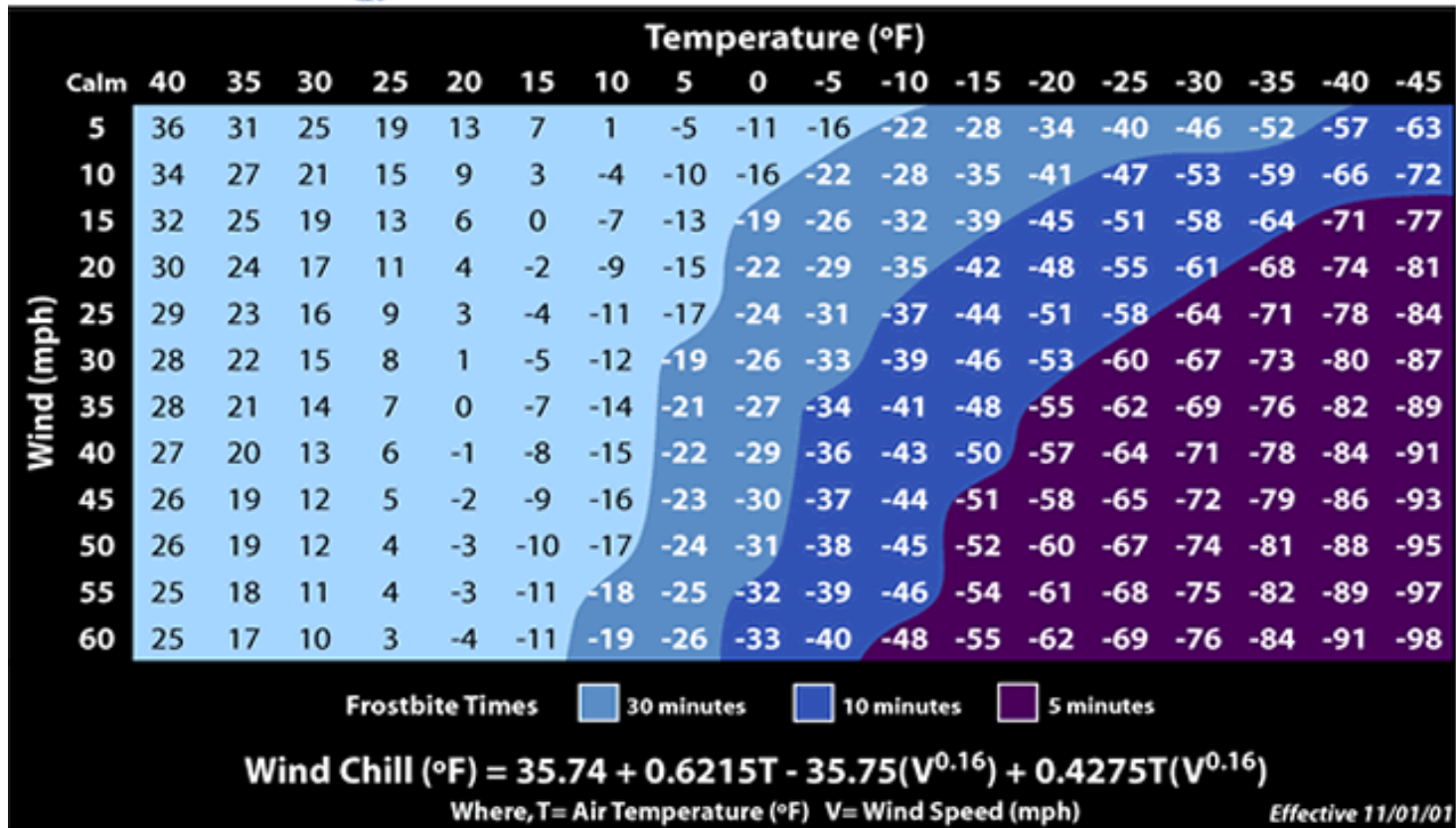


Figure 5.6 – Age Demographics in St. Lawrence County
(U.S. Census Bureau, 2020)

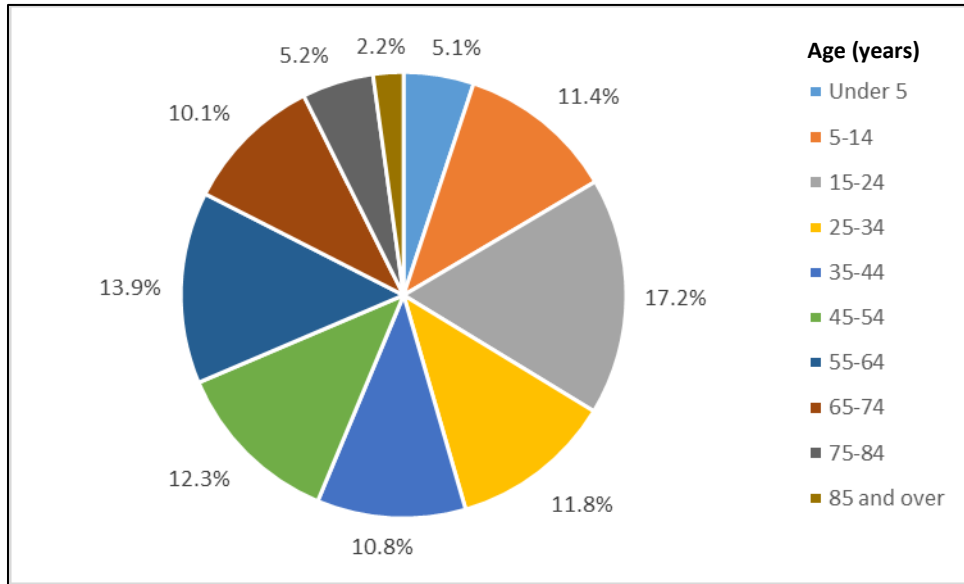






Table 5.10 – NCDC Extreme Temperature Events for St. Lawrence County, 2010-2021
(NCDC, 2021)

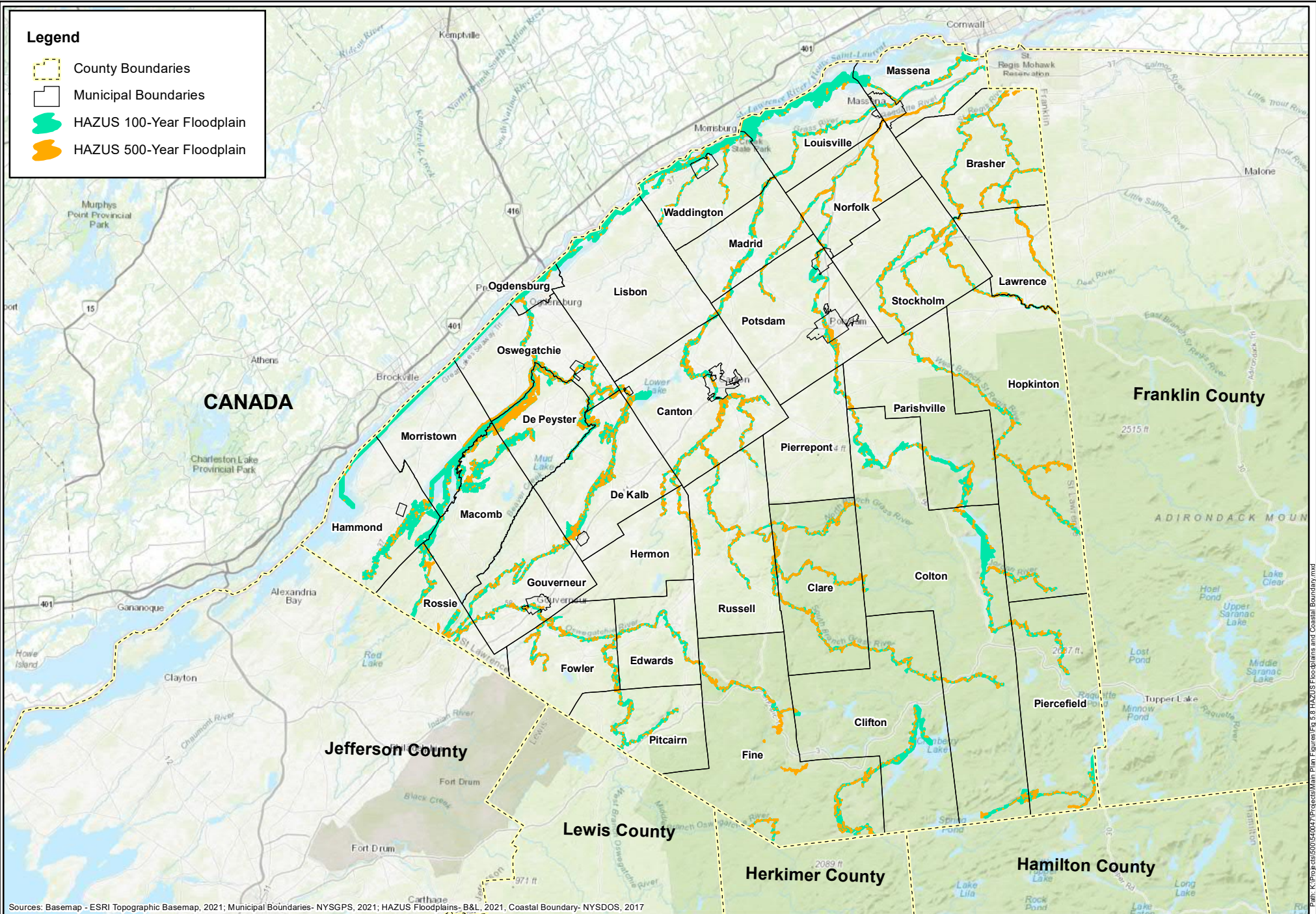
Portion of County	Date	Event	Property Damage (\$)	Crop Damage (\$)
Southeastern	1/7/2015	Extreme Cold/Wind Chill	0.00K	0.00K
Northern	1/7/2015	Extreme Cold/Wind Chill	0.00K	0.00K
Southwestern	1/7/2015	Extreme Cold/Wind Chill	0.00K	0.00K
Southeastern	2/1/2015	Cold/Wind Chill	0.00K	0.00K
Northern	2/1/2015	Cold/Wind Chill	0.00K	0.00K
Southwestern	2/1/2015	Cold/Wind Chill	0.00K	0.00K
Northern	7/21/2011	Heat	0.00K	0.00K
Southwestern	7/21/2011	Heat	0.00K	0.00K
Southwestern	3/17/2012	Heat	0.00K	25.00K
Northern	3/17/2012	Heat	0.00K	25.00K
Southeastern	3/17/2012	Heat	0.00K	20.00K
Northern	7/1/2018	Heat	0.00K	0.00K
Southwestern	7/1/2018	Heat	0.00K	0.00K
Southwestern	6/18/2020	Heat	0.00K	0.00K
Northern	6/18/2020	Heat	0.00K	0.00K
Northern	7/7/2020	Heat	0.00K	0.00K
Southwestern	7/7/2020	Heat	0.00K	0.00K

Table 5.11 – Ice Jam Database Hazard Events in St. Lawrence County
(USACE, CRREL, 2020)

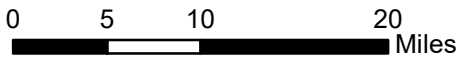
Jam Date	Location	Jurisdiction	Water	Details
2/6/2011	Chase Mills	Town of Louisville	Grasse River	Ice jam increased water (7.60 feet)
1/24/2012	Chase Mills	Town of Louisville	Grasse River	Ice jam increased water (6.44 feet)
1/22/2014	Pierrepont	Town of Pierrepont	Racquette River	Ice jam increased water levels resulting in minor flooding
4/10/2014	Heuvelton	Village of Heuvelton, Town of Oswegatchie	Oswegatchie River	Ice jam release resulted in flood advisory

Legend

-  County Boundaries
-  Municipal Boundaries
-  HAZUS 100-Year Floodplain
-  HAZUS 500-Year Floodplain



Sources: Basemap - ESRI Topographic Basemap, 2021; Municipal Boundaries- NYSGPS, 2021; HAZUS Floodplains- B&L, 2021; Coastal Boundary- NYSDOS, 2017



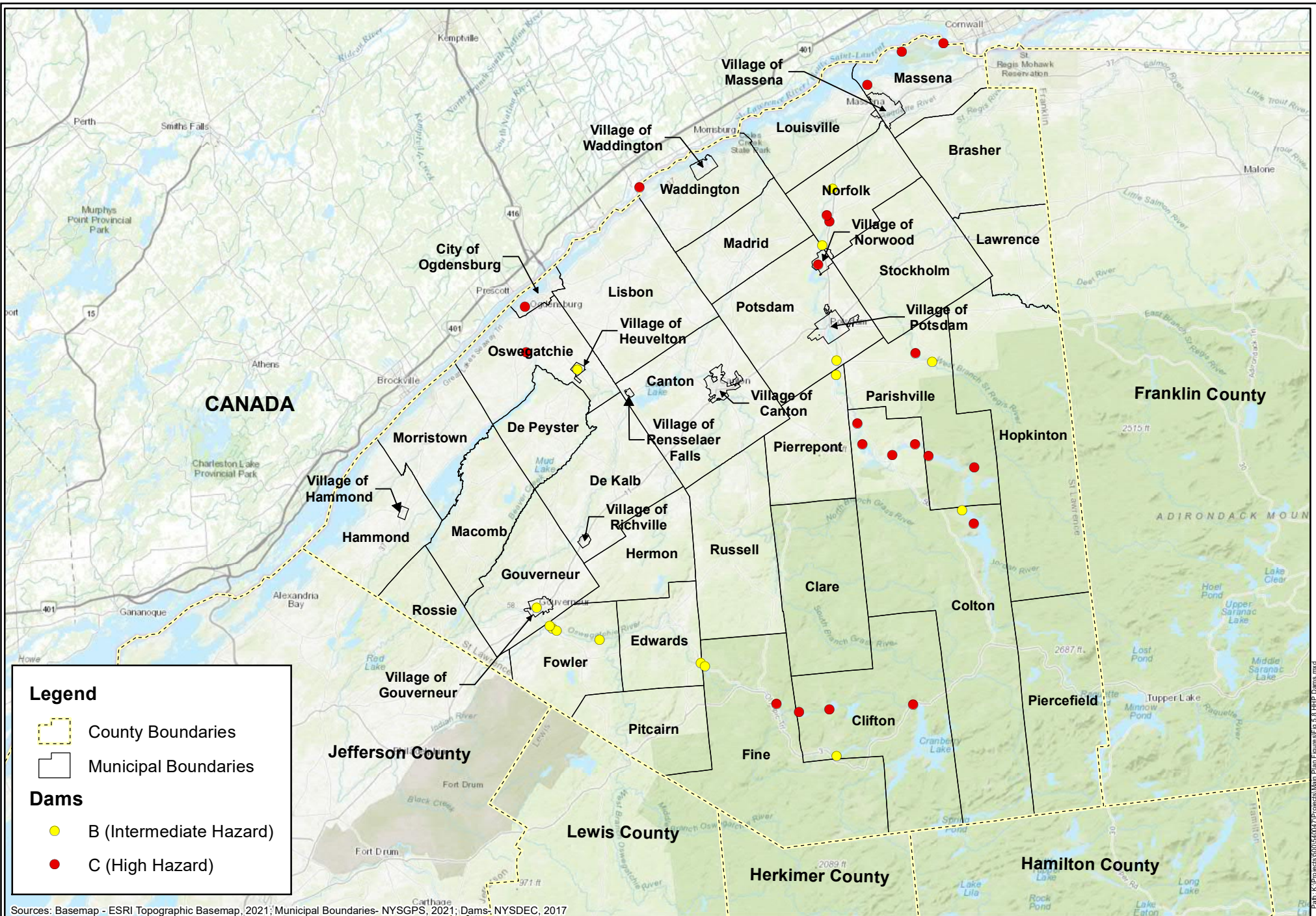
St. Lawrence County
 Hazard Mitigation Plan
HAZUS-Generated Floodplains
 St. Lawrence County November 2021 New York

Figure
 5.7
 Project
 No.
 540.047





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Table 5.12 - Dam Hazard Potential Classification

NYSDEC Dam Classification	Description
Class A – Low Hazard	A dam failure is unlikely to result in damage to anything more than isolated or unoccupied buildings, undeveloped lands, minor roads such as town or country roads; is unlikely to result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; and/or is otherwise unlikely to pose the threat of personal injuring, substantial economic loss or substantial environmental damage.
Class B – Moderate Hazard	A dam failure may result in damage to isolated homes, main highways, and minor railroads; may result in the interruption of important utilities, including water supply, sewage treatment, fuel, power, cable, or telephone infrastructure; and/or is otherwise likely to pose the threat of personal injury and/or substantial economic loss or substantial environmental damage. Loss of human life is not expected.
Class C – High Hazard	A dam failure may result in widespread or serious damage to home (s); damage to main highways, industrial or commercial buildings, railroads, and/or important utilities, including water supply, sewage treatment, fuel, power, cable or telephone infrastructure; or substantial environmental damage; such as the loss of human life or widespread substantial economic loss is likely.
Class D – Negligible or No Hazard	A dam that has been breached or removed, or has failed or otherwise no longer materially impounds waters, or a dam that was planned but never constructed. Class “D” dams are considered to be defunct dams posing negligible or no hazard. The department may retain pertinent records regarding such dams.



Legend

-  County Boundaries
-  Municipal Boundaries
- Dams**
-  B (Intermediate Hazard)
-  C (High Hazard)

Sources: Basemap - ESRI Topographic Basemap, 2021; Municipal Boundaries- NYSGPS, 2021; Dams- NYSDEC, 2017



St. Lawrence County
Hazard Mitigation Plan
Intermediate and High-Hazard Dams
St. Lawrence County November 2021 New York





Figure
5.8
Project
No.
540.047

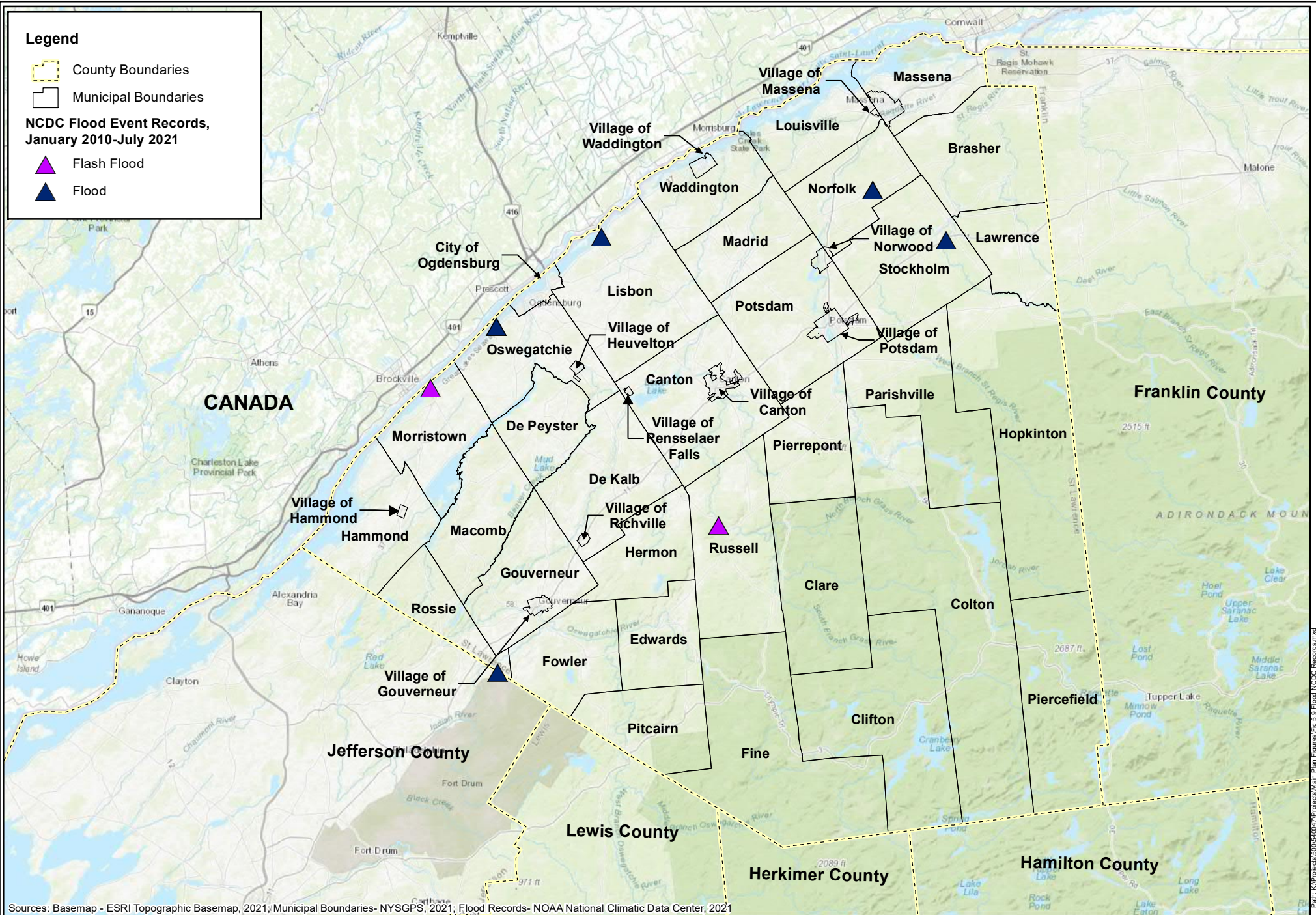
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Table 5.13 –NCDC Flooding Events for St. Lawrence County, 2010–2021
(NOAA NCDC, 2021)

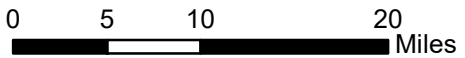
Location	Jurisdiction	Date	Event	Magnitude	Deaths (#)	Injuries (#)	Property Damage (\$)	Crop Damage (\$)
Stockholm Center	Town of Stockholm	08/2/2010	Flood	-	0	0	40.00K	0.00K
Ogdensburg	Town of Oswegatchie	09/30/2010	Flood	-	0	0	150.00K	0.00K
Ogdensburg	Town of Oswegatchie	10/01/2010	Flood	-	0	0	150.00K	0.00K
Plumbrook	Towns of Norfolk and Louisville	04/28/2011	Flood	-	0	0	1.00M	0.00K
Plumbrook	Towns of Norfolk and Louisville	05/01/2011	Flood	-	0	0	0.00K	0.00K
Spragueville	Towns of Hammond and Rossie	4/9/2014	Flood	-	0	0	10.00K	0.00K
North Corners	Towns of Lisbon, Waddington, and Louisville	4/15/2014	Flood	-	0	0	4.100M	0.00K
Russel	Town of Hammond	7/24/2017	Flash Flood	-	0	0	5.00K	0.00K
Morristown	Town of Hammond	7/24/2017	Flash Flood	-	0	0	100.00K	0.00K
Totals: 9		--	--	--	0	0	5.555M	0.00K

Legend

-  County Boundaries
-  Municipal Boundaries
- NCDC Flood Event Records, January 2010-July 2021**
-  Flash Flood
-  Flood



Sources: Basemap - ESRI Topographic Basemap, 2021; Municipal Boundaries- NYSGPS, 2021; Flood Records- NOAA National Climatic Data Center, 2021



St. Lawrence County
Hazard Mitigation Plan
NOAA NCDC Flood Records
St. Lawrence County November 2021 New York

Figure
5.9
Project No.
540.047

Path: K:\Info\540.047\MapDocs\Map Plan Figures\Fig 5.9 Flood NCDC Records.mxd

Table 5.19 – U.S. Drought Monitor Classification Matrix
(U.S. Drought Monitor, 2021)

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	<p>Going into drought:</p> <ul style="list-style-type: none"> • short-term dryness slowing planting, growth of crops or pastures <p>Coming out of drought:</p> <ul style="list-style-type: none"> • some lingering water deficits • pastures or crops not fully recovered 	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	<ul style="list-style-type: none"> • Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested 	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	<ul style="list-style-type: none"> • Crop or pasture losses likely • Water shortages common • Water restrictions imposed 	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	<ul style="list-style-type: none"> • Major crop/pasture losses • Widespread water shortages or restrictions 	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	<ul style="list-style-type: none"> • Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies 	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Figure 5.10 – NYS Seismic Hazard Map
(USGS, 2014)

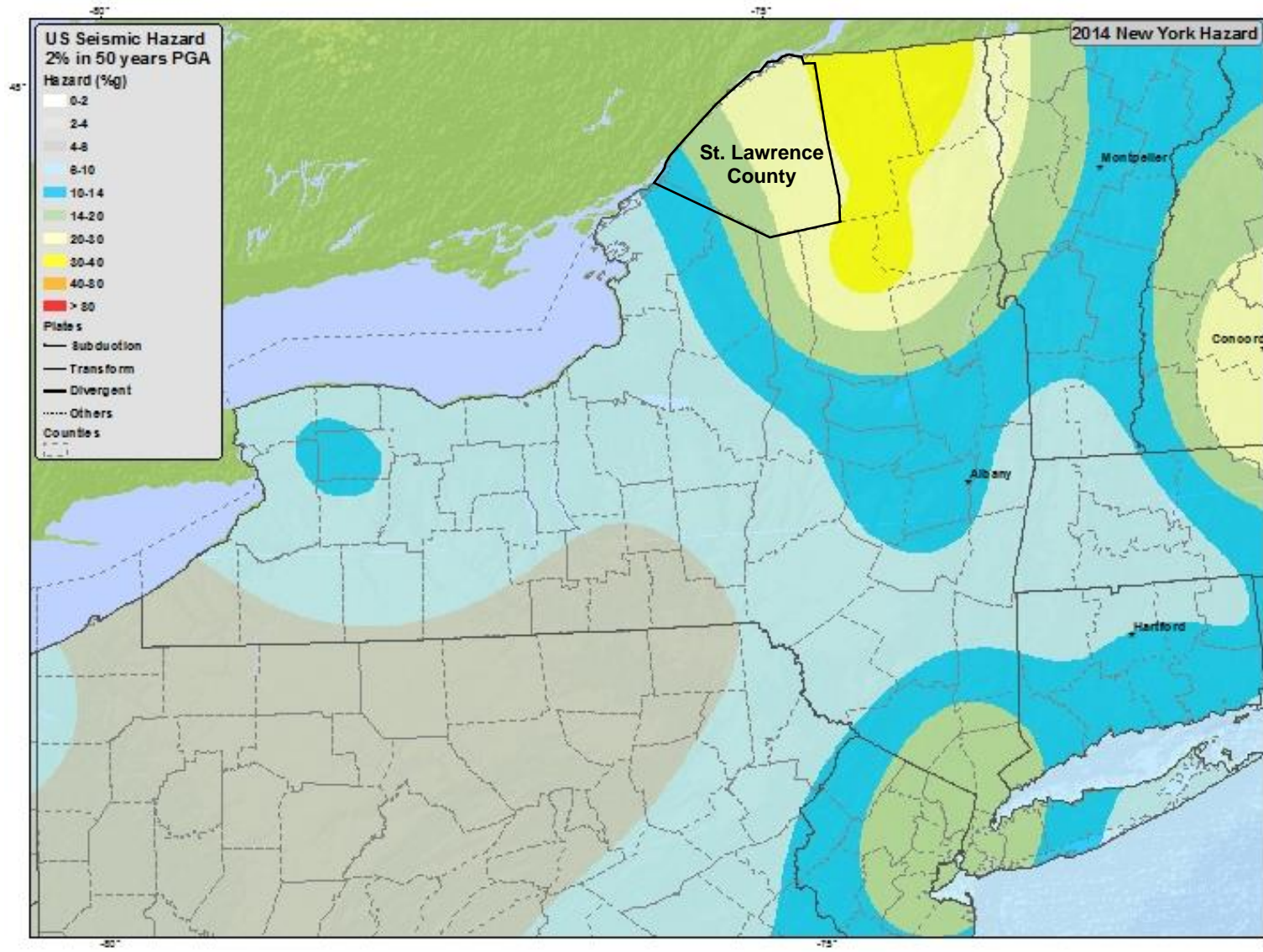


Table 5.20 – Modified Mercalli Intensity Scale
(USGS, 2021)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Table 5.21 – Historic Significant Earthquakes in St. Lawrence County Since 1800-2021 (USGS, Earthquake Catalog, 2021)			
Epicenter Location	Date	Jurisdiction	Magnitude
Lisbon, NY	12/18/1867	Town of Lisbon	4.3
Massena, NY	9/5/1944	Town of Massena	5.5
Oswegatchie, NY	7/5/1987	Town of Oswegatchie	2.9
Clare, NY	10/13/1997	Town of Clare	3.0
Norfolk, NY	3/17/2004	Town of Norfolk	2.7
Norfolk, NY	9/4/2004	Town of Norfolk	2.9
Massena, NY	11/28/2015	Town of Massena	3.3
Massena, NY	7/14/2021	Town of Massena	2.8

FIGURE 5.11

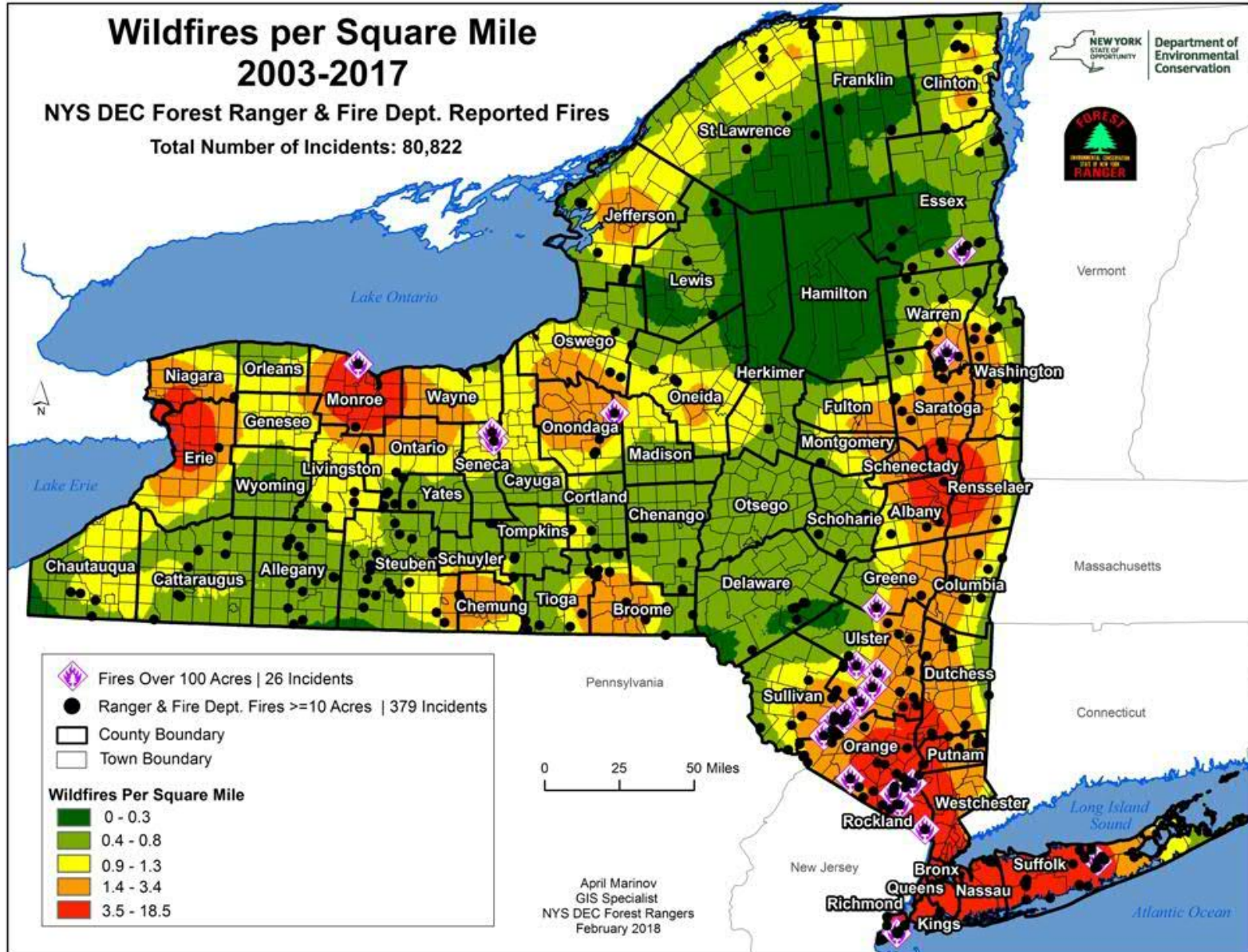
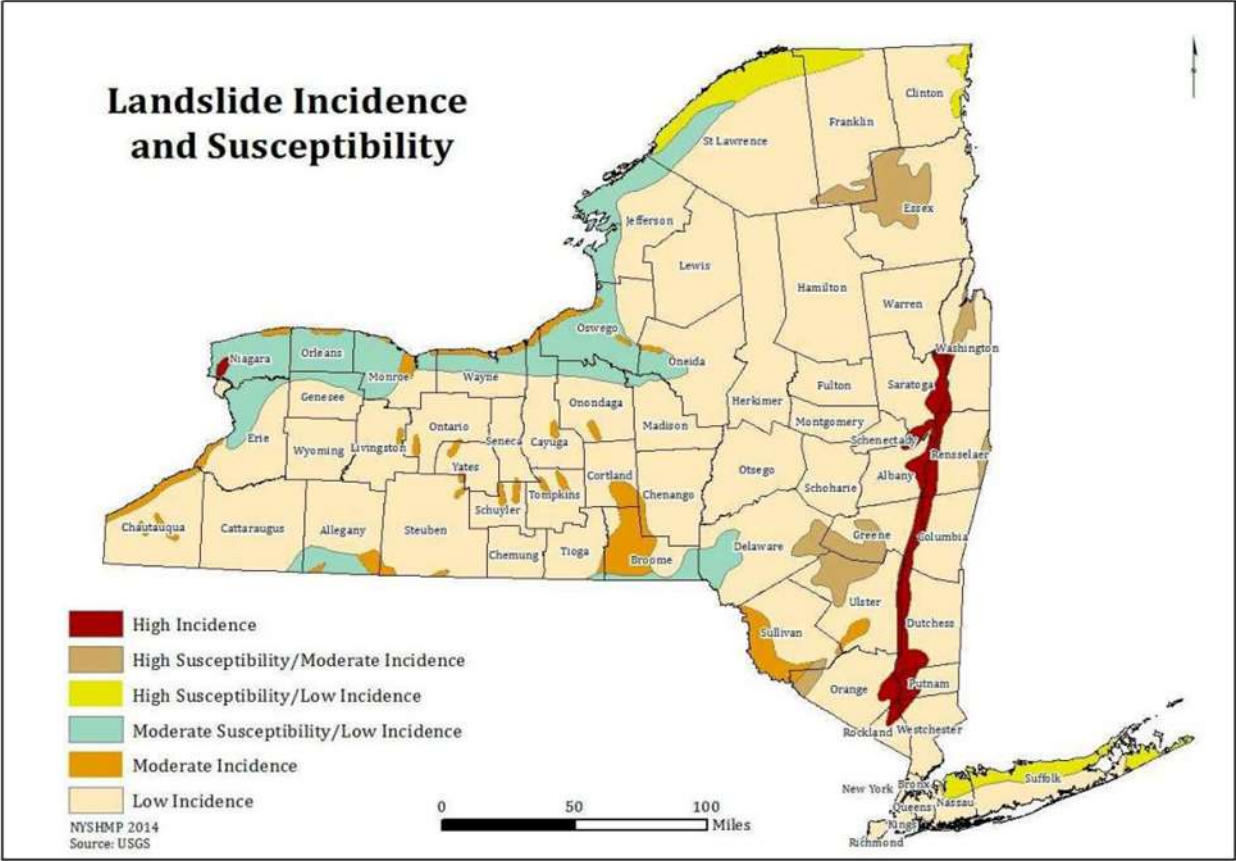


Figure 5.12



N **Figure 5.13 Ash Distribution in NYS**

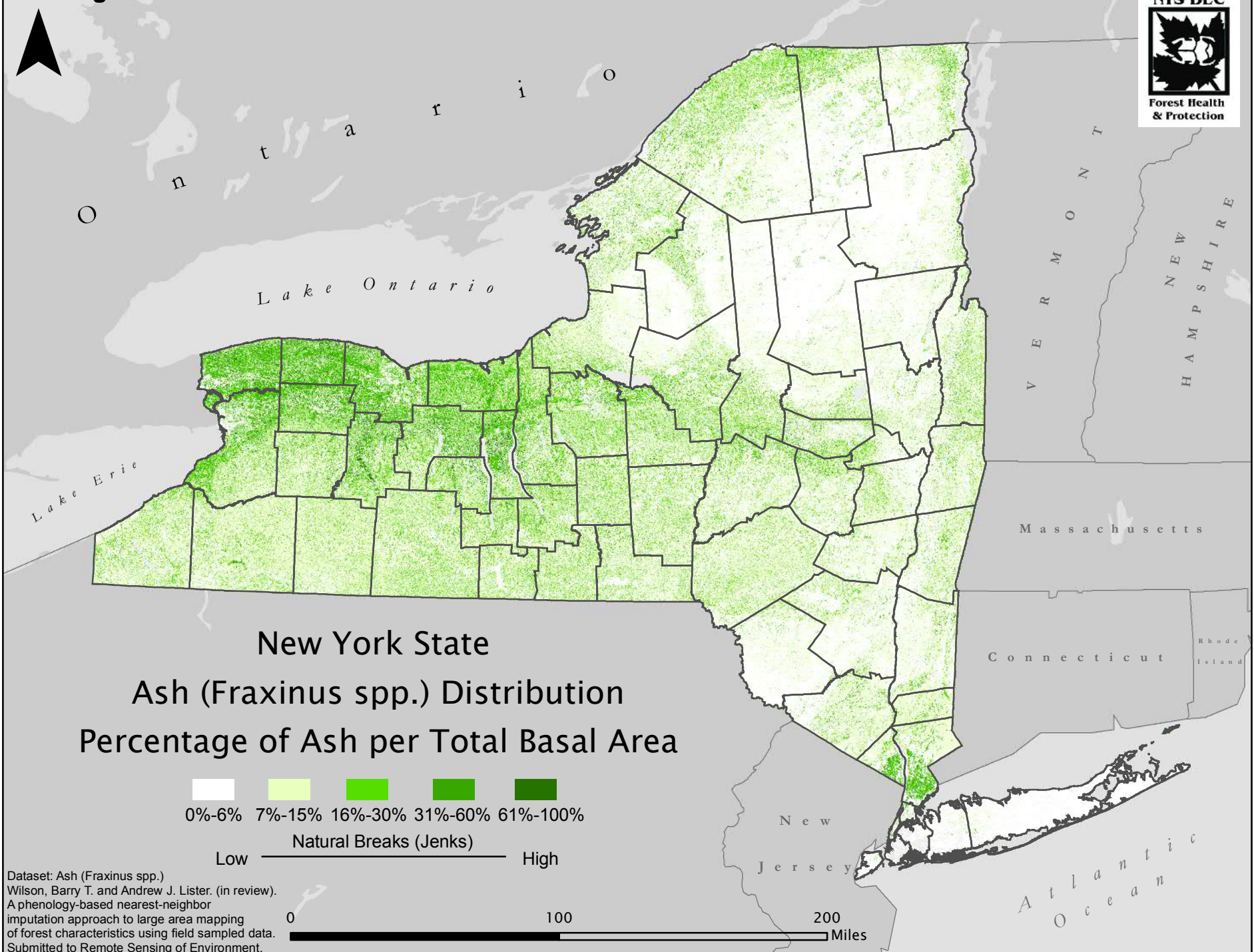


Figure 5.14

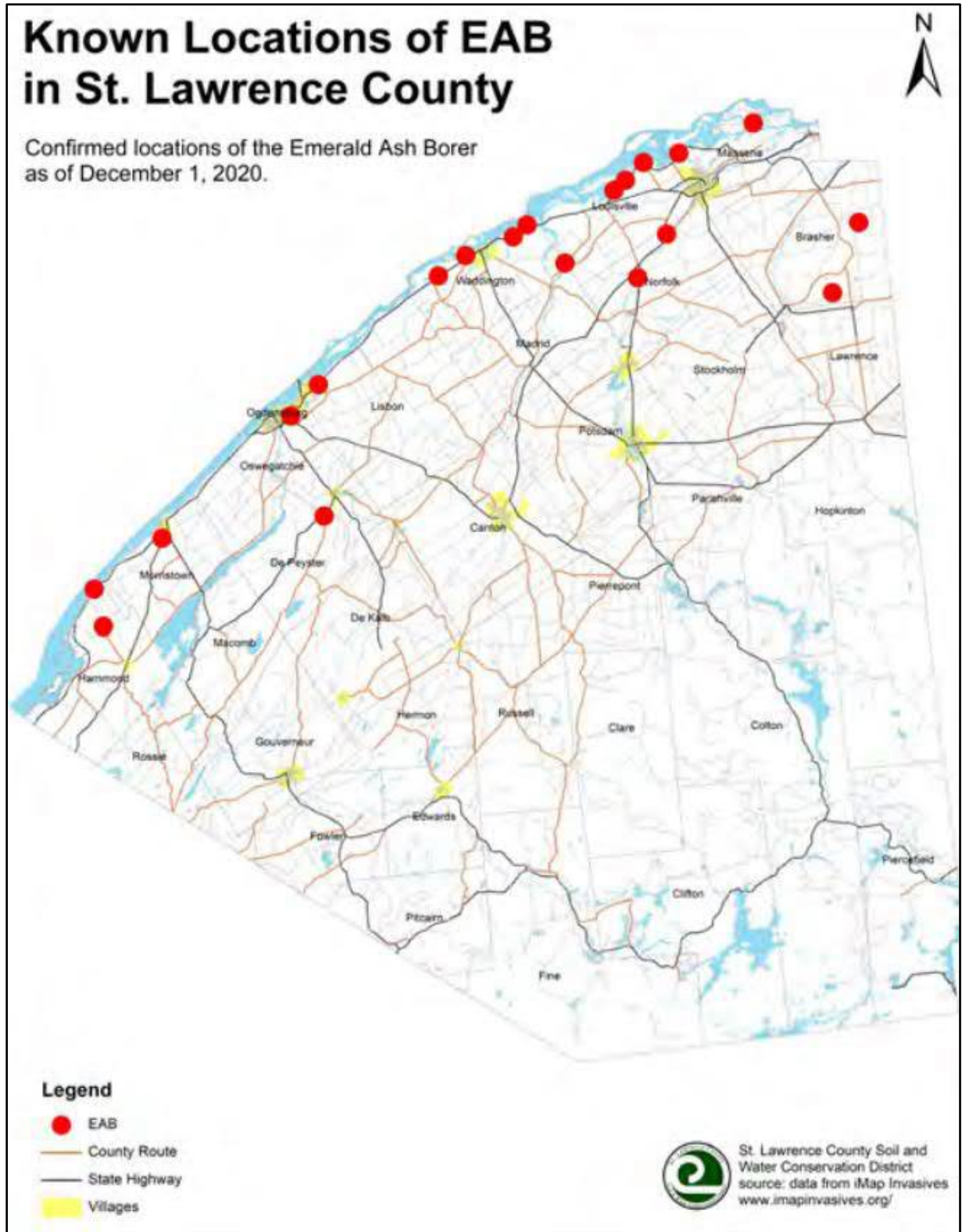


Table 6.4 Total Assessed Market Value of Properties by Jurisdiction (St. Lawrence County Parcel Data, 2020)	
Jurisdiction	Total Assessed Market Value of Properties
Brasher, Town	\$100,502,409.00
Canton, Town	\$195,199,341.00
Canton, Village	\$417,208,980.00
Clare, Town	\$1,158,751.00
Clifton, Town	\$198,228,415.00
Colton, Town	\$414,668,333.00
De Kalb, Town	\$105,530,877.00
De Peyster, Town	\$32,471,925.00
Edwards, Town	\$59,023,160.00
Fine, Town	\$188,671,190.00
Fowler, Town	\$16,041,358.00
Gouverneur, Town	\$142,105,620.00
Gouverneur, Village	\$148,362,896.00
Hammond, Town	\$203,229,000.00
Hammond, Village	\$13,127,224.00
Hermon, Town	\$75,285,116.00
Heuvelton, Village	\$32,604,816.00
Hopkinton, Town	\$121,586,020.00
Lawrence, Town	\$98,152,644.00
Lisbon, Town	\$177,600,286.00
Louisville, Town	\$171,138,861.00
Macomb, Town	\$48,098,149.00
Madrid, Town	\$98,467,865.00
Massena, Town	\$352,876,394.00
Massena, Village	\$439,183,071.00
Morristown, Town	\$202,776,865.00
Norfolk, Town	\$149,610,228.00
Norwood, Village	\$56,673,103.00
Ogdensburg, City	\$640,667,070.00
Oswegatchie, Town	\$241,915,044.00
Parishville, Town	\$12,528,750.00
Piercefield, Town	\$128,673,669.00
Pierrepont, Town	\$151,156,375.00
Pitcairn, Town	\$61,495,912.00
Potsdam, Town	\$318,019,610.00
Potsdam, Village	\$506,146,617.00
Rensselaer Falls, Village	\$8,344,900.00
Richville, Village	\$8,949,575.00
Rossie, Town	\$56,730,375.00
Russell, Town	\$73,129,082.00
Stockholm, Town	\$148,310,868.00
Waddington, Town	\$186,380,000.00
Waddington, Village	\$67,830,800.00
St. Lawrence County Total	\$6,869,861,544.00

Figure 6.1 – NYS Social Vulnerability Index
(NYS Hazard Mitigation Plan, 2019)

Social Vulnerability Index (SOVI)

Risk Index

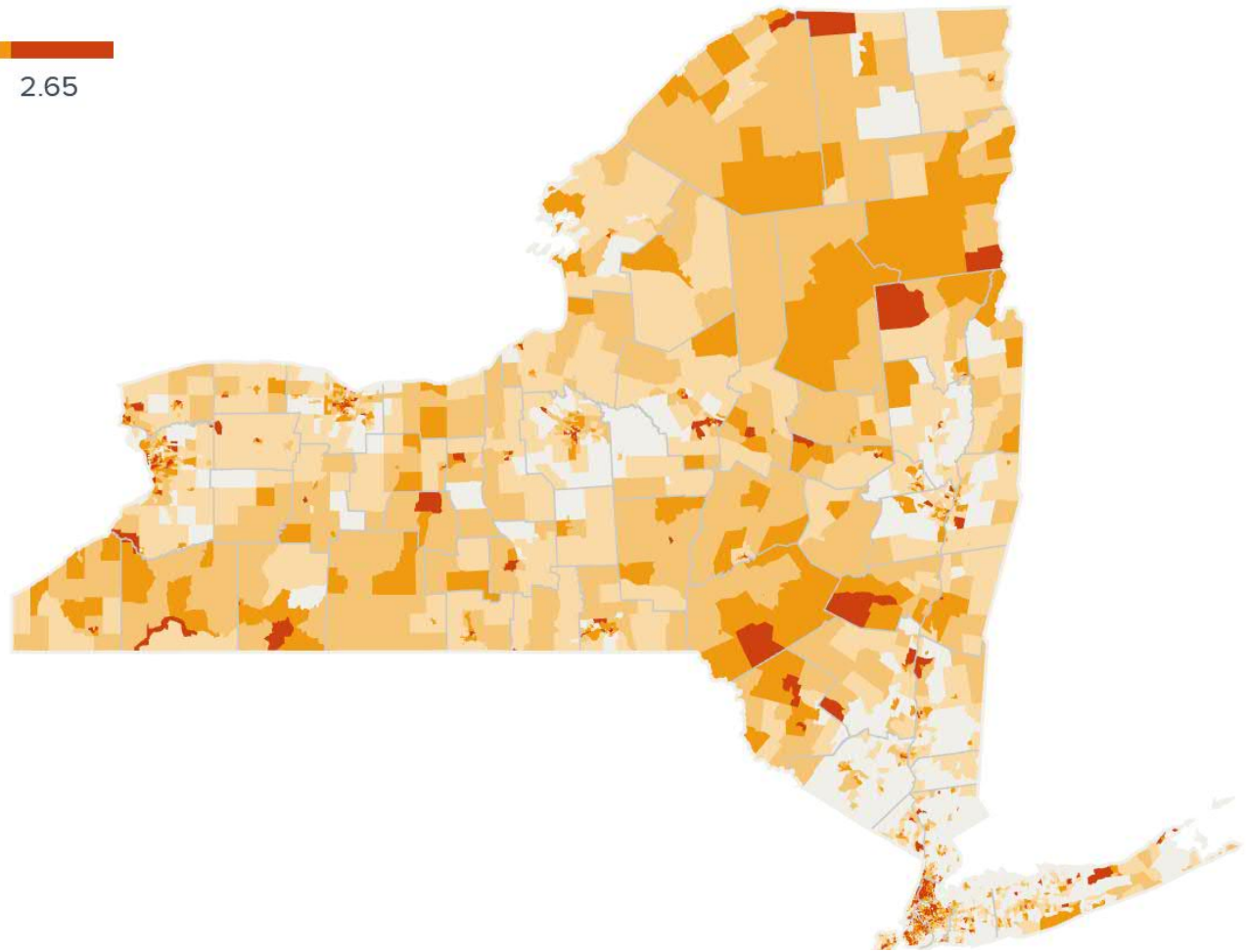


Table 7.1 - St. Lawrence County 2015 Mitigation Actions

Action ID	Mitigation Action	Hazard(s) Mitigated	2015 HMP Goals Met	Lead Agency	Support Agencies	Estimated Cost Level	Potential Funding Sources	Implementation Timeframe	Targeted Development (new or existing)	Status
STL 1	Create digital Flood Insurance Maps (FIRMs) which would be accessible to anyone, via internet portal through FEMA website. Currently St. Lawrence County is one the few New York State Counties which does not have digital FIRM data.	Flood	1,2	FEMA	St. Lawrence County Planning Department	Low	FEMA	Long	New	Ongoing - FEMA is currently working to develop digital floodplain mapping for all of St. Lawrence County. The development of new FIRMs is not an action that the County can directly undertake, but the County included a related action to disseminate the data once FEMA's project is complete.
STL 2	Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Severe storms, ice storms	1,2,3	Individual municipalities	New York State Department of Transportation, County Highway Dept	Low	FEMA (HMGP and PDM funds)	Short	Existing	Not completed - the County Dept. of Highways responds to downed trees as needed, but no formal plan in place. There are challenges with staff levels. The County Dept. of Highways has response plan that identifies 3 zones, and damages are surveyed in each zone, which works well. No longer a priority mitigation action because this is a routine responsibility of the highway department.
STL 3	Install larger fuel tanks at the County Highway facility in the Town of Canton, additional fuel will be helpful during cleanup and repairs after severe storms and ice storms.	Severe storms, ice storms	1	St. Lawrence County Department of Highways	New York State Department of Transportation	Medium	FEMA (HMGP and PDM funds)	Moderate	New	Not completed, but still a priority. Re-included in HMP update as a preparedness action.
STL 4	Identification and prioritizing of deficient and vulnerable bridges within the County. Replacement or reinforcement of high priority structures may be required.	Flood	1,2,3	St. Lawrence County Department of Highways	New York State Department of Transportation	High	FEMA (HMGP and PDM funds), other funds (TBD)	Short	New	Ongoing – the County Dept. of Highways has completed a number of bridge rehabilitation projects and has a list of bridges that are inspected after flooding events. The County Route 24 bridge over the Grass River in the Town of Russell was replaced in 2018. There are still bridges that would benefit from rehabilitation or replacement to reduce damage risks from flooding or ice jams, so this action was re-included in the HMP update for specific structures.
STL 5	Creating a secondary location with fuel storage, equipment, maintenance, highway administration, and alternate 911 dispatch center will improve response time and quality during a hazard event.	Severe Storms, Flood, Ice Storms	1	St. Lawrence County Department of Highways	Local municipalities	High	FEMA (HMGP and PDM funds), other funds (TBD)	Moderate	New	Completed - a new highway facility is being constructed at 522 County Rt 28A in Lisbon (construction commenced in July 2021); a backup 911 location was established in Massena which includes a new generator and just came online in the spring of 2020. Both projects were completely funded by the County.
STL 6	Install a full backup power system for the County's Human Services Center, will ensure that the County can still meet the demands of its residents during extended power outages.	Ice storms	1	St. Lawrence County Department of Government Services/ Buildings and Grounds	None specified	Medium	FEMA (HMGP and PDM funds), other funds (TBD)	Moderate	Existing	Partially completed - the County installed a generator at the Human Resources Center a few years ago, which can power coolers and fridges but cannot power the entire building. A new action to add additional backup power for this facility is included in the HMP update.
STL 7	Installation of full back-up power systems at schools, institutions, and other public infrastructure will create a larger network of shelter areas for the County residents.	Severe storms (winter/summer)	1	St. Lawrence County Department of Highways	None specified	Medium	FEMA (HMGP and PDM funds), other funds (TBD)	Moderate	Existing	Ongoing - the County works with the Red Cross for sheltering needs. There is already a large network of shelter locations, and the County has MOUs in place with various facilities. Schools are commonly used for emergency shelters with fire departments as backup locations. Most schools do not have backup power, with the exception of BOCES. This action was re-included for the plan update.

Table 7.1 - St. Lawrence County 2015 Mitigation Actions

Action ID	Mitigation Action	Hazard(s) Mitigated	2015 HMP Goals Met	Lead Agency	Support Agencies	Estimated Cost Level	Potential Funding Sources	Implementation Timeframe	Targeted Development (new or existing)	Status
STL 8	Continued public awareness and education campaigns by the St. Lawrence County Environmental Management Council (EMC).	Infestation	2	St. Lawrence County Environmental Management Council	St. Lawrence County Planning Department	Low	Local and state funds	Short	New, Existing	Ongoing- the County Environmental Management Council continues to work on public outreach campaigns to educate County residents about environmental issues. This action was modified and re-included in the HMP update to target outreach related to emerald ash borer and Eurasian watermilfoil.

Table 7.2 - St. Lawrence County Mitigation Actions

Action ID	Action Title	Hazard(s) Addressed	Assumed Implementing Agencies (Lead* & Support)	Planning Mechanism(s)	Timeframe for Implementation	New or Existing Development	Estimated Cost	Potential Funding Source(s)	Priority	HMP Goal(s) Met
SLC 1	Complete a stormwater capacity analysis for the area between Court Street and Judson Street in the Village of Canton extending west to the Grass River.	Flood	St. Lawrence County Highway Dept*, St. Lawrence County Governmental Services/Buildings & Grounds, Village of Canton DPW	St. Lawrence County Facility Management Plan, Village of Canton Comprehensive Plan	5 years	Existing	\$50K	NYSEFC- CWSRF; FEMA- BRIC	High	4.g., 4.h.
SLC 2 (Re-included from 2015)	Work with school districts to install backup power at schools throughout the County, or purchase generators on trailers for use at multiple facilities.	All	St. Lawrence County Emergency Management*, local School Districts	St. Lawrence-Lewis BOCES District-Wide Safety Plan and local capital project plans	5 years	Existing	\$100K-500K per school	School District budgets, FEMA-BRIC, DASNY- SAM	High	4.d., 4.e.
SLC 3	Continue coordination with FEMA for digital FIRM project and disseminate new FIRM data once available.	Flood	St. Lawrence County Planning Dept. *, FEMA	Local Comprehensive Plans	5-10 years (dependent on FEMA Study)	Existing and New	Low	County Budget	Medium	1.b.
SLC 4 (Re-included from 2015)	Identify bridges with scour issues throughout the County to prioritize structure replacement or rehabilitation.	Flood, Ice Jam	St. Lawrence County Highway Dept.*	None	5 years	Existing	\$1,000	County Budget	Medium	4.g, 4.i.
SLC 5	Purchase trailers that can be stored on County property to store shelter supplies (preparedness)	All	St. Lawrence County Emergency Management*, Red Cross	St. Lawrence County Comprehensive Emergency Management Plan	2 years	Existing	\$30K	County Budget	Medium	3.b.
SLC 6 (Re-included from 2015)	Install larger fuel tanks at the County Highway facility in the Town of Canton (preparedness)	Severe Thunderstorm/ Wind/Tornado, Ice Storm	St. Lawrence County Highway Dept. *, Village of Canton DPW	St. Lawrence County Highway Dept. annual project list	2 years	Existing	Canton Facility - \$250-500K; New Facilities- \$100-200K each	County Budget, FEMA- BRIC	Medium	4.e.
SLC 7 (Re-included from 2015)	Expand the backup power system at the County Human Services Center.	All	St. Lawrence County Department of Government Services/ Buildings and Grounds	St. Lawrence County Facility Management Plan	5 years	Existing	\$300K (diesel) to \$500K (natural gas)	County Budget, FEMA- BRIC, DASNY- SAM	Medium	4.d., 4.e.
SLC 8	Replace County Route 49 bridge over the St. Regis River with a single-span structure.	Flood, Ice Jam	St. Lawrence County Highway Dept.*	2019 Bridge Selection (Prioritization) Criteria	5 years	Existing	\$5-6 million	NYSDOT- Bridge NY, FEMA- PDM	Medium	4.i.
SLC 9	Complete and document outreach to CSX regarding stormwater outfall maintenance in railroad right-of-way in the Village of Canton (preparedness)	Flood	St. Lawrence County Highway Dept*, CSX	None	1 year	Existing	Low	County Budget	Low	4.g., 4.h.

Table 7.5 - County Mitigation Action STAPLEE Evaluation

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
SLC 1	+	+	0	+	0	0	0	+	+	0	Low	Medium	1
SLC 2	+	+	+	+	0	-	0	0	+	0	Medium	High	2
SLC 3	+	+	+	+	+	+	0	+	+	+	Low	Low	3
SLC 4	+	+	+	+	+	0	0	+	+	+	High	Low	4
SLC 5	+	+	+	+	+	0	0	+	+	+	Medium	Medium	5
SLC 6	+	+	+	+	+	-	0	0	+	0	Low	High	6
SLC 7	+	+	+	+	+	-	0	0	+	0	Medium	High	7
SLC 8	+	0	0	+	+	-	+	0	+	-	Medium	High	8
SLC 9	+	+	0	+	0	+	0	+	+	+	Low	Low	9

Table 7.6 - Potential Funding Sources for Mitigation Actions

Agency	Program	Description	Web Link
DASNY	State and Municipal Facilities Program	Funding for projects that support community and economic development	https://www.dasny.org/about/what-we-do/grants-administration
FEMA	Assistance to Firefighters Grant Program	Grant funding to equip and train emergency personnel, enhance efficiencies, and support community resilience.	https://www.fema.gov/grants/preparedness/firefighters
FEMA	Building Resilient Infrastructure & Communities (BRIC)	Funding for states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.	https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities
FEMA	Hazard Mitigation Grant Program (HMGP)	Funding for state, local, tribal and territorial governments so they can rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a presidentially declared disaster.	https://www.fema.gov/grants/mitigation/hazard-mitigation
FEMA	Flood Mitigation Assistance (FMA) Program	Funding for planning and projects to reduce or eliminate risk of flood damage to buildings that are insured annually under the National Flood Insurance Program.	https://www.fema.gov/grants/mitigation/floods
FEMA	Rehabilitation of High Hazard Potential Dams Grant Program	Funding for eligible dam rehabilitation projects including technical, planning, design, and construction activities toward the repair, removal, or structural or nonstructural rehabilitation of eligible high hazard potential dams.	https://www.fema.gov/emergency-managers/risk-management/dam-safety/rehabilitation-high-hazard-potential-dams/resources
NYSDEC	Water Quality Improvement Program (WQIP)	Funding for projects that directly address documented water quality impairments or protect a drinking water source.	https://www.dec.ny.gov/pubs/4774.html
NYSDEC	Urban and Community Forestry Grants	Funding for improving urban and community forest health and increasing the sustainability of forestry programs. Eligible projects include: tree inventories, management plans, tree planting, maintenance, and education programming.	https://www.dec.ny.gov/lands/5285.html
NYS DOT	Bridge NY	Funding for bridge/culvert rehabilitation or replacement.	https://www.dot.ny.gov/BRIDGE_NY

Table 7.6 - Potential Funding Sources for Mitigation Actions

Agency	Program	Description	Web Link
NYSDOT	Consolidated Local Street and Highway Improvement Program (CHIPS)	Funding for municipalities to support the construction and repair of highways, bridges, highway-railroad crossings, and other facilities that are not on the State highway system.	https://www.dot.ny.gov/programs/chips
NYSEFC	Clean Water State Revolving Fund (CWSRF)	Financing for wastewater and sewer infrastructure projects to municipalities throughout New York State. Eligible projects include: construction or restoration of sewers and wastewater treatment facilities, stormwater management, landfill closures, and habitat restoration and protection projects.	https://efc.ny.gov/CWSRF
NYSEFC	Drinking Water State Revolving Fund (DWSRF)	Financing for drinking water projects. Eligible project include: treatment plants, distribution mains, and storage facilities.	https://efc.ny.gov/dwsrf
NYSEFC	Water Infrastructure Improvements Act (WIIA)	Funding for water infrastructure projects that increase community resilience to flooding and are critical to protecting public health and the environment.	https://efc.ny.gov/wii
New York State	Lake Ontario Resiliency and Economic Development Initiative (REDI)	Funding to improve shoreline resiliency in communities along Lake Ontario and the St. Lawrence River.	https://www.governor.ny.gov/programs/lake-ontario-resiliency-and-economic-development-initiative-redi
NYSOCR	Community Development Block Grant (CDBG) Program	Financial assistance to eligible cities, towns, and villages with populations under 50,000 and counties with an area population under 200,000 to develop viable communities by providing affordable housing and suitable living environments, as well as expanding economic opportunities, principally for persons of low and moderate income.	https://hcr.ny.gov/community-development-block-grant
USDA	ReConnect Loan and Grant Program	The Broadband ReConnect Program furnishes loans and grants to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide broadband service in eligible rural areas.	https://www.usda.gov/reconnect

Table 7.6 - Potential Funding Sources for Mitigation Actions

Agency	Program	Description	Web Link
USDA Rural Development	Community Facilities Loan/Grant Program	Funding to develop essential community facilities in rural areas	https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program
USDA Rural Development	Water & Waste Disposal Loan/Grant Program	Funding for drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and stormwater drainage in eligible rural areas.	https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ny

Table 8.1 – FIRM Availability for St. Lawrence County Jurisdictions
(FEMA, Flood Map Service Center, 2021)

Jurisdiction	Flood Map Number(s)	Effective Date
Town of Brasher	361171A	1/2/1986
Town of Canton	3611720067B, 3611720075B, 3611720056B, 3611720025B	8/17/1998
Village of Canton	3606970002C	5/2/1994
Town of Clare	361422A	7/16/1982
Town of Clifton	361173B	5/15/1986
Town of Colton	361423A	5/1/1985
Town of De Kalb	Unmapped	Unmapped
Town of De Peyster	361175A	7/23/1982
Town of Edwards	361176B (Town) 361463B (former Village)	7/30/1982 (Town) 7/23/1982 (former Village)
Town of Fine	361177B	5/1/1985
Town of Fowler	3606980010B, 3606980020B, 3606980005B, 3606980015B	6/5/1989
Town of Gouverneur	361178A	8/6/1982
Village of Gouverneur	3606990001C	3/2/1997
Town of Hammond	Unmapped	Unmapped
Village of Hammond	Unmapped	Unmapped
Town of Hermon	Unmapped (Town) 3614640001A (former Village)	Unmapped (Town) 8/3/1998 (former Village)
Village of Heuvelton	360701B	4/30/1986
Town of Hopkinton	361179A	11/11/1982
Town of Lawrence	Unmapped	Unmapped
Town of Lisbon	Unmapped	Unmapped
Town of Louisville	Unmapped	Unmapped
Town of Macomb	Unmapped	Unmapped
Town of Madrid	Unmapped	Unmapped
Town of Massena	3611820025B	6/17/1986
Village of Massena	3607050001B, 3607050002B	11/4/1980
Town of Morristown	360706C (Town) 3615570001B (former Village)	8/6/1982 (Town) 12/1/1980 (former Village)
Town of Norfolk	361183B	4/15/1986
Village of Norwood	361345A	4/30/1986
City of Ogdensburg	360707001B, 3607070002B, 3607070003B	11/4/1980
Town of Oswegatchie	3607080025C	5/1/1985

**Table 8.1 – FIRM Availability for St. Lawrence County Jurisdictions
(FEMA, Flood Map Service Center, 2021)**

Jurisdiction	Flood Map Number(s)	Effective Date
Town of Parishville	361425A	7/30/1982
Town of Piercefield	361426A	1/5/1984
Town of Pierrepont	Unmapped	Unmapped
Town of Pitcairn	3611840010B, 3611840015B, 3611840020B, 3611840025B	8/13/1982
Town of Potsdam	361185A	3/3/1986
Village of Potsdam	3607090003C	1/4/1996
Village of Rensselaer Falls	361466B	1/5/1984
Village of Richville	36147A	1/6/1984
Town of Rossie	361186B	10/15/1985
Town of Russell	Unmapped	Unmapped
Town of Stockholm	361429B	4/15/1986
Town of Waddington	361187B	4/15/1986
Village of Waddington	361468A	5/11/1979

**Table 8.2 – NFIP Policy Statistics for St. Lawrence County
as of October 16, 2021**

(FEMA, 2021)

Jurisdiction	Active Policies	Total Premium and Policy Fees	Total Policy Coverage
Town of Brasher	10	\$6,525	\$1,631,400
Town of Canton	9	\$9,844	\$2,671,000
Village of Canton	3	\$1,545	\$1,230,000
Town of Clare*	-	-	-
Town of Clifton	1	\$304	\$70,000
Town of Colton	10	\$11,242	\$2,150,000
Town of De Kalb	3	\$1,323	\$700,000
Town of De Peyster	0	\$0	\$0
Town of Edwards*	0	\$0	\$0
Town of Fine	4	\$2,570	\$315,700
Town of Fowler	7	\$27,085	\$1,552,000
Town of Gouverneur	3	\$6,197	\$336,000
Village of Gouverneur	10	\$9,523	\$613,000
Town of Hammond	1	\$420	\$350,000
Village of Hammond*	-	-	-
Town of Hermon**	0	\$0	\$0
Village of Heuvelton	4	\$5,878	\$729,400
Town of Hopkinton	1	\$321	\$140,000
Town of Lawrence	1	\$519	\$350,000
Town of Lisbon	0	\$0	\$0
Town of Louisville	2	\$1,038	\$700,000
Town of Macomb	0	\$0	\$0
Town of Madrid	1	\$467	\$350,000
Town of Massena	1	\$420	\$350,000
Village of Massena	5	\$4,473	\$534,800
Town of Morristown**	19	\$20,650	\$3,461,400
Town of Norfolk	2	\$1,098	\$64,000
Village of Norwood	1	\$2,584	\$300,000
City of Ogdensburg	9	\$7,370	\$1,129,400
Town of Oswegatchie	16	\$15,107	\$2,461,200
Town of Parishville	3	\$3,228	\$231,000
Town of Piercefield	1	\$502	\$38,000
Town of Pierrepont	2	\$894	\$525,000

**Table 8.2 – NFIP Policy Statistics for St. Lawrence County
as of October 16, 2021**

(FEMA, 2021)

Jurisdiction	Active Policies	Total Premium and Policy Fees	Total Policy Coverage
Town of Pitcairn	2	\$788	\$490,000
Town of Potsdam	6	\$50,590	\$2,327,700
Village of Potsdam	3	\$3,755	\$592,000
Village of Rensselaer Falls	2	\$934	\$525,000
Village of Richville	1	\$539	\$33,000
Town of Rossie	3	\$1,844	\$396,000
Town of Russell	2	\$861	\$490,000
Town of Stockholm	4	\$5,263	\$410,000
Town of Waddington	1	\$2,094	\$137,500
Village of Waddington	2	\$1,605	\$600,000
St. Lawrence County	155	\$209,400.00	\$28,984,500
<p>*No policy data were reported for the Town of Clare, though this community participates in the NFIP. The Village of Hammond does not participate in the NFIP. **NFIP Policy data for the Villages of Hermon and Morristown were combined with the Town of Hermon and Morristown, respectively, as both Villages were recently dissolved.</p>			

**Table 8.3 – NFIP Loss Statistics for Municipalities in St. Lawrence County
as of October 16, 2021
(FEMA, 2021)**

Jurisdiction	Total Losses	Total Payments (\$)	Average Payments (\$)
Town of Brasher	5	\$51,241.30	\$10,248.26
Town of Canton	3	\$46,041.21	\$15,347.07
Village of Canton	1	\$0.00	\$0.00
Town of Clare*	-	-	-
Town Clifton	0	\$0.00	\$0.00
Town of Colton	0	\$0.00	\$0.00
Town of De Kalb	0	\$0.00	\$0.00
Town of De Peyster	0	\$0.00	\$0.00
Town of Edwards	0	\$0.00	\$0.00
Town of Fine	3	\$18,036.75	\$6,012.25
Town of Fowler	3	\$54,694.66	\$18,231.55
Town of Gouverneur	3	\$27,072.44	\$9,024.15
Village of Gouverneur	16	\$43,314.69	\$2,707.17
Town of Hammond	1	\$1,173.22	\$1,173.22
Village of Hammond*	-	-	-
Town of Hermon**	0	\$0.00	\$0.00
Village of Heuvelton	0	\$0.00	\$0.00
Town of Hopkinton	0	\$0.00	\$0.00
Town of Lawrence	0	\$0.00	\$0.00
Town of Lisbon	0	\$0.00	\$0.00
Town of Louisville	7	\$95,872.43	\$13,696.06
Town of Macomb	0	\$0.00	\$0.00
Town of Madrid	5	\$4,283.50	\$856.70
Town of Massena	1	\$5,079.37	\$5,079.37
Village of Massena	2	\$10,562.84	\$5,281.42
Town of Morristown**	5	\$2,691.25	\$538.25
Town of Norfolk	0	\$0.00	\$0.00
Village of Norwood	2	\$4,865.01	\$2,432.51
Town of Oswegatchie	2	\$1,313.00	\$656.50
City of Ogdensburg	9	\$76,735.37	\$8,526.15
Town of Parishville	0	\$0.00	\$0.00
Town of Piercefield	0	\$0.00	\$0.00
Town of Pierrepont	0	\$0.00	\$0.00

**Table 8.3 – NFIP Loss Statistics for Municipalities in St. Lawrence County
as of October 16, 2021
(FEMA, 2021)**

Jurisdiction	Total Losses	Total Payments (\$)	Average Payments (\$)
Town of Pitcairn	0	\$0.00	\$0.00
Town of Potsdam	0	\$0.00	\$0.00
Village of Potsdam	0	\$0.00	\$0.00
Village of Rensselaer Falls	1	\$0.00	\$0.00
Village of Richville	1	\$0.00	\$0.00
Town of Rossie	3	\$52,352.56	\$17,450.85
Town of Russell	2	\$969.30	\$484.65
Town of Stockholm	6	\$40,334.53	\$6,722.42
Town of Waddington	0	\$0.00	\$0.00
Village of Waddington	0	\$0.00	\$0.00
Total	81	\$536,633.43	\$124,468.55
<p>*No policy data were reported for the Town of Clare, though this community participates in the NFIP. The Village of Hammond does not participate in the NFIP. **NFIP Policy data for the Villages of Hermon and Morrystown were combined with the Town of Hermon and Morrystown, respectively, as both Villages were recently dissolved.</p>			

Table 8.4 – NFIP Repetitive Loss Properties in St. Lawrence County as of October 16, 2021
FEMA, 2021

Jurisdiction	Repetitive Loss Properties	Total Losses	Building Payments	Contents Payments	Total Payments
Gouverneur, Village	2	6	\$18,280.38	\$0.00	\$18,280.38
Louisville, Town	1	4	\$23,573.27	\$5,232.66	\$28,805.93
Oswegatchie, Town	1	2	\$27,361.32	\$0.00	\$27,361.32
Rossie, Town	1	2	\$52,352.56	\$0.00	\$52,352.56
TOTAL	5	14	\$121,567.53	\$5,232.66	\$126,800.19

Appendix B

Jurisdictional Annexes

Jurisdictional Annex

Town of Brasher

1. Contacts

The contacts for the Town of Brasher regarding this plan are identified as follows:

- Mark Peets – Town Supervisor
Address: PO Box 358, Brasher Falls, NY 13613
Phone: (315) 389-4223
Email: supervisor@townofbrasher.com
- Larry Hewlett – Highway Superintendent
Address: PO Box 358, Brasher Falls, NY 13613
Phone: (315) 389-4223
Email: highway@townofbrasher.com

Town Website: <https://www.townofbrasher.com/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 2,627 people live in the Town of Brasher. The Town's population has increased by 4.6% since the 2010 Census (2,512) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Brasher is located in the northern portion of St. Lawrence County and is bordered by the Town of Massena to the north, the St. Regis Mohawk Reservation (Franklin County) to the north, Towns of Norfolk and Stockholm to the west, Town of Lawrence to the south, and Towns of Moira and Bombay (Franklin County) to the east.

2.3 Governing Body

The Town of Brasher is governed by a five-member Town Board, which includes the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a new subdivision on County Route 53 was developed and recently completed. The subdivision lots are all located on the St. Regis River. In addition, a solar array project in the Town is currently in the planning stages. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Brasher	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	Yes	In place
Local Emergency Operations Plan	Yes	Established in 1998 after ice storm
Continuity of Operations Plan	No	
Transportation Plan	No	No formal plan, but school buses have been used in the past for transporting residents to shelters, and for food distribution during COVID-19 pandemic.
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Fire Protection Plan	Yes	Helena and Brasher-Winthrop Fire Departments have this in place.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Brasher	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	
Fire department ISO rating	Yes	
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	In place
NFIP Participant/Floodplain ordinance	Yes	Current participant
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	Original FEMA FIRMs, FEMA Flood Study update in progress
Acquisition of land for open space and public recreation	No	
Administration		
Planning Board	Yes	Established
Mitigation Planning Committee	Yes	Established for HMP update
Maintenance programs to reduce risk	Yes	In place
Mutual aid agreements	Yes	In place
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor and Highway Superintendent
Community Planner	No	
Civil Engineer	Other	The Town has an engineer on a retainer to assist as needed
GIS Coordinator	Other	Town has an agreement with DANC for GIS services

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Brasher	Notes
Technical Abilities		
Warning systems/services	Yes	Information can be disseminated to residents on Town Website, Facebook page, and on the message board sign at the Tri-Town Arena.
Hazard data and information	Yes	Compiled for HMP update
Grant writing	No	No grant writer position, but Town can handle some grant applications depending on the project.
HAZUS analysis	Yes	Completed Countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	Yes	Potential for solar projects
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA funding used in past
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Town Website and Facebook page
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Route 37C, Brasher Falls-Helena Rd, and River St. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Town Hall	11 Factory Street, Brasher Falls, NY 13613	Town of Brasher	Yes	Yes	No	Backup power available
Highway Department	1900 County Route 53, Brasher Falls, NY 13613	Town of Brasher	Yes	Yes	Yes	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Brasher based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately owned properties.

- Potential Temporary Housing Locations
 - Town Ball Field near WWTP – 168 Dullea Rd, Brasher Falls, NY 13613
- Potential Permanent Housing Locations
 - Privately owned vacant land throughout Town (coordination required with landowners for potential property purchase or subdivisions)

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4. The Town chose to profile the same hazards selected by the County for the HMP update.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	3	2	3	3	High	1
Severe Winter Storm	3	1	2	3	High	2
Ice Storm	3	1	3	2	Moderate	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Ice Jam	2	1	3	2	Moderate	6
Flood	2	2	1	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	3	1	2	Moderate	10
Landslide	1	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities include any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Brasher. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Infrastructure in the Town of Brasher		
Facility Name	Address	Located in Floodplain*
Public Utilities		
Water Storage Tank/Radio Tower	off of County Route 55	No
Water Treatment Plant	441A Quinell Road, Brasher Falls, NY 13613	100-year
Wastewater Treatment Plant	164 Dullea Road, Brasher Falls, NY 13613	No
Emergency and Medical Services		
Brasher-Winthrop Fire Dept.	708 NY-11C, Winthrop, NY 13697	No
Helena Volunteer Fire Dept.	1175 NY-37C, Helena, NY 13649	No
Tri-Town Volunteer Rescue Squad	900 NY-11C, Brasher Falls, NY 13613	No
Municipal Services		
Town of Brasher Highway Dept.	1900 County Route 53, Brasher Falls, NY 13613	No
Brasher Town Hall	11 Factory Street, Brasher Falls, NY 13613	No
Community Services		
Tri-Town Arena	746 State Highway 11C, Brasher Falls, NY 13613	No
*Based on HAZUS-modeled 100-year and 500-year floodplains		

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Brasher.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Brasher. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Regis River, Deer River, and their tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. These events could occur anywhere within the Town. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's primary evacuation routes (State Routes 37C, 11C, and County Routes 37 and 53) would be most impactful to Town residents. Impacts related to storm events would primarily impact the more populated portions of the Town, including the hamlets of Brasher Falls, Helena, and Brasher Center.

5.1.3 Historical Hazard Occurrences and Damage Estimates

In addition to the severe storm events reported within St. Lawrence County, the NCDC reports five specific severe storm events that occurred in the Town of Brasher between 2010 and 2021 (frequency of about once every other

year). One of these records was a hail event, one was a funnel cloud, and the rest were thunderstorm winds. Estimated damages for the Town of Brasher ranged from \$0 to \$5,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes in the past 11 years. The Town of Brasher reported lightning damage to some Town facilities in the past five years, resulting in the loss of some equipment at the Town Highway Department, WWTP, pump station, and water plant.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	8/18/2015	50 knots	\$5,000.00	-
Hail	6/28/2016	1"	\$0.00	-
Thunderstorm Wind	10/10/2020	55 knots	\$5,000.00	-
Thunderstorm Wind	7/13/2021	50 knots	\$2,000.00	-
Funnel Cloud	7/20/2021		\$0.00	-
Total			\$12,000.00	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to impact the Town of Brasher. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Severe Winter Storm

5.2.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm event, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one municipality within the County. The entire Town of Brasher is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's primary

evacuation routes (State Routes 37C, 11C, and County Routes 37 and 53) would be most impactful to Town residents. Impacts related to severe winter storms would primarily impact the more populated portions of the Town, including the hamlets of Brasher Falls, Helena, and Brasher Center.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Brasher has been affected by a number of severe winter storm events reported for the County, described in Section 5.3 of the main body of the plan.

5.2.4 Future Potential Impacts

The Town of Brasher will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 Ice Storm

5.3.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Brasher is susceptible to damages from an ice storm event. Damages to the Town's primary evacuation routes (State Routes 37C, 11C, and County Routes 37 and 53) would be most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town, including the hamlets of Brasher Falls, Helena, and Brasher Center.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Town of Brasher lies, which are described in

Section 5.2 of the main body of the plan. No damage estimates from these events specific to the Town of Brasher were reported.

5.3.4 Future Potential Impacts

The Town of Brasher will continue to experience ice storm events in the future. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's primary evacuation routes (State Routes 37C, 11C, and County Routes 37 and 53) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Brasher Falls, Helena, and Brasher Center.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Brasher were reported for this event.

5.4.4 Future Potential Impacts

The Town of Brasher is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Extreme Temperatures

5.5.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 7.6% of the population in the Town of Brasher is under 5 years old, and 14.5% of the population is over 65 years old. Approximately 13.8% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Brasher lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Brasher.

5.5.4 Future Potential Impacts

The Town of Brasher will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 Ice Jam

5.6.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to ice jams, as documented in their hazard analysis in Section 4.1. Ice jams are most common along the St. Regis River, which runs through the Town of Brasher. Most ice jams in the County occur in Brasher. Properties along the St. Regis River and the Deer River are most vulnerable to ice jams. The Town's wastewater treatment plant is located on the St. Regis River and is vulnerable to damages from ice jams.

5.6.3 Historical Hazard Occurrences and Damage Estimates

The Town of Brasher was affected by 26 ice jams reported by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. The USACE CRREL has not reported any ice jams in Brasher since 2010, however, the Town has experienced ice jams on a regular basis according to local records. The Town's wastewater treatment plant and a nearby campground were damaged by an ice jam in recent years.

5.6.4 Future Potential Impacts

Properties along the St. Regis River and Deer River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Flood

5.7.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to flooding, as documented in their hazard analysis in Section 4.1. The Town is drained by the St. Regis River and Deer River, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Brasher, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Brasher that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of Brasher Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
58,861 acres	3.1%	0.33%

5.7.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC did not report any floods in the Town of Brasher since 2010. As described in Section 6.0 of this annex, five (5) NFIP loss claims have been paid as of October 2021 in the Town of Brasher totaling \$51,241.30. There are no repetitive loss properties in the Town.

5.7.4 Future Potential Impacts

Properties along the St. Regis River, Deer River, and their tributaries are vulnerable to flooding. About 3.1% of the Town of Brasher is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County. In addition, one critical facility, the Town's water treatment plant, is located within the 100-year floodplain based on the HAZUS assessment.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. This is due to a drought's widespread extent and potential to cause moderate damages. Agricultural areas (which are mostly in the northern part of the Town) and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on private wells and are susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Brasher or the rest of St. Lawrence County since 2010. There are no damage estimates related to droughts for the Town.

5.8.4 Future Potential Impacts

The entire Town of Brasher remains susceptible to a drought event. Agricultural lands and residences that are not connected to public water are the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which occurred in the Town of Brasher. There are also no local records of significant earthquake events affecting the Town. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Wildfire

5.10.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.10.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor grass/brush fires occasionally occur. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The southwestern corner of the Town is mapped with a higher wildfire density during this time (1.4 to 3.4 fires per square mile). The NYSDEC map also shows two wildfires greater than 10 acres in size that occurred along the eastern border of the Town (on the St. Lawrence/Franklin County boundary). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Town of Brasher remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Landslide

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Brasher is mapped in an area with high susceptibility but low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the St. Regis River are particularly susceptible.

5.11.3 Historical Hazard Occurrences and Damage Estimates

Local records reported bank erosion caused by flooding along the St. Regis River, which required emergency stabilization for a residence on Maple Ridge

Rd as well as the road itself. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Areas along steep slopes within the Town remain susceptible to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.12 Infestation

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town has a low overall vulnerability for infestations, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Brasher is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Brasher (Figure 5.13, Appendix A of the main body of the plan).

5.12.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Brasher, however, it has been detected in the Town of Massena which is directly north of Brasher. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Brasher in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.12.4 Future Potential Impacts

The entire Town of Brasher remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Brasher currently participates in the NFIP. As of October 2021, five (5) NFIP loss claims have been paid in the Town of Brasher totaling \$51,241.30. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed three mitigation actions in the 2015 St Lawrence County HMP, and the status of each action is summarized in Table 8, below. Two of the Town's 2015 mitigation actions were re-included for the 2021 update.

Table 8. Status of 2015 Mitigation Actions
Town of Brasher

Proposed Mitigation Action	Hazard(s) Mitigated	2015 Goals and Objectives Met	Implementing Agency	Status
Maple Ridge Road bank stabilization project to reduce erosion caused by the flooding of the St. Regis River. The river bank will need to be stabilized with fill and a retaining wall. Then the road can be repaired as needed. Landowner consultation would be needed.	Flood	1,2,3	Town of Brasher Highway Department	Completed. Emergency mitigation completed in this location over the last few years; bank stabilization completed because a road and house were at risk. Road was damaged first; a home was then at risk and required major stabilization efforts. The stabilization work has held up very well.
Construction of a retaining wall northeast of the St. Regis River is recommended. To reduce flooding of the Riverside Campground and homes on Congress Street Extension. Flooding here is caused by a backup of water due to ice jams.	Ice jam, flood	1,2,3	Town of Brasher Highway Department	Some small-scale shoreline stabilization projects have been completed by homeowners, but there is still a need for a retaining wall. Re-included for HMP update as an ongoing action.
Complete a drainage capability study of the Earls Creek system and rehabilitation of existing drainage system along Small Road in Brasher Falls.	Flood	1,2,3	Town of Brasher Highway Department	A drainage study has not been completed. Some drainage pipes replaced along Small Road; USACE did a lot of work in this area previously. Drainage study for Earls Creek re-included for HMP update as an ongoing action.

7.2 Proposed Mitigation Actions

The Town proposed three mitigation actions to be included in the HMP update. One of these actions is new (Brasher 1) and two are ongoing (Brasher 2 and Brasher 3, carried over from the last HMP). These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Brasher									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Brasher 1	Complete a hydraulic study for the St. Regis River on Maple Ridge Rd to identify potential flood mitigation projects.	Flood, Ice Jam	Town of Brasher Highway Dept. *, County SWCD, USACE	None	5 years	Existing	\$30,000	Town Budget, FEMA - BRIC	1
Brasher 2 (Ongoing from 2015)	Complete a hydraulic study for Earls Creek to identify potential flood mitigation projects.	Flood	Town of Brasher Highway Dept. *, County SWCD, USACE	None	5 years	Existing	\$30,000	Town Budget, FEMA - BRIC	2
Brasher 3 (Ongoing from 2015)	Construct a retaining wall along the St. Regis River	Flood	Brasher Town Board*	None	5 years	Existing	\$1 million	Town Budget, FEMA - BRIC	3
Potential Funding Sources									
FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Brasher
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Mitigation Action Worksheet

Project Name:	Complete a hydraulic study for the St. Regis River on Maple Ridge Rd to identify potential flood mitigation projects.
Project ID:	Brasher 1

Risk/Vulnerability

Hazard of Concern:	Flood, Ice Jam
Description of the Problem:	Properties on Maple Ridge Rd experience recurring flooding issues from the St. Regis River. However, the best option for flood mitigation is not clear.

Action of Project Intended for Implementation

Description of the Solution:	Conduct a hydraulic study for the St. Regis River along Maple Ridge Rd to identify problems and high-priority flood mitigation projects.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	A study will provide an overview of the drainage area and will prioritize problem areas to be studied further or mitigated
Useful Life:	Short-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget, FEMA - BRIC
Responsible Organization:	Town of Brasher Highway Dept. *, County SWCD, USACE	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Elevate structures along River	High	Not practical or cost effective, private ownership
	Complete a hydraulic study for the St. Regis River on Maple Ridge Rd	\$30K	Best starting point to identify potential flood mitigation options

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Brasher
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Mitigation Action Worksheet

Project Name:	Complete a hydraulic study for Earls Creek to identify potential flood mitigation projects.
Project ID:	Brasher 2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	Earls Creek is a tributary of the Raquette River in the Town of Brasher that crosses Massena-Helena Rd (County Rt 37) and parallels Carey Rd. The Town experiences recurring flooding issues near this stream during heavy precipitation events. However, the best option for flood mitigation is not clear.

Action of Project Intended for Implementation

Description of the Solution:	Conduct a hydraulic study for Earls Creek to identify problems and high-priority flood mitigation projects.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	A study will provide an overview of the drainage area and will prioritize problem areas to be studied further or mitigated
Useful Life:	Short-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget, FEMA - BRIC
Responsible Organization:	Town of Brasher Highway Dept. *, County SWCD, USACE	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Install larger culvert at Massena-Helena Rd to improve stream flow	\$10K	May help temporarily, but does not address issues with stream channel
	Complete a hydraulic study for Earls Creek	\$30K	Best starting point to identify highest priority actions to take to improve flow in stream channel and reduce flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Brasher
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Mitigation Action Worksheet

Project Name:	Construct a retaining wall along the St. Regis River
Project ID:	Brasher 3

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding along the St. Regis River, specifically at the Riverside Campground and homes on Congress St Extension, which is caused by a backup of water due to ice jams.

Action of Project Intended for Implementation

Description of the Solution:	Construct a retaining wall to protect the riverbank from erosion caused by recurring flooding and ice jams.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood damages to adjacent properties and infrastructure
Useful Life:	Long-term		
Estimated Cost:	\$1 million		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town Budget, FEMA - BRIC
Responsible Organization:	Brasher Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Stabilize the shoreline using nature-based features such as vegetation plantings	High	May not provide necessary level of protection. A combination of nature-based and hard armor may be a better option.
	Construct a retaining wall along the river bank	\$1 million	Offers greatest amount of shoreline protection from erosion related to ice jams and flooding.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Brasher T 1	+	+	+	+	+	0	0	+	+	+	Low	Medium	1
Brasher T 2	+	+	+	+	+	0	0	+	+	+	Low	Medium	2
Brasher T 3	+	+	0	+	0	-	-	0	+	-	Medium	High	3

Jurisdictional Annex

Town of Canton

1. Contacts

The primary contact for the Town of Canton regarding this plan is the Town Supervisor:

- Mary Ann Ashley – Town Supervisor
Address: 60 Main Street, Canton, NY 13617
Phone: (315) 386-2962
Email: mashley@cantonny.gov

Town Website: <https://cantonny.gov/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 11,638 people live in the Town of Canton. The Town's population has increased by 4.6% compared with the 2010 Census (10,995) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Canton is located in the central portion of St. Lawrence County and is bordered by the Town of Lisbon to the north, Potsdam and Pierrepont to the east, Russell to the south, and De Kalb and Oswegatchie to the west. Canton is easily accessed from State Highway 11, State Route 310, State Route 68 east/west, and County Route 27.

2.3 Governing Body

The Town of Canton is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), St. Lawrence Health System, a new facility, was constructed in the Town of Canton in 2016. In addition, the Town recently received a grant for improvements to Miner Street Road. The project will involve road replacement along with new tree plantings and electrical poles. The New

York Power Authority (NYPA) is in the process of replacing powerlines throughout the Town, and the Town has coordinated with NYPA to retain Town access to portions of the powerline corridor. Projects currently in the planning stages include a Michaels Arts and Crafts store and two solar array projects. None of the recent or proposed developments are located in areas of concern regarding natural hazards. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town recently updated their comprehensive plan (a joint plan with the Villages of Canton and Rensselaer Falls), which incorporated information that was covered in the 2015 HMP. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Canton	Notes
Plans		
Comprehensive Plan	Yes	Just updated – Town/Village of Canton and Village of Rensselaer Falls
Capital Improvement Plan	No	
Economic Development Plan	No	No standalone plan but covered by Comprehensive Plan
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Canton	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible – Currently undergoing review of code
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place – Currently undergoing review of zoning laws
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	Yes	
Flood insurance rate maps	Yes	FEMA working on new flood study Countywide to generate new mapping
Acquisition of land for open space and public recreation	Yes	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	Agreements with four volunteer fire departments
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	Yes	Shared service with Village of Canton Economic Development Office
Civil Engineer	No	
GIS Coordinator	Yes	Agreement with DANC

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Canton	Notes
Technical Abilities		
Warning systems/services	Yes	Town website; Town Clerk Facebook page
Hazard data and information	Yes	Obtained for HMP update
Grant writing	Yes	Board members, with assistance from Economic Development Office
HAZUS analysis	Unknown	Completed Countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	Village of Canton administers all water/sewer
Impact fees for new development	Yes	
Storm water utility fee	Yes	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	Waterfront Advisory Committee Joint Sustainability Committee Trails Committee Grass River Heritage
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	Canton fire department works with schools; highway department also completes public outreach
Storm Ready certification	Yes	
Firewise Communities certification	Yes	
Public-private partnership initiatives addressing disaster-related issues	Yes	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 11, State Route 310, State Route 68 east/west, and County Route 27. The Town's emergency shelter locations are summarized in Table 2, below. The Town of Canton utilizes the Town website, social media, radio, and TV message as its emergency communication systems. In addition, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
SUNY Canton	34 Cornell Drive, Canton, NY 13617	State University of New York (SUNY)	Yes	Yes	Yes, in certain parts of the dorms	Backup power available. Availability depends on presence of students and incident size/duration.
St. Lawrence University	23 Romoda Drive, Canton, NY 13617	St. Lawrence University	Yes	Yes	No	Does not have whole-campus backup system. Availability depends on presence of students and incident size/duration.
St. Lawrence-Lewis BOCES	40 West Main Street, Canton, NY 13617	St. Lawrence-Lewis BOCES	Yes	Yes	No	-
U.S. Army Reserve Center	45 West Main Street, Canton, NY 13617	U.S. Army Reserve Center	Yes	Yes	No	-

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Canton based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - SUNY Canton – 34 Cornell Drive, Canton, NY 13617
 - St. Lawrence University – 23 Romoda Drive, Canton, NY 13617
 - Privately owned vacant land (lots)
 - Hugh C. Williams Senior High School – 99 State Street, Canton, NY 13617
 - Save a Lot (large lot) – 5933 US-11, Canton, NY 13617
 - Town woodlot
 - Campgrounds in surrounding
 - Taylor Park – Taylor Park Road, Canton, NY 13617
- Potential Permanent Housing Locations
 - Vacant Town property off of Barber Road

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/ Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	2	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	3	1	2	Moderate	10
Infestation	2	1	1	1	Low	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Canton. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Infrastructure in the Town of Canton		
Facility Name	Address	Located in Floodplain*
Community Services		
Library	8 Park St, Canton, NY 13617	No
Morley Library	7230 County Rd 27, Canton, NY 13617	No
EMS/Fire Department		
Canton Fire Department	77 Riverside Dr., Canton, NY 13617	100YR and 500YR
Canton Rescue Squad	77 Riverside Dr., Canton, NY 13617	100YR and 500YR
Morley Volunteer Fire Company	7220 CR 27, Canton, NY 13617	No
Pierrepoint Volunteer Fire	62 Old County Rd., Canton, NY 13617	No
Pyrites Volunteer Fire Department	Churchill St, Pyrites, NY 13677	100YR
Federal Facilities		
U.S. Army Reserve Center	45 W Main St, Canton, NY 13617	No
County and Municipal Facilities		
Highway Department	9 Stiles Ave, Canton, NY 13617	No
Municipal Offices	60 Main St, Canton, NY 13617	No
Sanitary Sewage Collection System	throughout portions of Town	-
Kimball Hill Radio Tower (SLC ES Owned)	-	-
*Based on HAZUS-modeled 100-year and 500-year floodplains		

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Canton.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Canton. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Grass River and its tributaries, and Little River and its tributaries are likely to experience increased flooding occurrences.

The Town of Canton chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's primary evacuation routes (U.S. Route 11, State Highway 310, State Highway 68, and County Route 27) would be most impactful to Town residents. Impacts related to storm events would primarily impact the more populated portions of the Town, including the Villages of Canton and Rensselaer Falls and Hamlets of Pyrites and Morley.

5.1.3 Historical Hazard Occurrences and Damage Estimates

In addition to the severe storm events reported within St. Lawrence County, the NCDC reports five specific severe storm events that occurred in the Town of Canton between 2010 and 2021 (frequency of about twice every 5 years). One of these records was a hail event, and four were thunderstorm winds. Estimated damages for the Town of Canton ranged from \$0 to \$10,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes affecting the Town in the past 11 years.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	8/11/2012	0.88 in.	\$0	-
Thunderstorm Wind	8/11/2012	50 knots.	\$2,000	-
Thunderstorm Wind	7/19/2013	55 knots.	\$10,000	-
Thunderstorm Wind	9/11/2013	50 knots.	\$5,000	-
Thunderstorm Wind	8/4/2017	50 knots.	\$2,000	-
Total			\$19,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Canton is susceptible to damages from an ice storm event. Damages to the Town's primary evacuation routes (U.S. Route 11, State Highway 310, State Highway 68, and County Route 27) would be

most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town, including the Villages of Canton and Rensselaer Falls and Hamlets of Pyrites and Morley.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. The Town of Canton was affected by three ice storm events that occurred in St. Lawrence County, recorded by the NCDC, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specifically for the Town of Canton.

5.2.4 Future Potential Impacts

The Town of Canton will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Canton is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's primary evacuation routes (U.S. Route 11, State Highway 310, State Highway 68, and County Route 27) would be most impactful to Town residents. Impacts related to severe winter storms

would primarily impact the more populated portions of the Town, including the Villages of Canton and Rensselaer Falls and Hamlets of Pyrites and Morley.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Canton has been affected by a number of severe winter storm events that were reported for the County, described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. There are no specific damage estimates for the Town related to severe winter storms.

5.3.4 Future Potential Impacts

The Town of Canton will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's primary evacuation routes (U.S. Route 11, State Highway 310, State Highway 68, and County Route 27) would be most impactful to Town residents. Impacts related to nor'easters would primarily impact the more populated portions of the Town, including the Villages of Canton and Rensselaer Falls and Hamlets of Pyrites and Morley.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected

St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Canton were reported for this event.

5.4.4 Future Potential Impacts

The Town of Canton is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. FEMA provides flood insurance rate maps for the Town of Canton, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Canton that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of Canton Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
64,837 acres	5.3%	0.32%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood events in the Town of Canton since 2010. However, local records reported flooding in the hamlet of Pyrites that shut down a County bridge, and flooding in the Village of Canton at Taylor Park. As described in Section 6.0 of this annex, three NFIP loss claims have been paid as of October 2021 in the Town of Canton totaling \$46,041.21. There are no repetitive loss properties in the Town of Canton.

5.5.4 Future Potential Impacts

Properties along the Grass River, Little River, and their tributaries are vulnerable to flooding. About 5.3% of the Town of Canton is within a mapped 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.6 Extreme Temperatures

5.6.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Canton is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 2.6% of the population in the Town of Canton is under 5 years old, and 13.4% of the population is over 65 years old. Approximately 10.0% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Canton lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specifically for the Town of Canton.

5.6.4 Future Potential Impacts

The Town of Canton will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 Ice Jam

5.7.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Ice jams are common along the Grass River, which flows through the Town of Canton. Properties along the Grass River are most vulnerable to ice jams.

5.7.3 Historical Hazard Occurrences and Damage Estimates

The Town of Canton was affected by 21 ice jams reported by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. The USACE CRREL has not reported any ice jams in Canton since 2010, however, the Town reports local records of ice jams in the last 10 years. No damage estimates related to ice jams are reported for the Town of Canton.

5.7.4 Future Potential Impacts

Properties along streams throughout the Town, primarily the Grass River, are vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system. Properties in the Town rely on public wells that may be susceptible to low water yields during a drought. Residences that experience low yields from private wells as well as agricultural lands would be most susceptible to a drought event.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Canton or the rest of St. Lawrence County since 2010. The Town reported a local record of a drought during the summer of 2020, however, no specific damage estimates were reported.

5.8.4 Future Potential Impacts

The entire Town of Canton remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Canton. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Wildfire

5.10.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open

fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.10.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor grass/brush fires occasionally occur. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

Undeveloped areas in the Town of Canton remain susceptible to a wildfire. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Canton is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Canton (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Canton, however, it has been detected in the Town of Lisbon, which is directly north of Canton. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Canton in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Canton remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Canton currently participates in the NFIP. As of October 2021, three (3) NFIP loss claims have been paid as in the Town of Canton totaling \$46,041.21. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed two mitigation actions in the 2015 St. Lawrence County HMP. A status update is provided in Table 8, below. The Town did not re-include their 2015 mitigation actions for the 2021 HMP update.

Table 8. Hazard Mitigation Action Progress Town of Canton				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for assessing and maintaining proper stormwater flow along the Grass River in adjacent swales, bridge openings and low-lying park areas.	Severe Storms, Flood	1,2	Village/Town Highway and DPW	No progress to date. Revised stormwater management action include for HMP update.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, Severe storm	1,2,3	Village/Town Highway and DPW	Routine maintenance for DPW; regularly done after storm events

7.2 Proposed Mitigation Actions

The Town proposed four new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions
Town of Canton

Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Canton T1	Install a generator for municipal building (joint facility with Village of Canton) and upgrade the existing generator at the Town highway department.	All	Canton Town Board*, Town of Canton Highway Dept	Comprehensive Plan	5 years	Existing	\$20-25K	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Canton T2	Complete a stormwater drainage improvements project along Wilkinson Rd.	Flood	Town of Canton Highway Dept*, Canton Town Board	Comprehensive Plan	5 years	Existing	High	NYS DOT - CHIPS, Town Budget	2
Canton T3	Raise elevation of Irish Settlement Rd to reduce flooding and washouts.	Flood	Town of Canton Highway Dept*, Canton Town Board	Comprehensive Plan	5 years	Existing	\$1 million	Town Budget, NYSDOT- CHIPS, FEMA- BRIC	3
Canton T4	Pyrites kayak launch flood resiliency study	Flood, Severe Thunderstorm/ Wind/ Hail/ Tornado	Canton Town Board*	Comprehensive Plan	5 years	Existing	\$20,000	Town Budget	4

Potential Funding Sources

DASNY SAM: <https://www.dasny.org/about-us/what-we-do/grants-administration>

FEMA BRIC: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

NYSDOT CHIPS: <https://www.dot.ny.gov/programs/chips>

USDA RD Community Facilities: <https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program>

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Canton
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Mitigation Action Worksheet

Project Name:	Install a generator for municipal building (joint facility with Village of Canton) and upgrade the existing generator at the Town highway department.
Project ID:	Canton T1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The municipal building (which is also used by the Village of Canton) currently lacks a backup generator. The Town Highway Department has a generator but it cannot power the entire facility. Therefore, both facilities are vulnerable to power outages. Both are critical facilities and provide important services during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the municipal building and the highway department to ensure continuity of operations during a storm event.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$20-25K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Canton Town Board* and Highway Dept	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Purchase portable generators	\$10K	More flexibility for use but may not power entire facility, requires additional coordination for setup and use.
	Install on-demand generators at the municipal building and the highway department	\$20-25K	Most comprehensive solution to ensure continuity of critical services

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Canton
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Mitigation Action Worksheet

Project Name:	Complete a stormwater drainage improvements project along Wilkinson Rd.
Project ID:	Canton T2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues along Wilkinson Rd during heavy precipitation events. Additional culverts are needed to improve drainage in this area.

Action of Project Intended for Implementation

Description of the Solution:	Install new stormwater drainage infrastructure to improve drainage and reduce flooding.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	3 years	Potential Funding Sources:	NYSDOT - CHIPS, Town Budget
Responsible Organization:	Town of Canton Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Replace culverts/stormwater pipes as needed when issues arise	\$10K or more each occurrence	Reactive approach
	Complete a stormwater drainage improvements project along Wilkinson Rd	High	Targets larger area, best way to mitigate future issues

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Canton
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Mitigation Action Worksheet

Project Name:	Raise elevation of Irish Settlement Rd to reduce flooding and washouts.
Project ID:	Canton T3

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding and washout issues along Irish Settlement Road. The road provides a connection between County Rt 15 and State Highway 68, and is surrounded by state land.

Action of Project Intended for Implementation

Description of the Solution:	Raise elevation of the road to reduce flood vulnerability and future damages, and to keep road open to traffic.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood damage to roadway
Useful Life:	Long-term		
Estimated Cost:	\$1 million		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town Budget, NYSDOT- CHIPS, FEMA- BRIC
Responsible Organization:	Town of Canton Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Install additional larger culverts along road to convey stormwater drainage	\$10K or more each culvert	Road still subject to flooding due to low elevation
	Raise elevation of Irish Settlement Rd	\$1 million	Best approach to reduce flooding and washout of road

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Canton
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Mitigation Action Worksheet

Project Name:	Pyrites kayak launch flood resiliency study
Project ID:	Canton T4

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Pyrites kayak launch (off County Rt 47 on the Grass River) has experienced recurring damages during storm events. The walkway from the parking lot to the kayak launch consists of gravel and sand. The walkway has been eroded during heavy rain events. The Town has brought additional material in multiple times as a temporary repair, but a more permanent solution is needed for long-term mitigation and resiliency during storm events. An engineering study is needed to review potential solutions.

Action of Project Intended for Implementation

Description of the Solution:	Conduct an engineering study to review potential resiliency improvements for the Pyrites kayak launch.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low for study	Estimated Benefits (losses avoided):	Comprehensive assessment of potential storm resiliency improvements for kayak launch
Useful Life:	Short-term for study		
Estimated Cost:	\$20,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1-2 years	Potential Funding Sources:	Town Budget
Responsible Organization:	Canton Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Build new kayak launch in different location	High	Not practical, may be difficult to permit. A new location may require additional land acquisition by Town.
	Conduct an engineering study	\$20,000	Will provide comprehensive review of alternatives for Town to improve resiliency of kayak launch

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Canton T1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Canton T2	+	+	0	+	+	-	0	0	+	0	Medium	High	2
Canton T3	+	+	0	+	+	-	0	0	+	0	Medium	High	3
Canton T4	+	+	+	+	+	0	0	+	+	+	Low	Low	4

Jurisdictional Annex

Village of Canton

1. Contacts

The contacts for the Village of Canton regarding this plan are identified as follows:

- Michael Dalton – Mayor
Address: 60 Main Street, Canton, NY 13617
Phone: (315) 386-2871
Email: mdalton@cantonny.gov
- Village Superintendent
Address: 60 Main Street, Canton, NY 13617
Phone: (315) 386-2871
Email: subt@cantonny.gov

Village Website: <https://cantonny.gov/>

2. Municipal Profile

2.1 Population

The 2020 U.S. Census reported that 7,155 people live in the Village of Canton, an increase of 13.3% compared to the 2010 Census population of 6,314 (U.S. Census Bureau, 2021).

2.2 Location

The Village of Canton is located within the Town of Canton in central St. Lawrence County. The Village of Canton is easily accessed from State Highway 11, State Route 310, State Route 68, and County Route 27.

2.3 Governing Body

The Village of Canton is governed by a five-member Village board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a medical office building associated with the St. Lawrence Health Systems, was constructed in the Village of Canton in 2018. A Fairfield hotel was constructed in 2019/2020. A Walgreens Pharmacy was constructed in 2019. A new McDonalds was constructed in 2021. The construction of a Tim Horton's in progress with approvals. A solar array was constructed in 2018/2019. Anticipated construction includes a cul-de-sac project that consists of six lots off of Miner Street as well as a few individual single family projects on Minor and Grove Street. A Village Flats project includes six townhouses and plans to develop more duplexes. A 30,000 square foot mixed-use residential/commercial complex is proposed in the former Jubilee Plaza. Additionally, SUNY Canton and St. Lawrence University have developed new dorm facilities in the last 5 years. St. Lawrence University also recently expanded their ice rink. None of the recent developments in the Village are located in known natural hazard-prone areas. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Village's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village recently updated their comprehensive plan (a joint plan with the Town of Canton and Village of Rensselaer Falls), which incorporated information that was covered in the 2015 HMP. The Village is also a registered Climate Smart Community. The Village's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Canton	Notes
Plans		
Comprehensive Plan	Yes	Recently updated – adopted 10/7/2019
Capital Improvement Plan	Yes	In place
Economic Development Plan	Yes	In progress - should be completed in 2021

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Canton	Notes
Local Emergency Operations Plan	No	Currently work through St. Lawrence County Plan and implement NIMS Incident Command System as needed
Continuity of Operations Plan	Yes	Village PD is accredited, so this plan is a requirement.
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	
Fire department ISO rating	Yes	Improved since last rating based on fire department and Village water supply; went up a class in rating
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place – updated December 2021
Subdivision ordinance	Yes	In place
NFIP Participant/Floodplain ordinance	Yes	Current participant
Natural hazard specific ordinance	Yes	In Place
Flood insurance rate maps	Yes	FEMA is completing a new flood study that will generate new mapping county-wide
Acquisition of land for open space and public recreation	Yes	In Place
Administration		
Planning Commission	Yes	In Place
Mitigation Planning Committee	Yes	In Place
Maintenance programs to reduce risk	Yes	In Place – Ongoing inspections
Mutual aid agreements	Yes	In Place

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Canton	Notes
Staff		
Chief Building Official	Yes	Code Enforcement Officer (appointed to full time in April 2021)
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	The Mayor, who delegates based on emergency
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	
Economic Developer	Yes	In Place
Technical Abilities		
Warning systems/services	Yes	In Place
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	In Place
Authority to levy taxes for specific purposes	Yes	In Place
Fees for water, sewer, gas, or electric services	Yes	In Place
Impact fees for new development	Yes	In Place
Storm water utility fee	Yes	In Place
Incur debt through general obligation bonds and/or special tax bonds	Yes	In Place
Incur debt through private activities	Yes	In Place
Community Development Block Grant	Yes	In Place
Other federal funding programs	Yes	In Place
State funding programs	Yes	In Place
Local funding programs	Yes	In Place
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	Grass River Heritage
Ongoing public education or information program	Yes	In Place

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Canton	Notes
Natural disaster or safety related school programs	Yes	Police and Fire Departments work with schools for safety programs
Storm Ready certification	Yes	In Place
Firewise Communities certification	Yes	In Place
Public-private partnership initiatives addressing disaster-related issues	Yes	In Place

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include State Highway 11, State Route 310, State Route 68, and County Route 27. The Village’s emergency shelter locations are summarized in Table 2, below. The Village of Canton utilizes the Village website, social media, local news, a reverse 911 system, the universities reverse 911 system, and a school call alert system as its emergency communication systems. In addition, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
SUNY Canton	34 Cornell Drive, Canton, NY 13617	State University of New York (SUNY)	Yes	Yes	Yes, in certain parts of the dorms	Backup power available. Availability depends on presence of students and incident size/duration.
St. Lawrence University	23 Romoda Drive, Canton, NY 13617	St. Lawrence University	Yes	Yes	No	Does not have whole-campus backup system. Availability depends on presence of students and incident size/duration.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Canton Central School	99 State Street, Canton, NY 13617	Canton Central School District	Yes	Yes	No	-

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Canton based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Bend in the River Park (open space) – 90 Lincoln Street, Canton, NY 13617
 - Canton Recreation Pavilion (time of year dependent if ice is in) – 90 Lincoln Street, Canton, NY 13617
 - Mobile Home Parks – Route 11
 - Taylor Park (outside of Village) – Taylor Park Road, Canton, NY 13617
 - Willow Island – 1 West Main Street, Canton, NY 13617
 - Commerce Lane (open space on existing property)
 - Schools – open space on existing properties
- Potential Permanent Housing Locations
 - Maple Hill – residential area with open lots

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	2	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	3	1	1	Moderate	10
Infestation	1	1	1	1	Low	11

4.2 Critical Facilities

Critical facilities include those that are critical for emergency response or that require special emergency response in the event of hazardous incidents as identified by the Village of Canton. Table 5, below, denotes the types and locations of critical facilities within the Village.

Table 5. Critical Infrastructure in the Village of Canton		
Facility Name	Address	Located in Floodplain*
Public Utilities		
Municipal Stormwater System	Located throughout the Village	No
Municipal Water System	Supplied from various wells located in Town of Pierrepont	No
Sewer Pump Station	115 E Main St	No
Sewer Pump Station	139 State St	No
Sewer Pump Station	17 Commerce Ln	No
Sewer Pump Station	26 Sullivan Dr	No
Sewer Pump Station	5912 U.S. Route 11	No
Sewer Pump Station	6232 County Rt 37	No
Sewer Pump Station	87 Riverside Dr	100YR
Wastewater Treatment Facility	Sullivan Dr, Canton, NY 13617	No
Closed Landfill	2395 County Rt 21, Hermon, NY 13652	No
County and Municipal Services		
Canton Municipal Building (Includes Village and Town Offices and Village Police Dept.)	60 Main St, Canton NY 13617	No
Canton Village Department of Public Works	70 Lincoln St, Canton, NY 13617	No
Canton Fire Department	77 Riverside Dr, Canton, NY 13617	100YR
Canton Recreation Pavilion	90 Lincoln St, Canton, NY 13617	No
Canton Town Highway Department	9 Stiles Ave, Canton, NY 13617	No
St. Lawrence County Highway Department - Main Facility	44 Park St, Canton, NY 13617	No
St. Lawrence County Offices	48 Court St, Canton, NY 13617	No
St. Lawrence County Public Safety Complex (includes NYS Police)	49 Court St, Canton, NY 13617	No
Community Services		
Banford Elementary School	99 State St, Canton, NY 13617	No
Hugh C. Williams Senior High School	99 State St, Canton, NY 13617	No
J. Manley McKenney Middle School	99 State St, Canton, NY 13617	No
St. Catherine of Siena Academy	2 Powers St, Canton NY 13617	No
St. Lawrence University	23 Romoda Dr, Canton, NY 13617	No
St. Lawrence-Lewis BOCES	40 W Main St, Canton, NY 13617	No
SUNY Canton	34 Cornell Dr, Canton, NY 13617	No
*Based on HAZUS-modeled 100-year and 500-year floodplains		

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Village of Canton.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan (Volume I).

The probability of climate-related hazard events is expected to increase in the future within the Village of Canton. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Grass River and its tributaries are likely to experience increased flooding occurrences. The Village of Canton is a registered Climate Smart Community.

The Village of Canton chose not to profile landslide in their annex even though it was profiled for the County. The Village does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1. Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highways 68, 310, and County Route 27) would be most impactful to Village residents. Damages related to severe storms would primarily impact the more densely populated portions of the Village as well as SUNY Canton during the school year.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reported 180 severe storm events throughout St. Lawrence County between 2010 and 2021, ten of which were reported to occur in the Village of Canton (frequency of about once per year). One of these records was a hail event, one was a lightning event, and the rest were thunderstorm winds. Estimated damages for the Village of Canton ranged from \$0 to \$20,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes in the past 11 years.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	6/8/2011	55 knots	\$20,000.00	-
Thunderstorm Wind	7/17/2011	50 knots	\$10,000.00	-
Hail	7/4/2012	1.50 in.	\$0.00	-
Thunderstorm Wind	5/21/2013	55 knots	\$20,000.00	-
Thunderstorm Wind	5/22/2013	50 knots	\$10,000.00	-
Thunderstorm Wind	7/19/2013	50 knots	\$20,000.00	-
Thunderstorm Wind	7/8/2014	50 knots	\$5,000.00	-
Thunderstorm Wind	7/8/2017	55 knots	\$20,000.00	-
Lightning	8/4/2017	-	\$1,000.00	-
Thunderstorm Wind	7/20/2021	52 knots	\$10,000.00	-
Total			\$116,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Canton is susceptible to damages from an ice

storm event. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highways 68, 310, and County Route 27) would be most impactful to Village residents. Damages related to ice storms would primarily impact the more densely populated portions of the Village as well as SUNY Canton during the school year.

5.2.3 Historical Hazard Occurrences and Damage Estimate

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Village of Canton lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Canton.

5.2.4 Future Potential Impacts

The Village of Canton will continue to experience ice storm events in the future. The Village Department of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.2 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.3 Hazard Vulnerability

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one municipality within the County. The entire Village of Canton is susceptible to damages from a severe winter storm event. The Village Department of Public Works clears Village streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highways 68, 310, and County Route 27) would be most impactful to Village residents. Damages related to severe winter storms

would primarily impact the more densely populated portions of the Village as well as SUNY Canton during the school year.

5.3.4 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Village of Canton has been affected by a number of severe winter storm events reported for the County, which are described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Canton. The Village reported local records of recent winter storms that resulted in power outages.

5.3.5 Future Potential Impacts

The Village of Canton will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Village is moderately vulnerable to nor'easters, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highways 68, 310, and County Route 27) would be most impactful to Village residents. Damages related to coastal storms would primarily impact the more densely populated portions of the Village as well as SUNY Canton during the school year.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected

St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Canton were reported for this event.

5.4.4 Future Potential Impacts

The Village of Canton is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.2 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.3 Hazard Vulnerability

The Village is moderately vulnerable to flooding, as documented in their hazard analysis in Section 4.1. The Village is generally drained by the Grass River and tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Village of Canton, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Village of Canton that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Village of Canton Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
2,703 acres	5.5%	0.17%

5.5.4 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Village of Canton since 2010. As described in Section 6.0 of this annex, one NFIP loss claim has been filed as of October 2021 in the Village of Canton but no payments were made. There are no repetitive loss properties in the Village of Canton.

5.5.5 Future Potential Impacts

Properties along the Grass River and its tributaries remain vulnerable to flooding. About 5.5% of the Village of Canton is within a mapped 100-year floodplain. One of the Village's sewage pump stations on Riverside Drive is located in the HAZUS-modeled 100-year floodplain.

5.6 Extreme Temperatures

5.6.2 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.3 Hazard Vulnerability

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Village of Canton is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 1.5% of the population in the Village of Canton is under 5 years old, and 11.7% of the population is over 65 years old. Approximately 13.0% of the Village's

population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.4 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Canton lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specifically for the Village of Canton.

5.6.5 Future Potential Impacts

The Village of Canton will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 Ice Jam

5.7.2 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.3 Hazard Vulnerability

The Village is moderately vulnerable to ice jams, as documented in their hazard analysis in Section 4.1. Properties along the Grass River, which flows through the Village, are most vulnerable to ice jams.

5.7.4 Historical Hazard Occurrences and Damage Estimates

The USACE, CRREL reports no specific ice jam events for the Village of Canton. No damage estimates are reported specifically for the Village of Canton related to ice jams.

5.7.5 Future Potential Impacts

Properties along streams throughout the Village, primarily the Grass River are vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 Drought

5.8.2 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.3 Hazard Vulnerability

The Village is moderately vulnerable to droughts, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Village residents are served by municipal water and are less susceptible to low water yields during a drought compared to properties that rely on private wells. Agricultural lands are present in the eastern portion of the Village, which are most susceptible to drought-related impacts.

5.8.4 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Village of Canton, and there are no local drought records for the Village. The Village has a municipal water system that serves the Village, and has not been significantly impacted by droughts.

5.8.5 Future Potential Impacts

The entire Village of Canton remains susceptible to a drought event. Agricultural lands (mostly in the eastern portion of the Village) are the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Village is moderately vulnerable to earthquakes, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's (and St. Lawrence County's) critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, but these events were not located in the Village of Canton. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to earthquakes.

5.10 Wildfire

5.10.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Village is moderately vulnerable to wildfires, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Village are susceptible to wildfires. Significant wildfires have not been reported in the Village, but this hazard was included in this annex for future mitigation planning consideration.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Village experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. Due to the limited amount of undeveloped land within the Village this number is likely lower than reported. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Village of Canton remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Village is moderately vulnerable to infestations, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village of Canton is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per

total basal area ranges from about 7 to 30% in the Village of Canton (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Village of Canton, however, it has been detected in the Town of Lisbon which adjoins the Town of Canton to the north. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Village in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Village of Canton remains susceptible to an infestation event. Given the Village's location, the emerald ash borer is likely to migrate to the Village over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Canton currently participates in the NFIP. As of October 2021, one NFIP loss claim has been filed as of October 2021 in the Village of Canton but no payments were made. There are no repetitive loss properties in the Village.

The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed two mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. None of the Village’s 2015 mitigation actions were re-included for the 2021 update.

Table 8. Hazard Mitigation Action Progress Village of Canton				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for assessing and maintaining proper stormwater flow along the Grass River in adjacent swales, bridge openings and low-lying park areas.	Severe storms, floods	1,2	Village/ Town Highway and DPW	Ongoing. New stormwater related actions included for HMP update. There is a watershed management plan being developed for STL river - Grass River included in larger watershed. A stormwater improvements project was completed along Main Street around 2012 that included storm and sanitary sewer conveyance separation. New development is required to address stormwater management.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, Severe storm	1,2,3	Village/ Town Highway and DPW	Routine maintenance for DPW; regularly done after storm events

7.2 Proposed Mitigation Actions

The Village proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Canton V1	Upgrade stormwater conveyance throughout Village. Two focus areas are along Crescent Street (between Pleasant St and E Main St) and Pearl Street, however, the entire stormwater system in the Village is aging and in need of upgrades.	Flood	Village of Canton DPW*, Canton Village Board; St. Lawrence County Dept of Buildings & Grounds	Comprehensive Plan, Capital Improvement Plan	5 years	Existing	\$86.6K for Crescent St; \$150-200K for Pearl St; millions to rehab entire system	NYSEFC- CWSRF, NYSDOT - CHIPS, FEMA- BRIC, Village Budget	1
Canton V2	Village water system improvements project	Drought	Canton Village Board* and DPW	Comprehensive Plan, Capital Improvement Plan	5 years	Existing	\$10 million	NYSEFC- DWSRF, USDA RD Water/Waste Disposal Program, Village Budget	2
Canton V3	Install generator for municipal facilities and emergency shelters (including municipal building, Village Wastewater Treatment Facility, St. Lawrence University, and Canton Central School District).	All	Canton Village Board*, Canton Police Department, Canton DPW, Canton CSD, and St. Lawrence University	Comprehensive Plan, Capital Improvement Plan	5 years	Existing	Muni building- \$52K; WWTF - \$20K; Schools - \$100K	Village Budget, School District and University Budgets, NYSEFC- CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips NYSEFC CWSRF: https://efc.ny.gov/CWSRF NYSEFC DWSRF: https://efc.ny.gov/dwsrf USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Village's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Canton
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Mitigation Action Worksheet

Project Name:	Upgrade stormwater conveyance throughout Village. Two focus areas are along Crescent Street (between Pleasant St and E Main St) and Pearl Street, however, the entire stormwater system in the Village is aging and in need of upgrades.
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Project ID:	Canton V1
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Risk/Vulnerability

Hazard of Concern:	Flood
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Description of the Problem:	The Village experiences recurring flooding issues along Crescent St and Pearl St during heavy precipitation events, in addition to other areas. The entire stormwater system in the Village is in need of upgrades such as updating catch basins and clearing out or replacing drainage pipes.
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Action of Project Intended for Implementation

Description of the Solution:	New stormwater drainage infrastructure is needed to improve flows and reduce flooding.
-------------------------------------	--

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	\$86.6K for Crescent St; \$150-200K for Pearl St; millions to rehab entire system		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	3 years	Potential Funding Sources:	NYSEFC- CWSRF, NYSDOT - CHIPS, FEMA- BRIC, Village Budget
Responsible Organization:	Village of Canton DPW*, Village Board; St. Lawrence County Dept of Buildings & Grounds	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan, Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No
	Replace culverts in-kind as needed	\$10K+ each culvert	Reactive approach, does not mitigate future infrastructure failures
	Upgrade stormwater conveyance throughout Village	Millions	Most comprehensive approach to reduce stormwater related flooding throughout Village

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Canton
Mitigation Action Worksheet	
Project Name:	Village water system improvements project
Project ID:	Canton V2
Risk/Vulnerability	
Hazard of Concern:	Drought
Description of the Problem:	Currently the Village only has a single source of water; with new development and potential drought issues, a secondary source of supply is needed. On occasion the Village well experiences flow issues, and the existing water transmission main is more than 100yrs old and in need of replacement.
Action of Project Intended for Implementation	
Description of the Solution:	Develop a secondary water supply source (already have location for new groundwater source identified) and replace water transmission main (6-6.5 miles total)

Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Improved water infrastructure resiliency
Useful Life:	Long-term		
Estimated Cost:	\$10 million		

Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- DWSRF, USDA RD Water/Waste Disposal Program, Village Budget
Responsible Organization:	Canton Village Board* and DPW	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan, Capital Improvement Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Develop backup water supply only	High - millions	Provides source redundancy but transmission main still at risk of failure
	Develop backup supply source and replace transmission main	\$10 million	Most comprehensive approach to increase water system resiliency

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Canton
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Mitigation Action Worksheet

Project Name:	Acquire a generator for municipal facilities and emergency shelters (including muni building (which includes PD), WWTF, St Lawrence University (may have some but not for whole campus), Canton CSD
Project ID:	Canton V3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	Multiple critical facilities in the Village lack a source of backup power. Some of the Village's sewer pump stations have portable generators available, but not on-demand systems. These facilities include emergency shelter locations and other municipal facilities that are critical to maintaining various functions for the community.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator for each facility to maintain continuity of operations for critical public services.
-------------------------------------	--

Is this project related to a Critical Facility? Yes **X** No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	Muni bldg- \$52K; WWTF - \$20K; Schools - \$100K each		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, School District and University Budgets, NYSEFC-CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Canton Village Board*, Canton Police Department, Canton DPW, Canton CSD, and St. Lawrence University	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan, Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Purchase portable generators that can be shared among multiple facilities	\$30K+ each	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generators for each facility	\$20K to \$100K per facility	Offers maximum protection for each facility

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Canton V1	+	+	0	+	+	-	0	0	+	0	Medium	High	1
Canton V2	+	+	0	+	+	-	0	-	+	-	High	High	2
Canton V3	+	+	0	+	0	-	0	-	+	0	Medium	High	3

Jurisdictional Annex

Town of Clare

1.0 Contacts

The contacts for the Town of Clare regarding this plan are identified as follows:

- Francis Sharpstene – Town Supervisor
Address: 172 Dean Road, Russell, NY 13684
Phone: (315) 386-2301
Email: townofclareny@gmail.com

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 100 people live in the Town of Clare. The Town's population has decreased by 4.8% since the 2010 Census (105) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Clare is located in the central portion of St. Lawrence County and is bordered by the Town of Pierrepont to the north, Russell and Fine to the west, Colton to the east, and Clifton to the south and east. The Town of Clare is easily accessed from County Route 27, White Road, and Downerville Road.

2.3 Governing Body

The Town of Clare is governed by a five member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), several seasonal residences and hunting camps were constructed. No other significant commercial or residential developments have occurred in the Town since 2015. No new development has

occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Clare	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 (Required by NYS)
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	Fire department re-opened, fire district and emergency services established

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Clare	Notes
Site plan review requirements	No	
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	No	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	Fire department has shared services agreement w/ Town of Russell and Town of Canton Ambulance
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	Yes	contracted w/ newspaper for notices
Hazard data and information	Yes	
Grant writing	Yes	someone in Town of Russell helps w/ grant writing
HAZUS analysis	Yes	
Funding Resources		
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Clare	Notes
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	
State funding programs	Yes	Mostly road improvement programs
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	No	
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include County Route 27, White Road, and Downerville Road. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Department	2211 County Road 27 Russell, NY 13684	DeGrass Fire Department	Yes	Yes	Yes	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Clare based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Large Field at Fire Department- 2211 County Road 27, Russell, NY, 13684
- Potential Permanent Housing Locations
 - No likely locations within the Town limits. Privately owned vacant properties in adjacent municipalities may be used; additional coordination required for potential purchase or subdivision of existing properties.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Ice Jam	2	2	2	2	Moderate	4
Flood	2	2	2	1	Moderate	5
Coastal Storm (Nor'easter)	3	1	1	2	Moderate	6
Extreme Temperatures	3	1	1	2	Moderate	7
Drought	3	1	1	1	Moderate	8
Wildfire	1	2	1	1	Low	9
Infestation	2	1	1	1	Low	10

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Clare. Table 5, below, denotes the types and locations of critical facilities within the Town.

Facility Name	Address	Located in Floodplain*
Emergency and Medical Services		
Fire Department	2211 County Road 27, Russell, NY, 13684	No
Municipal Services		
Town Hall and Highway Department	3441 County Route 27, Russell NY 13684	No

*Based on HAZUS-modeled 100-year and 500-year floodplains

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as

sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Clare.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Clare. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Grass River and its tributaries are likely to experience increased flooding occurrences.

The Town of Clare chose not to profile earthquake or landslide in their annex even though these hazards were profiled for the County. The Town does not have a history of damaging earthquakes or landslides, nor do they have any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (County Rt 27, White Rd, and Downerville Rd) would be most impactful to Town residents. Impacts related to severe storms would primarily impact the more populated portions of the Town (generally along County Route 27). The Town is very

sparsely populated. It is entirely located within the Adirondack Park, and mostly consists of forested land.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reported 180 severe storm records in St. Lawrence County between 2010 and 2021. None of the reported events were noted as specifically impacting the Town of Clare, however, there are local records of severe thunderstorm, wind, and hail events. The NCDC reports no tornadoes in the past 11 years affecting the Town. The Town reported a local record of a windstorm in 2009 blocked multiple Town roads, which caused significant school bus delays (students were stuck on buses until roads were cleared).

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Clare is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (County Rt 27, White Rd, and Downerville Rd) would be most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town (generally along County Route 27).

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Clare lies, and are described in Section 5.2 of the main body of the plan. The most impactful ice storm in the

Town occurred in 1998, which caused some properties to lose power for three months.

5.2.4 Future Potential Impacts

The Town of Clare will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Clare is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (County Rt 27, White Rd, and Downerville Rd) would be most impactful to Town residents. Impacts related to severe winter storms would primarily impact the more populated portions of the Town (generally along County Route 27).

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. These storms typically affect more than one area within the County. The Town of Clare has been affected by a number of severe winter storm events reported for the County, described in Section 5.3 of the main body of

the plan. The NCDC does not report any severe winter storm damage estimates specific to the Town of Clare.

5.3.4 Future Potential Impacts

The Town of Clare will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Ice Jam

5.4.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the Grass River and North Branch Grass River are vulnerable to ice jams.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The Town of Clare was affected by two ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. Both of these events occurred on the Grass River. The USACE CRREL has not reported any ice jams in Clare since 1929, however, the Town has experienced ice jams in recent years according to local records. The Town is generally impacted by break-up jams, which occur during thaws in the winter and cause flooding and ice buildup along Town roads.

5.4.4 Future Potential Impacts

Properties along the Grass River and North Branch Grass River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Grass River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Clare, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Town of Clare that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Town of Clare Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
62,088 acres	2.6%	0.35%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDL did not report any flood records for the Town of Clare since 2010. However, local records indicate recurring flood issues throughout the Town, primarily related to inadequate drainage during heavy precipitation events. Dean Road is susceptible to flooding during the spring. The last significant flood that impacted the Town occurred in 1985, which shut down multiple

roads and caused culvert washouts. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Clare. There are no repetitive loss properties in the Town limits.

5.5.4 Future Potential Impacts

Properties along the Grass River, North Branch Grass River, and their tributaries are vulnerable to flooding. About 2.6% of the Town of Clare is within a mapped 100-year floodplain.

5.6 Coastal Storm (Nor'easter)

5.6.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A coastal storm could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (County Rt 27, White Rd, and Downerville Rd) would be most impactful to Town residents. Impacts related to coastal storms would primarily impact the more populated portions of the Town (generally along County Route 27).

5.6.3 Historical Hazard Occurrences and Damage Estimates

There are no NCDC damage estimates for this hazard specific to the Town of Clare. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Clare were reported for this event.

5.6.4 Future Potential Impacts

The Town of Clare is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.7 Extreme Temperatures

5.7.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. Historically, extreme temperatures have occurred about once a year in St. Lawrence County, with the first recorded event being in 2007. These temperatures typically affect most or all of the County. The entire Town of Clare is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 3.5% of the population in the Town of Clare is under 5 years old, and 15.3% of the population is over 65 years old. Approximately 22.4% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Clare lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures were reported specific to the Town of Clare.

5.7.4 Future Potential Impacts

The Town of Clare will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas (which are very limited within the Town) and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system, therefore, all developed properties in the Town rely on private wells for their water supply.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Clare. According to local records, a drought in 2019 caused many wells to dry up. The fire department had to resupply affected wells.

5.8.4 Future Potential Impacts

The entire Town of Clare remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Wildfire

5.9.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town's overall vulnerability to wildfires is low, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant

wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor fires occasionally occur. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0 to 0.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The southwestern corner of the Town is mapped with a higher wildfire density during this time period (0.4 to 0.8 fires per square mile). The NYSDEC map also shows two wildfires greater than 10 acres in size that occurred along the eastern border of the Town (on the St. Lawrence/Franklin County boundary). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

The entire Town of Clare remains susceptible to a wildfire. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Clare is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Clare (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Clare, however, it has been detected in multiple municipalities in the northern portion of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Clare in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Town of Clare remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Clare currently participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Town of Clare. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 7, below. None of the Town's 2015 mitigation actions were re-included for the 2021 update.

Table 7. Hazard Mitigation Action Progress Town of Clare				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice Storm, Severe storm	1,2,3	Town of Clare Highway Department	No formal plan in place, but not a significant need. The Highway Department takes care of routine debris management and the Town does not have any concerns regarding this capability.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Town of Clare									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Clare 1	Install a generator for the Town Hall and Highway Department	All	Town of Clare Town Board*, Town of Clare Highway Dept.	Emergency Operations Plan	5 years	Existing	\$30,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Clare 2	Develop an informational document that can be shared with residents regarding shelter locations and opportunities for hazard mitigation that they can implement on their properties.	All	Town of Clare Town Board*	Emergency Operations Plan	5 years	Existing	\$1,000	Town Budget	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Clare
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Mitigation Action Worksheet

Project Name:	Install a generator for the Town Hall and Highway Department
Project ID:	Clare 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall and Highway Dept currently lack backup power. These facilities provide critical services for Town residents especially during hazard events.

Action of Project Intended for Implementation

Description of the Solution:	Purchase generators for Town Hall and highway department to maintain operations during power outages.
-------------------------------------	---

Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Town of Clare Town Board*, Town Highway Dept.	Local Planning Mechanisms to be used in Implementation, if any:	Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between facilities	\$15K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at each facility	\$30K	Offers maximum protection for each facility

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Clare
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Mitigation Action Worksheet

Project Name:	Develop an informational document that can be shared with residents regarding shelter locations and opportunities for hazard mitigation that they can implement on their properties.
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Project ID:	Clare 2
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Risk/Vulnerability

Hazard of Concern:	All
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Description of the Problem:	The Town has a small, rural population and relies on local news/radio outlets for sharing emergency alerts and information. Town residents would benefit from accessing hazard mitigation information before such an event occurs. The fire department was recently re-opened and can now be used as an emergency shelter if needed.
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Action of Project Intended for Implementation

Description of the Solution:	Develop a public information document that summarizes emergency shelter protocol in the Town (where to go, how residents would be notified, etc.) as well as general hazard mitigation opportunities that property owners can take advantage of (such as structural improvements and considerations for new development).
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Better informed public regarding hazard mitigation and emergency protocol.
Useful Life:	Short-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget
Responsible Organization:	Town of Clare Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Notify residents of mitigative actions to take after a hazard event occurs	\$1,000	Reactive approach, does not prevent damages
	Develop an informational document to share with public proactively focused on hazard mitigation	\$1,000	Proactive approach that may help property owners reduce damage potential before a hazard event occurs

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Clare 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Clare 2	+	+	+	+	+	+	0	+	+	+	Low	Low	2

Jurisdictional Annex

Town of Clifton

1.0 Contacts

The contacts for the Town of Clifton regarding this plan are identified as follows:

- Charles Hooven – Town Supervisor
Address: 7171 State Highway 3, Cranberry Lake, NY 12927
Phone: (315) 848-2821
Email: supervisorhooven@gmail.com

Town Website: <https://townclifton.digitaltowpath.org:10155/content>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 675 people live in the Town of Clifton. The Town's population has decreased by 10.1% since the 2010 Census (751) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Clifton is located in the southern portion of St. Lawrence County and is bordered by the Town of Clare to the north, Town of Fine to the west, Town of Colton to the north and east, and Towns of Webb (Herkimer County) and Long Lake (Hamilton County) to the south. The Town of Clifton is easily accessed from State Route 3.

2.3 Governing Body

The Town of Clifton is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the Town expanded municipal water service in Star Lake (a joint project with the Town of Fine) and made improvements to the existing Newton Falls water system. The Town is currently progressing an

improvements project for the Newton Falls wastewater treatment plant. Finally, the County Industrial Development Agency is working to market the former Newton Falls Paper Mill for future development. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Clifton	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	Yes	Dam failure plan for Cranberry Lake
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	In place

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Clifton	Notes
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	Yes	In place
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	No	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	Highway maintenance
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Works with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	
Grant writing	Yes	Contract with DANC or consultants
HAZUS analysis	Yes	
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Clifton	Notes
Incur debt through private activities	No	
Community Development Block Grant	Yes	In past
Other federal funding programs	Yes	USDA
State funding programs	Yes	NYSEFC
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	Local senior citizens group
Ongoing public education or information program	Yes	Town website, library programs
Natural disaster or safety related school programs	Yes	Fire prevention
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town includes State Route 3. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Cranberry Lake Fire Station	7115 NY-3, Cranberry Lake, NY 12927	Cranberry Lake Fire District	Yes	Yes	No-Contract with shelter in Potsdam	Backup power available
Newton Falls Fire Department	955 County Rt. 60 Newton Falls, NY 13666	Newton Falls Volunteer Fire Dept Inc.	Yes	No	No-Contract with shelter in Potsdam	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Clifton based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Cranberry Lake State Campground - 230 Lone Pine Rd, Cranberry Lake, NY 12927
 - Former J&L Site (remediation complete) – intersection of State Route 3 and County Route 60
 - Clifton-Fine Central School - 11 Hall Ave, Star Lake, NY 13690
- Potential Permanent Housing Locations
 - No locations identified within Town.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Table 4. Hazard Vulnerability by Event

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	2	1	2	2	Moderate	4
Extreme Temperatures	3	1	1	2	Moderate	5
Flood	2	2	2	2	Moderate	6
Wildfire	1	3	1	2	Moderate	7
Earthquake	2	3	1	1	Moderate	8

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Clifton. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities

Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Sewer Pump Station	Joy St, Clifton, NY 13690	No
Radio Communications	Cranberry Lake Radio Tower (on Cell Tower)	-	-
Radio Communications	Newton Falls Radio Tower (Water Tower)	-	-
Public Utilities	Municipal Water System	State Route 3 and County Route 60 corridors	-
State Facility	Cranberry Lake State Campground	230 Lone Pine Rd, Cranberry Lake, NY 12927	100YR
Municipal Services	Town Highway Department	66 River Rd, Newton Falls, NY 13666	No
State Facility	NYS DOT Highway Garage	7045 St Rte 3, Cranberry Lake NY, 12927	No
EMS/Fire Department	Cranberry Lake Volunteer Fire Department	7115 NY-3, Cranberry Lake, NY 12927	No
Municipal Services	Town Hall	7171 NY-3, Cranberry Lake, NY 12927	No

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Clifton Community Library	7171 NY-3, Cranberry Lake, NY 12927	No
EMS/Fire Department	Newton Falls Volunteer Fire Department	955 County Rt. 60, Newton Falls, NY 13666	No
Public Utilities	Wastewater Treatment Facility	County Rt 60 Newton Falls	No
State Facility	NYSDEC Fire Protection Building		
Public Utilities	Municipal Water System (Star Lake, Newton Falls)	-	-

*Based on HAZUS-modeled 100-year and 500-year floodplains

FEMA’s High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. Four of these dams are located in the Town of Clifton, and all are hydropower dams (Table 6, below). The Town does not have any significant concerns regarding these dams. The Town indicated the Cranberry Lake hydropower dam has not been used recently and the owner may remove it. If an issue occurs with any dams in the Town, there is protocol in place for town notification, which was just updated recently. The Town and Dam owners will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Benson Mines Little River Dam	B	Oswegatchie River	Ying Sum Tsui (private)	not available	1/11/2016	8/23/2018
Browns Falls Dam	C	Oswegatchie River	Erie Boulevard Hydropower, LP/Brookfield Renewable	16.0	5/31/2019	7/29/1998
Cranberry Lake Dam	C	Oswegatchie River	Ampersand Cranberry Lake Hydro, LLC.	not available	12/14/2018	1/27/2015
Newton Falls Dam	C	Oswegatchie River	Erie Boulevard Hydropower, LP/Brookfield Renewable	1.5	5/31/2019	9/16/1998
*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes. **Capacity information obtained from Natural Resources Canada, 2021						

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Clifton. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River and its tributaries, and the Little River and its tributaries are likely to experience increased flooding occurrences.

The Town of Clifton chose not to profile drought, ice jam, infestation, or landslide in their annex even though it was profiled for the County. The Town does not have a history of these hazards, nor do they have any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or State Route 3 (the Town's primary evacuation route) would be most impactful to Town residents. Impacts related to severe storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake (which is partially located in the Town of Fine), Newton Falls, and Cranberry Lake. Cranberry Lake State Campground would also be

particularly vulnerable to storm damages when it is open for camping (generally late May to early October).

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports six specific severe storm events that occurred in the Town of Clifton between 2010 and 2021 (frequency of about once every two years). Two of these records were hail events, and the rest were thunderstorm winds. Estimated damages for the Town of Clifton ranged from \$0 to \$20,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes in the past 11 years. Local records report a recent microburst that affected the Town, which caused tree damage.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	7/26/2011	1 inch	\$0.00	-
Hail	7/17/2012	1 inch	\$0.00	-
Thunderstorm Wind	7/8/2014	55 knots	\$20,000.00	-
Thunderstorm Wind	9/10/2016	50 knots	\$10,000.00	-
Thunderstorm Wind	5/25/2019	55 knots	\$2,000.00	-
Thunderstorm Wind	5/25/2019	50 knots	\$5,000.00	-
Total			\$37,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Clifton is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or State Route 3 would be most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake, Newton Falls, and Cranberry Lake.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Clifton lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms were reported for the Town of Clifton.

5.2.4 Future Potential Impacts

The Town of Clifton will continue to experience ice storm events in the future. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Clifton is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears

Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or State Route 3 would be most impactful to Town residents. Impacts related to severe winter storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake, Newton Falls, and Cranberry Lake.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Clifton has been affected by multiple severe winter storm events reported for the County, which are described in Section 5.3 of the main body of the plan. The Town also has local records of regular severe winter storm events (occurring multiple times per year). These storms typically affect more than one town within the County.

5.3.4 Future Potential Impacts

The Town of Clifton will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Flood

5.4.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is generally drained by the Oswegatchie River, and the Little River which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Clifton, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate

100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Clifton that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of Clifton Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
96,593 acres	2.3%	0.05%

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Town of Clifton since 2010, but there are local records of flooding. The Town reports some minor flooding on back roads in spring, but does not cause significant impacts on access. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Clifton. There are no repetitive loss properties in the Town limits.

5.4.4 Future Potential Impacts

Properties along streams throughout the Town, including the Oswegatchie River and its tributaries, and the Little River and its tributaries are vulnerable to flooding. About 2.3% of the Town of Clifton is within a mapped 100-year floodplain.

5.5 Coastal Storm (Nor'easter)

5.5.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or State Route 3 would be most impactful to Town residents. Impacts related to coastal storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake, Newton Falls, and Cranberry Lake.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Clifton were reported for this event.

5.5.4 Future Potential Impacts

The Town of Clifton is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 Extreme Temperatures

5.6.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperatures, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Town of Clifton is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to

sufficiently heat or cool their homes. Approximately 0.5% of the population in the Town of Clifton is under 5 years old, and 24.5% of the population is over 65 years old. Approximately 14.7% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Clifton lies, which are described in Section 5.5 of the main body of the plan. No specific damage estimates related to extreme temperatures were reported for the Town of Clifton.

5.6.4 Future Potential Impacts

The Town of Clifton will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 Wildfire

5.7.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to wildfires, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.7.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor fires have been reported by local records. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0 to 0.3 wildfires per square mile from 2003 to 2017 based on reports from the NYSDEC. The NYSDEC map does not show any wildfires greater than 10 acres in size that occurred in the Town during this timeframe. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.7.4 Future Potential Impacts

The entire Town of Clifton remains susceptible to a wildfire. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.8 Earthquake

5.8.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to earthquakes, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.8.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021; none of these events occurred in the Town of Clifton. The Town does not have local records of earthquakes. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Clifton currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Town of Clifton. There are no repetitive loss properties in the Town limits.

The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 9, below. The Town's 2015 mitigation action was not re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Town of Clifton				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm, Severe storm	1,2,3	Town of Clifton Highway Department	Routine responsibility of highway department that is adequately addressed, not a high priority to have a formal document in place

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Clifton									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Clifton 1	Install generator for highway garage	All	Clifton Town Board* and Highway Dept.	None	5 years	Existing	\$35,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	Medium
Clifton 2	Renovate community center to make the facility ADA compliant and add air conditioning so it can function as a cooling center	Extreme Temperatures	Clifton Town Board*	None	5 years	Existing	\$500,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	Medium
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Clifton
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Mitigation Action Worksheet

Project Name:	Install generator for highway garage
Project ID:	Clifton 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town highway garage is the only Town facility that lacks backup power. The highway garage provides critical services especially during hazard events.

Action of Project Intended for Implementation

Description of the Solution:	Purchase a generator for the highway garage so operations are not interrupted during power outages.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$35,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Clifton Town Board* and Highway Dept.	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Purchase portable generator to share between Town facilities	\$15K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at highway garage	\$35K	Offers maximum protection for highway garage

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Clifton
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Mitigation Action Worksheet

Project Name:	Renovate community center to make the facility ADA compliant and add air conditioning so it can function as a cooling center
Project ID:	Clifton 2

Risk/Vulnerability

Hazard of Concern:	Extreme Temperatures
Description of the Problem:	The Clifton Community Center could be used as a potential emergency shelter location, but it is in need of structural retrofitting to be a viable choice. The existing building is not ADA compliant. In addition, the Town does not currently have a designated cooling center.

Action of Project Intended for Implementation

Description of the Solution:	Retrofit existing community center so that it meets ADA accessibility criteria and has air conditioning so that it can function as a cooling center during heat waves.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved sheltering abilities for residents, ability for Town to provide a cooling center during heat waves.
Useful Life:	Long-term		
Estimated Cost:	\$500K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Clifton Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Construct new community center in same location (demo existing building)	High	Reasonable option but public is opposed to replacing existing building.
	Retrofit existing community center	\$500K	More cost effective, would have more public support

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Clifton 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Clifton 2	+	+	0	+	+	-	0	0	+	0	Medium	High	2

Jurisdictional Annex

Town of Colton

1. Contacts

The contacts for the Town of Colton regarding this plan are identified as follows:

- Ronald Roberts – Town Supervisor
Address: 94 Main Street, Colton, NY 12927
Phone: (315) 262-2810
Email: townsup@townofcolton.com
- Darren Richards – Safety Officer
Address: 94 Main Street, Colton, NY 12927
Phone: (315) 262-2810
Email: codeenf@townofcolton.com

Town Website: <https://www.townofcolton.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 1,530 people live in the Town of Colton. The Town's population has increased by 5.4% since the 2010 Census (1,451) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Colton is located in the southern portion of St. Lawrence County and is bordered by the Town of Parishville to the north, Towns of Hopkinton and Piercefield to the east, Town of Long Lake (Hamilton County) to the south, and Towns of Pierrepont, Clare, and Clifton to the west. The Town of Colton is easily accessed from State Route 3, State Route 56, and State Route 68.

2.3 Governing Body

The Town of Colton is governed by a five (5)-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), three facilities have been constructed and one is anticipated. The Swift Field ice rink underwent improvements in 2015 that included a pavilion and a 15,000 square foot recreation facility. The Town took over the former fire station at 89 Riverside Drive in 2019, which is now used by the Town Dept. of Public Works. The Town installed an emergency generator at their well site in 2016. Lastly, a new salt barn is proposed at the highway barn on 2500 Route 56 in 2022. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Colton	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	Expired
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	In place
Continuity of Operations Plan	No	DPW operations plan
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	Yes	In place for Fire District 1
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Fire Protection Plan	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Colton	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Fire Department ISO updated in 2020
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	In place
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	Yes	In place
Flood insurance rate maps	Yes	In place
Acquisition of land for open space and public recreation	Yes	In place
Administration		
Planning Commission	Yes	Established
Mitigation Planning Committee	Yes	Established
Maintenance programs to reduce risk	Yes	In place
Mutual aid agreements	Yes	In place
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	Yes	
Civil Engineer	Yes	
GIS Coordinator	Yes	Town contacts with DANC for GIS services
Technical Abilities		
Warning systems/services	Yes	Information can be disseminated to residents on Town website, social media, and message boards.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Colton	Notes
Hazard data and information	Yes	Compiled for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Route 3, State Route 56, and State Route 68. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Colton-Pierrepont Central School	4921 NY-56, Colton, NY 13625	Colton-Pierrepont CSD	Yes	Yes	No	Main shelter. Backup power available.
Colton Town Hall	94 Main Street, Colton, NY 13625	Town of Colton	Yes	Yes	No	Backup power available
Maintenance and Storage Building	25 Wildwood Road, Colton, NY 13625	Town of Colton	Yes	Yes	Yes	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Colton based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Fireman's Field – 80 Riverside Dr, Colton, NY 13625
 - Higley Flow State Park - 442 Cold Brook Dr, Colton, NY 13625
- Potential Permanent Housing Locations
 - Potentially privately owned vacant lots that may be sold or subdivided if owners are willing.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Vulnerability Rank	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Wildfire	2	3	1	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Extreme Temperatures	3	1	1	2	Moderate	8
Drought	3	1	2	1	Moderate	9
Earthquake	2	3	1	1	Moderate	10
Infestation	2	1	2	1	Moderate	11
Landslide	1	3	1	1	Moderate	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Colton. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Radio Communications	South Colton Radio Tower (WNPI Owned)	-	-
Public Utilities	Colton Medical Center	8 Gulf Road, Colton, NY 13625	No
Public Utilities	DPW Maintenance and Storage Facility	89 Riverside Drive, Colton, NY 13625	No
Community Services	Swift Field	14 Sugarbush Lane, South Colton, NY 13687	No
Public Utilities	Sewage Collection System Lift Stations	Gulf Road, Riverside Drive, State Route 56, Spring Street	-
Municipal Services	Colton Highway Department	3759 NY-56, South Colton, NY 13687	No
EMS/Fire Department	Colton Volunteer Fire Department	80 Riverside Dr, Colton, NY 13625	No
Community Services	Community Center	9 Sugarbush Lane, South Colton, NY 13678	No
Municipal Services	Colton Town Hall	94 Main Street, Colton, NY 13625	100YR
Public Utilities	Town Transfer Station	132 Lenny Road, Colton, NY 13625	No
Public Utilities	Wastewater Treatment Facility	Spring Street, Colton NY 13625	No
Educational Facilities	Colton-Pierrepoint Central School	4921 State Hwy 56, Colton, NY 13625	No
**Based on HAZUS-modeled 100-year and 500-year floodplains			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may

apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. Six of these dams are located in the Town of Colton, and all are hydropower dams owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Stark Falls Dam	B	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	26.0	5/31/2019	7/29/1998
Colton Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	36.0	5/31/2019	7/30/1997
Higley Falls Power Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	6.0	5/31/2019	7/30/1997
Five Falls Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	24.0	5/31/2019	7/27/1998
South Colton Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	21.0	5/31/2019	7/29/1998
Carry Falls Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	Not available	5/31/2019	7/29/1998

*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.
 **Capacity information obtained from Natural Resources Canada, 2021

The Town indicated that properties around the Lower Higley Flow flood when Brookfield releases water from the Higley Falls Power Dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Colton. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River and its tributaries, Grass River and its tributaries, and the Bog River and its tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 3, 56, and 68) would be most impactful to Town residents. Impacts related to severe storms would primarily impact the more populated portions of the Town, including the hamlets of Colton and South Colton. The majority of the Town is located within the Adirondack Park, and is sparsely populated.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reported 180 severe storm events reported within St. Lawrence County between 2010 and 2021. Of these records, seven severe storm events were noted as occurring in the Town of Colton (frequency of about once per year to once every two years). One of these records was hail (reported on the same day as a thunderstorm wind event), and the rest were thunderstorm winds. Estimated damages for the Town of Colton ranged from zero to \$60,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes since 2010 for St. Lawrence County.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/17/2012	55 knots	\$25,000.00	-
Thunderstorm Wind	5/22/2013	50 knots	\$5,000.00	-
Thunderstorm Wind	7/18/2013	50 knots	\$0.00	-
Hail	7/18/2013	0.75 in	\$15,000.00	-
Thunderstorm Wind	7/9/2016	65 knots	\$60,000.00	-
Thunderstorm Wind	7/19/2020	50 knots	\$15,000.00	-
Thunderstorm Wind	7/20/2021	50 knots	\$5,000.00	-
Total			\$125,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Colton is susceptible to damages from an ice storm event.

Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 3, 56, and 68) would be most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town, including the hamlets of Colton and South Colton.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, one ice storm was reported by the NCDC in the portion of St. Lawrence County where the Town of Colton lies, which is described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Colton.

5.2.4 Future Potential Impacts

The Town of Colton will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Colton is susceptible to damages from a severe winter storm event. The Town Highway Department clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 3, 56, and 68) would be most impactful to Town residents. Impacts related to severe winter storms would primarily

impact the more populated portions of the Town, including the hamlets of Colton and South Colton.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. These storms typically affect more than one town within the County. The Town of Colton has been affected by a number of winter storm events reported for the southeastern portion of St. Lawrence County, which are described in Section 5.3 of the main body of the plan. The NCDRC reported one damage estimate specific to the Town of Colton, totaling \$5,000.

5.3.4 Future Potential Impacts

The Town of Colton will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 3, 56, and 68) would be most impactful to Town residents. Impacts related to coastal storms would primarily impact the more populated portions of the Town, including the hamlets of Colton and South Colton.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC database contains no recorded damages for coastal storms affecting St. Lawrence County. A recent nor'easter affected St. Lawrence

County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Colton were reported for this event.

5.4.4 Future Potential Impacts

The Town of Colton is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Raquette River and its tributaries, Grass River and its tributaries, and the Bog River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Colton, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Colton that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of Colton Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
162,316 acres	2.7%	0.10%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC did not report any flood records for the Town of Colton since 2010, however, the Town reported local records of recurring flooding issues along Lower Higley Flow. The Town's primary concern regarding flooding is dam failure; Lower Higley Flow tends to flood when Brookfield releases water from the hydropower dam. This has caused damages to private properties along Gulf Road. As described in Section 6.0 of this annex, no NFIP loss claims have been filed as of October 2021 in the Town of Colton.

5.5.4 Future Potential Impacts

Properties along streams throughout the Town, including the Raquette River, Grass River, Bog River, and their tributaries are vulnerable to flooding. About 2.7% of the Town of Colton is within a mapped 100-year floodplain.

5.6 Wildfire

5.6.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.6.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor grass/brush fires occasionally occur. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0 to 0.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.6.4 Future Potential Impacts

The entire Town of Colton remains susceptible to a wildfire particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.7 Ice Jam

5.7.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily the Raquette River and Grass River are vulnerable to ice jams. Ice jams along the Raquette River that affect the more populated areas of the Town would be of primary concern.

5.7.3 Historical Hazard Occurrences and Damage Estimates

The U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) reports no specific ice jam events for the Town of Colton. There are no historical ice jam records reported in the Town of Colton, but this hazard was profiled for future mitigation planning consideration.

5.7.4 Future Potential Impacts

Properties along streams throughout the Town, primarily the Raquette River, the Grass River, and the Bog River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 Extreme Temperatures

5.8.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Town of Colton is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 4.9% of the population in the Town of Colton is under 5 years old, and 32.3% of the population is over 65 years old. Approximately 13.7% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.8.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Colton lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specifically for the Town of Colton.

5.8.4 Future Potential Impacts

The Town of Colton will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.9 Drought

5.9.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town residents are served by municipal water, but others rely on public wells and are susceptible to low water yields during a drought.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Colton, and there are no local records of significant droughts or damage estimates available for the Town.

5.9.4 Future Potential Impacts

The entire Town of Colton remains susceptible to a drought, particularly agricultural lands and residences that are not connected to public water. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Earthquake

5.10.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, two earthquakes were reported in St. Lawrence County between 2010 and 2021. None of these records were located in the Town of Colton. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Colton is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about zero to 15% in the Town of Colton (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Colton, however, it has been detected in multiple municipalities in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Colton in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Colton remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.12 Landslide

5.12.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Colton is mapped in an area with high susceptibility but low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Rivers are particularly susceptible.

5.12.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of landslides occurring specifically in the Town of Colton. A landslide has the potential to cause thousands of dollars in damages.

5.12.4 Future Potential Impacts

Areas with steep slopes in the Town remain vulnerable to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Colton currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Town of Colton. In addition, there are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed two mitigation actions in the 2015 St. Lawrence County HMP, and status updates are summarized in Table 9, below. None of the Town's 2015 mitigation actions were re-included for the 2021 update.

Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Complete an engineering study (dam integrity study/dam flow study) to analyze the potential impacts from a dam failure – coordinate with Brookfield Power.	Dam failure, Flood	1,2	Town of Colton	Not progressed to date. Not a high priority at this time.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, Severe storm	1,2,3	Town of Colton Highway Department	No formal plan in place but this is a routine responsibility of the highway department, and is adequately managed. Not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Colton									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Colton 1	Install generator for Community Center	All	Colton Town Board*	Comprehensive Emergency Management Plan	1 year	Existing	\$12K	Town Buildings & Grounds Budget, DASNY-SAM, FEMA-BRIC, USDA RD - Community Facilities	1
Colton 2	Add secondary water main crossing beneath River to improve water distribution system redundancy	Flood, Ice Jam	Colton Town Board*	None	5 years	Existing	\$1 million	NYSEFC-DWSRF, USDA RD Water/Waste Disposal Program, Town Budget	2
Colton 3	Install a seawall on Gulf Rd along the Lower Higley Flow (Raquette River)	Flood	Colton Town Board*, Brookfield Renewables	None	5 years	Existing	\$1 million	FEMA- BRIC, Town Budget	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEFC DWSRF: https://efc.ny.gov/dwsrf USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Colton
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Mitigation Action Worksheet

Project Name:	Install generator for Community Center
Project ID:	Colton 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The South Colton Community Center currently lacks backup power. This facility would be a good emergency shelter or warming/cooling station if backup power were available.

Action of Project Intended for Implementation

Description of the Solution:	Install backup generator at Community Center, would require an automatic transfer switch and new electrical panel.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$12,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Buildings & Grounds Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Colton Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Emergency Management Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Purchase portable generator to share between multiple Town facilities	\$10K+ each	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at Community Center	\$12K	Offers maximum protection for Community Center

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Colton
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Mitigation Action Worksheet

Project Name:	Add secondary water main crossing beneath River to improve water distribution system redundancy
Project ID:	Colton 2

Risk/Vulnerability

Hazard of Concern:	Flood, Ice Jam
Description of the Problem:	Currently, the Town only has one water main crossing beneath the Raquette River. A secondary water crossing is needed for redundancy of the water distribution system if the existing pipe were to become damaged during a flood or ice jam event. The existing water main is in good condition and has not been damaged by such events. However, the Town experiences recurring flood and ice jam events along the Raquette River, and there is potential for a break to occur that would significantly disrupt the water distribution system.

Action of Project Intended for Implementation

Description of the Solution:	Install a secondary water main crossing beneath the Raquette River, parallel to the existing water main.
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Is this project related to a Critical Facility? Yes X No
(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	A secondary crossing would provide redundancy for the Town's water transmission infrastructure if the existing pipe were to become damaged, and allow the Town water system to continue operations.
Useful Life:	Long-term		
Estimated Cost:	\$1 million		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- DWSRF, USDA RD Water/Waste Disposal Program, Town Budget
Responsible Organization:	Colton Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Re-route existing water transmission main	\$1 million	Still lacks redundancy, cannot avoid river crossing even for new alignment
	Add secondary water main crossing beneath River	\$1 million	Offers redundancy and more resiliency for water distribution infrastructure

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Colton
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Mitigation Action Worksheet

Project Name:	Install a seawall on Gulf Rd along the Lower Higley Flow (Raquette River)
Project ID:	Colton 3

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding around the Lower Higley Flow. The area tends to flood when Brookfield releases water; there is some documented damage but no NFIP claims.

Action of Project Intended for Implementation

Description of the Solution:	Install a seawall along the Raquette River to protect properties along Gulf Rd from flooding when the Brookfield dam releases water. The Town envisions the seawall extending approximately 1 mile, from Kunoco Food Mart to just past the powerline corridor.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood damages to adjacent properties and infrastructure
Useful Life:	Long-term		
Estimated Cost:	\$1 million		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	FEMA- BRIC, Town Budget
Responsible Organization:	Colton Town Board*, Brookfield Renewables	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Stabilize the shoreline using nature-based features such as vegetation plantings	High	May not provide necessary level of protection. May be used in combination with hard armoring.
	Construct a seawall	\$1 million	Offers greatest amount of shoreline protection from erosion related to flooding.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Colton 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Colton 2	+	+	0	+	+	-	-	-	+	-	High	High	2
Colton 3	+	+	0	+	0	-	-	0	+	-	Medium	High	3

Jurisdictional Annex

Town of De Kalb

1. Contacts

The contacts for the Town of De Kalb regarding this plan are identified as follows:

- John Frary – Town Supervisor
Address: 2907 Co Rd 17, De Kalb Junction, NY 13630
Phone: (315) 322-1863
Email: supervisor@townofDeKalb.org
- Wayne Holland – Highway Supervisor
Address: 2907 Co Rd 17, De Kalb Junction, NY 13630
Phone: (315) 322-1863
Email: DeKalbhighway@yahoo.com

Town Website: <https://www.townofDeKalb.org/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 2,375 people live in the Town of De Kalb. The Town's population has decreased by 2.4% since the 2010 Census (2,434) (U.S. Census Bureau, 2021).

2.2 Location

The Town of De Kalb is located in the central portion of St. Lawrence County and is bordered by the Towns of De Peyster and Oswegatchie to the north, Canton to the east, Hermon to the south, and Gouverneur to the west. The Town of De Kalb is easily accessed from U.S. Route 11 and State Route 812.

2.3 Governing Body

The Town of De Kalb is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), numerous development projects have been completed or are anticipated to be completed in the future. The town constructed a new cold storage barn off of Route 812 on Town property in 2018. Expansions at the Corning Plant have been ongoing since 2017. Three new storage barns at a hardware store are being constructed and are anticipated to be completed within 2021. Three solar array projects off of Cousintown Road and US 11 have been permitted but construction has not started yet. A gas production facility at Gebarten Acres is in the planning stages. Lastly, there is a request for the construction of a 60 MW solar array off of County Route 20 in Bigelow and is in the very early stages of review. No other significant commercial or residential developments have occurred in the Town since 2015. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of De Kalb	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to Covid-19 pandemic (required by NYS)
Fire Protection Plan	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of De Kalb	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes/No	The Town is listed as a current NFIP participant but has rescinded their floodplain ordinance.
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	Unmapped by FEMA. FEMA in process of new flood study to develop new mapping Countywide.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	DANC (highway, water, & sewer mapping)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of De Kalb	Notes
Technical Abilities		
Warning systems/services	No	
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed for HMP update Countywide
Funding Resources		
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	Pandemic relief - \$200K
State funding programs	No	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Website outreach
Natural disaster or safety related school programs	Yes	Fire Department
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include U.S. Route 11 and State Route 812. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Hermon- De Kalb Central School	709 East De Kalb Road, De Kalb Junction, 13630	Hermon-De Kalb CSD	Yes	Yes	No	Backup power available
De Kalb Junction VFD	4323 US Highway 11, De Kalb Junction, NY 13630	Dekalb Fire District	Yes	Yes	No	May not be official but has been used; Backup power available
Richville Fire Department	71 Main Street, Richville, NY 13681	Richville Fire District	Yes	Yes	No	-

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of De Kalb based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Town Barn property - 2907 County Rt 17, De Kalb Junction, NY 13630
 - Vacant Town property (more than 100 acres) off of County Rt 17
 - Pipeline Park – Adjacent to the fire department and baseball field on U.S. Route 11
- Potential Permanent Housing Locations
 - Senior/Low Income Apartments in Town if openings available

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Wildfire	2	3	2	2	High	4
Drought	3	1	2	2	Moderate	5
Flood	2	2	1	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Extreme Temperatures	3	1	1	2	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Infestation	2	1	2	1	Moderate	10
Landslide	1	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of De Kalb. Table 3, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Sewer Pump Station	42 Gibbons St	No
Public Utilities	Sewer Pump Station	4269 U.S. Route 11	No

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Municipal Water System	-	-
Public Utilities	Pump Station	4269 US-11, De Kalb Junction, NY 13630	No
Municipal Services	Town of De Kalb Highway Department	2810 State Route 812	No
Municipal Services	De Kalb Town Hall	2907 County Road 17	No
EMS/Fire Department	De Kalb Junction Volunteer Fire Department	4323 US-11, De Kalb Junction, NY 13630	No
Public Utilities	Wastewater Treatment Facility	County Road 17	No
Public Utilities	Water Storage Tanks	Multiple properties	-
Educational Facilities	Hermon-De Kalb Central School	709 E De Kalb Rd, De Kalb Junction, NY 13630	No
*Based on HAZUS-modeled 100-year and 500-year floodplains			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of De Kalb.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of De Kalb. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie, its tributaries, and Beaver Creek are likely to experience increased flooding occurrences.

The Town of De Kalb chose not to profile coastal storm in their annex even though it was profiled for the County. The Town does not have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 812) would be most impactful to Town residents. Impacts related to severe storms would primarily impact the more populated portions of the Town, including the hamlet of De Kalb Junction and Village of Richville. The Town also has a large Amish population, and communication with these

residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.1.3 Historical Hazard Occurrences and Damage Estimates

There have been 180 severe storm events reported by the NCDC within St. Lawrence County between 2010 and 2021. None of these records were reported to occur specifically in the Town of De Kalb during this time period, however, the Town has local records of severe thunderstorm, wind, and hail events. The NCDC reports no tornadoes since 2010 in the Town.

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of De Kalb is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Rt 11, State Highway 812) would be most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town, including the hamlet of De Kalb Junction and Village of Richville. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Three ice storms were reported in the portion of St. Lawrence County where the Town of De Kalb lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specifically for the Town of De Kalb.

5.2.4 Future Potential Impacts

The Town of De Kalb will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of De Kalb is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Rt 11, State Highway 812) would be most impactful to Town residents. Impacts related to severe winter storms would primarily impact the more populated portions of the Town, including the hamlet of De Kalb Junction and Village of Richville. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of De Kalb has been affected by a number of severe winter storm events reported for the County, which are described in Section 5.3 of the main body of the plan. These storms typically affect more than one Town within the County. The NCDC did not report any specific damage estimates for the Town related to severe winter storms.

5.3.4 Future Potential Impacts

The Town of De Kalb will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Wildfire

5.4.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is highly vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires.

5.4.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor grass/brush fires occasionally occur according to local records. The fire department responds to multiple calls for brush fires during the spring and summer months. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.4.4 Future Potential Impacts

The entire Town of De Kalb remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.5 Drought

5.5.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on private wells and may be susceptible to low water yields during a drought.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reports no specific drought events for the Town of De Kalb. The Town reported local records of some water supply issues in 2018-2019, which resulted in the need to haul water in for residents.

5.5.4 Future Potential Impacts

The entire Town of De Kalb remains susceptible to a drought event, and agricultural lands and residences that are not connected to public water are the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.6 Flood

5.6.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River, its tributaries, and Beaver Creek, which drain to the St. Lawrence River. The Town of De Kalb is not mapped by existing FEMA flood insurance rate maps. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of De Kalb that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Town of De Kalb Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
52,736 acres	7.1%	0.25%

5.6.3 Historical Hazard Occurrences and Damage Estimates

According to the NCDRC, there have been no flood records in the Town of De Kalb since 2010, but there are local records of flood events. The Town reported recent flooding occurrences along the Oswegatchie River, but there was little damage reported. There has also been flooding on Snowshoe Island (which is on the Oswegatchie River), but this area is comprised mainly of vacant land, and no structures were impacted. As described in Section 6.0 of this annex, no NFIP loss claims have been filed in the Town of De Kalb as of October 2021. There are no repetitive loss properties in the Town.

5.6.4 Future Potential Impacts

Properties along streams throughout the Town, including the Oswegatchie River and its tributaries and Beaver Creek are vulnerable to flooding. About 7.1% of the Town of De Kalb is within a mapped 100-year floodplain.

5.7 Ice Jam

5.7.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the Oswegatchie River are most vulnerable to impacts from ice jams.

5.7.3 Historical Hazard Occurrences and Damage Estimates

According to the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) there are no historical records of an ice jam occurring specifically in the Town of De Kalb. No damages related to ice jams are reported specifically for the Town.

5.7.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along the Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 Extreme Temperatures

5.8.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of De Kalb is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 8.5% of the population in the Town of De Kalb is under 5 years old, and 12.5% of the population is over 65 years old. Approximately 33.5% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.8.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of De Kalb lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specifically for the Town of De Kalb.

5.8.4 Future Potential Impacts

The Town of De Kalb will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to earthquakes, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, but there are no historical records of earthquakes occurring specifically in the Town of De Kalb. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to infestations, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of De Kalb is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of De Kalb (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of De Kalb, however, it has been detected in the Town of De Peyster, which joins De Kalb to the north. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of De Kalb in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Town of De Kalb remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.11 Landslide

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of De Kalb is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Oswegatchie River are particularly susceptible.

5.11.3 Historical Hazard Occurrences and Damage Estimates

Local records reported multiple occurrences of rockslides on County Route 11, which have resulted in road closures but did not cause significant damages. A

landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Steep slopes in the Town remain vulnerable to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of De Kalb currently participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Town of De Kalb. There are no repetitive loss properties in the Town.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and a status update is provided in Table 7, below. The Town’s 2015 mitigation action was not re-included for the 2021 update.

Table 7. Hazard Mitigation Action Progress Town of De Kalb				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, Severe storm	1,2,3	Town Highway Department	No formal plan in place, but this is a routine responsibility of highway department that is adequately addressed.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Town of De Kalb									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
De Kalb 1	Upgrade culverts on Limekiln Rd to improve stormwater drainage.	Flood	Town of De Kalb Highway Dept*, Town Board	None	5 years	Existing	\$15,000	NYS DOT - CHIPS, Town Budget	1
De Kalb 2	Install generator for Town Barn	All	De Kalb Town Board* and Highway Dept.	None	5 years	Existing	\$15-20K	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of De Kalb
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Mitigation Action Worksheet

Project Name:	Upgrade culverts on Limekiln Rd to improve stormwater drainage.
Project ID:	De Kalb 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues on Limekiln Rd during heavy precipitation events and existing culverts are eroded and become washed out. There are currently two culverts in the problem location; the Town plans to replace them with a single larger culvert pipe to improve flows.

Action of Project Intended for Implementation

Description of the Solution:	Replace culvert with a single larger culvert pipe to improve stormwater flows.
-------------------------------------	--

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term (30+ years)		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSDOT - CHIPS, Town Budget
Responsible Organization:	Town of De Kalb Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Replace culverts in-kind	\$10K	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Replace with larger single culvert pipe	\$15K	Improved ability to handle high flows and reduce future flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of De Kalb
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Mitigation Action Worksheet

Project Name:	Install generator for Town Barn
Project ID:	De Kalb 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Barn currently lacks a backup generator, and provides critical community services especially during hazard events.

Action of Project Intended for Implementation

Description of the Solution:	Install backup generator at the Town Barn so that it can continue operations during a power outage.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15-20K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	De Kalb Town Board* and Highway Dept.	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at highway barn	\$15-20K	Offers maximum protection for highway barn

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
De Kalb 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
De Kalb 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2

Jurisdictional Annex

Town of De Peyster

1. Contacts

The contacts for the Town of De Peyster regarding this plan are identified as follows:

- Richard Pray, Board Member
Address: 3517 Co. Rt. 10, De Peyster, NY 13633
Phone: (315) 344-6484
Email: mlsrichard@yahoo.com

2. Municipal Profile

2.1 Population

The 2020 Census reported that 1,023 people live in the Town of De Peyster. The Town's population has increased by 2.5% since the 2010 Census (998) (U.S. Census Bureau, 2021).

2.2 Location

The Town of De Peyster is located in the northwestern portion of St. Lawrence County and is bordered by the Town of Oswegatchie to the north and east, DeKalb to the south, and Macomb to the west. The Town of De Peyster is easily accessed from State Route 184, County Route 10, County Route 11, and County Route 17.

2.3 Governing Body

The Town of De Peyster is governed by a five-member Town Council, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), no significant commercial or residential developments have occurred in the Town. No new development has occurred in the Special Flood Hazard Area. The Town's vulnerability to natural hazards has not changed.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of De Peyster	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Fire Protection Plan	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	
Fire department ISO rating	N/A	
Site plan review requirements	N/A	

Land Use Regulations		
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	No	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Heuvelton Code Enforcement Officer
Floodplain Administrator	Yes	Heuvelton Code Enforcement Officer
Emergency Manager	Yes	Board Member
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	No	Coordinate with FEMA as needed
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed Countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	

State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Program in place
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Route 184, County Route 10, County Route 11, and County Route 17. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Masonic Hall (Round Hall)	4399 County Road 10 De Peyster, NY 13633	Town of De Peyster	Yes	Yes	No	No backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of De Peyster based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Town Park at Round Hall - County Route 10

- Property at Highway Garage
- Potential Permanent Housing Locations
 - None identified within Town. Potentially privately owned vacant properties if owners were willing to sell or subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town’s natural hazard analysis results are provided in Table 4.

Table 3. Hazard Analysis Criteria						
Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Table 4. Hazard Vulnerability by Event						
Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	3	3	2	3	High	1
Ice Storm	3	1	2	3	High	2
Severe Winter Storm	3	1	2	2	Moderate	3
Drought	3	1	1	2	Moderate	4
Flood	1	2	1	2	Moderate	5

4.2 Critical Facilities

Critical facilities include any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of De Peyster. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Infrastructure in the Town of De Peyster		
Facility Name	Address	Located in Floodplain
Municipal Services		
Round Hall and Town Park	4399 County Road 10, De Peyster, NY 13633	No
Highway Garage	4671 County Route 10, De Peyster, NY 13654	No
*Based on HAZUS-modeled 100-year and 500-year floodplains		

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of De Peyster.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of De Peyster. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River, and Fish Creek and its tributaries are likely to experience increased flooding occurrences.

The Town of De Peyster chose not to profile earthquake, coastal storm, landslide, ice jam, infestation, wildfire, or extreme temperatures in their annex even though they were profiled for the County. The Town does not have any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Route 184 and County Routes 10, 11, and 17) would be most impactful to Town residents. Impacts related to severe storms would primarily impact the more populated portions of the Town, generally along main roadways. The Town is very sparsely populated. The Town also has a large Amish population, and

communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.1.3 Historical Hazard Occurrences and Damage Estimates

There have been 180 severe storm events reported by the NCDC within St. Lawrence County between 2010 and 2021. One of these records was located in the Town of De Peyster, which is summarized in Table 6, below. This event caused approximately \$5,000 worth of damages according to the NCDC. No crop damages were reported.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	8/22/2017	50 knots	\$5,000.00	-

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of De Peyster is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Route 184 and County Routes 10, 11, and 17) would be most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town, generally along main roadways. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the northern portion of St. Lawrence County where the Town of De Peyster lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of De Peyster.

5.2.4 Future Potential Impacts

The Town of De Peyster will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is moderately vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within County. The entire Town of De Peyster is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Route 184 and County Routes 10, 11, and 17) would be most impactful to Town residents. Impacts related to severe winter storms would primarily impact the more populated portions of the Town, generally along main roadways. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about sixteen times annually in St. Lawrence County. The Town of De Peyster has been affected by a number of severe winter storm events reported for the County, which are described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Town of De Peyster.

5.3.4 Future Potential Impacts

The Town of De Peyster will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Drought

5.4.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of De Peyster is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. All Town residents rely on private wells and are susceptible to low water yields during a drought.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of De Peyster. However, local records reported that minor droughts have affected agricultural operations including crops and water for livestock.

5.4.4 Future Potential Impacts

The entire Town of De Peyster remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River, and Fish Creek which drain to the St. Lawrence River and Black Lake respectively. FEMA provides flood insurance rate maps for the Town of De Peyster, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of De Peyster that is located within 100-year and 500-year floodplains, as modeled by HAZUS. About 11.7% of the Town of De Peyster is within a mapped 100-year floodplain.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of De Peyster Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
28,862 acres	11.7%	0.96%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Town of De Peyster since 2010. There are also no local records of significant flood damages in the Town. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of De Peyster.

5.5.4 Future Potential Impacts

Properties along the Oswegatchie River and Fish Creek and their tributaries are vulnerable to flooding.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of De Peyster currently participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Town of De Peyster. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed two mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. None of the Town’s 2015 mitigation actions were re-included for the 2021 update.

Table 8. Hazard Mitigation Action Progress Town of De Peyster				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Create a capital reserve fund to implement mitigation actions that would reduce the effects of severe winter storm hazard events.	Severe winter Storm	1,2,3	Town Board	Complete, the Town has a capital reserve fund in place for projects.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm, severe storm	1,2,3	Town Highway Department	Routine responsibility of highway department that is adequately addressed. No formal plan in place but not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of De Peyster									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
De Peyster 1	Generator for the masonic hall (shelter location)	All	De Peyster Town Board*	Capital Improvement Plan	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
De Peyster 2	Develop a public communication plan to notify residents of hazard events and opportunities for mitigation	All	De Peyster Town Board*	None	5 years	N/A	\$1,000	Town Budget	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of De Peyster
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Mitigation Action Worksheet

Project Name:	Install generator for the masonic hall (shelter location)
Project ID:	De Peyster 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The masonic hall is the Town's emergency shelter location, and lacks a source of backup power. This limits the facility's use as a shelter during power outages.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the masonic hall so that it can continue operations as an emergency shelter during power outages.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	De Peyster Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between facilities	\$15K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility, limitations on length of use. Requires more coordination for usage.
	Install on-demand generator at masonic hall	\$30K	Offers maximum protection for masonic hall

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of De Peyster
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Mitigation Action Worksheet

Project Name:	Develop a public communication plan to notify residents of hazard events and opportunities for mitigation.
Project ID:	De Peyster 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town is very rural (nearly half of the Town's population is Amish) and there is not a formal public communication system in place.

Action of Project Intended for Implementation

Description of the Solution:	Develop a public communication plan that outlines the means of public outreach (such as a website, local news outlets, or radio) and maintain a list of current contacts for the Amish community. The plan would also include educational outreach to residents regarding hazard mitigation opportunities for severe thunderstorm/wind events, ice storms, severe winter storms, droughts, and flooding.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Town more easily able to reach vulnerable residents before, during, and after a disaster event.
Useful Life:	Long-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget
Responsible Organization:	De Peyster Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Rely on other Countywide agencies (Arc, Meals on Wheels, County Office for Aging, etc) to contact vulnerable individuals	Low	Reactive approach, does not address mitigation
	Develop a public communication plan including educational outreach for mitigation opportunities	\$1,000	Allows Town to directly reach out to individuals who may need assistance, including Amish community. Opportunity for Town to share information on hazard mitigation to reduce potential property damages.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
De Peyster 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
De Peyster 2	+	+	0	+	+	+	0	+	+	+	Low	Low	2

Jurisdictional Annex

Town of Edwards

1. Contacts

The contacts for the Town of Edwards regarding this plan are identified as follows:

- Jan C. Lennox, Town Supervisor (through 12/31/2021)
Address: P.O. Box 24, Edwards, NY 13635
Phone: (315) 562-8264
Email: townofedwards@tds.net
- Jeffrey Shippee, Town Supervisor (as of 1/1/2022)
Address: P.O. Box 24, Edwards, NY 13635
Phone: (315) 640-0650
Email: townofedwards@tds.net

Town Website: <https://www.edwardsny.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 1,015 people live in the Town of Edwards. The Town's population has decreased by 12.2% since the 2010 Census (1,156) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Edwards is located in the southwestern portion of St. Lawrence County and is bordered by the Town of Hermon to the north, Towns of Russell and Fine to the east, Town of Pitcairn to the south, and Town of Fowler to the west. Edwards is easily accessed from State Highway 58, County Route 24, and River Road.

2.3 Governing Body

The Town of Edwards is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), fire hall improvements were completed in 2016 and a few new houses were constructed in 2019. About six to seven lots along the river are proposed to be developed in Talcville, and other new developments are proposed in South Edwards (Clear Lake). No other significant commercial or residential developments have occurred in the Town since 2015. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Edwards	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Includes response for windstorm/ice storm (needs to be updated with school)
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Edwards	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place – Planning Board
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	Town and former Village are mapped by FEMA. FEMA currently working on flood study that will generate new floodplain mapping countywide.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	Agreement in place with neighboring communities (Hermon, Russell, Edwards, Fowler, and Fine)
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor and Fire Chief supports
Community Planner	No	Town works with County as needed
Civil Engineer	No	Contracted out to consultants
GIS Coordinator	No	Work with DANC

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Edwards	Notes
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	Contract out with engineering consultant
HAZUS analysis	Yes	Completed Countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	Recently had a solar project ready to go and the company couldn't reach an agreement with National Grid's connection fee
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	CDBG grant received in past for Main Street and other projects
Other federal funding programs	Yes	Have worked with Rural Development before (equipment purchases, etc.)
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Lots of public outreach for mosquito spraying; website/posts around Town
Natural disaster or safety related school programs	Yes	Fire department works with schools for fire prevention week and during summer school
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 58, County Route 24, and River Road. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Hall	115 New Street, Edwards, NY 13635	Edwards Fire District	Yes	Yes	No	-
Edwards-Knox Central School	2512 County Route 24, Hermon, NY 13652	Edwards-Knox CSD	Yes	Yes	No	Town would work with school to shelter people there if over 24 hours. Use of schools would require extra coordination.

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Edwards based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Land at Town Barn – Town barn property
 - Lions have a field – Opposite of Town Barn Drive (private)
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town if owners were willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	2	3	High	1
Severe Winter Storm	3	1	2	3	High	2
Ice Storm	3	1	2	2	Moderate	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Drought	3	1	2	2	Moderate	6
Wildfire	2	3	1	2	Moderate	7
Extreme Temperatures	3	1	1	2	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Ice Jam	2	2	1	1	Moderate	10
Landslide	1	3	1	1	Moderate	11
Infestation	2	1	2	1	Moderate	12

4.2 Critical Facilities

Critical facilities include any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Edwards. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Hepburn Library	205 Main Street, Edwards, NY 13635	No
EMS/Fire Department	Edwards Fire Department Rescue Squad	115 New Street, Edwards, NY 13635	No
EMS/Fire Department	Edwards Volunteer Fire Department	115 New Street, Edwards, NY 13635	No
Municipal Services	Highway Department	Town Barn Drive, Edwards, NY 13635	No
Municipal Services	Town Hall	161 Main Street, Edwards, NY 13635	No
Public Utilities	Wastewater Treatment Facility	133 New Street, Edwards NY 13635	100YR
Public Utilities	Water System	Throughout Town	-
Radio Communications	Communications Tower	-	

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams are located in the Town of Edwards, and is a hydropower dam owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below). The Town indicated that the South Edwards Dam has had high water warnings in the last five years. In the case of dam failure there would likely be time to evacuate, but this is still a concern for the Town. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply

with the NYSDEC dam safety program to minimize risk associated with these structures.

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
South Edwards Dam	B	Oswegatchie River	Erie Boulevard Hydropower, LP/Brookfield Renewable	4.0	5/31/2019	7/29/1998
<i>*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes. **Capacity information obtained from Natural Resources Canada, 2021</i>						

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Edwards. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River and its tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, County Route 24, and River Rd) would be most impactful to Town residents. Impacts related to severe storms would primarily impact the more populated portions of the Town, including the former Village of Edwards (which was dissolved in 2012).

5.1.3 Historical Hazard Occurrences and Damage Estimates

A total of 180 severe storm events were reported within St. Lawrence County between 2010 and 2021 by the NCDC. Of these records, six were located in the Town of Edwards (with a frequency of about once every one to two years). Three of these records were hail events (two events occurred on the same date), and three were thunderstorm winds. Estimated damages for the Town of Edwards ranged from \$0 to \$20,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes since 2010. The Town indicated that a microburst resulted in some damage including downed trees and utility lines.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	5/26/2011	1"	\$0.00	-
Thunderstorm Wind	5/26/2011	52 knots	\$1,000.00	-
Hail	7/17/2012	1"	\$0.00	-
Hail	7/17/2012	1"	\$0.00	-
Thunderstorm Wind	3/20/2020	50 knots	\$5,000.00	-
Thunderstorm Wind	6/21/2021	50 knots	\$20,000.00	-
Total			\$26,000	-

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Severe Winter Storm

5.2.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one Town within the County. The entire Town of Edwards is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears

Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, County Route 24, and River Rd) would be most impactful to Town residents. Impacts related to severe winter storms would primarily impact the more populated portions of the Town, including the former Village of Edwards (which was dissolved in 2012).

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Edwards has been affected by a number of severe winter storm events reported for the County, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC reports seven (7) damage estimates specific to the Town of Edwards, ranging from \$5,000 to \$10,000.

5.2.4 *Future Potential Impacts*

The Town of Edwards will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 **Ice Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Edwards is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, County Route 24, and River Rd) would be most impactful to Town residents. Impacts related to ice storms would

primarily impact the more populated portions of the Town, including the former Village of Edwards (which was dissolved in 2012).

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Edwards lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Edwards.

5.3.4 *Future Potential Impacts*

The Town of Edwards will continue to experience ice storm events in the future. The Town Highway Department completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, County Route 24, and River Rd) would be most impactful to Town residents. Impacts related to coastal storms would primarily impact the more populated portions of the Town, including the former Village of Edwards (which was dissolved in 2012).

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Edwards were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Edwards is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Flood**

5.5.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Edwards, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Edwards that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Edwards Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
33,240 acres	1.8%	0.08%

5.5.3 Historical Hazard Occurrences and Damage Estimates

According to the NCDRC, there have been no flood records for the Town of Edwards since 2010, however, there are local records of minor flooding issues along Spruce Road where it crosses Elm Creek. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Edwards. There are no repetitive loss properties in the Town.

5.5.4 Future Potential Impacts

Properties along streams throughout the Town, including the Oswegatchie River and its tributaries are vulnerable to flooding. About 1.8% of the Town of Edwards is within a mapped 100-year floodplain.

5.6 Drought

5.6.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of Edwards is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas (mostly in the northeastern portion of the Town) and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on public wells and may be susceptible to low water yields during a drought.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Edwards. Local records reported minor droughts where the Town and fire department have assisted farmers and other residents with water supply when private wells dried up in the past.

5.6.4 *Future Potential Impacts*

The entire Town of Edwards remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.7 **Wildfire**

5.7.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

According to the NCDC, there are no historical records of wildfires occurring specifically in the Town of Edwards. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.3 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The northern portion of the Town is mapped with a higher wildfire density during this time period (0.9 to 1.3 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.7.4 *Future Potential Impacts*

The entire Town of Edwards remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.8 **Extreme Temperatures**

5.8.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Town of Edwards is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 7.7% of the population in the Town of Edwards is under 5 years old, and 21.2% of the population is over 65 years old. Approximately 14.0% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Edwards lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Edwards.

5.8.4 *Future Potential Impacts*

The Town of Edwards will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.9 **Earthquake**

5.9.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. The Town of Edwards is moderately susceptible to a potential earthquake event, due to the lack of warning and moderate extent and damages associated with this hazard. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021; however, none of these records were located in the Town of Edwards. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Ice Jam

5.10.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the Oswegatchie are vulnerable to ice jams.

5.10.3 Historical Hazard Occurrences and Damage Estimates

The USACE CRREL database reports no specific ice jam events for the Town of Edwards, and there are no local records of damaging ice jams in the Town. Ice jams have potential to cause tens of thousands of dollars in damages.

5.10.4 Future Potential Impacts

Properties along the Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.11 Landslide

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Edwards is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Rivers are particularly susceptible.

5.11.3 Historical Hazard Occurrences and Damage Estimates

Local records reported a landslide on Trout Lake Road (around 2008-2010), which was caused by water entering between rock layers, which froze and broke apart. No specific damage estimates were reported for this event. Road washouts along steep slopes are also a common occurrence in the Town. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Steep slopes in the Town remain vulnerable to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.12 Infestation

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Edwards is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 15% in the Town of Edwards (Figure 5.13, Appendix A of the main body of the plan).

5.12.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Edwards, however, it has been detected in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Edwards in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.12.4 Future Potential Impacts

The entire Town of Edwards remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Edwards participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Town of Edwards and there are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. The Town’s 2015 mitigation action was not re-included for the 2021 HMP update.

Table 9. Hazard Mitigation Action Progress Town of Edwards				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Edwards Highway Department	Routine responsibility of highway department that is adequately addressed. No need for formal plan at this time/not a high priority.

7.2 Proposed Mitigation Actions

The Town proposed four new actions to be included in the HMP update. Three actions are considered mitigation and one is considered preparedness (Edwards 2); however, this action was included in the plan because it relates to emergency sheltering. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Edwards									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Edwards 1	Upgrade culvert on Spruce Rd over Elm Creek to improve stream flow conveyance.	Flood	Town of Edwards Highway Dept*, Town Board	None	5 years	Existing	\$15K	NYSDOT - CHIPS, Town Budget	1
Edwards 2 (Preparedness)	Develop formal sheltering protocol with Edwards-Knox CSD	All	Edwards Town Board*, Edwards-Knox CSD	Local Emergency Operations Plan	1 year	Existing	\$1,000.00	Town Budget, School District Budget	2
Edwards 3	Install generator for wastewater treatment facility	All	Edwards Town Board*	Local Emergency Operations Plan	5 years	Existing	\$40K	Town Budget, NYSEFC-CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	3
Edwards 4	Install generator for Town Barn	All	Edwards Town Board* and Highway Dept	Local Emergency Operations Plan	5 years	Existing	\$30K	Town Budget, DASNY-SAM, FEMA- BRIC, USDA RD - Community Facilities	4
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips NYSEFC CWSRF: https://efc.ny.gov/CWSRF USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Edwards
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Mitigation Action Worksheet

Project Name:	Upgrade culvert on Spruce Rd over Elm Creek to improve stream flow conveyance.
Project ID:	Edwards 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues on Spruce Rd during heavy precipitation events, due to confined drainage for Elm Creek.

Action of Project Intended for Implementation

Description of the Solution:	Replace existing culvert with a larger culvert pipe to improve stream flow and prevent over-topping.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term (30+ years)		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYS DOT - CHIPS, Town Budget
Responsible Organization:	Town of Edwards Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace in-kind	\$12,000	New structure may improve flows temporarily but not a long-term solutions
	Replace existing culvert with a larger pipe	\$15,000	Would accommodate larger flood flows and reduce flood damages more long-term

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Edwards
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Mitigation Action Worksheet

Project Name:	Develop formal sheltering protocol with Edwards-Knox CSD
Project ID:	Edwards 2 (Preparedness)

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Edwards-Knox CSD may be used as emergency shelter locations by residents in the Town of Edwards. The Town does not currently have a formal agreement in place for sheltering protocol with the school.

Action of Project Intended for Implementation

Description of the Solution:	Developing a formal sheltering protocol plan will allow more efficient operations if the Town needs to shelter residents at the school.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Town and school district can more easily implement sheltering needs as they arise
Useful Life:	Short-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget, School District Budget
Responsible Organization:	Edwards Town Board*, Edwards-Knox CSD	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Coordinate with Red Cross for sheltering as need arises	Low	Reactive approach
	Develop formal sheltering protocol with Edwards-Knox CSD	\$1,000	Proactive measure to increase efficiency of shelter operations with school district.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Edwards
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Mitigation Action Worksheet

Project Name:	Install generator for wastewater treatment facility
Project ID:	Edwards 3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town WWTF currently lacks a standby backup generator, which leaves it vulnerable to power outages. The WWTF provides a critical community service. The Town has a portable generator that can be shared among multiple facilities, but this adds coordination time when the need arises and may not power the entire facility.

Action of Project Intended for Implementation

Description of the Solution:	Install a standby generator at the WWTF so that it can continue operating during a power outage.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations and reduced risk of equipment damage
Useful Life:	Long-term		
Estimated Cost:	\$40,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, NYSEFC- CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Edwards Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase an additional portable generator	\$15,000	More flexible options for use but requires additional coordination for use and may not power entire facility/limitations on run time
	Add on-demand generator for WWTF	\$40,000	Best protection of WWTF

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Edwards
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Mitigation Action Worksheet

Project Name:	Install generator for Town Barn
Project ID:	Edwards 4

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Barn currently lacks a backup generator. The Town Barn provides critical community services which could be interrupted during a power outage. The Town has a portable generator that can be shared among multiple facilities, but this adds coordination time when the need arises and may not power the entire facility.

Action of Project Intended for Implementation

Description of the Solution:	Install a standby generator at the Town Barn so that it can continue operating during a power outage.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$30,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Edwards Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase an additional portable generator	\$15,000	More flexible options for use but requires additional coordination for use and may not power entire facility/limitations on run time
	Add on-demand generator	\$40,000	Best protection of Town Barn and highway operations

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Edwards 1	+	+	+	+	+	0	+	+	+	+	Medium	Medium	1
Edwards 2	+	+	+	+	+	+	0	+	+	+	Low	Low	2
Edwards 3	+	+	+	+	+	0	0	0	+	0	Medium	Medium	3
Edwards 4	+	+	+	+	+	0	0	0	+	0	Medium	Medium	4

Jurisdictional Annex

Town of Fine

1. Contacts

The contacts for the Town of Fine regarding this plan are identified as follows:

- Jeremy Thompson – Town Supervisor
Address: 4078 State Highway 3, Star Lake, NY 13690
Phone: (315) 848-3121
Email: finetownsupervisor@gmail.com
- Mark Hall – Water Superintendent
Address: 4078 State Highway 3, Star Lake, NY 13690
Phone: (315) 848-3121
Email: starlakewaterdept@gmail.com

Town Website: <https://townfine.digitaltowpath.org:10054/content>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 1,304 people live in the Town of Fine. The Town's population has decreased by 13.8% since the 2010 Census (1,512) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Fine is located along the southern border of St. Lawrence County and is bordered by the Town of Russell to the north, Towns of Clare and Clifton to the east, Towns of Webb (Herkimer County) and Diana (Lewis County) to the south, and Towns of Pitcairn and Edwards to the west. The Town of Fine is easily accessed from State Route 3.

2.3 Governing Body

The Town of Fine is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a water system improvements project was completed in 2020. There is a planned hospital expansion that involves the creation of a new emergency room. Additionally, there is a Dollar General planned for construction in the future along State Route 3. No other significant commercial or residential developments have occurred in the Town since 2015. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Fine	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Np	
Continuity of Operations Plan	No	
Transportation Plan	Yes	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in Response to COVID-19 pandemic (required by NYS)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Fine	Notes
Other Special Plans	Yes	Waterfront Revitalization Emergency Preparedness Plan; Star Lake Water District has Standard Operating Procedure Plan and Emergency Plan
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	Updated 2020
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	No	Subject to Adirondack Park Agency (APA) regulations
Subdivision ordinance	No	Subject to APA regulations
NFIP Participant/Floodplain ordinance	Yes	In place
Natural hazard specific ordinance	No	Subject to APA regulations
Flood insurance rate maps	Yes	New mapping in progress from FEMA countywide
Acquisition of land for open space and public recreation	No	Subject to APA regulations
Administration		
Planning Commission	No	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Contract with DANC

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Fine	Notes
Technical Abilities		
Warning systems/services	Yes	Fire Department has a digital sign; Town website; looking to add digital signage
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	DANC assists
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA Rural Development
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Town website and social media
Natural disaster or safety related school programs	Yes	Fire prevention program with school
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	Eamouth – endowment fund; more economic development related

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Route 3. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Clifton-Fine Central School	11 Hall Avenue, Star lake, NY 13690	Clifton-Fine CSD	Yes	Yes	No	Backup power available
SUNY ESF Ranger School	257 Ranger School Road, Wanakena, NY 13695	SUNY ESF	Yes	Yes	No	Backup power available
Clifton-Fine Arena	4173 State Route 3, Star Lake, NY 13690	Towns of Clifton and Fine	Yes	Yes	No	No backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Fine based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Clifton-Fine Central School - 11 Hall Avenue, Star lake, NY 13690
 - Cranberry Lake Campground – 230 Lone Pine Road, Cranberry Lake, NY 12927 (Town of Clifton)
 - Former J&L Site (remediation complete) - at intersection of State Rt 3 and County Rt 60 in Town of Clifton
- Potential Permanent Housing Locations
 - Vacant privately owned properties in Town if owners were willing to sell or subdivide. Note that new development would be subject to APA regulations and approval.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	2	3	High	1
Ice Storm	3	1	2	3	High	2
Severe Winter Storm	3	1	2	2	Moderate	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Ice Jam	2	2	2	2	Moderate	6
Drought	2	2	2	1	Moderate	7
Extreme Temperatures	3	1	2	1	Moderate	8
Wildfire	2	2	1	2	Moderate	9
Earthquake	2	3	1	1	Moderate	10
Infestation	2	1	2	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Fine. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Community Center/Community Food Pantry	4208 NY-3, Star Lake, NY 13690	No
Educational Facilities	Clifton-Fine Central School	11 Hall Ave, Star Lake, NY 13690	No
Educational Facilities	SUNY ESF Ranger School	257 Ranger School Rd, Wanakena, NY 13695	No
EMS/Fire Department	Fine Volunteer Fire Department	582 Spring St, Fine, NY 13639	No
EMS/Fire Department	Star Lake Volunteer Fire Department	4078 NY-3, Star Lake, NY 13690	No
Hospital	Clifton-Fine Hospital	1014 Oswegatchie Trail Rd, Star Lake, NY 13690	No
Municipal Services	Highway Barn	615 Oswegatchie Trail Rd, Oswegatchie, NY 13670	No
Municipal Services	Municipal Office Building	4078 NY-3, Star Lake, NY 13690	No
Public Utilities	Municipal Stormwater System (Wanakena)	-	-
Public Utilities	Municipal Water System	Star Lake and Wanakena (multiple locations)	-
Public Utilities	Sewer Pump Station	Hamele St, Fine, NY 13695	No
Public Utilities	Star Lake Transfer Station	4582 State Highway 3, Star Lake, NY 13690	No
Public Utilities	Wastewater Treatment Facility	S Shore Rd, Wanakena, NY	100YR and 500YR
Public Utilities	Water Storage Tank	off State Route 3	No
Public Utilities	Water Treatment Plant and Lift Station	off State Route 3	No
Radio Communications	Star Lake Radio Tower (at Fire Dept building)	-	-
*Based on HAZUS-modeled 100-year and 500-year floodplains			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard

mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. Two of these dams are located in the Town of Fine, and both are hydropower dams owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Flat Rock Dam	C	Oswegatchie River	Erie Boulevard Hydropower, LP/Brookfield Renewable	5.0	5/31/2019	7/29/1998
Niagara Mohawk Power Dam	B	Oswegatchie River	Erie Boulevard Hydropower, LP/Brookfield Renewable	1.8	5/31/2019	7/29/1998

*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.
 **Capacity information obtained from Natural Resources Canada, 2021

The Town did not indicate concerns regarding these dams. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Fine. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River, its tributaries, and Little River and its tributaries are likely to experience increased flooding occurrences.

The Town of Fine chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or State Route 3, the Town's primary evacuation route, would be most impactful to Town residents. Impacts related to severe storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake, Wanakena, and

Fine. The SUNY ESF Ranger School is located in Wanakena and would be especially vulnerable to impacts, especially during the fall and spring semesters when most students are on campus.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reported 180 severe storm records throughout St. Lawrence County between 2010 and 2021. Six of these records occurred in the Town of Fine (frequency of about once every one to two years). One of these records was a hail event, and the rest were thunderstorm winds. Estimated damages for the Town of Fine ranged from \$0 to \$20,000 per event (Table 7). The Town also reported some power outages in the past due to wind. Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes since 2010 for St. Lawrence County.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	7/26/2011	0.75 in.	\$0.00	-
Thunderstorm Wind	8/5/2012	50 knots	\$5,000.00	-
Thunderstorm Wind	5/1/2017	60 knots	\$20,000.00	-
Thunderstorm Wind	6/13/2018	50 knots	\$10,000.00	-
Thunderstorm Wind	3/20/2020	50 knots	\$5,000.00	-
Thunderstorm Wind	6/27/2020	50 knots	\$2,000.00	-
Total			\$42,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County.

The entire Town of Fine is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or State Route 3, the Town's primary evacuation route, would be most impactful to Town residents. Impacts related to ice storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake, Wanakena, and Fine.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Fine lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Fine.

5.2.4 Future Potential Impacts

The Town of Fine will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is moderately vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Fine is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter

storm events. Damages to the Town's critical infrastructure or State Route 3, the Town's primary evacuation route, would be most impactful to Town residents. Impacts related to severe winter storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake, Wanakena, and Fine.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Fine has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. Severe winter storms typically occur multiple times annually in St. Lawrence County. These storms typically affect most or all of the County. The NCDC reports one winter storm record specific to the Town of Fine in 2018 that resulted in \$10,000 of damage estimates.

5.3.4 Future Potential Impacts

The Town of Fine will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or State Route 3, the Town's primary evacuation route, would be most impactful to Town residents. Impacts related to coastal storms would primarily impact the more populated portions of the Town, including the hamlets of Star Lake, Wanakena, and Fine.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Fine were reported for this event.

5.4.4 Future Potential Impacts

The Town of Fine is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River, its tributaries, and Little River and its tributaries which drain to the St. Lawrence River and the Grass River respectively. FEMA provides flood insurance rate maps for the Town of Fine, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of

Fine that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of Fine Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
108,234 acres	1.8%	0.44%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Town of Fine since 2010, but there are local records of flood issues. Recently (about 2018), a flood on Coffin Mills Road was caused by a dam break, which led to a road washout. As described in Section 6.0 of this annex, three (3) NFIP loss claims have been paid as of October 2021 in the Town of Fine totaling \$18,036.75. There are no repetitive loss properties within the Town.

5.5.4 Future Potential Impacts

Properties along streams throughout the Town, including the Oswegatchie River, its tributaries, and Little River and its tributaries are vulnerable to flooding. About 1.8% of the Town of Fine is within a mapped 100-year floodplain.

5.6 Ice Jam

5.6.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Historically, ice jams have occurred about once a year in St. Lawrence County. Properties along streams throughout the Town, primarily along the Oswegatchie River and Little River are vulnerable to ice jams.

5.6.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of an ice jam occurring specifically in the Town of Fine. In 2015, a footbridge in Wanakena was damaged during an ice jam/flood event. The damaged bridge was raised when it was reconstructed to prevent future damages from flooding and ice jams.

5.6.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along the Oswegatchie River and Little River, remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Drought

5.7.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The Town has a municipal water system that serves residents in Star Lake and Wanakena. However, properties that rely on private wells and agricultural lands (though not prevalent within Town), would be most susceptible to a drought event.

5.7.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Fine or the rest of St. Lawrence County since 2010. There are no specific damage estimates related to droughts for the Town.

5.7.4 Future Potential Impacts

The entire Town of Fine remains susceptible to a drought event, and agricultural lands and residences that are not connected to public water are

the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.8 Extreme Temperatures

5.8.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Town of Fine is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.3% of the population in the Town of Fine is under 5 years old, and 30.3% of the population is over 65 years old. Approximately 18.0% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.8.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Fine lies, which are described in Section 5.5 of the main body of the plan.. No damage estimates related to extreme temperatures are reported specific to the Town of Fine.

5.8.4 Future Potential Impacts

The Town of Fine will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.9 Wildfire

5.9.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0 to 0.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The northwestern corner of the Town is mapped with a higher wildfire density during this time (0.4 to 0.8 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

The entire Town of Fine remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Earthquake

5.10.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes originating in St. Lawrence County between 2010 and 2021; but none of these events were located in the Town of Fine, nor are there local records of significant earthquake events. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, earthquakes the Town remains susceptible to earthquakes.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Fine is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 15% in the Town of Fine (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Fine, however, it has been detected in the northern part of the County in recent years. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Fine in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Fine remains susceptible to an infestation event. The emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Fine participates in the NFIP. As of October 2021, three NFIP loss claims have been paid in the Town of Fine totaling \$18,036.75. There are no repetitive loss properties within the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. None of the Town’s 2015 mitigation actions were re-included for the 2021 HMP update.

Table 9. Hazard Mitigation Action Progress Town of Fine				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Severe winter storm, ice storm	1,2,3	Town of Fine Highway Department	Routine responsibility of highway dept. that is adequately addressed, a formal plan is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed four new actions to be included in the HMP update. Three are considered mitigation and one is preparedness. The preparedness action (Fine 2) was still included in this plan because it relates to emergency sheltering. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Fine									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Fine 1	Upgrade culverts on Youngs Rd.	Flood	Town of Fine Highway Dept*, Town Board	None	5 years	Existing	\$20,000.00	NYS DOT - CHIPS, Town Budget	1
Fine 2 (Preparedness)	Develop formal plans with SUNY ESF Ranger School and Clifton-Fine CSD for sheltering and emergency operations protocol	All	Fine Town Board*, SUNY-ESF, Clifton-Fine CSD	None	5 years	Existing	\$2,000.00	Town Budget, SUNY ESF and School District Budget	2
Fine 3	Install generator for municipal building	All	Fine Town Board*	None	5 years	Existing	\$15,000.00	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	3
Fine 4	Install generator for Arena	All	Fine Town Board*	None	5 years	Existing	\$15,000.00	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	4
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Fine
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Mitigation Action Worksheet

Project Name:	Upgrade culverts on Youngs Rd.
Project ID:	Fine 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town experiences recurring flooding issues on Youngs Rd during heavy precipitation events.

Action of Project Intended for Implementation

Description of the Solution:	Replace culverts with larger pipes to improve stormwater flows.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term (30+ years)		
Estimated Cost:	\$20,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSDOT - CHIPS, Town Budget
Responsible Organization:	Town of Fine Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No improvements compared to current conditions
	Replace culverts in-kind	\$15,000	May help drainage temporarily but may not accommodate higher flows, leading to flooding issues
	Upgrade culverts with larger pipes	\$20,000	Better flood flow accommodation, reduction of flood-related damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Fine
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Mitigation Action Worksheet

Project Name:	Develop formal plans with SUNY ESF Ranger School and Clifton-Fine CSD for sheltering and emergency operations protocol
Project ID:	Fine 2 (Preparedness)

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The SUNY ESF Ranger School in Wanakena may be used as an emergency shelter location by residents in the Town of Fine, but the Town does not currently have a formal agreement in place for sheltering protocol with ESF.

Action of Project Intended for Implementation

Description of the Solution:	Developing a formal sheltering protocol plan will allow more efficient operations if the Town needs to shelter residents at the Ranger School.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Town and school facilities can more easily implement sheltering needs as they arise
Useful Life:	Short-term		
Estimated Cost:	\$2,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, SUNY ESF and School District Budget
Responsible Organization:	Fine Town Board*, SUNY-ESF, Clifton-Fine CSD	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No improvement from existing conditions
	Coordinate with American Red Cross for sheltering needs	Low	Red Cross would likely become involved if sheltering needs arise, but Town would benefit from having direct plans in place with schools
	Develop formal plans with SUNY ESF Ranger School and Clifton-Fine CSD	\$2,000	Improved efficiency of sheltering operations

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Fine
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Mitigation Action Worksheet

Project Name:	Install generator for municipal building
Project ID:	Fine 3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town currently lacks backup power for the municipal building, which provides critical community services and is vulnerable to a power outage. The municipal building is the Town's incident command center.

Action of Project Intended for Implementation

Description of the Solution:	Install a standby generator at the municipal building so that it may continue operations during a power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations at municipal building.
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Fine Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No improvement from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at municipal building	\$15K	Offers maximum protection for municipal building

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Fine
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Mitigation Action Worksheet

Project Name:	Install generator for Arena
Project ID:	Fine 4

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town currently lacks backup power for the Arena, which is a potential emergency shelter location. The facility is vulnerable to a power outage.

Action of Project Intended for Implementation

Description of the Solution:	Install a standby generator at the Arena so that it may be used as an emergency shelter and continue operations during a power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations at the Arena.
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Fine Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No improvement from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at Arena	\$15K	Offers maximum protection for the Arena and expands its potential usage as an emergency shelter.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Fine 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Fine 2	+	+	+	+	+	+	0	0	+	+	Low	Low	2
Fine 3	+	+	+	+	+	0	0	0	+	0	Medium	Medium	3
Fine 4	+	+	+	+	+	0	0	0	+	0	Medium	Medium	4

Jurisdictional Annex

Town of Fowler

1. Contacts

The contacts for the Town of Fowler regarding this plan are identified as follows:

- Ricky W. Newvine – Town Supervisor
Address: 87 Little York Road, Gouverneur, NY 13642
Phone: (315) 287-4098
Email: newvinesnapa@yahoo.com

Town Website: <https://www.fowlerny.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 2,142 people live in the Town of Fowler. The Town's population has decreased by 2.7% since the 2010 Census (2,202) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Fowler is located along the western border of St. Lawrence County and is bordered by the Towns of Gouverneur and Hermon to the north, Edwards to the east, Pitcairn and Diana (Lewis County), and Antwerp (Jefferson County) to the south, and Rossie to the west.

2.3 Governing Body

The Town of Fowler is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), two new houses were constructed on Burns Road, one in 2020 and the other in 2021. An orchard was developed on Burns Road in 2021. A pavilion was constructed at Town Hall in 2021. Lastly, a

playground was constructed at the Town Hall in 2017. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Fowler	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	In place

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Fowler	Notes
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	No	
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation	No	
Other	Yes	Town has Land Use regulations in place but no Zoning ordinance.
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	With County and (T) Rossie and Edwards
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor and Town Clerk
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	No agreement with DANC
Technical Abilities		
Warning systems/services	Yes	Website and social media
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	Work with Lewis County
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Fowler	Notes
Incur debt through general obligation bonds and/or special tax bonds	Yes	Highway Department
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	USDA Rural Development
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Program in place
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	Seniors Program – meal delivery (82 families); Home Assistance Program – grocery assistance for residents (funded by donations);

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 812, State Highway 58, and County Routes 22 and 24. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Town Hall (Command Center)	87 Little York Road, Gouverneur, NY 13642	Town of Fowler	Yes	Yes	No	Backup power available
BOCES Southwest Career & Technical Education Center	3606 State Highway 58 Gouverneur, NY 13642	St. Lawrence-Lewis BOCES	Yes	Yes	Yes	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Fowler based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Rod and Gun Club property
 - Town Hall and Ball Diamond/Park - 87 Little York Rd, Gouverneur, NY 13642
 - Town storage facility on Sullivan Rd
- **Potential Permanent Housing Locations**
 - Privately owned vacant properties in Town, if owners were willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm, Wind, Hail, or Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Ice Jam	2	2	2	2	Moderate	6
Wildfire	2	3	1	2	Moderate	7
Extreme Temperatures	3	1	1	2	Moderate	8
Drought	3	1	2	1	Moderate	9
Earthquake	2	3	1	1	Moderate	10
Landslide	1	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents

as identified by the Town of Fowler. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Town Beach on Sylvia Lake	Pumphouse Rd	No
Educational Facilities	BOCES Southwest Technical Education Center	3606 NY-58, Gouverneur, NY 13642	No
Municipal Services	Highway Department	87 Little York Rd, Gouverneur, NY 13642	No
Municipal Services	Town Hall (new pavilion next to playground)	87 Little York Rd, Gouverneur, NY 13642	No
State Facility	NYS DOT Facility	Country Club Rd, Fowler, New York 13642	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. Four of these dams are located in the Town of Fowler, and all are hydropower dams. (Table 6, below).

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Dam Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Emeryville Dam	B	Oswegatchie River	KE Emeryville, LLC	3.4	12/16/1988	7/26/2002
Hailesboro #4 Plant Dam	B	Oswegatchie River	Hydro Development Group Incorporated	1.4	4/27/1995	6/15/1995
Hailesboro Mill #6 Dam	B	Oswegatchie River	ENEL - Engineering and Regulatory Affairs	Not available	No EAP on File	7/15/2008

Table 6. Intermediate and High-Hazard Potential Dams <i>(NYSDEC, 2021)</i>						
Dam Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Hailsboro Mill #3 Dam	B	Oswegatchie River	ENEL Green Power North America Inc.	Not available	No EAP on File	7/15/2008
<i>*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.</i> <i>**Capacity information obtained from Natural Resources Canada, 2021</i>						

The Town did not indicate any specific concerns regarding the dams. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Dam owners will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Fowler. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River and its tributaries, are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 812 and 58 and County Routes 22 and 24) would be most impactful to Town residents. Storm events would primarily impact the more populated portions of the Town, including the hamlets of Fowler and Hailesboro.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reported 180 severe storm events in St. Lawrence County between 2010 and 2021. One of these events occurred in the Town of Fowler. The event was a thunderstorm wind that resulted in approximately \$5,000 of property damages in the Town (Table 7). Actual damages were likely greater than those estimated by the NCDC. Severe storms occur about once a year to every two years in the Town (not all events are reported by NCDC). The NCDC reports no tornadoes for St. Lawrence County since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	6/8/2011	55 knots	\$5,000.00	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Fowler is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 812 and 58 and County Routes 22 and 24) would be most impactful to Town residents. Storm events would primarily impact the more populated portions of the Town, including the hamlets of Fowler and Hailesboro.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Fowler lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Fowler.

5.2.4 *Future Potential Impacts*

The Town of Fowler will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Fowler is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 812 and 58 and County Routes 22 and 24) would be most impactful to Town residents. Storm events would primarily impact the more populated portions of the Town, including the hamlets of Fowler and Hailesboro.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about sixteen times annually in St. Lawrence County. The Town of Fowler has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Fowler.

5.3.4 *Future Potential Impacts*

The Town of Fowler will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 812 and 58 and County Routes 22 and 24) would be most impactful to Town residents. Storm events would primarily impact the more populated portions of the Town, including the hamlets of Fowler and Hailesboro.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Fowler were reported for this event.

5.4.4 Future Potential Impacts

The Town of Fowler is very likely to experience nor’easter events in the future. The severity and frequency of nor’easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River and its tributaries which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Fowler, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Fowler that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Fowler Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
38,541 acres	3.7%	0.25%

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

According to the NCDL, there were no floods specifically impacting the Town of Fowler since 2010, however, there are local records of flooding events. The Town reports incidents of flooding on County Route 24, and River Road. The flood on River Road was about three years ago, and took out a driveway. The Town also reports issues with beaver dams. As described in Section 6.0 of this annex, three NFIP loss claims have been paid as of October 2021 in the Town of Fowler totaling \$54,694.66. There are no repetitive loss properties in the Town.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the Oswegatchie and its tributaries are vulnerable to flooding. About 3.7% of the Town of Fowler is within a mapped 100-year floodplain.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the Oswegatchie River are vulnerable to ice jams, particularly along River Road.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

There are no USACE CRREL or local records of an ice jam occurring specifically in the Town of Fowler. No damage estimates related to ice jams are reported specifically for the Town.

5.6.4 *Future Potential Impacts*

Properties along the Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 **Wildfire**

5.7.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The Town reports several wildfire events last year, one of which was reported on Route 58. According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The eastern edge of the Town is mapped with a lower wildfire density during this time period (0.4 to 0.8 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.7.4 *Future Potential Impacts*

The entire Town of Fowler remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.8 Extreme Temperatures

5.8.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Town of Fowler is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.8% of the population in the Town of Fowler is under 5 years old, and 22.8% of the population is over 65 years old. Approximately 16.1% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Fowler lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Fowler.

5.8.4 *Future Potential Impacts*

The Town of Fowler will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.9 Drought

5.9.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of Fowler is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural lands (mostly in the western portion of the Town) and properties served by private wells would experience the most significant impacts. The Town of Fowler does not have a municipal water system; therefore, all Town residents rely on private wells and may be susceptible to low water yields during a drought.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Fowler. There are no specific damage estimates related to droughts in the Town.

5.9.4 Future Potential Impacts

The entire Town of Fowler remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Earthquake

5.10.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location

within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021; however, none of these records were located in the Town of Fowler. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.11 Landslide

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Fowler is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Oswegatchie are particularly susceptible.

5.11.3 Historical Hazard Occurrences and Damage Estimates

The Town reported a local record of a landslide near the Emeryville Bridge on County Route 22 over the Oswegatchie River. This bridge is now closed due to rockslide concerns. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Steep slopes in the Town remain vulnerable to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.12 Infestation

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town's overall vulnerability for infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Fowler is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Fowler (Figure 5.13, Appendix A of the main body of the plan).

5.12.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Fowler, however, it has been detected in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Fowler in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.12.4 Future Potential Impacts

The entire Town of Fowler remains susceptible to an infestation event. Given the documented infestations in the northern part of the County, the emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Fowler participates in the NFIP. As of October 2021, three NFIP loss claims have been paid in the Town of Fowler totaling \$54,694.66. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. The Town’s 2015 mitigation action was not re-included for the 2021 HMP update.

Table 9. Hazard Mitigation Action Progress Town of Fowler				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Severe storm, ice storm	1,2,3	Town of Fowler Highway Department	Routine responsibility of highway department that is adequately addressed. The Highway Dept cuts back trees in town right-of-ways to limit damage if they fall. The animal control officer assists highway department for problem areas associated with beaver dams. Highway department now has upgraded equipment to better handle prevention and preparedness efforts.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Fowler									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Fowler 1	Install generators for Town Hall and Highway Dept	All	Fowler Town Board*	Local Emergency Operations Plan	5 years	Existing	\$30,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	Medium
Fowler 2	Complete drainage improvements along Emeryville Rd and develop a beaver maintenance plan.	Flood	Town of Fowler Highway Dept*, Fowler Town Board	None	5 years	Existing	High	NYSEFC- CWSRF, NYSDOT - CHIPS, FEMA- BRIC, Town Budget	Medium
<p>Potential Funding Sources</p> <p>DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration</p> <p>FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities</p> <p>NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips</p> <p>NYSEFC CWSRF: https://efc.ny.gov/CWSRF</p> <p>USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program</p>									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Fowler
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Mitigation Action Worksheet

Project Name:	Install generators for Town Hall and Highway Dept
Project ID:	Fowler 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall and Highway Department currently lack backup generators. Both facilities provide critical community services, especially during hazard events.

Action of Project Intended for Implementation

Description of the Solution:	Install a standby generator at the Town Hall and Highway Dept so that both facilities may continue operating during power outages.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations at Town facilities
Useful Life:	Long-term		
Estimated Cost:	\$30,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Fowler Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at town hall and highway department	\$30K	Offers maximum protection for Town facilities

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Fowler
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Mitigation Action Worksheet

Project Name:	Complete drainage improvements along Emeryville Rd and develop a beaver maintenance plan.
Project ID:	Fowler 2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues on Emeryville Rd, primarily due to beaver dams coupled with a lack of designated drainage infrastructure.

Action of Project Intended for Implementation

Description of the Solution:	Install stormwater conveyance infrastructure along Emeryville Rd (ditches, culverts), and develop a beaver dam maintenance plan to target the cause of the problem.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- CWSRF, NYSDOT - CHIPS, FEMA- BRIC, Town Budget
Responsible Organization:	Town of Fowler Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Complete drainage improvements only	High	May help short-term but does not address root of flood issues in this location
	Complete drainage improvements and develop a beaver maintenance plan	High	Most comprehensive approach for flood mitigation

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Fowler 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Fowler 2	+	+	0	+	+	-	0	0	+	0	Medium	High	2

Jurisdictional Annex

Town of Gouverneur

1. Contacts

The contacts for the Town of Gouverneur regarding this plan are identified as follows:

- Dave Spilman Jr. – Town Supervisor
Address: 1227 US Highway 11, Gouverneur, NY 13642
Phone: (315) 287-2340
Email: townsupervisor@gouverneurny.com
- Diane Kelly – Bookkeeper
Address: 1227 US Highway 11, Gouverneur, NY 13642
Phone: (315) 287-2340
Email: bookkeeper@gouverneurny.com

Town Website: <https://www.gouverneurny.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 6,551 people live in the Town of Gouverneur. The Town’s population has decreased by 7.5% since the 2010 Census (7,085) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Gouverneur is located in the western portion of St. Lawrence County and is bordered by the Towns of Macomb and De Kalb to the north, Hermon to the east, Fowler to the south, and Rossie to the west. The Town of Gouverneur is easily accessed from NY-11 and NY-58.

2.3 Governing Body

The Town of Gouverneur is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a solar array on the Scotch Settlement was constructed in 2017. New water lines were installed in 2020 on US Highway 11 within the water district from the chlorination building to the end of the water lines. Additionally, there are plans to develop a disaster relief center attached to the community center, five solar arrays, and a water tower on the west side of the Town. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Gouverneur	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in Response to the COVID-19 pandemic (required by NYS)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Gouverneur	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place through ICC
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA completing flood study to update mapping Countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Town has an arrangement with DANC for GIS services.
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Gouverneur	Notes
Grant writing	No	
HAZUS analysis	Yes	Completed for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	USDA RD (water project – also CDBG)
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	No	
Natural disaster or safety related school programs	Yes	Fire department, school coordination
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	Schools, fire department, Village and Town joint efforts

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include US-11 and NY-58. The Town's emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Community Center	4673 NY-58, Gouverneur, NY 13642	Village of Gouverneur	Yes	Yes	No	Backup power available
Future Disaster Relief Center	4673 NY-58, Gouverneur, NY 13642	Village of Gouverneur	Yes	Yes	No	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Gouverneur based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Town property – 100 acres behind Town Hall
 - Five mobile home parks with vacancy
- **Potential Permanent Housing Locations**
 - Town property – 100 acres behind Town Hall
 - Other vacant lots in Town (privately owned) if owners were willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	2	2	Moderate	6
Drought	3	1	2	2	Moderate	7
Ice Jam	2	2	2	1	Moderate	8
Landslide	2	3	1	1	Moderate	9
Wildfire	1	3	1	2	Moderate	10
Earthquake	2	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Gouverneur. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Community Services	Community Center	4673 NY-58, Gouverneur, NY 13642	No
Emergency Services	Gouverneur Volunteer Rescue Squad	1024 US-11, Gouverneur, NY 13642	No
EMS/Fire Department	Gouverneur Fire Department	1035 US-11, Gouverneur, NY 13642	No
EMS/Fire Department	Gouverneur Volunteer Rescue Squad	1024 US-11, Gouverneur, NY 13642	No
Municipal Services	Town Hall	87 Little York Rd, Gouverneur, NY 13642	No
Municipal Services	Town of Gouverneur	38 Country Club Rd, Gouverneur, NY 13642	No
Public Utilities	5 sewer pump stations	Multiple properties	

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Gouverneur Transfer Station	1831 US Highway 11, Gouverneur, NY 13642	No
Public Utilities	Municipal Water System	-	-
Public Utilities	Sewer Collection System	-	-
Public Utilities	Sewer Pump Station	1056 U.S. Route 11	No
Public Utilities	Sewer Pump Station	1119 U.S. Route 11	No
Public Utilities	Sewer Pump Station	1450 County Rt 12	100YR
Public Utilities	Sewer Pump Station	55 Owl Rd	No
Public Utilities	Sewer Pump Station	970 U.S. Route 11	No
Public Utilities	Two small chlorination buildings in the Town	-	-
Public Utilities	Wastewater Treatment Facility	4727 St. Highway 58 Gouverneur, NY 13642	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Gouverneur.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Gouverneur. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River and its tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical record documentation, but were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to Town residents. Storms would primarily impact the more populated portions of the Town, including the Village of Gouverneur and the U.S. Route 11/State Highway 58 corridors.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Four of these events occurred in the Town of Gouverneur (frequency of about once every two to three years). One of these records was a hail event, and the rest were thunderstorm winds. Estimated damages for the Town of Gouverneur ranged from \$0 to \$25,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes in the County since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	6/8/2011	55 knots	\$15,000.00	-
Thunderstorm Wind	2/25/2017	55 knots	\$25,000.00	-
Hail	3/29/2020	1.00 in.	\$0.00	-
Thunderstorm Wind	6/27/2020	55 knots	\$20,000.00	-
Total			\$60.00K	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Gouverneur is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to Town residents. Storms would primarily impact the more populated portions

of the Town, including the Village of Gouverneur and the U.S. Route 11/State Highway 58 corridors.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Gouverneur lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms were reported for the Town of Gouverneur.

5.2.4 *Future Potential Impacts*

The Town of Gouverneur will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one Town within the County. The entire Town of Gouverneur is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to Town residents. Storms would primarily impact the more populated portions of the Town, including the Village of Gouverneur and the U.S. Route 11/State Highway 58 corridors.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Gouverneur has been affected by a number of severe winter storm events, described in Section 5.1.4 of the main body of the plan. These storms typically affect most or all of the County. The Town reported a local record of a severe winter storm occurring two years ago. The NCDC does not report any winter storm damage estimates specific to the Town of Gouverneur.

5.3.4 *Future Potential Impacts*

The Town of Gouverneur will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to Town residents. Storms would primarily impact the more populated portions of the Town, including the Village of Gouverneur and the U.S. Route 11/State Highway 58 corridors.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Gouverneur were reported for this event.

5.4.4 Future Potential Impacts

The Town of Gouverneur is very likely to experience nor’easter events in the future. The severity and frequency of nor’easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River and its tributaries which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Gouverneur, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Gouverneur that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Gouverneur Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
44,932 acres	3.3%	0.12%

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC did not report any flood records for the Town of Gouverneur since 2010. The Town reports stormwater related localized flooding issues that have impacted the Town's sewer system. As described in Section 6.0 of this annex, three NFIP loss claims have been paid as of October 2021 in the Town of Gouverneur totaling \$27,072.44. There are no repetitive loss properties in the Town of Gouverneur.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the Oswegatchie River and its tributaries are vulnerable to flooding. About 3.3% of the Town of Gouverneur is within a mapped 100-year floodplain.

5.6 **Extreme Temperatures**

5.6.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an extreme temperature event, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Gouverneur is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.0% of the population in the Town of Gouverneur is under 5 years old, and 16.3% of the population is over 65 years old. Approximately 15.8% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Gouverneur lies, which are described in Section 5.5 of the main body of the plan. The Town also reports having to open the community center as a cooling center during the past two years. No damage estimates related to extreme temperatures are reported specific to the Town of Gouverneur.

5.6.4 *Future Potential Impacts*

The Town of Gouverneur will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 **Drought**

5.7.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of Gouverneur is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on private wells and are susceptible to low water yields during a drought.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC reports no specific drought events for the Town of Gouverneur, and there are no damage estimates for the Town related to droughts.

5.7.4 *Future Potential Impacts*

The entire Town of Gouverneur remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.8 **Ice Jam**

5.8.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the Oswegatchie River are most vulnerable to ice jams.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

There are no historical records of an ice jam occurring specifically in the Town of Gouverneur. Regardless, this hazard was included in this annex for future mitigation planning consideration. No damage estimates related to ice jams are reported specifically for the Town.

5.8.4 *Future Potential Impacts*

Properties along the Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.9 **Landslide**

5.9.1 *Description*

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Gouverneur is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Oswegatchie River are particularly susceptible. The NCDRC reports no specific landslide events for St. Lawrence County.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The Town reports local records of rockslide issues within rock cuts along County highways. No damage estimates were reported. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

Steep slopes in the Town remain vulnerable to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.10 Wildfire

5.10.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Town of Gouverneur remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Earthquake

5.11.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.11.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Gouverneur. There are no local records of earthquakes affecting the Town. Regardless, this hazard was included in this annex for future mitigation planning consideration. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the entire Town remains susceptible to earthquakes.

5.12 Infestation

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town's overall vulnerability for an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Gouverneur is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Gouverneur (Figure 5.13, Appendix A of the main body of the plan).

5.12.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Gouverneur, however, it has been detected in surrounding municipalities. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Gouverneur in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.12.4 Future Potential Impacts

The entire Town of Gouverneur remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the

Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Gouverneur currently participates in the NFIP. As of October 2021, three NFIP loss claims have been paid in the Town of Gouverneur totaling \$27,072.44. There are no repetitive loss properties in the Town of Gouverneur. The Town's Code Enforcement Officer serves as the Local Floodplain Administrator. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. The Town’s 2015 mitigation action was not re-included for the 2021 HMP update.

Table 8. Hazard Mitigation Action Progress Town of Gouverneur				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe winter storm	1,2,3	Town of Gouverneur Highway Department	Routine responsibility of highway dept. that is adequately addressed, a formal plan is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Gouverneur									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Gouverneur T1	Complete sanitary sewer system upgrades	Flood	Gouverneur Town Board*, DANC	Continuity of Operations Plan	5 years	Existing	\$500K to \$1 million	NYSEFC - CWSRF, NYSDEC- WQIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Town Budget	High
Gouverneur T2	Construct a disaster relief center attached to the existing community center	All	Gouverneur Town Board*	Local Emergency Operations Plan	2 years	New	\$2 million	USDA RD - Community Facilities Program, FEMA- BRIC, NYSOCR- CDBG, Town Budget	High
Potential Funding Sources FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDEC WQIP: https://www.dec.ny.gov/pubs/4774.html NYSEFC CWSRF: https://efc.ny.gov/CWSRF NYSOCR CDBG: https://hcr.ny.gov/community-development-block-grant USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program USDA RD Water & Waste Disposal: https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ny									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Gouverneur
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Mitigation Action Worksheet

Project Name:	Complete sanitary sewer system upgrades
Project ID:	Gouverneur T1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town's sanitary sewer system was originally installed in 1994/1995. The Town has recurring issues with stormwater infiltration into sewer lines, which adds unnecessary flows to the sewage treatment plant that lead to additional wear on the system.

Action of Project Intended for Implementation

Description of the Solution:	Complete improvements to existing sanitary sewer collection system, including sewer main, manhole, and pump station improvements. Manholes will be rehabilitated (coated, raised, new frames/covers installed) or replaced, and deteriorated sewer mains will be replaced or lined to prevent stormwater inflow/infiltration.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of sewer system operations, reduced damage potential
Useful Life:	Long-term (30+ years)		
Estimated Cost:	\$500K to \$1 million		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC - CWSRF, NYSDEC- WQIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Town Budget
Responsible Organization:	Gouverneur Town Board*, DANC	Local Planning Mechanisms to be used in Implementation, if any:	Continuity of Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Repair sewer system components as needed when problems arise	High	Reactive approach, not a long-term solution. Issues will continue to evolve.
	Complete sanitary sewer system upgrades	\$500K-1 million	Most comprehensive approach to improving system resiliency

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Gouverneur
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Mitigation Action Worksheet

Project Name:	Construct a disaster relief center attached to the existing community center
Project ID:	Gouverneur T2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Community Center can serve as an emergency shelter for residents in the Town and Village of Gouverneur. Currently, the facility lacks space to house residents overnight if needed. Additional space would be required for it to fully function as a shelter. The existing Community Center is not in a floodplain or otherwise hazard-prone location; the addition is proposed to provide additional space for sheltering needs.

Action of Project Intended for Implementation

Description of the Solution:	Construct a new disaster relief center facility attached to the community center. Backup power is already available.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Improved disaster response during emergency events
Useful Life:	Long-term		
Estimated Cost:	\$2 million		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	1-2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	USDA RD - Community Facilities Program, FEMA- BRIC, NYSOCR-CDBG, Town Budget
Responsible Organization:	Gouverneur Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	House residents at another facility if overnight sheltering is required	Low	Would require additional coordination
	Construct a disaster relief center	\$2 million	Town would have ownership of facility and be able to better protect residents during an emergency

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Gouverneur T1	+	+	0	+	+	-	+	0	+	-	Medium	High	1
Gouverneur T2	+	0	0	+	+	-	0	-	+	-	High	High	2

Jurisdictional Annex

Village of Gouverneur

1. Contacts

The contacts for the Village of Gouverneur regarding this plan are identified as follows:

- Ronald McDougall – Mayor
Address: 33 Clinton Street, Gouverneur, NY 13642
Phone: (315) 287-1720
Email: ronaldpmcdougall@gmail.com
- Barbara Finnie – Clerk
Address: 33 Clinton Street, Gouverneur, NY 13642
Phone: (315) 287-1720
Email: bfinnie@villageofgouverneurny.gov

Village Website: <https://www.villageofgouverneur.org/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 3,526 people live in the Village of Gouverneur, indicating a 10.7% decrease in population since the 2010 Census (3,949) (U.S. Census Bureau, 2021).

2.2 Location

The Village of Gouverneur is located in the Town of Gouverneur, in the western portion of St. Lawrence County. Gouverneur is easily accessed from US 11 (Main Street) and NY-58.

2.3 Governing Body

The Village of Gouverneur is governed by a five-member Village Board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the Terrace Apartment Complex was constructed (around 2018) and a new phase of construction was proposed at the property for the fall of 2021. A Dunkin Donuts was developed on U.S. Route 11. The Village recently partnered with the Town of Lowville (Lewis County) to develop low-income housing. A pizzeria on Main Street is currently being rebuilt (a fire occurred at the building). The McDonalds in the Village was remodeled in 2019. Additionally, the Village is in the planning stage of a sewer system improvements project. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Village's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Gouverneur	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	Water/sewer department develops plans to submit to DEC/DOH

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Gouverneur	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Village Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	Planning Board reviews
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	No	
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation	No	
Administration		
Planning Board	Yes	Established
Mitigation Planning Committee	Yes	Established for HMP update
Maintenance programs to reduce risk	Yes	Sewer and storm maintenance, brush pickup, remove trees
Mutual aid agreements	Yes	In place
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Mayor
Emergency Manager	Yes	Mayor
Community Planner	No	Not on staff, contract out
Civil Engineer	No	Not on staff, contract out
GIS Coordinator	Other	Village has an agreement with DANC for GIS services

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Gouverneur	Notes
Technical Abilities		
Warning systems/services	Yes	Information can be disseminated to residents on Village Website, Facebook page, and on the message board sign at the Kinney’s Drug Store.
Hazard data and information	Yes	Compiled for HMP update
Grant writing	No	DANC or outside contractor
HAZUS analysis	Yes	Completed for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	No	
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include U.S. Route 11 (Main Street) and State Highway 58. The Village's emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Community Center	4673 NY-58, Gouverneur, NY, 13642	Village of Gouverneur	Yes	Yes	No	Backup power available
Municipal Building	33 Clinton Street, Gouverneur, NY 13642	Village of Gouverneur	Yes	Yes	No	Backup power available
Recreation Center	3 Trinity Avenue, Gouverneur, NY 13642	Privately Owned	Yes	Yes	No	No backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Gouverneur based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately owned properties.

- **Potential Temporary Housing Locations**
 - Fairgrounds – 85 E Barney St, Gouverneur, NY 13642
- **Potential Permanent Housing Locations**
 - Fairgrounds – 85 E Barney St, Gouverneur, NY 13642

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	2	2	Moderate	6
Ice Jam	2	2	1	2	Moderate	7
Earthquake	2	3	1	1	Moderate	8
Drought	3	1	1	1	Moderate	9
Infestation	2	1	1	1	Low	10

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Gouverneur. Table 5, below, denotes the types and locations of critical facilities within the Village.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Educational Facilities	Gouverneur Elementary School	111 Gleason St, Gouverneur, NY 13642	No
Educational Facilities	Gouverneur High School	133 E Barney St, Gouverneur, NY 13642	No
Educational Facilities	Gouverneur Middle School	25 Wilson St, Gouverneur, NY 13642	No
Educational Facilities	St. James School	20 S Gordon St, Gouverneur, NY 13642	No
Hospital	Gouverneur Hospital	77 W Barney St, Gouverneur, NY 13642	No
Municipal Services	DPW Garage	33 Clinton Street, Gouverneur, NY 13642	100YR and 500YR
Municipal Services	Municipal Building	33 Clinton Street, Gouverneur, NY 13642	100YR and 500YR
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Municipal Water System	-	-
Public Utilities	Sewage pump stations	Clinton Street, Depot Street, Mills Park (siphon chamber)	100YR (at Mills Park)
Public Utilities	Sewer Pump Station	120 Johnstown St	100YR
Public Utilities	Sewer Pump Station	243 Clinton St	no
Public Utilities	Sewer Pump Station	4673 State Hwy 58	100YR, 500YR
Public Utilities	Village Hydropower Plant	U.S. Route 11	
Public Utilities	Wastewater Treatment Facility (main building)	4727 State Hwy 58, Gouverneur, NY 13642	No
Public Utilities	Water Filtration Plant	260 Grove Street, Gouverneur, NY 13642	100YR
Public Utilities	Water Tower	176 Pooler Road, Gouverneur, NY 13642	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under

the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams is located in the Village of Gouverneur, and is owned by the Village (Table 6, below).

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Gouverneur Village Dam	B	Oswegatchie River	Village of Gouverneur	not available	1/1/1985	6/7/2017
*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes. **Capacity information obtained from Natural Resources Canada, 2021						

The Village indicated no concerns regarding the Village Dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Village will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Gouverneur. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River are likely to experience increased flooding occurrences.

The Village of Gouverneur chose not to profile landslide or wildfire in their annex even though these hazards were profiled for the County. The Village does not have a history of these events, and they do not have any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards lack historical records, but they were profiled for future planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Village is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to residents. The Village is densely populated, and damages within the Village limits would impact multiple residents.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDL has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Three of these events occurred in the Village of Gouverneur (frequency of about once every two to three years). One of these records was a hail event, and the others were thunderstorm winds. Estimated damages for the Village of Gouverneur ranged from \$0 to \$10,000 per event (Table 7). The Village also reported a microburst on 7/15/1995 involving heavy rains and strong winds resulting in downed trees. Actual damages were likely greater than those estimated by the NCDL. The NCDL reports no tornadoes in the County since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/9/2010	50 knots	\$5,000.00	-
Thunderstorm Wind	7/8/2014	55 knots	\$10,000.00	-
Hail	3/29/2020	0.75 inches	\$0.00	-
Total			\$15,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Gouverneur is susceptible to damages from an ice storm event. Damages to the Village's critical

infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to residents. The Village is densely populated, and damages within the Village limits would impact multiple residents.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Village of Gouverneur lies, and are described in Section 5.2 of the main body of the plan. The Village also reports a large ice storm in 1998. No damage estimates related to ice storms are reported specific to the Village of Gouverneur.

5.2.4 Future Potential Impacts

The Village of Gouverneur will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Village Department of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. Severe winter storms typically affect more than one area within the County. The entire Village of Gouverneur is susceptible to damages from a severe winter storm event. The Village Department of Public Works clears Village streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to residents. The Village is

densely populated, and damages within the Village limits would impact multiple residents.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur 16 times annually in St. Lawrence County. These storms typically affect more than one area within the County. The Village of Gouverneur has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan.

5.3.4 *Future Potential Impacts*

The Village of Gouverneur will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11 and State Highway 58) would be most impactful to residents. The Village is densely populated, and damages within the Village limits would impact multiple residents.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Gouverneur were reported for this event.

5.4.4 Future Potential Impacts

The Village of Gouverneur is very likely to experience nor’easter events in the future. The severity and frequency of nor’easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by the Oswegatchie River which drains to the St. Lawrence River. FEMA provides flood insurance rate maps for the Village of Gouverneur, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Village of Gouverneur that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>	
Village of Gouverneur	Percent of Total Area

Total Area	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
1,438 acres	9.5%	0.47%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC did not report any flood records for the Village since 2010, but local records reported occasional flooding issues along Grove Street. Also, the Depot Street culvert crossing (which conveys a tributary of the Oswegatchie River) floods when the water level of the River is high and the stream can't discharge. Additionally, storm water related flooding has occurred on Cambray Court and William Street by the cemetery. The Village also reports that the Sewer Plant will flood when the Oswegatchie River gets high.

As described in Section 6.0 of this annex, a total of 16 NFIP loss claims have been paid in the Village of Gouverneur as of October 2021, totaling \$43,314.69. There are two repetitive loss properties in the Village of Gouverneur, both are single family residences. The properties have collectively incurred six flood losses, with a total of \$18,280.38 in building damages. No content damage payments were reported.

5.5.4 Future Potential Impacts

Properties along surface waters throughout the Village, particularly along the Oswegatchie River, are vulnerable to flooding. About 9.5% of the Village of Gouverneur is within a mapped 100-year floodplain.

5.6 Extreme Temperatures

5.6.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. Extreme temperatures typically affect most or all of the County. The entire Village of Gouverneur is

susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes.

Approximately 6.8% of the population in the Village is under 5 years old, and 21.1% of the population is over 65 years old. Approximately 23.7% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Gouverneur lies, and is described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures were reported for the Village of Gouverneur.

5.6.4 *Future Potential Impacts*

The Village of Gouverneur will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and severity in the future due to climate change.

5.7 **Ice Jam**

5.7.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Village, primarily along the Oswegatchie River are vulnerable to ice jams.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The USACE CRREL does not report any historical records of an ice jam occurring specifically in the Village of Gouverneur. Local records reported that ice jams occur on the Oswegatchie River, but they do not often result in the Village dam being blocked, nor do they frequently result in damages. No damage estimates related to ice jams are reported specific to the Village.

5.7.4 *Future Potential Impacts*

Properties along streams throughout the Village, primarily along the Oswegatchie remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 **Earthquake**

5.8.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. The Village of Gouverneur is moderately susceptible to a potential earthquake event, due to the lack of warning and moderate extent and damages associated with this hazard. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

There have been two earthquakes reported in St. Lawrence County between 2010 and 2021. According to the USGS Earthquake Catalog, there are no historical records of earthquakes occurring specifically in the Village of Gouverneur, and there are no local records for this hazard. Regardless, this

hazard was included in this annex for future mitigation planning consideration. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the entire Village remains susceptible.

5.9 Drought

5.9.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Village of Gouverneur is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. Village residents are served by a municipal water system, which is supplied by the Oswegatchie River, reducing overall drought vulnerability compared to areas in the County that are dependent on groundwater wells.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Village of Gouverneur. There are no specific damage estimates related to droughts for the Village.

5.9.4 Future Potential Impacts

The entire Village of Gouverneur remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Infestation

5.10.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 *Hazard Vulnerability*

The Village's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village of Gouverneur is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village of Gouverneur (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 *Historical Hazard Occurrences and Damage Estimates*

The emerald ash borer has not yet been detected in the Village of Gouverneur, however, it has been detected in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Village of Gouverneur in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 *Future Potential Impacts*

The entire Village of Gouverneur remains susceptible to an infestation event. The emerald ash borer is likely to migrate to the Village in the future, as it has already been detected in the northern part of the County. Proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Gouverneur participates in the NFIP. As of October 2021, a total of 16 NFIP loss claims have been paid in the Village of Gouverneur totaling \$43,314.69. There are two repetitive loss properties in the Village of Gouverneur (both single family residences). The properties have collectively incurred six flood losses, with a total of \$18,280.38 in building damages. No content damage payments were reported.

The Village Mayor serves as the Local Floodplain Administrator. The Village will continue to comply with the NFIP by enforcing floodplain management requirements and

regulating new development in Special Flood Hazard Areas, among other required duties. The Village will also consider potential mitigation efforts for the properties that have experienced multiple flood-related losses.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed one mitigation action in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. None of the Village’s 2015 mitigation actions were re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Village of Gouverneur				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Village Department of Public Works	Routine responsibility for Village Department of Public Works- no need for formal plan at this time, adequately addressed as-is.

7.2 Proposed Mitigation Actions

The Village proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Village of Gouverneur									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Gouverneur V1	Install generator for the recreational center	All	Gouverneur Village Board*	None	5 years	Existing	\$15,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Gouverneur V2	Complete a stormwater conveyance infrastructure improvements project to improve drainage throughout Village.	Flood	Village of Gouverneur DPW*, Gouverneur Village Board	None	5 years	Existing	High	NYSEFC- CWSRF, NYSDOT - CHIPS, FEMA- BRIC, Village Budget	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips NYSEFC CWSRF: https://efc.ny.gov/CWSRF USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Village's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village's STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Gouverneur
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Mitigation Action Worksheet

Project Name:	Install generator for the recreational center
Project ID:	Gouverneur V1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	Currently, the recreational center does not have backup power. This facility is one of the Village's emergency shelter locations and may also be used as temporary housing for the Gouverneur Correctional Facility.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the recreational center so that it may continue operations during a power outage and function as a shelter location.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Gouverneur Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at recreational center	\$15K	Offers maximum protection for recreational center and improves its ability to function as a shelter

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Gouverneur
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Mitigation Action Worksheet

Project Name:	Complete a stormwater conveyance infrastructure improvements project to improve drainage throughout Village.
Project ID:	Gouverneur V2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	Replace stormwater conveyance infrastructure to improve drainage throughout Village and reduce flooding risks.

Action of Project Intended for Implementation

Description of the Solution:	Replace stormwater conveyance infrastructure to improve drainage throughout Village and reduce flooding risks.
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Is this project related to a Critical Facility? Yes _____ No X
(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- CWSRF, NYSDOT - CHIPS, FEMA- BRIC, Village Budget
Responsible Organization:	Village of Gouverneur DPW*, Village Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culverts as needed	\$10,000	Reactive approach; does not aim to mitigate damages
	Complete a stormwater infrastructure improvements project	High	Proactive approach for entire system, more likely to reduce future flooding and related damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Gouverneur V1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Gouverneur V2	+	+	0	+	+	-	0	0	+	0	Medium	High	2

Jurisdictional Annex

Town of Hammond

1. Contacts

The contacts for the Town of Hammond regarding this plan are identified as follows:

- Ron Bertram – Town Supervisor
Address: PO Box 219, Hammond, NY 13646
Phone: (315) 324-5321
Email: townsupervisor@townofhammond.com

Website: <https://townofhammondny.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 1,258 people live in the Town of Hammond. The Town’s population has increased by 5.6% since the 2010 Census (1,191) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Hammond is located along the western boundary of St. Lawrence County and is bordered by the Towns of Morristown and Macomb to the east, Rossie to the south, Alexandria (Jefferson County) to the west, and the St. Lawrence River to the north. Hammond is easily accessed from State Highway 37, County Route 6, and State Highway 12.

2.3 Governing Body

The Town of Hammond is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), there has been residential development along the St. Lawrence River and Black Lake. Additionally, a new town hall, new fire station, and a Dollar General have been developed in the Town. No new

development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Hammond	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	Yes	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Hammond	Notes
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	Town participates in NFIP but is unmapped by FEMA FIRMs
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	FEMA in progress of flood study to generate updated floodplain mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	Planning Board
Mitigation Planning Committee	Yes	Town Supervisor
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Work with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Hammond	Notes
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA Rural Development
State funding programs	Yes	
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	Fire Department programs
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 37, County Route 6, and State Highway 12. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Station	300 Lake Street, Hammond, NY 13646	Village of Hammond	Yes	No	No	Bathrooms are ADA accessible but unlikely to meet today’s standards
Hammond Central School	51 South Main Street, Hammond, NY 13646	Hammond CSD	Yes	No	No	School not set up well for overnight sheltering. Heating limited with only standby generators.

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Hammond based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Fire Department – 300 Lake Street, Hammond, NY 13646
 - Hammond Central School (large lot) – 51 South Main Street, Hammond, NY 13646
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town if owners were willing to sell or subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/ Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Ice Jam	2	2	2	1	Moderate	6
Flood	2	2	3	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	2	1	1	Low	10
Infestation	2	1	1	1	Low	11

4.2 Critical Facilities

Critical facilities include any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Hammond. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
EMS/Fire Department	Hammond Fire & Rescue	300 Lake St, Hammond, NY 13646	No
Municipal Services	Town Barn	1876 County Route 6, Hammond, NY 13646	No
Municipal Services	Town Hall	17 North Main Street, Hammond, NY 13646	No
Radio Communications	Hammond Radio Tower (on school)	-	-
Radio Communications	Radio Tower (County Tower)	off Sand Street	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC)

with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Hammond.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Hammond. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River, Chippewa Creek, Crooked Creek and Black Creek are likely to experience increased flooding occurrences.

The Town of Hammond chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 12 and 37 and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated

portions of the Town, including the Village of Hammond and hamlets of Chippewa Bay, North Hammond, Oak Point, and Schermerhorn Landing.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Three of these events occurred in the Town of Hammond (frequency of about once every two to three years). All reported events were thunderstorm winds. Estimated damages for the Town of Hammond ranged from \$2,000 to \$10,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The Town reports that severe storms are primarily cause limited utility damage. Private property damages are generally low as the Town does not have much high-density housing. There are no hazardous trees present near Town buildings. The Town is at the end of the line for National Grid (25 mile power line coming from Ogdensburg), with no other connections, so if damages occur anywhere in that span, power outages occur within the Town. The NCDC has not reported any tornado events in St. Lawrence County since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	8/4/2017	50 knots	\$2,000.00	-
Thunderstorm Wind	6/29/2019	50 knots.	\$5,000.00	-
Thunderstorm Wind	6/28/2020	50 knots	\$10,000.00	-
Total			\$17,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Hammond is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 12 and 37 and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Hammond and hamlets of Chippewa Bay, North Hammond, Oak Point, and Schermerhorn Landing.

5.2.3 Historical Hazard Occurrences and Damage Estimates

The NCDC does not have specific information on which towns were affected by ice storms, as these events are reported at the County level. Since 1998, three ice storms were reported in the southern portion of St. Lawrence County where the Town of Hammond lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Hammond. The Town was impacted by the 1998 ice storm that affected much of St. Lawrence County. Another smaller ice storm occurred in Hammond in 2008 or 2009 according to local records.

5.2.4 Future Potential Impacts

The Town of Hammond will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Hammond is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Private owners are responsible for clearing private roads. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 12 and 37 and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Hammond and hamlets of Chippewa Bay, North Hammond, Oak Point, and Schermerhorn Landing.

5.3.3 Historical Hazard Occurrences and Damage Estimates

The Town of Hammond has been affected by a number of severe winter storm events reported for the County, described in Section 5.3 of the main body of the plan. The Town reports that severe winter storms within the Town cause access issues to developments around shorelines, and access issues to lots on private roads. Severe winter storms also create access issues for emergency vehicles. The NCDC does not report any winter storm damage estimates specific to the Town of Hammond.

5.3.4 Future Potential Impacts

The Town of Hammond will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Flood

5.4.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is highly vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by Chippewa Creek, Crooked Creek and Black Creek. Chippewa Creek and Crooked Creek drain to the St. Lawrence River, and Black creek drains to Butterfield Lake. The Town of Hammond is not mapped by existing FEMA flood insurance rate maps. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Hammond that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Hammond Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
49,526 acres	8.8%	0.05%

The St. Lawrence River Shoreline Resiliency Study, which was completed by BCA Architects and Rootz, LLC in 2019, assessed the vulnerability of shoreline ecosystems along the upper St. Lawrence River in the Towns of Hammond, Morristown, Oswegatchie, and Lisbon. As part of the study, a Floodplain Protection Overlay District indicating locations that are vulnerable to flooding throughout the study area. The proposed Floodplain Protection Overlay District generated by this study is generally limited to properties that are immediately adjacent to the St. Lawrence River shoreline. The Floodplain Protection Overlay District extends further inland along Schermerhorn Landing, Chippewa Bay, Allen’s Point, and Oak Point in the Town of Hammond. Further information regarding this plan is provided in Section 5.7 of the main body of the plan.

5.4.3 Historical Hazard Occurrences and Damage Estimates

According to the NCDC, three flood records were noted to specifically impact the Town of Hammond since 2010. One event occurred on 4/9/2014 and involved runoff from heavy rain and snowmelt causing rivers and streams to flood across St. Lawrence County. This event caused \$10,000 of property damage within the Town of Hammond. Two events occurred on 7/24/2017 and involved flash flooding across the western/central St. Lawrence County. One event resulted in \$5,000 of property damages, while the other resulted in \$100,000 of property damages within the Town of Hammond. The Town was also impacted by the 2017 and 2019 high water levels on the St. Lawrence River. The Town has experienced stormwater drainage issues in the past, but they have largely been mitigated by culvert replacements. As described in Section 6.0 of this annex, one NFIP loss claim has been paid in the Town of Hammond as of October 2021 totaling \$1,173.22. There are no repetitive loss properties in the Town.

5.4.4 Future Potential Impacts

Properties along streams throughout the Town, including Chippewa Creek, Crooked Creek and Black Creek are vulnerable to flooding. About 8.8% of the Town of Hammond is within a mapped 100-year floodplain.

5.5 Coastal Storm (Nor'easter)

5.5.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 12 and 37 and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Hammond and

hamlets of Chippewa Bay, North Hammond, Oak Point, and Schermerhorn Landing.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Hammond were reported for this event or by the NCDC.

5.5.4 *Future Potential Impacts*

The Town of Hammond is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 **Extreme Temperatures**

5.6.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Hammond is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 4.8% of the population in the Town is under 5 years old, and 20.9% of the population is over 65 years old. Approximately 17.8% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events. The Town is primarily concerned about extreme heat events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Hammond lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Hammond.

5.6.4 *Future Potential Impacts*

The Town of Hammond will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change. The new Fire Department will have air conditioning so that it may function as a cooling center during heat waves.

5.7 **Ice Jam**

5.7.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along Chippewa Creek, Crooked Creek and Black Creek are vulnerable to ice jams.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

There are no USACE CRREL records of an ice jam occurring specifically in the Town of Hammond, but local records reported flooding issues in Chippewa Bay caused by ice buildup in culverts. No damage estimates related to ice jams were reported for the Town.

5.7.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along Chippewa Creek, Crooked Creek and Black Creek remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 **Drought**

5.8.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system. Residents rely on private wells and may be susceptible to low water yields during a drought. The Town indicated that droughts tend to be very localized and are not typically a town-wide issue. Crop damages can occur, but soils in the Town are predominantly clays, which retain moisture well.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC reports no specific drought events for the Town of Hammond. There are no specific damage estimates related to droughts for the Town.

5.8.4 *Future Potential Impacts*

The entire Town of Hammond remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to impacts from an earthquake. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

There have been two earthquakes reported in St. Lawrence County between 2010 and 2021. The Town reports that tremors have been felt during previous minor events, but there are no known damages. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town's overall vulnerability for an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Hammond is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Hammond (Figure 5.13, Appendix A of the main body of the plan). Additionally, Eurasian watermilfoil is of concern for the Town. Eurasian watermilfoil is an invasive aquatic plant that has been reported in Black Lake and the St. Lawrence River, both of which border the Town of Hammond.

5.10.3 Historical Hazard Occurrences and Damage Estimates

The Town of Hammond was the first municipality in St. Lawrence County where the emerald ash borer was documented. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. The Black Lake Invasive Weeds Committee worked with Quantitative Environmental Analysis, LLC to develop a Eurasian Watermilfoil Management Plan in 2008 (which is provided in Appendix H of the main plan). It was estimated total removal would cost up to \$20 to 30 million.

5.10.4 Future Potential Impacts

The entire Town of Hammond remains susceptible to an infestation event. The emerald ash borer was recently detected in the Town and will likely continue to spread. Proactive ash tree management will be critical to reduce potential impacts of this species.

5.11 Wildfire

5.11.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.11.2 *Hazard Vulnerability*

The Town's overall vulnerability for a wildfire is low, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.11.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Hammond reports wildfires occurring on state forest land within town. The NYSDEC helps the Town with wildfire equipment. According to Figure 5.11 (Appendix A of the main body of the plan), about half of the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC, and half of the Town is mapped with a higher wildfire density during this time period (1.4 to 3.4 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 *Future Potential Impacts*

The entire Town of Hammond remains susceptible to a wildfire. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Hammond currently participates in the NFIP. As of October 2021, one NFIP loss claim has been paid in the Town totaling \$1,173.22. There are no repetitive loss properties in the Town of Hammond. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed two mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. One of the Town’s 2015 mitigation actions was revised and re-included for the 2021 update.

Table 8. Hazard Mitigation Action Progress Town of Hammond				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Installation of a generator for the Town Barn will insure that power outages will not limit the capabilities of this facility. A generator at the fueling depot at bus garage will provide power to fuel Town and Village vehicles, when power is down. A generator at the Town fire hall will provide a shelter location in the event of extended power outages.	Ice storms, severe winter storm, severe storm, utility failure	1	Town/Village of Hammond Board	Partially completed. Upgrade of fueling depot recently completed that included addition of a generator. This facility is shared by the school, fire department, and Town. Town Barn still lacks generator.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm, severe storm	1,2,3	Village and Town Highway and Public Works Departments	Routine responsibility for DPW that is adequately addressed (Town and Village share DPW). Formal plan is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Hammond									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Hammond T1	Install generator at the fire department	All	Hammond Fire & Rescue*, Hammond Town Board	Continuity of Operations Plan	5 years	Existing	\$15K	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Hammond T2	Install generator for Town Barn	All	Hammond Town Board* and Highway Dept	Continuity of Operations Plan	5 years	Existing	\$15K	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Hammond T3	Build a new Community Center	All	Hammond Fire & Rescue*, Hammond Town Board	Comprehensive Plan	5 years	New	\$650K-750K	Town Budget, USDA RD - Community Facilities, FEMA - BRIC	3
<p>Potential Funding Sources</p> <p>DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration</p> <p>FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities</p> <p>USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program</p>									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis is provided in Table 10 (Attachment A). The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Hammond
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Mitigation Action Worksheet

Project Name:	Install generator at the fire department
Project ID:	Hammond T1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Fire Department currently does not have a backup generator. The Fire Department is one of the Town's emergency shelter locations and is in need of backup power to ensure that it can continue to function during emergency events.

Action of Project Intended for Implementation

Description of the Solution:	Install generator at Fire Department to ensure the facility can continue operations during a power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Hammond Fire & Rescue*, Hammond Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Continuity of Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at fire department	\$15K	Offers maximum protection for fire department

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Hammond
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Mitigation Action Worksheet

Project Name:	Install generator for Town Barn
Project ID:	Hammond T2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Barn currently does not have a backup generator. The town highway department operates from this facility and provides critical community services during emergency events.

Action of Project Intended for Implementation

Description of the Solution:	Install generator at the Town Barn to ensure the highway department can continue critical operations during a power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Hammond Town Board* and Highway Dept	Local Planning Mechanisms to be used in Implementation, if any:	Continuity of Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at Town Barn	\$15K	Offers maximum protection for Town Barn

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Hammond
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Mitigation Action Worksheet

Project Name:	Build a new Community Center
Project ID:	Hammond T3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Fire Department is one of the Town's emergency shelter locations; however, the existing facility is not adequate for mass sheltering needs. The Fire Department is not in a floodplain or other hazard-prone area, but cellular communications and bathroom space at the existing facility are limited. Additionally, sheltering residents there may impact emergency response operations. The Town is primarily concerned about potential sheltering needs for severe winter storms and ice storms.

Action of Project Intended for Implementation

Description of the Solution:	Hammond Fire & Rescue plans to build a new facility that can function as more of a community center and emergency shelter. The fire department has secured about 1/3 of the necessary funding to date. The new facility may be constructed in a separate lot at the rear of the fire station, or as an addition to the existing building. These locations are not located in a floodplain or other hazard-prone area.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved emergency sheltering abilities
Useful Life:	Long-term		
Estimated Cost:	\$650-750K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, USDA RD - Community Facilities, FEMA - BRIC
Responsible Organization:	Hammond Fire & Rescue*, Hammond Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Retrofit existing fire station (addition to existing facility)	High	This is an option being considered (adding on to existing fire station). May be more cost effective than constructing a brand new facility; would still accomplish sheltering goals.
	Construct a new Community Center as a separate building	\$650-750K	May be best to have community center building separate from fire station to maintain efficiency of emergency operations.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Hammond T1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Hammond T2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Hammond T3	+	0	0	+	+	-	0	0	+	-	Medium	High	3

Jurisdictional Annex

Village of Hammond

1. Contacts

The contacts for the Village of Hammond regarding this plan are identified as follows:

- Shelly Youngs, Mayor
Address: P.O. Box 188, Hammond, NY 13646
Phone: (315) 783-4209
Email: csyongs@hotmail.com

Village Website: <http://www.hammondnewyork.com/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 273 people live in the Village of Hammond. The Village's population has decreased by 2.5% since the 2010 Census (280) (U.S. Census Bureau, 2021).

2.2 Location

The Village of Hammond is located centrally within the Town of Hammond in western St. Lawrence County. Hammond is easily accessed from State Highway 37, and County Route 6.

2.3 Governing Body

The Village of Hammond is governed by a three-member Village Board, including the Mayor and two Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a Dollar Store was built on South Main Street, a new Municipal Office Building is in development on Main Street, and the wastewater treatment facility was upgraded. A pavilion is currently planned. No new development has occurred in the Special Flood Hazard Area, and the

reported developments have not changed the Village's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Hammond	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	Yes	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Hammond	Notes
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	No	
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	Village is unmapped by FEMA. FEMA is working on a flood study that will generate new mapping countywide.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	Town and Village share planning board
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer (shared w/ Town of Hammond)
Floodplain Administrator	Yes	Code Enforcement Officer (shared w/ Town of Hammond)
Emergency Manager	Yes	Mayor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Worked with DANC in past
Technical Abilities		
Warning systems/services	Yes	Fire whistle, Village website
Hazard data and information	Yes	Compiled for HMP update
Grant writing	Yes	Work with USDA, County, or consultants
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Hammond	Notes
Community Development Block Grant	No	
Other federal funding programs	Yes	Recently updated sewer system with USDA RD
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Website, fire prevention programs open to public as well as school
Natural disaster or safety related school programs	Yes	Fire department works with school
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include State Highway 37, Lake St/County Route 6, and St Lawrence Ave (goes to Rt 12). The Village’s emergency shelter locations are summarized in Table 2, below. In addition to the Village’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Hammond Central School	51 S Main St, Hammond, NY 13646	Hammond CSD	Yes	Yes	Yes	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Hammond based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - School parking lot- 51 S Main St, Hammond, NY 13646
 - Fire Department parking lot- 301 Lake Street, Hammond, New York 13646
 - FFA Fairgrounds
- **Potential Permanent Housing Locations**
 - No locations identified in Village. Potentially privately owned vacant properties in the Town of Hammond if owners were willing to sell or subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Vulnerability Rank	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	1	2	Moderate	5
Ice Jam	2	2	2	1	Moderate	6
Flood	2	2	2	1	Moderate	7
Drought	3	1	1	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Infestation	2	1	1	1	Low	10

4.2 Critical Facilities

Critical facilities include any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Hammond. Table 5, below, denotes the types and locations of critical facilities within the Village.

Type	Facility Name	Address	Located in Floodplain*
Educational Facilities	Hammond Central School	51 S Main St, Hammond, NY 13646	No
Municipal Services	Village Hall	301 Lake Street, Hammond, New York 13646	No
Public Utilities	Wastewater Treatment Facility	Lake Street, Hammond, NY 13646	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA’s High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place.

Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Village of Hammond.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Hammond. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the brook in the center of the Village are likely to experience increased flooding occurrences.

The Village of Hammond chose not to profile landslide or wildfire in their annex even though these events were profiled for the County. The Village does not have a history of landslides or undeveloped areas that are vulnerable to wildfires. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards do not have historical records, but they were included for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 37, Lake Street (County Route 6), and St. Lawrence Avenue) would be most impactful to Village residents. Storm damages would impact the high-density developed portions of the Village, generally along Main Street and adjacent residential streets.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. One of these events occurred in the Village of Hammond. This event was a thunderstorm that involved winds at a magnitude of 50 knots on 9/10/2016. Estimated damages for the Village of Hammond were \$5,000. Actual damages were likely greater than those estimated by the NCDC. The Village reported that past high wind events have caused significant tree damage throughout the Village. The NCDC has not reported any tornadoes in St. Lawrence County since 2010.

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Ice Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Hammond is susceptible to damages from an ice storm event. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 37, Lake Street (County Route 6), and St. Lawrence Avenue) would be most impactful to Village residents. Storm damages would impact the high-density developed portions of the Village, generally along Main Street and adjacent residential streets.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Village of Hammond lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Hammond. The Village reported that the

most substantial ice storm occurred in 1998, which caused significant damages.

5.2.4 *Future Potential Impacts*

The Village of Hammond will continue to experience ice storm events in the future. The Hammond Department of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Village of Hammond is susceptible to damages from a severe winter storm event. The Hammond Department of Public Works clears Village streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 37, Lake Street (County Route 6), and St. Lawrence Avenue) would be most impactful to Village residents. Storm damages would impact the high-density developed portions of the Village, generally along Main Street and adjacent residential streets.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

The Village of Hammond has been affected by a number of severe winter storm events reported for the County, described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Hammond.

5.3.4 *Future Potential Impacts*

The Village of Hammond will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 37, Lake Street (County Route 6), and St. Lawrence Avenue) would be most impactful to Village residents. Storm damages would impact the high-density developed portions of the Village, generally along Main Street and adjacent residential streets.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Hammond were reported for this event.

5.4.4 *Future Potential Impacts*

The Village of Hammond is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Extreme Temperatures

5.5.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Village of Hammond is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.5% of the population in the Village is under 5 years old, and 16.5% of the population is over 65 years old. Approximately 19.0% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two extreme cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Hammond lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Hammond.

5.5.4 *Future Potential Impacts*

The Village of Hammond will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 Ice Jam

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the tributary of Black Lake in the Village are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

There are no USACE CRREL records of an ice jam occurring specifically in the Village of Hammond, however, local records indicate that ice jams occur annually along the tributary of Black Lake that flows through the Village. The Village recently constructed a retaining wall along the stream which has reduced the frequency of ice jams and related flooding. In the past, the Village had to break up ice hourly in order to prevent flooding during ice jam events.

5.6.4 *Future Potential Impacts*

Properties along the tributary of Black Lake in the Village are vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Flood

5.7.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by a tributary

of Black Lake, which flows through the center of the Village. The Village of Hammond is not mapped by existing FEMA flood insurance rate maps. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Village of Hammond that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 6. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Village of Hammond Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
374 acres	0%	0%

5.7.3 Historical Hazard Occurrences and Damage Estimates

According to the NCDC, no flood records were noted to specifically impact the Village of Hammond since 2010. However, local records reported occurrences of flooding where the tributary of Black Lake runs through the center of the Village. Mill Street is particularly susceptible to flooding. The Village is unmapped by FEMA and does not participate in the National Flood Insurance Program (NFIP). There are no repetitive loss properties in the Village.

5.7.4 Future Potential Impacts

Properties along the tributary of Black Lake in the Village are vulnerable to flooding. The Village of Hammond is not within a mapped 100-year floodplain according to the HAZUS flood model.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Village does not have a municipal water system. Residents rely on private wells and may be susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Village of Hammond. The Village reports a drought a few years ago involving the need for a couple people to drill new wells; however, droughts are not common in the Village. Residents that rely on private wells and agricultural lands (limited within the Village), would be most susceptible to a drought event.

5.8.4 Future Potential Impacts

The entire Village of Hammond remains susceptible to a drought event, and agricultural lands and residences that are not connected to public water are the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Village's overall vulnerability to an earthquake is low, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

There have been two earthquakes reported in St. Lawrence County between 2010 and 2021. According to the USGS Earthquake Catalog, there are no historical records of earthquakes occurring specifically in the Village of Hammond. The Village reports some small events in the past from local records. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to earthquakes.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The primary concern regarding an infestation in the Village of Hammond is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village of Hammond (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Village of Hammond, however, it has been detected in the northern portion of the Town of Hammond which surrounds the Village. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Village in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. The Village does not have any current issues with the emerald ash borer, but is coordinating with the County to implement proactive management strategies. An infestation has the potential to cause thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Village of Hammond remains susceptible to an infestation event. Given the Village's location, the emerald ash borer is likely to migrate to the Village over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Hammond currently does not participate in the NFIP. The Village does not have Flood Insurance Rate Maps issued by FEMA. The Village does not typically experience significant flooding that leads to property damages. There are no repetitive loss properties in the Village.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed two mitigation actions in the 2015 St. Lawrence County HMP, and status updates are provided in Table 7, below. The Village’s former actions were not re-included for the HMP update.

Table 7. Hazard Mitigation Action Progress Village of Hammond				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Installation of a generator for the Town Barn will insure that power outages will not limit the capabilities of this facility. A generator at the fueling depot at bus garage will provide power to fuel Town and Village vehicles, when power is down. A generator at the Town fire hall will provide a shelter location in the event of extended power outages.	Ice storms, severe winter storm, severe storm, utility failure	1	Town/Village of Hammond Board	Partially completed. Upgrade of fueling depot recently completed that included addition of a generator. This facility is shared by the school, fire department, and Town. Town Barn still lacks generator. This action was re-included by the Town of Hammond for the HMP update.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm, Severe storm	1,2,3	Village and Town Highway and Public Works Departments	Routine responsibility for DPW that is adequately addressed (Town and Village share DPW). Formal plan is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Village proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Village of Hammond									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Hammond V1	Install generator and air conditioning at Village Hall	All	Hammond Village Board*	Continuity of Operations Plan	5 years	Existing	\$25,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Hammond V2	Expand air conditioning at school to improve use as a cooling center	Extreme Temperatures	Hammond CSD*, Hammond Village Board	Comprehensive Plan	5 years	Existing	\$50,000	School District Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
<p>Potential Funding Sources</p> <p>DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration</p> <p>FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities</p> <p>USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program</p>									

7.3 Cost-Benefit Analysis

Each of the Village’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village’s STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Hammond
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Mitigation Action Worksheet

Project Name:	Install generator and air conditioning at Village Hall
Project ID:	Hammond V1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Village Hall is a critical community facility and does not currently have a backup generator. The Village also does not have a designated cooling station that residents could use during heat waves.

Action of Project Intended for Implementation

Description of the Solution:	The installation of a generator at the Village Hall would ensure that the Village can continue critical functions during a power outage. Installation of air conditioning at this facility would allow it to be used as a cooling center during heat wave events.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$25,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Hammond Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Continuity of Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No improvements from existing conditions
	Purchase portable generators and/or air conditioning units	\$10,000	Portable units would offer more flexibility, but may not power/cool entire facility and require additional coordination for usage
	Install generator and air conditioning at Village Hall	\$25,000	Offers greatest protection for Village Hall and improves its use as a shelter and cooling center

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Hammond
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Mitigation Action Worksheet

Project Name:	Expand air conditioning at school to improve use as a cooling center
Project ID:	Hammond V2

Risk/Vulnerability

Hazard of Concern:	Extreme Temperatures
Description of the Problem:	The school does not currently have air conditioning in all rooms. Heat waves are occurring more frequently in the County, particularly earlier in the summer and later into the early fall, when school is in session. Young children may be more vulnerable to heat-related stressors. Additionally, all residents do not have air conditioning at home and a cooling center would help prevent heat stroke or other medical concerns.

Action of Project Intended for Implementation

Description of the Solution:	Work with Hammond CSD to expand air conditioning to protect students and other Village residents during heat wave events.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved ability for Town to provide a cooling center during heat waves.
Useful Life:	Long-term		
Estimated Cost:	\$50,000		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	School District Budget, DASNY-SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Hammond CSD*, Hammond Village Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No improvements from existing conditions
	Purchase portable air conditioning units for classrooms	\$15,000	Portable units would offer more flexibility, but would not cool entire facility and would require additional coordination for usage
	Expand air conditioning at school to improve use as a cooling center	\$50,000	Offers most protection for students and improves the school's use as a cooling center for Town residents

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Hammond V1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Hammond V2	+	+	+	+	0	0	0	0	+	0	Medium	Medium	2

Jurisdictional Annex

Town of Hermon

1. Contacts

The contacts for the Town of Hermon regarding this plan are identified as follows:

- Art Baker – Town Supervisor
Address: 109 Church Street, Hermon, NY 13652
Phone: (315) 347-3606
Email: supervisor@hermonny.org
 - Michael McQuade – Codes Officer
Address: 109 Church Street, Hermon, NY 13652
Phone: (315) 347-3606
Email: hermoncodes@hermonny.org
- Website: <https://www.hermonny.org>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 1,074 people live in the Town of Hermon. The Town's population has decreased by 3.1% since the 2010 Census (1,108) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Hermon is located in the central portion of St. Lawrence County and is bordered by the Town of De Kalb to the north, Gouverneur to the west, Fowler and Edwards to the south, and Russell to the east. Hermon is easily accessed from County Route 20, County Route 21, and County Route 17

2.3 Governing Body

The Town of Hermon is governed by a five-member town board, including the Supervisor and four board members. The former Village of Hermon was dissolved into the Town in 2016.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the Town converted the former fire hall to a new Town Hall and constructed a new fire hall in 2016. Additionally, the Town is currently in the planning stages of municipal sewer and water system improvements projects. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Hermon	Notes
Plans		
Comprehensive Plan	Yes	In place (2016)
Capital Improvement Plan	Yes	In place
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	Yes	
Stormwater Management Plan	Yes	For water/sewer projects
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Fire Protection Plan	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Hermon	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	Yes	
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	Former Village of Hermon has FEMA FIRM mapping, but remainder of Town is unmapped.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	No	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor and Highway Superintendent
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Hermon	Notes
Technical Abilities		
Warning systems/services	Yes	Fire Department and Highway Department
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	In place
HAZUS analysis	Yes	Completed for HMP update countywide
Funding Resources		
Capital improvements project funding	Yes	In place
Authority to levy taxes for specific purposes	Yes	In place
Fees for water, sewer, gas, or electric services	Yes	Water and Sewer
Impact fees for new development	Yes	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	In place
Incur debt through private activities	No	
Community Development Block Grant	Yes	In place
Other federal funding programs	Yes	B&L submitted for water and sewer
State funding programs	Yes	In place
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Program in place – Website regularly updated. Facebook page
Natural disaster or safety related school programs	Yes	In place
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include County Route 20, County Route 21, and County Route 17. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Hall	1650 County Rd 21, Hermon, NY 13652	Hermon Volunteer Fire Dept.	Yes	Yes	No	Kitchen, community room space, bathrooms, no generator)
Hermon-De Kalb Central School	709 E De Kalb Road, De Kalb	Hermon-DeKalb CSD	Yes	Yes	No	-

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Hermon based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Undeveloped land around Fire Hall (1650 County Rt 21)
 - Town property near salt barn
- **Potential Permanent Housing Locations**
 - No Town-owned properties identified. Potentially privately owned vacant properties in Town if owners were willing to sell or subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town review multiple hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/ Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Ice Jam	2	2	2	1	Moderate	6
Extreme temperatures	3	1	1	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Wildfire	2	3	1	1	Moderate	9
Infestation	2	1	2	2	Moderate	10
Earthquake	2	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Hermon. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Library	105 Main Street, Hermon, NY 13652	No
EMS/Fire Department	Hermon Volunteer Fire Department	1650 Co Rd 21, Hermon, NY 13652	No
Municipal Services	Hermon Town Hall	109 Church St, Hermon, NY 13652	No
Municipal Services	Salt Barn	Near WWTP	No
Municipal Services	Town of Hermon Highway Department	109 Church St, Hermon, NY 13652	No
Public Utilities	Spring Site	off Washington St (in Town of Russell)	No
Public Utilities	Town of Hermon Water System	-	-
Public Utilities	Wastewater Treatment Facility	off Water St, Hermon NY	500YR
Public Utilities	Water Tower	High St, Hermon, NY 13652	No
Public Utilities	Water Treatment Plant	Washington St, Hermon, NY 13652	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Hermon.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Hermon. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along Elm Creek, Tanner Creek, and Carter Creek are likely to experience increased flooding occurrences.

The Town of Hermon chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 17, 20, and 21) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlet of Hermon (the former Village of Hermon).

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. None of these records were located in the Town of Hermon. The NCDC also has no records of tornadoes affecting the Town since 2010. Although there are no specific NCDC records, local records indicate that the Town experiences severe storms regularly, about once a year.

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Ice Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Hermon is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 17, 20, and 21) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlet of Hermon (the former Village of Hermon).

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC does not have specific information on which towns were affected by ice storms, as these events are reported at the County level. Since 1998, three ice storms were reported in the southern portion of St. Lawrence County where the Town of Hermon lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Hermon.

5.2.4 *Future Potential Impacts*

The Town of Hermon will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. Severe winter storms typically affect more than one area within the County. The entire Town of Hermon is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 17, 20, and 21) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlet of Hermon (the former Village of Hermon).

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Hermon has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDC does not report any winter storm damage estimates specific to the Town of Hermon.

5.3.4 *Future Potential Impacts*

The Town of Hermon will continue to experience severe winter storm events in the future. Severe winter storms are common throughout St. Lawrence County and occur about sixteen (16) times annually. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 17, 20, and 21) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlet of Hermon (the former Village of Hermon).

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Hermon were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Hermon is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by Elm Creek, Tanner Creek, and Carter Creek which drain to Harrison Creek. FEMA provides flood insurance rate maps for the former Village of Hermon limits (which was dissolved into the Town of Hermon in 2016). The remaining portion of the Town is unmapped by existing FEMA flood insurance rate maps. FEMA does not currently have digital floodplain data available for St. Lawrence County, and is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Town of Hermon that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 6. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Hermon Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
34,678 acres	0.5%	0.08%

5.5.3 Historical Hazard Occurrences and Damage Estimates

There are no NCDC flood records for the Town of Hermon, however, local records indicate that road washouts were caused by flash flooding during

summer 2019. The floods were caused when beaver dams breached along Elm Creek.

As described in Section 6.0 of this annex, no NFIP loss claims have been filed as of October 2021 in the Town of Hermon (including the former Village of Hermon). There are no repetitive loss properties in the Town of Hermon.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Town, including Elm Creek, Tanner Creek, and Carter Creek are vulnerable to flooding. About 0.5% of the Town of Hermon is within a mapped 100-year floodplain.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along Elm Creek, are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

There are no USACE CRREL or local records of ice jams occurring in the Town of Hermon. This hazard was included in this annex for future mitigation planning consideration. No damage estimates related to ice jams are reported specific to the Town.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along Elm Creek remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Extreme Temperatures

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. Extreme temperatures typically affect most or all of the County. The entire Town of Hermon is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 7.1% of the population in the Town is under 5 years old, and 19.8% of the population is over 65 years old. Approximately 9.9% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Hermon lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Hermon.

5.7.4 *Future Potential Impacts*

The Town of Hermon will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town (generally the former Village limits) are served by municipal water, but others in the Town rely on private wells and may be susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Hermon. The Town supplies municipal water to some residents (generally within the limits of the former Village). Properties that rely on private wells and agricultural lands (mostly in the northern portion of the Town), would be most susceptible to a drought event.

5.8.4 Future Potential Impacts

The entire Town of Hermon remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Wildfire

5.9.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.4 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The southwestern corner of the Town is mapped with a higher wildfire density during this time period (0.9 to 1.3 fires per square mile). The NYSDEC map also shows two wildfires greater than 10 acres in size that occurred along the eastern border of the Town (on the St. Lawrence/Franklin County boundary). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

The entire Town of Hermon remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Hermon is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are

vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Hermon (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Hermon, however, it has been detected in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Hermon in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Town of Hermon remains susceptible to an infestation event. The emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.11 Earthquake

5.11.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. There have been two earthquakes reported in St. Lawrence County between 2010 and 2021. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.11.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there are no historical records of earthquakes occurring specifically in the Town of Hermon. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Hermon currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Town of Hermon (including claims filed within the former Village of Hermon). There are no repetitive loss properties in the Town of Hermon. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed two mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 7, below. None of the Town’s 2015 mitigation actions were re-included for the 2021 update.

Table 7. Hazard Mitigation Action Progress <i>Town of Hermon</i>				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
The Historic Bridge which carries Main Street over Elm Creek should be replaced or rehabilitated as needed. If this structure were to be washed out by flooding parts of the Town would be cut off.	Structural collapse, flood	1,2,3	Town of Hermon	Completed in 2020.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm, severe storm	1,2,3	Village and Town Highway and Public Works Departments	Routine responsibility of highway department that is adequately addressed, formal plan is not a high priority at this time. The Town has implemented more proactive debris management practices and is paying more attention to road shoulder work. Culverts are upsized as needed to improve drainage.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions for the HMP update and one preparedness action. The preparedness action (Hermon 3) was included because it relates to resident communication during hazard events, which is a priority for the Town. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Town of Hermon									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Hermon 1	Water system improvements project	Drought	Hermon Town Board*	Comprehensive Plan	5 years	Existing	\$	Town Budget, NYSEFC - DWSRF; USDA RD Water & Waste Disposal; NYSOCR CDBG	1
Hermon 2	Install generator for the Fire Hall, Town Hall, and Library	All	Hermon Fire Dept*, Hermon Town Board*	Comprehensive Plan	5 years	Existing	\$45,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Hermon 3 (Preparedness)	Develop a communication plan for vulnerable residents who don't have access to a computer or cell phone	All	Hermon Town Board*	Comprehensive Plan	1 year	N/A	\$1,000	Town Budget	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEFC DWSRF: https://efc.ny.gov/dwsrf NYSOCR CDBG: https://hcr.ny.gov/community-development-block-grant USDA RD Water & Waste Disposal: https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ny USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Hermon
------------------------------	-----------------------

Mitigation Action Worksheet

Project Name:	Water system improvements project
Project ID:	Hermon 1

Risk/Vulnerability

Hazard of Concern:	Drought
Description of the Problem:	The Town has a municipal water system that serves the former Village of Hermon. The Town also supplies the neighboring Town of De Kalb with water. The Town's system was originally constructed in the 1890s, and most components have surpassed their useful lives and are in need of replacement. In addition, the distribution system contains undersized water mains and lead service laterals and does not provide adequate fire flows. Finally, several system components have no redundancy, and the system has no water meters. Water meters are needed to improve the Town's ability to detect leaks and monitor water usage. Other improvements are needed to improve the resiliency of the system.

Action of Project Intended for Implementation

Description of the Solution:	The proposed project includes connection of the water system to an additional existing spring (Spring No. 5), repairs to the existing raw water supply pipe, construction of a new raw water supply pipe from the spring site to the Water Treatment Plant (WTP), and rehabilitation of the existing WTP. In addition, the Town's existing, decommissioned water tower will be demolished, and all existing water distribution mains will be replaced and water meters will be installed at each property within the District. New water main may also be installed in order to eliminate dead ends in the distribution system.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Adding meters for the Town's water system would help the Town easily identify leaks and conserve water
Useful Life:	Long-term (30 years)		
Estimated Cost:	\$7.65 million		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, NYSEFC - DWSRF; USDA RD Water & Waste Disposal; NYSOCR CDBG
Responsible Organization:	Hermon Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Install master water meters that cover multiple properties	High	Provides general locations of leaks or excessive usage but more difficult to determine specific locations
	Install water meters for all properties connected to Town water system and complete additional system improvements	\$7.65 million	Most comprehensive approach for analyzing water system usage and implementing additional conservation measures when needed.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Hermon
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Mitigation Action Worksheet

Project Name:	Install generator for the Fire Hall, Town Hall, and Library
Project ID:	Hermon 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Fire Hall, Town Hall, and Library are all critical community facilities that currently lack a backup generator. The Fire Hall is one of the Town's emergency shelter locations. The Town Hall serves as a potential shelter location and provides critical services. The Library is a shared facility with Hermon Family Health Care which provides critical services to residents.

Action of Project Intended for Implementation

Description of the Solution:	Install generators at each facility to ensure continuity of emergency services and shelter operations during a power outage.
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Is this project related to a Critical Facility? Yes **X** No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$45,000 (\$15K each building)		

Plan for Implementation

Prioritization:	Fire Hall - High Town Hall – Medium/Low Library- Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$20K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at each facility	\$45K (\$15K each)	Offers maximum protection for each facility

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Hermon
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Mitigation Action Worksheet

Project Name:	Develop a communication plan for vulnerable residents who don't have access to a computer or cell phone
Project ID:	Hermon 3 (Preparedness)

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town has a website and Facebook page that they routinely use to share information with residents. Alerts are also sent to cell phones. However, some residents do not have cell phones or internet/computer access, and the Town does not currently have a plan in place to reach these residents during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Develop a communication plan that outlines steps for Town staff to take to reach vulnerable residents during an emergency event. Maintain list of residents to directly reach out to, and update annually.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Town more easily able to reach vulnerable residents before, during, and after a disaster event.
Useful Life:	Short-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget
Responsible Organization:	Hermon Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions.
	Rely on other agencies (Arc, Meals on Wheels, County Office for Aging, etc.) to contact vulnerable individuals	Low	Other agencies may be involved depending on the event, but adds another layer of communication/complexity. All vulnerable residents may not be reached by other agencies.
	Develop a communication plan for vulnerable residents	\$1,000	Allows Town to take more control over communication process and ensure all residents are reached

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Hermon 1	+	0	0	+	+	-	0	0	+	-	High	High	1
Hermon 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Hermon 3	+	+	0	+	+	+	0	+	+	+	Low	Low	3

Jurisdictional Annex

Village of Heuvelton

1. Contacts

The contacts for the Village of Heuvelton regarding this plan are identified as follows:

- Barbara Lashua – Mayor
Address: 51 State Street, Heuvelton, NY 13654
Phone: (315) 344-2214
Email: blashua@twcny.rr.com; villageclerk@heuveltonny.com
- Tim Murray – DPW Supervisor
Address: 51 State Street, Heuvelton, NY 13654
Phone: (315) 344-2214

Village Website: <http://www.heuveltonny.com/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 722 people live in the Village of Heuvelton, which represents a population increase of 1.1% since the 2010 Census (714). (U.S. Census Bureau, 2021).

2.2 Location

The Village of Heuvelton is located within the Town of Oswegatchie in northeastern portion of St. Lawrence County. Heuvelton is easily accessed from State Highway 812 and Lisbon Street.

2.3 Governing Body

The Village of Heuvelton is governed by a five-member Village Board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a building was demolished on Main Street and converted to a parking lot. Four properties also have been developed on Main Street. An ongoing restoration project at Pickens Hall (83 N State Street) is nearly complete. A private solar array project off of Taylor Road is currently in the planning stages, and a Credit Union is planned to be constructed adjacent to Pickens Hall. Lastly, the Village is planning to construct a pavilion at their boat launch site. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Village’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Heuvelton	Notes
Plans		
Comprehensive Plan	Yes	Older, but in place
Capital Improvement Plan	Yes	Older, but in place
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Heuvelton	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	4 for ½ residential; 3 for commercial/industrial properties
Fire department ISO rating	Yes	5 within Village; 9 within five miles of the Village; 10 outside of that five-mile radius
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA working on update for County
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Mayor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Work with DANC
Technical Abilities		
Warning systems/services	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Heuvelton	Notes
Hazard date and information	Yes	Documented for HMP update
Grant writing	Yes	No within Village; work with engineers and DANC
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	Also fees for outside user hookups
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	Solar development proposed at sludge spreading field Village will have revenue from solar community (Community Solar)
Incur debt through private activities	No	
Community Development Block Grant	Yes	Have used in the past
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Facebook page (community page) and Village website
Natural disaster or safety related school programs	Yes	Fire department works with school;
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include NY-812 and Lisbon Street. The Village’s emergency shelter locations are summarized in Table 2, below. The

St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Hall	95 State Street, Heuvelton, NY 13654	Village of Heuvelton	Yes	Yes	No	Back power available
Heuvelton Central School	87 E Washington St, Heuvelton, NY 13654	Heuvelton CSD	Yes	Yes	No	

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Heuvelton based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Village boat launch area – Lisbon Street, Heuvelton, NY 13654
 - School ball field/parking lots - 87 E Washington St, Heuvelton, NY 13654
 - Frary’s Monuments – Annette Street, Heuvelton, NY 13654
 - Village lot – Main Street
- **Potential Permanent Housing Locations**
 - Village property off Taylor Road
 - Potentially privately owned vacant properties in adjoining Town of Oswegatchie if owners are willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village’s natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor’easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Ice Jam	2	2	2	1	Moderate	6
Flood	2	2	1	2	Moderate	7
Earthquake	2	3	1	1	Moderate	8
Drought	3	1	1	1	Moderate	9
Infestation	2	1	2	1	Moderate	10

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Heuvelton. Table 5, below, denotes the types and locations of critical facilities within the Village.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Educational Facilities	Heuvelton Central School	87 Washington St, Heuvelton, NY 13654	No
EMS/Fire Department	Heuvelton Volunteer Fire Department	95 State St., Heuvelton, NY 13654	No
Municipal Services	Oswegatchie Town Hall	51 North State Street, Heuvelton, NY 13654	No
Municipal Services	WWTP/DPW Facility	51 N State St, Heuvelton, NY 13654	No
Public Utilities	Municipal Water System	-	-
Public Utilities	Sewer Lift Station	101 Horseshoe Rd	No
Public Utilities	Sewer Lift Station	2 State St	No
Public Utilities	Sewer Lift Station	32 Wilson St	No
Public Utilities	Sewer Lift Station	74 Water St	No
Public Utilities	Wastewater Treatment Facility	101 Horseshoe Rd, Heuvelton, NY 13654	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams is located in the Village of Heuvelton, and is a

hydropower dam owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Table 6. Intermediate and High-Hazard Potential Dams <i>(NYSDEC, 2021)</i>						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Heuvelton Dam	B	Oswegatchie River	Erie Boulevard Hydropower (Brookfield Renewable)	1.0	5/31/2019	6/14/1995

**Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.*
***Capacity information obtained from Natural Resources Canada, 2021*

The Village did not indicate any concerns regarding the dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Village and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Heuvelton. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River are likely to experience increased flooding occurrences.

The Village of Heuvelton chose not to profile landslide or wildfire in their annex even though these hazards were profiled for the County. The Village does not have a history of these hazards nor do they have any significant concerns regarding them. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 812 and Lisbon Street) would be most impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, generally on the northern side of the Oswegatchie River.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Four of these events occurred in the Village of Heuvelton. One of these records was a hail event, and the rest were thunderstorm winds. Estimated damages for the Village of Heuvelton ranged from \$0 to \$10,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes since 2010.

Table 7. Severe Storm Event Records for the Village of Heuvelton				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/23/2012	50 knots	\$10,000	-
Thunderstorm Wind	7/19/2013	50 knots	\$10,000	-
Hail	7/18/2016	0.75 in.	\$0	-
Thunderstorm Wind	7/20/2021	52 knots	\$10,000	-
Total			\$30,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Heuvelton is susceptible to damages from an ice storm event. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 812 and Lisbon Street) would be most impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, generally on the northern side of the Oswegatchie River.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Since 1998, the NCDC reported four ice storms were reported in the northern portion of St. Lawrence County where the Village of Heuvelton lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Heuvelton.

5.2.4 *Future Potential Impacts*

The Village of Heuvelton will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Village Department of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Village of Heuvelton is susceptible to damages from a severe winter storm event. The Town of Oswegatchie Highway Department is responsible for snow removal on Village streets. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 812 and Lisbon Street) would be most impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, generally on the northern side of the Oswegatchie River.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

The Village of Heuvelton has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These

storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Heuvelton.

5.3.4 Future Potential Impacts

The Village of Heuvelton will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Village is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 812 and Lisbon Street) would be most impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, generally on the northern side of the Oswegatchie River.

5.4.3 Historical Hazard Occurrences and Damage Estimates

Nor'easters occur infrequently (once every few years) in the Village of Heuvelton. The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Heuvelton were reported for this event.

5.4.4 *Future Potential Impacts*

The Village of Heuvelton is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Extreme Temperatures**

5.5.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Village of Heuvelton is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 3.3% of the population in the Village is under 5 years old, and 11.6% of the population is over 65 years old. Approximately 8.4% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Heuvelton lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Heuvelton.

5.5.4 *Future Potential Impacts*

The Village of Heuvelton will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme

temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 Ice Jam

5.6.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Village is moderately vulnerable to ice jams, as documented in their hazard analysis in Section 4.1. Properties along the Oswegatchie River within the Village of Heuvelton are vulnerable to ice jams.

5.6.3 Historical Hazard Occurrences and Damage Estimates

There are no USACE CRREL records of an ice jam occurring specifically in the Village of Heuvelton. No damage estimates related to ice jams are reported specifically for the Village. Local records report potential ice jam issues for the bridge that crosses the Oswegatchie River, especially when the water level is high.

5.6.4 Future Potential Impacts

Properties along the Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Flood

5.7.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Village is moderately vulnerable to flooding, as documented in their hazard analysis in Section 4.1. The Village is generally drained by the Oswegatchie River and its tributaries which drains to the St. Lawrence River. FEMA provides flood insurance rate maps for the Village of Heuvelton, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Village of Heuvelton that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Village of Heuvelton Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
556 acres	14.4%	0.46%

5.7.3 Historical Hazard Occurrences and Damage Estimates

According to the NCDC, no flood records were noted to specifically impact the Village of Heuvelton since 2010. Local records indicate that flooding has occurred along the Oswegatchie River. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Village of Heuvelton. There are no repetitive loss properties in the Village.

5.7.4 Future Potential Impacts

Properties along streams throughout the Village, including the Oswegatchie River and its tributaries are vulnerable to flooding. About 14.4% of the Village of Heuvelton is within a mapped 100-year floodplain.

5.8 Earthquake

5.8.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Village is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.8.3 Historical Hazard Occurrences and Damage Estimates

There have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these USGS historical records occurred in the Village of Heuvelton, and there are no local records of earthquakes for the Village. Regardless, this hazard was included for future mitigation planning considerations. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to earthquakes.

5.9 Drought

5.9.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Village of Heuvelton is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. The Village is served by a municipal water system, which reduces residents' vulnerability to droughts compared to other areas in the County that rely on private wells.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reports no specific drought events for the Village of Heuvelton or the rest of St. Lawrence County since 2010. There are no specific damage estimates for the Village related to a drought.

5.9.4 Future Potential Impacts

The entire Village of Heuvelton remains susceptible to a drought event, and agricultural lands and residences that are not connected to public water are the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Village is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village of Heuvelton is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village of Heuvelton (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Village of Heuvelton, however, it has been detected in nearby municipalities (City of Ogdensburg, Town of De Peyster, and Town of Morristown). The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Village of Heuvelton in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. The Village reports that the Village Cemetery has old trees, and the street backs up to cemetery, so there is potential for damage. An infestation has the potential to cause thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Village of Heuvelton remains susceptible to an infestation event. Given the Village's location, the emerald ash borer is likely to migrate to the Village over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Heuvelton currently participates in the NFIP. As of October 2021 no NFIP loss claims have been filed in the Village of Heuvelton. There are no repetitive loss properties in the Village. The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed four mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. None of the Village’s 2015 mitigation actions were re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Village of Heuvelton				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Blight, infestation, ice storm, tornado, severe winter storm, and severe storm	1,2,3	Village of Heuvelton Department of Public Works	Department of Public Works takes care of this. Village is also very aggressive about taking care of tree maintenance pre-emptively
Reevaluate existing policies for evacuation, provision of heat, food, shelter with local school district and fire department.	Severe winter storm, severe storm, ice storm, and tornado	1	Village Heuvelton Department of Public Works	No progress to date. Not a high priority at this time.
Develop a strategic plan that makes provisions for mutual aid between departments, in the event of a wide-spread disaster that would render the Route 812 Bridge impassable. The Heuvelton Volunteer Fire Department is located on the south side of the bridge.	Flood, ice jam, and severe storm	1,2,3	Village of Heuvelton	No specific plan developed, but mutual aid agreements are in place with various entities.
Design and engineer a plan to install curbing and additional storm drains at strategic locations through the Village. Reducing the occurrences of washouts, and over taxing of waste water treatment plant. Apply for additional funds finance the project.	Flood	2	Village of Heuvelton Department of Public Work	Stormwater improvements not progressed yet; however, the Village is progressing a sewer system improvements project that will decommission their wastewater treatment plant. Sanitary waste will be conveyed to the City of Ogdensburg for treatment, which will reduce system operating costs for the Village.

7.2 Proposed Mitigation Actions

The Village proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Village of Heuvelton									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Heuvelton 1	Install generator at municipal building (joint facility with Town of Oswegatchie)	All	Heuvelton Village Board*, Oswegatchie Town Board	Capital Improvement Plan	5 years	Existing	\$15,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Heuvelton 2	Install generator at department of public works shop	All	Heuvelton DPW* and Village Board	Capital Improvement Plan	5 years	Existing	\$15,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Heuvelton 3	Boat launch improvements (structural integrity, better access for emergency response)	Flood	Heuvelton Village Board*	Comprehensive Plan	5 years	Existing	High	Village Budget, FEMA- BRIC	3
<p>Potential Funding Sources</p> <p>DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration</p> <p>FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities</p> <p>USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program</p>									

7.3 Cost-Benefit Analysis

Each of the Village’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Heuvelton
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Mitigation Action Worksheet

Project Name:	Install generator at municipal building (joint facility with Town of Oswegatchie)
Project ID:	Heuvelton 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The municipal building (which is a joint facility with the Town of Oswegatchie) currently lacks a backup generator. The municipal building is a critical community facility.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the municipal building to ensure continuity of operations during a storm event for both the Village and Town.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Heuvelton Village Board*, Oswegatchie Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Village facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at municipal building	\$15-20K	Offers maximum protection for municipal building

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Heuvelton
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Mitigation Action Worksheet

Project Name:	Install generator at department of public works shop
Project ID:	Heuvelton 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Village DPW shop currently lacks a backup generator. The Village DPW operates out of this facility.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the DPW shop to ensure that the DPW can continue to provide critical community services during a power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Heuvelton DPW* and Village Board	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Village facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at DPW Shop	\$15-20K	Offers maximum protection for DPW Shop

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Heuvelton
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Mitigation Action Worksheet

Project Name:	Boat launch improvements (structural integrity, better access for emergency response)
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Project ID:	Heuvelton 3
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Risk/Vulnerability

Hazard of Concern:	Flood
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Description of the Problem:	The Village boat launch on the Oswegatchie River is used for a variety of recreational functions as well as emergency response access to the River. The boat launch and docks are in need of structural improvements to improve their resiliency to flooding and improve access for emergency response boats.
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Action of Project Intended for Implementation

Description of the Solution:	Reconstruct the boat launch and docks using a more resilient design that is able to handle high water and flood events. Improved structural integrity will also improve emergency response access.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood/ice jam damages to boat launch
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, FEMA- BRIC
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Responsible Organization:	Heuvelton Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Build new boat launch in different location	High	Not feasible, more costly compared to improvements and may require new property acquisition
	Improve existing boat launch	High	Most realistic option to improve resiliency of boat launch and usage for emergency response to River

Progress Report (for Plan Maintenance)

Date of Status Report:	
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Report of Progress:	
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Update Evaluation of the Problem and/or Solution:	
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Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Heuvelton 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Heuvelton 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Heuvelton 3	+	+	+	+	+	-	0	0	+	0	Medium	High	3

Jurisdictional Annex

Town of Hopkinton

1. Contacts

The contacts for the Town of Hopkinton regarding this plan are identified as follows:

- Susan Wood – Town Supervisor
Address: 7 Church Street, Hopkinton, NY 12965
Phone: (315) 328-4187 ext. 5
Email: supervisor@townofhopkinton.org

Town Website: <https://www.townofhopkinton.org/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 1,105 people live in the Town of Hopkinton. The Town's population has increased by 2.6% since the 2010 Census (1,077) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Hopkinton is located along the eastern border of St. Lawrence County and is bordered by the Town of Lawrence and Stockholm to the north, Parishville and Colton to the west, Piercefield to the south, and the Towns of Waverly and Tupper Lake (Franklin County) to the east. Hopkinton is easily accessed from NY-11B, NY-72, and County Route 49.

2.3 Governing Body

The Town of Hopkinton is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the Town constructed a new municipal building in January 2016. A Dollar General was developed in 2018. Additionally, a new fire station is in the planning stages. No new development has occurred in

the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Hopkinton	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	Yes	In place
Site plan review requirements	No	

Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	FEMA working on flood study that will generate new mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	No	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Agreement with DANC
Technical Abilities		
Warning systems/services	Yes	Website, Highway Department, Fire Department Facebook
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	Considering new fire station
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	

Other federal funding programs	Yes	
State funding programs	Yes	DASNY
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	
Ongoing public education or information program	Yes	Program in place
Natural disaster or safety related school programs	Yes	Fire Department partners with the school for fire prevention; open house for fire prevention week
Storm Ready certification	No	
Firewise Communities certification	Yes	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include NY-11B, NY-72, and County Route 49. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Town Hall	7 Church Street, Hopkinton, NY 12965	Town of Hopkinton	Yes	Yes	No	No backup power but has ability to hook up a generator
Fire Department	2876 NY-11B, Nicholville, NY 12965	Hopkinton Fire District	Yes	No	No	Backup power available
Parishville School	12 County Route 47, Parishville, NY 13672	Parishville-Hopkinton CSD	Yes	Yes	No	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Hopkinton based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Town Park
 - Private Campground
 - Field at municipal building
- **Potential Permanent Housing Locations**
 - No locations identified by Town; potentially privately owned vacant properties if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Sever Winter Storm	3	1	2	3	High	3
Flood	2	2	2	3	High	4
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	5
Ice Jam	2	2	2	1	Moderate	6
Extreme Temperatures	3	1	1	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Wildfire	2	3	1	1	Moderate	9
Infestation	3	1	2	1	Moderate	10
Earthquake	2	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Hopkinton. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
EMS/Fire Department	Hopkinton-Fort Jackson Fire Department	2876 SH 11B, Hopkinton, NY 12940	No
Municipal Services	Hopkinton Municipal Building (Command Center)	7 Church Street, Hopkinton, NY 12965	No
Municipal Services	Town Hall – Community Center	7 Church Street, Hopkinton, NY 12965	No
Municipal Services	Town of Hopkinton Highway Department	227 County Route 49, Fort Jackson, NY 12965	No
Radio Communications	White Hill Radio Tower (BOCES owned)	-	-

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place.

Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Hopkinton.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Hopkinton. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the West Branch of the St. Regis River and its tributaries are likely to experience increased flooding occurrences.

The Town of Hopkinton chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have documentation of past occurrences, but were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a storm event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 11B and 72 and County Route 49) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Hopkinton, Fort Jackson, and Lake Ozonia. The Town of Hopkinton also has a

large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Two of these events occurred in the Town of Hopkinton, one hail event and one thunderstorm wind event (frequency of about once every few years). Estimated damages for the Town of Hopkinton ranged from \$0 to \$25,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The Town also reports incidents of tree damage and debris due to high winds. No tornadoes have been reported in the Town since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	7/21/2010	1.00 in.	\$0	-
Thunderstorm Wind	7/17/2012	50 knots	\$25,000	-
Total			\$25,000	None reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Hopkinton is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 11B and 72 and County Route 49) would be most

impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Hopkinton, Fort Jackson, and Lake Ozonia. The Town of Hopkinton also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Since 1998, four ice storms were reported in the northern portion of St. Lawrence County where the Town of Hopkinton lies, which are described in Section 5.1.3 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Hopkinton.

5.2.4 *Future Potential Impacts*

The Town of Hopkinton will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one Town within the County. The entire Town of Hopkinton is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 11B and 72 and County Route 49) would be most impactful to Town residents. Storm damages would primarily impact

the more populated portions of the Town, including the hamlets of Hopkinton, Fort Jackson, and Lake Ozonia. The Town of Hopkinton also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Hopkinton has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDRC does not report any winter storm damage estimates specific to the Town of Hopkinton.

5.3.4 *Future Potential Impacts*

The Town of Hopkinton will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Flood**

5.4.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is highly vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the West Branch of the St. Regis River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Hopkinton, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood

any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Hopkinton that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Hopkinton Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
119.305 acres	1.7%	0.16%

5.4.3 Historical Hazard Occurrences and Damage Estimates

There are no NCDC flood records for the Town since 2010, however, there are local records of past floods. The Town reports a culvert washout on Fountain Road, a road washout on Jones Road, and a bridge/culvert washout on Lake Ozonia Road. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Hopkinton. There are no repetitive loss properties in the Town.

5.4.4 Future Potential Impacts

Properties along the West Branch of the St. Regis River and its tributaries are most vulnerable to flooding. About 1.7% of the Town of Hopkinton is within a mapped 100-year floodplain.

5.5 Coastal Storm (Nor'easter)

5.5.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 11B and 72 and County Route 49) would be most

impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Hopkinton, Fort Jackson, and Lake Ozonia. The Town of Hopkinton also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Hopkinton were reported for this event.

5.5.4 Future Potential Impacts

The Town of Hopkinton is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 Ice Jam

5.6.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the West Branch of the St. Regis River are vulnerable to ice jams.

5.6.3 Historical Hazard Occurrences and Damage Estimates

The Town of Hopkinton was affected by four ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering

Laboratory (CRREL) since 1911, which are described in of the County's 2015 HMP. Each ice jam occurred on the West Branch of the St. Regis River and resulted in increased water levels. The most recent ice jam was reported in 2003. No damage estimates related to ice jams are reported specific to the Town of Hopkinton.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along the West Branch of the St. Regis River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Town of Hopkinton is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 4.9% of the population in the Town is under 5 years old, and 18.7% of the population is over 65 years old. Approximately 4.0% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Hopkinton lies, which are described in Section 5.5 of the main body of the plan. No damage

estimates related to extreme temperatures are reported specific to the Town of Hopkinton.

5.7.4 Future Potential Impacts

The Town of Hopkinton will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system, therefore, Town residents rely on private wells and may be susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reports no specific drought events for the Town of Hopkinton. There are no specific damage estimates related to droughts for the Town.

5.8.4 Future Potential Impacts

The entire Town of Hopkinton remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 **Wildfire**

5.9.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0 to 0.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The northern third of the Town is mapped with a higher wildfire density during this time period (0.4 to 1.3 fires per square mile). The NYSDEC map also shows one wildfire greater than 10 acres in size that occurred in the southern portion of the Town.

5.9.4 *Future Potential Impacts*

The entire Town of Hopkinton remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 **Infestation**

5.10.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Hopkinton is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Hopkinton (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Hopkinton, however, it has been detected in several municipalities to the north and west of Hopkinton. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Hopkinton in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Town of Hopkinton remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.11 Earthquake

5.11.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location

within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.11.3 Historical Hazard Occurrences and Damage Estimates

There have been two earthquakes reported in St. Lawrence County between 2010 and 2021 according to the USGS Earthquake Catalog. None of these records were reported specifically in the Town of Hopkinton, and there are no local earthquake records for the Town. Regardless, this hazard was included in this annex for future mitigation planning consideration. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Hopkinton currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Town of Hopkinton. There are also no repetitive loss properties. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed five mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. One of the Town's 2015 actions was re-included for the 2021 update.

Table 8. Hazard Mitigation Action Progress Town of Hopkinton				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Designate an Emergency Operations Center (EOC), to provide assistance and information to the residents in the event of a severe ice/ winter storm. Disaster plans will delegate manpower to assist in shelters, transportation, maintaining roads and other miscellaneous emergency requirements. Fire and EMS personnel need to be on standby for additional services.	Severe winter storms, and ice storms	1	Town of Hopkinton Supervisor	Complete, the municipal building is the designated EOC.
Install larger culverts in problem areas as needed. Inspections during high precipitation events will be used to identify problem areas. Detailed record keeping will help to track of flood history within the Town.	Flood	1,2,3	Town of Hopkinton Highway Department	Complete. Culverts were upgraded on Lake Ozonia Rd; culvert replaced on Jones Road on May 3, 2021.
Purchase a generator for the Emergency Operations Center (EOC), during prolonged outages this facility can be used as an emergency shelter location.	Utility failure, flooding, tornado, ice/snow storms, and severe storm	1	Town of Hopkinton Supervisor	Complete.
Prepare inspection sheets for local businesses, to identify: exit doors, materials stored, locations of material safety data sheets (MSDS), and smoke alarm inspection. Information will be collected and filed for easy access in the event of an emergency. Additionally, promote education on fire prevention and safety.	Fire, wildfire	1	Town of Hopkinton Fire Department	Ongoing. Particularly of interest for farms and Dollar General in Town; not re-included in HMP update because this action is considered preparedness rather than mitigation.

Table 8. Hazard Mitigation Action Progress Town of Hopkinton				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Hopkinton Fire Department	Complete - this is a routine responsibility of highway department that is adequately addressed. The Town has improved communications among Town staff and EMS agencies that helps take care of debris management more efficiently.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Hopkinton									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Hopkinton 1	Upgrade culverts on Jones Rd with larger pipes to improve stormwater conveyance.	Flood	Town of Hopkinton Highway Dept*, Hopkinton Town Board	Capital Improvement Plan	5 years	Existing	\$20,000	NYSDOT - CHIPS, Town Budget	1
Hopkinton 2	Install generator for Town Hall	All	Hopkinton Town Board*	Capital Improvement Plan	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
<p>Potential Funding Sources</p> <p>DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration</p> <p>FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities</p> <p>NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips</p> <p>USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program</p>									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Hopkinton
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Mitigation Action Worksheet

Project Name:	Upgrade culverts on Jones Rd with larger pipes to improve stormwater conveyance.
Project ID:	Hopkinton 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues on Jones Rd during heavy precipitation events.

Action of Project Intended for Implementation

Description of the Solution:	Replace existing culverts with larger pipes to improve stormwater flows.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	\$5,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Implementation:	3 months	Potential Funding Sources:	NYS DOT - CHIPS, Town Budget
Responsible Organization:	Town of Hopkinton Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culvert in-kind	\$4,000	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Replace culvert with larger pipe with more flow capacity	\$5,000	Improved ability to handle high flows and reduce future flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Hopkinton
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Mitigation Action Worksheet

Project Name:	Install generator for Town Hall
Project ID:	Hopkinton 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall is a critical community facility that currently lacks a backup generator. The Town Hall is one of the Town's emergency shelter locations as well, and needs to be able to continue operating during a power outage.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Town Hall so that the Town can continue critical operations during an emergency event if there is a power outage, and the facility can be used as a shelter if needed.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$6,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	6 months	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Hopkinton Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$3,000	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at Town Hall	\$6,000	Offers maximum protection for Town Hall

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Hopkinton 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Hopkinton 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Hopkinton 3	+	+	+	+	+	+	0	+	+	+	Low	Low	3

Jurisdictional Annex

Town of Lawrence

1. Contacts

The contacts for the Town of Lawrence regarding this plan are identified as follows:

- Tracy Villnave – Town Clerk
Address: 11403 U.S. Highway 11, North Lawrence, NY 12967
Phone: (315) 740-0133
Email: lawrence_clerk@nnymail.com
- Donald Villnave – Town Supervisor
Address: 11403 U.S. Highway 11, North Lawrence, NY 12967
Phone: (315) 740-0105
Email: lawrence_supervisor@nnymail.com
lawrence_supervisor@nnymail.com

2. Municipal Profile

2.1 Population

The 2020 Census reported that 1,715 people live in the Town of Lawrence. The Town's population has decreased by 6.1% since the 2010 Census (1,826) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Lawrence is located in the northeastern portion of St. Lawrence County and is bordered by the Town of Brasher to the North, the Town of Stockholm to the west, the Town of Hopkinton to the south, and the Towns of Moira and Dickinson (Franklin County) to the east. Lawrence is easily accessed from US Rt. 11, Rt. 11C, and Rt. 11B.

2.3 Governing Body

The Town of Lawrence is governed by a five member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

There have been no significant developments completed or planned in the Town since the last County HMP (2015). No new development has occurred in the Special Flood Hazard Area. The Town’s vulnerability to natural hazards has not changed.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Lawrence	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 Pandemic (required by NYS)
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Lawrence	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes (NFIP), No (ordinance)	Town listed as NFIP participant but is unmapped by existing FEMA FIRMs. The Town rescinded their floodplain ordinance.
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	
Grant writing	No	
HAZUS analysis	Yes	
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Lawrence	Notes
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	Purchased a highway truck
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA RD used for highway truck
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	No	No website or social media pages; notices at office and local paper
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include US Rt. 11, Rt. 11C, and Rt. 11B. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
St. Lawrence Middle/High School	1039 NY-11C, Lawrence Falls, NY 13613	St. Lawrence CSD	Yes	Yes	No- Town contracts with Potsdam humane society, but likely not enough space for lots of pets	School recently added a generator

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Lawrence based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Lawrence Town Park/Ball field
 - Vacant land privately owned
 - Mobile home park privately owned
- Potential Permanent Housing Locations
 - None identified; potentially privately owned vacant land if owners willing to sell/subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Vulnerability Rank	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	1	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	2	1	1	Low	10
Infestation	2	1	1	1	Low	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Lawrence. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Educational Facilities	St. Lawrence High School	1039 State Hwy 11C, Brasher Falls, NY 13613	No
Educational Facilities	St. Lawrence Middle School	1039 State Hwy 11C, Brasher Falls, NY 13613	No
EMS/Fire Department	Nicholville Volunteer Fire Company	3341 NY-11B, Nicholville, NY 12965	No
Public Utilities	Wastewater Treatment Facility	Factory St, North Lawrence, NY 12967	100YR
Municipal Services	Highway Barns	Across Road from Municipal Building	No
Municipal Services	Municipal Building (includes highway dept. and museum)	11403 US HWY 11 North Lawrence, NY 12967	No
Public Utilities	Nicholville Sewer District	Bridge St and N Water St, Lawrence NY 12965	No

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Pump Stations	Moira-N Lawrence Rd, Toomey Bridge Rd, N Lawrence-Brasher Rd, Factory St, Grove St (all in N Lawrence Sewer District)	No
*Based on HAZUS-modeled 100-year and 500-year floodplains			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Lawrence.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Lawrence. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Regis River and Deer River are likely to experience increased flooding occurrences.

The Town of Lawrence chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards do not have historical records, but are included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, 11C, and 11B) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of North Lawrence, Lawrenceville, and Nicholville. The Town of Lawrence also has a large Amish population, and communication

with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Two of these events (one hailstorm and one thunderstorm wind) occurred in the Town of Lawrence (frequency of about once every few years). Estimated damages for the Town of Lawrence ranged from \$5,000 to \$10,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDRC. The NCDRC reports no tornadoes since 2010. The Town reported a recent wind storm that affected the northern part of the Town near Brasher.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	9/11/2013	1.75 in.	\$10,000	-
Thunderstorm Wind	5/27/2020	50 knots	\$5,000	-
Total			\$15,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Lawrence is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, 11C, and 11B) would be most impactful to Town

residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of North Lawrence, Lawrenceville, and Nicholville. The Town of Lawrence also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Town of Lawrence lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Lawrence.

5.2.4 Future Potential Impacts

The Town of Lawrence will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Department completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one Town within the County. The entire Town of Lawrence is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary

evacuation routes (U.S. Route 11, 11C, and 11B) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of North Lawrence, Lawrenceville, and Nicholville. The Town of Lawrence also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Lawrence has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. The NCDC does not report any winter storm damage estimates specific to the Town of Lawrence.

5.3.4 Future Potential Impacts

The Town of Lawrence will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, 11C, and 11B) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of North Lawrence, Lawrenceville, and Nicholville. The Town of Lawrence also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Lawrence were reported for this event.

5.4.4 Future Potential Impacts

The Town of Lawrence is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the St. Regis River and Deer River, which drain to the St. Lawrence River. The Town of Lawrence is not mapped by existing FEMA flood insurance rate maps. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Lawrence that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of Lawrence Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
30,517 acres	1.4%	0.34%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Town since 2010. The Town reports local flood records related to high water levels along several roadways, but they do not experience significant flooding issues. Development is generally elevated above floodplains. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Lawrence. The Town does not have any repetitive loss properties.

5.5.4 Future Potential Impacts

Properties along the St. Regis River and Deer River are most vulnerable to flooding. About 1.4% of the Town of Lawrence is within a mapped 100-year floodplain.

5.6 Ice Jam

5.6.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Regis River and the Deer River are vulnerable to ice jams.

5.6.3 Historical Hazard Occurrences and Damage Estimates

The Town of Lawrence was affected by four ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. Three (3) jams were recorded on the Deer River and one (1) was recorded on Allen Brook. The USACE CRREL has not reported any ice jams in the Town since 1978, however, the Town has experienced ice jams on a regular basis. The Town reports no significant issues with ice jams.

5.6.4 Future Potential Impacts

Properties along the St. Regis River and the Deer River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Extreme Temperatures

5.7.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. Extreme temperatures typically affect most or all of the County. The entire Town of Lawrence is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes.

Approximately 4.1% of the population in the Town is under 5 years old, and 12.2% of the population is over 65 years old. Approximately 17.6% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Lawrence lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Lawrence.

5.7.4 Future Potential Impacts

The Town of Lawrence will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system. Residents rely on private wells, and may be susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reports no specific drought events for the Town of Lawrence. Local records reported minor droughts over the last 5 years, which caused water supply issues in several private wells for properties within the Town.

5.8.4 Future Potential Impacts

The entire Town of Lawrence remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these events were reported specifically in the Town of Lawrence, and there are no local records of earthquakes for the Town. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Wildfire

5.10.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town's overall vulnerability to a wildfire is low, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.10.3 Historical Hazard Occurrences and Damage Estimates

The Town reports occasional occurrences of small wildfires. According to Figure 5.11 (Appendix A of the main body of the plan), about half of the Town experienced 0.4 to 0.8 wildfires per square mile and half the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A small area in the northern portion of the Town is mapped with a higher wildfire density during this time period (1.4 to 3.4 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Town of Lawrence remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Lawrence is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Lawrence (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has been detected near the border of the Town of Lawrence and Brasher. The emerald ash borer is able to spread two miles per year on average, and is likely to expand further south into the Town of Lawrence over the next few years. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Lawrence remains susceptible to an infestation event. The emerald ash borer is likely to migrate farther into the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Lawrence is listed as a current participant in the NFIP, even though the Town is unmapped by existing FEMA FIRMs. As of October 2021, no NFIP loss claims have been filed in the Town of Lawrence. There are no repetitive loss properties in the Town.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 8, below. The Town’s 2015 mitigation action was not re-included for the 2021 update.

Table 8. Hazard Mitigation Action Progress Town of Lawrence				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Lawrence Highway Department	Routine responsibility of highway department that is adequately addressed. Not a high priority to develop a formal plan at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Lawrence									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Lawrence 1	Install larger culverts along roadways that experience recurring flooding issues to improve flows.	Flood	Town of Lawrence Highway Dept*, Lawrence Town Board	Capital Improvement Plan	2 years	Existing	\$20,000	Town Budget, NYSDOT- CHIPS, FEMA- BRIC	1
Lawrence 2	Install an on-demand generator at the sewage treatment plant.	All	Lawrence Town Board*	Capital Improvement Plan	5 years	Existing	\$20,000	Town Budget, NYSEFC- CWSRF, FEMA- BRIC	2
Potential Funding Sources FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips NYSEFC CWSRF: https://efc.ny.gov/CWSRF									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Lawrence
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Mitigation Action Worksheet

Project Name:	Install larger culverts along roadways that experience recurring flooding issues to improve flows.
Project ID:	Lawrence 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues on multiple roadways.

Action of Project Intended for Implementation

Description of the Solution:	Install larger culverts to improve stormwater drainage and reduce flooding damages and impacts.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	\$20,000		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town Budget, NYSDOT- CHIPS, FEMA- BRIC
Responsible Organization:	Town of Lawrence Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culverts in-kind	\$10K	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Replace with larger structures	\$20K	Improved ability to handle high flows and reduce future flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Lawrence
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Mitigation Action Worksheet

Project Name:	Install an on-demand generator at the sewage treatment plant.
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Project ID:	Lawrence 2
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Risk/Vulnerability

Hazard of Concern:	All
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Description of the Problem:	The Town has portable generators for use at their wastewater treatment plant (WWTP) and sewage pump stations. However, the WWTP would benefit from an on-demand generator so that critical operations are not interrupted during a power outage.
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Action of Project Intended for Implementation

Description of the Solution:	Install an on-demand generator at the WWTP to ensure that system operations are not interrupted during a power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of critical operations at the WWTP
Useful Life:	Long-term		
Estimated Cost:	\$20,000		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, NYSEFC- CWSRF, FEMA- BRIC
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Responsible Organization:	Town of Lawrence Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the sewage treatment plant	\$20K	Offers maximum protection for sewage treatment plant to maintain critical operations

Progress Report (for Plan Maintenance)

Date of Status Report:	
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Report of Progress:	
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Update Evaluation of the Problem and/or Solution:	
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Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Lawrence 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Lawrence 2	+	+	+	+	+	0	0	0	+	+	Low	Medium	2

Jurisdictional Annex

Town of Lisbon

1. Contacts

The contacts for the Town of Lisbon regarding this plan are identified as follows:

- William Nelson – Town Supervisor
Address: 6963 County Route 10, Lisbon, NY 13658
Phone: (315) 393-0410
Email: supervisor@townoflisbonny.org

Website: <https://www.townoflisbonny.org/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 4,221 people live in the Town of Lisbon. The Town's population has increased by 2.9% since the 2010 Census (4,102) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Lisbon is located in the northwestern portion of St. Lawrence County and is bordered by the St. Lawrence River to the north, the Towns of Waddington, Madrid, and Potsdam to the east, the Town of Canton to the south, and the Town of Oswegatchie and City of Ogdensburg to the west. Lisbon is easily accessed from County Route 10, County Route 27, State Highway 37, and State Highway 68.

2.3 Governing Body

The Town of Lisbon is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the Town Campground was expanded, a handicap ramp was installed at the Town Hall, and a salt storage facility was developed. Additionally, numerous single-family residences were constructed

and an agricultural digester system was developed at a local farm. The Town Campground is partially located within the 100-year floodplain, but the recent expansion work was located outside of the Special Flood Hazard Area. The reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Lisbon	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	In progress, asset management plan completed by DANC in 2020
Economic Development Plan	No	
Local Emergency Operations Plan	No	In progress
Continuity of Operations Plan	No	In progress
Transportation Plan	No	
Stormwater Management Plan	No	In progress, working with DANC
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Lisbon	Notes
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes (NFIP)/No (ordinance0	Town is listed as current NFIP participant but is unmapped by FEMA. Floodplain ordinance was rescinded.
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	Town is unmapped by existing FEMA FIRMs. FEMA is working on flood study that will generate new mapping countywide.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Supervisor
Community Planner	Yes	Work with county planning office as needed
Civil Engineer	Yes	Work with various firms
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	No	Have fire bells for emergencies and a fire department sign board. Use Town website and Facebook.
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	RD/USDA
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	Reserve funding for highway and campground beach
Authority to levy taxes for specific purposes	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Lisbon	Notes
Fees for water, sewer, gas, or electric services	Yes	Water and sewer in hamlet
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA: fed stimulus package
State funding programs	Yes	EFC, funding for salt storage building and other projects
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	No	
Natural disaster or safety related school programs	Yes	Fire department and Town work with school
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include County Route 10, County Route 27 State Highway 37, and State Highway 68. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Lisbon Central School	6866 County Rt 10, Lisbon, NY, 13658	Lisbon CSD	Yes	Yes	Yes	Bathrooms are ADA accessible but unlikely to meet today's standards

3.2 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Lisbon based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Town Campground – 9975 NY-37, Ogdensburg, NY 13669
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town if owners were willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town’s natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	2	2	Moderate	6
Infestation	2	1	2	2	Moderate	7
Landslide	1	3	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Ice Jam	2	2	1	1	Moderate	10
Drought	3	1	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Lisbon. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
County Services	St. Lawrence County Highway Outpost Facility (in construction)	522 County Route 28A Lisbon, NY 13658	No
Educational Facilities	Lisbon Central School	6866 County Rt 10, Lisbon, NY 13658	No
EMS/Fire Department	Lisbon Volunteer Fire Corporation	7002 County Rt 10, Lisbon, NY 13658	No
Municipal Facility	Town Hall	6963 County Rt 10, Lisbon, NY 13658	No
Municipal Facility	Town Highway Department	50 Church Street, Lisbon, NY	No
Municipal Facility	Town Campground and Beach	9975 NY-37, Ogdensburg, NY 13669	100YR
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Sewer Pump Station	25 Maiden Ln	No
Public Utilities	Sewer Pump Station	36 Church St	No
Public Utilities	Sewer Pump Station	6750 County Rt 10	No
Public Utilities	Sewer Pump Station	6848 County Rt 10	No

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Sewer Pump Station	6859 County Rt 10	No
Public Utilities	Sewer Pump Station	6866 County Rt 10	No
Public Utilities	Sewer Pump Station	694 Hall Rd	No
Public Utilities	Sewer Pump Station	7016 County Rt 10	No
Public Utilities	Wastewater Treatment Facility	Hall Rd, Lisbon, NY 13658	No
Public Utilities	Water Tower and Treatment Plant	Church Street, next to Highway Dept.	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Lisbon.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Lisbon. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River, the Grass River, and Lisbon Creek are likely to experience increased flooding occurrences.

The Town of Lisbon chose not to profile wildfire in their annex even though it was profiled for the County. The Town does not have a history of wildfires nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37 and 68 and County Routes 10 and 27) would be most impactful to Town residents. Storm damages would primarily impact the

more populated portions of the Town, including the hamlets of Lisbon and Red Mills.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDL has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Eight of these events occurred in the Town of Lisbon (frequency of about once a year). All records were thunderstorm winds. Estimated damages for the Town of Lisbon ranged from \$2,000 to \$25,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDL. The NCDL reports no tornadoes in St. Lawrence County since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/21/2010	55 knots	\$25,000	-
Thunderstorm Wind	7/17/2011	55 knots	\$10,000	-
Thunderstorm Wind	7/17/2011	50 knots	\$10,000	-
Thunderstorm Wind	7/4/2012	55 knots	\$20,000	-
Thunderstorm Wind	5/22/2013	50 knots	\$5,000	-
Thunderstorm Wind	7/18/2013	50 knots	\$2,000	-
Thunderstorm Wind	9/26/2019	50 knots	\$5,000	-
Thunderstorm Wind	9/26/2019	55 knots	\$20,000	-
Total			\$97,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Lisbon is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37 and 68 and County Routes 10 and 27) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Lisbon and Red Mills.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the northern portion of St. Lawrence County where the Town of Lisbon lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town Lisbon.

5.2.4 Future Potential Impacts

The Town of Lisbon will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than

one town within the County. The entire Town of Lisbon is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37 and 68 and County Routes 10 and 27) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Lisbon and Red Mills.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Lisbon has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDC does not report any winter storm damage estimates specific to the Town of Lisbon.

5.3.4 *Future Potential Impacts*

The Town of Lisbon will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37 and 68 and County Routes 10 and 27) would be most impactful to Town residents. Storm damages would primarily impact the

more populated portions of the Town, including the hamlets of Lisbon and Red Mills.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Lisbon were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Lisbon is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Flood**

5.5.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by Lisbon Creek, which drains to the Oswegatchie River. The Town of Lisbon is not mapped by existing FEMA flood insurance rate maps. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7

summarizes the amount of land within the Town of Lisbon that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Lisbon Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
72,736 acres	3.8%	0.01%

The St. Lawrence River Shoreline Resiliency Study, which was completed by BCA Architects and Rootz, LLC in 2019, assessed the vulnerability of shoreline ecosystems along the upper St. Lawrence River in the Towns of Hammond, Morristown, Oswegatchie, and Lisbon. As part of the study, a Floodplain Protection Overlay District indicating locations that are vulnerable to flooding throughout the study area. The proposed Floodplain Protection Overlay District generated by this study is generally limited to properties that are immediately adjacent to the St. Lawrence River shoreline. The Floodplain Protection Overlay District extends further inland along Red Mills and the Lisbon Beach in the Town of Lisbon. Further information regarding this plan is provided in Section 5.7 of the main body of the plan.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reported one flood record for the Town of Lisbon since 2010. On 4/15/2014, snow melt and heavy rainfall combined to produce county-wide flooding. The St Regis River and Grass River were hit particularly hard, and flooding on the Grass River impacted the Town of Lisbon. No damage estimates specific to the Town of Lisbon are available. The Town also reports the St. Lawrence River being fairly well controlled; however there have been high water events that have caused damage. Flooding issues on local roadways, especially on low lying roads near Lisbon Swamp occur occasionally. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Lisbon. There are no repetitive loss properties in the Town.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the St. Lawrence River, the Grass River and Lisbon Creek are vulnerable to flooding. About 3.8% of the Town of Lisbon is within a mapped 100-year floodplain.

5.6 Extreme Temperatures

5.6.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Town of Lisbon is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes.

Approximately 4.5% of the population in the Town is under 5 years old, and 17.3% of the population is over 65 years old. Approximately 10.9% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Lisbon lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Lisbon.

5.6.4 *Future Potential Impacts*

The Town of Lisbon will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 Infestation

5.7.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Lisbon is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Lisbon (Figure 5.13, Appendix A of the main body of the plan).

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The emerald ash borer has been detected in the Town of Lisbon. The emerald ash borer is able to spread two miles per year on average, making it a hazard for surrounding municipalities as well. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.7.4 *Future Potential Impacts*

The entire Town of Lisbon remains susceptible to an infestation event. The Town is progressing proactive ash tree management, which will be critical to reduce impacts of the emerald ash borer.

5.8 Landslide

5.8.1 *Description*

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Lisbon is mapped in an area with high susceptibility but low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the St. Lawrence River are particularly susceptible.

5.8.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of significant landslides occurring specifically in the Town of Lisbon. The Town of Lisbon reports significant shoreline erosion (from local records) along the St. Lawrence River. The banks of the river in this area are 30-50 feet tall, and several homes are present that could be affected by a landslide event. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

Steep slopes in the Town remain vulnerable to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

There have been two earthquakes reported in St. Lawrence County between 2010 and 2021. According to the USGS Earthquake Catalog, there is one historical record of an earthquake occurring in the Town of Lisbon. An earthquake was recorded on 12/18/1867 with a magnitude of 4.3 on the Richter scale. The Town of Lisbon is located on Logan's Fault Line, and local records reported tremors in the past. No damage estimates were reported. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 **Ice Jam**

5.10.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.10.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Lawrence River and its tributaries, are vulnerable to ice jams.

5.10.3 *Historical Hazard Occurrences and Damage Estimates*

There are no USACE CRREL or local records of ice jams occurring specifically in the Town of Lisbon. This hazard was included in this annex for future mitigation planning consideration.

5.10.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along the St. Lawrence River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.11 Drought

5.11.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.11.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town residents are served by municipal water, but others rely on private wells and may be susceptible to low water yields during a drought.

5.11.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Lisbon. The Town's water system is supplied by two groundwater wells. The Town has not had any supply issues with their wells during past drought events.

5.11.4 *Future Potential Impacts*

The entire Town of Lisbon remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Lisbon is listed as a current NFIP participant, although the Town remains unmapped by FEMA's existing FIRMs. As of October 2021, no NFIP loss claims have been paid in the Town of Lisbon. There are no repetitive loss properties in the Town.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 8, below. The Town's 2015 mitigation action was not re-included for the 2021 update. The Town is continuing to upgrade highway department equipment. In addition, the Town keeps an up-to-date inventory of all culverts and works on replacements as needed. During snow or ice storms, the highway department pre-wets the roadways to reduce ice development. The Town also has a new salt storage building, which covers salt and sand and provides easy access for highway department vehicles. Many roads in the Town that were formerly gravel have been paved in recent years, which helps with snowmelt. Finally, the Town is working with National Grid to remove ash trees and brush in Town road right of ways proactively to reduce impacts of emerald ash borer.

Table 8. Hazard Mitigation Action Progress				
<i>Town of Lisbon</i>				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe	1,2,3	Town of Lisbon Highway Department	Ongoing responsibility of highway department, adequately addressed.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Lisbon									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Lisbon 1	Install generator for Town Hall	All	Lisbon Town Board*	Capital Improvement Plan	5 years	Existing	15000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Lisbon 2	Sewer collection system inflow and infiltration improvements and wastewater treatment plant upgrades	Flood, Severe Thunderstorm/ Wind/Tornado, Ice Storm	Lisbon Town Board*	Capital Improvement Plan	5 years	Existing	High	NYSEFC - CWSRF, NYSDEC- WQIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Town Budget	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEFC CWSRF: https://efc.ny.gov/CWSRF NYSDEC WQIP: https://www.dec.ny.gov/pubs/4774.html NYSOCR CDBG: https://hcr.ny.gov/community-development-block-grant USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Lisbon
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Mitigation Action Worksheet

Project Name:	Install generator for Town Hall
Project ID:	Lisbon 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall currently lacks a backup generator. The Town Hall is a critical community facility.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Town Hall so that the Town can continue critical operations during an emergency event if there is a power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Lisbon Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Town Hall	\$15K	Offers maximum protection for Town Hall

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Lisbon
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Mitigation Action Worksheet

Project Name:	Sewer collection system inflow and infiltration improvements and wastewater treatment plant upgrades
Project ID:	Lisbon 2

Risk/Vulnerability

Hazard of Concern:	Flood, Severe Thunderstorm/ Wind/Tornado, Ice Storm
Description of the Problem:	The Town's sewer collection system currently experiences high rates of stormwater inflow and infiltration during heavy precipitation events. This increases the amount of flows treated at the WWTP, resulting in unnecessary wear on WWTP equipment. Additionally, the major components at the Town's WWTP do not have redundancy at this time.

Action of Project Intended for Implementation

Description of the Solution:	Complete a sewer system improvements project to reduce stormwater infiltration (primarily manhole rehabilitation), and improve existing pump stations and WWTP infrastructure (including equipment upgrades and replacement of old infrastructure). This will increase the overall resiliency of the system.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of sewer system operations, reduced damage potential
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC - CWSRF, NYSDEC- WQIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Town Budget
Responsible Organization:	Lisbon Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Repair WWTP processes as needed, increase treatment capacity at WWTP to handle stormwater flows	High	Reactive approach. Does not mitigate stormwater infiltration.
	Sewer collection system inflow and infiltration improvements and wastewater treatment plant upgrades	High	Mitigates root of issue (stormwater infiltration) and increases overall WWTP resiliency

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Jurisdictional Annex

Town of Louisville

1. Contacts

The contacts for the Town of Louisville regarding this plan are identified as follows:

- Gail Schneider – Deputy Supervisor
Address: 14810 State Highway 37, Massena, NY 13662
Phone: (315) 769-0457
Email: mgschneid@twcny.rr.com
- Joanne Cameron – Town Clerk
Address: 14810 State Highway 37, Massena, NY 13662
Phone: (315) 769-0457
Email: louisville@nnyemail.com

Town Website: <http://www.louisvillenewyork.com/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 3,050 people live in the Town of Louisville. The Town’s population has decreased by 3.0% since the 2010 Census (3,145) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Louisville is located in the northern portion of St. Lawrence County and is bordered by the St. Lawrence River to the north, Village and Town of Massena to the east, Town of Norfolk and Madrid to the south, and Waddington to the west. Louisville is easily accessed from NY-37, NY-56, NY 131, County Route 14, County Route 36, and County Route 39.

2.3 Governing Body

The Town of Louisville is governed by a five-member Town Board, including the Supervisor and four Councilors.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), new single-family residences have been built within the Town (about 5 to 10 each year). No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Louisville	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Louisville	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible; Well enforced
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	In place; Reviewed recently
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes/No	Town is listed as a current NFIP participant but floodplain ordinance has been rescinded (Town is unmapped by existing FEMA FIRMs)
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	Unmapped by existing FIRMS but mapping is currently being updated by FEMA
Acquisition of land for open space and public recreation	Yes	Part of the Comprehensive Plan
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	Yes	Town Supervisor
Civil Engineer	Yes	Contract with engineering firm
GIS Coordinator	Yes	DANC

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Louisville	Notes
Technical Abilities		
Warning systems/services	Yes	Town website; Facebook
Hazard date and information	Yes	Documented for HMP update
Grant writing	Yes	In-house
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	Depends on individual regulations; solar – would be responsible for legal/Town costs
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	Have applied in the past
Other federal funding programs	Yes	Active RD funding for Town office building
State funding programs	Yes	EFC for water system
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Fire department connects
Natural disaster or safety related school programs	No	Louisville doesn't have own School District (Massena); also no fire district; fire department is independently contracted
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	Informally – Curran Logging and others work with Town as needed

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include NY-37, NY-56, NY 131, County Route 14, County Route 36, and County Route 39. NY-56 takes people away from water and therefore routes depend on emergency situation and where people are going. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Town Office	14810 NY-37, Massena, NY 13662	Town of Louisville	Yes	Yes	Yes	Backup power available
Fire Department	14818 NY-37, Massena, NY 13662	Louisville Volunteer Fire Dept	Yes	Yes	Yes	Backup power available
Community Center (Arena)	44 Arena Drive, Chase Mills, NY 13621	Town of Louisville	Yes	Yes	Yes	No backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Louisville based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Town Office land (Town owned)
 - Community Center land
 - Golf course – State Highway 131
 - Massena Intake (owned by NYPA, maintained by the Town of Louisville) – State Highway 131
 - Privately owned fields – Throughout town
 - Whalen Park – State Highway 131

- Mobile home park – State Highway 56
- Mobile home park – Town Line Road
- **Potential Permanent Housing Locations**
 - Town owned property on County Route 39 behind fire station
 - Town owned property by bridge on County Route 39

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town’s natural hazard analysis results are provided in Table 4.

Table 3. Hazard Analysis Criteria						
Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Table 4. Hazard Vulnerability by Event						
Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor’easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	1	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Drought	3	1	1	2	Moderate	8

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Wildfire	1	3	1	2	Moderate	9
Earthquake	2	3	1	1	Moderate	10
Landslide	1	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Louisville. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Community Services	Community Center (Arena)	44 Arena Drive, Chase Mills, NY 13621	No
EMS/Fire Department	Louisville Volunteer Fire Department	14818 NY-37, Massena, NY 13662	No
Municipal Services	Town Office and Highway Garage	14810 State Highway 37, Massena, NY 13662	No
Public Utilities	3 Water Towers	Multiple properties	
Public Utilities	Municipal Water System	-	-
Public Utilities	Municipal Water System	-	-

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may

apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Louisville.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Louisville. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River, Raquette River, and the Grass River and their tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but are included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, and 131 and County Routes 14, 36, and 39) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Louisville and Chase Mills.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. None of the reported records occurred in the Town of Louisville, however, the Town is regularly affected by severe storms (about once a year). No tornadoes have been reported in the Town since 2010.

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Ice Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Louisville is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, and 131 and County Routes 14, 36, and 39) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Louisville and Chase Mills.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the northern portion of St. Lawrence County where the Town of Louisville lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Louisville. The Town also reports a large ice storm in 1998.

5.2.4 *Future Potential Impacts*

The Town of Louisville will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one municipality within the County. The entire Town of Louisville is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, and 131 and County Routes 14, 36, and 39) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Louisville and Chase Mills.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Louisville has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Louisville.

5.3.4 *Future Potential Impacts*

The Town of Louisville will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, and 131 and County Routes 14, 36, and 39) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Louisville and Chase Mills.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Louisville were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Louisville is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Grass River and tributaries which drain to the St. Lawrence River. The Town of Louisville is not mapped by existing FEMA flood insurance rate maps. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Town of Louisville that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 6. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Louisville Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
40,670 acres	14.6%	0.20%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reported three flood records for the Town of Louisville since 2010. One event occurred on 4/30/2021 and involved flooding along the Raquette River after a combination of heavy rains and snow melt. No damage estimates are available specific to the Town of Louisville. The second event occurred on 5/1/2011 and involved flooding along the Raquette River after a combination of heavy rain and snow melt. No damage estimates are available specific to the Town of Louisville. The third event occurred on

4/15/2021 and involved flooding along the Grass River and St. Regis River after a combination of heavy rain and snow melt. No damage estimates are available specific to the Town of Louisville. The Town also reports beaver related flood issues that started in the 1950s-1960s when beavers were introduced to the Town.

As described in Section 6.0 of this annex, seven (7) NFIP loss claims have been paid as of October 2021 in the Town of Louisville totaling \$95,872.43. There is one repetitive loss property in the Town of Louisville, which is a single family residence. The property has incurred four flood-related losses, with a total of \$23,573.27 in building damages. Content damage payments totaled \$5,232.66.

5.5.4 Future Potential Impacts

Properties along the St. Lawrence River, Raquette River, and the Grass River and its tributaries are most vulnerable to flooding. About 14.6% of the Town of Louisville is within a mapped 100-year floodplain.

5.6 Extreme Temperatures

5.6.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Louisville is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.6% of the population in the Town is under 5 years old, and 16.0% of the population is over 65 years old. Approximately 8.3% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Louisville lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Louisville.

5.6.4 *Future Potential Impacts*

The Town of Louisville will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 **Ice Jam**

5.7.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Lawrence River, Raquette River, and the Grass River are vulnerable to ice jams.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Louisville was affected by three ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. All three ice jams occurred on the Grass River. The USACE CRREL has not reported any ice jams in Louisville since 2012. No damage estimates related to ice jams are reported specific to the Town of Louisville. The Town reports no issues with ice jams in the last 10 years, consistent with the USACE CRREL

records. The Town indicated that they have experienced fewer ice jams since the dam in the Town of Massena was removed.

5.7.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along the St. Lawrence River, Raquette River, and the Grass River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 **Drought**

5.8.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on public wells and may be susceptible to low water yields during a drought. According to the Town, residents that used to have drilled wells that are now on municipal water are more aware of drought and water conservation measures. Residents on dug wells are often always aware of drought/water conservation measures, as they tend to experience more supply issues during droughts. The Town's water system is supplied by the St. Lawrence River.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC reports no specific drought events for the Town of Louisville or the rest of St. Lawrence County since 2010. There are no specific damage estimates for the Town related to drought events.

5.8.4 *Future Potential Impacts*

The entire Town of Louisville remains susceptible to a drought event, and agricultural lands and residences that are not connected to public water are

the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 **Wildfire**

5.9.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration. The Town of Louisville reports the Curran Logging property as a potential wildfire hazard. It is the only large processing facility in town that contains wood chips and mulch.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

The entire Town of Louisville remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Earthquake

5.10.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Louisville. Local records indicated that several small earthquakes have occurred in recent years, but they did not result in any damages. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. The Town remains susceptible to an earthquake.

5.11 Landslide

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Louisville is mapped in an area with high susceptibility but low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the St. Lawrence River and Grass River are particularly susceptible.

5.11.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of significant landslides occurring specifically in the Town of Louisville. The Town reports past landslides along the Grass River (from local records). A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Steep slopes in the Town remain vulnerable to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.12 **Infestation**

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Louisville is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Louisville (Figure 5.13, Appendix A of the main body of the plan).

5.12.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer was recently detected in the Town of Louisville along with other municipalities in the northern portion of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to spread throughout the Town of Louisville. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.12.4 Future Potential Impacts

The entire Town of Louisville remains susceptible to an infestation event. The emerald ash borer was recently detected in the Town, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Louisville is listed as a current NFIP participant even though the Town is not mapped by FEMA's existing FIRMs. As of October 2021, seven NFIP loss claims have been paid in the Town of Louisville totaling \$95,872.43. There is one repetitive loss property in the Town of Louisville limits, which is a single family residence. The property has incurred four flood-related losses, with a total of \$23,573.27 in building damages. Content damage payments totaled \$5,232.66.

The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties. The Town will also consider potential mitigation efforts for the property in the Town that has experienced multiple flood-related losses.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed two mitigation action in the 2015 St. Lawrence County HMP, and their statuses are summarized in Table 7, below. One of the Town’s 2015 mitigation actions was revised and re-included for the 2021 update.

Table 7. Hazard Mitigation Action Progress Town of Louisville				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Louisville Highway Department	Complete. Town highway department takes care of this routinely, formal plan not a high priority at this time.
Locating/removing hazardous beaver dams on an annual basis. Can reduce the possibility of flooding as a result of beaver dams.	Flood	1,2,3	Town of Louisville Highway Department	Ongoing; not necessarily annual but completed as needed (usually multiple times per year). Re-included for HMP update.

7.2 Proposed Mitigation Actions

The Town proposed three mitigation actions to be included in the HMP update; two are new and one is ongoing from the 2015 HMP. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Town of Louisville									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Louisville 1	Replace culverts for River crossing on County Route 36 with larger pipes.	Flood	Town of Louisville Highway Dept*, Louisville Town Board	Comprehensive Plan	5 years	Existing	\$20K	NYS DOT - CHIPS, Town Budget	1
Louisville 2 (Ongoing from 2015)	Develop a beaver dam management plan	Flood	Louisville Town Board*, NYSDEC Region 6	Comprehensive Plan	5 years	Existing	\$5K	Town Budget	2
Louisville 3	Install generator for Community Center	All	Louisville Town Board*	Comprehensive Plan	5 years	Existing	\$15K	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	3

Potential Funding Sources

DASNY SAM: <https://www.dasny.org/about-us/what-we-do/grants-administration>
 FEMA BRIC: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>
 NYSDOT CHIPS: <https://www.dot.ny.gov/programs/chips>
 USDA RD Community Facilities: <https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program>

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Louisville
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Mitigation Action Worksheet

Project Name:	Replace culverts for River crossing on County Route 36 with larger pipes.
Project ID:	Louisville 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues on County Route 36 during heavy precipitation events.

Action of Project Intended for Implementation

Description of the Solution:	Replace culverts with larger culvert pipes to improve stormwater flows.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term (30+ years)		
Estimated Cost:	\$20,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSDOT - CHIPS, Town Budget
Responsible Organization:	Town of Louisville Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culverts in-kind	\$15,000	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Replace with larger pipes	\$20,000	Improved ability to handle high flows and reduce future flood damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Louisville
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Mitigation Action Worksheet

Project Name:	Develop a beaver dam management plan
Project ID:	Louisville 2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues along multiple roadways (Nation Rd, Dishaw Rd, Whalen Rd, Willard Rd) from beaver dams. The Town removes hazardous beaver dams as needed, but does not have a formal management plan in place.

Action of Project Intended for Implementation

Description of the Solution:	Develop a formal beaver dam management plan that outlines responsibilities for proactive inspection, agency coordination, and dam maintenance.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Defined steps in place for beaver population management, including agency coordination and protocol for addressing flood-prone areas related to beaver dams
Useful Life:	Short-term		
Estimated Cost:	\$5,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget
Responsible Organization:	Louisville Town Board*, NYSDEC Region 6	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Trap and relocate beavers as needed	Low	Reactive approach
	Develop a beaver dam management plan	\$5,000	Formal protocol in place for managing beaver dam issues

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Louisville
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Mitigation Action Worksheet

Project Name:	Install generator for Community Center
Project ID:	Louisville 3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town's Community Center lacks a backup generator. This is a critical community facility that could be used as one of the Town's emergency shelter locations.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Community Center to ensure continuity of operations during an emergency event, and to allow the Town to use this space as an emergency shelter if needed.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Louisville Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Community Center	\$15K	Offers maximum protection for Community Center

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Louisville 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Louisville 2	+	+	0	+	-	+	0	+	+	+	Low	Low	2
Louisville 3	+	+	+	+	+	0	0	0	+	0	Medium	Medium	3

Jurisdictional Annex

Town of Macomb

1. Contacts

The contacts for the Town of Macomb regarding this plan are identified as follows:

- Bret Martin – Board Member
Address: 2487 California Road, Gouverneur, NY 13642
Phone: (315) 578-2728
Email: moneypit@cit-tele.com
- Carson Gates – Road Crew Member

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 912 people live in the Town of Macomb. The Town's population has increased by 0.7% since the 2010 Census (906) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Macomb is located in the western portion of St. Lawrence County and is bordered by the Town of Gouverneur to the east, Rossie to the south, Hammond and Morristown to the west, and De Peyster to the north. Macomb is easily accessed from NY-58, NY-184, County Route 8, and County Route 10.

2.3 Governing Body

The Town of Macomb is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a golf course was developed in the Town around 2018. Additionally, vacant lots along Black Lake Road were recently subdivided. No other significant commercial or residential developments have occurred in the Town since 2015. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Macomb	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	Yes	In place for Highway Department only
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Macomb	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	
Fire department ISO rating	Yes	2 fire departments
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes/No	Town is listed as a current NFIP participant, but has rescinded floodplain regulations.
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	FEMA is working on a flood study that will generate new mapping countywide. Town is unmapped by existing FEMA FIRMs
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	Planning Board
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	Highway Department programs
Mutual aid agreements	No	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	No	
Civil Engineer	No	Contracted out for projects as needed
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	No	
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	Hired out
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Macomb	Notes
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	No	
State funding programs	Yes	DASNY
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Community bulletin board; looking into developing a Town website.
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include NY-58, NY-184, County Route 8, and County Route 10. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Town Hall	6663 NY-58, Hammond, NY 13646	Town of Macomb	No	Yes	Yes	No generator or fridge; can hold 25-30 people
Methodist Church	12 County Rt 7/2063 County Rt 10, Macomb, NY 13633	Wesleyan Methodist Church	No	Yes	Yes	-

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Macomb based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Privately owned vacant land (large amount of agricultural land within Town)
- Potential Permanent Housing Locations
 - None identified; potentially privately owned vacant land if owners willing to sell/subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Flood	2	2	2	2	Moderate	3
Extreme Temperatures	3	1	2	2	Moderate	4
Drought	3	1	2	1	Moderate	5
Severe Winter Storm	3	1	1	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Wildfire	1	3	1	2	Moderate	8
Infestation	2	1	2	1	Moderate	9
Earthquake	1	3	1	1	Moderate	10
Coastal Storm (Nor'easter)	3	1	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Macomb. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Municipal Services	Town Hall	6663 NY-58, Hammond, NY 13646	No
Municipal Services	Town Highway Garage	6669 NY-58, Hammond, NY 13646	No
*Based on HAZUS-modeled 100-year and 500-year floodplains			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Macomb.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Macomb. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along Fish Creek, Birch Creek, and Beaver Creek may experience increased flooding occurrences.

The Town of Macomb chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but are included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, State Highway 184, County Route 8, and County Route 10) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Brasie Corners and Pope Mills. The Town also has a large Amish population,

and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. None of these events occurred in the Town of Macomb, but the Town does experience these events regularly (about once a year). The NCDC did not report any tornados since 2010 in the Town.

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Macomb is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, State Highway 184, County Route 8, and County Route 10) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Brasie Corners and Pope Mills. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Macomb lies, and are described in

Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Macomb.

5.2.4 Future Potential Impacts

The Town of Macomb will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Flood

5.3.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by Fish Creek, Birch Creek, and Beaver Creek, which drain to Hickory Lake and Black Lake. The Town of Macomb is not mapped by existing FEMA flood insurance rate maps. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Town of Macomb that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 6. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Town of Macomb Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
40,278 acres	6.1%	0.15%

5.3.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Town of Macomb since 2010, and there are no local records of significant flood issues. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Macomb. There are no repetitive loss properties in the Town.

5.3.4 Future Potential Impacts

Properties along waterbodies throughout the Town, including Black Lake, Fish Creek, Birch Creek, and Beaver Creek are vulnerable to flooding. About 6.1% of the Town of Macomb is within a mapped 100-year floodplain.

5.4 Extreme Temperatures

5.4.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes.

Approximately 4.2% of the population in the Town is under 5 years old, and 20.0% of the population is over 65 years old. Approximately 30.3% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.4.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Macomb lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Macomb.

5.4.4 Future Potential Impacts

The Town of Macomb will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.5 Drought

5.5.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system, therefore, residents rely on public wells and may be susceptible to low water yields during a drought.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Macomb or the rest of St. Lawrence County since 2010. There are no specific damage estimates for the Town related to past droughts.

5.5.4 Future Potential Impacts

The entire Town of Macomb remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.6 Severe Winter Storm

5.6.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to severe winter storms, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one municipality within the County. The entire Town of Macomb is susceptible to damages from a severe winter storm event. The Town Highway Department clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, State Highway 184, County Route 8, and County Route 10) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Brasie Corners and Pope Mills. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.6.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Macomb has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDC does not report any winter storm damage estimates specific to the Town of Macomb.

5.6.4 Future Potential Impacts

The Town of Macomb will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.7 Ice Jam

5.7.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the Fish Creek, Birch Creek, and Beaver Creek are vulnerable to ice jams.

5.7.3 Historical Hazard Occurrences and Damage Estimates

There are no USACE CRREL records of ice jams occurring in the Town of Macomb. Local records indicated that ice jams have occurred along the Oswegatchie River within an oxbow, which do not cause major issues or damages.

5.7.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along the Fish Creek, Birch Creek, and Beaver Creek remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 Wildfire

5.8.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.8.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

The entire Town of Macomb remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Infestation

5.9.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Macomb is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Macomb (Figure 5.13, Appendix A of the main body of the plan). Additionally, Eurasian watermilfoil is of concern for the Town. Eurasian watermilfoil is an invasive

aquatic plant that has been reported in Black Lake, which borders the Town of Macomb.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Macomb, however, it has been detected in surrounding municipalities in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Macomb in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. The Black Lake Invasive Weeds Committee worked with Quantitative Environmental Analysis, LLC to develop a Eurasian Watermilfoil Management Plan in 2008 (which is provided in Appendix H of the main plan). It was estimated total removal would cost up to \$20 to 30 million.

5.9.4 Future Potential Impacts

The entire Town of Macomb remains susceptible to an infestation event. The emerald ash borer was recently detected in adjacent municipalities, and is likely to reach the Town of Macomb over the next several years. Proactive ash tree management will be critical to reduce potential impacts of this species.

5.10 Earthquake

5.10.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. The Town of Macomb is moderately susceptible to a potential earthquake event, due to the lack of warning and moderate extent and damages associated with this hazard. An earthquake could impact any location within the Town, though historically, St. Lawrence

County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Macomb, and there are no local records of earthquakes affecting the Town. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.11 Coastal Storm (Nor'easter)

5.11.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 58, State Highway 184, County Route 8, and County Route 10) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Brasie Corners and Pope Mills. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.11.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no reported damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Macomb were reported for this event.

5.11.4 Future Potential Impacts

The Town of Macomb is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Macomb is listed as a current NFIP participant but is unmapped by FEMA's existing FIRMs. As of October 2021, no NFIP claims have been filed in the Town. There are no repetitive loss properties in the Town.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed three mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 7, below. None of the Town's 2015 actions were re-included for the 2021 update.

Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Install 4 foot culvert toward Route 58 from current culvert, to minimize flooding at intersection with California Road. Additional, ditch cleaning will expedite the flow through the channels, and reduce overland flooding.	Flood	3	Town of Macomb Highway Department	Complete, larger pipe installed in 2019.
Creating digital Flood Insurance Rate Maps (FIRM) will allow digital access to images of 100-year and 500-year flood plains.	Flood	1,2	Town of Macomb Code Enforcement Office	In progress. FEMA is working on a flood study that will generate new floodplain mapping countywide. The Town will cooperate with FEMA as needed throughout the study phase.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Macomb Highway Department	Routine responsibility of highway department that is adequately addressed. The Town has upgraded multiple culverts over the years.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions and one preparedness action to be included in the HMP update. Their preparedness action (Macomb 3) was included even though it is not considered mitigation because it is still a priority action for the Town related to public outreach and notification for hazard events. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Town of Macomb									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Macomb 1	Install generator for Town Hall and highway barn	All	Macomb Town Board* and Highway Dept.	Capital Improvement Plan	5 years	Existing	\$50K	Town Budget, DASNY- SAM	1
Macomb 2	Raise elevation of California Road to reduce flooding issues	Flood	Macomb Town Highway Dept*	Capital Improvement Plan	5 years	Existing	\$1 million	Town Budget, NYSDOT-CHIPS, FEMA-BRIC	2
Macomb 3 (Preparedness)	Identify vulnerable individuals within the Town who may require assistance during hazard events. Update list annually or as needed.	All	Town Board*	None	1 year	N/A	\$1,000	Town Budget	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Macomb
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Mitigation Action Worksheet

Project Name:	Install generator for Town Hall and highway barn
Project ID:	Macomb 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall and highway barn are critical community facilities that currently lack backup generators. The Town Hall is one of the Town's emergency shelter locations.

Action of Project Intended for Implementation

Description of the Solution:	Install generator at Town Hall and highway barn so that the Town can continue critical operations during emergencies. This would also allow the Town Hall to be used as an emergency shelter if needed.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$25-30K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	DASNY- SAM (funding awarded), Town Budget
Responsible Organization:	Macomb Town Board* and Highway Dept.	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generators to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the highway barn and Town Hall	\$25-30K	Offers maximum protection for facilities

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Macomb
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Mitigation Action Worksheet

Project Name:	Raise elevation of California Rd to reduce flooding issues
Project ID:	Macomb 2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues along California Road.

Action of Project Intended for Implementation

Description of the Solution:	Raise elevation of the road to reduce flood vulnerability and future damages, and to keep road open to traffic.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood damage to roadway
Useful Life:	Long-term		
Estimated Cost:	\$1 million		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, NYSDOT- CHIPS, FEMA- BRIC
Responsible Organization:	Macomb Town Highway Dept*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Install additional larger culverts along road to convey stormwater drainage	\$30,000	Would help convey stormwater flows during storm events but road still susceptible to flooding; portion of road is surrounded by wetlands along Birch Creek
	Raise road elevation	\$1 million	Better solution to reduce flood risk of road

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Macomb
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Mitigation Action Worksheet

Project Name:	Identify vulnerable individuals within the Town who may require assistance during hazard events. Update list annually or as needed.
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Project ID:	Macomb 3 (Preparedness)
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Risk/Vulnerability

Hazard of Concern:	All
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Description of the Problem:	The Town has a Facebook page that they use to share information with residents. However, some residents may not have access to Facebook, and the Town does not have a current database for residents who may require help during emergencies (elderly residents, individuals with special needs, etc.).
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Action of Project Intended for Implementation

Description of the Solution:	Develop a list of residents who may need extra assistance during an emergency event, and update annually. Develop a plan that outlines responsibilities and steps for Town to take to reach out to individuals during an emergency.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Town more easily able to reach vulnerable residents before, during, and after a disaster event.
Useful Life:	Short-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Town Budget
Responsible Organization:	Macomb Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Rely on other agencies (Arc, Meals on Wheels, County Office for Aging) to contact vulnerable individuals	Low to none	Other agencies may be involved depending on the event, but adds another layer of communication/complexity. All vulnerable residents may not be reached by others.
	Identify vulnerable individuals within the Town and maintain updated list annually	\$1,000	Allows Town to take more control over communication process and ensure all residents are reached

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Macomb 1	+	+	+	+	+	-	0	+	+	0	Medium	Medium	1
Macomb 2	+	+	0	+	+	-	0	0	+	-	Medium	High	2
Macomb 3	+	+	0	+	+	+	0	+	+	+	Low	Low	3

Jurisdictional Annex

Town of Madrid

1. Contacts

The primary contact for the Town of Madrid regarding this plan are identified as follows:

- Tony Cooper – Town Supervisor
Address: 3529 County Route 14, Madrid, NY 13660
Phone: (315) 322-5760
Email: supervisor@townofmadrid.com

Town Website: <http://townofmadrid.org/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 1,744 people live in the Town of Madrid. The Town’s population has increased by 0.5% since the 2010 Census (1,735) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Madrid is located in the northern portion of St. Lawrence County and is bordered by the Towns of Waddington and Louisville to the north, Norfolk to the east, Potsdam to the south, and Lisbon to the west. Madrid is easily accessed from State Hwy 310, State Hwy 345, County Rt 14, County Rt 30, and County Rt 31.

2.3 Governing Body

The Town of Madrid is governed by a five-member Town Council, including the Supervisor and four councilors.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), an addition was added to the Municipal Building in 2016, a Dollar General was built in 2019, a restaurant was built, and a

water tower was built in 2020. Additionally, there has been ongoing redevelopment within the hamlet of Madrid. Finally, a veterinary clinic is proposed to be constructed in 2022. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Madrid	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	Yes	Highway department has purchasing document for equipment replacement
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 Pandemic (required by NYS)
Other Special Plans	Unknown	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Madrid	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes/No	Town is listed as a current NFIP participant but has a rescinded floodplain ordinance.
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	Town is unmapped by existing FEMA FIRMs. FEMA is working on a flood study that will generate new mapping countywide.
Acquisition of land for open space and public recreation	Yes	
Administration		
Planning Commission	Yes	Planning board
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Town works with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Madrid	Notes
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	USDA (used in past for plow truck, water tower, new water meters)
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Town Website
Natural disaster or safety related school programs	Yes	Fire Department/Rescue Squad work with schools
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	Gas company sends info annually about digging safety, which is posted to Town website

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Hwy 310, State Hwy 345, County Rt 14, County Rt 30, and County Rt 31. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Municipal Building	3529 County Route 14, Madrid NY	Town of Madrid	Yes	Yes	May be able to bring crates in, but not a lot of resources for care	Needs generator. Local farmers may be able to provide portable generator if needed.

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Madrid based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Madrid Municipal Park - Old Mechanic Street
 - Private vacant land throughout Town
- **Potential Permanent Housing Locations**
 - None identified; potentially privately owned vacant land if owners willing to sell/subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	Moderate	3
Extreme Temperatures	3	1	1	2	Moderate	4
Flood	2	2	1	2	Moderate	5
Drought	3	1	2	1	Moderate	6
Earthquake	2	3	1	1	Moderate	7
Wildfire	1	3	1	2	Moderate	8
Ice Jam	2	2	1	1	Moderate	9
Infestation	2	1	2	1	Moderate	10

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Madrid. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Madrid Community Building and Town Park	1835 State Hwy 345, Madrid, NY 13660	No
Community Services	Madrid Hepburn Library	11 Church St, Madrid, NY 13660	No
County Services	St. Lawrence County Highway Outpost Facility (salt storage at Town Highway Dept.)	3529 County Rd 14, Madrid, NY 13660	No
Educational Facilities	Madrid-Waddington Central School	2582 State Hwy 345, Madrid, NY 13660	No
EMS/Fire Department	Madrid Fire Department	10 Church St, Madrid, NY 13660	No
EMS/Fire Department	Madrid Rescue Squad	Depot St, Madrid, NY 13660	No
Municipal Services	Town Municipal Building	3529 County Rd 14, Madrid, NY 13660	No
Public Utilities	Wastewater Treatment Facility	River Rd, Madrid, NY 13660	100YR
Public Utilities	Water Treatment Plant	3529 County Route 14	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Madrid.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Madrid. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Grass River and Trout Brook may experience increased flooding occurrences.

The Town of Madrid chose not to profile coastal storm or landslide in their annex even though these hazards were profiled for the County. The Town does not have any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards do not have historical records, but are included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 310 and 345 and County Routes 14, 30, and 31) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlet of Madrid.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. One of these events occurred in the Town of Madrid. Severe storms affect the Town about once a year, it is noted that not all events are reported by NCDC. This event occurred on 7/23/2012, and involved thunderstorm winds at 50 knots. Total estimated property damage was \$10,000. Actual property damages were likely greater than those reported by the NCDC. The NCDC reports no tornadoes affecting the Town since 2010.

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Ice Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Madrid is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 310 and 345 and County Routes 14, 30, and 31) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlet of Madrid.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the northern portion of St. Lawrence County where the Town of Madrid lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Madrid.

5.2.4 *Future Potential Impacts*

The Town of Madrid will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Department completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Town of Madrid is susceptible to damages from a severe winter storm event. The Town Highway Department clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Department of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 310 and 345 and County Routes 14, 30, and 31) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlet of Madrid.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Madrid has been affected by a number of severe winter storm events, which are described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Madrid.

5.3.4 Future Potential Impacts

The Town of Madrid will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Flood

5.4.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Grass River and Trout Brook, which drain to the St. Lawrence River and the Raquette River, respectively. The Town is unmapped by existing FEMA FIRMs. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Town of Madrid that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 6. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Madrid Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
33,504 acres	4.6%	0.14%

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC did not report any flood records for the Town of Madrid since 2010, however, there are NFIP loss claims and local records of flooding in the Town, particularly along the Grass River. As described in Section 6.0 of this annex, five NFIP loss claims have been paid as of October 2021 in the Town of Madrid totaling \$4,283.50. There are no repetitive loss properties in the Town of Madrid.

5.4.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the Grass River and Trout Brook are vulnerable to flooding. About 4.6% of the Town of Madrid is within a mapped 100-year floodplain.

5.5 **Drought**

5.5.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on public wells and may be susceptible to low water yields during a drought.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Madrid or the rest of St. Lawrence County since 2010. There are no specific damage estimates for the Town related to past drought events.

5.5.4 *Future Potential Impacts*

The entire Town of Madrid remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.6 Extreme Temperatures

5.6.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Madrid is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 9.9% of the population in the Town is under 5 years old, and 12.8% of the population is over 65 years old. Approximately 25.0% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Madrid lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Madrid.

5.6.4 *Future Potential Impacts*

The Town of Madrid will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 **Wildfire**

5.7.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

While the Town did not report wildfires that have caused significant damages, minor fires occasionally occur in the state forest. According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.7.4 *Future Potential Impacts*

The entire Town of Madrid remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.8 **Earthquake**

5.8.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.8.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes recorded in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Madrid. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. The entire Town remains susceptible to earthquakes.

5.9 Ice Jam

5.9.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the Grass River are vulnerable to ice jams.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The USACE CRREL did not report any ice jam records for the Town, however, local records reported occasional ice jams along the Grass River that have

caused flooding in local parks. These ice jams have historically occurred in March or April when the parks are not in use.

5.9.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along the Grass River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Madrid is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Madrid (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has been detected near the border of the Town of Madrid and Town of Waddington. The emerald ash borer is able to spread two miles per year on average, and is likely to spread further into the Town of Madrid in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Town of Madrid remains susceptible to an infestation event. The emerald ash borer is likely to migrate farther into the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Madrid currently participates in the NFIP. As of October 2021, five NFIP loss claims have been paid in the Town of Madrid totaling \$4,283.50. There are no repetitive loss property in the Town of Madrid. The Town's former floodplain ordinance was rescinded, and the Town is unmapped by existing FEMA FIRMs. The Town plans to develop a new floodplain ordinance based on FEMA's new mapping that is generated from the ongoing flood study for St. Lawrence County. This is included as a mitigation action, described further in Section 7.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed four mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 7, below. Two of the Town's former actions were re-included for the 2021 HMP update.

Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Raise areas of roadways in the Town which are continually flooded this will reduce flooding impacts as well as maintenance costs. Three areas have been identified thus far, each segment between $\frac{3}{4}$ and 1.5 miles in length.	Flood	2,3	Town of Madrid Highway Department	Not completed yet. There is one area around the intersection of County Rt 14 and County Rt 31 that has occasional flooding issues but it is not a significant concern. Not a high priority at this time.
Designate a Floodplain Management Administrator	Flood	2,3	Madrid Town Board	Not completed yet, re-included for HMP update.
Implement, and update/ revise as necessary, floodplain ordinances to comply with current and future FEMA FIRMs and regulations	Flood	2,3	Madrid Town Board	Not completed yet, re-included for HMP update.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Madrid Highway Department	Routine responsibility of highway dept. that is adequately addressed. A formal plan is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Town of Madrid									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Madrid 1	Install generator for municipal building	All	Madrid Town Board*	None	5 years		\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Madrid 2	Develop a local floodplain ordinance to comply with NFIP and designate a local floodplain administrator	Flood	Madrid Town Board*	None	5 years		\$10,000	Town Budget	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Madrid
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Mitigation Action Worksheet

Project Name:	Install generator for municipal building
Project ID:	Madrid 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town's municipal building does not have a backup generator. The municipal building is a critical community facility, and functions as the Town's emergency shelter.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the municipal building to ensure continuity of critical operations and improve the Town's sheltering abilities.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Madrid Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the municipal building	\$15K	Offers maximum protection for municipal building to maintain continuity of operations

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Madrid
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Mitigation Action Worksheet

Project Name:	Develop a local floodplain ordinance to comply with NFIP and designate a local floodplain administrator
Project ID:	Madrid 2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town formerly had floodplain regulations in place but they have since been rescinded. The Town remains unmapped by the existing FEMA flood insurance rate maps. FEMA is actively conducting a new flood study for St. Lawrence County that will generate floodplain mapping for all municipalities.

Action of Project Intended for Implementation

Description of the Solution:	Develop and adopt a local floodplain ordinance based on FEMA's new floodplain mapping (currently in progress) that will comply with the NFIP. Designate a local floodplain administrator to enforce the regulations for developments within the Town.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Reduction of flood losses and damages
Useful Life:	Long-term		
Estimated Cost:	\$10,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget
Responsible Organization:	Madrid Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Re-adopt former floodplain regulations that were rescinded	\$1K	Currently the Town is unmapped by FEMA - no designated special flood hazard areas to regulate at this time
	Develop a local floodplain ordinance to comply with NFIP and designate a floodplain administrator	\$10K	Would be done after new FEMA mapping is generated, so specific areas can be targeted for protection.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Madrid 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Madrid 2	+	+	+	+	+	+	+	+	+	+	Low	Low	2

Jurisdictional Annex

Town of Massena

1. Contacts

The contacts for the Town of Massena regarding this plan are identified as follows:

- Patrick O’Brien – First Asst. Chief, Massena Fire Department
Address: PO Box 6411, 34 Andrews Street, Massena, NY 13662
Phone: (315) 769-2380
Email: patrick.obrien@massenafd.org
- Jason Olson – Chief of Police
Address: 60 Main Street, Massena, NY 13662
Phone: (315) 769-3577
Email: jolson@massenapd.com

Town and Village Website: <https://massena.us/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 12,433 people live in the Town of Massena. The Town’s population has decreased by 3.5% since the 2010 Census (12,883) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Massena is located in the northeastern corner of St. Lawrence County and is bordered by the St. Lawrence River to the north, Town of Louisville to the west, Norfolk and Brasher to the south, and the St. Regis Mohawk Reservation (Franklin County) to the east.

2.3 Governing Body

The Town of Massena is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), several private developments have been completed in the Town. A new cellular antenna was installed on the Town’s water tower. ALCOA also completed a dredging project in the Grass River, and installed capacitor bank and breaker foundations on Dennison Road. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Massena	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	Currently undergoing significant update
Continuity of Operations Plan	Yes	
Transportation Plan	Yes	
Stormwater Management Plan	No	
Community Wildfire Protection	Yes	Urban wildfire interface plan in place with fire department
Pandemic Response Plan	Yes	Developed in Response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Massena	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	
Fire department ISO rating	Yes	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	
Acquisition of land for open space and public recreation	Yes	
Administration		
Planning Board	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	Yes	
Civil Engineer	Yes	
GIS Coordinator	Yes	Work with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	
Grant writing	Yes	
HAZUS analysis	Yes	
Funding Resources		
Capital improvements project funding	No	Water projects are in the works
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Massena	Notes
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	
Storm Ready certification	N/A	Town reached out to NWS to begin certification process for emergency management plan update – should be in place in 2021.
Firewise Communities certification	N/A	
Public-private partnership initiatives addressing disaster-related issues	Yes	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Route 37 and State Route 420. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Massena Neighborhood Center	61 Beach Street, Massena, NY	St. Lawrence County Community	Yes	Yes	Yes	Shared with Village.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
	13662	Development Program				
St. Mary's Church	105 Cornell Avenue, Massena, NY 13662	Greater Massena Catholic Community	Yes	Yes	Yes	Shared with Village. Needs generator.

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Massena based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Robert Moses State Park – 32 Beach Marina Road, Massena, NY 13662
 - Cole's Creek State Park – 13003 NY-37, Waddington, NY 13694
 - KOA (privately owned) – 84 County Route 42, Massena, NY 13662
 - St. Lawrence Centre (parking) – 6100 Mall Road, Massena, NY 13662
 - Industrial Park – Commerce Drive, Massena, NY 13662
 - Village property behind DPW and sand pits – 85 Robinson Road, Massena, NY 13662
 - Town-owned vacant land – 1498 State Hwy 131, Massena, NY 13662
- **Potential Permanent Housing Locations**
 - Town-owned vacant land – 1498 State Hwy 131, Massena, NY 13662

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Flood	2	2	2	2	Moderate	4
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	5
Drought	3	1	2	1	Moderate	6
Extreme Temperatures	3	1	1	2	Moderate	7
Wildfire	1	3	1	2	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Ice Jam	2	2	1	1	Moderate	10
Landslide	1	3	1	1	moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Massena. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Library	41 Glenn Street, Massena, NY 13662	No
Community Services	Massena Community Center	61 Beach Street #103, Massena, NY 13662	No
Community Services	Massena International Airport	90 Aviation Road, Massena, NY 13662	No
Community Services	Museum	79 Main Street, Massena, NY 13662	No
Educational Facility	Holy Name of Jesus Academy	337 Trippany Rd, Massena, NY 13662	No
Emergency Services	Massena Police Department	60 Main Street, Massena, NY 13662	No
Federal	U.S. Border Patrol	US Border Patrol, 180 Andrews St # 2, Massena, NY 13662	No
Federal	U.S. Port of Entry	30M Seaway International Bridge Rooseveltown, NY 13683	No
EMS/Fire Department	ALCOA Plant West	State Route 131, Massena, NY 13662	No
EMS/Fire Department	Massena Rescue Squad (in Village but serves Town)	341 E Orvis St, Massena, NY 13662	No
EMS/Fire Department	Massena Volunteer Fire Department (in Village but owned by Town)	34 Andrews St, Massena, NY 13662	100YR
EMS/Fire Department	Seaway Valley Ambulance Service	202 N Main St, Massena, NY 13662	No
Municipal Services	Town Hall	60 Main St #3, Massena, NY 13662	No
Municipal Services	Town Highway Garage	60 North Main Street, Massena, NY 13662	No
Public Utilities	Closed Landfill	49 Dump Road, Massena, NY 13662	No
Public Utilities	Massena Transfer Station	49 Dump Road, Massena, NY 13662	No

Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Municipal Water System	-	-
Public Utilities	Sewer Pump Station	59 Smith Rd	100YR
Public Utilities	Sewer Pump Station	6100 State Hwy 37	No
Public Utilities	Sewer Pump Station	State Hwy 420	No
Commerce	St. Lawrence Seaway Development Corporation Eisenhower Lock	St. Lawrence River	-
Commerce	St. Lawrence Seaway Development Corporation Snell Lock	St. Lawrence River	-

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. Three of these dams are located in the Town of Massena, and all are hydropower dams owned by New York Power Authority (Table 6, below).

Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Long Sault Dam	C	St Lawrence River	New York Power Authority	not available	12/1/2018	9/22/1999
Massena Intake Dam	C	Massena Power Canal	New York Power Authority	not available	12/1/2018	8/2/1995
Robert Moses-Robert H.	C	St Lawrence River	New York Power Authority	912.0	12/1/2018	12/31/1901

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Saunders Power Dam						
*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.						
**Capacity information obtained from Natural Resources Canada, 2021						

The Town indicated concerns regarding the Massena Intake Dam. It is adjacent to the Town’s largest employer (the ALOCA aluminum plant). Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and NYPA will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Massena. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River, Raquette River, and Grass River are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, 131, and 420) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Massena and hamlets of Massena Center and Rooseveltown.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Five of these events occurred in the Town of Massena (frequency of about once every two years). Three records were thunderstorm winds, and two were hail events (both occurred on the same date). Estimated damages for the Town of Massena ranged from \$0 to \$5,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes in Massena since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/10/2013	52 knots	\$0.00	-
Hail	10/1/2019	1 inch	\$0.00	-
Hail	10/1/2019	2 inches	\$0.00	-
Thunderstorm Wind	3/20/2020	51 knots	\$0.00	-
Thunderstorm Wind	3/20/2020	60 knots	\$5,000.00	-
Total			\$5,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Massena is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, 131, and 420) would be most impactful to

Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Massena and hamlets of Massena Center and Rooseveltown.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Town of Massena lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Massena.

5.2.4 *Future Potential Impacts*

The Town of Massena will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Massena is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, 131, and 420) would be most impactful to Town residents. Storm damages would primarily impact the

more populated portions of the Town, including the Village of Massena and hamlets of Massena Center and Rooseveltown.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Massena has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Massena.

5.3.4 *Future Potential Impacts*

The Town of Massena will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Flood**

5.4.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Raquette River, and Grass River, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Massena, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in

any given year). Table 8 summarizes the amount of land within the Town of Massena that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Massena Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
33,148 acres	5.9%	0.41%

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Town of Massena since 2010. Local records reported recurring flooding issues on Pratt Place up until a few years ago. Residents had to be rescued from their homes during previous flood events. The Village Public Works has since improved conditions. The Pratt Place/Water Street area can become overwhelmed quickly during heavy precipitation events causing water backing up into basements. The Town also reports concerns regarding the Massena Intake Dam adjacent to the aluminum plant. As described in Section 6.0 of this annex, one NFIP loss claim has been paid as of October 2021 in the Town of Massena totaling \$5,079.37. There are no repetitive loss properties in the Town of Massena.

5.4.4 Future Potential Impacts

Properties along streams throughout the Town, including the St. Lawrence River, Raquette River, and Grass River are vulnerable to flooding. About 5.9% of the Town of Massena is within a mapped 100-year floodplain.

5.5 Coastal Storm (Nor'easter)

5.5.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 37, 56, 131, and 420) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Massena and hamlets of Massena Center and Rooseveltown.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Massena were reported for this event.

5.5.4 Future Potential Impacts

The Town of Massena is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 Drought

5.6.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on private wells and may be susceptible to low water yields during a drought.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Massena. The Town has a municipal water system that serves portions of the Town. No specific damage estimates are available for the Town related to past droughts.

5.6.4 *Future Potential Impacts*

The entire Town of Massena remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Massena is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 4.1% of the population in the Town is under 5 years old, and 23.5% of the population is over 65 years old. Approximately 18.8% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Massena lies, which are described in Section 5.5 of the main body of the plan. No damage

estimates related to extreme temperatures are reported specific to the Town of Massena.

5.7.4 *Future Potential Impacts*

The Town of Massena will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 **Wildfire**

5.8.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 *Future Potential Impacts*

The entire Town of Massena remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, and the epicenters of both earthquakes were located in Massena. The first earthquake occurred on 11/28/2015 and registered 3.3 on the Richter scale. The second occurred on 7/14/2021 and registered 2.8 on the Richter scale. There are no specific damage estimates for either incident. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Ice Jam

5.10.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, St. Lawrence River, Raquette River, and Grass River are vulnerable to ice jams.

5.10.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of an ice jam occurring specifically in the Town of Massena. No damage estimates related to ice jams are reported specifically for the Town.

5.10.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along the St. Lawrence River, Raquette River, and Grass River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.11 **Landslide**

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Massena is mapped in an area with high susceptibility but low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the St. Regis River are particularly susceptible. The NCDRC reports no specific landslide events for St. Lawrence County. The Village and Town of Massena indicated that the primary locations of concern are by the seaway locks.

5.11.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of significant landslides occurring specifically in the Town of Massena. The Village and Town report issues by the seaway where the locks are. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Steep slopes in the Town remain susceptible to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.12 **Infestation**

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Massena is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Lisbon (Figure 5.13, Appendix A of the main body of the plan).

5.12.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has been detected in the Town of Massena. The emerald ash borer is able to spread two miles per year on average, making it a hazard for surrounding municipalities as well. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive

emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.12.4 Future Potential Impacts

The entire Town of Massena remains susceptible to an infestation event. Proactive ash tree management will be critical to reduce impacts of the emerald ash borer on the Town, which is likely to continue to spread.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Massena currently participates in the NFIP. As of October 2021, one NFIP loss claim has been paid in the Town of Massena totaling \$5,079.37. There are no repetitive loss properties in the Town of Massena.

The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed two mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. One of the Town’s 2015 actions was re-included for the 2021 update as a joint action with the Village of Massena.

Table 9. Hazard Mitigation Action Progress Town of Massena				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Creating reserve fund for future mitigation efforts this will allow for projects to progress more quickly as needed, to reduce impacts from hazards.	Severe storm	1	Town of Massena Board	Complete. Town budget may be used to help fund mitigation projects.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Massena Highway Department	Ongoing. Routine responsibility that is adequately addressed by highway department. No formal plan in place, re-included for HMP update as joint action with Village.

7.2 Proposed Mitigation Actions

The Town proposed three mitigation actions, including one joint action with the Village of Massena (an ongoing action from the 2015 HMP), to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Massena									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Massena T1	Update and improve the stormwater conveyance infrastructure in the Pontoon Bridge area to assist with recurring drainage issues encountered in the roadway.	Flood	Town of Massena Highway Dept*, Town Board	Comprehensive Plan	5 years	Existing	High	NYSEFC-CWSRF, NYSDOT - CHIPS, FEMA-BRIC, Town Budget	1
Massena T2	Train code enforcement staff to adequately recognize and enforce NFIP regulations and update floodplain ordinance.	Flood	Massena Town Board*	Comprehensive Plan	5 years	Existing	\$10,000	Town Budget	2
Massena TV1 (Ongoing from 2015)	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing before, during, and after disaster events.	Flood, Severe Thunderstorm/ Wind/Tornado, Ice Storm	Town of Massena Highway Dept*, Village of Massena DPW	Local Emergency Operations Plan	2 years	Existing	\$1,000	Town and Village Budget	3
Potential Funding Sources FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips NYSEFC CWSRF: https://efc.ny.gov/CWSRF									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Massena
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Mitigation Action Worksheet

Project Name:	Update and improve the stormwater conveyance infrastructure in the Pontoon Bridge area to assist with recurring drainage issues encountered in the roadway.
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Project ID:	Massena T1
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Risk/Vulnerability

Hazard of Concern:	Flood
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Description of the Problem:	The Town experiences recurring flooding issues on Pontoon Bridge Rd during heavy precipitation events, which crosses the Grass River near its confluence with the St. Lawrence River.
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Action of Project Intended for Implementation

Description of the Solution:	Rehabilitate and replace/upgrade existing stormwater drainage infrastructure to improve water conveyance and reduce flooding issues.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- CWSRF, NYSDOT - CHIPS, FEMA- BRIC, Town Budget
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Responsible Organization:	Town of Massena Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace existing infrastructure in-kind	High	May help convey flows temporarily and increase resiliency of system, but does not account for increased storm flows and the Town may still experience flooding issues
	Update and improve the stormwater conveyance infrastructure	High	Most comprehensive solution to reduce flood issues

Progress Report (for Plan Maintenance)

Date of Status Report:	
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Report of Progress:	
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Update Evaluation of the Problem and/or Solution:	
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Name of Jurisdiction:	Town of Massena
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St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Mitigation Action Worksheet	
Project Name:	Train code enforcement staff to adequately recognize and enforce NFIP regulations and update floodplain ordinance.
Project ID:	Massena T2
Risk/Vulnerability	
Hazard of Concern:	Flood
Description of the Problem:	The Town is a current participant in the NFIP and has local floodplain regulations in place. Code enforcement staff are responsible for enforcing these regulations. Additionally, FEMA is actively working on a new flood study for St. Lawrence County that will generate new floodplain mapping for all municipalities. The existing floodplain ordinance should be updated to reflect the new FEMA mapping once it is available, and code enforcement staff would benefit from additional training to recognize and enforce these regulations.
Action of Project Intended for Implementation	
Description of the Solution:	Update the existing floodplain ordinance to reflect the new FEMA mapping. Provide training for code enforcement staff so that they are able to recognize and review floodplain impacts for proposed development projects to ensure they are compliant with the Town's regulations.

Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Reduction of flood losses and damages
Useful Life:	Long-term		
Estimated Cost:	\$10,000		

Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget
Responsible Organization:	Massena Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)			
	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Train staff and keep existing regulations	\$5,000	Does not account for new mapping that FEMA is generating; special flood hazard areas may change
	Train staff and update floodplain regulations based on FEMA's new FIRM mapping, once completed	\$10,000	Allows Town to update code to reflect any changes in floodplain mapping to ensure protection of all identified floodplain areas and reduce losses for new development

Progress Report (for Plan Maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town and Village of Massena
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Mitigation Action Worksheet

Project Name:	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing before, during, and after disaster events.
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Project ID:	Massena TV1
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Risk/Vulnerability

Hazard of Concern:	Flood, Severe Thunderstorm/ Wind/Tornado, Ice Storm
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Description of the Problem:	The Town highway department and Village DPW are responsible for keeping roadways free of debris. The Town and Village do their best to manage debris proactively before emergency events, but there is no formal protocol or plan in place at this time that clearly defines responsibilities and priority locations.
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Action of Project Intended for Implementation

Description of the Solution:	Develop a formal protocol/plan document that defines and prioritizes zones to be inspected within the Town and Village for debris management, as well as frequency of inspections, and responsibilities among highway department and DPW staff.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Formal protocol in place outlining priority for road maintenance and inspecting/ clearing debris before, during, and after a hazard event
Useful Life:	Long-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town and Village Budgets
Responsible Organization:	Town of Massena Highway Dept*, Village of Massena DPW	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Develop list of priority roads for inspection after a storm event	\$1,000	Reactive approach
	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing	\$1,000	Includes mitigation/proactive approach before storm events occur

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Massena T1	+	+	0	+	+	-	0	0	+	0	Medium	High	1
Massena T2	+	+	0	+	+	+	+	+	+	-	Low	Low	2
Massena TV1	+	+	+	+	+	+	0	+	+	+	Low	Low	5

Jurisdictional Annex

Village of Massena

1. Contacts

The contacts for the Village of Massena regarding this plan are identified as follows:

- Patrick O’Brien – First Asst. Chief, Massena Fire Department
Address: PO Box 6411, 34 Andrews Street, Massena, NY 13662
Phone: (315) 769-2380
Email: patrick.obrien@massenafd.org
- Jason Olson – Chief of Police
Address: 60 Main Street, Massena, NY 13662
Phone: (315) 769-3577
Email: jolson@massenapd.com

Town and Village Website: <https://massena.us/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 10,151 live in the Village of Massena, which reflects a 7.2% decrease in population from the 2010 Census (10,936). (U.S. Census Bureau, 2021).

2.2 Location

The Village of Massena is located in the Town of Massena, in the northeastern corner of St. Lawrence County.

2.3 Governing Body

The Village of Massena is governed by a five-member Village Board, including the Mayor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a number of projects have been completed in the Village. The Village constructed a new salt barn and storage barn, and installed a new boiler system at the DPW facility. In addition, the Village repaired an existing sanitary sewer line on the footbridge over the Grass River, and installed a new sewer pipe at Main Street and State Route 37. Water mains were replaced in numerous locations, including along State Route 37 at Amherst Rd, Prospect Ave, Main St, Grove St, Urban Dr, Bayley Rd, and at State Route 420 where it intersects the CSX railroad tracks.

Capital projects have also been completed for multiple buildings in the Massena Central School District, including the High School, Jr. High School, Nightengale Elementary, Madison Elementary, Jefferson Elementary, and at the Administration and transportation buildings.

Private developments in the Village over the last 5 years have included a new cellular antenna on the Village water tower, the Mercantile Building at Water St and Main St, a new yarn factory at the Village Industrial Park (Trade Dr), an ALDI Store at Malby Ave and State Route 37, and the Citizens Advocate Building at 16 Phillips St. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Village's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Massena	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Massena	Notes
Continuity of Operations Plan	Yes	
Transportation Plan	Yes	
Stormwater Management Plan	Yes	
Community Wildfire Protection	Yes	Urban wildfire interface plan in place with fire department
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	Yes	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA working on flood study to generate updated FIRM maps countywide
Acquisition of land for open space and public recreation	Yes	Greenbelt preservation; GPD requirements
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Massena	Notes
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	No	
Civil Engineer	Yes	Engineer on staff but not designated Village engineer
GIS Coordinator	Yes	Works with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	
Storm Ready certification	Yes	
Firewise Communities certification	N/A	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Massena	Notes
Public-private partnership initiatives addressing disaster-related issues	Yes	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include State Route 37 and State Route 420. The Village's emergency shelter locations are summarized in Table 2, below. In addition to the Village's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Massena Neighborhood Center	61 Beach Street, Massena, NY 13662	St. Lawrence County Community Development Program	Yes	Yes	Yes	Shared with Town.
St. Mary's Church	105 Cornell Avenue, Massena, NY 13662	Greater Massena Catholic Community	Yes	Yes	Yes	Shared with Town. Needs generator.

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Massena based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Robert Moses State Park – 32 Beach Marina Road, Massena, NY 13662
 - Cole's Creek State Park – 13003 NY-37, Waddington, NY 13694
 - KOA (privately owned) – 84 County Route 42, Massena, NY 13662
 - St. Lawrence Centre (parking area) – 6100 Mall Road, Massena, NY 13662

- Industrial Park – Commerce Drive, Massena, NY 13662
- Village property behind DPW and sand pits – 85 Robinson Road, Massena, NY 13662
- Village-owned vacant land – 1498 State Hwy 131, Massena, NY 13662
- **Potential Permanent Housing Locations**
 - Village-owned vacant land – 1498 State Hwy 131, Massena, NY 13662

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Flood	2	2	2	2	Moderate	4
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	5
Drought	3	1	2	1	Moderate	6
Extreme Temperatures	3	1	1	2	Moderate	7

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Wildfire	1	3	1	2	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Ice Jam	2	2	1	1	Moderate	10
Landslide	1	3	1	1	moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Massena. Table 5, below, denotes the types and locations of critical facilities within the Village.

Type	Facility Name	Address	Located in Floodplain*
Community Services	Massena Community Center	61 Beach Street, Massena, NY 13662	No
Educational Facilities	J.W. Leary Junior High School	1 School St, Massena, NY 13662	No
Educational Facilities	Jefferson Elementary School	75 Bailey Rd, Massena, NY 13662	No
Educational Facilities	Madison Elementary School	25 Owl Ave, Massena, NY 13662	No
Educational Facilities	Massena Senior High School	84 Nightengale Ave, Massena, NY 13662	No
Educational Facilities	Nightengale Elementary School	84 Nightengale Ave, Massena, NY 13662	No
Educational Facilities	Trinity Catholic School	188 Main St, Massena, NY 13662	No
Emergency Services	Massena Police Department	60 Main Street, Massena, NY 13662	No
Emergency Services	NYS Police	29 Stearns St, Massena, NY 13662	No
EMS/Fire Department	Massena Rescue Squad (Town owned, also serves Village)	341 E Orvis St, Massena, NY 13662	No
EMS/Fire Department	Massena Volunteer Fire Department (Also serves Town)	34 Andrews St, Massena, NY 13662	100YR
Federal	Great Lakes St. Lawrence Seaway Development Corp.	180 Andrews St # 1, Massena, NY 13662	No

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Hospital	Massena Memorial Hospital	1 Hospital Dr, Massena, NY 13662	No
Municipal Services	Department of Public Works Facilities	Gouverneur Street, Brier Hill (Potato Street Road)	No
Municipal Services	Massena Radio Tower	Laurel Terrace Apartments	No
Municipal Services	Village Hall	60 Main Street, Massena, NY 13662	No
Public Utilities	Liberty Utilities	33 Stearns St, Suite 1, Massena, NY 13662	No
Public Utilities	Massena Electric Department	71 E Hatfield St, Massena, NY 13662	No
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Municipal Water System	-	-
Public Utilities	Sewer Pump Station	231 E Hatfield St	No
Public Utilities	Sewer Pump Station	62 Urban Dr Ext	No
Public Utilities	Sewer Pump Station	74 E Hatfield St	No
Public Utilities	Sewer Pump Station	76 Cook St	No
Public Utilities	Wastewater Treatment Facility	E Orvis St, Massena, NY 13662	100YR and 500YR
Radio Communications	Massena Radio Tower (On Laurel Terrace Apts.)	-	-

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in Village of Massena.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Massena. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River and the Grass River are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Village is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (State Highways 37 and 420) would be most impactful to Village residents. Storm damages would impact the majority of the Village, as it is densely developed.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Five of these events occurred in the Village of Massena (frequency of about once every two years). Three records were thunderstorm winds, and two were hail events (both occurred on the same date). Estimated damages for the Village of Massena ranged from zero to \$50,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/17/2011	60 knots	\$25,000.00	-
Thunderstorm Wind	7/23/2012	55 knots	\$15,000.00	-
Thunderstorm Wind	7/10/2013	55 knots	\$50,000.00	-
Hail	6/28/2016	1 inch	\$0.00	-
Hail	6/28/2016	1 inch	\$0.00	-
Total			\$90,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Massena is susceptible to damages from an ice storm event. Damages to the Village's critical infrastructure or primary evacuation routes (State Highways 37 and 420) would be most impactful to

Village residents. Storm damages would impact the majority of the Village, as it is densely developed.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Village of Massena lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Massena.

5.2.4 *Future Potential Impacts*

The Village of Massena will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Village of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Village of Massena is susceptible to damages from a severe winter storm event. The Village Department of Public Works clears Village streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (State Highways 37 and 420) would be most impactful to Village residents. Storm damages would impact the majority of the Village, as it is densely developed.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times per year in St. Lawrence County. The Village of Massena has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one Village within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Massena.

5.3.4 *Future Potential Impacts*

The Village of Massena will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Flood**

5.4.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by the Raquette River and the Grass River, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Village of Massena, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Village that is located within 100-year and 500-year

floodplains, as modeled by HAZUS. In addition to modeled floodplain areas, the Village indicated that the land surrounding the Massena Intake Dam adjacent to the aluminum plant would be particularly vulnerable to flooding events.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Village of Massena Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
3,018 acres	3.6%	2.45%

5.4.3 Historical Hazard Occurrences and Damage Estimates

According to NOAA's Storm Events Database, since 2010, no flood records were noted to specifically impact the Village of Massena. Local records reported that the stormwater system in the Platt Place/Water Street area can become overwhelmed quickly during heavy precipitation events causing water backing up into basements. As described in Section 6.0 of this annex, two NFIP loss claims have been paid as of October 2021 in the Village of Massena totaling \$10,562.84. There are no repetitive loss properties in the Village of Massena.

5.4.4 Future Potential Impacts

Properties along streams throughout the Village, including the Raquette River and Grass River are vulnerable to flooding. About 3.6% of the Village of Massena is within a mapped 100-year floodplain.

5.5 **Coastal Storm (Nor'easter)**

5.5.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Village is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary

evacuation routes (State Highways 37 and 420) would be most impactful to Village residents. Storm damages would impact the majority of the Village, as it is densely developed.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. Local records indicated that a nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Massena were reported for this event.

5.5.4 Future Potential Impacts

The Village of Massena is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 Drought

5.6.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Village residents are served by municipal water system which is supplied by surface water, and are therefore less susceptible to low water yields during a drought compared to areas in the County that rely on private wells.

5.6.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Village of Massena or the rest of St. Lawrence County since 2010. There are no specific damage estimates for the Village related to droughts.

5.6.4 *Future Potential Impacts*

The entire Village of Massena remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire Village of Massena is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 4.0% of the population in the Village is under 5 years old, and 21.6% of the population is over 65 years old. Approximately 17.7% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Massena lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Massena.

5.7.4 *Future Potential Impacts*

The Village of Massena will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme

temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Wildfire

5.8.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Village is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Village are susceptible to wildfires. Significant wildfires have not been reported in the Village, but this hazard was included in this annex for future mitigation planning consideration.

5.8.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Village experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

The entire Village of Massena remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Village is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, and the epicenters of both earthquakes were located in Massena. The first occurred on 11/28/2015 and registered 3.3 on the Richter scale. The second occurred on 7/14/2021 and registered 2.8 on the Richter scale. There are no specific damage estimates for either incident. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the entire Village remains susceptible.

5.10 Ice Jam

5.10.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Village is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Village, including the Raquette River and Grass River are vulnerable to ice jams.

5.10.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of an ice jam occurring specifically in the Village of Massena. No damage estimates related to ice jams are reported specifically for the Village.

5.10.4 Future Potential Impacts

Properties along streams throughout the Village, primarily along the Raquette River and Grass River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.11 **Landslide**

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Village is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Village of Massena is mapped in an area with high susceptibility but low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Grass River are particularly susceptible.

5.11.3 Historical Hazard Occurrences and Damage Estimates

Local records reported landslide issues along the St. Lawrence River where locks are. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.12 Infestation

5.12.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 *Hazard Vulnerability*

The Village's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village of Massena is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village of Massena (Figure 5.13, Appendix A of the main body of the plan).

5.12.3 *Historical Hazard Occurrences and Damage Estimates*

The emerald ash borer has been detected in the Town of Massena just north of the Village limits. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Village in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.12.4 *Future Potential Impacts*

The entire Village of Massena remains susceptible to an infestation event. Given the Villages' location, the emerald ash borer is likely to migrate to the Village over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Massena currently participates in the NFIP. As of October 2021, two NFIP loss claims have been paid in the Village of Massena totaling \$10,562.84. There are no repetitive loss properties in the Village.

The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed three mitigation actions in the 2015 St. Lawrence County HMP, and their statuses are summarized in Table 8, below. Two of the Village's 2015 mitigation actions were re-included for the 2021 update (one as a joint action with the Town of Massena). In addition to the actions described in Table 8, the Village recently stabilized the bank of the Grass River near the wastewater treatment plant, and replaced the 24" water intake pipe.

Table 8. Hazard Mitigation Action Progress Village of Massena				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Village of Massena Department of Public Works	Ongoing; routine responsibility of DPW that is adequately addressed. Formal plan is not in place, re-included for HMP update (joint action with Town)
Inspection and maintenance of the storm water system on an annual basis will ensure storm water system is efficient and can handle runoff.	Flood	1,2	Village of Massena Department of Public Works	Ongoing, stormwater system mitigation action re-included for HMP update
Installation of a slip line on the existing siphon along the Grass River on a prominent downtown parcel to prevent inundation and improve the salability of the property	Flood	1,2	Village of Massena Department of Public Works	Not completed, not a high priority at this time.

7.2 Proposed Mitigation Actions

The Village proposed five mitigation actions for the HMP update, including one joint action with the Town of Massena. Two of these actions, including the joint action with the Town, are ongoing actions from 2015. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Village of Massena									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Massena V1	Install generator for Massena Community Center	All	Massena Village Board*	Emergency Management Plan (currently undergoing update)	2 years	Existing	\$15-20K	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Massena V2	Install generator for St. Mary's Church	All	Massena Village Board*	Emergency Management Plan (currently undergoing update)	2 years	Existing	\$15-20K	Village Budget, DASNY- SAM, FEMA- BRIC	2
Massena V3 (Ongoing from 2015)	Conduct a study of the stormwater system capabilities in the Water Street area of the Village to determine the system's ability to handle runoff.	Flood	Village of Massena DPW*, Massena Village Board	Comprehensive Plan	5 years	Existing	\$30,000	NYSEFC- CWSRF, FEMA- BRIC, Village Budget	3

**Table 9. Proposed Hazard Mitigation Actions
Village of Massena**

Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Massena V4	Contract with Research, Applied Technology, Education, and Service (RATES) to conduct a feasibility study regarding the placement of real-time stage height sensors for early warning of rising water levels in the Water Street area	Flood	Village of Massena DPW*	Comprehensive Plan	5 years	Existing	\$30,000	Village Budget	4
Massena TV1 (Ongoing from 2015)	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing before, during, and after disaster events.	Flood, Severe Thunderstorm/ Wind/Tornado, Ice Storm	Town of Massena Highway Dept*, Village of Massena DPW	Local Emergency Operations Plan	2 years	Existing	\$1,000	Town and Village Budget	5

Potential Funding Sources

DASNY SAM: <https://www.dasny.org/about-us/what-we-do/grants-administration>
 FEMA BRIC: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>
 NYSEFC CWSRF: <https://efc.ny.gov/CWSRF>
 USDA RD Community Facilities: <https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program>

7.3 Cost-Benefit Analysis

Each of the Village’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Massena
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Mitigation Action Worksheet

Project Name:	Install generator for Massena Community Center
Project ID:	Massena V1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Community Center is a designated emergency shelter location and lacks a backup power source. Therefore, continuity of operations and sheltering abilities would be limited during power outages.

Action of Project Intended for Implementation

Description of the Solution:	Install generator at the Community Center to ensure continuity of critical operations during hazard events.
------------------------------	---

Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Ensure continuity of operations at the Community Center (emergency shelter) during a power outage resulting from natural hazard events.
Useful Life:	Long-term		
Estimated Cost:	\$15-20K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	6 months	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Village Board	Local Planning Mechanisms to be used in Implementation, if any:	Emergency Management Plan (currently undergoing update)

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Community Center has potential to lose power during a hazard event.
	Purchase portable generator to be shared between multiple facilities	\$8,000	Only one facility operational at a time during a power outage; multiple critical facilities lack backup power.
	Install standalone generator for Community Center	\$15-20K	Maximum protection of sheltering capabilities for Village and Town residents

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Massena
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Mitigation Action Worksheet

Project Name:	Install a generator for St. Mary's Church
Project ID:	Massena V2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	St. Mary's Church is a potential emergency shelter location and lacks a backup power source. Therefore, continuity of operations and sheltering abilities would be limited during power outages.

Action of Project Intended for Implementation
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Description of the Solution:	Install generator at the Church to ensure continuity of critical operations during hazard events.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Ensure continuity of operations at the Church (emergency shelter) during a power outage resulting from natural hazard events.
Useful Life:	Long-term		
Estimated Cost:	\$15-20K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	6 months	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC
Responsible Organization:	Village Board	Local Planning Mechanisms to be used in Implementation, if any:	Emergency Management Plan (currently undergoing update)

Three Alternatives Considered (Including No Action)
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	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Church has potential to lose power during a hazard event.
	Purchase portable generator to be shared between multiple facilities	\$8,000	Only one facility operational at a time during a power outage; multiple critical facilities lack backup power.
	Install standalone generator for Community Center	\$15-20K	Maximum protection of sheltering capabilities for Village and Town residents

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Massena
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Mitigation Action Worksheet

Project Name:	Conduct a study of the stormwater system capabilities in the Water Street area of the Village to determine the system's ability to handle runoff.
Project ID:	Massena V3

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Village's existing stormwater improvements infrastructure around Water Street is in need of upgrades to reduce recurring flooding issues, but an engineering study is needed to identify and prioritize issues in the existing system.

Action of Project Intended for Implementation

Description of the Solution:	Conduct an engineering study of the existing stormwater system to identify constraints and prioritize necessary improvements related to flood mitigation.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	A study will review the existing system and prioritize areas and methods of rehabilitation/ replacement to maximize benefits
Useful Life:	Short-term		
Estimated Cost:	\$30,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- CWSRF, FEMA- BRIC, Village Budget
Responsible Organization:	Village of Massena DPW*, Village Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace existing infrastructure in-kind	\$500,000	May help convey flows temporarily and increase resiliency of system, but does not account for increased storm flows and the village may still experience flooding issues
	Conduct a study of the stormwater system capabilities in the Water Street area	\$30,000	Allows Village to identify problem areas that may need increased capacity to reduce flooding issues

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Massena
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Mitigation Action Worksheet

Project Name:	Contract with Research, Applied Technology, Education, and Service (RATES) to conduct a feasibility study regarding the placement of real-time stage height sensors for early warning of rising water levels in the Water Street area
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Project ID:	Massena V4
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Risk/Vulnerability

Hazard of Concern:	Flood
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Description of the Problem:	The Village experiences recurring flooding issues along Pratt Place and Water Street, which are adjacent to the Grass River.
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Action of Project Intended for Implementation

Description of the Solution:	A feasibility study is needed to determine the best approach for flood mitigation in this area. The Village would like to consider placing real-time stage height sensors so that rising water levels can be quickly detected. This would provide more warning for residents before flooding occurs.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	A study would outline benefits of installing height sensors for this flood-prone area, and possible other alternatives that the Village could consider for flood mitigation
Useful Life:	Short-term		
Estimated Cost:	\$30,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget
Responsible Organization:	Village of Massena DPW*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Install water level sensors in this location	\$50,000	Future action after study completed
	Conduct a feasibility study regarding the placement of real-time stage height sensors	\$30,000	First step to identify benefits and other potential alternatives for flood mitigation

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town and Village of Massena
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Mitigation Action Worksheet

Project Name:	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing before, during, and after disaster events.
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Project ID:	Massena TV1
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Risk/Vulnerability

Hazard of Concern:	Flood, Severe Thunderstorm/ Wind/Tornado, Ice Storm
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Description of the Problem:	The Town highway department and Village DPW are responsible for keeping roadways free of debris. The Town and Village do their best to manage debris proactively before emergency events, but there is no formal protocol or plan in place at this time that clearly defines responsibilities and priority locations.
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Action of Project Intended for Implementation

Description of the Solution:	Develop a formal protocol/plan document that defines and prioritizes zones to be inspected within the Town and Village for debris management, as well as frequency of inspections, and responsibilities among highway department and DPW staff.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Formal protocol in place outlining priority for road maintenance and inspecting/ clearing debris before, during, and after a hazard event
Useful Life:	Long-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town and Village Budgets
Responsible Organization:	Town of Massena Highway Dept*, Village of Massena DPW	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Develop list of priority roads for inspection after a storm event	\$1,000	Reactive approach
	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing	\$1,000	Includes mitigation/proactive approach before storm events occur

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Massena V1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Massena V2	+	+	+	+	0	0	0	0	+	0	Medium	Medium	2
Massena V3	+	+	+	+	+	0	0	+	+	+	Low	Medium	3
Massena V4	+	+	+	+	+	0	0	+	+	+	Low	Medium	4
Massena TV1	+	+	+	+	+	+	0	+	+	+	Low	Low	5

Jurisdictional Annex

Town of Morristown

1. Contacts

The contacts for the Town of Morristown regarding this plan are identified as follows:

- Frank Putnam – Town Supervisor
Address: P.O. Box 240, Morristown, NY 13664
Phone: (315) 783-4790
Email: supervisor@townofmorristownny.org
- Chris Coffin – Deputy Supervisor
Address: P.O. Box 240, Morristown, NY 13664
Phone: (315) 375-6510 (Town Clerk’s Office)
Email: jazzbirks@yahoo.com

Town Website: <https://www.townofmorristownny.org/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 2,082 people live in the Town of Morristown. The Town’s population has increased by 5.5% since the 2010 Census (1,974) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Morristown is located in the western portion of St. Lawrence County and is bordered by the Town of Oswegatchie to the east, De Peyster to the east, Macomb to the south, Hammond to the west, and the St. Lawrence River to the north.

2.3 Governing Body

The Town of Morristown is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), no significant developments have been constructed in the Town. A Dollar General is currently planned for development. No new development has occurred in the Special Flood Hazard Area, and the Town’s vulnerability to natural hazards has not changed.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town recently updated their Comprehensive Plan, which directly incorporated the prior HMP. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Morristown	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	Currently a work in progress
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	Yes	LWRP
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Morristown	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	No	
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA is working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	Yes	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	Fire Departments
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Work with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Morristown	Notes
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	None active but Town has potential to do so for projects if needed
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA
State funding programs	Yes	
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	More Fire/rescue for emergency preparedness
Ongoing public education or information program	Yes	Town website, Facebook page, and post office notices; Black Lake Chamber of Commerce Gateway Museum – invasive species programs
Natural disaster or safety related school programs	Yes	Fire Departments work with the schools; Black Lake Chamber of Commerce Gateway Museum – invasive species programs
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 37, State Highway 12, State Highway 58, and County Route 6. The Town uses social media and the Town’s website to provide evacuation information to the public. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Morristown Fire and Rescue Company #1	200 Morris Street, Morristown, NY 13664	Town of Morristown	Yes	Yes	No	Backup power available

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Brier Hill Fire Department	2680 NY-37, Brier Hill, NY 13614	Brier Hill Fire Company, Inc.	Yes	Yes	No	Backup power available, new facility built in the last 3-4 years

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Morristown based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Cartier State Park – Jacques Cartier State Park, Ogdensburg, NY 13669
 - Morristown Fire and Rescue Company #1 (large field at station) – 200 Morris Street, Morristown, NY 13664
 - Red Barn Trails Farmhouse (open fields) – 515 River Road East, Ogdensburg, NY 13669
 - Campgrounds around Black Lake
- Potential Permanent Housing Locations
 - Potentially privately owned vacant properties in Town, if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Vulnerability Rank	Jurisdiction Rank
Ice Storm	3	2	3	2	High	1
Severe Winter Storm	3	1	2	3	High	2
Drought	3	1	2	3	High	3
Severe Thunderstorm/Wind/Hail/Tornado	2	2	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Infestation	2	1	2	3	Moderate	6
Flood	1	2	2	2	Moderate	7
Earthquake	2	3	1	1	Moderate	8
Ice Jam	1	3	1	1	Moderate	9
Coastal Storm (Nor'easter)	3	1	1	1	Moderate	10
Wildfire	1	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Morristown. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Library	200 Main Street, Morristown, NY 13664	No
Community Services	United Methodist Church	504 Gouverneur Street, Morristown, NY 13664	No
Educational Facilities	Morristown Central School	408 Gouverneur St, Morristown, NY 13664	No
EMS/Fire Department	Brier Hill Fire Department	2680 NY-37, Brier Hill, NY 13614	No
EMS/Fire Department	Morristown Fire & Rescue Company #1	200 Morris St, Morristown, NY 13664	No
Municipal Services	Department of Public Works Facilities	Gouverneur Street, Brier Hill (Potato Street Road)	No
Municipal Services	Town Hall	604 Main Street, Morristown, NY 13664	No
Public Utilities	Wastewater Treatment Facility	High Street, Morristown, NY 13664	No
*Based on HAZUS-modeled 100-year and 500-year floodplains			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Morristown.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Morristown. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along Chippewa Creek are likely to experience increased flooding occurrences.

The Town of Morristown chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Ice Storm

5.1.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Morristown is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 12, State Highway 58, and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Morristown (the former Village), Brier Hill, and Edwardsville.

5.1.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the southern portion of St. Lawrence County where the Town of Morristown lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Morristown.

5.1.4 Future Potential Impacts

The Town of Morristown will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.2 Severe Winter Storm

5.2.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Morristown is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 12, State Highway 58, and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Morristown (the former Village), Brier Hill, and Edwardsville.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Morristown has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Morristown.

5.2.4 Future Potential Impacts

The Town of Morristown will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 Drought

5.3.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but some areas rely on private wells and may be susceptible to low water yields during a drought.

5.3.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Morristown. Damage estimates for past droughts in the Town are not available.

5.3.4 Future Potential Impacts

The entire Town of Morristown remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.4 Severe Thunderstorm, Wind, Hail, or Tornado

5.4.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property.

Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 12, State Highway 58, and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Morristown (the former Village), Brier Hill, and Edwardsville.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Eight of these events occurred in the Town of Morristown (frequency of about once a year). All of these events were thunderstorm winds. Estimated damages for the Town of Morristown ranged from \$0 to \$5,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC.

Table 6. Severe Storm Event Records for the Town of Morristown				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	5/22/2013	50 knots	\$5,000	-
Thunderstorm Wind	7/18/2013	50 knots	\$5,000	-
Thunderstorm Wind	9/10/2016	50 knots	\$5,000	-
Thunderstorm Wind	8/4/2017	50 knots	\$0.00	-
Thunderstorm Wind	8/4/2017	50 knots	\$2,000	-
Thunderstorm Wind	8/4/2017	50 knots	\$5,000	-
Thunderstorm Wind	3/20/2020	51 knots	\$0	-
Thunderstorm Wind	7/13/2021	50 knots	\$2,000	-
Total			\$24,000	None Reported

5.4.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.5 Extreme Temperatures

5.5.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Morristown is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.9% of the population in the Town is under 5 years old, and 19.8% of the population is over 65 years old. Approximately 34.7% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Morristown lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Morristown.

5.5.4 Future Potential Impacts

The Town of Morristown will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 Infestation

5.6.1 Description

For a description of this hazard, please see Section 5.1.12 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Morristown is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Morristown (Figure 5.13, Appendix A of the main body of the plan). Additionally, Eurasian watermilfoil is of concern for the Town. Eurasian watermilfoil is an invasive aquatic plant that has been reported in Black Lake and the St. Lawrence River, both of which border the Town of Morristown.

5.6.3 Historical Hazard Occurrences and Damage Estimates

Emerald ash borer has been detected in the Town of Morristown. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive ash tree management countywide at over \$820,000 per year to keep up with anticipated spread. The Black Lake Invasive Weeds Committee worked with Quantitative Environmental Analysis, LLC to develop a Eurasian Watermilfoil Management Plan in 2008 (which is provided in Appendix H of the main plan). It was estimated total removal would cost up to \$20 to 30 million.

5.6.4 Future Potential Impacts

The entire Town of Morristown remains susceptible to an infestation event. The emerald ash borer was recently detected in the Town, and is likely to continue to spread. Proactive ash tree management will be critical to reduce potential impacts of this species.

5.7 Flood

5.7.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by Black Lake and Chippewa Creek, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Morristown, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas

that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Morristown that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Town of Morristown Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
38,210 acres	12.9%	0.06%

The St. Lawrence River Shoreline Resiliency Study, which was completed by BCA Architects and Rootz, LLC in 2019, assessed the vulnerability of shoreline ecosystems along the upper St. Lawrence River in the Towns of Hammond, Morristown, Oswegatchie, and Lisbon. As part of the study, a Floodplain Protection Overlay District indicating locations that are vulnerable to flooding throughout the study area. The proposed Floodplain Protection Overlay District generated by this study is generally limited to properties that are immediately adjacent to the St. Lawrence River shoreline. The Floodplain Protection Overlay District extends further inland along Morristown Bay in the Town of Morristown. Further information regarding this plan is provided in Section 5.7 of the main body of the plan.

5.7.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC did not report any flood records for the Town of Morristown since 2010. Local records reported flooding issues related to beaver dams, specifically on State Highway 37 and State Highway 58. Most areas affected by beaver dams are undeveloped. As described in Section 6.0 of this annex, five NFIP loss claims have been paid as of October 2021 in the Town of Morristown totaling \$2,691.25. There are no repetitive loss properties in the Town of Morristown limits.

5.7.4 Future Potential Impacts

Properties along streams throughout the Town, including the St. Lawrence River and Chippewa Creek are vulnerable to flooding. About 12.9% of the Town of Morristown is within a mapped 100-year floodplain.

5.8 Earthquake

5.8.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.8.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Morristown. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.9 Ice Jam

5.9.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along Chippewa Creek are vulnerable to ice jams.

5.9.3 Historical Hazard Occurrences and Damage Estimates

There are no USACE CRREL or local historical records of an ice jam occurring specifically in the Town of Morristown.

5.9.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along Chippewa Creek remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.10 Coastal Storm (Nor'easter)

5.10.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town of Morristown is moderately susceptible to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 12, State Highway 58, and County Route 6) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Morristown (the former Village), Brier Hill, and Edwardsville.

5.10.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected

St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Morristown were reported for this event.

5.10.4 Future Potential Impacts

The Town of Morristown is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.11 Wildfire

5.11.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town of Morristown is moderately susceptible to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.11.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.4 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The southeastern corner of the Town is mapped with a higher wildfire density during this time period (0.9 to 1.3 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

The entire Town of Morristown remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Morristown currently participates in the NFIP. As of October 2021, five NFIP loss claims have been paid in the Town of Morristown totaling \$2,691.25. There are no repetitive loss properties in the Town of Morristown.

The Town's Code Enforcement Officer serves as the Local Floodplain Administrator. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed three mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. One of the Town's 2015 mitigation actions was re-included for the 2021 HMP update. St. Lawrence County recently completed a project in Morristown involving the Northumberland Street bridge over the Morristown Bay. This project was funded under the NYS REDI program (\$2.1 million) and involved removal of the deteriorated bridge structure, widening of the causeway, and relocating the former bridge-mounted water and sewer mains underground. This work improved the overall resiliency of the project area, reducing the risk of flood-related damages.

2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Creating a capital reserve fund will allow for a more efficient and timely response to severe events.	Severe Storms	1	Town of Morristown	Complete. Town's capital reserves have improved over last decade. The Town is working with DANC on a Capital Reserve Plan.
Incorporate emergency coordination center and shelter into new Town/ Village fire Hall. Incorporate communications, backup generator, food storage and distribution system, sufficient sanitation for shelter capacity, cots, privacy partitions, storage facility, tables, etc.	All Hazards	1	Town of Morristown Board	Completed. Brier Hill Fire Dept. improvements addressed this need; doubled capacity for sheltering.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice Storm, severe storm	1,2,3	Town of Morristown Highway and DPW Department	Ongoing - routine responsibility of highway department, but no formal document in place. Re-included for HMP update.

7.2 Proposed Mitigation Actions

The Town proposed three mitigation actions to be included in the HMP update, one of which is ongoing from 2015. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Morristown									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Morristown 1 (Ongoing from 2015)	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing before, during, and after disaster events.	Flood, Severe Thunderstorm/ Wind/Hail/ Tornado, Ice Storm	Town of Morristown Highway Dept.*	Comprehensive Plan	2 years	Existing	\$1,000	Town Budget	1
Morristown 2	Retrofit extra municipal building (from Village dissolution) to a shelter and heating/cooling center, and install a generator.	All	Morristown Town Board*	Comprehensive Plan	5 years	Existing	\$100,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Morristown 3	Water system engineering study (metering improvements)	Drought	Morristown Town Board*	Comprehensive Plan	5 years	Existing	\$25,000	NYSEFC- DWSRF, USDA RD Water/Waste Disposal Program, Town Budget	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEFC DWSRF: https://efc.ny.gov/dwsrf USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program USDA RD Water & Waste Disposal: https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ny									

7.3 Cost-Benefit Analysis

Each of the Town's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Morristown
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Mitigation Action Worksheet

Project Name:	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing before, during, and after disaster events.
Project ID:	Morristown 1

Risk/Vulnerability

Hazard of Concern:	Flood, Severe Thunderstorm/ Wind/Tornado, Ice Storm
Description of the Problem:	The Town highway department is responsible for keeping roadways free of debris. The highway department takes care of debris management proactively and during/after emergency events, but there is no formal protocol or plan in place at this time that clearly defines responsibilities and priority locations.

Action of Project Intended for Implementation

Description of the Solution:	Develop a formal protocol/plan document that defines and prioritizes zones to be inspected within the Town for debris management, and identifies targeted frequency of inspections and responsibilities among highway department staff.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Formal protocol in place outlining priority for road maintenance and inspecting/ clearing debris before, during, and after a hazard event
Useful Life:	Long-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town Budget
Responsible Organization:	Town of Morristown Highway Dept.*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Develop list of priority roads for inspection after a storm event	\$1,000	Reactive approach
	Develop a formal protocol document that outlines responsibilities and procedures for road maintenance and debris clearing	\$1,000	Includes mitigation/proactive approach before storm events occur

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Morristown
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Mitigation Action Worksheet

Project Name:	Retrofit extra municipal building (from Village dissolution) to a shelter and heating/cooling center, and install a generator.
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Project ID:	Morristown 2
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Risk/Vulnerability

Hazard of Concern:	All
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Description of the Problem:	When the Village of Morristown dissolved in 2018, the Town inherited two additional municipal buildings. One of these facilities could be used as an emergency shelter and heating/cooling station, but would require some improvements first such as a generator.
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Action of Project Intended for Implementation

Description of the Solution:	Retrofit facility for use as an emergency shelter by installing a backup generator, air conditioning, and adding kitchen, restroom, and shower facilities.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved sheltering and heating/cooling center facilities
Useful Life:	Long-term		
Estimated Cost:	\$100K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Morristown Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable air conditioning units and space heaters	\$15K	Portable units offer more flexibility, but may not cool/heat entire facility.
	Retrofit extra municipal building	\$100K	Offers best protection of facility to maintain critical services for residents

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Morristown
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Mitigation Action Worksheet

Project Name:	Water system improvements project (metering improvements)
Project ID:	Morristown 3

Risk/Vulnerability

Hazard of Concern:	Drought
Description of the Problem:	The Town has a municipal water system that serves the former Village of Morristown. The system is in need of replacement and additional water meters to improve the Town's ability to detect leaks and monitor water usage.

Action of Project Intended for Implementation

Description of the Solution:	Complete a water system improvements project to replace existing water meters and install new meters where needed. This would also allow the Town to more accurately compare total water usage to wastewater treatment plant flows for a potential future sewer system improvements project (the WWTP and collection system experiences high rates of inflow/infiltration of stormwater).
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Additional metering for the Town's water system would help the Town easily identify leaks and conserve water.
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- DWSRF, USDA RD Water/Waste Disposal Program, Town Budget
Responsible Organization:	Morristown Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Install master water meters that cover multiple properties	High	Provides general locations of leaks or excessive usage but more difficult to determine specific locations
	Install water meters for all properties connected to Town water system	High	Most comprehensive approach for analyzing water system usage and implementing additional conservation measures when needed.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Morristown 1	+	+	+	+	+	+	0	+	+	+	Low	Low	1
Morristown 2	+	+	0	+	+	-	0	0	+	0	Medium	High	2
Morristown 3	+	+	+	+	+	0	0	+	+	+	Low	Medium	3

Jurisdictional Annex

Town of Norfolk

1. Contacts

The contacts for the Town of Norfolk regarding this plan are identified as follows:

- Charles A. Pernice – Town Supervisor
Address: PO Box 481, 5 West Main Street, Norfolk, NY 13667
Phone: (315) 384-4722
Email: norfolktownsuper@verizon.net

Town Website: <https://www.norfolkny.com>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 4,453 people live in the Town of Norfolk. The Town’s population has decreased by 4.6% since the 2010 Census (4,668) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Norfolk is located in the northern portion of St. Lawrence County and is bordered by the Towns of Massena and Louisville to the north, the Town of Brasher to the east, the Towns of Stockholm and Potsdam to the south, and the Town of Madrid to the west. The Town of Norfolk is easily accessed from State Highway 56 and County Route 310.

2.3 Governing Body

The Town of Norfolk is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), no new developments have been constructed in the Town. A private solar array project and a Dollar General are currently in the planning stages. No new development has occurred in the Special Flood Hazard Area, and Town’s vulnerability to natural hazards has not changed.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Norfolk	Notes
Plans		
Comprehensive Plan	Yes	Developed in 2008
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Norfolk	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	Last rating was 5 out of 10
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	Planning Board
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	Town highway department has informal shared service agreements with Town of Brasher and Village of Norwood, and formal agreements in place with County and NYSDOT.
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Work with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Norfolk	Notes
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	USDA
State funding programs	Yes	Court Grants used in past
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Town website
Natural disaster or safety related school programs	Yes	Fire department works with schools
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 56 and State Highway 310. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Department	1 Furnace St, Norfolk, NY 13667	Town of Norfolk, Norfolk Fire District	Yes	No	No	Backup power available
American Legion	2 E High St, Norfolk, NY 13667	American Legion Post 925	Yes	Yes	No	Backup power available
Community Center (Arena)	Clinton Street, Norfolk, NY 13667	Town of Norfolk	Yes	Yes	No	No backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Norfolk based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Ballpark next to Arena – Clinton Street, Norfolk, NY 13667
 - Ballpark in Raymondville – 342 Joy Rd, Norfolk, NY 13667
 - Fire Hall – 1 Furnace St, Norfolk, NY 13667
 - Parking lot at Arena – Clinton Street, Norfolk, NY 13667
- **Potential Permanent Housing Locations**
 - Privately owned vacant land within Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town’s natural hazard analysis results are provided in Table 4.

Table 3. Hazard Analysis Criteria

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Table 4. Hazard Vulnerability by Event

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Ice Jam	2	2	2	2	Moderate	6
Flood	2	2	2	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	3	1	1	Moderate	10
Infestation	2	1	1	1	Low	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Norfolk. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities

Type	Facility Name	Address	Located in Floodplain*
Community Services	Community Center (Arena)	Clinton Street, Norfolk, NY 13667	No
Community Services	Hepburn Library	1 Hepburn Street, Norfolk, NY 13667	No
Educational Facilities	Norwood-Norfolk Central School	7852 State Hwy 56, Norwood, NY 13668	No
EMS/Fire Department	Norfolk Volunteer Fire Department	1 Furnace St, Norfolk, NY 13667	100YR and 500YR
EMS/Fire Department	Norfolk Volunteer Rescue Squad	7 Sedwick St, Norfolk, NY 13667	No
Municipal Services	Police Department	5 West Main Street, Norfolk, NY 13667	No

Type	Facility Name	Address	Located in Floodplain*
Municipal Services	Town of Norfolk Highway Garage	5 West Main Street, Norfolk, NY 13667	No
Municipal Services	Town Office	5 West Main Street, Norfolk, NY 13667	No
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Municipal Water System	-	-
Public Utilities	Sewer Pump Station	20 Knapps Station Rd	No
Public Utilities	Sewer Pump Station	6 Remington Ave	No
Public Utilities	Sewer Pump Station	8 River Rd	No
Public Utilities	Sewer Pump Station	N Main St	No
Public Utilities	Wastewater Treatment Facility	River Rd	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. Four of these dams are located in the Town of Norfolk, and all are hydropower dams owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Dam Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Raymondville Dam	B	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	2.0	5/31/2019	7/29/1997
Yaleville Dam	B	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	2.0	5/31/2019	8/8/2001
East Norfolk Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	5.0	5/31/2019	7/29/1997
Norfolk Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	5.0	5/31/2019	7/29/1997

**Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.*
***Capacity information obtained from Natural Resources Canada, 2021*

The Town indicated that the dams are well controlled, however, there are earthquake related concerns regarding the dams. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Norfolk. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River and its tributaries are likely to experience increased flooding occurrences.

The Town of Norfolk chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Town is susceptible to damages from a severe thunderstorm, wind, hail, or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property.

Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 56 and 310) would be most impactful to Town residents.

Storm damages would primarily impact the more populated portions of the

Town, including the Village of Norwood and hamlets of Norfolk and Raymondville.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Five of these events occurred in the Town of Norfolk (frequency of about once every two years). Four these records were thunderstorm winds and one was a funnel cloud. Estimated damages for the Town of Norfolk ranged from zero to \$5,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The Town reports limited damage from storms including occasional downed trees.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	5/22/2013	50 knots	\$5,000.00	-
Funnel Cloud	7/8/2014	-	\$0.00	-
Thunderstorm Wind	7/9/2016	50 knots	\$5,000.00	-
Thunderstorm Wind	8/4/2017	50 knots	\$2,000.00	-
Thunderstorm Wind	10/10/2020	50 knots	\$2,000.00	-
Total			\$14,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town of Norfolk in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Norfolk is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation

routes (State Highways 56 and 310) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Norwood and hamlets of Norfolk and Raymondville.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the southern portion of St. Lawrence County where the Town of Norfolk lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Norfolk. The Town also reports a large ice storm in 1998.

5.2.4 *Future Potential Impacts*

The Town of Norfolk will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Town of Norfolk is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 56 and 310) would be most impactful to

Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Norwood and hamlets of Norfolk and Raymondville.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Norfolk has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDRC does not report any winter storm damage estimates specific to the Town of Norfolk.

5.3.4 Future Potential Impacts

The Town of Norfolk will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Coastal Storm (Nor'easter)

5.4.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 56 and 310) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Norwood and hamlets of Norfolk and Raymondville.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. Local records reported a nor'easter in St. Lawrence County on February 3, 2021, which involved up to

14 inches of snow across the County. No damages in the Town of Norfolk were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Norfolk will continue to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Extreme Temperatures**

5.5.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Norfolk is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 6.6% of the population in the Town is under 5 years old, and 14.7% of the population is over 65 years old. Approximately 22.6% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Norfolk lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Norfolk.

5.5.4 *Future Potential Impacts*

The Town of Norfolk will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the Raquette River and Plum Brook, mainly within the reservation, are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Norfolk was affected by 19 ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. Seventeen of these ice jams occurred on the Raquette River, and two occurred on Plum Brook. The USACE CRREL has not reported any ice jams in Norfolk since 2003, however, the Town reported local records of ice jams in recent years. No damage estimates related to ice jams are reported specific to the Town of Norfolk.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along Raquette River and Plum Brook remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Flood

5.7.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the properties along the Raquette River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Norfolk, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Norfolk that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Norfolk Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
36,778 acres	2.2%	0.53%

5.7.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reported two flood records in the Town of Norfolk since 2010. The first event occurred on 4/28/2011 and involved flooding along the Raquette River after heavy rains and snow melts. The second event occurred on 5/7/2011 and involved flooding along the Raquette River after heavy rains and snow melts. Specific damage estimates are not available for these events. The Town reports a low risk of flooding along the Raquette River.

Additionally, approximately 5-7 years ago there was a risk of flooding when the reservoirs were full. Also, there are stormwater related issues during heavy rain events, and beaver related issues on Dishaw Road. The Town has done lots of improvements last few years to upgrade culverts.

As described in Section 6.0 of this annex, no NFIP loss claims have been filed as of October 2021 in the Town of Norfolk. There are no repetitive loss properties in the Town.

5.7.4 Future Potential Impacts

Properties along streams throughout the Town, including the Raquette River and its tributaries are vulnerable to flooding. About 2.2% of the Town of Norfolk is within a mapped 100-year floodplain.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on public wells and may be susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reports no specific drought events for the Town of Norfolk or the rest of St. Lawrence County since 2010. There are no specific damage estimates for the Town related to previous droughts.

5.8.4 Future Potential Impacts

The entire Town of Norfolk remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 **Earthquake**

5.9.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. The Town has earthquake related concerns about dams within the Town. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Norfolk, and there are no local records of earthquakes affecting the Town. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to an earthquake.

5.10 **Wildfire**

5.10.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The NYSDEC map also shows two wildfires greater than 10 acres in size that occurred within the Town. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Town of Norfolk remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.11 **Infestation**

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Norfolk is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash

trees per total basal area ranges from about 7 to 30% in the Town of Norfolk (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has been detected in the Town of Norfolk. The emerald ash borer is able to spread two miles per year on average, and is likely to continue to spread throughout the Town. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Norfolk remains susceptible to an infestation event. The emerald ash borer was recently detected in the Town, and is likely to continue to spread. Proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Norfolk currently participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Town of Norfolk, and there are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 9, below. The Town’s 2015 mitigation action was not re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Town of Norfolk				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Norfolk Highway Department	Routine responsibility of highway department that is adequately addressed. The Town Highway Dept has a bucket truck to assist with tree management. A formal plan is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Norfolk									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Norfolk 1	Install generator for Town Office/Highway/Police Department Complex	All	Norfolk Town Board*, Norfolk Highway Dept	None	5 years	Existing	\$20,000	Town Budget, American Rescue Plan stimulus funds, DASNY-SAM, FEMA-BRIC, USDA RD - Community Facilities	1
Norfolk 2	Install generator for Arena	All	Norfolk Town Board*	None	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Norfolk 3	Water system improvements project	Drought	Norfolk Town Board*	Comprehensive Plan	5 years	Existing	\$5 million	NYSEFC- DWSRF, USDA RD Water/Waste Disposal Program, Town Budget	3

Potential Funding Sources

DASNY SAM: <https://www.dasny.org/about-us/what-we-do/grants-administration>

FEMA BRIC: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

NYSEFC DWSRF: <https://efc.ny.gov/dwsrf>

USDA RD Community Facilities: <https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program>

USDA RD Water & Waste Disposal: <https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ny>

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Norfolk
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Mitigation Action Worksheet

Project Name:	Install generator for Town Office/Highway/Police Department Complex
Project ID:	Norfolk 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Office/Highway/Police Department complex is a critical community facility and lacks a backup generator.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the municipal building complex to ensure that the Town, highway department, and police department can continue critical operations during emergency events.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$20,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, American Rescue Plan funds, DASNY- SAM, FEMA-BRIC, USDA RD - Community Facilities
Responsible Organization:	Norfolk Town Board*, Norfolk Highway Dept	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to be shared between multiple facilities	\$10,000	Only one facility operational at a time during a power outage; multiple critical facilities lack backup power.
	Install standalone generator for Town Office/Highway/Police Department Complex	\$20K	Maximum protection of facility, Town able to maintain critical operations during emergency event

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Norfolk
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Mitigation Action Worksheet

Project Name:	Install generator for Arena
Project ID:	Norfolk 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Arena currently lacks a backup generator. This facility could be used as an emergency shelter if backup power were available. The Arena already has a kitchen that could be utilized for shelter operations.

Action of Project Intended for Implementation

Description of the Solution:	Install a backup generator at the Arena so that it may be used as an emergency shelter location, and maintain operations during sustained power outages.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Norfolk Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to be shared between multiple facilities	\$10,000	Only one facility operational at a time during a power outage; multiple critical facilities lack backup power.
	Install standalone generator for Arena	\$15K	Maximum protection of facility, provides additional shelter location for Town residents

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Norfolk
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Mitigation Action Worksheet

Project Name:	Water system improvements project
Project ID:	Norfolk 3

Risk/Vulnerability

Hazard of Concern:	Drought
Description of the Problem:	The Town operates a municipal water system that is supplied by groundwater wells. The distribution system does not currently have any water meters for connected properties. The Town has experienced supply issues during drought events when public usage increases to water lawns. During the summer of 2020, the Town's supply got very low.

Action of Project Intended for Implementation

Description of the Solution:	Complete a water system improvements project to install water meters for users throughout the system. This will allow the Town to better detect leaks and monitor high rates of water usage, especially during drought events, to conserve the overall water supply.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Yes	Estimated Benefits (losses avoided):	Improved water supply monitoring and conservation
Useful Life:	Long-term		
Estimated Cost:	\$5 million		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC- DWSRF, USDA RD Water/Waste Disposal Program, Town Budget
Responsible Organization:	Norfolk Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Install master water meters that cover multiple properties	High	Provides general locations of leaks or excessive usage but more difficult to determine specific locations
	Complete comprehensive water system improvements project to install meters for all properties	\$5 million	Most comprehensive approach for analyzing water system usage and implementing additional conservation measures when needed.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Norfolk 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Norfolk 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Norfolk 3	+	+	0	+	+	-	0	-	+	-	High	High	3

Jurisdictional Annex

Village of Norwood

1. Contacts

The contacts for the Village of Norwood regarding this plan are identified as follows:

- Tim Levison – Mayor
Address: 15 South Main Street, Norwood, NY 13668
Phone: (315) 353-2372
Email: mayor@norwoodny.org
- Nancy Berger – Village Clerk
Address: 15 South Main Street, Norwood, NY 13668
Phone: (315) 353-6111
Email: villageclerk@norwoodny.org

Village Website: <https://norwoodny.org/>

2. Municipal Profile

2.1 Population

The 2020 Census estimated that 1,552 people live in the Village of Norwood, indicating a population decrease of 6.3% since the 2010 Census (1,657) (U.S. Census Bureau, 2021).

2.2 Location

The Village of Norwood is located within the Towns of Norfolk and Potsdam in northeastern portion of St. Lawrence County. Norwood is easily accessed from State Highway 56, County Road 48, and County Route 35.

2.3 Governing Body

The Village of Norwood is governed by a five member Village Board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a Dollar General was constructed in the Village at 57 South Main Street in 2017. A propane/fuel facility was also constructed recently. The Village expects additional private residences to be constructed along the Raquette River in the future. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Village's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village is a registered Climate Smart Community. The Village's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Norwood	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Norwood	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	Rating as of 2017: 5
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	Yes	
Flood insurance rate maps	Yes	FEMA is working on a flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	No	
Mutual aid agreements	Yes	Fire Department, Department of Public Works
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Mayor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	DANC

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Norwood	Notes
Technical Abilities		
Warning systems/services	Yes	Village website, Village Facebook page, Fire Department Facebook page and message board
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	Used in past.
Other federal funding programs	Yes	USDA
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	Norwood Lake Association
Ongoing public education or information program	Yes	Website/Facebook pages
Natural disaster or safety related school programs	Yes	Fire Department and Police department programs
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include State Highway 56, County Road 35, County Road 48, and Outer Maple Street. The Village’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Village Hall	11 South Main Street, Norwood, NY 13668	Village of Norwood	Yes	Yes	No	Backup power not available. Fire department has portable generators.
Norwood-Norfolk High School	7852 State Highway 56, Norwood, NY 13668	Norwood-Norfolk CSD	Yes	Yes	No	-
BOCES Seaway Tech Campus	7227 NY-56, Norwood, NY 13668	St. Lawrence-Lewis BOCES	Yes	Yes	No	-
St. Andrew’s Catholic Church	4 Park Ave, Norwood, NY 13668	St. Andrew’s Catholic Church	Yes	Yes	No	No backup power available.

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Norwood based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Ball field behind school – 7852 NY-56
 - Ball field by well field – 4th Avenue
 - Fireman’s field – 32 Morgan Rd
- **Potential Permanent Housing Locations**
 - Acreage along the River – residential development
 - Fireman’s field – 32 Morgan Rd

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	3	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Ice Jam	2	2	2	2	Moderate	6
Flood	2	2	2	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	3	1	2	Moderate	10
Landslide	1	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Norwood. Table 5, below, denotes the types and locations of critical facilities within the Village.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Norwood Salt Barn (private facility)	1252 River Rd, Norwood, NY 13668	No
EMS/Fire Department	Norwood Volunteer Fire Department	2 Bernard Ave, Norwood, NY 13668	No
Municipal Services	Highway Department	11 Bernard Avenue, Norwood, NY 13668	No
Municipal Services	Village Hall	15 South Main Street, Norwood, NY 13668	No
Public Utilities	Sewage pump stations (4)	Multiple properties	-
Public Utilities	Verizon building	Near Village Hall	No
Public Utilities	Wastewater Treatment Facility	J Liebfred Drive, Norwood, NY 13668	No
Public Utilities	Water System - well site	10 Sports Ave, Norwood NY	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams are located in the Village of Norwood, and is a hydropower dam owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below). The Village did not indicate any concerns regarding the Dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Village and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Norwood Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	2.0	5/31/2019	7/29/1997

**Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.
**Capacity information obtained from Natural Resources Canada, 2021*

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Norwood. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River and its tributaries are likely to experience increased flooding occurrences. The Village of Norwood is a registered Climate Smart Community.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. The entire Village is susceptible to damages from a severe thunderstorm, wind, hail or tornado event. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 56, County Route 35, County Route 48, and Outer Maple Street) would be most impactful to Village residents. Storm damages would primarily affect the more populated portions of the Village, which generally includes areas between Prospect Street and Elm Street/Whitney Street.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. One of these events occurred in the Village of Norwood. The Village experiences severe storm events more regularly than is indicated by the NCDC records (about once per year/once every two years).

The record reported in the Village was a thunderstorm wind that is detailed in Table 7, below. The NCDC estimated that this event caused about \$20,000 in property damages. The Village has experienced tree damage due to previous storms and microbursts. The NCDC reports no tornadoes affecting the Village since 2010.

Table 7. Severe Storm Event Records for the Village of Norwood				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/20/2021	55 knots	\$20,000.00	-

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Norwood is susceptible to damages from an ice storm event. Damages to the Village’s critical infrastructure or primary evacuation routes (State Highway 56, County Route 35, County Route 48, and Outer Maple Street) would be most impactful to Village residents. Storm damages would primarily affect the more populated portions of the Village, which generally includes areas between Prospect Street and Elm Street/Whitney Street.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. The most significant ice storm that affected the Village occurred in 1998. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Village of Norwood lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Norwood.

5.2.4 *Future Potential Impacts*

The Village of Norwood will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Village Department of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Village of Norwood is susceptible to damages from a severe winter storm event. The Norwood Department of Public Works clears Village streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 56, County Route 35, County Route 48, and Outer Maple Street) would be most impactful to Village residents. Storm damages would primarily affect the more populated portions of the Village, which generally includes areas between Prospect Street and Elm Street/Whitney Street.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Village of Norwood has been affected by a number of severe winter storm events, described in Section 5.1.4 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Norwood.

5.3.4 *Future Potential Impacts*

The Village of Norwood will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 56, County Route 35, County Route 48, and Outer Maple Street) would be most impactful to Village residents. Storm damages would primarily affect the more populated portions of the Village, which generally includes areas between Prospect Street and Elm Street/Whitney Street.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of

snow across the County. No damages in the Village of Norwood were reported for this event.

5.4.4 *Future Potential Impacts*

The Village of Norwood is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Extreme Temperatures**

5.5.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Village of Norwood is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 3.3% of the population in the Village is under 5 years old, and 29.3% of the population is over 65 years old. Approximately 15.5% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Norwood lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Norwood.

5.5.4 *Future Potential Impacts*

The Village of Norwood will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Village, primarily the Raquette River are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

There are no historical records of an ice jam occurring specifically in the Village of Norwood, nor are any damage estimates related to ice jams reported. However, local records indicate that the Village has experienced ice jams on a regular basis on the Raquette River.

5.6.4 *Future Potential Impacts*

Properties within the Village along the Raquette River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 Flood

5.7.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by the Raquette River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Village of Norwood, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Village of Norwood that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Village of Norwood Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
1,434 acres	8.6%	0.29%

5.7.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC did not report any flood records for the Village of Norwood since 2010. The Village reported frequent flooding issues on River Street. A home on River Street was flooded in 2011. The Village also experiences recurring flooding issues related to beaver dams.

As described in Section 6.0 of this annex, two NFIP loss claims have been paid as of October 2021 in the Village of totaling \$4,865.01. There are no repetitive loss properties in the Village of Norwood limits.

5.7.4 Future Potential Impacts

Properties along streams throughout the Village, including the Raquette River and its tributaries are vulnerable to flooding. About 8.6% of the Village of Norwood is within a mapped 100-year floodplain, based on the HAZUS flood model that was generated for St. Lawrence County.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Village of Norwood is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. Village residents are served by a municipal water system, which reduces their susceptibility to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reports no specific drought events for the Village of Norwood or the rest of St. Lawrence County since 2010. There are no specific damage estimates related to previous droughts in the Village.

5.8.4 Future Potential Impacts

The entire Village of Norwood remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Village of Norwood. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to earthquakes.

5.10 Wildfire

5.10.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.10.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open

fields and brush lands within the Village are susceptible to wildfires. Significant wildfires have not been reported in the Village, but this hazard was included in this annex for future mitigation planning consideration.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), the Village experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The NYSDEC map also shows one wildfire greater than 10 acres in size that occurred in the Town of Potsdam, near the Village. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

The entire Village of Norwood remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Landslide

5.11.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Village is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Village of Norwood is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Raquette River are particularly susceptible.

5.11.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of landslides occurring specifically in the Village of Norwood. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past. Landslides could impact the Village in the future.

5.12 Infestation

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Village's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village of Norwood (Figure 5.13, Appendix A of the main body of the plan). Additionally, Eurasian watermilfoil is of concern for the Village. Eurasian watermilfoil is an invasive aquatic plant that has been reported in Norwood Lake, which is located on the Raquette River south of Norwood in the Village of Potsdam.

5.12.3 Historical Hazard Occurrences and Damage Estimates

Emerald ash borer has not been documented in the Village to date, but it has been detected in the Town of Norfolk, north of the Village. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost

of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. Additionally, Eurasian watermilfoil has been detected in Norwood Lake, which is on the Raquette River in the Village of Potsdam (south of Norwood). The NYSDEC and Clarkson University are collaborating on eradication and control methods that may be used for this species.

5.12.4 Future Potential Impacts

The entire Village of Norwood remains susceptible to an infestation event. The emerald ash borer was recently detected in the adjacent Town of Norfolk, and is likely to reach the Village in the future. Proactive ash tree management will be critical to reduce potential impacts of this species. Proactive management is also critical to reduce the spread of Eurasian watermilfoil in the Raquette River.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Norwood currently participates in the NFIP. As of October 2021, two NFIP loss claims have been paid as of October 2021 in the Village of totaling \$4,865.01. There are no repetitive loss properties in the Village. The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 9, below. The Village’s 2015 action was not re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Village of Norwood				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, Severe storm	1,2,3	Village Department of Public Works	Routine responsibility of DPW, adequately addressed. A formal plan is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Village proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Village of Norwood									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Norwood 1	Complete a sewer collection system inflow and infiltration reduction project	Flood	Norwood Village Board*, Village DPW	Comprehensive Plan	5 years	Existing	High	NYSEFC - CWSRF, NYSEDEC- WQIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Village Budget	1
Norwood 2	Install a larger culvert and new stormwater conveyance piping to improve drainage between Baldwin St and Mechanic St.	Flood	Village of Norwood DPW*, Village Board	Comprehensive Plan	5 years	Existing	\$50,000	NYSDOT - CHIPS, Village Budget	2
Norwood 3	Upgrade Village Hall to improve use as a shelter facility. Add a generator, purchase cots and bedding, and add shower facilities.	All	Norwood Village Board*	Local Emergency Operations Plan	5 years	Existing	\$40,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEDEC WQIP: https://www.dec.ny.gov/pubs/4774.html NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips NYSEFC CWSRF: https://efc.ny.gov/CWSRF USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program USDA RD Water & Waste Disposal: https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/n									

7.3 Cost-Benefit Analysis

Each of the Village's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village's STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Norwood
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Mitigation Action Worksheet

Project Name:	Complete a sewer collection system inflow and infiltration reduction project
Project ID:	Norwood 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Village operates a sanitary sewer system that serves Village residents. The existing sewer collection system is aging and experiences high rates of stormwater inflow and infiltration during heavy precipitation events. This leads to additional, unnecessary flows being treated at the WWTP.

Action of Project Intended for Implementation

Description of the Solution:	Complete a sewer system improvements project to reduce stormwater infiltration, which will reduce unnecessary wear on the Village WWTP and improve the overall resiliency of the system.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of sewer system operations, reduced damage potential
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC - CWSRF, NYSDEC- WOIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Village Budget
Responsible Organization:	Norwood Village Board*, Village DPW	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Share public education materials regarding proper stormwater disposal	Low	Relies on public to implement stormwater reduction measures. Does not improve collection system
	Complete an inflow and infiltration reduction project for sewer system	High	Best option to increase resiliency of sewer system

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Norwood
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Mitigation Action Worksheet

Project Name:	Install a larger culvert and new stormwater conveyance piping to improve drainage between Baldwin St and Mechanic St.
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Project ID:	Norwood 2
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Risk/Vulnerability

Hazard of Concern:	Flood
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Description of the Problem:	The Village experiences recurring flooding issues between Baldwin St and Mechanic St during heavy precipitation events.
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Action of Project Intended for Implementation

Description of the Solution:	Install a larger culvert and about 1,000 feet of new stormwater conveyance piping to improve stormwater drainage and reduce flooding issues.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	\$50K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYS DOT - CHIPS, Village Budget
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Responsible Organization:	Village of Norwood DPW*, Village Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culvert in-kind	\$20K	May help temporarily but may not accommodate larger flows that lead to flooding issues
	Install a larger culvert and new stormwater conveyance piping	\$50K	Better high flow accommodation to reduce flood risk and damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Norwood
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Mitigation Action Worksheet

Project Name:	Upgrade Village Hall to improve use as a shelter facility. Add a generator, purchase cots and bedding, and add shower facilities.
Project ID:	Norwood 3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Village Hall is a critical community facility and is one of the Village's designated emergency shelters. This facility does not currently have a backup generator and is in need of other improvements to maximize sheltering capabilities.

Action of Project Intended for Implementation

Description of the Solution:	Retrofit the Village Hall to improve its use as an emergency shelter. Improvements would include: installation of a backup generator, purchase of cots/bedding, and installation of shower facilities.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved sheltering abilities
Useful Life:	Long-term		
Estimated Cost:	\$40K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Norwood Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Local Emergency Operations Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase generator only	\$15K	Ensures facility can remain operable during power outage, but facility still lacks other amenities that would support its use as an emergency shelter
	Purchase generator and complete other upgrades to Village Hall	\$40K	Significantly improves facility's use as shelter location

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Norwood 1	+	+	0	+	+	-	+	0	+	-	Medium	High	1
Norwood 2	+	+	0	+	+	0	0	0	+	+	Medium	Medium	2
Norwood 3	+	+	+	+	+	0	0	+	+	+	Medium	Medium	3

Jurisdictional Annex

City of Ogdensburg

1. Contacts

The contacts for the City of Ogdensburg regarding this plan are identified as follows:

- Andrea Smith – Planning Director
Address: 330 Ford Street, Ogdensburg, NY 13669
Phone: (315) 393-7150
Email: asmith@ogdensburg.org
- Stephen Jellie – City Manager
Address: 330 Ford Street, Ogdensburg, NY 13669
Phone: (315) 393-6100
Email: sjellie@ogdensburg.org

City Website: <https://www.ogdensburg.org>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 10,064 people live in the City of Ogdensburg. The City's population has decreased by 9.6% since the 2010 Census (11,128) (U.S. Census Bureau, 2021).

2.2 Location

The City of Ogdensburg is located in the northwestern portion of St. Lawrence County and is bordered by the Town of Lisbon to the east, the Town of Oswegatchie to the west and south, and the St. Lawrence River to the north. Ogdensburg is easily accessed from State Highway 37, State Highway 812, and State Highway 68.

2.3 Governing Body

The City of Ogdensburg is governed by a seven-member City Council, including the Mayor and six councilors.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the East River Street pump station was rehabilitated, and a solar project was completed. Additionally, the City is currently progressing rehabilitation projects for the Waste Water Treatment Facility and Main Street pump station. Redevelopment is also planned at the former Diamond National Site. The East River Street pump station is located in the 100-year floodplain, but work was completed within the existing structure. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the City’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The City has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The City is a registered Climate Smart Community, and participated in the St. Lawrence River Shoreline Resiliency Study. The City’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	City of Ogdensburg	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	City of Ogdensburg	Notes
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	City Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	
Acquisition of land for open space and public recreation	Yes	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	
Community Planner	Yes	
Civil Engineer	No	Engineering services contracted with consultant firms
GIS Coordinator	Yes	Works with DANC

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	City of Ogdensburg	Notes
Technical Abilities		
Warning systems/services	Yes	Water/Sewer alerts, City website, social media, text/email alerts
Hazard data and information	Yes	
Grant writing	Yes	
HAZUS analysis	Yes	
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	
Storm water utility fee	Yes	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the City include State Highway 37, State Highway 812, and State Highway 68. The City’s emergency shelter locations are

summarized in Table 2, below. Although pets are not accepted at the City's emergency shelters, there is an ASPCA just outside of the City on State Highway 68. Additionally, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Ogdensburg Free Academy	1100 State St, Ogdensburg, NY 13669	Ogdensburg CSD	Yes	Yes	No – ASPCA just outside of City	Backup power available
John F. Kennedy School	801-809 Park St, Ogdensburg, NY 13669	Ogdensburg CSD	Yes	Yes	No- ASPCA just outside City	
Grant C. Madill Elementary School	800 Jefferson Ave, Ogdensburg, NY 13669	Ogdensburg CSD	Yes	Yes	No- ASPCA just outside City	
NYS Armory	225 Elizabeth St, Ogdensburg, NY 13669	New York State	Yes	No	No- ASPCA just outside City	Backup power available
Lockwood Civic Center	141 W River St, Ogdensburg, NY 13669	City of Ogdensburg	Yes	Yes	No- ASPCA just outside City	No backup generator but mobile unit available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the City of Ogdensburg based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - 5 acre parking lot downtown
 - Vacant property- Patterson St and Route 37
 - St. Lawrence Psychiatric Center- 1 Chimney Point Dr.
 - Port Authority- 1 Bridge Plaza
- **Potential Permanent Housing Locations**
 - Available vacant parcels in City

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The City reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The City's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Flood	2	2	3	2	High	4
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	5
Ice Jam	2	2	2	2	Moderate	6
Extreme Temperatures	3	1	1	2	Moderate	7
Earthquake	2	3	1	1	Moderate	8
Drought	3	1	1	1	Moderate	9
Landslide	1	3	1	1	Moderate	10
Infestation	2	1	1	1	Low	11
Wildfire	1	2	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the City of Ogdensburg. Table 5, below, denotes the types and locations of critical facilities within the City.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Dobisky Center	100 Riverside Ave, Ogdensburg, NY 13669	100YR and 500YR
Community Services	Lockwood Civic Center	141 W River St, Ogdensburg, NY 13669	No
Educational Facilities	BOCES Northwest Technical Education Center	1000 Park St, Ogdensburg, NY 13669	No
Educational Facilities	Grant C. Madill Elementary School	800 Jefferson Ave, Ogdensburg, NY 13669	No
Educational Facilities	John F. Kennedy Elementary School	801-809 Park St, Ogdensburg, NY 13669	No
Educational Facilities	Ogdensburg Free Academy	1100 State St, Ogdensburg, NY 13669	No
EMS/Fire Department	Ogdensburg Volunteer Rescue Squad	1223 Pickering St, Ogdensburg, NY 13669	No
EMS/Fire Department	Ogdensburg Fire Department	718 Ford St., Ogdensburg, NY 13669	No
Federal Facility	U.S. Customs - Ogdensburg Port of Entry	104 Bridge Approach Rd, Ogdensburg, NY 13669	No
Federal Facility	U.S. Customs/Border Patrol	127 N Water St, Ogdensburg, NY 13669	100YR and 500YR
Hospital	St. Lawrence Psychiatric Center	1 Chimney Point Dr, Ogdensburg, NY 13669	No
Hospital	Claxton-Hepburn Medical Center	214 King St, Ogdensburg, NY 13669	No
Municipal Services	Ogdensburg City Hall	330 Ford St, Ogdensburg, NY 13669	No
Municipal Services	Ogdensburg Police Department	800 Park St, Ogdensburg, NY 13669	No
Municipal Services	Ogdensburg City Department of Public Works	901 Champlain St, Ogdensburg, NY 13669	No
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Closed Landfill	1201 Champlain St, Ogdensburg, NY 13669	No

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Public Utilities	Municipal Water System	Jefferson Ave, Ogdensburg, NY 13669	No
Public Utilities	Ogdensburg Transfer Station	522 County Route 28A, Ogdensburg, NY 13669	No
Public Utilities	Wastewater Treatment Facility	Railroad Street, Ogdensburg, NY 13669	No
Public Utilities	Sewer Pump Station	1 Bridge Plaza	no
Public Utilities	Sewer Pump Station	110 Chimney Point Dr	no
Public Utilities	Sewer Pump Station	15 Main St	no
Public Utilities	Sewer Pump Station	54 E River St	100YR
Public Utilities	Sewer Pump Station	803 S Water St	100YR
Public Utilities	Sewer Pump Station	State Hwy 37	no
State Facility	Ogdensburg Port of Entry	2 Paterson Street, Ogdensburg, NY 13669	100YR
State Facility	Ogdensburg Bridge & Port Authority	1 Bridge Plaza, Ogdensburg, NY 13669	No
State Facility	NYS DOCCS Riverview Correctional Facility	1110 Tibbitts Dr., Ogdensburg, NY 13669	No
State Facility	NYS Armory	225 Elizabeth St, Ogdensburg, NY 13669	No
State Facility	NYS Trooper Barracks	410 Cedar St, Ogdensburg, NY 13669	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the

NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams is located in the City of Ogdensburg, and is a hydropower dam owned by Ampersand Ogdensburg Hydro, LLC (Table 6, below).

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Ogdensburg Water Power Company Dam	C	Oswegatchie River	Ampersand Ogdensburg Hydro, LLC	3.5	12/6/2019	9/16/2014
*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.						
**Capacity information obtained from Natural Resources Canada, 2021						

The City indicated that the addition of the tailrace to the dam in the early 1990s has increased water velocity, particularly during times of high water. This has caused increased damages to the adjacent seawall and trail. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The City and Ampersand will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the City of Ogdensburg. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River and Oswegatchie River are likely to experience increased flooding occurrences. The City of Ogdensburg is a registered Climate Smart Community.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The City is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the City's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 812, and State Highway 68) would be most impactful to residents. Storm damages could impact the entire City, as it is densely populated.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Nine of these events occurred in the City of Ogdensburg (frequency of about once a year). Two of these records were hail

events, and the rest were thunderstorm winds. Estimated damages for the City of Ogdensburg ranged from \$0 to \$50,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The City indicated that one of their pump stations has been damaged during severe winds, requiring structural improvements. There are no records of tornado events affecting the City since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/21/2010	1.25"	\$0.00	-
Hail	7/21/2010	55 knots	\$50,000.00	-
Thunderstorm Wind	8/4/2010	50 knots	\$50,000.00	-
Thunderstorm Wind	7/17/2011	55 knots	\$20,000.00	-
Thunderstorm Wind	7/17/2011	60 knots	\$15,000.00	-
Thunderstorm Wind	9/8/2012	51 knots	\$10,000.00	-
Thunderstorm Wind	7/19/2013	55 knots	\$20,000.00	-
Hail	9/11/2013	1"	\$0.00	-
Thunderstorm Wind	7/13/2021	50 knots	\$2,000.00	-
Total			\$167,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the City in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The City is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire City is susceptible to damages from an ice storm event. Damages to the City's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 812, and State Highway 68) would be most

impactful to residents. Storm damages could impact the entire City, as it is densely populated.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the City of Ogdensburg lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the City of Ogdensburg. The City reports several ice storms affecting the City in the past, with the largest storm occurring in 1998.

5.2.4 *Future Potential Impacts*

The City of Ogdensburg will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The City Department of Public Works completes tree maintenance within City road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The City is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire City of Ogdensburg is susceptible to damages from a severe winter storm event. The City Department of Public Works clears City streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the City's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 812, and State Highway 68) would be most impactful to residents. Storm damages could impact the entire City, as it is densely populated.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The City of Ogdensburg has been affected by a number of severe winter storm events, which are described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDRC does not report any winter storm damage estimates specific to the City of Ogdensburg.

5.3.4 *Future Potential Impacts*

The City of Ogdensburg will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Flood**

5.4.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The City is highly vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The City is generally drained by the Oswegatchie River, which drains to the St. Lawrence River. FEMA provides flood insurance rate maps for the City of Ogdensburg, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the City of

Ogdensburg that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
City of Ogdensburg Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
5,151 acres	28.5%	0.31%

5.4.3 Historical Hazard Occurrences and Damage Estimates

According to NOAA’s Storm Events Database, since 2010, two flood records were noted to specifically impact the City of Ogdensburg. These were the same event, recorded on concurring days. The event occurred on 9/30/2010 and 10/1/2010 and involved flooding throughout the City of Ogdensburg. During this event, 35 to 40 homes experienced basement flooding, and multiple streets were flooded throughout the City. The City was also affected by the 2017 and 2019 high water events on the St. Lawrence River. As described in Section 6.0 of this annex, two NFIP loss claims have been paid as of October 2021 in the City of Ogdensburg totaling \$1,313.00. There are no repetitive loss properties in the City.

5.4.4 Future Potential Impacts

Properties along streams throughout the City, including the St. Lawrence River and Oswegatchie are vulnerable to flooding. About 28.5% of the City of Ogdensburg is within a mapped 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.5 Coastal Storm (Nor’easter)

5.5.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 Hazard Vulnerability

The City is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the City. Damages to the City's critical infrastructure or primary evacuation routes (State Highway 37, State Highway 812, and State Highway 68) would be most impactful to residents. Storm damages could impact the entire City, as it is densely populated.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the City were reported for this event.

5.5.4 Future Potential Impacts

The City of Ogdensburg is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 Ice Jam

5.6.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 Hazard Vulnerability

The City is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the City, primarily along the St. Lawrence River and Oswegatchie River are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

There are no historical records of an ice jam occurring in the City of Ogdensburg, and there are no damage estimates for ice jams. However, local records indicate that the City experiences ice jams. A significant ice jam occurred in 2019 near the east and westbound State Highway 68 bridges over the Oswegatchie River.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the City, primarily along the St. Lawrence River and Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The City is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These temperatures typically affect most or all of the County. The entire City of Ogdensburg is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 4.3% of the population in the City is under 5 years old, and 16.1% of the population is over 65 years old. Approximately 21.0% of the City's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the City of Ogdensburg lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the City of Ogdensburg.

5.7.4 *Future Potential Impacts*

The City of Ogdensburg will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 **Earthquake**

5.8.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The City is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the City, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the City's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the City and its residents.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these events occurred in the City of Ogdensburg. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 *Future Potential Impacts*

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the City remains susceptible to an earthquake.

5.9 **Drought**

5.9.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The City is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. City residents are served by municipal water that is supplied by the St. Lawrence River for water. Therefore, residents are less susceptible to low water yields during a drought compared to other areas in the County that rely on private wells.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC reports no specific drought events for the City of Ogdensburg or the rest of St. Lawrence County since 2010. There are no damage estimates related to droughts for the City.

5.9.4 *Future Potential Impacts*

The entire City of Ogdensburg remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.10 **Landslide**

5.10.1 *Description*

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.10.2 Hazard Vulnerability

The City is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The City is mapped in an area with high susceptibility but low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the St. Lawrence River and Oswegatchie River are particularly susceptible. The NCDRC reports no specific landslide events for St. Lawrence County.

5.10.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of landslides occurring specifically in the City of Ogdensburg. The City reports a history of landslides on Proctor Ave caused by flooding. Properties in this area without shoreline stabilization were affected during high water events in 2017 and 2019. Clay subsoils are present in this area, making it highly susceptible. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past. The City could experience landslides in the future, particularly along the Oswegatchie and St. Lawrence Rivers.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The City's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The City of Ogdensburg's main concern regarding infestation is a beetle that affects maple trees, the Asian

Longhorned Beetle (*Anoplophora glabripennis*), which has been detected in New York City. Over 40% of trees in the City of Ogdensburg are maples, leaving them susceptible to an outbreak. Another concern regarding an infestation in the City is the emerald ash borer, which has been documented in the City as well as other municipalities in the northern part of St. Lawrence County. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the City of Ogdensburg (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

As of December 2020, the emerald ash borer has been detected in the City of Ogdensburg and in other municipalities in the northern portion of the County. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire City of Ogdensburg remains susceptible to an infestation event. Emerald ash borer infestations are likely to spread, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.12 Wildfire

5.12.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.12.2 Hazard Vulnerability

The City's overall vulnerability to a wildfire is low, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the City are susceptible to wildfires. Significant

wildfires have not been reported in the City, but this hazard was included in this annex for future mitigation planning consideration.

5.12.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), the City experienced 0.4 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The City is largely developed; therefore, the number of wildfires is likely less than reported by the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.12.4 Future Potential Impacts

The entire City of Ogdensburg remains susceptible to a wildfire. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The City of Ogdensburg currently participates in the NFIP. As of October 2021, two NFIP loss claims have been paid in the City of Ogdensburg totaling \$1,313.00. There are no repetitive loss properties in the City. The City will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The City proposed three mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. None of the City’s 2015 actions were re-included for the 2021 HMP update.

Table 9. Hazard Mitigation Action Progress City of Ogdensburg				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop warning system to alert boaters of impending high wind events, is proposed. Additionally, the use of education tools such as brochures and signage will inform the boating community of the probability of future high wind events.	Severe storms	1	Fire Department and Park and Recreation	No progress to date, not a high priority at this time
Complete an engineering study to identify potential high risk buildings (earthquake). Additionally, emergency evacuation routes will be defined and practiced.	Earthquake	1,2	Engineering Department	More general property condition assessments of city facilities have been completed - not specific to earthquakes though. Code enforcement reviews new construction.
Create an information pamphlet to educate residents on how they can help to reduce utility impacts on their own property. Additionally, the City’s website has the capability to do automatic alerts; this system can help to increase community awareness during an emergency and or loss of power.	Severe winter storm	1,2	Planning department of Public Works, Comptroller	Completed - website is utilized for alerts (road closures, etc.)

7.2 Proposed Mitigation Actions

The City proposed five new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on the worksheets provided in Attachment A.

Table 10. Proposed Hazard Mitigation Actions City of Ogdensburg									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Ogdensburg 1	Install generator for two sewage pump stations (Heavy Industrial and Light Industrial Parks)	All	Ogdensburg DPW*	Capital Improvement Plan	5 years	Existing	\$10,000.00	City Budget, NYSEFC-CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Ogdensburg 2	Install generator for the Lockwood Civic Center/Arena	All	Ogdensburg City Council*	Capital Improvement Plan	5 years	Existing	\$15,000.00	City Budget, DASNY-SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Ogdensburg 3	Shoreline resiliency improvements	Flood	Ogdensburg City Council*	Ogdensburg LWRP	5 years	Existing	\$2 million	NYS- REDI, FEMA-BRIC, City Budget	3
Ogdensburg 4	Elevate City structures along shoreline above floodplain	Flood	Ogdensburg City Council*	Ogdensburg LWRP	5 years	Existing	High	FEMA- BRIC, City Budget	4
Ogdensburg 5	Main St Pump Station and South Water St Pump Station Improvements	All	Ogdensburg DPW*, Ogdensburg City Council	Capital Improvement Plan	5 years	Existing	High	NYSEFC - CWSRF, USDA RD - Water & Waste Disposal Program, NYSOCR-CDBG, City Budget	5
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEFC CWSRF: https://efc.ny.gov/CWSRF NYS REDI: https://www.governor.ny.gov/programs/lake-ontario-resiliency-and-economic-development-initiative-redi USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program USDA RD Water & Waste Disposal: https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/n									

7.3 Cost-Benefit Analysis

Each of the City's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The City's STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the action.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	City of Ogdensburg
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Mitigation Action Worksheet

Project Name:	Install generator for two sewage pump stations (Heavy Industrial and Light Industrial Parks)
Project ID:	Ogdensburg 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	Two of the City's sewage pump stations lack a backup generator, leaving them susceptible to operational interruptions during a power outage.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Heavy Industrial and Light Industrial pump stations so that both will continue to function during power outages.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$10K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	City Budget, NYSEFC- CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Ogdensburg DPW*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to be shared between multiple facilities	\$5,000	Only one facility operational at a time during a power outage; multiple critical facilities lack backup power.
	Install standalone generator for both pump stations	\$10,000	Maximum protection of pump stations, ensuring continuity of critical utility operations

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	City of Ogdensburg
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Mitigation Action Worksheet

Project Name:	Install generator for the Lockwood Civic Center/Arena
Project ID:	Ogdensburg 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Civic Center/Arena is a critical community facility that lacks a backup generator. This facility could be used as an additional emergency shelter location if backup power were available.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Arena so that it may continue critical operations during an emergency event.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	City Budget, DASNY- SAM, FEMA-BRIC, USDA RD - Community Facilities
Responsible Organization:	Ogdensburg City Council*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator	\$10,000	May not power entire facility, more coordination required for usage.
	Install standalone generator for Civic Center/Arena	\$15,000	Maximum protection of facility and expands shelter location options for City

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	City of Ogdensburg
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Mitigation Action Worksheet

Project Name:	Shoreline resiliency improvements
Project ID:	Ogdensburg 3

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The City has experienced recurring flooding and high water events along the St. Lawrence River that have caused significant damages to shoreline properties.

Action of Project Intended for Implementation

Description of the Solution:	Complete shoreline resiliency projects to protect shoreline properties from future flood damages. The existing limestone seawalls are in poor condition. The City is reviewing the conditions of the entire City-owned portion of the shoreline (from N Water St to Caroline Street), and is considering shoreline hardening techniques as well as more naturalized/green approaches in various locations.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood damages to shoreline properties
Useful Life:	Long-term		
Estimated Cost:	\$2 million		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYS- REDI, FEMA- BRIC, City Budget
Responsible Organization:	Ogdensburg City Council*	Local Planning Mechanisms to be used in Implementation, if any:	City of Ogdensburg LWRP

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Stabilize the shoreline using nature-based features such as vegetation plantings	High	May not provide necessary level of protection. A combination of nature-based and hard armor may be a better option.
	Complete comprehensive shoreline resiliency improvements, using combination of naturalized and hard infrastructure approaches	\$2 million	Offers greatest amount of shoreline protection from erosion and flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	City of Ogdensburg
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Mitigation Action Worksheet

Project Name:	Elevate City structures along shoreline above floodplain
Project ID:	Ogdensburg 4

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The City has experienced recurring flooding and high water events along the St. Lawrence River that have caused significant damages to shoreline properties.

Action of Project Intended for Implementation

Description of the Solution:	The City plans to elevate existing City-owned structures on the shoreline (primarily on parkland) above the base flood elevation to protect them from future flood damages.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Reduced flood damages to City structures
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	FEMA- BRIC, City Budget
Responsible Organization:	Ogdensburg City Council*	Local Planning Mechanisms to be used in Implementation, if any:	City of Ogdensburg LWRP

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Construct shoreline protection in front of City structures	High	Partial solution, but structures still need to be elevated above flood elevation to reduce damage risk
	Elevate City structures	High	Offers maximum protection of City structures

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	City of Ogdensburg
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Mitigation Action Worksheet

Project Name:	Main St Pump Station and South Water St Pump Station Improvements
Project ID:	Ogdensburg 5

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The City's existing Main Street and South Water Street sewage pump stations are aging, and are in need of structural improvements to improve their resiliency to flood and wind storm events.

Action of Project Intended for Implementation

Description of the Solution:	Rehabilitate pump stations to improve their structural integrity. The South Water St pump station is located in the mapped 100-year floodplain and should be raised above the base flood elevation to improve its flood resiliency.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Improved continuity of sewer system operations, reduced damage potential
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC - CWSRF, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, City Budget
Responsible Organization:	Ogdensburg DPW*, City Council	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions
	Repair pump station components as needed (reactive approach)	Medium-high	Reactive approach, does not address flood mitigation
	Complete comprehensive improvements to both pump stations, including flood mitigation	High	Proactively addresses deficiencies and offers maximum protection from flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Ogdensburg 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Ogdensburg 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Ogdensburg 3	+	+	0	+	0	-	+	0	+	-	Medium	High	3
Ogdensburg 4	+	+	0	+	+	-	+	-	+	-	High	High	4
Ogdensburg 5	+	+	0	+	+	-	0	0	+	-	High	High	5

Jurisdictional Annex

Town of Oswegatchie

1. Contacts

The contacts for the Town of Oswegatchie regarding this plan are identified as follows:

- Russ Lawrence – Town Code Enforcement Officer
Address: 51 N State Street, Heuvelton, NY 13654
Phone: (315) 344-2400
Email: codes@townofoswegatchie.com

Town Website: <https://www.townofoswegatchie.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 4,158 people live in the Town of Oswegatchie. The Town’s population has decreased by 5.3% since the 2010 Census (4,397) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Oswegatchie is located in the northwestern portion of St. Lawrence County and is bordered by the St. Lawrence River and City of Ogdensburg to the north, Towns of Lisbon and Canton to the east, Towns of De Kalb and De Peyster to the south, and Town of Morristown to the west. The Town of Oswegatchie is easily accessed from State Highway 37, State Highway 812, and State Highway 68.

2.3 Governing Body

The Town of Oswegatchie is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), seven private solar array projects have been proposed in the Town. One project has been permitted for construction and the others are still in the planning stages. No other significant commercial or residential developments have occurred in the Town since 2015. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Oswegatchie	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Oswegatchie	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	In place – Local law from 1987
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	Updated in progress
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor/Code Enforcement Officer
Community Planner	No	
Civil Engineer	Yes	Work with a consulting firm. Usually Tisdale & Associates
GIS Coordinator		
Technical Abilities		
Warning systems/services	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Oswegatchie	Notes
Hazard date and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	No	
State funding programs	Yes	DASNY, Division of Cemeteries
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	No	
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include NY-812, NY-68, NY-37, and NY-184. NY-184 runs along the water so travel on this route may be dependent on situation. Shelter and evacuation route information is made available to the public through the Town's website and the fire department message board. The

Town's emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Heuvelton Volunteer Fire Department	95 North State Street, Heuvelton, NY 13654	Village of Heuvelton	Yes	Yes	No	Backup power available
Heuvelton Central School	87 E Washington St, Heuvelton, NY 13654	Heuvelton CSD	Yes	Yes	No	Generator may be available but cannot power entire building

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Oswegatchie based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Wadhams Hall Seminary – 6866 NY-37, Ogdensburg, NY 13669
 - Stonefence Motel – 7191 NY-37, Ogdensburg, NY 13669
 - Inn at Grand View – 6765 NY-37, Ogdensburg, NY 13669
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant land in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
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1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Vulnerability Rank	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Flood	2	2	3	2	High	4
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	5
Ice Jam	2	2	2	2	Moderate	6
Extreme Temperatures	3	1	1	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Infestation	2	1	2	1	Moderate	10
Wildfire	1	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Oswegatchie. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Community Services	Foxwood Memorial Park (mausoleum) and crematory next door	5968 NY-812, Ogdensburg, NY 13669	No
Municipal Services	Town Hall	51 State Street, Heuvelton, NY 13654	No
Municipal Services	Town of Oswegatchie Highway Department	4960 County Route 6, Ogdensburg, NY 13669	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA’s High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams is located in the Town of Oswegatchie, and is a hydropower dam owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Table 6. Intermediate and High-Hazard Potential Dams <i>(NYSDEC, 2021)</i>						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Eel Weir Dam	C	Oswegatchie River	Erie Boulevard Hydropower (Brookfield Renewable)	4.0	5/31/2019	7/29/1997
<i>*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes. **Capacity information obtained from Natural Resources Canada, 2021</i>						

The Town indicated no concerns regarding the Dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Oswegatchie. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River, and the Oswegatchie River and its tributaries are likely to experience increased flooding occurrences.

The Town of Oswegatchie chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. The Town indicated that tornados are a concern due to large amount of open space within the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 812, 68, 37, and 184) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Heuvelton and hamlet of

Galilee. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Four of these events occurred in the Town of Oswegatchie (frequency of about once every two years). These events are summarized in Table 7, below. Estimated property damages ranged from zero to \$50,000 per event. Actual damages were likely greater than those estimated by the NCDC. No tornado events have been reported in the Town since 2010.

Table 7. Severe Storm Event Records for the Town of Oswegatchie				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	9/26/2019	1.25"	\$0	-
Thunderstorm Wind	11/15/2020	50 knots	\$25,000	-
Thunderstorm Wind	7/20/2021	55 knots	\$0	-
Thunderstorm Wind	7/20/2021	55 knots	\$50,000	-
Total			\$75,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Oswegatchie is susceptible to damages from an ice storm event. Damages to the Town’s critical infrastructure or primary evacuation

routes (State Highways 812, 68, 37, and 184) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Heuvelton and hamlet of Galilee. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Town of Oswegatchie lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Oswegatchie.

5.2.4 *Future Potential Impacts*

The Town of Oswegatchie will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Oswegatchie is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary

evacuation routes (State Highways 812, 68, 37, and 184) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Heuvelton and hamlet of Galilee. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Oswegatchie has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Oswegatchie.

5.3.4 *Future Potential Impacts*

The Town of Oswegatchie will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Flood**

5.4.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is highly vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St.

Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Oswegatchie that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Oswegatchie Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
45,061 acres	7.7%	0.18%

The St. Lawrence River Shoreline Resiliency Study, which was completed by BCA Architects and Rootz, LLC in 2019, assessed the vulnerability of shoreline ecosystems along the upper St. Lawrence River in the Towns of Hammond, Morristown, Oswegatchie, and Lisbon. As part of the study, a Floodplain Protection Overlay District indicating locations that are vulnerable to flooding throughout the study area. The proposed Floodplain Protection Overlay District generated by this study is generally limited to properties that are immediately adjacent to the St. Lawrence River shoreline. Further information regarding this plan is provided in Section 5.7 of the main body of the plan.

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reported two flood records in the Town of Oswegatchie since 2010. Both records reflected a single event, and were recorded on 9/30/2010 and 10/1/2010. These records involved flooding throughout the Town of Oswegatchie. Multiple homes experienced basement flooding during this event, and multiple roadways became flooded. The Town also reported local records of flooding issues on the Oswegatchie River, and sporadic stormwater issues occurring occasionally throughout the Town.

As described in Section 6.0 of this annex, nine NFIP loss claims have been paid as of October 2021 in the Town of Oswegatchie totaling \$76,735.37. There is one repetitive loss property in the Town, which is a single family residence. The property has incurred two flood related losses, with a total of

\$27,361.32 in building damages. No content damage payments were reported.

5.4.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the St. Lawrence River and Oswegatchie River are vulnerable to flooding. About 7.7% of the Town of Oswegatchie is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.5 **Ice Jam**

5.5.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Lawrence River and Oswegatchie River are vulnerable to ice jams.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Oswegatchie was affected by five ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in Section 5.6 of the County's 2015 HMP. All reported ice jams occurred on the Oswegatchie River. The USACE CRREL has not reported any ice jams in Oswegatchie since 2006, however, local records indicate that the Town experiences ice jams on a regular basis. The Town indicated that ice jams typically occur along the Oswegatchie River, where jams cause bottleneck effects. Fewer ice jam issues are reported on the St. Lawrence River.

5.5.4 *Future Potential Impacts*

Properties along streams and rivers throughout the Town, primarily along the St. Lawrence River and Oswegatchie River, remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.6 **Coastal Storm (Nor'easter)**

5.6.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 812, 68, 37, and 184) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Heuvelton and hamlet of Galilee. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Oswegatchie were reported for this event.

5.6.4 *Future Potential Impacts*

The Town of Oswegatchie is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Oswegatchie is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 8.0% of the population in the Town is under 5 years old, and 22.0% of the population is over 65 years old. Approximately 23.2% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Oswegatchie lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported for the Town of Oswegatchie.

5.7.4 *Future Potential Impacts*

The Town of Oswegatchie will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Drought

5.8.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system, therefore, residents rely on private wells which may be susceptible to low water yields during a drought.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Oswegatchie or the rest of St. Lawrence County since 2010. There are no specific damage estimates available for the Town related to previous droughts.

5.8.4 *Future Potential Impacts*

The entire Town of Oswegatchie remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the

Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents. The Town indicated that seismic activity is a concern; however, earthquake vulnerability in areas of concern was reduced when the Town's building codes were updated in 2016.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Oswegatchie. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the entire Town remains susceptible.

5.10 **Infestation**

5.10.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Oswegatchie is the emerald ash borer, which was recently detected in the Town and in other portions of the County. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Hammond (Figure 5.13, Appendix A of the main body of the plan). Additionally, Eurasian watermilfoil is of concern for the Town. Eurasian watermilfoil is an invasive aquatic plant that has been reported in Black Lake and the St. Lawrence River, both of which border the Town of Oswegatchie.

Additionally, European water chestnut (*Trapa natans*) was just discovered in the Oswegatchie River within the Town in the summer of 2021.

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Oswegatchie, however, it has been detected in the Town of Lisbon which is directly north of Oswegatchie. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. The Black Lake Invasive Weeds Committee worked with Quantitative Environmental Analysis, LLC to develop a Eurasian Watermilfoil Management Plan in 2008 (which is provided in Appendix H of the main plan). It was estimated total removal would cost up to \$20 to 30 million. Additionally, the Town received funding to study invasive weeds in Black Lake, which is an ongoing joint effort with NYSDEC.

5.10.4 Future Potential Impacts

The entire Town of Oswegatchie remains susceptible to an infestation event. The emerald ash borer was recently detected in the Town, and is likely to continue to spread. Proactive ash tree management will be critical to reduce potential impacts of this species, as well as proactive waterbody management to reduce the spread of Eurasian watermilfoil and European water chestnut. The Town is planning to develop a management plan for European water chestnut that will outline management techniques for existing populations and ways to reduce spread expansion of this species within Black Lake and nearby waterbodies.

5.11 **Wildfire**

5.11.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.11.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor grass/brush fires occasionally occur. According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.4 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

The entire Town of Oswegatchie remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Oswegatchie currently participates in the NFIP. As of October 2021 nine NFIP loss claims have been paid in the Town of Oswegatchie totaling \$76,735.37. There is one repetitive loss property in the Town, which is a single family residence. The property has incurred two flood related losses, with a total of \$27,361.32 in building damages. No content damage payments were reported. The Town's Code Enforcement Officer serves as the Local Floodplain Administrator. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new

development in Special Flood Hazard Areas, among other required duties. The Town will also consider potential mitigation efforts for the repetitive loss property in the Town.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed three mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. None of the Town’s 2015 mitigation actions were re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Town of Oswegatchie				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Implement an annual right of way tree evaluation to identify any new hazards.	Ice storm, infestations, flooding, severe winter storm	1,2,3	Town Department	Ongoing; highway dept. completes clearing and grubbing operations regularly.
Upgrade deficient culverts, to reduce flooding. Continue to monitor culverts, especially after heavy rain/flash flooding events.	Flood	2,3	Town Highway Department	Ongoing maintenance for highway dept.; Town also monitors new driveways and other developments to make sure ditches can maintain flows.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town Highway Department	In place, highway department responsible.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Oswegatchie									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Oswegatchie 1	Install generator for Town Hall	All	Oswegatchie Town Board*	None	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Oswegatchie 2	Install generator for highway department	All	Oswegatchie Town Highway Dept*	None	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Oswegatchie
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Mitigation Action Worksheet

Project Name:	Install generator for Town Hall
Project ID:	Oswegatchie 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall lacks a backup generator, and is susceptible to interruptions in critical operations during a sustained power outage.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Town Hall so that the Town can continue critical operations during emergency events.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Oswegatchie Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Town Hall	\$15K	Offers maximum protection for Town Hall

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Oswegatchie
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Mitigation Action Worksheet

Project Name:	Install generator for highway department
Project ID:	Oswegatchie 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town highway department lacks a backup generator, and is susceptible to interruptions in critical operations during a sustained power outage.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator for the highway department facility so that critical community services can continue during emergency events.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Oswegatchie Town Highway Dept*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the highway department	\$15K	Offers maximum protection for highway department

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Oswegatchie 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Oswegatchie 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2

Jurisdictional Annex

Town of Parishville

1. Contacts

The contacts for the Town of Parishville regarding this plan are identified as follows:

- Rod Votra – Town Supervisor
Address: P.O. Box 155, Parishville, NY 13672
Phone: (315) 265-2131
Email: sparishville@yahoo.com
- Connie Maguire – Town Clerk
Address: P.O. Box 246, Parishville, NY 13672
Phone: (315) 265-2131
Email: tcparishville@yahoo.com

Town Website: <https://www.parishvilleny.us/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 2,038 people live in the Town of Parishville. The Town's population has decreased by 5.3% since the 2010 Census (2,153) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Parishville is located in the eastern portion of St. Lawrence County and is bordered by the Towns of Stockholm and Potsdam to the north, Hopkinton to the east, Colton to the south, and Pierrepont to the west. The southern half of the Town is within the Adirondack Park. Parishville is easily accessed State Highway 72, County Route 56, County Route 58, and County Route 47.

2.3 Governing Body

The Town of Parishville is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

A new fire department facility was constructed in 2021. No other significant commercial or residential developments have occurred in the Town since the last County HMP (2015). No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Parishville	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Parishville	Notes
Fire department ISO rating	No	
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA is working on flood study to generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	Yes	
Civil Engineer	Yes	
GIS Coordinator	Yes	Works with DANC
Technical Abilities		
Warning systems/services	Yes	Fire Department
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	Fees for subdivision
Storm water utility fee	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Parishville	Notes
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA Rural Development
State funding programs	No	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Fire Department does fire prevention with schools
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 72, County Route 56, County Route 58, and County Route 47. The Town website, Facebook page, and the radio are all used to provide shelter and evacuations route information out to the public. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Parishville-Hopkinton School	12 County Route 47, Parishville, NY 13672	Parishville-Hopkinton CSD	Yes	Yes	No	Backup power available, Primary location,

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
						Coordination with multiple entities required
Highway Department	102 Akins Rd, Dickinson Center, NY 12930	Town of Parishville	Yes	Yes	Yes	Backup power available, alternative location to school
Town Office	1772 NY-72, Parishville, NY 13672	Town of Parishville	Yes	Yes	Yes	No backup power available
Fire Department	25 Rutman Road, Parishville, NY 13672	Town of Parishville	Yes	Yes	Yes	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Parishville based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Town Park - 40 Park Street
 - Land around Fire Hall – 25 Rutman Road
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town’s natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	2	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor’easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	1	2	Moderate	5
Ice Jam	2	2	1	2	Moderate	6
Flood	2	2	1	2	Moderate	7
Earthquake	2	3	1	1	Moderate	8
Wildfire	1	3	1	2	Moderate	9
Infestation	2	1	2	1	Moderate	10
Drought	3	1	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Parishville. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Educational Facilities	Parishville-Hopkinton Central School	12 County Rt 47, Parishville, NY 13672	No
EMS/Fire Department	Parishville Volunteer Fire Company	25 Rutman Rd, Parishville, NY 13672	No
Municipal Services	Town of Parishville Highway Department	102 Akins Rd, Dickinson Center, NY 12930	No
Municipal Services	Town Office	1772 NY-72, Parishville, NY 13672	No
Municipal Services	Transfer Station	42 Rutman Road, Parishville, NY 13672	No
Public Utilities	Municipal Water System	-	-
Public Utilities	Water Treatment Plant and Water Tower	10 Taylor Hill Rd, Parishville, NY 13672	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. Four of these dams are located in the Town of Parishville, and all are hydropower dams owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Parishville Development Dam	B	West Branch St Regis River	Erie Boulevard Hydropower (Brookfield Renewable)	3.0	5/31/2019	8/3/1999
Allen Falls Development Dam	C	West Branch St Regis River	Erie Boulevard Hydropower (Brookfield Renewable)	4.0	5/31/2019	7/30/1997

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Blake Falls Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	15.0	5/31/2019	7/29/1998
Rainbow Falls Dam	C	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	25.0	5/31/2019	7/29/1998
*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes. **Capacity information obtained from Natural Resources Canada, 2021						

The Town indicated no concerns regarding the dams. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Parishville. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Regis River, Parkhurst Brook, and Alder Meadow Brook are likely to experience increased flooding occurrences.

The Town of Parishville chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 72, County Route 56, County Route 58, and County Route 47) would be most impactful to Town residents. Storm damages would primarily affect the more populated portions of the Town, such as the hamlet of Parishville.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Four of these events occurred in the Town of Parishville (frequency of about once every two to three years). All of these records were thunderstorm winds. Estimated damages for the Town of Parishville ranged from \$2,000 to \$10,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. No tornadoes were reported for the Town by NCDC since 2010.

Table 7. Severe Storm Event Records for the Town of Parishville				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/17/2011	50 knots	\$10,000	-
Thunderstorm Wind	7/19/2020	50 knots	\$10,000	-
Thunderstorm Wind	7/19/2020	50 knots	\$10,000	-
Thunderstorm Wind	3/26/2021	50 knots	\$2,000	-
Total			\$32,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town of Parishville in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Parishville is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 72, County Route 56, County Route 58, and County Route 47) would be most impactful to Town residents. Storm damages would

primarily affect the more populated portions of the Town, such as the hamlet of Parishville.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Town of Parishville lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Parishville.

5.2.4 *Future Potential Impacts*

The Town of Parishville will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Town of Parishville is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 72, County Route 56, County Route 58, and County Route 47) would be most impactful to Town residents. Storm damages would primarily affect the more populated portions of the Town, such as the hamlet of Parishville.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Parishville has been affected by a number of severe winter storm events, which are described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDRC does not report any winter storm damage estimates specific to the Town of Parishville.

5.3.4 *Future Potential Impacts*

The Town of Parishville will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 72, County Route 56, County Route 58, and County Route 47) would be most impactful to Town residents. Storm damages would primarily affect the more populated portions of the Town, such as the hamlet of Parishville.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Parishville were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Parishville will continue to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Extreme Temperatures**

5.5.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Parishville is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.6% of the population in the Town is under 5 years old, and 20.7% of the population is over 65 years old. Approximately 14.0% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Parishville lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Parishville.

5.5.4 *Future Potential Impacts*

The Town of Parishville will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Regis River are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

There are no USACE CRREL records of an ice jam occurring specifically in the Town of Parishville. Local records reported an ice jam on the St. Regis River, which did not cause significant damage. No damage estimates related to ice jams are reported specifically for the Town.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along the St. Regis River, remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 **Flood**

5.7.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the St. Regis River, Parkhurst Brook, and Alder Meadow Brook, which drain to the St. Lawrence River, the Raquette River and the St. Regis River respectively. FEMA provides flood insurance rate maps for the Town of Parishville, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Parishville that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Parishville Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
64,943 acres	2.1%	0.17%

5.7.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Town of Parishville since 2010. Local records reported flooding issues every two to three years related to stormwater conveyance, but the Town does not have significant flooding issues. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Parishville. There are no repetitive loss properties in the Town.

5.7.4 Future Potential Impacts

Properties along streams throughout the Town, including the St. Regis River, Parkhurst Brook, and Alder Meadow Brook are vulnerable to flooding. About

2.1% of the Town of Parishville is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.8 Earthquake

5.8.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.8.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which occurred in the Town of Parishville. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the entire Town remains susceptible.

5.9 Wildfire

5.9.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forests, open fields, and brush lands within the Town are susceptible to wildfires.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.4 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The northern portion of the Town is mapped with a higher wildfire density during this time period (1.4 to 3.4 fires per square mile), and the southern portion of the Town is mapped with a lower wildfire density during this time period (0 to 0.3 fires per square mile). One wildfire over 10 acres in size was reported by the NYSDEC during this timeframe in Parishville, which occurred on the western side of the Town near its border with the Town of Colton. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

The entire Town of Parishville remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Drought

5.10.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on public wells and may be susceptible to low water yields during a drought. The Town has not had

any water supply issues over the past 30 years. The Town has a backup well, and is currently progressing an improvements project for their water system infrastructure.

5.10.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Parishville or the rest of St. Lawrence County since 2010. There are no specific damage estimates available for the Town related to droughts.

5.10.4 Future Potential Impacts

The entire Town of Parishville remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Parishville is the emerald ash borer, which was documented in the northern portion of St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 15% in the Town of Parishville (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Parishville, however, it has been detected in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Parishville in the near future. Areas where ash

trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Parishville remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Parishville currently participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Town of Parishville. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed three mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 9, below. None of the Town's 2015 mitigation actions were re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Town of Parishville				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Complete a comprehensive study of the drainage areas along Sinclair Road to determine the most cost effective way to alleviate flooding impacts.	Flood	3	Town of Parishville Highway Department Superintendent	Completed - installed several new larger culverts on Sinclair Road
Install an on-demand generator, at the Highway Garage. The Highway Department Building houses all Town plow and utility vehicles. Power is needed to access building as well as fuel storage.	Severe storms, severe winter storm, ice storm, and utility failure	1	Town of Parishville Highway Department	Completed
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm, severe winter storm	1,2,3	Town of Parishville Highway Department	In place. Highway department responsible for implementing.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Parishville									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Parishville 1	Install generator for Town Office	All	Parishville Town Board*	None	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Parishville 2	Add air conditioning and showers to Town Highway Department to improve use as emergency shelter and cooling center facility	All	Parishville Highway Dept*	None	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Parishville
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Mitigation Action Worksheet

Project Name:	Install generator for Town Office
Project ID:	Parishville 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Office lacks a backup generator and remains susceptible to interruptions during emergency events with power outages.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Town Office to ensure continuity of critical operations during an emergency event.
-------------------------------------	---

Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Parishville Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Town Office	\$15K	Offers maximum protection for Town Office

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Parishville
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Mitigation Action Worksheet

Project Name:	Add air conditioning and showers to Town Highway Department to improve use as emergency shelter and cooling center facility
Project ID:	Parishville 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town highway department is a potential emergency shelter location for Town residents, but does not have enough shower facilities to support a large number of residents. Additionally, the highway department does not have air conditioning, and cannot be used as a cooling center during heat waves.

Action of Project Intended for Implementation

Description of the Solution:	Add air conditioning and shower facilities to the highway department to improve its use as a shelter facility and cooling center.
-------------------------------------	---

Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved sheltering abilities and cooling center for residents.
Useful Life:	Long-term		
Estimated Cost:	\$10K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Parishville Highway Dept*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Rent portable showers when needed	Low	Less costly but requires additional coordination to implement; may not be available when needed
	Add showers to Town Highway Department	\$10K	Most comprehensive solution to improving highway department's use as a shelter facility.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Parishville 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Parishville 2	+	+	+	+	+	+	0	+	+	+	Medium	Low	2

Jurisdictional Annex

Town of Piercefield

1. Contacts

The contacts for the Town of Piercefield regarding this plan are identified as follows:

- Neil Pickering – Town Supervisor
Address: 48 Waller St, Piercefield, NY 12973
Phone: (518) 359-3664
Email: blvdws@gmail.com

Town Website: <https://www.piercefield.org/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 282 people live in the Town of Piercefield. The Town's population has decreased by 9.0% since the 2010 Census (310) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Piercefield is located in the southeastern corner of St. Lawrence County and is bordered by the Town of Hopkinton to the north, Tupper Lake (Franklin County) to the east, Long Lake (Hamilton County) to the south, and Colton to the west. The Town of Piercefield is entirely within the Adirondack Park. Piercefield is easily accessed from State Highway 3.

2.3 Governing Body

The Town of Piercefield is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

No significant commercial or residential developments have occurred in the Town since the County's original HMP was developed in 2015. No new development has occurred in the Special Flood Hazard Area. The Town's vulnerability to natural hazards has not changed.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Piercefield	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	No	In place
Subdivision ordinance	Yes	In place
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Piercefield	Notes
Flood insurance rate maps	Yes	FEMA currently working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	Yes	Work with St. Lawrence County
Civil Engineer	Yes	Work with St. Lawrence County
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	In past
Other federal funding programs	No	
State funding programs	Yes	
Programs/Organization		

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Piercefield	Notes
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Town website for outreach
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 3. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Youth Center	48 Waller Street, Piercefield, NY 12973	Town of Piercefield	Yes	No	No	Backup power is available. Located above Town Hall.

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Piercefield based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Town owned land off of State Route 3

- Massawepie Scout Camp - 930 Massawepie Road, Childwold, NY 12922
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant land in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Severe Winter Storm	3	1	2	3	High	2
Ice Storm	3	1	2	2	Moderate	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Flood	2	2	1	2	Moderate	6
Drought	3	1	1	2	Moderate	7
Wildfire	1	3	1	2	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Ice Jam	2	2	1	1	Moderate	10

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Infestation	2	1	2	1	Moderate	11
Landslide	1	3	1	1	Moderate	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Piercefield. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
Community Services	Massawepie Scout Camp	930 Massawepie Road, Childwold, NY 12922	No
EMS/Fire Department	Piercefield Volunteer Fire Company	34 Waller St, Piercefield, NY 12973	No
Municipal Services	Town Park	48 Waller Street, Piercefield, NY 12973	No
Municipal Services	Town Hall and Youth Center	Pine Street, Tupper Lake, NY 12986	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Piercefield.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Piercefield. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River and its tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation route (State Highway 3) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Piercefield, Childwold, Conifer, and Mount Arab. Severe storms during the summer months could also significantly affect the Massawepie Scout Camp when it is in use.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. One of these events occurred in the Town of Piercefield. Although only one event was reported for the Town by NCDC, the Town experiences severe storms more regularly, about once a year to once every two years. The reported thunderstorm wind record is summarized in Table 6, below. This event caused approximately \$2,000 in property damages according to the NCDC. Actual damages may have been greater.

Table 6. Severe Storm Event Records for the Town of Piercefield				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	6/20/2016	50 knots	\$2,000	-

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Severe Winter Storm

5.2.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Town of Piercefield is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation route (State Highway 3) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Piercefield, Childwold, Conifer, and Mount Arab.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Piercefield has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Piercefield.

5.2.4 *Future Potential Impacts*

The Town of Piercefield will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 **Ice Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. Damages to the Town's critical infrastructure or primary evacuation route (State Highway 3) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Piercefield, Childwold, Conifer, and Mount Arab.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Piercefield lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Piercefield. The Town also reports not being significantly affected by the large ice storm in 1998.

5.3.4 *Future Potential Impacts*

The Town of Piercefield will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation route (State Highway 3) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Piercefield, Childwold, Conifer, and Mount Arab.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms in St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Piercefield were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Piercefield is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 Extreme Temperatures

5.5.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 6.2% of the population in the Town is under 5 years old, and 51.2% of the population is over 65 years old. Approximately 12.9% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Piercefield lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Piercefield.

5.5.4 *Future Potential Impacts*

The Town of Piercefield will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.6 Flood

5.6.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Raquette River and its tributaries, which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Piercefield, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Piercefield that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Piercefield Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
71,699 acres	2.3%	0.13%

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC did not report any flood records for the Town of Piercefield since 2010. The Town indicated that flooding is not a major concern. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Piercefield. There are no repetitive loss properties in the Town.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the Raquette River and its tributaries are vulnerable to flooding. About 2.3% of the Town of Piercefield is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.7 **Drought**

5.7.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of Piercefield is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. A portion of the Town is served by municipal water, but many properties are not. Properties that rely on private wells as well as agricultural lands (mostly in the southern portion of the Town), would be most susceptible to a drought event.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Piercefield or the rest of St. Lawrence County since 2010. There are no specific damage estimates of drought impacts for the Town.

5.7.4 *Future Potential Impacts*

The majority of the Town of Piercefield remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.8 Wildfire

5.8.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0 to 0.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 *Future Potential Impacts*

The entire Town of Piercefield remains susceptible to a wildfire particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location

within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021. None of these events occurred in the Town of Piercefield. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Ice Jam

5.10.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Regis River and the Deer River are vulnerable to ice jams.

5.10.3 Historical Hazard Occurrences and Damage Estimates

There are no USACE CRREL or local historical records of an ice jam occurring in the Town of Piercefield. No damage estimates related to ice jams are reported for the Town.

5.10.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along the Raquette River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.11 **Infestation**

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Piercefield is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about zero to 15% in the Town of Piercefield (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Piercefield. However, it has been detected in the northern portion of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Piercefield in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Piercefield remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the

Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.12 Landslide

5.12.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Piercefield is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Raquette River are particularly susceptible.

5.12.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of landslides occurring in the Town of Piercefield. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.12.4 Future Potential Impacts

A landslide could occur in the Town, but this hazard is unlikely to cause significant property damage given the rural setting of the Town. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Piercefield currently participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Town of Piercefield. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 8, below. The Town’s 2015 action was not re-included for the 2021 HMP update.

Table 8. Hazard Mitigation Action Progress Town of Piercefield				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm, sever winter storm	1,2,3	Town of Piercefield Highway Department	Routine responsibility of highway department that is adequately addressed. No formal plan in place but not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on the worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Piercefield									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Piercefield 1	Upgrade existing generator at Town Hall/Youth Center so backup power is available for entire facility	All	Piercefield Town Board*	Capital Improvement Plan	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Piercefield 2	Add air conditioning at Town Hall/Youth Center so it can be used as a cooling center	Extreme Temperatures	Piercefield Town Board*	Capital Improvement Plan	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Piercefield
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Mitigation Action Worksheet

Project Name:	Upgrade existing generator at Town Hall/Youth Center so backup power is available for entire facility
Project ID:	Piercefield 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall has a generator but it does not power the entire facility. A new generator that can power the whole facility would greatly improve its use as an emergency shelter.

Action of Project Intended for Implementation

Description of the Solution:	Install a new generator at the Town Hall so backup power is available for entire facility. This would ensure continuity of critical operations during an emergency event.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Piercefield Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to supplement backup power for Town Hall/Youth Center	\$10K	More flexible option as portable units can be used at different facilities when needed, but requires more coordination for usage.
	Upgrade generator at the Town Hall/Youth Center	\$15K	Offers maximum protection for facility

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Piercefield
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Mitigation Action Worksheet

Project Name:	Add air conditioning at Town Hall/Youth Center so it can be used as a cooling center
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Project ID:	Piercefield 2
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Risk/Vulnerability

Hazard of Concern:	Extreme Temperatures
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Description of the Problem:	The Youth Center is located above the Town Hall and is the Town's primary emergency shelter location, but it does not currently have air conditioning. The Town does not have a designated cooling center that residents could use during a heat wave.
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Action of Project Intended for Implementation

Description of the Solution:	Retrofit the Town Hall/Youth Center to add air conditioning so it can function as a cooling center for residents.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved ability for Town to provide a cooling center during heat waves.
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
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Responsible Organization:	Piercefield Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable air conditioning units	\$5K	More flexible option as portable units can be used at different facilities when needed, but may not cool entire facility
	Retrofit facility to install central air conditioning	\$15K	Most comprehensive solution for Town to establish cooling center

Progress Report (for Plan Maintenance)

Date of Status Report:	
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Report of Progress:	
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Update Evaluation of the Problem and/or Solution:	
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Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Piercefield 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Piercefield 2	+	+	+	+	+	0	0	+	+	+	Medium	Medium	2

Jurisdictional Annex

Town of Pierrepont

1. Contacts

The contacts for the Town of Pierrepont regarding this plan are identified as follows:

- Jane Powers – Town Supervisor
Address: 864 NY-68, Canton, NY 13617
Phone: (315) 379-0415
Email: jbpowers@northnet.org
- Roger Murray – Deputy Supervisor
Address: 864 NY-68, Canton, NY 13617
Phone: (315) 379-0415
Email: rmurray15@twcny.rr.com

Town Website: <https://www.townofpierrepont.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 2,523 people live in the Town of Pierrepont. The Town's population has decreased by 2.5% since the 2010 Census (2,589) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Pierrepont is located in the central portion of St. Lawrence County and is bordered by the Towns of Potsdam and Canton to the north, Parishville and Colton to the east, Clare to the south, and Russell to the west. Pierrepont is easily accessed from State Highway 68, County Route 24, County Route 29, and State Highway 56.

2.3 Governing Body

The Town of Pierrepont is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), apartment buildings in Hannawa Falls were constructed in 2020. No other significant commercial or residential developments have occurred in the Town since 2015. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Pierrepont	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	N	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Pierrepont	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	Part of Zoning Code
NFIP Participant/Floodplain ordinance	Yes/No	Town is listed as an active NFIP participant, but has rescinded their floodplain ordinance.
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	Town is unmapped by existing FEMA FIRMs. FEMA is working on flood study that will generate new FIRM mapping countywide.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	Highway; risk management through insurance
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	Yes	Town Planning Board
Civil Engineer	No	
GIS Coordinator	Yes	Ability to use DANC mapping primarily related to real property tax mapping County coordinates

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Pierrepont	Notes
Technical Abilities		
Warning systems/services	Yes	Town website
Hazard date and information	Yes	Documented for HMP update
Grant writing	Yes	Work with St. Lawrence County for assistance
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	No town utility services
Impact fees for new development	Yes	Planning board is addressing; specifically for solar
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	FEMA, LGE grant
State funding programs	Yes	Court funding
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	
Ongoing public education or information program	Yes	Program in place
Natural disaster or safety related school programs	Yes	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 68, County Route 24, County Route 29, and State Highway 56. Shelter and evacuation route information is provided to the public using the Town website and message boards of the fire department and Town Hall. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Colton- Pierrepoint School	4921 NY-56, Colton, NY 13625	Colton-Pierrepoint CSD	Yes	Yes	Yes	Backup power is available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Pierrepoint based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Colton Volunteer Fire Department – 4921 NY-56, Colton, NY 13625
 - Pierrepoint Fire Department – 62 Old Country Road, Canton, NY 13617
 - Colton-Pierrepoint Central School – 4921 NY-56, Colton, NY 13625
 - Higley Park – 442 Cold Brook Drive, Colton, NY 13625
 - Postwood Park - Postwood Park Rd, Pierrepoint, NY 13676
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town, if owners willing to sell or subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Ice Jam	2	2	2	2	Moderate	6
Extreme Temperatures	3	1	2	2	Moderate	7
Drought	3	1	2	2	Moderate	8
Wildfire	2	3	1	2	Moderate	9
Earthquake	2	3	1	1	Moderate	10
Infestation	2	1	2	1	Moderate	11
Landslide	1	3	1	1	Moderate	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Pierrepont. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
EMS/Fire Department	Hannawa Falls Volunteer Fire Department	Mill St, Hannawa Falls, NY 13647	No
Municipal Services	Highway Department	864 County Road 29, Canton, NY 13617	No
Municipal Services	Town Hall	864 NY-68, Canton, NY 13617	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams is located in the Town of Pierrepont, and is a hydropower dam owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Dam Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Hannawa Dam	B	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	8.0	5/31/2019	7/30/1997

**Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes.*
***Capacity information obtained from Natural Resources Canada, 2021*

The Town indicated no concerns regarding the dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Pierrepont. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River, the Little River, Leonard Brook and their tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 68, County Route 24, County Route 29, and State Highway 56) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Pierrepont, Hannawa Falls, and Crary Mills.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Six of these events occurred in the Town of Pierrepont (frequency of about once every two years). All of these events were thunderstorm winds. Estimated damages for the Town of Pierrepont ranged from \$2,000 to \$25,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. There are no recorded coastal storms or tornadoes affecting the Town since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/17/2012	60 knots	\$25,000	-
Thunderstorm Wind	7/18/2013	50 knots	\$10,000	-
Thunderstorm Wind	7/8/2017	55 knots	\$15,000	-
Thunderstorm Wind	8/4/2017	50 knots	\$2,000	-
Thunderstorm Wind	7/11/2019	50 knots	\$20,000	-
Thunderstorm Wind	7/11/2019	50 knots	\$15,000	-
Total			\$87,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Pierrepont is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 68, County Route 24, County Route 29, and State Highway 56) would be most impactful to Town residents. Storm damages

would primarily impact the more populated portions of the Town, including the hamlets of Pierrepont, Hannawa Falls, and Crary Mills.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Pierrepont lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Pierrepont.

5.2.4 *Future Potential Impacts*

The Town of Pierrepont will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Town of Pierrepont is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 68, County Route 24, County Route 29, and State Highway 56) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Pierrepont, Hannawa Falls, and Crary Mills.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Pierrepont has been affected by a number of severe winter storm events reported for the County, which are described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDRC does not report any winter storm damage estimates specific to the Town of Pierrepont.

5.3.4 *Future Potential Impacts*

The Town of Pierrepont will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 68, County Route 24, County Route 29, and State Highway 56) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Pierrepont, Hannawa Falls, and Crary Mills.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Pierrepont were reported for this event.

5.4.4 Future Potential Impacts

The Town of Pierrepont is very likely to experience nor’easter events in the future. The severity and frequency of nor’easters, while difficult to predict, may increase in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Raquette River, the Little River, and Leonard Brook, which drain to the St. Lawrence and the Grass River respectively. The Town of Pierrepont is unmapped by existing FEMA FIRMs. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Pierrepont that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Pierrepont Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
39,162 acres	0.5%	0.03%

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC did not report any flood records for the Town of Pierrepont since 2010. The Town reported local records of recurring flooding issues in Hannawa Falls. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Pierrepont. There are no repetitive loss properties in the Town.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the Raquette River, the Little River and its tributaries, and Leonard Brook and its tributaries are vulnerable to flooding. About 0.5% of the Town of Pierrepont is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Regis River and the Deer River are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Pierrepont was affected by one ice jam recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which is described in the County's 2015 HMP. The ice jam was reported in 2014 on the Raquette River. No damage estimates related to ice jams are reported specific to the Town of Pierrepont. The Town also reports local records of ice jams along the Raquette River in the Hannawa Falls area in recent years.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along the St. Regis River and the Deer River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Pierrepont is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 7.4% of the population in the Town is under 5 years old, and 22.4% of the population is over 65 years old. Approximately 7.2% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Pierrepont lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Pierrepont.

5.7.4 *Future Potential Impacts*

The Town of Pierrepont will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 **Drought**

5.8.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of Pierrepont is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system. Residents rely on private wells, which may be susceptible to low water yields during a drought. Agricultural lands (mostly in the southwestern portion of the Town) would also be susceptible.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC reports no specific drought events for the Town of Pierrepont or the rest of St. Lawrence County since 2010. There are no specific damage estimates for the Town related to droughts. The Town does not have a municipal water system.

5.8.4 *Future Potential Impacts*

The entire Town of Pierrepont remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Wildfire

5.9.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.4 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The northern portion of the Town is mapped with a higher wildfire density during this time period (0.9 to 1.3 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

The entire Town of Pierrepont remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Earthquake

5.10.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which occurred in the Town of Pierrepont. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the entire Town remains susceptible to an earthquake.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Pierrepont is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Pierrepont (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Pierrepont, however, it has been detected in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Pierrepont in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Pierrepont remains susceptible to an infestation event. The emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.12 **Landslide**

5.12.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Pierrepont is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the St. Regis River and Deer River are particularly susceptible.

5.12.3 Historical Hazard Occurrences and Damage Estimates

The Town reported a local record of a landslide occurring near County Route 24, but it was not close to the road and did not cause significant infrastructure

or property damage. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.12.4 Future Potential Impacts

The Town of Pierrepont is susceptible to landslides in the future. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Pierrepont is listed as a current NFIP participant, although the Town is not mapped by FEMA's existing FIRMs. As of October 2021, no NFIP loss claims have been paid in the Town of Pierrepont. There are no repetitive loss properties in the Town. The Town included an NFIP-related mitigation action for the HMP update to coincide with FEMA's flood study update that will generate new FIRM mapping countywide.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 9, below. The Town’s 2015 action was not re-included for the 2021 HMP update.

Table 9. Hazard Mitigation Action Progress Town of Pierrepont				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe winter storm	1,2,3	Town of Pierrepont Highway Department	Routine responsibility of highway department that is adequately addressed. No formal plan in place but that is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Pierrepont									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Pierrepont 1	Install on-demand generators at Town Hall and Highway Department	All	Pierrepont Town Board* and Highway Dept	None	5 years	Existing	\$30,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Pierrepont 2	Develop a local floodplain ordinance to comply with NFIP and designate a local floodplain administrator	Flood	Pierrepont Town Board*	None	5 years	Existing and New	\$10,000	Town Budget	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Pierrepont
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Mitigation Action Worksheet

Project Name:	Install on-demand generators at Town Hall and Highway Department
Project ID:	Pierrepont 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town has portable generators for use at the Town Hall and Highway Department, but neither facility has on-demand backup power available. Portable generators require additional coordination and planning for use, and may not power each facility entirely.

Action of Project Intended for Implementation

Description of the Solution:	Install on-demand generators at the Town Hall and Highway Department to reduce interruptions in critical services during emergency events.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Pierrepont Town Board* and Highway Dept	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase additional portable generators to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but requires more coordination for usage.
	Install on-demand generator at the Town Hall and Highway Department	\$20K	Offers maximum protection for critical facilities to ensure continuity of operations

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Pierrepont
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Mitigation Action Worksheet

Project Name:	Develop a local floodplain ordinance to comply with NFIP and designate a local floodplain administrator
Project ID:	Pierrepont 2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town formerly had floodplain regulations in place but they have since been rescinded. The Town remains unmapped by the existing FEMA flood insurance rate maps. FEMA is actively conducting a new flood study for St. Lawrence County that will generate floodplain mapping for all municipalities.

Action of Project Intended for Implementation

Description of the Solution:	Develop and adopt a local floodplain ordinance based on FEMA's new floodplain mapping (currently in progress) that will comply with the NFIP. Designate a local floodplain administrator to enforce the regulations for developments within the Town.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Reduction of flood losses and damages
Useful Life:	Long-term		
Estimated Cost:	\$10K		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget
Responsible Organization:	Pierrepont Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Re-adopt former floodplain regulations that were rescinded	\$1K	Currently the Town is unmapped by FEMA - no designated special flood hazard areas to regulate at this time
	Develop a local floodplain ordinance to comply with NFIP and designate a floodplain administrator	\$10K	Would be done after new FEMA mapping is generated, so specific areas can be targeted for protection.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Pierrepont 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Pierrepont 2	+	+	+	+	+	+	+	+	+	-	Low	Low	2

Jurisdictional Annex

Town of Pitcairn

1. Contacts

The contacts for the Town of Pitcairn regarding this plan are identified as follows:

- Clyde (Sam) Frank Jr. – Town Supervisor
Address: 10 Edwards Rd, Harrisville, NY 13648
Phone: (315) 543-2111
Email: pitcairnsuper@gmail.com
- Jerry McIntosh – Highway Superintendent
Address: 10 Edwards Rd, Harrisville, NY 13648
Phone: (315) 543-2111
Email (Town Clerk): pitcairnclerk@gmail.com

Town Website: <https://www.townofpitcairn.com/>

2. Municipal Profile

2.1 Population

The 2020 Census Reported that 790 people live in the Town of Pitcairn. The Town’s population has decreased by 7.1% since the 2010 Census (846) (U.S. Census Bureau, 2019).

2.2 Location

The Town of Pitcairn is located in the southern portion of St. Lawrence County and is bordered by the Towns of Fowler and Edwards to the north, the Town of Fine to the east, and the Town of Diana (Lewis County) to the south. Pitcairn is easily accessed from State Hwy 3 and State Hwy 812.

2.3 Governing Body

The Town of Pitcairn is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a Dollar General, a Pole Barn at the Municipal Building, and several private camps were constructed within the Town. No other significant commercial or residential developments have occurred in the Town since 2015. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Pitcairn	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	Yes	Highway Dept. equipment
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	Yes	Not Town based, fire department handles this
Pandemic Response Plan	Yes	Developed in response to COVID-19 Pandemic
Other Special Plans	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Pitcairn	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA actively working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	Shared services with County, Fire Depts. have agreements among one another
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	Yes	Town website, local paper for outreach

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Pitcairn	Notes
Hazard date and information	Yes	Documented for HMP update
Grant writing	Yes	DANC assists
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	No	
State funding programs	Yes	
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Town Website
Natural disaster or safety related school programs	Yes	Fire dept. works with schools
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 3 and State Highway 812. The Town's emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer

group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Harrisville Fire Department (located in Town of Diana, Lewis County)	14226 Church St, Harrisville, NY 13648	Harrisville Vol. Fire Dept Inc.	Yes	Yes	No	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Pitcairn based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Vacant Town property - 10 Edwards Rd
 - Vacant Town property - 80 Backus Rd
- **Potential Permanent Housing Locations**
 - Vacant Town properties listed above
 - Potentially other privately owned vacant properties in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town’s natural hazard analysis results are provided in Table 4.

Table 3. Hazard Analysis Criteria						
Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	Moderate	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	2	2	Moderate	5
Extreme Temperatures	3	1	1	2	Moderate	6
Ice Jam	2	2	2	1	Moderate	7
Drought	3	1	1	1	Moderate	8
Wildfire	1	3	1	1	Moderate	9
Infestation	2	1	2	1	Moderate	10
Landslide	1	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Pitcairn. Table 5, below, denotes the types and locations of critical facilities within the Town.

Facility Name	Address	Located in Floodplain*
Town Hall and Highway Dept	10 Edwards Rd, Harrisville, NY 13648	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New

York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Pitcairn.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Pitcairn. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River, Big Creek, and Jenny Creek are likely to experience increased flooding occurrences.

The Town of Pitcairn chose not to profile earthquake in their annex even though it was profiled for the County. The Town does not have a history of earthquakes nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 3 and 812) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Pitcairn,

East Pitcairn, and Geers Corners. Severe storms during the summers months could also adversely affect Camp Trefoil (a Girl Scout Camp) when it is in use.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Three of these events occurred in the Town of Pitcairn (frequency of about once every three years). All of these records were thunderstorm winds. Estimated damages for the Town of Pitcairn ranged from \$2,000 to \$75,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes affecting the Town since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	5/1/2017	70 knots	\$75,000	-
Thunderstorm Wind	8/22/2017	50 knots	\$2,000	-
Thunderstorm Wind	6/13/2018	50 knots	\$10,000	-
Total			\$87,000	-

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town of Pitcairn in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Pitcairn is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation

routes (State Highways 3 and 812) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Pitcairn, East Pitcairn, and Geers Corners.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Pitcairn lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Pitcairn.

5.2.4 Future Potential Impacts

The Town of Pitcairn will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Town of Pitcairn is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary

evacuation routes (State Highways 3 and 812) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Pitcairn, East Pitcairn, and Geers Corners.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Pitcairn has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Pitcairn.

5.3.4 *Future Potential Impacts*

The Town of Pitcairn will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highways 3 and 812) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Pitcairn, East Pitcairn, and Geers Corners.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Pitcairn were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Pitcairn is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Flood**

5.5.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Oswegatchie River, Big Creek and Jenny Creek, which drain to the Oswegatchie River, and the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Pitcairn, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7

summarizes the amount of land within the Town of Pitcairn that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Pitcairn Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
37,761	2.8%	0.07%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has not reported any flood records for the Town of Pitcairn since 2010. The Town reported local records of flooding due to beaver dams. Beaver dam related flooding has impacted properties along Stone Road, Garrison Road, the CJayville area, Fullerville Road, Goose Pond Road and other back roads. The Town has a beaver control permit to help mitigate these issues. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Pitcairn. There are no repetitive loss properties in the Town.

5.5.4 Future Potential Impacts

Properties along the Oswegatchie River, Big Creek, and Jenny Creek are most vulnerable to flooding. About 2.8% of the Town of Pitcairn is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.6 Extreme Temperatures

5.6.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Pitcairn is susceptible to

extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 2.2% of the population in the Town is under 5 years old, and 17.2% of the population is over 65 years old. Approximately 11.8% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two extreme cold/wind chill events and one heat wave were reported in the portion of St. Lawrence County where the Town of Pitcairn lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Pitcairn.

5.6.4 *Future Potential Impacts*

The Town of Pitcairn will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 **Ice Jam**

5.7.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the Oswegatchie River, Big Creek, and Jenny Creek are vulnerable to ice jams.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Pitcairn was affected by three ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. The most recent ice jam was reported in 2003. All of these events occurred on the Oswegatchie River. The Town has not experienced many issues with ice jams other than ice accumulating at a bridge on State Highway 812 in the late 1990s.

5.7.4 *Future Potential Impacts*

Properties along the Oswegatchie River, Big Creek, and Jenny Creek remain most vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 **Drought**

5.8.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of Pitcairn is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system, therefore, residents rely on private wells and may be susceptible to low water yields during a drought. Agricultural lands (mostly in the northern portion of the Town), are also vulnerable to a drought event.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Pitcairn or the rest of St. Lawrence County since 2010. The Town does not have a municipal water system, and some residents have had supply issues with private wells in the past.

5.8.4 *Future Potential Impacts*

The entire Town of Pitcairn remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 **Wildfire**

5.9.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), about half of the Town experienced 0.4 to 0.8 wildfires per square mile, and half of the Town experienced 0 to 0.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

The entire Town of Pitcairn remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 **Landslide**

5.10.1 *Description*

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.10.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Pitcairn is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Oswegatchie River are particularly susceptible.

5.10.3 *Historical Hazard Occurrences and Damage Estimates*

During periods of heavy rain, the Town experiences erosion issues on Stone Road that can lead to washouts, but significant property damages have not occurred. A landslide has the potential to cause thousands of dollars in damages.

5.10.4 *Future Potential Impacts*

The Town remains susceptible to landslides, particularly areas with steep slopes. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.11 Infestation

5.11.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Pitcairn is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 0 to 15% in the Town of Pitcairn (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 *Historical Hazard Occurrences and Damage Estimates*

The emerald ash borer has not been documented in the Town of Pitcairn, but it is present in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to spread to the Town in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 *Future Potential Impacts*

The entire Town of Pitcairn remains susceptible to an infestation event. The emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Pitcairn currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Town of Pitcairn. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 8, below. The Town’s 2015 mitigation action was not re-included for the 2021 update.

Table 8. Hazard Mitigation Action Progress <i>Town of Pitcairn</i>				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Pitcairn Highway Department	Routine responsibility of highway department that is adequately addressed. No formal plan in place but not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Pitcairn									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Pitcairn 1	Upgrade drainage pipes on Radish Rd (off Rt 812) that were damaged by storm event recently.	Flood	Town of Pitcairn Highway Dept*, Pitcairn Town Board	Capital Improvement Plan	5 years	Existing	\$20,000	NYS DOT - CHIPS, Town Budget	1
Pitcairn 2	Upgrade culverts on Fullerville Rd, Edwards Rd, and Rose Rd to improve stormwater drainage.	Flood	Town of Pitcairn Highway Dept*, Pitcairn Town Board	Capital Improvement Plan	5 years	Existing	\$20,000	NYS DOT - CHIPS, Town Budget	2
Potential Funding Sources									
NYS DOT CHIPS: https://www.dot.ny.gov/programs/chips									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Pitcairn
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Mitigation Action Worksheet

Project Name:	Upgrade drainage pipes on Radish Rd (off Rt 812) that were damaged by storm event recently.
Project ID:	Pitcairn 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The existing drainage pipes on Radish Rd were recently damaged and are in need of replacement to ensure proper stormwater conveyance and prevent flooding issues.

Action of Project Intended for Implementation

Description of the Solution:	Replace drainage pipes with larger sized pipes to better accommodate storm flows.
-------------------------------------	---

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	\$20K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYS DOT - CHIPS, Town Budget
Responsible Organization:	Town of Pitcairn Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culverts in-kind	\$10K	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Upgrade with larger pipes	\$20K	Improved ability to handle high flows and reduce future flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Pitcairn
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Mitigation Action Worksheet

Project Name:	Upgrade culverts on Fullerville Rd, Edwards Rd, and Rose Rd to improve stormwater drainage.
Project ID:	Pitcairn 2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues on Fullerville Rd, Edwards Rd, and Rose Rd (near the Scout Camp) during heavy precipitation events.

Action of Project Intended for Implementation

Description of the Solution:	Replace culverts with larger culvert pipes to improve stormwater flows.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	\$20K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYS DOT - CHIPS, Town Budget
Responsible Organization:	Town of Pitcairn Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	Capital Improvement Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culverts in-kind	\$10K	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Replace with larger structures	\$20K	Improved ability to handle high flows and reduce future flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Pitcairn 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Pitcairn 2	+	+	+	+	+	0	0	+	+	+	Medium	Medium	2

Jurisdictional Annex

Town of Potsdam

1. Contacts

The contacts for the Town of Potsdam regarding this plan are identified as follows:

- Jeff Murray – Code Enforcement Officer
Address: 18 Elm Street, Potsdam, NY 13676
Phone: (315) 265-0670
Email: code@potsdamny.us
- Mike McQuade – Code Enforcement Officer
Address: 18 Elm Street, Potsdam, NY 13676
Phone: (315) 265-0670
Email: code@potsdamny.us

Town Website: <https://potsdamny.us/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 14,901 people live in the Town of Potsdam. The Town's population has decreased by 11.8% since the 2010 Census (16,041) (U.S. Census Bureau, 2019).

2.2 Location

The Town of Potsdam is located in the northern portion of St. Lawrence County and is bordered by the Towns of Norfolk and Stockholm to the east, Pierrepont and Parishville to the south, Canton and Lisbon to the west, and Madrid to the north. The Town of Potsdam is easily accessed from U.S. Route 11, State Highway 56, and State Highway 345.

2.3 Governing Body

The Town of Potsdam is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the Town is progressing sewer and water system extension projects along the State Highway 56 corridor (both projects are still in the design stage). No other significant commercial or residential developments have occurred in the Town. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town is a Bronze Certified Climate Smart Community, and completed a joint Climate Vulnerability Assessment with the Village of Potsdam in 2020, which directly incorporated the 2015 HMP. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Potsdam	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Potsdam	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA progressing flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer. Any building adjacent to water is required to have floodplain survey to document development.
Emergency Manager	Yes	Code Enforcement Officer
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Work with DANC for GIS – Beginning to work with them more for various services

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Potsdam	Notes
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	Town is looking into part time grant-write; considering for future
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	No	
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	Climate Smart Communities Task Force (joint with Village of Potsdam)
Ongoing public education or information program	Yes	Website and Facebook page
Natural disaster or safety related school programs	Yes	Fire Department programs
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Recreation Center Programs	Yes	Town/Village summer youth recreation programs

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include U.S. Route 11, State Highway 56, and State Highway 345. Shelter and evacuation route information is made available to the public through the Town’s website and their Facebook page. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Town Hall	18 Elm Street, Potsdam, NY 13676	Town of Potsdam	Yes	Yes	No	Backup power is available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Potsdam based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Postwood Park – Postwood Park Road, Potsdam NY 13676
 - Village Park
 - Town Barns – 19 Madrid Ave, Potsdam, NY 13676
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Infestation	3	3	3	3	High	1
Severe Winter Storm	3	1	3	3	High	2
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	2	High	3
Ice Storm	3	1	3	1	Moderate	4
Flood	2	1	2	2	Moderate	5
Ice Jam	2	1	2	2	Moderate	6
Coastal Storm	3	1	1	2	Moderate	7
Extreme Temperatures	3	1	1	2	Moderate	8
Wildfire	2	3	1	1	Moderate	9
Drought	3	1	1	2	Moderate	10
Earthquake	1	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents

as identified by the Town of Potsdam. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
County Services	St. Lawrence County Highway Outpost Facility (operating from Town of Potsdam facility)	19 Madrid Ave, Potsdam, NY 13676	No
Educational Facilities	BOCES Seaway Technical Education Center	7227 NY-56, Norwood, NY 13668	No
EMS/Fire Department	County Fire Training Facility	45 Blanchard Rd., Potsdam, NY 13676	No
EMS/Fire Department	Potsdam Fire Department	42 Main St, Potsdam, NY 13676	No
EMS/Fire Department	Potsdam Volunteer Rescue Squad	29 Elm St, Potsdam, NY 13676	No
EMS/Fire Department	West Potsdam Volunteer Fire Company	801 CR 34, Potsdam, NY 13676	No
Municipal Services	Court Building	35 Market Street, Potsdam, NY 13676	No
Municipal Services	Town Barns	19 Madrid Avenue, Potsdam, NY 13676	No
Municipal Services	Town Hall	18 Elm Street, Potsdam, NY 13676	No
Public Utilities	Casella Transfer Station	472 West Parishville Road, Potsdam, NY 13676	No
Public Utilities	Municipal Water System (serves paper company and small development off of Sissonville Rd)	Sissonville Rd, Potsdam, NY 13676	100YR
Public Utilities	Wastewater Treatment Facility (serves paper company and small development off of Sissonville Rd)	Sissonville Rd, Potsdam, NY 13676	100YR

* Based on HAZUS-modeled 100-year and 500-year floodplains

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St.

Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams is located in the Town of Potsdam, which is a hydropower dam owned by Erie Boulevard Hydropower (Brookfield Renewable) (Table 6, below).

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Sugar Island Dam	B	Raquette River	Erie Boulevard Hydropower (Brookfield Renewable)	4.0	5/31/2019	7/30/1997
*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes. **Capacity information obtained from Natural Resources Canada, 2021						

The Town indicated no concerns regarding the dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and Brookfield will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Potsdam. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River and its tributaries, and the Grass River are likely to experience increased flooding occurrences. The Town of Potsdam is a Bronze-Certified Climate Smart Community. The Town and Village of Potsdam have a joint Climate Smart Community Task Force, which takes the lead on developing and implementing climate-smart initiatives.

The Town of Potsdam chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Infestation

5.1.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Potsdam is the emerald ash borer, which was documented in the northern part of St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash

trees per total basal area ranges from about 7 to 30% in the Town of Potsdam (Figure 5.13, Appendix A of the main body of the plan).

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The emerald ash borer has not yet been detected in the Town of Potsdam, however, it has been detected in the Town of Norfolk, north of Potsdam. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Potsdam in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.1.4 *Future Potential Impacts*

The entire Town of Potsdam remains susceptible to an infestation event. Given the Town's location, the emerald ash borer is likely to migrate to the Town over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.2 **Severe Winter Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Potsdam is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, and State Highway 345)

would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Potsdam and hamlets of Crary Mills, Hewittville, West Potsdam, and Unionville.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Potsdam has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect most or all of the County. The NCDC does not report any winter storm damage estimates specific to the Town of Potsdam.

5.2.4 Future Potential Impacts

The Town of Potsdam will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 Severe Thunderstorm, Wind, Hail, or Tornado

5.3.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, and State Highway 345) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Potsdam and hamlets of Crary Mills, Hewittville, West Potsdam, and Unionville.

5.3.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Seven of these events occurred in the Town of Potsdam (frequency of about once every one to two years). One of these records was hail event, and the rest were thunderstorm winds. Estimated damages for the Town of Potsdam ranged from zero to \$100,000 per event (Table 7). Actual damages were likely greater than those estimated by the NCDC. The Town also reported a derecho in 2012, which caused significant damages throughout the Village including roofs of buildings being blown off. The NCDC does not report any tornadoes occurring in the Town since 2010.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/17/2012	65 knots	\$100,000	-
Hail	7/17/2012	0.88 in.	\$0	-
Thunderstorm Wind	7/19/2013	55 knots	\$0	-
Thunderstorm Wind	7/8/2014	60 knots	\$20,000	-
Thunderstorm Wind	2/25/2017	55 knots	\$25,000	-
Thunderstorm Wind	2/25/2017	55 knots	\$25,000	-
Thunderstorm Wind	8/2/2020	50 knots	\$5,000	-
Total			\$175,000	None Reported

5.3.4 Future Potential Impacts

Severe thunderstorms, winds, hail, and tornado events will continue to occur in the Town of Potsdam. The frequency and magnitude of severe storm events may increase due to climate change.

5.4 Ice Storm

5.4.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the

County. The entire Town of Potsdam is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, and State Highway 345) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Potsdam and hamlets of Crary Mills, Hewittville, West Potsdam, and Unionville.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the northern portion of St. Lawrence County where the Town of Potsdam lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Potsdam.

5.4.4 *Future Potential Impacts*

The Town of Potsdam will continue to experience ice storm events in the future. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.5 **Flood**

5.5.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Raquette River and its tributaries, and the Grass River which drain to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Potsdam, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be

generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of Potsdam that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Potsdam Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
61,512	2.1%	0.10%

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC did not report any flood records for the Town of Potsdam since 2010. The Town reports local records of road flooding issues on Wilkinson Road, Giffin Road, and on various rural gravel roads. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Potsdam. There are no repetitive loss properties in the Town.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Town, including Raquette River and its tributaries, and the Grass River are vulnerable to flooding. About 2.1 % of the Town of Potsdam is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the Raquette River and its tributaries, the Grass River, and Parkhurst Brook are vulnerable to ice jams.

5.6.3 Historical Hazard Occurrences and Damage Estimates

The Town of Potsdam was affected by two ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. Both ice jams occurred on Parkhurst Brook.

5.6.4 Future Potential Impacts

Properties along streams throughout the Town, primarily along the Raquette River and its tributaries, the Grass River, and Parkhurst Brook are vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 **Coastal Storm (Nor'easter)**

5.7.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, and State Highway 345) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Potsdam and hamlets of Crary Mills, Hewittville, West Potsdam, and Unionville.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Potsdam were reported for this event.

5.7.4 *Future Potential Impacts*

The Town of Potsdam is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.8 **Extreme Temperatures**

5.8.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Potsdam is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 3.2% of the population in the Town is under 5 years old, and 13.0% of the population is over 65 years old. Approximately 20.3% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Potsdam lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Potsdam.

5.8.4 *Future Potential Impacts*

The Town of Potsdam will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.9 **Wildfire**

5.9.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The NYSDEC map also shows one wildfire greater than 10 acres in size that occurred in the center of the Town. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

The entire Town of Potsdam remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 **Drought**

5.10.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.10.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. Portions of the Town are served by municipal water, but others rely on private wells and are susceptible to low water yields during a drought.

5.10.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Town of Potsdam or the rest of St. Lawrence County since 2010. There are no specific damage estimates related to droughts for the Town.

5.10.4 *Future Potential Impacts*

The entire Town of Potsdam remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.11 **Earthquake**

5.11.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. The Town of Potsdam is moderately susceptible to a potential earthquake event, due to the lack of warning and moderate extent and damages associated with this hazard. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.11.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been four earthquakes reported in St. Lawrence County between 2010 and 2021. None of these records occurred in the Town of Potsdam. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. The entire Town remains susceptible to earthquakes.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Potsdam currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Town of Potsdam to date. There are no repetitive loss properties in the Town. The Town's Code Enforcement Officer serves as the Local Floodplain Administrator. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties. The Town requires any building that is

proposed to be constructed adjacent to a waterbody in the Town is required to have floodplain survey.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 9, below. The Town’s 2015 mitigation action was not re-included for the 2021 HMP update.

Table 9. Hazard Mitigation Action Progress Town of Potsdam				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm, severe storm	1,2,3	Town of Potsdam Highway Department	Routine responsibility of highway department that is adequately addressed. No formal plan in place but not a high priority at this time.

7.2 Proposed Mitigation Actions

The Town proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Potsdam									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Potsdam T1	Develop a proactive ash tree management plan with the St. Lawrence County Soil & Water Conservation District	Severe Thunderstorm/ Wind/Hail/ Tornado, Ice Storm, Severe Winter Storm	Potsdam Town Board*, St. Lawrence County SWCD, St. Lawrence County EMC	Comprehensive Plan	2 years	Existing	\$10,000	Town Budget, FEMA- BRIC, NYSDEC - Urban and Community Forestry Grant	1
Potsdam T2	Extend municipal sewer and water along Route 56 corridor	Drought, Flood	Potsdam Town Board*	Comprehensive Plan	5 years	Existing	High	NYSEFC - CWSRF, NYSDEC- WQIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Town Budget	2

Potential Funding Sources

FEMA BRIC: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

NYSDEC Urban and Community Forestry: <https://www.dec.ny.gov/lands/5285.html>

NYSDEC WQIP: <https://www.dec.ny.gov/pubs/4774.html>

NYSEFC CWSRF: <https://efc.ny.gov/CWSRF>

NYSOCR CDBG: <https://hcr.ny.gov/community-development-block-grant>

USDA RD Water & Waste Disposal: <https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ny>

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Potsdam
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Mitigation Action Worksheet

Project Name:	Develop a proactive ash tree management plan with the St. Lawrence County Soil & Water Conservation District
Project ID:	Potsdam T1

Risk/Vulnerability

Hazard of Concern:	Severe Thunderstorm/Wind/Tornado, Ice Storm, Severe Winter Storm
Description of the Problem:	Emerald ash borer was recently detected in the northern part of St. Lawrence County, and it is continuing to spread at a rate of about 1-2 miles per year. All ash trees in the County are susceptible to damage from the ash borer. Proactive action is required to identify ash trees and make a plan for reducing damage potential.

Action of Project Intended for Implementation

Description of the Solution:	Work with the St. Lawrence County Soil & Water Conservation District to develop a proactive ash tree management plan. The County SWCD would assist with marking ash trees along Town roadways. The management plan would outline steps for the Town to take to remove hazard trees, which would reduce future storm-related damages to properties and public infrastructure.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Allows town to identify hazard trees and outlines best management practices to reduce damages caused by EAB infestations, and mitigate potential tree-related damages during future storm events.
Useful Life:	Short-term		
Estimated Cost:	\$10K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Town Budget, FEMA- BRIC, NYSDEC - Urban and Community Forestry Grant
Responsible Organization:	Potsdam Town Board*, St. Lawrence County SWCD, St. Lawrence County EMC	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Remove dead ash trees as issues arise	Medium	Reactive approach only. Does not adequately prevent damages
	Develop a proactive ash tree management plan	\$10K	Allows Town to identify vulnerable locations and take proactive measures to remove ash trees, preventing future storm damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Potsdam
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Mitigation Action Worksheet

Project Name:	Extend municipal sewer and water along Route 56 corridor
Project ID:	Potsdam T2

Risk/Vulnerability

Hazard of Concern:	Drought, Flood
Description of the Problem:	The Town is looking to extend municipal water and sewer service along the State Route 56 north corridor. Residents in this location are currently served by private wells and septic systems. Multiple residents have had well issues and even more have had issues with septic systems.

Action of Project Intended for Implementation

Description of the Solution:	Extending municipal water and sewer service along State Route 56 would alleviate current residents' issues with well water supply and septic system operations. This would ensure that residents in this area have adequate water supply during a drought, and reduce the risk of septic systems being compromised by flooding events.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved water supply and sewer service for residents in district
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC - CWSRF, NYSDEC- WQIP, USDA RD - Water & Waste Disposal Program, NYSOCR- CDBG, Town Budget
Responsible Organization:	Potsdam Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Haul water in for residents when wells are affected by a drought	Low	Reactive approach only; does not mitigate effects of drought or address septic issues
	Extend municipal sewer and water along Route 56 corridor	High	Most comprehensive approach to ensure residents in this area have access to water and sewer services

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Potsdam T1	+	+	0	+	+	+	+	+	+	+	Low	Low	1
Potsdam T2	+	0	0	+	+	-	0	0	+	-	Medium	High	2

Jurisdictional Annex

Village of Potsdam

1. Contacts

The contacts for the Village of Potsdam regarding this plan are identified as follows:

- Greg Thompson – Village Administrator
Address: P.O. Box 5168, Potsdam, NY 13676
Phone: (315) 265-7480
Email: gthompson@vi.potsdam.ny.us
- Fred Hanss – Planning Director
Address: P.O. Box 5168, Potsdam, NY 13676
Phone: (315) 265-1670
Email: fhanss@vi.potsdam.ny.us

Village Website: <http://vi.potsdam.ny.us/content/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 8,312 people live in the Village of Potsdam. The Village's population has decreased by 11.8% since the 2010 Census (9,428) (U.S. Census Bureau, 2021).

2.2 Location

The Village of Potsdam is located in the southeast portion of the Town of Potsdam in northern St. Lawrence County. Potsdam is easily accessed from U.S. Route 11, State Highway 56, State Highway 345, State Highway 11B, and State Highway 72.

2.3 Governing Body

The Village of Potsdam is governed by a five-member Village Board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015) there have been numerous developments in the Village. The Village completed significant upgrades at their wastewater treatment plant and sewage pump stations. The Vecino Group rehabilitated Clarkson University's Old Snell Hall, which was converted to a 98-unit affordable housing complex. A retail project along Market Street, a hotel, and a hydroelectric plant have also been developed. Additionally, a new outpatient surgical center at the hospital's main campus is planned for future development. Finally, the Village secured a \$10 million Downtown Revitalization Initiative grant to undertake a wide range of activities including: improvements to mixed-use/commercial buildings, the provision of economic development grants to allow for the expansion of arts and cultural institutions, retail, lodgings, the development of a riverwalk trail along the Raquette River, and streetscape enhancements for the Market Street National Register District.

The wastewater treatment plant site and one sewage pump station are located in the 100-year floodplain; however, the upgrades were constructed in accordance with local floodplain regulations to ensure that these facilities are protected from future flood events. The Village's vulnerability to flooding and other natural hazards has not changed.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village is a Bronze Certified Climate Smart Community, and completed a joint Climate Vulnerability Assessment with the Town of Potsdam in 2020, which directly incorporated the 2015 HMP. The Village's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Potsdam	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	In progress
Economic Development Plan	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Potsdam	Notes
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	Stormwater management included in zoning; follow state regulations
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	Yes	Climate Vulnerability Assessment, Airport plan
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	In place
Fire department ISO rating	Yes	In place
Site plan review requirements	Yes	In place
Land Use Regulations		
Zoning ordinance	Yes	In place
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	Current participant/In place
Natural hazard specific ordinance	Yes	Natural conservation area zoning overlay, floodplain – designated open space
Flood insurance rate maps	Yes	Some calls with larger group with FEMA, looking at Raquette River to include for mapping
Acquisition of land for open space and public recreation	Yes	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Potsdam	Notes
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Village Administrator
Community Planner	Yes	
Civil Engineer	Yes	Contract with various engineering firms for projects based on needs
GIS Coordinator	Yes	Contract with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	Climate Smart Community Task Force (joint with town), Village PB
Ongoing public education or information program	Yes	Facebook page, website, climate smart task force website

Planning Mechanism	Village of Potsdam	Notes
Natural disaster or safety related school programs	Yes	Fire prevention program, Universities provide safety training/coordination, Liberty Utilities require training with fire department, Brookfield has plan in place related to flooding
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include U.S. Route 11, State Highway 56, State Highway 345, State Highway 11B, and State Highway 72. It is noted that emergency evacuation signage is not provided. Shelter and evacuation route information is made available to the public through public radio, Village website, Facebook, and highway warning signs. The Village's emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
SUNY Potsdam (Maxi Hall for residents)	44 Pierrepont Avenue, Potsdam, NY 13676	State University of New York	Yes	Yes	No	Back power is available
Clarkson University (utility workers/ responders)	8 Clarkson Avenue, Potsdam, NY 13699	Clarkson University	Yes	Yes	No	Backup power is available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Potsdam based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Athletic fields at universities and high school
 - Pine Street Arena
 - Various large parking lots in Village (such as Big Lots Plaza, Price Chopper Plaza, and Lowe's Home Improvement)
 - Undeveloped land around airport
 - University Dorms (if vacant)

- **Potential Permanent Housing Locations**
 - Multiple housing complexes in Village
 - Privately owned vacant properties if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	2	High	1
Severe Winter Storm	3	1	2	3	High	2
Ice Storm	3	1	3	1	Moderate	3
Extreme Temperatures	3	1	2	2	Moderate	4
Flood	2	1	2	2	Moderate	5
Coastal Storm (Nor'easter)	3	1	1	2	Moderate	6
Drought	3	1	1	2	Moderate	7
Ice Jam	2	1	2	1	Moderate	8
Earthquake	1	3	1	1	Moderate	9
Infestation	1	3	1	1	Moderate	10

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Potsdam. Table 5, below, denotes the types and locations of critical facilities within the Village.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Potsdam Damon Field Airport	Damon Field, Potsdam, NY 13676	No
Educational Facilities	A.A. Kingston Middle School	29 Leroy St, Potsdam, NY 13676	No
Educational Facilities	Clarkson University	8 Clarkson Ave, Potsdam, NY 13699	No
Educational Facilities	Lawrence Avenue Elementary	29 Leroy St, Potsdam, NY 13676	No
Educational Facilities	Potsdam High School	29 Leroy St, Potsdam, NY 13676	No
Educational Facilities	SUNY Potsdam	44 Pierrepoint Ave, Potsdam, NY 13676	No
Emergency Services	NYSDEC Potsdam Office	190 Outer Main Street, Suite 103, Potsdam, NY 13676	No
Hospital	Canton-Potsdam Hospital	50 Leroy St, Potsdam, NY 13676	No
Municipal Services	Civic Center	2 Park St Potsdam, NY 13676	No
Municipal Services	Village Dept. of Public Works	Lower Cherry Street	100YR
Municipal Services	Town of Potsdam Highway Barn (located in Village)	19 Madrid Avenue, Potsdam, NY 13676	No
Municipal Services	Village Offices	2 Park Street, Potsdam, NY 13676	No
Public Utilities	Municipal Stormwater System	-	-
Public Utilities	Municipal Water System	-	-
Public Utilities	Sewer Pump Station	15 Hatch Rd	No
Public Utilities	Sewer Pump Station	159 Clarkson Ave	No
Public Utilities	Sewer Pump Station	198 Main St	No
Public Utilities	Sewer Pump Station	3 Island St	100YR
Public Utilities	Sewer Pump Station	43 Lawrence Ave	No
Public Utilities	Sewer Pump Station	44 Pierrepoint Ave	No
Public Utilities	Sewer Pump Station	Country Ln/State Hwy 56	No
Public Utilities	Wastewater Treatment Facility	Lower Cherry Street, Potsdam, NY 13676	100YR

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Village of Potsdam.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Potsdam. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Raquette River are likely to experience increased flooding occurrences. The Village of Potsdam is a Bronze-Certified Climate Smart Community. The Village and Town of Potsdam have a joint Climate Smart Community Task Force, which takes the lead on developing and implementing climate-smart initiatives.

The Village of Potsdam chose not to profile landslide or wildfire in their annex even though these hazards were profiled for the County. The Village does not have a history nor any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, State Highway 345, State Highway 11B, and State Highway 72) would be most impactful to residents. Storm damages could impact the

entire Village, as it is largely developed. SUNY Potsdam and Clarkson University are located in the Village and would be most susceptible to storm damages during the Fall and Spring semesters when most students are on campus.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Seventeen of these events occurred in the Village of Potsdam (frequency of once or twice per year).

These records included three hail events, one lighting event, and the rest were thunderstorm winds. Estimated damages for the Village of Potsdam ranged from zero to \$50,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The Village reports that downtown and SUNY Potsdam were hit hard in recent events.

Table 6. Severe Storm Event Records for the Village of Potsdam				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/21/2010	55 knots	\$50,000	-
Hail	7/21/2010	1.75"	\$25,000	\$25,000
Thunderstorm Wind	6/8/2011	55 knots	\$25,000	-
Thunderstorm Wind	7/17/2011	55 knots	\$25,000	-
Thunderstorm Wind	9/8/2012	60 knots	\$35,000	-
Thunderstorm Wind	5/22/2013	50 knots	\$10,000	-
Thunderstorm Wind	7/19/2013	55 knots	\$25,000	-
Thunderstorm Wind	7/8/2014	60 knots	\$50,000	-
Thunderstorm Wind	8/18/2015	55 knots	\$50,000	-
Thunderstorm Wind	7/18/2016	50 knots	\$10,000	-
Thunderstorm Wind	7/8/2017	55 knots	\$25,000	-
Lightning	8/4/2017	N/A	\$1,000	-
Hail	5/4/2018	1.25"	\$0	
Hail	7/11/2019	1"	\$0	
Thunderstorm Wind	3/20/2020	50 knots	\$5,000	
Thunderstorm Wind	7/13/2021	50 knots	\$2,000	
Thunderstorm Wind	7/20/2021	55 knots	\$20,000	
Total			\$358,000	\$25,000

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Severe Winter Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Village of Potsdam is susceptible to damages from a severe winter storm event. The Village Department of Public Works clears streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, State Highway 345, State Highway 11B, and State Highway 72) would be most impactful to residents. Storm damages could impact the entire Village, as it is largely developed. SUNY Potsdam and Clarkson University are located in the Village and would be most susceptible to storm damages during the Fall and Spring semesters when most students are on campus.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Village of Potsdam has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Potsdam.

5.2.4 *Future Potential Impacts*

The Village of Potsdam will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 **Ice Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Potsdam is susceptible to damages from an ice storm event. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, State Highway 345, State Highway 11B, and State Highway 72) would be most impactful to residents. Storm damages could impact the entire Village, as it is largely developed. SUNY Potsdam and Clarkson University are located in the Village and would be most susceptible to storm damages during the Fall and Spring semesters when most students are on campus.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the northern portion of St. Lawrence County where the Village of Potsdam lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Potsdam.

5.3.4 *Future Potential Impacts*

The Village of Potsdam will continue to experience ice storm events in the future. The Village Department of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.4 **Extreme Temperatures**

5.4.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 2.5% of the population in the Village is under 5 years old, and 8.6% of the population is over 65 years old. Approximately 29.1% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Potsdam lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Potsdam.

5.4.4 *Future Potential Impacts*

The Village of Potsdam will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.5 Flood

5.5.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by the Raquette River which drains to the St. Lawrence River. FEMA provides flood insurance rate maps for the Village of Potsdam, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Village of Potsdam that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Village of Potsdam Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
3,479	8.6%	2.89%

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC did not report any flood records for the Village of Potsdam since 2010. The Village reports local records of a major flood event in 2010 and 2011. The flood in 2010 was caused by heavy precipitation in the Crosstown Canal, resulting in significant residential flooding on Cross Street, Waverly

Street, and Canal Street. The Village reports that the most flood prone areas are in open space, and in residences on Market Street and Pine Street that back up to the Raquette River. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Village of Potsdam. There are no repetitive loss properties in the Village.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Village, including the Raquette River are vulnerable to flooding. About 8.6% of the Village of Potsdam is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.6 **Coastal Storm (Nor'easter)**

5.6.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11, State Highway 56, State Highway 345, State Highway 11B, and State Highway 72) would be most impactful to residents. Storm damages could impact the entire Village, as it is largely developed. SUNY Potsdam and Clarkson University are located in the Village and would be most susceptible to storm damages during the Fall and Spring semesters when most students are on campus.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Potsdam were reported for this event.

5.6.4 *Future Potential Impacts*

The Village of Potsdam is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.7 **Drought**

5.7.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Village of Potsdam is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. The Village has a municipal water system that relies on water from the Raquette River, therefore, residents are less susceptible to low water yields during a drought compared to properties in other areas that are dependent on private wells.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Village of Potsdam or the rest of St. Lawrence County since 2010. The Village has a municipal water system that the Village. Agricultural lands (limited to the eastern portion of the Village), would be most susceptible to a drought event.

5.7.4 *Future Potential Impacts*

The entire Village of Potsdam remains susceptible to a drought event, and agricultural lands are the most susceptible. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.8 Ice Jam

5.8.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Village, primarily along the Raquette River are vulnerable to ice jams.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

There are no historical records of an ice jam occurring in the Village of Potsdam. No damage estimates related to ice jams are reported specifically for the Village.

5.8.4 *Future Potential Impacts*

Properties along the Raquette River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.9 Earthquake

5.9.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. There have been two earthquakes reported in St. Lawrence County between 2010 and 2021. The Village of Potsdam is moderately susceptible to a potential earthquake event, due to the lack of warning and moderate extent and damages associated with this hazard. An

earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there are no historical records of earthquakes occurring specifically in the Village of Potsdam. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to earthquakes.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Village is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village on Potsdam is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village of Potsdam (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Village of Potsdam, however, it has been detected in the northern part of the County. The emerald ash borer is able to spread two miles per year on average, and is

likely to reach the Village of Potsdam in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Village of Potsdam remains susceptible to an infestation event. The emerald ash borer is likely to migrate to the Village in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Potsdam currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Village of Potsdam. There are no repetitive loss properties in the Village. The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed two mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. Both of the Village’s 2015 mitigation actions were revised and re-included for the 2021 HMP update.

Table 8. Hazard Mitigation Action Progress Village of Potsdam				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Renovation of the Cross Town Canal, and new storm water management regulations will both help to reduce the occurrence of flooding events Renovation of the Cross Town Canal, and new storm water management regulations will both help to reduce the occurrence of flooding events	Flood	2,3	Village of Potsdam Superintendent of Public Works, Village of Potsdam Planning Director	Ongoing: Some renovations completed- eliminated two obstructions in Canal; one at corner of Leroy and Clinton St (12" sewer main removed from Canal and reconstructed a section of it); the other at Pleasant St - removed 12" sewer and 8" water and did gravity feed under Canal for sewer (\$600K total cost) Engineering report prepared for remainder of Canal System. Village is considering upstream stormwater catchment alternatives to reduce flooding. Revised and re-included for HMP update.
Update zoning regulations for the development of residential and commercial properties within FEMA Special Flood Hazard Areas, can help to reduce flooding, by keeping the natural buffers which are important to flood control.	Flood	1,2	Village of Potsdam Code Enforcement Office	Not completed; overlay in zoning code for natural resource conservation but not specifically flooding. Revised and re-included for HMP update.

7.2 Proposed Mitigation Actions

The Village proposed two mitigation actions to be included in the HMP update. Both actions are ongoing projects from the 2015 HMP. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Village of Potsdam									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Potsdam V1 (Ongoing from 2015)	Complete improvements to the Crosstown Canal to improve stormwater drainage through Village.	Flood	Village of Potsdam DPW*, Potsdam Village Board	Comprehensive Plan, Climate Vulnerability Assessment Report	5 years	Existing	\$15 million	NYSEFC CWSRF, FEMA- BRIC, Village Budget	1
Potsdam V2 (Ongoing from 2015)	Update zoning regulations for the development of residential and commercial properties within FEMA Special Flood Hazard Areas	Flood	Potsdam Village Board*	Comprehensive Plan, Climate Vulnerability Assessment Report	5 years	Existing	\$30,000	Village Budget	2
Potential Funding Sources NYSEFC CWSRF: https://efc.ny.gov/CWSRF FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities									

7.3 Cost-Benefit Analysis

Each of the Village's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Potsdam
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Mitigation Action Worksheet

Project Name:	Complete improvements to the Crosstown Canal to improve stormwater drainage through Village.
Project ID:	Potsdam V1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Crosstown Canal is an enclosed drainageway that drains the eastern portion of the Village as well as surrounding land within the Town of Potsdam. The Canal discharges to the Raquette River. The Canal is over 100 years old and has structural deficiencies and inadequate drainage capacity - it is generally overloaded during 10-year or greater intensity storms. The Village experiences recurring flooding issues on Lawrence Ave, Clinton St, Leroy St, Broad St, Pleasant St, Garden St, Munson St, Waverly St, Market St, Elderkin St, Canal St, and Washington St due to the limited capacity of the Canal.

Action of Project Intended for Implementation

Description of the Solution:	Rehabilitate and upgrade Crosstown Canal to increase its stormwater conveyance capacity. Replacing and reinforcing the roof of the Canal is the most cost-effective and least intrusive option.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	\$15 million		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSEFC CWSRF, FEMA- BRIC, Village Budget
Responsible Organization:	Village of Potsdam DPW*, Village Board	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan, Climate Vulnerability Assessment Report

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Full replacement/reconstruction of Canal	High	Would achieve goals but high cost and requires additional disturbance
	Roof replacement/reinforcement	\$15 million	Most cost effective and least intrusive alternative that still improves drainage throughout system.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Potsdam
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Mitigation Action Worksheet

Project Name:	Update zoning regulations for the development of residential and commercial properties within FEMA Special Flood Hazard Areas
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Project ID:	Potsdam V2
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Risk/Vulnerability

Hazard of Concern:	Flood
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Description of the Problem:	FEMA is actively conducting a new flood study for St. Lawrence County that will generate floodplain mapping for all municipalities. Updates to the Village's zoning regulations are needed to reflect the new mapping, once available, to protect floodplain areas and reduce risk of flood damages.
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Action of Project Intended for Implementation

Description of the Solution:	Update zoning regulations based on FEMA's new floodplain mapping (currently in progress) to outline restrictions and requirements for developments within a floodplain.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Help reduce flooding by keeping the natural buffers which are important to flood control.
Useful Life:	Long-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget
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Responsible Organization:	Potsdam Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan, Climate Vulnerability Assessment Report
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Require shoreline stabilization for new development along surface waters	Medium	May help reduce flood risk for new developments in existing floodplains but does not address updated floodplain mapping
	Update zoning regulations for the development of residential and commercial properties within FEMA Special Flood Hazard Areas	\$30K	Allows Village to incorporate new FEMA floodplain mapping into zoning code to best protect new developments and reduce impacts on special flood hazard areas.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Potsdam V1	+	+	0	+	+	-	0	-	+	-	High	High	1
Potsdam V2	+	+	+	+	+	0	+	+	+	-	Low	Medium	2

Jurisdictional Annex

Village of Rensselaer Falls

1. Contacts

The contacts for the Village of Rensselaer Falls regarding this plan are identified as follows:

- Michael Hammond – Mayor
Address: P.O. Box 1, Rensselaer Falls, NY 13680
Phone: (315) 276-0189
Email: rfmayorhammond@gmail.com
- James Blackburn – Second Assistant Chief, Fire & Secretary of EMS
Address: P.O. Box 154, Rensselaer Falls, NY 13680
Phone: (315) 854-4855
Email: jblackburn4287@gmail.com

Village Website: <https://www.rensselearfallsny.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 361 people live in the Village of Rensselaer Falls. The Village’s population increased by 8.7% since the 2010 Census population of 332 (U.S. Census Bureau, 2021).

2.2 Location

The Village of Rensselaer Falls is located in the western corner of the Town of Canton in central St. Lawrence County.

2.3 Governing Body

The Village of Rensselaer Falls is governed by a five-member Village Board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a new park (Pioneer Park) was constructed in 2021. The Village also opened up a road behind the cemetery. Planned development in the Village includes potential development on Firemen’s Island, apartments and shops on Rensselaer Street, a pavilion at the existing Village playground, and Oswegatchie Education Center. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Village’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village recently updated their comprehensive plan (a joint plan with the Town and Village of Canton), which considered information covered in the 2015 HMP. The Village’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Rensselaer Falls	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	CEMP – in progress (almost done)
Continuity of Operations Plan	No	
Transportation Plan	Yes	Coordination for students/family transportation
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other	Yes	Local Waterfront Revitalization Plan

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Rensselaer Falls	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	Rating is a 9
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	Updated code in 2014/15
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA actively working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	Yes	Pioneers Village Park
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Village works with DANC for GIS services
Economic Development Consortium	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Rensselaer Falls	Notes
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA RD funding for sewer upgrade
State funding programs	Yes	Funding for comprehensive plan and LWRP – part of Canton grant
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

The major roadway in the Village of Rensselaer Falls is County Route 15 (Front St). Shelter and evacuation route information is made available to the public through public radio, the Village website, Facebook, and highway warning signs. The Village’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Rensselaer Falls Fire Department	424 Rensselaer Street, Rensselaer Falls, NY 13680	Rensselaer Falls Fire District	Yes	Yes	No	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Rensselaer Falls based on the 2015 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Land behind Fire Department - 424 Rensselaer St, Rensselaer Falls, NY 13680
 - Land behind United Helpers Facility - 207 Congress St, Rensselaer Falls, NY 13680
 - Privately owned farms just outside of Village
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant land in Village or in the Town of Canton if owners willing to sell or subdivide.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	3	1	3	3	High	1
Severe Winter Storm	3	1	3	3	High	2
Ice Storm	3	1	3	2	High	3
Coastal Storm (Nor'easter)	3	1	2	3	High	4
Earthquake	3	3	2	1	High	5
Landslide	2	3	2	2	High	6
Extreme Temperatures	3	1	1	3	Moderate	7
Flood	2	2	2	2	Moderate	8
Ice Jam	2	2	2	2	Moderate	9
Drought	3	1	2	2	Moderate	10
Infestation	2	3	2	1	Moderate	11
Wildfire	2	3	1	1	Moderate	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Rensselaer Falls. Table 5, below, denotes the types and locations of critical facilities within the Village.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	United Helpers Nursing Home	207 Congress St, Rensselaer Falls, NY 13680	No
Community Services	Village Office and Historical Society	106 Canton St, Rensselaer Falls, NY 13680	No
EMS/Fire Department	Rensselaer Falls Volunteer Fire & Rescue	424 Rensselaer St, Rensselaer Falls, NY 13680	No
Municipal Services	Library	212 Rensselaer St, Rensselaer Falls, NY 13680	No
Public Utilities	Wastewater Treatment Facility	Johnson Rd, Rensselaer Falls, NY 13680	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Village of Rensselaer Falls.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Rensselaer Falls. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Oswegatchie River are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation route (County Route 15) would be most impactful to Village residents. Storm damages would impact the majority of the Village, as it is nearly all developed.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. One of these events, a thunderstorm wind, occurred in the Village of Rensselaer Falls. The Village experiences severe

storms more often than indicated by the NCDC records (once a year to once every few years). Property damage estimates reported by the NCDC for the Village were \$5,000 (Table 6). Actual damages were likely greater than those estimated by the NCDC. The Village indicated that they have experienced tree damage associated with severe storms in the past.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/18/2016	50 knots	\$5,000	-

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Severe Winter Storm

5.2.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one Village within the County. The entire Village of Rensselaer Falls is susceptible to damages from a severe winter storm event. The Town of Canton Highway Department clears Village streets during heavy snow events (the Village does not have a Department of Public Works). Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation route (County Route 15) would be most impactful to Village residents. Storm damages would impact the majority of the Village, as it is nearly all developed.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Village of Rensselaer Falls has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the

plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Rensselaer Falls.

5.2.4 Future Potential Impacts

The Village of Rensselaer Falls will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 Ice Storm

5.3.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Rensselaer Falls is susceptible to damages from an ice storm event. Damages to the Village's critical infrastructure or primary evacuation route (County Route 15) would be most impactful to Village residents. Storm damages would impact the majority of the Village, as it is nearly all developed.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Village of Rensselaer Falls lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Rensselaer Falls.

5.3.4 Future Potential Impacts

The Village of Rensselaer Falls will continue to experience ice storm events in the future. The Town of Canton completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines,

which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Village is highly vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Village. Damages to the Village's critical infrastructure or primary evacuation route (County Route 15) would be most impactful to Village residents. Storm damages would impact the majority of the Village, as it is nearly all developed.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Rensselaer Falls were reported for this event.

5.4.4 *Future Potential Impacts*

The Village of Rensselaer Falls will continue to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Earthquake**

5.5.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Village is highly vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.5.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which occurred in the Village of Rensselaer Falls. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.5.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to earthquakes.

5.6 Landslide

5.6.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Village is highly vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Village of Rensselaer Falls is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Oswegatchie River are particularly susceptible.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

There are no historical records of landslides occurring specifically in the Village of Rensselaer Falls. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.6.4 *Future Potential Impacts*

The Village may experience landslides in the future in vulnerable locations. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Village of Rensselaer Falls is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 9.4% of the population in the Village is under 5 years old, and 9.7% of the population is over 65 years old. Approximately 8.2% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Rensselaer Falls lies,

which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Rensselaer Falls.

5.7.4 Future Potential Impacts

The Village of Rensselaer Falls will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Flood

5.8.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by the Oswegatchie River which drains to the St. Lawrence River. FEMA provides flood insurance rate maps for the Village of Rensselaer Falls, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Village that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Village of Rensselaer Falls Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
200 acres	18.6%	1.63%

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC has not reported any flood records in the Village of Rensselaer Falls since 2010. The Village reports a local record of a washout on County Route 15 between Heuvelton and Rensselaer Falls, which was caused by debris in drainageways. There was also another culvert problem area on County Route 15 in the Village, which caused sinkholes. As described in Section 6.0 of this annex, no NFIP loss claims have been filed as of October 2021 in the Village of Rensselaer Falls. There are no repetitive loss properties in the Village.

5.8.4 Future Potential Impacts

Properties along the Oswegatchie River are vulnerable to flooding. About 18.6% of the Village of Rensselaer Falls is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.9 Ice Jam

5.9.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Village is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the Oswegatchie River are vulnerable to ice jams.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

There are no USACE CRREL records of an ice jam occurring specifically in the Village of Rensselaer Falls. The Village reports local records of ice jams in past years on the Oswegatchie River, just across the Town of Canton border. The Fire Department had to evacuate residents from homes when they were flooded.

5.9.4 *Future Potential Impacts*

Properties along the Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.10 **Drought**

5.10.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.10.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Village of Rensselaer Falls is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. The Village does not have a municipal water system, therefore, residents rely on private wells and are susceptible to low water yields during a drought.

5.10.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no specific drought events for the Village of Rensselaer Falls or the rest of St. Lawrence County since 2010. The Village does not have a municipal water system. Properties that rely on private wells would be most susceptible to a drought event. There are no agricultural lands within the Village.

5.10.4 Future Potential Impacts

The entire Village of Rensselaer Falls remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Village is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Village of Rensselaer Falls, however, it has been detected in the northern portion of the County, including the Town of De Peyster near the Village's western boundary. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Village in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Village of Rensselaer Falls remains susceptible to an infestation event. Given the Village's location, the emerald ash borer is likely to migrate

to the Village over the next several years, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.12 Wildfire

5.12.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Village is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Village are susceptible to wildfires. Significant wildfires have not been reported in the Village, but this hazard was included in this annex for future mitigation planning consideration.

5.12.3 Historical Hazard Occurrences and Damage Estimates

According to Figure 5.11 (Appendix A of the main body of the plan), the Village experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. Wildfires are more common in undeveloped areas, therefore, this number is likely less than reported. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.12.4 Future Potential Impacts

Undeveloped areas in the Village of Rensselaer Falls remain susceptible to a wildfire. Most of the Village is developed, which reduces the Village's vulnerability to this hazard. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Rensselaer Falls currently participates in the NFIP. As of October 2021, no NFIP loss claims have been paid in the Village of Rensselaer Falls. There are no repetitive loss properties in the Village. The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed two mitigation actions in the 2015 St. Lawrence County HMP, and a status update is provided in Table 8, below. None of the Village’s 2015 mitigation actions were re-included for the 2021 update. The Village is working to develop a formal shared services agreement with the Fire Department. Additionally, about \$50,000 to \$100,000 worth of street improvements are completed annually that are funded by the Village budget and NYSDOT CHIPs program.

Table 8. Hazard Mitigation Action Progress Village of Rensselaer Falls				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Severe storms	1,2,3	Village of Rensselaer Falls Department of Public Works	Village does not have a Dept. of Public Works; Town of Canton maintains streets and infrastructure within Village. The Fire Department supports with debris removal during storm events. The Village has a memorandum of understanding (MOU) established for any work completed in the Village by the Town.
Review and update zoning code to limit development potential of certain waterfront properties to limit the risk of damage to buildings and potential loss of life.	Flooding	1,2,3	Village Board, Planning Board	Zoning code was adopted in 2015.

7.2 Proposed Mitigation Actions

The Village proposed two new mitigation actions and one preparedness to be included in the HMP update. The preparedness action (Rensselaer Falls 3) was still outlined in this plan because it is a priority for the Village, even though it is not considered mitigation. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Village of Rensselaer Falls									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Rensselaer Falls 1	Conduct an engineering feasibility study for a stormwater infrastructure improvements project within the Village.	Flood	Rensselaer Falls Village Board*, Town of Canton and De Kalb Highway Depts., St. Lawrence County Highway Dept	Comprehensive Plan, Village LWRP	1-2 years	Existing	\$15-20K	NYSEFC CWSRF, FEMA- BRIC, Village Budget	1
Rensselaer Falls 2	Install generator for Village Office and Library facility	All	Rensselaer Falls Village Board*	Comprehensive Emergency Management Plan	5 years	Existing	\$20,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Rensselaer Falls 3 (Preparedness)	Improve emergency communications by expanding broadband internet access throughout Village, and update list of vulnerable residents annually.	All	Rensselaer Falls Village Board*	Comprehensive Plan	2 years	Existing	\$100,000	Village Budget, FEMA- BRIC, USDA ReConnect Program	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEFC CWSRF: https://efc.ny.gov/CWSRF USDA ReConnect: https://www.usda.gov/reconnect USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Village’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Rensselaer Falls
------------------------------	-----------------------------

Mitigation Action Worksheet

Project Name:	Conduct an engineering feasibility study for a stormwater infrastructure improvements project
Project ID:	Rensselaer Falls 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Village's existing stormwater infrastructure is in need of upgrades to reduce recurring flooding issues. The Village lies downhill from the Town of Canton (between Town and Oswegatchie River), and receives significant stormwater flows during heavy rain events. Many ditches routinely overflow. The Village has removed trees and placed sidewalks to improve ditch drainage as well as other short-term fixes, but a comprehensive system upgrade is needed. An engineering study is needed to identify and prioritize issues in the existing system.

Action of Project Intended for Implementation

Description of the Solution:	Conduct an engineering study of the existing stormwater system to identify constraints and prioritize necessary improvements related to flood mitigation.
-------------------------------------	---

Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Short-term		
Estimated Cost:	\$15-20K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	1-2 years
Estimated Time Required for Implementation:	1-2 years	Potential Funding Sources:	NYSEFC CWSRF, FEMA- BRIC, Village Budget
Responsible Organization:	Village of Rensselaer Falls Village Board*, Town of Canton and De Kalb Highway Depts, St. Lawrence County Highway Dept.	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan, Village LWRP

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Repair system components as needed.	\$8-15K for drainage improvements per year	Reactive approach only; does not mitigate flood damages or risk.
	Conduct an engineering feasibility study for a stormwater infrastructure improvements project	\$15-20K	Most comprehensive solution to increase resiliency of stormwater conveyance system and reduce flood risk/ damages.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Rensselaer Falls
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Mitigation Action Worksheet

Project Name:	Install generator for Village Office and Library facility
Project ID:	Rensselaer Falls 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Village Office and Library (same facility) currently do not have a backup generator. This facility provides critical community services and needs to be able to function during an emergency event.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Village Office/Library facility to ensure that critical operations can be maintained during an emergency with a sustained power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$20K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Rensselaer Falls Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Emergency Management Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Village Office and Library facility	\$20K	Offers maximum protection for facility allowing continuity of services

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Rensselaer Falls
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Mitigation Action Worksheet

Project Name:	Improve emergency communications by expanding broadband internet access throughout Village, and update list of vulnerable residents annually.
Project ID:	Rensselaer Falls 3 (Preparedness)

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The entire Village does not have broadband internet access, which limits communications for residents. Additionally, the Village has a list of vulnerable residents (primarily elderly individuals) that they check in with during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Expand broadband internet access throughout Village and continue to maintain list of residents to check in with that may not have access to other forms of communication. Update resident list annually.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved internet availability within Village, residents able to access information more easily and faster.
Useful Life:	Long-term		
Estimated Cost:	\$100K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	Village Budget, FEMA- BRIC, USDA ReConnect Program
Responsible Organization:	Rensselaer Falls Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from exiting conditions
	Install additional cell towers for mobile broadband connectivity (personal hotspots from cell phones)	High	Requires cell phone for usage. Less effective than expanding internet services.
	Install fiber optic/cable based system	\$100K	Most comprehensive approach to improving communications and internet access in Village

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Rensselaer Falls 1	+	+	+	+	+	0	0	+	+	+	Low	Medium	1
Rensselaer Falls 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Rensselaer Falls 3	+	0	0	+	+	-	0	0	+	0	Medium	High	3

Jurisdictional Annex

Village of Richville

1. Contacts

The contacts for the Village of Richville regarding this plan are identified as follows:

- Ella Mae Fenlong- Mayor
Address: P.O. Box 285, Richville, NY 13681
Phone: 315-287-0956
Email: vofrichville@gmail.com
- Shelly Prashaw- Village Clerk
Address: P.O. Box 285, Richville NY 13681
Phone: 315-289-5768
Email: vofrichville@gmail.com

2. Municipal Profile

2.1 Population

The 2020 Census reported that 234 people live in the Village of Richville. The Village population has decreased by 27.6% since the 2010 Census (332) (U.S. Census Bureau, 2021).

2.2 Location

The Village of Richville is located in the southern portion of the Town of De Kalb in southern central St. Lawrence County. Richville is easily accessed from U.S. Route 11.

2.3 Governing Body

The Village of Richville is governed by a five-member Village Board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), there has been no new development in the Village. No new development has occurred in the Special Flood Hazard Area. The Village’s vulnerability to natural hazards has not changed.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Richville	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Other Special Plans	No	
Development Approvals		
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes/No	Village is listed as a current NFIP participant but has rescinded their floodplain ordinance
Natural hazard specific ordinance	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Richville	Notes
Flood insurance rate maps	Yes	FEMA actively working on flood study that will generate new FIRM mapping countywide.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	No	Not in Village, but Town of De Kalb has Planning Board
Mitigation Planning Committee	Yes	Established for HMP update
Maintenance programs to reduce risk	Yes	Town of De Kalb Highway
Mutual aid agreements	Yes	De Kalb Fire District
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Mayor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	No	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	Village signs annual agreement w/ SLC Housing Council so residents can apply for funding.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Richville	Notes
State funding programs	No	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Social media outreach, bulletin board available outside library
Natural disaster or safety related school programs	Yes	Fire Department programs
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include U.S. Route 11 and Main Street. The Village’s emergency shelter locations are summarized in Table 2, below. In addition to the Village’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Hall	71 Main St, Richville, NY 13681	Richville Fire District	Yes	Yes	Yes	-

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Richville based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately owned properties. The

potential housing locations identified for the Town of De Kalb were also listed for the Village of Richville, as there are not any identified locations within the Village limits.

- **Potential Temporary Housing Locations**
 - De Kalb Town Barn property - 2907 County Rt 17, De Kalb Junction, NY 13630
 - Vacant Town of De Kalb property (more than 100 acres) off of County Rt 17
 - Pipeline Park – Adjacent to the fire department and baseball field on U.S. Route 11
- **Potential Permanent Housing Locations**
 - Senior/Low Income Apartments in Town of De Kalb if openings available

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village’s natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	2	3	High	1
Severe Winter Storm	3	1	2	3	High	2
Ice Storm	3	1	3	2	High	3
Extreme Temperatures	3	1	1	2	Moderate	4
Flood	2	2	1	2	Moderate	5
Earthquake	2	3	1	1	Moderate	6
Wildfire	1	2	1	1	Low	7
Infestation	2	1	1	1	Low	8

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Richville. Table 5, below, denotes the types and locations of critical facilities within the Village.

Table 5. Critical Infrastructure in the Village of Richville		
Facility Name	Address	Located in Floodplain*
Municipal Services		
Village Hall/Library	87 Main St, Richville, NY 13681	No
Historical Society	59 Main St, Richville, NY 13681	No
Fire Station	71 Main St, Richville, NY 13681	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>		

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Village of Richville.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Richville. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along Boland Creek are likely to experience increased flooding occurrences.

The Village of Richville chose not to profile coastal storm, drought, ice jam, or landslide in their annex even though these hazards were profiled for the County. The Village does not have any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11 and Main Street) would be most impactful to residents. Storm damages would primarily impact the developed portions of the Village, which are generally along the Main Street and Depot Street corridors.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. None of these records occurred in the Village of Richville, however, the Village does experience severe storm events regularly (about once every few years). The NCDC did not report any tornadoes affecting the Village since 2010.

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Village of Richville. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Severe Winter Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Village of Richville is susceptible to damages from a severe winter storm event. The Town of De Kalb Highway Dept. clears Village streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11 and Main Street) would be most impactful to residents. Storm damages would primarily impact the developed portions of the Village, which are generally along the Main Street and Depot Street corridors.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Village of Richville has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Richville.

5.2.4 *Future Potential Impacts*

The Village of Richville will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.3 **Ice Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Richville is susceptible to damages from an ice storm event. Damages to the Village's critical infrastructure or primary evacuation routes (U.S. Route 11 and Main Street) would be most impactful to residents. Storm damages would primarily impact the developed portions of the Village, which are generally along the Main Street and Depot Street corridors.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Village of Richville lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Richville.

5.3.4 *Future Potential Impacts*

The Village of Richville will continue to experience ice storm events in the future. The Town of De Kalb Highway Dept. completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.4 Extreme Temperatures

5.4.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Village is moderately vulnerable to extreme temperature events, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Village of Richville is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 9.0% of the population in the Village is under 5 years old, and 21.4% of the population is over 65 years old. Approximately 13.8% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Richville lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Richville.

5.4.4 *Future potential Impacts*

The Village of Richville will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.5 Flood

5.5.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by Boland Creek, which drains to the Oswegatchie River. FEMA provides flood insurance rate maps for the Village of Richville, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Village that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 6. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Village of Richville Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
476 acres	0.0%	0.0%

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC did not report any flood records for the Village of Richville since 2010. As described in Section 6.0 of this annex, one NFIP loss claim has been filed as of October 2021 in the Village of Richville but no payments were made. There are no repetitive loss properties in the Village.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Village, including Boland Creek may be vulnerable to flooding. The HAZUS flood model completed for St. Lawrence County did not generate any 100-year or 500-year floodplains in the Village of Richville.

5.6 **Earthquake**

5.6.1 *Description*

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Village is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which were located in the Village of Richville. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.6.4 *Future Potential Impacts*

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to an earthquake.

5.7 **Wildfire**

5.7.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Village's overall vulnerability to a wildfire is low, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Village are susceptible to wildfires. Significant wildfires have not been reported in the Village, but this hazard was included in this annex for future mitigation planning consideration.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), the Village experienced 0.4 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. Wildfires are most common in undeveloped areas, therefore, this number is likely lower than reported. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.7.4 *Future Potential Impacts*

Undeveloped areas in the Village of Richville remain susceptible to a wildfire. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.8 **Infestation**

5.8.1 *Description*

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Village's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village of Richville is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village (Figure 5.13, Appendix A of the main body of the plan).

5.8.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Village of Richville, however, it has been documented in the norther portion of the County. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Village in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.8.4 Future Potential Impacts

The entire Village of Richville remains susceptible to an infestation event. Given the Village's location, the emerald ash borer is likely to migrate to the Village in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Richville currently participates in the NFIP. As of October 2021, one NFIP loss claim was filed in the Village of Richville, but no payments were made. There are no repetitive loss properties in the Village. The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 7, below. The Village’s 2015 action was not re-included for the HMP update.

Table 7. Hazard Mitigation Action Progress Village of Richville				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Severe storms	1,2,3	Town of De Kalb Highway Department	The Village does not have a DPW, the Town of De Kalb Highway Dept. works with the Village. This is a routine responsibility of the highway department that is adequately addressed. There is not a formal plan in place but that is not a high priority at this time.

7.2 Proposed Mitigation Actions

The Village proposed two new mitigation actions to be included in the HMP update. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Village of Richville									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Richville 1	Develop protocol for communicating with vulnerable residents before and during hazard events, and providing educational outreach to residents regarding opportunities for hazard mitigation. Maintain list of residents who may need assistance and update annually or as needed.	All	Richville Village Board*	Comprehensive Plan	1 year	Existing	\$1,000	Village Budget	1
Richville 2	Install generator for Village Hall	All	Richville Village Board*	Comprehensive Plan	5 years	Existing	\$15,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Village's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village's STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Village of Richville
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Mitigation Action Worksheet

Project Name:	Develop protocol for communicating with vulnerable residents before and during hazard events, and providing educational outreach to residents regarding opportunities for hazard mitigation. Maintain list of residents who may need assistance and update annually or as needed.
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Project ID:	Richville 1
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Risk/Vulnerability

Hazard of Concern:	All
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Description of the Problem:	The Village generally knows of residents who may require additional assistance during emergencies, but does not have a formal list that is regularly updated. Additionally, Village residents would benefit from more targeted outreach regarding potential hazard mitigation strategies that they can implement.
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Action of Project Intended for Implementation

Description of the Solution:	Develop a list of residents who may need extra assistance during an emergency event, and update annually. Develop a plan that outlines responsibilities and steps for Village staff to take to reach out to individuals during an emergency. The plan would also include educational outreach to residents regarding hazard mitigation opportunities for severe thunderstorm/wind/tornado events, ice storms, severe winter storms, earthquakes, wildfire, flood, and extreme temperatures.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Village more easily able to reach vulnerable residents before, during, and after a disaster event. Village residents better prepared to mitigate impacts from hazard events.
Useful Life:	Short-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	Village Budget
Responsible Organization:	Richville Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Rely on other agencies (Arc, Meals on Wheels, County Office for Aging) to contact vulnerable individuals	Low	Other agencies may be involved depending on the event, but adds another layer of communication/complexity. All vulnerable residents may not be reached by other agencies.
	Develop protocol for communicating with vulnerable residents and regularly update contact list; complete educational outreach to residents regarding mitigation opportunities.	\$1,000	Allows Village to take control over communication process and ensure all residents are reached. Residents better equipped to mitigate impacts from hazard events.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Richville
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Mitigation Action Worksheet

Project Name:	Install generator for Village Hall
Project ID:	Richville 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Village Hall is a critical facility and does not currently have a backup generator.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Village Hall so that it can continue to provide critical services during emergencies with sustained power outages.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15,000.00		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Richville Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Village facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Village Hall	\$20K	Offers maximum protection for Village Hall

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Richville 1	+	+	0	+	+	+	0	+	+	+	Low	Low	1
Richville 2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2

Jurisdictional Annex

Town of Rossie

1. Contacts

The contacts for the Town of Rossie regarding this plan are identified as follows:

- Harry Turnbull – Town Supervisor
Address: 908 County Route 3, Redwood, NY 13679
Phone: (315) 287-1765
Email: supervisor@rossieny.org
- James Mandigo – Councilman
Address: 908 County Route 3, Redwood, NY 13679
Phone: (315) 287-0659
Email: mandigosauto@gmail.com

Town Website: <https://www.townrossie.digitaltowpath.org/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 799 people live in the Town of Rossie. The Town's population has decreased by 8.9% since the 2010 Census (877) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Rossie is located in the southwestern portion of St. Lawrence County and is bordered by the Towns of Hammond and Macomb to the north, the Towns of Gouverneur and Fowler to the east, and the Towns of Theresa and Antwerp (Jefferson County) to the south. Rossie is easily accessed from County Route 3, County Route 10, U.S. Route 11, County Routes 12, 9, 8, and Jefferson County Route 25.

2.3 Governing Body

The Town of Rossie is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), a solar project in Somerville on U.S. Route 11 and a butcher shop on Lockie Road were developed in the Town. In addition, the Town is looking to acquire additional land to expand their Town Barn property. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Rossie	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Rossie	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	No	Town is working on developing zoning.
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA actively working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	County and other shared services agreements with bordering municipalities
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	County works with DANC for GIS services
Technical Abilities		
Warning systems/services	Yes	Information is posted on bulletin outside and inside Town Barn, and on Town website
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	
HAZUS analysis	No	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Rossie	Notes
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	No	
Incur debt through private activities	Yes	
Community Development Block Grant	No	
Other federal funding programs	No	
State funding programs	Yes	CHIPS, others
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	No	
Natural disaster or safety related school programs	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include County Routes 3, 8, 9, 10, and 12, U.S. Route 11, and Jefferson County Route 25. The Town’s emergency shelter locations are summarized in Table 2, below. In addition to the Town’s pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Town Barn	908 County Route 3, Rossie NY, 13646	Town of Rossie	No (small facility, no backup power)	Yes	Pets not accepted at Town Barn, but the dog warden has a kennel	No backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Rossie based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Community Center - next to Town Barn - 908 County Route 3, Rossie NY, 13646
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant land in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Flood	2	2	2	3	High	4
Ice Jam	2	2	2	2	Moderate	5
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	6
Wildfire	2	3	1	2	Moderate	7
Extreme Temperatures	3	1	2	2	Moderate	8
Drought	3	1	2	1	Moderate	9
Landslide	2	3	1	1	Moderate	10
Earthquake	2	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Rossie. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Community Center (next to Town Barn)	908 County Route 3, Rossie NY, 13646	No
Municipal Services	Town Hall and Highway Barn	908 County Route 3, Rossie NY, 13646	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Rossie.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Rossie. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Indian River, Oswegatchie River, their tributaries, and Grass Creek are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 3, 8, 9, 10, and 12, U.S. Route 11, and Jefferson County Route 25) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Rossie, Wegatchie, Somerville, and Spragueville.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. None of these events occurred in the Town of Rossie. Although there are no records for the Town reported by the NCDC, the Town does experience severe storms, with a frequency of about once every two to three years. There are no severe storm events or damage estimates reported specific to the Town of Rossie. Additionally, no tornado events have been reported for the Town since 2010.

5.1.4 *Future Potential Impacts*

Severe storms will continue to occur in the Town. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Ice Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of St. Lawrence County. The entire Town of Rossie is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 3, 8, 9, 10, and 12, U.S. Route 11, and Jefferson County Route 25) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Rossie, Wegatchie, Somerville, and Spragueville.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Rossie lies, and are described in

Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Rossie.

5.2.4 *Future Potential Impacts*

The Town of Rossie will continue to experience ice storm events in the future. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one Town the County. The entire Town of Rossie is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 3, 8, 9, 10, and 12, U.S. Route 11, and Jefferson County Route 25) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Rossie, Wegatchie, Somerville, and Spragueville.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Rossie has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDRC does not report any winter storm damage estimates specific to the Town of Rossie.

5.3.4 Future Potential Impacts

The Town of Rossie will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Flood

5.4.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Town is highly vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Indian River, Oswegatchie River, and their tributaries. FEMA provides flood insurance rate maps for the Town of Rossie, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 6 summarizes the amount of land within the Town of Rossie that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 6. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Rossie Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
25,066 acres	6.1%	0.50%

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC did not report any flood records for the Town of Rossie since 2010. The Town indicated that the area around County Route 31 and Brasie's Corners-Rossie Road is primarily susceptible to flooding along the Indian River. There is a power dam in the Town of Theresa (Jefferson County) upstream, and the Town of Rossie experiences flooding in the area if dam is released concurrently with heavy rainfall. Flooding issues tend to occur along River Road, as well as on County Route 3 (along the St. Lawrence/Jefferson County line) due to beaver dams. Additionally, the Town has had flooding issues in an area just below the Town Barn on the Indian River. An island blocks flow in this location. Much of the flooding concerns in the Town are related to beaver dams.

As described in Section 6.0 of this annex, three NFIP loss claims have been paid as of October 2021 in the Town of Rossie totaling \$52,352.56. There is one repetitive loss property in the Town of Rossie limits, which is a single family residence. The property has incurred two flood related losses, with a total of \$52,352.56 in building damages. No content damage payments were reported.

5.4.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the Indian River, Oswegatchie River, and their tributaries are vulnerable to flooding. About 6.1% of the Town of Rossie is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.5 **Ice Jam**

5.5.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town,

primarily along the Indian River and Oswegatchie River, are vulnerable to ice jams.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

There are no historical records of an ice jam occurring specifically in the Town of Rossie according to the USACE CRREL. The Town reported local records of ice jams have occurred on the Oswegatchie River in the hamlet of Wegatchie (County Route 12).

5.5.4 *Future Potential Impacts*

Properties along the Indian River and Oswegatchie River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.6 **Coastal Storm (Nor'easter)**

5.6.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (County Routes 3, 8, 9, 10, and 12, U.S. Route 11, and Jefferson County Route 25) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Rossie, Wegatchie, Somerville, and Spragueville.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of

snow across the County. No damages in the Town of Rossie were reported for this event.

5.6.4 *Future Potential Impacts*

The Town of Rossie is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.7 **Wildfire**

5.7.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.7.4 *Future Potential Impacts*

The entire Town of Rossie remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The entire Town of Rossie is moderately susceptible to a drought due to the widespread extent and potential to cause moderate damages. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system, therefore residents rely on private wells and may be susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Rossie or the rest of St. Lawrence County since 2010. There are no specific damage estimates related to previous droughts affecting the Town. The Town does not have a municipal water system. Properties that rely on private wells and agricultural lands throughout the Town, would be most susceptible to a drought event.

5.8.4 Future Potential Impacts

The entire Town of Rossie remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Extreme Temperatures

5.9.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to extreme temperatures, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Rossie is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 7.8% of the population in the Town is under 5 years old, and 8.6% of the population is over 65 years old. Approximately 29.6% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.9.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Rossie lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Rossie.

5.9.4 Future Potential Impacts

The Town of Rossie will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.10 Landslide

5.10.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Rossie is mapped in an area with

low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Indian River are particularly susceptible.

5.10.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of landslides occurring specifically in the Town of Rossie. Recently, rockslides along County Route 3, New Connecticut Road, County Route 10, Hall Road, and County Route 8 have occurred in the Town. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

The Town may experience landslides in the future in vulnerable locations. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

5.11 Earthquake

5.11.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.11.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none

of which occurred in the Town of Rossie. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.12 Infestation

5.12.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concerns regarding an infestation in the Town of Rossie include the emerald ash borer and Eurasian watermilfoil. Emerald ash borer was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Rossie (Figure 5.13, Appendix A of the main body of the plan). Eurasian watermilfoil is an invasive aquatic plant that has been reported in Black Lake, which borders the Town of Rossie.

5.12.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Rossie, however, it has been detected in the Town of Hammond which is directly north of Rossie. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Rossie in the near future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. The Black Lake Invasive Weeds Committee worked with Quantitative Environmental Analysis,

LLC to develop a Eurasian Watermilfoil Management Plan in 2008 (which is provided in Appendix H of the main plan). It was estimated total removal would cost up to \$20 to 30 million.

5.12.4 Future Potential Impacts

The entire Town of Rossie remains susceptible to an infestation event. The emerald ash borer was recently detected in the Town of Hammond, and is likely to reach the Town of Rossie over the next several years. Eurasian watermilfoil remains a concern for Black Lake. Proactive management will be critical to reduce potential impacts of both species.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Rossie currently participates in the NFIP. As of October 2021, three NFIP loss claims have been paid in the Town of Rossie, totaling \$52,352.56. There is one repetitive loss property in the Town, which is a single-family residence. The property has incurred two flood related losses, with a total of \$52,352.56 in building damages. No content damage payments were reported. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties. The Town will

also consider potential mitigation efforts for the property that has experienced multiple flood-related losses.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 7, below. The Town’s 2015 mitigation action was not re-included for the 2021 update.

Table 7. Hazard Mitigation Action Progress Town of Rossie				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities	Ice storm	1,2,3	Town Highway Department	Routine responsibility of highway department that is adequately addressed. No need for formal plan at this time.

7.2 Proposed Mitigation Actions

The Town proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 8, below and on worksheets included in Attachment A.

Table 8. Proposed Hazard Mitigation Actions Town of Rossie									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Rossie 1	Install generator for Town Barn	All	Rossie Town Highway Dept*	None	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Rossie 2	Complete a hydraulic study for potential flood mitigation projects for Indian River	Flood	Rossie Town Board*	None	5 years	Existing	\$30,000	Town Budget, FEMA- BRIC	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 9) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Rossie
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Mitigation Action Worksheet

Project Name:	Install generator for Town Barn
Project ID:	Rossie 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Barn is a critical facility and lacks a backup generator. This leaves it vulnerable to power outages during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Install a generator at the Town Barn to ensure that critical operations are not interrupted during emergencies with sustained power outages.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:		Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Town Barn	\$20K	Offers maximum protection for Town Barn

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Rossie
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Mitigation Action Worksheet

Project Name:	Complete a hydraulic study for potential flood mitigation projects for Indian River
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Project ID:	Rossie 2
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Risk/Vulnerability

Hazard of Concern:	Flood
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Description of the Problem:	There is an existing island located in the bend of Indian River that impedes flow. During high flow events, water backs all the way up to River Rd across from Flemings Camp Rd. A hydraulic study to identify potential flood mitigation projects is needed, as the Town is not certain of how to reduce flooding in this area.
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Action of Project Intended for Implementation

Description of the Solution:	Complete a hydraulic engineering study for the Indian River to review problem areas and identify and prioritize potential mitigation projects that could reduce flooding impacts.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	A study would identify highest priority areas to be addressed for flood mitigation and would better inform potential options
Useful Life:	Short-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, FEMA- BRIC
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Responsible Organization:		Local Planning Mechanisms to be used in Implementation, if any:	None
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Implement flood mitigation projects	High	Future step; need to identify specific locations and alternatives first.
	Complete a hydraulic study	\$30K	Allows Town to review target areas that would benefit most from flood mitigation, and review potential alternatives for solutions

Progress Report (for Plan Maintenance)

Date of Status Report:	
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Report of Progress:	
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Update Evaluation of the Problem and/or Solution:	
---	--

Table 9. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Rossie 1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Rossie 2	+	+	+	+	+	0	0	+	+	+	Low	Low	2

Jurisdictional Annex

Town of Russell

1. Contacts

The contacts for the Town of Russell regarding this plan are identified as follows:

- Tess Eells – Town Clerk
Address: P.O. Box 628, Russell NY 13684
Phone: 315-347-2358
Email: russellnyclerk@gmail.com
- Timothy White – Town Supervisor
Address: P.O. Box 628, Russell NY 13684
Phone: (315)-244-1686
Email: russelltownsupervisor@gmail.com

Town Website: <https://russellny.org/index.html>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 1,872 people live in the Town of Russell. The Town’s population has increased by 0.9% since the 2010 Census (1,856) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Russell is located in Central St. Lawrence County and is bordered by the Town of Canton to the north, the Towns of Pierrepont and Clare to the east, the Town of Fine to the south, and the Towns of Edwards and Hermon to the west. Russell is easily accessed from County Route 17 and County Route 24.

2.3 Governing Body

The Town of Russell is governed by a five-member Town Board, including the Supervisor and four board members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), multiple residences were developed in the Town. In addition, a private solar array project is planned at 1040 County Route 21, and other private solar projects have been proposed. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Russell	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Russell	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	No	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	No	
Subdivision ordinance	No	
NFIP Participant/Floodplain ordinance	Yes/No	Town is listed as an active NFIP participant but has rescinded floodplain regulations
Natural hazard specific ordinance	No	
Flood insurance rate maps	No	Town is unmapped by existing FEMA FIRMs. FEMA actively working on flood study that will generate new FIRM mapping countywide.
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	No	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	Ambulance service is now through Hermon Rescue
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Assessor works with DANC
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP Update
Grant writing	Yes	Town works with County for grant writing assistance
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	Recently used for road improvements, elevator added to Town Hall, new Highway Dept. vehicles (new plow truck, utility truck)

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Russell	Notes
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	None active at the moment but available
Incur debt through private activities	No	
Community Development Block Grant	Yes	Goes through County
Other federal funding programs	Yes	Goes through County
State funding programs	Yes	Solar panels installed
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Town Website, Town does a lot of training events for highway dept.
Natural disaster or safety related school programs	Yes	Fire dept. does fire prevention training with schools
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include County Route 17 and County Route 24. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Hall	5 Pestle Street Rd Russell, NY 13684	Russell Volunteer Fire Department	Yes	Yes	Yes- Town has a dog enforcement officer with a kennel	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Russell based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Town Ball Field- 821 Blanchard Hill Rd, Russell, NY 13684
 - Field above Town Hall- 8 Pestle Street Rd, Russell, NY 13684
 - Land behind Town Barn - 42 Pestle Street Rd, Russell, NY 13684

- **Potential Permanent Housing Locations**
 - Land behind Town Barn - 42 Pestle Street Rd, Russell, NY 13684
 - Potentially privately owned vacant properties in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Flood	2	2	1	2	Moderate	5
Ice Jam	2	2	1	2	Moderate	6
Extreme Temperatures	3	1	1	2	Moderate	7
Wildfire	1	3	1	2	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Drought	3	1	1	1	Moderate	10
Infestation	2	1	2	1	Moderate	11
Landslide	1	3	1	1	Moderate	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Russell. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Public Library	24 Pestle Street Rd, Russell, NY 13684	No
Community Services	Town Ball Field	821 Blanchard Hill Rd, Russell, NY 13684	500YR
Community Services	Town Park	3654 Pestle Street Rd, Russell, NY 13684	No
Educational Facilities	Edwards-Knox Central School	2512 County Route 24, Hermon, NY 13652	No
EMS/Fire Department	DeGrasse, Clare, & South Russell Volunteer Fire Dept.	2211 CR 27, Russell, NY 13684	No
EMS/Fire Department	Russell Volunteer Fire Department	5 Pestle Street Rd, Russell, NY 13684	No
Municipal Services	Town Court House	9 Pestle Street Rd, Russell, NY 13684	No
Municipal Services	Town Hall	4 Pestle Street Rd, Russell, NY 13684	No
Municipal Services	Town Hwy Dept.	42 Pestle Street Rd, Russell, NY 13684	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Russell.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan (Volume I).

The probability of climate-related hazard events is expected to increase in the future within the Town of Russell. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the Grass River and the Little River are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. The Town of Russell reports typical damage associated with severe storms, including downed trees, occurring within the Town. Damages to the Town's critical infrastructure or primary evacuation routes (County Route 17 and County Route 24) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Degrasse and Russell.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Seven of these events occurred in the Town of Russell (frequency of about once a year to once every two years). All of these events were thunderstorm winds. Estimated damages for the Town of Russell ranged from \$2000 to \$30,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The NCDC reports no tornadoes affecting the Town since 2010.

Table 6. Severe Storm Event Records for the Town of Russell				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/4/2012	50 knots	\$5,000	-
Thunderstorm Wind	7/17/2012	50 knots	\$10,000	-
Thunderstorm Wind	5/1/2017	55 knots	\$30,000	-
Thunderstorm Wind	7/8/2017	55 knots	\$10,000	-
Thunderstorm Wind	5/4/2018	50 knots	\$10,000	-
Thunderstorm Wind	7/11/2019	50 knots	\$5,000	-
Thunderstorm Wind	8/2/2020	50 knots	\$2,000	-
Total			\$72,000	-

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town of Russell in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Russell is susceptible to damages from an ice storm

event. Damages to the Town's critical infrastructure or primary evacuation routes (County Route 17 and County Route 24) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Degrasse and Russell.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, three ice storms were reported in the portion of St. Lawrence County where the Town of Russell lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Russell. The 1998 ice storm was the most significant ice storm that affected the Town. More recent ice storms have primarily caused downed tree limbs.

5.2.4 *Future Potential Impacts*

The Town of Russell will continue to experience ice storm events in the future. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Russell is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (County Route 17 and County Route 24) would be most

impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Degrasse and Russell.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Russell has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Russell.

5.3.4 *Future Potential Impacts*

The Town of Russell will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (County Route 17 and County Route 24) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Degrasse and Russell.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of

snow across the County. No damages in the Town of Russell were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Russell is very likely to experience nor’easter events in the future. The severity and frequency of nor’easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Flood**

5.5.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Grass River and Little River, which drain to the St. Lawrence River. The Town of Russell is not mapped by FEMA’s existing flood insurance rate maps (FIRMs). FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Russell that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Russell Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
62,280 acres	2.4%	0.21%

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has not reported any flood records for the Town of Russell since 2010. The Town used to experience recurring flooding issues along Pestle Street Rd and at the bridge on Silver Hill Road over Plumb Brook. Pestle Street Rd and the Silver Hill Rd bridge have since been raised, which has reduced flooding issues. As described in Section 6.0 of this annex, two NFIP loss claims have been paid as of October 2021 in the Town of Russell totaling \$969.30. There are no repetitive loss properties in the Town of Russell.

5.5.4 *Future Potential Impacts*

Properties along streams throughout the Town, including the Grass River and Little River are vulnerable to flooding. About 2.4% of the Town of Russell is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.6 **Ice Jam**

5.6.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the Grass River, Little River and Elm Creek are vulnerable to ice jams.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Russell was affected by three ice jams recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. The USACE CRREL has not reported any ice jams in Russell since 2003, however, the Town has experienced ice jams recently according to local

records, which occur mainly along Pestle Street. These events have not caused significant damages in recent years.

5.6.4 *Future Potential Impacts*

Properties along streams throughout the Town, primarily along the Grass River, Little River and Elm Creek remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.7 **Extreme Temperatures**

5.7.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperatures, as documented in their hazard analysis in Section 4.1. These events typically affect most of the County. The entire Town of Russell is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 5.8% of the population in the Town is under 5 years old, and 21.9% of the population is over 65 years old. Approximately 15.9% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Russell lies, which are described in Section 5.5 of the main body of the plan. The Town reports no history of opening heating/cooling centers. No damage estimates related to extreme temperatures are reported specific to the Town of Russell.

5.7.4 *Future Potential Impacts*

The Town of Russell will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.8 Wildfire

5.8.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.8.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, minor grass/brush fires occasionally occur. According to Figure 5.11 (Appendix A of the main body of the plan), the Town experienced 0.3 to 0.8 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The NYSDEC map also shows one wildfire greater than 10 acres in size that occurred centrally in the Town of Russell. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

The entire Town of Russell remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which were located in the Town of Russell. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Drought

5.10.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does

not have a municipal water system, therefore, residents rely on private wells and may be susceptible to low water yields during a drought.

5.10.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Town of Russell or the rest of St. Lawrence County since 2010. However, a few properties in the Town each year are typically affected by a drought according to local records. The Town indicated that many private wells in the Town have experienced low yields during recent drought events. Some residents had to re-drill their wells, and others were filled by the Russell Volunteer Fire Department.

5.10.4 Future Potential Impacts

The entire Town of Russell remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Town of Russell is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 15% in the Town of Russell (Figure 5.13, Appendix A of the main body of the plan).

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Russell, however, it has been detected in the northern part of the County. The

emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread. The Russell Highway Superintendent has a list of all ash tree locations in the Town that will be used for proactive management. An infestation has the potential to cause thousands of dollars in damages.

5.11.4 Future Potential Impacts

The entire Town of Russell remains susceptible to an infestation event. The emerald ash borer is present in the County and is likely to migrate to the Town of Russell in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.12 Landslide

5.12.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Russell is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the Grass River and Little River are particularly susceptible. Ford Road is an area of concern for the Town due to steep slopes.

5.12.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of significant landslides occurring in the Town of Russell. The Town indicated that landslide events are not a significant issue, but some small areas of concern are present. The Town has worked with

NYSDEC to cut back and add slope protection on Ford Road. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.12.4 Future Potential Impacts

Portions of the Town of Russell remain susceptible to landslides. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Russell currently participates in the NFIP. As of October 2021, two NFIP loss claims have been paid in the Town totaling \$969.30. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 8, below. This action was re-included for the 2021 update. In addition to the information below, several bridge replacement projects have been completed in the Town, including County Route 27 over the Grass River (which was under construction as of Fall 2021), County Route 17 over Plumb Brook (replaced around 2019) and Silver Hill Rd over Plumb Brook. Each of these projects helped reduce flooding issues within the Town.

Table 8. Hazard Mitigation Action Progress Town of Russell				
Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Realign bridge on Spicer Road, to reduce erosion and bridge scouring, as well as armor channel to increase stability of embankment.	Structural Collapse	1,2,3	Town Highway Department	Ongoing. The bridge is not currently used. Engineering design is complete for realignment, but the Town needs more funding to progress construction. Re-included for HMP update.

7.2 Proposed Mitigation Actions

The Town proposed two mitigation actions to be included in the HMP update, one of which is an ongoing project from the 2015 HMP. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Town of Russell									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Russell 1	Install generator for Town Hall, Highway Department, and Library	All	Russell Town Board*, Highway Dept	None	5 years	Existing	\$10K for each building	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	1
Russell 2 (Ongoing from 2015)	Realign bridge on Spicer Road over Plumb Brook and install bank stabilization	Flood, Ice Jam	Russell Highway Dept*, Town Board	None	5 years	Existing	\$1 million	NYS DOT- Bridge NY, FEMA-PDM, Town Budget	2
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSDOT Bridge NY: https://www.dot.ny.gov/BRIDGENY USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Russell
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Mitigation Action Worksheet

Project Name:	Install generator for Town Hall, Highway Department, and Library
Project ID:	Russell 1

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Hall, Highway Department, and Library are all critical community facilities that lack backup generators. This leaves these facilities vulnerable to power outages during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Install a backup generator at each facility to ensure that critical services are not interrupted during emergency events with sustained power outages.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$10K for each building - \$30K total		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Russell Town Board*, Highway Dept	Local Planning Mechanisms to be used in Implementation, if any:	

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at each facility	\$30K	Offers maximum protection for each facility to maintain operations during a power outage

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet

Name of Jurisdiction:	Town of Russell
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Mitigation Action Worksheet

Project Name:	Realign bridge on Spicer Road over Plumb Brook and install bank stabilization
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Project ID:	Russell 2
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Risk/Vulnerability

Hazard of Concern:	All
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Description of the Problem:	The existing bridge on Spicer Road over Plumb Brook is not currently used, and needs to be realigned due to erosion and scour issues. The bridge realignment is designed, but funding is needed to progress the project into construction.
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Action of Project Intended for Implementation

Description of the Solution:	Progress Spicer Road bridge realignment project through construction to improve its structural integrity, flood resiliency, and open the bridge back up to traffic.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced impacts from future flood and/or ice jam events
Useful Life:	Long-term		
Estimated Cost:	\$1 million		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
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Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSDOT- Bridge NY, FEMA- PDM, Town Budget
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Responsible Organization:	Russell Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	
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Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Rehabilitate existing bridge	High	Temporary solution; does not mitigate future flood damages
	Realign bridge to reduce flood risk	\$1 million	Most comprehensive and proactive solution to reduce future flood damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
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Report of Progress:	
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Update Evaluation of the Problem and/or Solution:	
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Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Russell 1	+	+	+	+	+	0	0	0	+	0	Medium	Medium	1
Russell 2	+	+	0	+	+	-	-	0	+	-	Medium	High	2

St. Lawrence County Annex

1. Contacts

The primary contacts for St. Lawrence County regarding this plan are identified as follows:

- Matthew Denner – Director, St. Lawrence County Office of Emergency Services
- Jason Pfothauer – Director, St. Lawrence County Planning Office
- Heidi Ames – Grants Manager, St. Lawrence County Planning Office
- Donald Chambers – Superintendent, St. Lawrence County Highway Department
- Ian Hazen – St. Lawrence County Highway Department

Website: <https://stlawco.org/>

2. County Profile

2.1 Population

The 2020 Census estimated that 108,505 people live in St. Lawrence County. The County's population has decreased by 3.1% since the 2010 Census (111,944) (U.S. Census Bureau, 2021).

2.2 Location

St. Lawrence County is located in the northern portion of New York State and is bordered by Franklin County to the East, Hamilton County and Lewis county to the south, and Jefferson County to the southwest. The St. Lawrence River acts as the northwestern and northern border of the County. Ontario, Canada is across the St. Lawrence River from St. Lawrence County. Major transportation routes in St. Lawrence County include U.S. Route 11 and numerous state roadways, as described in Section 2.6 of the main body of the plan.

2.3 Governing Body

St. Lawrence County is governed by the Board of Legislators. There are 15 legislative districts throughout the County.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), there has been 25 small-scale solar projects. More solar projects are planned for the future. Recent developments within each jurisdiction are discussed in each municipality's jurisdictional annex.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The County has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The County worked with BCA Architects and Rootz, LLC to complete a Shoreline Resiliency Study for the St. Lawrence River in 2019. This study assessed the vulnerability of shoreline ecosystems along the upper St. Lawrence River including the Towns of Hammond, Morristown, Oswegatchie, and Lisbon. A separate study was completed for the City of Ogdensburg. The goal of this Countywide study was to identify potential measures that could be taken to increase flood resiliency in these locations. In addition, the County was granted funding for multiple projects through the Great Lakes Resiliency and Economic Development Initiative (REDI) program to mitigate impacts from the 2017 and 2019 St. Lawrence River high water levels and increase flood resiliency in shoreline communities. Finally, the County is currently participating in the Jefferson-St. Lawrence Coastal Lakeshore Economy and Resiliency Initiative (CLEAR), which is targeting shoreline resiliency efforts along the St. Lawrence River. The County's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities- St. Lawrence County	
Plans	
Comprehensive Plan	No
Capital Improvement Plan	No
Economic Development Plan	Yes
Comprehensive Emergency Management Plan	Yes
Continuity of Operations Plan	Yes
Transportation Plan	No
Stormwater Management Plan	No
Community Wildfire Protection	No
Other Plans	St. Lawrence River Shoreline Resiliency Study Comprehensive Land Use Plan Agricultural Development Plan Facility Management Plan
Development Approvals	
Building Code	Yes
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A

Table 1. Planning Mechanisms and Capabilities- St. Lawrence County	
Fire department ISO rating	N/A
Site plan review requirements	No
Land Use Regulations	
Zoning ordinance	No
Subdivision ordinance	No
Floodplain ordinance	No
Natural hazard specific ordinance	No
Flood insurance rate maps	Yes
Acquisition of land for open space and public recreation	No
Administration	
Planning Commission	Yes
Mitigation Planning Committee	Yes
Maintenance programs to reduce risk	Yes
Mutual aid agreements	Yes
Staff	
Chief Building Official	No (covered by municipalities)
Floodplain Administrator	No (covered by municipalities)
Emergency Manager	Yes
Community Planner	Yes
Civil Engineer	Yes
GIS Coordinator	No; GIS services available from DANC
Technical Abilities	
Warning systems/services	Yes
Hazard data and information	Yes
Grant writing	Yes
HAZUS analysis	No
Funding Resources	
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Storm water utility fee	No
Incur debt through general obligation bonds and/or special tax bonds	Yes
Incur debt through private activities	No
Community Development Block Grant	Yes
Other federal funding programs	Yes
State funding programs	Yes
Programs/Organizations	
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Environmental Management Council Emerald Ash Borer Taskforce County Animal Response Team
Ongoing public education or information program	Yes
Natural disaster or safety related school programs	Yes
Storm Ready certification	No
Firewise Communities certification	No

Table 1. Planning Mechanisms and Capabilities- St. Lawrence County	
Public-private partnership initiatives addressing disaster-related issues	Yes

3.2 Emergency Communications, Routes, and Shelters

The St. Lawrence County Office of Emergency Services operates the central 911 dispatch and emergency communications. The County shares information with the public using social media accounts, the County website, local news and radio outlets, and the NY Alert System. Transportation systems in the County are discussed in detail in Section 2.6 of the main body of the plan. Major transportation routes within the County include U.S. Route 11, State Route 3, and State Route 37. Numerous other state and County roadways are present throughout the County.

Emergency shelter locations are addressed at the municipal level. Details are provided in each municipality’s annex. The County works with the American Red Cross for emergency shelter operations. The established heating or cooling centers throughout the County are generally the same as Red Cross shelter locations. The County’s shelter list is not publicly shared but it generally includes schools that have shower, bathroom, and kitchen facilities and food supplies. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies in addition to local pet sheltering abilities within each municipality.

3.3 Temporary and Permanent Housing Locations

Potential temporary and permanent housing locations for displaced residents are addressed at the municipal level. Details are provided in each municipality’s annex.

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The County reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 2. The County's natural hazard analysis results are provided in Table 3.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Extreme Temperatures	3	1	2	2	Moderate	5
Ice Jam	2	2	2	1	Moderate	6
Flood	2	2	1	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Wildfire	1	3	1	2	Moderate	10
Landslide	1	3	1	1	Moderate	11
Infestation	2	1	1	1	Low	12

4.2 Critical Facilities

Critical facilities include any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as

identified by the County. Table 4 (Attachment A) denotes the types and locations of critical facilities within the County.

5. Priority Hazard Events

The natural hazards profiled by the County are detailed in Section 5.0 of the main body of the plan.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

All municipalities within St. Lawrence County except the Village of Hammond currently participate in the NFIP. As of October 2021, 81 NFIP loss claims have been paid in St. Lawrence County totaling \$536,633.43. There are five repetitive loss properties in the County totaling 14 collective losses. Total building damages for repetitive loss properties were \$121,567.53, and total content damages were \$126,800.19.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The County proposed eight mitigation actions in the 2015 St Lawrence County HMP, and their statuses are summarized in Table 5 (Attachment A). The County updated and re-included four of these actions for the HMP update.

7.2 Proposed Mitigation Actions

The County proposed nine mitigation actions to be included in the HMP update, four of which (SLC 2, SLC 4, SLC 6, and SLC 7) are ongoing projects from the 2015 HMP. These actions are described in detail in Table 6 (Attachment A) and in the action worksheets provided in Attachment A. Three of the County's proposed actions (SLC 5, SLC 6, and SLC 9) are considered preparedness rather than mitigation; however, the County chose to include them in this plan because they are still priority projects that are relevant to hazard mitigation concerns.

7.3 Cost-Benefit Analysis

Each of the County's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis. The County's STAPLEE analysis is provided in Table 7 (Attachment A). The STAPLEE analysis includes the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental, as detailed in Section 7.2.3 of the main body of the plan.

Attachment A

Mitigation Action Worksheets and Additional Tables

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 4 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
St. Lawrence County Highway Department - Main Facility	County Services	44 Park St, Canton, NY 13617	Village of Canton	No
St. Lawrence County Highway Outpost Facility (at Town Highway Dept.)	County Services	19 Madrid Ave, Potsdam, NY 13676	Town of Potsdam	No
St. Lawrence County Highway Outpost Facility (at Town Highway Dept.)	County Services	3529 County Rd 14, Madrid, NY 13660	Town of Madrid	No
St. Lawrence County Highway Outpost Facility (in construction)	County Services	3896 County Route 24, Russell, NY 13684	Town of Russell	No
St. Lawrence County Highway Outpost Facility (in construction)	County Services	522 County Route 28A, Lisbon, NY 13658	Town of Lisbon	No
St. Lawrence County Offices	County Services	48 Court St, Canton, NY 13617	Village of Canton	No
St. Lawrence County Public Safety Complex (includes NYS Police)	County Services	49 Court St, Canton, NY 13617	Village of Canton	No
A.A. Kingston Middle School	Educational Facilities	29 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
Banford Elementary School	Educational Facilities	99 State St, Canton, NY 13617	Village of Canton	No
BOCES Northwest Technical Education Center	Educational Facilities	1000 Park St, Ogdensburg, NY 13669	City of Ogdensburg	No
BOCES Seaway Technical Education Center	Educational Facilities	7227 NY-56, Norwood, NY 13668	Town of Potsdam	No
BOCES Southwest Technical Education Center	Educational Facilities	3606 NY-58, Gouverneur, NY 13642	Town of Fowler	No
Clarkson University	Educational Facilities	8 Clarkson Ave, Potsdam, NY 13699	Village of Potsdam	No
Clifton-Fine Central School	Educational Facilities	11 Hall Ave, Star Lake, NY 13690	Town of Fine	No
Colton-Pierrepont Central School	Educational Facilities	4921 State Hwy 56, Colton, NY 13625	Town of Colton	No
Edwards-Knox Central School	Educational Facilities	2512 County Route 24, Hermon, NY 13652	Town of Russell	No
Gouverneur Elementary School	Educational Facilities	111 Gleason St, Gouverneur, NY 13642	Village of Gouverneur	No
Gouverneur High School	Educational Facilities	133 E Barney St, Gouverneur, NY 13642	Village of Gouverneur	No
Gouverneur Middle School	Educational Facilities	25 Wilson St, Gouverneur, NY 13642	Village of Gouverneur	No
Grant C. Madill Elementary School	Educational Facilities	800 Jefferson Ave, Ogdensburg, NY 13669	City of Ogdensburg	No
Hammond Central School	Educational Facilities	51 S Main St, Hammond, NY 13646	Village of Hammond	No
Hermon-DeKalb Central School	Educational Facilities	709 E Dekalb Rd, Dekalb Junction, NY 13630	Town of De Kalb	No
Heuvelton Central School	Educational Facilities	87 Washington St, Heuvelton, NY 13654	Village of Heuvelton	No
Hugh C. Williams Senior High School	Educational Facilities	99 State St, Canton, NY 13617	Village of Canton	No
J. Manley McKenney Middle School	Educational Facilities	99 State St, Canton, NY 13617	Village of Canton	No
J.W. Leary Junior High School	Educational Facilities	1 School St, Massena, NY 13662	Village of Massena	No
Jefferson Elementary School	Educational Facilities	75 Bailey Rd, Massena, NY 13662	Village of Massena	No
John F. Kennedy Elementary School	Educational Facilities	801-809 Park St, Ogdensburg, NY 13669	City of Ogdensburg	No
Lawrence Avenue Elementary	Educational Facilities	29 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
Lisbon Central School	Educational Facilities	6866 County Rt 10, Lisbon, NY 13658	Town of Lisbon	No
Madison Elementary School	Educational Facilities	25 Owl Ave, Massena, NY 13662	Village of Massena	No
Madrid-Waddington Central School	Educational Facilities	2582 State Hwy 345, Madrid, NY 13660	Town of Madrid	No
Massena Senior High School	Educational Facilities	84 Nightengale Ave, Massena, NY 13662	Village of Massena	No
Morristown Central School	Educational Facilities	408 Gouverneur St, Morristown, NY 13664	Town of Morristown	No
Nightengale Elementary School	Educational Facilities	84 Nightengale Ave, Massena, NY 13662	Village of Massena	No
Norwood-Norfolk Central School	Educational Facilities	7852 State Hwy 56, Norwood, NY 13668	Town of Norfolk	No
Ogdensburg Free Academy	Educational Facilities	1100 State St, Ogdensburg, NY 13669	City of Ogdensburg	No
Parishville-Hopkinton Central School	Educational Facilities	12 County Rt 47, Parishville, NY 13672	Town of Parishville	No
Potsdam High School	Educational Facilities	29 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
St. James School	Educational Facilities	20 S Gordon St, Gouverneur, NY 13642	Village of Gouverneur	No
St. Lawrence Elementary	Educational Facilities	1039 State Hwy 11C, Brasher Falls, NY 13613	Town of Brasher	No

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 4 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
St. Lawrence High School	Educational Facilities	1039 State Hwy 11C, Brasher Falls, NY 13613	Town of Lawrence	No
St. Lawrence Middle School	Educational Facilities	1039 State Hwy 11C, Brasher Falls, NY 13613	Town of Lawrence	No
St. Lawrence University	Educational Facilities	23 Romoda Dr, Canton, NY 13617	Village of Canton	No
St. Lawrence-Lewis BOCES	Educational Facilities	40 W Main St, Canton, NY 13617	Village of Canton	No
St. Marguerite D'Youville Academy	Educational Facilities	315 Gates St, Ogdensburg, NY 13669	City of Ogdensburg	No
SUNY Canton	Educational Facilities	34 Cornell Dr, Canton, NY 13617	Village of Canton	No
SUNY ESF Ranger School	Educational Facilities	257 Ranger School Rd, Wanakena, NY 13695	Town of Fine	No
SUNY Potsdam	Educational Facilities	44 Pierrepont Ave, Potsdam, NY 13676	Village of Potsdam	No
Trinity Catholic School	Educational Facilities	188 Main St, Massena, NY 13662	Village of Massena	No
ALCOA Plant West	EMS/Fire Department	State Route 131, Massena, NY 13662	Town of Massena	No
Basher-Winthrop Volunteer Fire Department	EMS/Fire Department	708 NY-11C, Winthrop, NY 13697	Town of Brasher	No
Brier Hill Fire Department	EMS/Fire Department	2680 NY-37, Brier Hill, NY 13614	Town of Morristown	No
Canton Fire Department	EMS/Fire Department	77 Riverside Dr., Canton, NY 13617	Town of Canton	100YR and 500YR
Canton Rescue Squad	EMS/Fire Department	77 Riverside Dr., Canton, NY 13617	Town of Canton	100YR and 500YR
Colton Volunteer Fire Department	EMS/Fire Department	80 Riverside Dr, Colton, NY 13625	Town of Colton	No
County Fire Training Facility	EMS/Fire Department	45 Blanchard Rd., Potsdam, NY 13676	Town of Potsdam	No
Cranberry Lake Volunteer Fire Department	EMS/Fire Department	7115 NY-3, Cranberry Lake, NY 12927	Town of Clifton	No
De Kalb Junction Volunteer Fire Department	EMS/Fire Department	4323 US-11, De Kalb Junction, NY 13630	Town of De Kalb	No
DeGrasse Clare & South Russell Volunteer Fire Department	EMS/Fire Department	2211 CR 27, Russell, NY 13684	Town of Russell	No
Edwards Volunteer Fire Department and Rescue Squad	EMS/Fire Department	115 New St., Edwards, NY 13635	Town of Edwards	No
Fine Volunteer Fire Department	EMS/Fire Department	582 Spring St, Fine, NY 13639	Town of Fine	No
Gouverneur Fire Department	EMS/Fire Department	1035 US-11, Gouverneur, NY 13642	Town of Gouverneur	No
Gouverneur Volunteer Rescue Squad	EMS/Fire Department	1024 US-11, Gouverneur, NY 13642	Town of Gouverneur	No
Hammond Fire & Rescue	EMS/Fire Department	300 Lake St, Hammond, NY 13646	Town of Hammond	No
Hannawa Falls Volunteer Fire Department	EMS/Fire Department	Mill St, Hannawa Falls, NY 13647	Town of Pierrepont	No
Helena Volunteer Fire Department	EMS/Fire Department	1175 SH 37C, PO Box 82, Helena, NY 13649	Town of Brasher	No
Hermon Volunteer Fire Department	EMS/Fire Department	1650 Co Rd 21, Hermon, NY 13652	Town of Hermon	No
Heuvelton Volunteer Fire Department	EMS/Fire Department	95 State St., Heuvelton, NY 13654	Village of Heuvelton	No
Hopkinton-Fort Jackson Fire Department	EMS/Fire Department	2876 SH 11B, Hopkinton, NY 12940	Town of Hopkinton	No
Lawrenceville Volunteer Fire Department	EMS/Fire Department	1081 CR 54, Lawrenceville, NY 12949	Town of Lawrenceville	No
Lisbon Volunteer Fire Corporation	EMS/Fire Department	1330 Woodbine Rd, Woodbine, MD 21797	Town of Lisbon	No
Louisville Volunteer Fire Department	EMS/Fire Department	14818 NY-37, Massena, NY 13662	Town of Louisville	No
Madrid Fire Department	EMS/Fire Department	10 Church St, Madrid, NY 13660	Town of Madrid	No
Madrid Rescue Squad	EMS/Fire Department	Depot St, Madrid, NY 13660	Town of Madrid	No
Massena Rescue Squad	EMS/Fire Department	341 E Orvis St, Massena, NY 13662	Town of Massena	No
Massena Volunteer Fire Department	EMS/Fire Department	34 Andrews St, Massena, NY 13662	Town of Massena	100YR
Morley Volunteer Fire Company	EMS/Fire Department	7220 CR 27, Canton, NY 13617	Town of Canton	No
Morristown Fire & Rescue Company #1	EMS/Fire Department	200 Morris St, Morristown, NY 13664	Town of Morristown	No
Newton Falls Volunteer Fire Department	EMS/Fire Department	955 County Rt. 60, Newton Falls, NY 13666	Town of Clifton	No
Nicholville Volunteer Fire Company	EMS/Fire Department	3341 NY-11B, Nicholville, NY 12965	Town of Lawrence	No
Norfolk Volunteer Fire Department	EMS/Fire Department	1 Furnace St, Norfolk, NY 13667	Town of Norfolk	100YR and 500YR

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 4 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
Norfolk Volunteer Rescue Squad	EMS/Fire Department	7 Sedwick St, Norfolk, NY 13667	Town of Norfolk	No
Norwood Volunteer Fire Department	EMS/Fire Department	Bernard Ave, Norwood, NY 13668	Village of Norwood	No
Ogdensburg Fire Department	EMS/Fire Department	718 Ford St., Ogdensburg, NY 13669	City of Ogdensburg	No
Ogdensburg Volunteer Rescue Squad	EMS/Fire Department	1223 Pickering St, Ogdensburg, NY 13669	City of Ogdensburg	No
Parishville Volunteer Fire Company	EMS/Fire Department	25 Rutman Rd, Parishville, NY 13672	Town of Parishville	No
Piercefield Volunteer Fire Company	EMS/Fire Department	34 Waller St, Piercefield, NY 12973	Town of Piercefield	No
Pierrepoint Volunteer Fire	EMS/Fire Department	62 Old County Rd., Canton, NY 13617	Town of Canton	No
Potsdam Fire Department	EMS/Fire Department	42 Main St, Potsdam, NY 13676	Town of Potsdam	No
Potsdam Volunteer Rescue Squad	EMS/Fire Department	29 Elm St, Potsdam, NY 13676	Town of Potsdam	No
Pyrites Volunteer Fire Department	EMS/Fire Department	Churchill St, Pyrites, NY 13677	Town of Canton	100YR
Rensselaer Falls Volunteer Fire & Rescue	EMS/Fire Department	424 Rensselaer St, Rensselaer Falls, NY 13680	Village of Rensselaer Falls	No
Russell Volunteer Fire Department	EMS/Fire Department	5 Pestle Street Rd, Russell, NY 13684	Town of Russell	No
Seaway Valley Ambulance Service	EMS/Fire Department	202 N Main St, Massena, NY 13662	Town of Massena	No
Star Lake Volunteer Fire Department	EMS/Fire Department	4078 NY-3, Star Lake, NY 13690	Town of Fine	No
Tri-Town Volunteer Rescue Squad	EMS/Fire Department	900 NY-11C, Brasher Falls, NY 13613	Town of Brasher	No
Waddington Rescue Squad	EMS/Fire Department	48 Maple St, Waddington, NY 13694	Town of Waddington	No
Waddington Volunteer Fire Department	EMS/Fire Department	51 Maple St, Waddington, NY 13694	Town of Waddington	No
West Potsdam Volunteer Fire Company	EMS/Fire Department	801 CR 34, Potsdam, NY 13676	Town of Potsdam	No
West Stockholm Volunteer Fire Department	EMS/Fire Department	143 Co Rd 57, West Stockholm, NY 13696	Town of Stockholm	No
U.S. Customs - Ogdensburg Port of Entry	Federal	104 Bridge Approach Rd, Ogdensburg, NY 13669	City of Ogdensburg	No
Canton-Potsdam Hospital	Hospital	50 Leroy St, Potsdam, NY 13676	Village of Potsdam	No
Claxton-Hepburn Medical Center	Hospital	214 King St, Ogdensburg, NY 13669	City of Ogdensburg	No
Clifton-Fine Hospital	Hospital	1014 Oswegatchie Trail Rd, Star Lake, NY 13690	Town of Fine	No
Gouverneur Hospital	Hospital	77 W Barney St, Gouverneur, NY 13642	Village of Gouverneur	No
Massena Memorial Hospital	Hospital	1 Hospital Dr, Massena, NY 13662	Village of Massena	No
St. Lawrence Psychiatric Center	Hospital	1 Chimney Point Dr, Ogdensburg, NY 13669	City of Ogdensburg	No
Brasher Radio Tower (on Water Tower)	Radio Communications	-	Town of Brasher	-
Cranberry Lake Radio Tower (on Cell Tower)	Radio Communications	-	Town of Clifton	-
Hammond Radio Tower (on school)	Radio Communications	-	Town of Hammond	-
Kimball Hill Radio Tower (SLC ES Owned)	Radio Communications	-	Town of Canton	-
Massena Radio Tower (On Laurel Terrace Apts.)	Radio Communications	-	Village of Massena	-
Newton Falls Radio Tower (Water Tower)	Radio Communications	-	Town of Clifton	-
South Colton Radio Tower (WNPI Owned)	Radio Communications	-	Town of Colton	-
Star Lake Radio Tower (at Fire Dept building)	Radio Communications	-	Town of Fine	-
White Hill Radio Tower (BOCES owned)	Radio Communications	-	Town of Hopkinton	-
NYS DOCCS Riverview Correctional Facility	State Facility	1110 Tibbits Dr., Ogdensburg, NY 13669	City of Ogdensburg	No
NYSDEC Potsdam Office	State Facility	190 Outer Main Street, Suite 103, Potsdam, NY 13676	Village of Potsdam	No
Great Lakes St. Lawrence Seaway Development Corp.	Federal	180 Andrews St # 1, Massena, NY 13662	Village of Massena	No
Liberty Utilities	Utilities – Oil/Gas	33 Stearns St Suite 1, Massena, NY 13662	Village of Massena	No
Massena Electric Department	Utilities – Power	71 E Hatfield St, Massena, NY 13662	Village of Massena	No
National Grid	Utilities – Power	Multiple locations throughout County	Countywide	-

St. Lawrence County Hazard Mitigation Plan Update
Critical Facilities

Table 4 - St. Lawrence County Critical Facilities				
Facility Name	Facility Type	Address	Municipality	Located in Floodplain*
Casella Transfer Station	Utilities – Solid Waste	472 West Parishville Road, Potsdam, NY 13676	Town of Potsdam	No
Closed Landfill	Utilities – Solid Waste	1201 Champlain St, Ogdensburg, NY 13669	City of Ogdensburg	No
Closed Landfill	Utilities – Solid Waste	2395 County Rt 21, Hermon, NY 13652	Village of Canton	No
Closed Landfill	Utilities – Solid Waste	49 Dump Road, Massena, NY 13662	Town of Massena	No
Gouverneur Transfer Station	Utilities – Solid Waste	1831 US Highway 11, Gouverneur, NY 13642	Town of Gouverneur	No
Massena Transfer Station	Utilities – Solid Waste	49 Dump Road, Massena, NY 13662	Town of Massena	No
Ogdensburg Transfer Station	Utilities – Solid Waste	522 County Route 28A, Ogdensburg, NY 13669	City of Ogdensburg	No
Star Lake Transfer Station	Utilities – Solid Waste	4582 State Highway 3, Star Lake, NY 13690	Town of Fine	No

*Based on HAZUS-modeled 100-year and 500-year floodplains

Table 5 - St. Lawrence County 2015 Mitigation Actions

Action ID	Mitigation Action	Hazard(s) Mitigated	2015 HMP Goals Met	Lead Agency	Support Agencies	Estimated Cost Level	Potential Funding Sources	Implementation Timeframe	Targeted Development (new or existing)	Status
STL 1	Create digital Flood Insurance Maps (FIRMs) which would be accessible to anyone, via internet portal through FEMA website. Currently St. Lawrence County is one the few New York State Counties which does not have digital FIRM data.	Flood	1,2	FEMA	St. Lawrence County Planning Department	Low	FEMA	Long	New	Ongoing - FEMA is currently working to develop digital floodplain mapping for all of St. Lawrence County. The development of new FIRMs is not an action that the County can directly undertake, but the County included a related action to disseminate the data once FEMA's project is complete.
STL 2	Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Severe storms, ice storms	1,2,3	Individual municipalities	New York State Department of Transportation, County Highway Dept	Low	FEMA (HMGP and PDM funds)	Short	Existing	Not completed - the County Dept. of Highways responds to downed trees as needed, but no formal plan in place. There are challenges with staff levels. The County Dept. of Highways has response plan that identifies 3 zones, and damages are surveyed in each zone, which works well. No longer a priority mitigation action because this is a routine responsibility of the highway department.
STL 3	Install larger fuel tanks at the County Highway facility in the Town of Canton, additional fuel will be helpful during cleanup and repairs after severe storms and ice storms.	Severe storms, ice storms	1	St. Lawrence County Department of Highways	New York State Department of Transportation	Medium	FEMA (HMGP and PDM funds)	Moderate	New	Not completed, but still a priority. Re-included in HMP update as a preparedness action.
STL 4	Identification and prioritizing of deficient and vulnerable bridges within the County. Replacement or reinforcement of high priority structures may be required.	Flood	1,2,3	St. Lawrence County Department of Highways	New York State Department of Transportation	High	FEMA (HMGP and PDM funds), other funds (TBD)	Short	New	Ongoing – the County Dept. of Highways has completed a number of bridge rehabilitation projects and has a list of bridges that are inspected after flooding events. The County Route 24 bridge over the Grass River in the Town of Russell was replaced in 2018. There are still bridges that would benefit from rehabilitation or replacement to reduce damage risks from flooding or ice jams, so this action was re-included in the HMP update for specific structures.
STL 5	Creating a secondary location with fuel storage, equipment, maintenance, highway administration, and alternate 911 dispatch center will improve response time and quality during a hazard event.	Severe Storms, Flood, Ice Storms	1	St. Lawrence County Department of Highways	Local municipalities	High	FEMA (HMGP and PDM funds), other funds (TBD)	Moderate	New	Completed - a new highway facility is being constructed at 522 County Rt 28A in Lisbon (construction commenced in July 2021); a backup 911 location was established in Massena which includes a new generator and just came online in the spring of 2020. Both projects were completely funded by the County.
STL 6	Install a full backup power system for the County's Human Services Center, will ensure that the County can still meet the demands of its residents during extended power outages.	Ice storms	1	St. Lawrence County Department of Government Services/ Buildings and Grounds	None specified	Medium	FEMA (HMGP and PDM funds), other funds (TBD)	Moderate	Existing	Partially completed - the County installed a generator at the Human Resources Center a few years ago, which can power coolers and fridges but cannot power the entire building. A new action to add additional backup power for this facility is included in the HMP update.
STL 7	Installation of full back-up power systems at schools, institutions, and other public infrastructure will create a larger network of shelter areas for the County residents.	Severe storms (winter/summer)	1	St. Lawrence County Department of Highways	None specified	Medium	FEMA (HMGP and PDM funds), other funds (TBD)	Moderate	Existing	Ongoing - the County works with the Red Cross for sheltering needs. There is already a large network of shelter locations, and the County has MOUs in place with various facilities. Schools are commonly used for emergency shelters with fire departments as backup locations. Most schools do not have backup power, with the exception of BOCES. This action was re-included for the plan update.

Table 5 - St. Lawrence County 2015 Mitigation Actions

Action ID	Mitigation Action	Hazard(s) Mitigated	2015 HMP Goals Met	Lead Agency	Support Agencies	Estimated Cost Level	Potential Funding Sources	Implementation Timeframe	Targeted Development (new or existing)	Status
STL 8	Continued public awareness and education campaigns by the St. Lawrence County Environmental Management Council (EMC).	Infestation	2	St. Lawrence County Environmental Management Council	St. Lawrence County Planning Department	Low	Local and state funds	Short	New, Existing	Ongoing- the County Environmental Management Council continues to work on public outreach campaigns to educate County residents about environmental issues. This action was modified and re-included in the HMP update to target outreach related to emerald ash borer and Eurasian watermilfoil.

Table 6 - St. Lawrence County Mitigation Actions

Action ID	Action Title	Hazard(s) Addressed	Assumed Implementing Agencies (Lead* & Support)	Planning Mechanism(s)	Timeframe for Implementation	New or Existing Development	Estimated Cost	Potential Funding Source(s)	Priority	HMP Goal(s) Met
SLC 1	Complete a stormwater capacity analysis for the area between Court Street and Judson Street in the Village of Canton extending west to the Grass River.	Flood	St. Lawrence County Highway Dept*, St. Lawrence County Governmental Services/Buildings & Grounds, Village of Canton DPW	St. Lawrence County Facility Management Plan, Village of Canton Comprehensive Plan	5 years	Existing	\$50K	NYSEFC- CWSRF; FEMA- BRIC	High	4.g., 4.h.
SLC 2 (Re-included from 2015)	Work with school districts to install backup power at schools throughout the County, or purchase generators on trailers for use at multiple facilities.	All	St. Lawrence County Emergency Management*, local School Districts	St. Lawrence-Lewis BOCES District-Wide Safety Plan and local capital project plans	5 years	Existing	\$100K-500K per school	School District budgets, FEMA-BRIC, DASNY- SAM	High	4.d., 4.e.
SLC 3	Continue coordination with FEMA for digital FIRM project and disseminate new FIRM data once available.	Flood	St. Lawrence County Planning Dept. *, FEMA	Local Comprehensive Plans	5-10 years (dependent on FEMA Study)	Existing and New	Low	County Budget	Medium	1.b.
SLC 4 (Re-included from 2015)	Identify bridges with scour issues throughout the County to prioritize structure replacement or rehabilitation.	Flood, Ice Jam	St. Lawrence County Highway Dept.*	None	5 years	Existing	\$1,000	County Budget	Medium	4.g, 4.i.
SLC 5	Purchase trailers that can be stored on County property to store shelter supplies (preparedness)	All	St. Lawrence County Emergency Management*, Red Cross	St. Lawrence County Comprehensive Emergency Management Plan	2 years	Existing	\$30K	County Budget	Medium	3.b.
SLC 6 (Re-included from 2015)	Install larger fuel tanks at the County Highway facility in the Town of Canton (preparedness)	Severe Thunderstorm/ Wind/Tornado, Ice Storm	St. Lawrence County Highway Dept. *, Village of Canton DPW	St. Lawrence County Highway Dept. annual project list	2 years	Existing	Canton Facility - \$250-500K; New Facilities- \$100-200K each	County Budget, FEMA- BRIC	Medium	4.e.
SLC 7 (Re-included from 2015)	Expand the backup power system at the County Human Services Center.	All	St. Lawrence County Department of Government Services/ Buildings and Grounds	St. Lawrence County Facility Management Plan	5 years	Existing	\$300K (diesel) to \$500K (natural gas)	County Budget, FEMA- BRIC, DASNY- SAM	Medium	4.d., 4.e.
SLC 8	Replace County Route 49 bridge over the St. Regis River with a single-span structure.	Flood, Ice Jam	St. Lawrence County Highway Dept.*	2019 Bridge Selection (Prioritization) Criteria	5 years	Existing	\$5-6 million	NYSDOT- Bridge NY, FEMA- PDM	Medium	4.i.
SLC 9	Complete and document outreach to CSX regarding stormwater outfall maintenance in railroad right-of-way in the Village of Canton (preparedness)	Flood	St. Lawrence County Highway Dept*, CSX	None	1 year	Existing	Low	County Budget	Low	4.g., 4.h.

Table 7. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
SLC 1	+	+	0	+	0	0	0	+	+	0	Low	Medium	1
SLC 2	+	+	+	+	0	-	0	0	+	0	Medium	High	2
SLC 3	+	+	+	+	+	+	0	+	+	+	Low	Low	3
SLC 4	+	+	+	+	+	0	0	+	+	+	High	Low	4
SLC 5	+	+	+	+	+	0	0	+	+	+	Medium	Medium	5
SLC 6	+	+	+	+	+	-	0	0	+	0	Low	High	6
SLC 7	+	+	+	+	+	-	0	0	+	0	Medium	High	7
SLC 8	+	0	0	+	+	-	+	0	+	-	Medium	High	8
SLC 9	+	+	0	+	0	+	0	+	+	+	Low	Low	9

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Continue coordination with FEMA for digital FIRM project and disseminate new FIRM data once available.
Project ID:	SLC 3

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	St. Lawrence County lacks digital floodplain data, and some jurisdictions in the County do not have FIRMs. FEMA is currently undertaking a project to develop digital floodplain data for the County. Municipalities would benefit from easy access and guidance to use and apply the new floodplain data.

Action of Project Intended for Implementation

Description of the Solution:	A link to FEMA's digital floodplain data can be added to the County website so it is easily accessible for municipalities. The data can also be added to DANC's online mapper. The County can also develop a short guidance document (or share guidance that is already available from FEMA) in this location to help jurisdictions implement floodplain regulations.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Jurisdictions would have easy access to new floodplain data and guidance to help them apply the new data to local planning and development decisions.
Useful Life:	Long-term		
Estimated Cost:	Low		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5-10 years (dependent on FEMA study)
Estimated Time Required for Implementation:	2 months (once data are available)	Potential Funding Sources:	County Budget
Responsible Organization:	St. Lawrence County Planning Department, DANC	Local Planning Mechanisms to be used in Implementation, if any:	Local Comprehensive Plans

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Municipalities/residents dependent on FEMA website for information
	Provide link to FEMA data and add to DANC mapper	Low	Assists municipalities/residents in finding data
	Provide link to FEMA data, add to DANC mapper, and develop guidance document	Low	Assists municipalities/residents in finding data and implementing regulations at a local level

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Install larger fuel tanks at the County Highway facility in the Town of Canton (preparedness).
Project ID:	SLC 6

Risk/Vulnerability

Hazard of Concern:	Severe Thunderstorm/ Wind/Tornado, Ice Storm
Description of the Problem:	The County Highway facility in Canton is used to fuel all County equipment as well as the County bus system and the Village of Canton's Dept. of Public Works, Village Fire Department. Currently, the facility's fuel storage capacity only lasts a few days. This could present a problem if fuel deliveries are interrupted during a storm event, which could limit the County's (and Village of Canton's) ability to respond to problems during a hazard event.

Action of Project Intended for Implementation

Description of the Solution:	Install a larger fuel tank to increase reserves at the County Highway facility in Canton, and increase fuel storage capacity at the three County highway outpost facilities (two currently under construction, the third to be built in 2022). Additional fuel access would be beneficial during cleanup and repairs after severe storms and ice storms, supporting continuity of operations. Adding fuel storage capacity at the outpost locations would provide backup fueling locations and subsequently reduce pressure on the Canton facility. This action is considered preparedness, but was included in the HMP update because it is a priority project for the County.
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Is this project related to a Critical Facility? Yes X No _____

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Additional fuel storage capacity at multiple County highway facilities would allow the County Highway Dept., Village DPW, and bus system to continue operations during a hazard event, ensuring continuity of operations.
Useful Life:	Long-term		
Estimated Cost:	Canton facility- \$250-500K New facilities - \$100-200K each		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	FEMA- BRIC
Responsible Organization:	St. Lawrence County Highway Dept. *, Village of Canton DPW	Local Planning Mechanisms to be used in Implementation, if any:	St. Lawrence County Highway Dept. annual project list

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Increase fuel storage capacity at Canton highway facility	High	Provides adequate fuel for the various entities that use this location.
	Increase fuel storage capacity at the Canton facility and outpost facilities	High	Provides adequate fuel reserve and adds backup fueling stations to reduce pressure off of Canton location.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Identify bridges with scour issues throughout the County to prioritize structure replacement or rehabilitation.
Project ID:	SLC 4

Risk/Vulnerability

Hazard of Concern:	Flood, Ice Jam
Description of the Problem:	The County has multiple bridges that present concerns regarding scour, overtopping, and flooding issues. Many structures are closed during floods and are inspected prior to opening. However, the County does not currently have a prioritized list of specific structures in need of improvements. The County Highway Dept. does have standard protocol in place to use for prioritizing bridge replacement.

Action of Project Intended for Implementation

Description of the Solution:	Inspect and create a list of bridges throughout the County that have scour issues and need to be rehabilitated or replaced.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Increased accessibility (fewer road closures/disruptions), improved stability and lifespan of transportation infrastructure
Useful Life:	Long-term		
Estimated Cost:	\$1,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	County Budget
Responsible Organization:	St. Lawrence County Highway Dept.*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No improvements to at-risk infrastructure
	Replace bridges as scour issues lead to damages during flood/ice jam events.	\$1 million per structure	Reactive approach; priority of structures for replacement not specifically addressed
	Create priority list for bridge replacement	\$1,000	Proactive approach, offers most protection

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Expand the backup power system at the County Human Services Center.
Project ID:	SLC 7

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The County installed a generator at the Human Services Center a few years ago, but this system is limited and only powers fridges and coolers. The Human Services Center provides critical human services including but not limited to mental health services and addiction counseling. An expanded backup power supply that powers the entire building would allow it to remain open to the public during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Install additional backup power supply at the Human Services Center to keep facility open to the public during hazard events. The County is looking to purchase a 100kW, 277/480V, three phase, SG Industrial Natural Gas generator with Heavy Duty Maximum Performance Package.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations and public services during hazard events as well as reduced risk of structural damage.
Useful Life:	Long-term		
Estimated Cost:	\$300K (diesel) to \$500K (natural gas)		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	FEMA- BRIC
Responsible Organization:	County Dept. of Government Services/Buildings and Grounds	Local Planning Mechanisms to be used in Implementation, if any:	St. Lawrence County Facility Management Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions.
	Purchase a portable generator to power equipment as needed.	\$100,000	May be used to supplement inadequate backup power in locations that have some existing backup power. May not be enough to power entire facilities if no existing backup power sources exist.
	Expand on-demand backup power at Human Services Center.	\$300K-\$500K	Ensures comprehensive operation of Human Services Center.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Work with school districts to install backup power at schools throughout the County, or purchase generators on trailers for use at multiple facilities.
Project ID:	SLC 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	Many schools are designated emergency shelter locations and most do not have full backup power. Although generators can be supplied by NYS during an emergency, it would be more beneficial to have backup power systems available at shelter locations. This would prevent disruptions in shelter operations due to power outages. Full, on-demand backup power systems could be installed at schools, or the County could purchase multiple 250kW generators on trailers for mobile use.

Action of Project Intended for Implementation

Description of the Solution:	Install full backup power systems at each school or purchase generators on trailers for use at multiple facilities.
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Is this project related to a Critical Facility? Yes **X** No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of shelter operations. Reduced risk of inoperable buildings if a power outage occurs.
Useful Life:	Long-term		
Estimated Cost:	\$100,000 to \$500,000 per school		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	FEMA- BRIC, School District budgets
Responsible Organization:	St. Lawrence County Emergency Management*, local School Districts	Local Planning Mechanisms to be used in Implementation, if any:	St. Lawrence-Lewis BOCES District-Wide Safety Plan and local capital project plans

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	Most schools still lack backup power sources.
	Purchase generators on trailers for mobile use that can be shared among school districts for use as needed.	\$100,000 per generator	Mobile units offer more flexibility since they can be shared among multiple facilities. May not power entire facility.
	Install full backup power systems at schools throughout the County.	\$500,000 per school	On-demand systems at each location would offer the most protection, but also most expensive option.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Purchase trailers that can be stored on County property to store shelter supplies.
Project ID:	SLC 5

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	Currently, shelter bedding and supplies are stored by the Red Cross at various private storage facilities throughout the County. If supplies could be stored on County-owned property, they would be more readily accessible when needed during an emergency.

Action of Project Intended for Implementation

Description of the Solution:	Purchase trailers to store supplies on County properties so that shelter supplies are more readily accessible when needed.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Easier access to shelter supplies would help the County respond more quickly when shelters need to be opened.
Useful Life:	Long-term		
Estimated Cost:	\$30,000		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	2 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	County budget
Responsible Organization:	St. Lawrence County Emergency Management*, Red Cross	Local Planning Mechanisms to be used in Implementation, if any:	St. Lawrence County Comprehensive Emergency Management Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change in current conditions
	Store shelter supplies in existing County facilities	None	Not feasible; limited storage space at existing facilities.
	Purchase trailers to store shelter supplies	\$30,000	Best option; County would have more immediate access to shelter supplies

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Complete a stormwater capacity analysis for the area between Court Street and Judson Street in the Village of Canton extending west to the Grass River.
Project ID:	SLC 1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	Multiple County office buildings and nearby residences on Court Street and Judson Street experience recurring flooding issues during heavy rain events due to inadequate, undersized stormwater conveyance infrastructure.

Action of Project Intended for Implementation

Description of the Solution:	A study is needed in order to pinpoint all problem areas and determine potential alternatives for a stormwater improvements project to reduce flooding issues.
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Is this project related to a Critical Facility? Yes **X** No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	An engineering study would provide a comprehensive assessment of the stormwater infrastructure and outline potential alternatives to improve the system and address flooding issues.
Useful Life:	Short-term		
Estimated Cost:	\$50,000		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	NYSEFC- CWSRF; FEMA- BRIC
Responsible Organization:	St. Lawrence County Highway Dept*, St. Lawrence County Governmental Services/Buildings & Grounds, Village of Canton DPW	Local Planning Mechanisms to be used in Implementation, if any:	St. Lawrence County Facility Management Plan, Village of Canton Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from current conditions, flooding problems would persist.
	Install larger stormwater pipes on Court Street and Judson Street	\$200,000	May not address all issues within area of concern.
	Complete capacity analysis	\$50,000	Comprehensive assessment of stormwater infrastructure within entire area of concern to maximize benefits of an improvements project.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Complete and document outreach to CSX regarding stormwater outfall maintenance in railroad right-of-way in the Village of Canton (preparedness).
Project ID:	SLC 9

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The existing stormwater outfall at the Grass River is located within the CSX right-of-way. CSX is responsible for maintaining the outfall, but maintenance is not done as often as it should be, and this leads to reduced stormwater conveyance capacity and flooding issues. The County Highway Dept. has offered to assist with maintenance in the past but coordination with CSX is required, and communication can be a challenge.

Action of Project Intended for Implementation

Description of the Solution:	County Highway Dept. to complete and document regular outreach to CSX to stress the need for outfall maintenance. This action is considered preparedness, but was included in the HMP because it is a priority for the County.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Improved communication with CSX may increase their awareness of outfall maintenance needs. Documentation of such outreach would be beneficial to have if the County elects to relocate the outfall outside of CSX right-of-way, if needed.
Useful Life:	Short-term		
Estimated Cost:	Low		

Plan for Implementation

Prioritization:	Low	Desired Timeframe for Implementation:	1 year
Estimated Time Required for Implementation:	1 year	Potential Funding Sources:	County budget
Responsible Organization:	St. Lawrence County Highway Dept*, CSX	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change in existing conditions
	Move outfall outside of railroad right of way	\$10,000	May be required eventually but first step is trying to improve conditions for existing location
	Document communication with railroad to try to improve maintenance	Low	First step in improving conditions

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	St. Lawrence County
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Mitigation Action Worksheet

Project Name:	Replace County Route 49 bridge over the St. Regis River with a single-span structure.
Project ID:	SLC 8

Risk/Vulnerability

Hazard of Concern:	Flood, Ice Jam
Description of the Problem:	The County Route 49 bridge over the St. Regis River is in poor condition. The bridge also carries a medium pressure gas main operated by Liberty Utilities, which could be damaged during a flood or ice jam event.

Action of Project Intended for Implementation

Description of the Solution:	Replacing the existing bridge with a single-span structure would increase the hydraulic capacity of the River channel and reduce damages from flooding or ice jams.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood and ice jam related damages to County transportation infrastructure and utility lines.
Useful Life:	Long-term		
Estimated Cost:	\$5-6 million		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	2 years	Potential Funding Sources:	NYSDOT- Bridge NY, FEMA- BRIC
Responsible Organization:	St. Lawrence County Highway Dept.*	Local Planning Mechanisms to be used in Implementation, if any:	2019 Bridge Selection (Prioritization) Criteria

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change in existing conditions, bridge still poses safety issues during flood and ice jam events.
	Rehabilitate existing bridge	\$3 million	Bridge is in poor condition, replacement is the best option.
	Replace existing bridge	\$5-6 million	Most comprehensive and long-term solution.

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Jurisdictional Annex

Town of Stockholm

1. Contacts

The contacts for the Town of Stockholm regarding this plan are identified as follows:

- Clark Decker – Town Supervisor
Address: 540 State Highway 11C, Winthrop, NY 13697
Phone: 315-389-5171
Email: TownOfStockholm@gmail.com
- Robin McClellan – Economic Development Chair
Address: 540 State Highway 11C, Winthrop, NY 13697
Phone: 315-389-5171
Email: robin.mcclellan@gmail.com

Town Website: <https://www.townofstockholm-ny.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 3,816 people live in the Town of Stockholm. The Town’s population has increased by 4.1% since the 2010 Census (3,665) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Stockholm is located in the northeastern portion of St. Lawrence County and is bordered by the Towns of Norfolk and Brasher to the north, the Town of Lawrence to the east, the Towns of Hopkinton and Parishville to the south, and the Town of Potsdam to the west. Stockholm is easily accessed from US Route 11, County Route 47, County Route 49, State Highway 420, 11A, 11B, 11C.

2.3 Governing Body

The Town of Stockholm is governed by a five-member Town Council, including the Supervisor and four council members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), the Town constructed a new town office. Private development projects including a solar array and a residential development (Mighty Pines) are currently in the planning stages. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Stockholm	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other Special Plans	No	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Stockholm	Notes
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA actively working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	Established for HMP update
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Work with DANC
Technical Abilities		
Warning systems/services	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Stockholm	Notes
Hazard data and information	Yes	Documented for HMP update
Grant writing	No	
HAZUS analysis	Yes	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	USDA Rural Development
State funding programs	Yes	
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Website for Town and West Stockholm Fire Department
Natural disaster or safety related school programs	Yes	Fire Departments work with schools for fire prevention
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include U.S. Route 11, County Route 47, County Route 49, State Highways 420, 11A, 11B, and 11C. The Town's emergency shelter locations are summarized in Table 2, below. In addition to the Town's pet sheltering capabilities, the St. Lawrence County Animal Response

Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
West Stockholm Fire Department	143 Co Rd 57, West Stockholm, NY 13696	West Stockholm Fire Dept	Yes	Yes	May be able to accommodate pets but no formal plan in place	Backup power available
Brasher-Winthrop Volunteer Fire Department	708 NY-11C, Winthrop, NY 13697	Brasher-Winthrop Volunteer Fire Dept	Yes	Yes	May be able to accommodate pets but no formal plan in place	Backup power available
Town Office	540 NY-11C, Winthrop, NY 13697	Town of Stockholm	Yes	Yes	May be able to accommodate pets but no formal plan in place	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Stockholm based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately owned properties.

- **Potential Temporary Housing Locations**
 - Community Center (Tri-Town Arena) in Brasher - 746 State Hwy 11C, Brasher Falls, NY 13613
 - Municipal lot in Winthrop
 - Fireman’s field - 143 Co Rd 57, West Stockholm, NY 13696
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	4
Ice Jam	2	2	2	2	Moderate	5
Flood	2	2	2	2	Moderate	6
Drought	3	1	2	2	Moderate	7
Extreme Temperatures	3	1	2	2	Moderate	8
Wildfire	2	3	1	1	Moderate	9
Earthquake	2	3	1	1	Moderate	10
Infestation	2	1	2	1	Moderate	11
Landslide	1	3	1	1	Moderate	12

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Stockholm. Table 5, below, denotes the types and locations of critical facilities within the Town.

Table 5. Critical Facilities			
Type	Facility Name	Address	Located in Floodplain*
Community Services	Community Center (Tri-Town Arena) - owned by and located in Town of Brasher	746 State Hwy 11C, Brasher Falls, NY 13613	No
EMS/Fire Department	West Stockholm Volunteer Fire Department	143 Co Rd 57, West Stockholm, NY 13696	No
Municipal Services	Highway Department	9561 U.S. Hwy 11, Winthrop, NY 13697	No
Municipal Services	Town Hall	540 State Hwy 11C, Winthrop, NY 13697	No
<i>*Based on HAZUS-modeled 100-year and 500-year floodplains</i>			

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Town of Stockholm.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Stockholm. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Regis River, and its tributaries are likely to experience increased flooding occurrences.

Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, County Route 47, County Route 49, State Highways 420, 11A, 11B, and 11C) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Winthrop, North Stockholm, West Stockholm, Sandfordville, and Brookdale. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Five of these events occurred in the Town of Stockholm (frequency of about once every two years). One of these records was a hail event, and the rest were thunderstorm winds. Estimated damages for the Town of Stockholm ranged from zero to \$25,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Hail	7/17/2012	0.75"	\$0	-
Thunderstorm Wind	7/8/2014	55 knots	\$25,000	-
Thunderstorm Wind	8/18/2015	50 knots	\$10,000	-
Thunderstorm Wind	7/11/2019	50 knots	\$10,000	-
Thunderstorm Wind	7/20/2021	50 knots	\$2,000	-
Total			\$47,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Town of Stockholm in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Stockholm is susceptible to damages from an ice storm event. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, County Route 47, County Route 49, State Highways 420, 11A, 11B, and 11C) would be most impactful to Town residents. Storm

damages would primarily impact the more populated portions of the Town, including the hamlets of Winthrop, North Stockholm, West Stockholm, Sandfordville, and Brookdale. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Town of Stockholm lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Stockholm.

5.2.4 *Future Potential Impacts*

The Town of Stockholm will continue to experience ice storm events in the future. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Stockholm is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, County Route 47, County Route 49, State Highways 420, 11A, 11B, and 11C) would be most impactful to Town

residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Winthrop, North Stockholm, West Stockholm, Sandfordville, and Brookdale. The Town also has a large Amish population, and communication with these residents can be challenging during emergencies, as they rely on verbal or printed communications.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Stockholm has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Stockholm.

5.3.4 *Future Potential Impacts*

The Town of Stockholm will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Coastal Storm (Nor'easter)**

5.4.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (U.S. Route 11, County Route 47, County Route 49, State Highways 420, 11A, 11B, and 11C) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the hamlets of Winthrop, North Stockholm, West Stockholm, Sandfordville, and Brookdale.

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC reports no significant recorded damages for coastal storms that have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Stockholm were reported for this event.

5.4.4 *Future Potential Impacts*

The Town of Stockholm is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.5 **Ice Jam**

5.5.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the St. Regis River are most vulnerable to ice jams.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Stockholm was affected by one ice jam recorded by the reported by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which are described in the County's 2015 HMP. The USACE CRREL has not reported any ice jams in Stockholm since 1996, however, local records indicate that the Town has experienced ice jams about every other year. No damage estimates related to ice jams are available for the Town.

5.5.4 Future Potential Impacts

Properties along the St. Regis River remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.6 Flood

5.6.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Town is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the St. Regis River and its tributaries, which drains to the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Stockholm, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA’s HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Town of Stockholm that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Stockholm Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
60,295 acres	3.0%	0.27%

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC reported one flood record for the Town of Stockholm since 2010. This event occurred on 8/2/2010 and involved flooding along the St. Regis River after heavy rains throughout the day. The total damage estimate for the Town resulting from this event was \$40,000. As described in Section 6.0 of this annex, six NFIP loss claims have been paid as of October 2021 in the Town of Stockholm totaling \$40,334.53. There are no repetitive loss properties in the Town.

5.6.4 *Future Potential Impacts*

Properties along the St. Regis River and its tributaries are vulnerable to flooding. About 3.0% of the Town of Stockholm is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.7 **Drought**

5.7.1 *Description*

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system. Residents rely on private wells, which may be susceptible to low water yields during a drought.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDRC reports no specific drought events for the Town of Stockholm. The Properties throughout the Town rely on private wells. Residents that have low water yields and agricultural lands would be most susceptible to a drought event. Local records indicated that during a recent drought in the summer of 2020, only about two-thirds of the typical corn crop was produced, causing a significant economic impact. Recent droughts reported by local records have

also affected maple syrup production and private wells have had reduced yields.

5.7.4 *Future Potential Impacts*

The entire Town of Stockholm remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.8 **Extreme Temperatures**

5.8.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.8.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperatures, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. The entire Town of Stockholm is susceptible to extreme temperatures. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 9.4% of the population in the Town is under 5 years old, and 14.1% of the population is over 65 years old. Approximately 9.9% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.8.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Stockholm lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Stockholm.

5.8.4 *Future Potential Impacts*

The Town of Stockholm will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.9 **Wildfire**

5.9.1 *Description*

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.9.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.9.3 *Historical Hazard Occurrences and Damage Estimates*

According to Figure 5.11 (Appendix A of the main body of the plan), most of the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. The northwestern corner of the Town is mapped with a higher wildfire density during this time period (1.4 to 3.4 fires per square mile). A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 *Future Potential Impacts*

The entire Town of Stockholm remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Earthquake

5.10.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.10.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021; none of which were located in the Town of Stockholm. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.10.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.11 Infestation

5.11.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in

the Town of Stockholm is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Stockholm (Figure 5.13, Appendix A of the main body of the plan). The Town is working with the St. Lawrence County SWCD to proactively manage ash trees and dead elm trees along Town roadways. There are a lot of ash trees along McIntyre Road, and overall about 25 hazard trees (ash and other species) per mile along Town roadways.

5.11.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has not yet been detected in the Town of Stockholm, however, it has been detected in the Towns of Norfolk and Brasher which are adjacent to Stockholm. The emerald ash borer is able to spread two miles per year on average, and is likely to reach the Town of Stockholm in the future. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.11.4 Future Potential Impacts

The entire Town of Stockholm remains susceptible to an infestation event. The emerald ash borer is likely to migrate to the Town in the future, and proactive ash tree management will be critical to reduce potential impacts of this species.

5.12 Landslide

5.12.1 Description

For a description of this hazard, please see Section 5.11 of the main body of the plan.

5.12.2 Hazard Vulnerability

The Town is moderately vulnerable to a landslide, as documented in their hazard analysis in Section 4.1. The Town of Stockholm is mapped in an area with low incidence for landslides (Figure 5.12, Appendix A of the main body of the plan). Areas with steep slopes or areas subject to erosion due to flooding along the St. Regis River are particularly susceptible. The NCDRC reports no specific landslide events for St. Lawrence County.

5.12.3 Historical Hazard Occurrences and Damage Estimates

There are no historical records of landslides occurring specifically in the Town of Stockholm. A landslide has the potential to cause hundreds of thousands of dollars in damages.

5.12.4 Future Potential Impacts

Landslides may occur in the future in the Town of Stockholm. Landslides typically occur on hilly or mountainous landscapes, and are also common in river valleys. They are most likely to occur in areas where they have occurred in the past.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Stockholm currently participates in the NFIP. As of October 2021, six NFIP loss claims have been paid as of October 2021 in the Town of Stockholm totaling \$40,334.53. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed four mitigation actions in the 2015 St. Lawrence County HMP, and their statuses are summarized in Table 8, below. Three of the Town's 2015 mitigation actions were revised and re-included for the 2021 HMP update. In addition to the progress described below, the Town is working with the County SWCD to implement proactive ash tree management to reduce the impact of emerald ash borer.

2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Raise roadbeds and install larger culverts will be installed at strategic locations. Culverts on Pickle Street, Old Market Road, Nichols Road, and East Part Road are proposed for replacement.	Flooding, severe storm, severe winter storm, ice storm	3	Town of Stockholm Highway Department	Ongoing: One location on Old Market Rd was improved; others not done yet. East Part Rd is highest priority/ Action revised and re-included for HMP update.
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Severe storm, severe winter storm, ice storm	1,2,3	Town of Stockholm Highway Department	Complete. Routine responsibility of highway department that is adequately addressed.
Install backup power at the Town Office, Town Barn and Brasher-Winthrop Fire Dept. Additional equipment purchases by local fire departments will provide equipment to mitigate damages to residences during storms.	Flood, severe storm, severe winter storm, and ice storm	1	Town of Stockholm Board, and Stockholm Fire Departments	Ongoing: Generator installed for Town Office; Town Barn uses mobile generator. Brasher-Winthrop Fire Dept has a generator; West Stockholm has a generator but it needs to be replaced. Action revised and re-included for HMP update.

Table 8. Hazard Mitigation Action Progress <i>Town of Stockholm</i>				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Incorporate emergency coordination center and shelter into new Town Hall and Offices. Incorporate communications, backup generator, food storage and distribution system, sufficient sanitation for shelter capacity, cots, privacy partitions, storage facility, tables, etc.	All hazards	1	Town of Stockholm Board	Ongoing: The Town recently constructed a new Town Office. There is a large space in the basement, with plumbing and ventilation in place for kitchen equipment; 2 bathrooms, no showers yet but drains are in place; and corner set aside for emergency command center. Generator installed, but may not power kitchen and other equipment. Revised and re-included for HMP update.

7.2 Proposed Mitigation Actions

The Town proposed five mitigation actions and one preparedness action to be included in the HMP update. The Town elected to include a preparedness action (Stockholm 5) because it is still a priority project, though not considered a mitigation strategy for the purpose of this plan. Four of these actions are ongoing projects from the 2015 HMP. These actions are described in Table 9, below and on worksheets included in Attachment A.

**Table 9. Proposed Hazard Mitigation Actions
Town of Stockholm**

Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Stockholm 1	Remove hazard trees based on the recent hazard tree inventory that was completed with the St. Lawrence County Soil & Water Conservation District to reduce potential damages during severe storm events.	Severe Thunderstorm/ Wind/Hail/ Tornado, Ice Storm, Severe Winter Storm	Stockholm Town Board*, St. Lawrence County SWCD, St. Lawrence County EMC	Town of Stockholm Hazard Tree Inventory	2 years	Existing	\$800,000	Town Budget, FEMA- BRIC, NYSDEC - Urban and Community Forestry Grant	1
Stockholm 2 (Ongoing from 2015)	Install additional backup power at the Town Office	All	Stockholm Town Board*	None	5 years	Existing	High	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Stockholm 3 (Ongoing from 2015)	Replace existing generator for West Stockholm Fire Department	All	West Stockholm Fire Dept*	None	5 years	Existing	\$15,000	Fire Dept Budget, FEMA- BRIC, USDA RD - Community Facilities	3

**Table 9. Proposed Hazard Mitigation Actions
Town of Stockholm**

Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Stockholm 4	Install generator for Town Barn	All	Stockholm Town Highway Dept*	None	5 years	Existing	\$15,000	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	4
Stockholm 5 (Preparedness; ongoing from 2015)	Purchase additional equipment for fire department to assist in storm damage response to residents	All	West Stockholm Fire Dept*, Stockholm Town Board	None	5 years	Existing	\$100,000	Town Budget, Fire Dept. budget, FEMA-ATF	5
Stockholm 6 (Ongoing from 2015)	Complete a flood mitigation project on East Part Road	Flood	Stockholm Town Highway Dept*	None	5 years	Existing	\$500,000	Town Budget, NYSDOT- CHIPS, FEMA- BRIC	6

Potential Funding Sources

DASNY SAM: <https://www.dasny.org/about-us/what-we-do/grants-administration>
 FEMA ATF: <https://www.fema.gov/grants/preparedness/firefighters>
 FEMA BRIC: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>
 NYSDEC Urban and Community Forestry Grants: <https://www.dec.ny.gov/lands/5285.html>
 NYSDOT CHIPS: <https://www.dot.ny.gov/programs/chips>
 USDA RD Community Facilities: <https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program>

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Stockholm
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Mitigation Action Worksheet

Project Name:	Remove hazard trees based on the recent hazard tree inventory that was completed with the St. Lawrence County Soil & Water Conservation District to reduce potential damages during severe storm events.
Project ID:	Stockholm 1

Risk/Vulnerability

Hazard of Concern:	Severe Thunderstorm/Wind/Tornado, Ice Storm, Severe Winter Storm
Description of the Problem:	Emerald ash borer was recently detected in the northern part of St. Lawrence County, including Norfolk and Brasher, which are adjacent to Stockholm. This species is continuing to spread at a rate of about 1-2 miles per year. All ash trees in the County are susceptible to damage from the ash borer. The Town completed a hazard tree inventory with the County SWCD to identify ash and other potentially hazardous trees in road right-of-ways that may cause infrastructure/property damage, particularly during storm events.

Action of Project Intended for Implementation

Description of the Solution:	Remove hazard trees identified in recent inventory to reduce risk of damages to properties and public infrastructure during severe thunderstorm/wind/tornado, ice storm, and severe winter storm events.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Low	Estimated Benefits (losses avoided):	Remove hazard trees to reduce damages caused by EAB infestations and potential tree-related damages during severe storm events.
Useful Life:	Long-term		
Estimated Cost:	\$800K		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, FEMA- BRIC, NYSDEC - Urban and Community Forestry Grant
Responsible Organization:	Stockholm Town Board*, St. Lawrence County SWCD, St. Lawrence County EMC	Local Planning Mechanisms to be used in Implementation, if any:	Town of Stockholm Hazard Tree Inventory Report

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Remove dead trees as they become affected by EAB	Medium	Reactive approach only
	Proactively remove ash and other hazard trees before they cause damage	\$800K	Proactive approach to mitigate potential damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Stockholm
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Mitigation Action Worksheet

Project Name:	Install additional backup power at the Town Office
Project ID:	Stockholm 2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town built a new Town Office facility in 2018, which can be used as an emergency shelter location. Various improvements are needed to improve the facility's ability to shelter residents. At this time, there is a large space in the basement with plumbing and ventilation in place for kitchen equipment; 2 bathrooms but no showers (though drains are in place); and an area set aside for emergency command center. There is also a generator in place, but it may not be able to power kitchen equipment.

Action of Project Intended for Implementation

Description of the Solution:	Upgrade backup power at the Town Office. The project may also include preparedness actions such as installing kitchen and shower facilities and purchasing supplies such as cots and privacy partitions to improve the Town Office's ability to function as an emergency shelter. An emergency command center will also be set up at the Town Office in the previously designated space.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved sheltering abilities and continuity of operations
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Stockholm Town Board*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase shelter supplies only	High	Partial solution, does not address facility improvements
	Install kitchen/shower facilities, add generator, and purchase supplies	High	Most comprehensive solution to ensure sheltering abilities for Town residents

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Stockholm
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Mitigation Action Worksheet

Project Name:	Replace existing generator for West Stockholm Fire Department
Project ID:	Stockholm 3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The West Stockholm Fire Dept has a generator but it is about 14 years old and nearing the end of its useful life. The fire department is one of the Town's emergency shelter locations. A replacement generator is needed at this facility to ensure continuity of critical operations during emergency events.

Action of Project Intended for Implementation

Description of the Solution:	Install a new generator at the West Stockholm Fire Department to ensure continuity of critical operations during emergency events with sustained power outages.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Fire Dept Budget, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	West Stockholm Fire Dept*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Replace on-demand generator at the fire department	\$15K	Offers maximum protection for fire department

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Stockholm
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Mitigation Action Worksheet

Project Name:	Install generator for Town Barn
Project ID:	Stockholm 4

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town Barn is a critical facility and lacks a backup generator. This leaves it vulnerable to power outages during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Install a backup generator at the Town Barn to ensure that critical operations are not interrupted during an emergency event with a sustained power outage.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Stockholm Town Highway Dept*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Town facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Town Barn	\$15K	Offers maximum protection for Town Barn

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Stockholm
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Mitigation Action Worksheet

Project Name:	Purchase additional equipment for fire department to assist in storm damage response to residents (Preparedness Action)
Project ID:	Stockholm 5 (Preparedness)

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Fire Department responds to residents as needed during storm events, particularly related to flooding or loss of power. The fire department is in need of additional equipment to better respond to residents during these situations.

Action of Project Intended for Implementation

Description of the Solution:	Purchase additional equipment such as pumps and portable generators that can be used at residences affected during storm events. This action is considered emergency preparedness rather than hazard mitigation, but was included because it is still a priority action for the Town.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Fire department better able to respond to emergencies
Useful Life:	Long-term		
Estimated Cost:	\$100K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, Fire Dept. budget, FEMA- ATF Grant
Responsible Organization:	West Stockholm Fire Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Rely on other fire departments for assistance when needed	Low	Other departments may not be available to assist when needed
	Purchase additional equipment for fire department	\$100K	Ensures fire department is able to assist residents during emergencies

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Stockholm
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Mitigation Action Worksheet

Project Name:	Complete a flood mitigation project on E Part Road
Project ID:	Stockholm 6

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Town experiences recurring flooding issues on E Part Road during heavy rain events. The road needs to be elevated and multiple culverts need to be installed/upgraded to reduce flood damages and impacts. The Town has had to evacuate residents during floods.

Action of Project Intended for Implementation

Description of the Solution:	Raise approximately 2 miles of E Part Rd to reduce flooding. Install or upgrade existing culverts at the following locations (lat/long coordinates): 135: 44.75389198 °N, -74.70760442 °W 137: 44.75458768 °N, -74.79852148 °W 138: 44.75811713 °N, -74.80148700 °W 139: 44.76335540 °N, -74.80496373 °W 140: 44.76402118 °N, -74.80529197 °W 141: 44.76138360 °N, -74.80536774 °W
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Reduced flood damage to roadway
Useful Life:	Long-term		
Estimated Cost:	\$500K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Town Budget, NYSDOT- CHIPS, FEMA- BRIC
Responsible Organization:	Stockholm Town Highway Dept*	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Install additional larger culverts along road to convey stormwater drainage	Medium	Partial solution; low spots in road still susceptible to flooding
	Elevate roadway and install new culverts	\$500K	Most comprehensive solution to reduce flood damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Stockholm 1	+	+	+	+	+	-	0	+	+	+	Medium	High	2
Stockholm 2	+	+	0	+	+	-	+	+	+	0	High	High	1
Stockholm 3	+	+	+	+	+	-	0	0	+	0	Medium	High	5
Stockholm 4	+	+	+	+	+	0	0	0	+	0	Medium	Medium	4
Stockholm 5	+	+	0	+	+	-	0	0	+	0	Medium	High	6
Stockholm 6	+	+	+	+	+	0	0	0	+	0	Medium	Medium	3

Jurisdictional Annex

Town of Waddington

1. Contacts

The contacts for the Town of Waddington regarding this plan are identified as follows:

- Alex Hammond – Town Supervisor
Address: 46 Maple St, Waddington, NY 13694
Phone: 315-250-6155
Email: waddingtonsupervisor1859@gmail.com
- Carol Burns – Town Clerk
Address: 46 Maple St, Waddington, NY 13694
Phone: 315-388-5629
Email: waddingtontownclerk@gmail.com

Town Website: <http://www.townofwaddington.com>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 2,235 people live in the Town of Waddington. The Town's population has decreased by 1.4% since the 2010 Census (2,266) (U.S. Census Bureau, 2021).

2.2 Location

The Town of Waddington is located in the northwestern portion of St. Lawrence County and is bordered by the Town of Louisville to the east, Town of Madrid to the south, Town of Lisbon to the west, and the St. Lawrence River to the north. Waddington is easily accessed from State Highway 37 and State Highway 345.

2.3 Governing Body

The Town of Waddington is governed by a five-member Town Council, including the Supervisor and four council members.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), two solar array projects have been proposed in the Town on County Route 31. No other significant developments have been constructed. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Town’s vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Town has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Town’s HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Waddington	Notes
Plans		
Comprehensive Plan	No	
Capital Improvement Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other	Yes	Local Waterfront Revitalization Plan
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Exiting Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Town Code Enforcement Officer responsible

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Waddington	Notes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA actively working on flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Town Clerk
Emergency Manager	Yes	Town Supervisor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	Town works with DANC and County planning board
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	Yes	Documented for HMP update
Grant writing	Yes	Board member and also sometimes works with county
HAZUS analysis	Yes	Competed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Town of Waddington	Notes
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Programs/Organization		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	Yes	
Ongoing public education or information program	Yes	
Natural disaster or safety related school programs	Yes	Fire prevention and evacuation drills with fire department and rescue squad
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Town include State Highway 37 and State Highway 345. The Town’s emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Department	51 Maple St, Waddington, NY 13694	Village of Waddington	Yes	Yes	No	Backup power available

Rescue Squad	48 Maple St, Waddington, NY 13694	Town of Waddington	Yes	Yes	No	Backup power available
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3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Town of Waddington based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- **Potential Temporary Housing Locations**
 - Multiple large parking lots in Village of Waddington
 - Vacant Town property off of State Hwy 37
- **Potential Permanent Housing Locations**
 - Potentially privately owned vacant properties in Town if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Town reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Town’s natural hazard analysis results are provided in Table 4.

Table 3. Hazard Analysis Criteria						
Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Flood	2	2	3	2	High	4
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	5
Extreme Temperatures	3	1	2	2	Moderate	6
Ice Jam	2	2	2	2	Moderate	7
Drought	3	1	2	1	Moderate	8
Earthquake	2	3	1	1	Moderate	9
Infestation	2	1	2	1	Moderate	10
Wildfire	1	3	1	1	Moderate	11

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Town of Waddington. Table 5, below, denotes the types and locations of critical facilities within the Town.

Type	Facility Name	Address	Located in Floodplain*
EMS/Fire Department	Waddington Rescue Squad	48 Maple St, Waddington, NY 13694	No
EMS/Fire Department	Waddington Volunteer Fire Department	51 Maple St, Waddington, NY 13694	No
Municipal Services	Old Town Hall	46 Maple St, Waddington, NY 13694	No
Municipal Services	Town of Waddington Highway Department	46 Maple St, Waddington, NY 13694	No
Municipal Services	Waddington Municipal Building	46 Maple St, Waddington, NY 13694	No

**Based on HAZUS-modeled 100-year and 500-year floodplains*

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an emergency action plan (EAP) in place. Federally owned dams, dams built under

the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan to be eligible for HHPD funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. One of these dams is located in the Town of Waddington, and is a hydropower dam owned by New York Power Authority (Table 6, below).

Table 6. Intermediate and High-Hazard Potential Dams (NYSDEC, 2021)						
Name	Hazard Classification*	Waterbody	Owner	Total Capacity (megawatts)**	Emergency Action Plan Date	Last NYSDEC Inspection
Iroquois Dam	C	St Lawrence River	New York Power Authority	not available	12/1/2018	8/2/1995
*Both Class B (Intermediate Hazard) and Class C (High Hazard) dams were reviewed for risk assessment purposes. **Capacity information obtained from Natural Resources Canada, 2021						

The Town indicated no concerns regarding the dam. Dam and flood-related mitigation actions that may apply to the HHPD grant program are detailed in Section 7, below. The Town and NYPA will continue to comply with the NYSDEC dam safety program to minimize risk associated with these structures.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Town of Waddington. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River, the Grass River, Sucker Brook, and Brandy Brook are likely to experience increased flooding occurrences.

The Town of Waddington chose not to profile landslide in their annex even though it was profiled for the County. The Town does not have a history of landslides nor do they have any significant concerns regarding this hazard. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 *Description*

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 37 and State Highway 345) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Waddington and hamlet of Chipman.

5.1.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. One of these events occurred in the Town of Waddington, which caused about \$25,000 in property damages according to the NCDC (Table 7). The Town experiences severe storm events once every 2-3 years. Actual damages were likely greater than those estimated by the NCDC. The Town indicated that Coles Creek State Park would be vulnerable to a severe storm event, as numerous people camp there during the summer. Recreational vehicles have been damaged at the campground during severe storms in the past.

Table 7. Severe Storm Event Records for the Town of Waddington				
Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	7/21/2010	55 knots	\$25,000	None Reported

5.1.4 *Future Potential Impacts*

Severe storms will continue to affect the Town in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 **Ice Storm**

5.2.1 *Description*

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 *Hazard Vulnerability*

The Town is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Town of Waddington is susceptible to damages from an ice storm event. Damages to the Town’s critical infrastructure or primary evacuation routes (State Highway 37 and State Highway 345) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Waddington and hamlet of Chipman.

5.2.3 *Historical Hazard Occurrences and Damage Estimates*

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Town of Waddington lies, which are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Town of Waddington.

5.2.4 *Future Potential Impacts*

The Town of Waddington will continue to experience ice storm events in the future. The Town Highway Dept. completes tree maintenance within Town road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 **Severe Winter Storm**

5.3.1 *Description*

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 *Hazard Vulnerability*

The Town is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one town within the County. The entire Town of Waddington is susceptible to damages from a severe winter storm event. The Town Highway Dept. clears Town streets during heavy snow events, and the Town works with the St. Lawrence County Highway Dept. and NYS Dept. of Transportation for clearing of other roadways. Roadway safety is a major concern during severe winter storm events. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 37 and State Highway 345) would be most impactful to Town residents. Storm damages would primarily impact the more populated portions of the Town, including the Village of Waddington and hamlet of Chipman.

5.3.3 *Historical Hazard Occurrences and Damage Estimates*

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Town of Waddington has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one town within the County. The NCDC does not report any winter storm damage estimates specific to the Town of Waddington.

5.3.4 *Future Potential Impacts*

The Town of Waddington will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 **Flood**

5.4.1 *Description*

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 *Hazard Vulnerability*

The Town is highly vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Town is generally drained by the Grass River, Sucker Brook, and Brandy Brook, and the St. Lawrence River. FEMA provides flood insurance rate maps for the Town of Waddington, however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The 100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 8 summarizes the amount of land within the Town of

Waddington that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 8. Summary of Areas in Floodplains <i>(Source: FEMA HAZUS Flood Model, B&L, 2021)</i>		
Town of Waddington Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
36,434 acres	9.9%	0.13%

5.4.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC did not report any flood records for the Town of Waddington since 2010. The Town borders the St. Lawrence River, but they did not experience significant flooding issues during the 2017 and 2019 high water levels. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Town of Waddington. There are no repetitive loss properties in the Town.

5.4.4 *Future Potential Impacts*

Properties along the St. Lawrence River, Grass River, Sucker Brook, and Brandy Brook are vulnerable to flooding. About 9.9% of the Town of Waddington is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.5 **Coastal Storm (Nor'easter)**

5.5.1 *Description*

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 *Hazard Vulnerability*

The Town is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor'easter could impact any location in the Town. Damages to the Town's critical infrastructure or primary evacuation routes (State Highway 37 and State Highway 345) would be most impactful to Town residents. Storm damages would primarily impact the more populated

portions of the Town, including the Village of Waddington and hamlet of Chipman.

5.5.3 *Historical Hazard Occurrences and Damage Estimates*

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Town of Waddington were reported for this event.

5.5.4 *Future Potential Impacts*

The Town of Waddington is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 **Extreme Temperatures**

5.6.1 *Description*

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 *Hazard Vulnerability*

The Town is moderately vulnerable to extreme temperatures, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 10.2% of the population in the Town is under 5 years old, and 23.6% of the population is over 65 years old. Approximately 11.0% of the Town's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 *Historical Hazard Occurrences and Damage Estimates*

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Town of Waddington lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Town of Waddington.

5.6.4 *Future Potential Impacts*

The Town of Waddington will continue to experience extreme temperature events in the future, as will the rest of St. Lawrence County. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change. The Town indicated that the Waddington Rescue Squad has air conditioning in meeting rooms that could be used as a cooling center for residents if needed.

5.7 **Ice Jam**

5.7.1 *Description*

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 *Hazard Vulnerability*

The Town is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along streams throughout the Town, primarily along the St. Lawrence River, the Grass River, Sucker Brook, and Brandy Brook are vulnerable to ice jams.

5.7.3 *Historical Hazard Occurrences and Damage Estimates*

The Town of Waddington was affected by one ice jam recorded by the U.S. Army Corps of Engineers (USACE) Cold Regions Research and Engineering Laboratory (CRREL) since 1911, which is described in the County's 2015 HMP. The USACE CRREL has not reported any ice jams in Waddington since 1964, however, local records reported recurring ice jams on Brandy Brook at the

County Route 33 bridge. Ice accumulates in this location, but the bridge is in good condition, and is inspected annually; significant damages have not occurred.

5.7.4 Future Potential Impacts

Properties along the St. Lawrence River, Grass River, Sucker Brook, and Brandy Brook remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 Drought

5.8.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Town is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. Agricultural areas and properties served by private wells would experience the most significant impacts. The Town does not have a municipal water system, therefore, residents rely on private wells and may be susceptible to low water yields during a drought.

5.8.3 Historical Hazard Occurrences and Damage Estimates

The NCDRC reports no specific drought events for the Town of Waddington or the rest of St. Lawrence County since 2010. There are no specific damage estimates available for droughts that affected the Town.

5.8.4 Future Potential Impacts

The entire Town of Waddington remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.9 Earthquake

5.9.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Town is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Town, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Town's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Town and its residents.

5.9.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which were located in the Town of Waddington. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.9.4 Future Potential Impacts

St Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Town remains susceptible to earthquakes.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Town is moderately vulnerable to an infestation, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in

the Town of Waddington is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Town of Waddington (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has been detected in the Town of Waddington. The emerald ash borer is able to spread two miles per year on average, making it a hazard for surrounding municipalities as well. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Town of Waddington remains susceptible to an infestation event. Proactive ash tree management will be critical to reduce impacts of the emerald ash borer on the Town.

5.11 Wildfire

5.11.1 Description

For a description of this hazard, please see Section 5.10 of the main body of the plan.

5.11.2 Hazard Vulnerability

The Town is moderately vulnerable to a wildfire, as documented in their hazard analysis in Section 4.1. Undeveloped lands such as forest and open fields and brush lands within the Town are susceptible to wildfires. Significant wildfires have not been reported in the Town, but this hazard was included in this annex for future mitigation planning consideration.

5.11.3 Historical Hazard Occurrences and Damage Estimates

While the Town did not report wildfires that have caused significant damages, brush fires occasionally occur. According to Figure 5.11 (Appendix A of the main body of the plan), half of the Town experienced 0.4 to 0.8 wildfires per square mile and half the Town experienced 0.9 to 1.3 wildfires per square mile from 2003 to 2017 according to reports from the NYSDEC. A wildfire has the potential to cause hundreds of thousands of dollars in damages.

5.11.4 Future Potential Impacts

The entire Town of Waddington remains susceptible to a wildfire, particularly undeveloped areas. Wildfires are likely to increase in frequency and magnitude in the future due to climate change.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Town of Waddington currently participates in the NFIP. As of October 2021 no NFIP loss claims have been paid in the Town. There are no repetitive loss properties in the Town. The Town will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Town proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 9, below. The Town’s 2015 mitigation action was re-included for the 2021 update.

Table 9. Hazard Mitigation Action Progress Town of Waddington				
2015 Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Replace approximately two miles of Hardscrabble Road which experiences reoccurring flooding and road deterioration. Project will include updated culverts and drainage along Hardscrabble Road.	Flood	2,3	Town of Waddington Highway Department	Ongoing. The Town recently completed about 0.6 miles of improvements along Hardscrabble Rd, additional work needed. Re-included for HMP update.

7.2 Proposed Mitigation Actions

The Town proposed two mitigation actions to be included in the HMP update, one of which is an ongoing project from the 2015 HMP. These actions are described in Table 10, below and on worksheets included in Attachment A.

Table 10. Proposed Hazard Mitigation Actions Town of Waddington									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Waddington T1	Replace culvert on Brown Church Rd with a larger culvert pipe.	Flood	Town of Waddington Highway Dept*, Waddington Town Board	None	5 years	Existing	\$15,000	NYSDOT - CHIPS, Town Budget	1
Waddington T2 (Ongoing from 2015)	Replace approx. 1.4 miles of Hardscrabble Rd, which experiences recurring flooding issues. New culverts and drainage infrastructure will be installed and the road surface will be improved.	Flood	Town of Waddington Highway Dept*, Waddington Town Board	None	5 years	Existing	High	NYSDOT - CHIPS, Town Budget	2
Potential Funding Sources NYSDOT CHIPS: https://www.dot.ny.gov/programs/chips									

7.3 Cost-Benefit Analysis

Each of the Town’s proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Town’s STAPLEE analysis (Table 11) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Waddington
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Mitigation Action Worksheet

Project Name:	Replace culvert on Brown Church Rd with a larger culvert pipe
Project ID:	Waddington T1

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues along Brown Church Rd.

Action of Project Intended for Implementation

Description of the Solution:	Upgrade culvert with larger sized pipe to improve stormwater flows.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term (30+ years)		
Estimated Cost:	\$15K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSDOT - CHIPS, Town Budget
Responsible Organization:	Town of Waddington Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culvert in-kind	\$10K	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Upgrade culvert with larger pipe	\$15K	Improved ability to handle high flows and reduce future flooding

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Town of Waddington
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Mitigation Action Worksheet

Project Name:	Replace approx. 1.4 miles of Hardscrabble Rd, which experiences recurring flooding issues. New culverts and drainage infrastructure will be installed and the road surface will be improved.
Project ID:	Waddington T2

Risk/Vulnerability

Hazard of Concern:	Flood
Description of the Problem:	The Town experiences recurring flooding issues along Hardscrabble Rd. Existing stormwater drainage infrastructure is not adequate.

Action of Project Intended for Implementation

Description of the Solution:	Resurface road and install new stormwater conveyance infrastructure, upgrading culverts/pipes where needed to adequately convey stormwater flows.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Improved stormwater drainage, reduced flood-related road closures and damages
Useful Life:	Long-term		
Estimated Cost:	High		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYSDOT - CHIPS, Town Budget
Responsible Organization:	Town of Waddington Highway Dept*, Town Board	Local Planning Mechanisms to be used in Implementation, if any:	None

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace culverts in-kind	\$30K	May help flows temporarily but not a long-term solution, may not be able to handle high flows
	Replace roadway and install new culverts/upgrade existing culverts where needed	High	Most comprehensive solution to reduce flood risk and damages in this location

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 11. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Waddington T1	+	+	+	+	+	0	0	+	+	+	Medium	Medium	1
Waddington T2	+	+	0	+	+	-	0	0	+	0	High	High	2

Jurisdictional Annex

Village of Waddington

1. Contacts

The contacts for the Village of Waddington regarding this plan are identified as follows:

- Michael Zagrobelny- Mayor
Address: 46B Maple Street, Waddington, NY 13694
Phone: (315) 244-5233
Email: waddmayor@gmail.com

Village Website: <https://www.villageofwaddington.com/>

2. Municipal Profile

2.1 Population

The 2020 Census reported that 937 people live in the Village of Waddington. The Village's population decreased by 3.6% since the 2010 Census population of 972 (U.S. Census Bureau, 2021).

2.2 Location

The Village of Waddington is located in the northwestern portion of the Town of Waddington in northwestern St. Lawrence County. The Village is easily accessed from State Highway 37, State Highway 345, and County Route 44 (Franklin Rd).

2.3 Governing Body

The Village of Waddington is governed by a five-member Village Board, including the Mayor and four Trustees.

2.4 Recent and Anticipated Future Development

Since the last County HMP (2015), new houses near the St. Lawrence River (bordering property owned by the NY Power Authority) were built. Renovations for the Fire Hall are planned. No new development has occurred in the Special Flood Hazard Area, and the reported developments have not changed the Village's vulnerability to natural hazards.

3. Capability Assessment

3.1 Planning and Regulatory Capability

The Village has considered the 2015 HMP when implementing their existing plans and regulations and progressing projects. The Village's HMP update will be incorporated into and referenced by future updates of the plans, policies, ordinances, programs, studies, and reports listed in Table 1, below.

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Waddington	Notes
Plans		
Comprehensive Plan	Yes	
Capital Improvement Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection	No	
Pandemic Response Plan	Yes	Developed in response to COVID-19 pandemic (required by NYS)
Other	Yes	Local Waterfront Revitalization Plan
Development Approvals		
Building Code	<ul style="list-style-type: none"> • 2020 Residential Code of NYS • 2020 Fire Code of NYS • 2020 Building Code of NYS • 2020 Existing Building Code of NYS • 2020 Energy Conservation Construction Code of NYS • 2020 Plumbing Code of NYS • 2020 Mechanical Code of NYS • 2020 Fuel Gas Code of NYS 	Code Enforcement Officer responsible
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	
Site plan review requirements	Yes	
Land Use Regulations		
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
NFIP Participant/Floodplain ordinance	Yes	

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Waddington	Notes
Natural hazard specific ordinance	No	
Flood insurance rate maps	Yes	FEMA is actively working on a flood study that will generate new FIRM mapping countywide
Acquisition of land for open space and public recreation	No	
Administration		
Planning Commission	Yes	
Mitigation Planning Committee	Yes	Established for HMP update
Maintenance programs to reduce risk	Yes	
Mutual aid agreements	Yes	
Staff		
Chief Building Official	Yes	Code Enforcement Officer
Floodplain Administrator	Yes	Code Enforcement Officer
Emergency Manager	Yes	Mayor
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical Abilities		
Warning systems/services	Yes	
Hazard data and information	No	Documented for HMP update
Grant writing	No	No grant writer on staff but Village handles some applications
HAZUS analysis	No	Completed countywide for HMP update
Funding Resources		
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	USDA funding for sewer project

Table 1. Planning Mechanisms and Capabilities		
Planning Mechanism	Village of Waddington	Notes
State funding programs	Yes	DASNY funding received for municipal building/arena projects NYS CWSRF and WIIA funding for sewer project
Programs/Organizations		
Local citizen groups or non-profit organizations focused on environmental protection emergency preparedness, access and functional needs	No	
Ongoing public education or information program	Yes	Village website, village holds as-needed community input sessions.
Natural disaster or safety related school programs	Yes	Fire Dept. works with schools for various programs such as emergency drills
Storm Ready certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	Village received 2 REDI grants (one for Ph 1 of sewer project, other for dock improvements at end of Main St - partnered w/ Town, also funded by NYPA funding from Town), Mike is on CLEAR initiative (river/lake flooding issues)

3.2 Emergency Communications, Routes, and Shelters

Major transportation routes within the Village include State Highway 37 and State Highway 345. The Village's emergency shelter locations are summarized in Table 2, below. The St. Lawrence County Animal Response Team (CART) is a volunteer group that can assist with coordinating animal sheltering needs during emergencies.

Table 2. Emergency Shelters						
Facility	Address	Owner/ Occupant	Support medical needs?	ADA Compliant?	Pets accepted?	Notes
Fire Department	51 Maple St, Waddington, NY 13694	Village of Waddington	Yes	Yes	No	Backup power available

3.3 Temporary and Permanent Housing Locations

The potential temporary and permanent housing locations listed below were identified for displaced residents in the Village of Waddington based on the 2017 NYS Hazard Mitigation Planning Standards. It is noted that formal agreements would need to be established in order to use privately-owned properties.

- Potential Temporary Housing Locations
 - Civic Center parking lot- Pine St
 - Village property on St. Lawrence Ave
 - Civic Center- Pine Street
- Potential Permanent Housing Locations
 - Town of Waddington property off of State Hwy 37
 - Additional privately owned vacant properties in Town of Waddington if owners willing to sell or subdivide

4. Hazard Vulnerabilities and Ranking

4.1 Risk Assessment

The Village reviewed multiple natural hazards to include in the HMP update. The hazard analysis criteria is summarized in Table 3. The Village's natural hazard analysis results are provided in Table 4.

Score	Extent	Onset	Impact	Frequency	Total Score	Overall Vulnerability
1	One location	Days of warning	Minor damages/ injuries	Rare	4 to 5	Low
2	Several locations	Hours of warning	Moderate damages/ injuries	Infrequent	6 to 8	Moderate
3	Large area	No warning	Severe damages/ injuries	Regular	9 to 12	High

Hazard Event	Extent	Onset	Impact (Damages and Injury)	Frequency	Overall Vulnerability	Jurisdiction Rank
Severe Thunderstorm/Wind/Hail/Tornado	2	2	3	3	High	1
Ice Storm	3	1	3	2	High	2
Severe Winter Storm	3	1	2	3	High	3
Flood	2	2	2	2	Moderate	4
Coastal Storm (Nor'easter)	3	1	2	2	Moderate	5
Extreme Temperatures	3	1	2	2	Moderate	6
Ice Jam	2	2	2	2	Moderate	7
Earthquake	2	3	1	1	Moderate	8
Drought	3	1	1	1	Moderate	9
Infestation	2	1	1	1	Low	10

4.2 Critical Facilities

Critical facilities are defined as any facility that is critical for emergency response or that requires special emergency response in the event of hazardous incidents as identified by the Village of Waddington. Table 5, below, denotes the types and locations of critical facilities within the Village.

Type	Facility Name	Address	Located in Floodplain*
EMS/Fire Dept	Waddington Volunteer Fire Dept.	51 Maple St, Waddington, NY 13694	No
EMS/Fire Dept	Waddington Rescue Squad	48 Maple St, Waddington, NY 13694	No
Municipal Services	Village DPW/sewage treatment plant	100 Park Lane Waddington, NY 13694	No
Municipal Services	Village Office	46B Maple St. Waddington, NY 13694	No
Public Utilities	Wastewater Treatment Facility	Park Ln, Waddington, NY 13694	No
Public Utilities	Water Treatment Plant and Wells	30 Franklin Rd, Waddington NY 13694	No
Community Services	Martin Civic Center	Pine St, Waddington NY 13694	No
Community Services	Whittaker Park	Park Ln, Waddington NY 13694	100YR
Community Services	Island View Park	St. Lawrence Ave, Waddington NY 13694	100YR

*Based on HAZUS-modeled 100-year and 500-year floodplains

FEMA's High Hazard Potential Dam (HHPD) grant program offers funding assistance for dam rehabilitation projects. Dams may be owned by public or private entities, and must be classified as high-hazard potential and have an

emergency action plan (EAP) in place. Federally-owned dams, dams built under the authority of the Secretary of Agriculture, and hydroelectric dams licensed by the Federal Energy Regulatory Commission (FERC) with an authorized capacity of more than 1.5 megawatts are not eligible for the 2021 funding program. In New York State, municipalities and non-profit organizations may apply for funding as sub-applicants to the NYSDEC. Municipalities must have an approved hazard mitigation plan that incorporates dam risk to be eligible for funding. According to the NYSDEC, there are 36 intermediate or high-hazard potential dams (Class B or C) in St. Lawrence County. These dams are shown on Figure 5.8, in Appendix A of the main body of the plan. There are no Class B or C dams located in the Village of Waddington.

5. Priority Hazard Events

The following sections detail the priority hazard events identified by the jurisdiction. Additional information about each hazard including frequency, history, and severity within St. Lawrence County is included within Section 5.0 of the main body of the Hazard Mitigation Plan.

The probability of climate-related hazard events is expected to increase in the future within the Village of Waddington. Climate change is expected to cause an increase in weather volatility, rising sea level, and greater temperature extremes. Properties along the St. Lawrence River, and Sucker Brook are likely to experience increased flooding occurrences.

The Village of Waddington chose not to profile wildfire or landslide in their annex even though these hazards were profiled for the County. The Village does not have a history of or any significant concerns regarding these hazards. Past occurrences of hazard events are indicated in their respective profiles below. Some hazards may not have historical records, but they were included in this annex for future mitigation planning consideration.

5.1 Severe Thunderstorm, Wind, Hail, or Tornado

5.1.1 Description

For a description of these hazards, please see Section 5.1 of the main body of the plan.

5.1.2 Hazard Vulnerability

The Village is highly vulnerable to a severe thunderstorm, wind, hail, or tornado event, as documented in their hazard analysis in Section 4.1. Fallen trees from severe winds can damage overhead utility lines, resulting in power outages. In addition, these events are likely to result in damages to private and public infrastructure and property. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 37 and State Highway 345) would be most impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, including the northern part of the Village along the State Highway 37 corridor.

5.1.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has reported 180 severe storm events in St. Lawrence County between 2010 and 2021. Five of these events occurred in the Village of Waddington (frequency of about once every two years). All of these records were thunderstorm winds. Estimated damages for the Village of Waddington ranged from \$2,000 to \$35,000 per event (Table 6). Actual damages were likely greater than those estimated by the NCDC. The Village indicated that they are typically affected by thunderstorms and microbursts that come south from the St. Lawrence River. In August 2021, there was a severe storm/microburst that caused damage to docks and boats in the St. Lawrence River as well as tree damage. The Village has also been affected by high winds and fog or frozen fog in recent years.

Event Type	Date	Magnitude	Estimated Property Damage	Estimated Crop Damage
Thunderstorm Wind	6/1/2013	50 knots	\$2,000	-
Thunderstorm Wind	6/24/2013	55 knots	\$10,000	-
Thunderstorm Wind	6/28/2016	55 knots	\$25,000	-
Thunderstorm Wind	6/24/2017	70 knots	\$35,000	-
Thunderstorm Wind	7/20/2021	50 knots	\$10,000	-
Total			\$82,000	None Reported

5.1.4 Future Potential Impacts

Severe storms will continue to affect the Village in the future. The frequency and magnitude of severe storm events may increase due to climate change.

5.2 Ice Storm

5.2.1 Description

For a description of this hazard, please see Section 5.2 of the main body of the plan.

5.2.2 Hazard Vulnerability

The Village is highly vulnerable to an ice storm, as documented in their hazard analysis in Section 4.1. These storms typically affect most or all of the County. The entire Village of Waddington is susceptible to damages from an

ice storm event. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 37 and State Highway 345) would be most impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, including the northern part of the Village along the State Highway 37 corridor.

5.2.3 Historical Hazard Occurrences and Damage Estimates

Historically, ice storms have occurred about once every three years in St. Lawrence County. Since 1998, four ice storms were reported in the portion of St. Lawrence County where the Village of Waddington lies, and are described in Section 5.2 of the main body of the plan. No damage estimates related to ice storms are reported specific to the Village of Waddington. The Village reports a large ice storm in 1998.

5.2.4 Future Potential Impacts

The Village of Waddington will continue to experience ice storm events in the future, as will the rest of St. Lawrence County. The Village Department of Public Works completes tree maintenance within Village road right of ways to minimize potential damages to overhead utility lines, which is common during ice storms. Private utility right of ways are generally maintained by the individual utility companies.

5.3 Severe Winter Storm

5.3.1 Description

For a description of this hazard, please see Section 5.3 of the main body of the plan.

5.3.2 Hazard Vulnerability

The Village is highly vulnerable to a severe winter storm, as documented in their hazard analysis in Section 4.1. These storms typically affect more than one area within the County. The entire Village of Waddington is susceptible to damages from a severe winter storm event. The Village Department of Public works clears streets during heavy snow events. Roadway safety is a major concern during severe winter storm events. Damages to the Village's critical infrastructure or primary evacuation routes (State Highway 37 and

State Highway 345) would be most impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, including the northern part of the Village along the State Highway 37 corridor.

5.3.3 Historical Hazard Occurrences and Damage Estimates

Severe winter storms typically occur about 16 times annually in St. Lawrence County. The Village of Waddington has been affected by a number of severe winter storm events, described in Section 5.3 of the main body of the plan. These storms typically affect more than one area within the County. The NCDC does not report any winter storm damage estimates specific to the Village of Waddington.

5.3.4 Future Potential Impacts

The Village of Waddington will continue to experience severe winter storm events in the future. The severity and frequency of severe winter storms may increase due to climate change.

5.4 Flood

5.4.1 Description

For a description of this hazard, please see Section 5.7 of the main body of the plan.

5.4.2 Hazard Vulnerability

The Village is moderately vulnerable to a flood, as documented in their hazard analysis in Section 4.1. The Village is generally drained by Sucker Brook, a tributary of the St. Lawrence River. The St. Lawrence River borders the Village to the north. FEMA provides flood insurance rate maps for the Village of Waddington; however, FEMA does not currently have digital floodplain data available for St. Lawrence County. FEMA is currently working on a flood study to update all floodplain mapping throughout the County, and digital mapping will be generated as part of this project. In lieu of FEMA digital data, FEMA's HAZUS software was used to model the approximate 100-year and 500-year floodplain areas in St. Lawrence County. This process is described in more detail in Section 4.4 of the main body of the plan. The

100-year floodplain corresponds with areas that are at high risk for flooding (1% likely to flood any given year), and areas within a 500-year floodplain are at moderate flood risk (0.2% likely to flood in any given year). Table 7 summarizes the amount of land within the Village of Waddington that is located within 100-year and 500-year floodplains, as modeled by HAZUS.

Table 7. Summary of Areas in Floodplains (Source: FEMA HAZUS Flood Model, B&L, 2021)		
Village of Waddington Total Area	Percent of Total Area	
	100-Year HAZUS Floodplain	500-Year HAZUS Floodplain
1,537 acres	7.4%	0.23%

5.4.3 Historical Hazard Occurrences and Damage Estimates

The NCDC has not reported any flood records for the Village of Waddington since 2010. The St. Lawrence River’s water level is controlled by dams. As described in Section 6.0 of this annex, no NFIP loss claims have been paid as of October 2021 in the Village of Waddington. There are no repetitive loss properties in the Village.

5.4.4 Future Potential Impacts

Properties along the St. Lawrence River and Sucker Brook are vulnerable to flooding. About 7.4% of the Village of Waddington is within a 100-year floodplain based on the HAZUS flood model that was generated for St. Lawrence County.

5.5 Coastal Storm (Nor’easter)

5.5.1 Description

For a description of this hazard, please see Section 5.4 of the main body of the plan.

5.5.2 Hazard Vulnerability

The Village is moderately vulnerable to a coastal storm, as documented in their hazard analysis in Section 4.1. A nor’easter could impact any location in the Village. Damages to the Village’s critical infrastructure or primary evacuation routes (State Highway 37 and State Highway 345) would be most

impactful to Village residents. Storm damages would primarily impact the more populated portions of the Village, including the northern part of the Village along the State Highway 37 corridor.

5.5.3 Historical Hazard Occurrences and Damage Estimates

The NCDC database contains no significant recorded damages for coastal storms which have affected St. Lawrence County. A recent nor'easter affected St. Lawrence County on February 3, 2021, which involved up to 14 inches of snow across the County. No damages in the Village of Waddington were reported for this event.

5.5.4 Future Potential Impacts

The Village of Waddington is very likely to experience nor'easter events in the future. The severity and frequency of nor'easters, while difficult to predict, may increase in the future due to climate change.

5.6 Extreme Temperatures

5.6.1 Description

For a description of this hazard, please see Section 5.5 of the main body of the plan.

5.6.2 Hazard Vulnerability

The Village is moderately vulnerable to extreme temperatures, as documented in their hazard analysis in Section 4.1. These events typically affect most or all of the County. Extreme temperature events tend to have greater impacts on vulnerable populations, including older adults (over 65 years), young children (under 5 years), people with health problems, or people who cannot afford to sufficiently heat or cool their homes. Approximately 15.5% of the population in the Village is under 5 years old, and 28.7% of the population is over 65 years old. Approximately 11.0% of the Village's population is below the poverty level. These populations are at a higher risk of being impacted by extreme temperature events.

5.6.3 Historical Hazard Occurrences and Damage Estimates

Since 2010, two cold/wind chill events and five heat waves were reported in the portion of St. Lawrence County where the Village of Waddington lies, which are described in Section 5.5 of the main body of the plan. No damage estimates related to extreme temperatures are reported specific to the Village of Waddington.

5.6.4 Future Potential Impacts

The Village of Waddington will continue to experience extreme temperature events in the future. Extreme temperatures are likely to increase in frequency and extremity in the future due to climate change.

5.7 Ice Jam

5.7.1 Description

For a description of this hazard, please see Section 5.6 of the main body of the plan.

5.7.2 Hazard Vulnerability

The Village is moderately vulnerable to an ice jam, as documented in their hazard analysis in Section 4.1. Properties along the St. Lawrence River and Sucker Brook are vulnerable to ice jams.

5.7.3 Historical Hazard Occurrences and Damage Estimates

There are no USACE CRREL historical records of an ice jam occurring specifically in the Village of Waddington. Local records indicate that ice jams have occurred on the St. Lawrence River.

5.7.4 Future Potential Impacts

Properties along St. Lawrence River and Sucker Brook remain vulnerable to ice jams. The frequency and magnitude of ice jam events may increase due to climate change.

5.8 Earthquake

5.8.1 Description

For a description of this hazard, please see Section 5.9 of the main body of the plan.

5.8.2 Hazard Vulnerability

The Village is moderately vulnerable to an earthquake, as documented in their hazard analysis in Section 4.1. An earthquake could impact any location within the Village, though historically, St. Lawrence County has not experienced significant earthquake damages. Earthquakes that damage the Village's critical infrastructure or emergency evacuation routes would result in the most significant impacts to the Village and its residents.

5.8.3 Historical Hazard Occurrences and Damage Estimates

According to the USGS Earthquake Catalog, there have been two earthquakes reported in St. Lawrence County between 2010 and 2021, none of which occurred in the Village of Waddington. An earthquake has the potential to cause hundreds of thousands of dollars in damages.

5.8.4 Future Potential Impacts

St. Lawrence County is within one of the most seismically active regions in New York State. Therefore, the Village remains susceptible to earthquakes.

5.9 Drought

5.9.1 Description

For a description of this hazard, please see Section 5.8 of the main body of the plan.

5.9.2 Hazard Vulnerability

The Village is moderately vulnerable to a drought, as documented in their hazard analysis in Section 4.1. The Village has a municipal water system that serves developed properties. Agricultural areas would experience the most significant impacts during droughts.

5.9.3 Historical Hazard Occurrences and Damage Estimates

The NCDC reports no specific drought events for the Village of Waddington or the rest of St. Lawrence County since 2010. The Village has not had any significant issues with their public water supply wells in the past five years, however, there have been instances of low yields in their wells that were close to becoming a concern.

5.9.4 Future Potential Impacts

The entire Village of Waddington remains susceptible to a drought event. Droughts are likely to increase in frequency and magnitude in the future due to climate change.

5.10 Infestation

5.10.1 Description

For a description of this hazard, please see Section 5.12 of the main body of the plan.

5.10.2 Hazard Vulnerability

The Village's overall vulnerability to an infestation is low, as documented in their hazard analysis in Section 4.1. The primary concern regarding an infestation in the Village of Waddington is the emerald ash borer, which was documented in St. Lawrence County in recent years. Forested areas with ash trees are vulnerable. The NYSDEC estimates that the total percentage of ash trees per total basal area ranges from about 7 to 30% in the Village of Waddington (Figure 5.13, Appendix A of the main body of the plan).

5.10.3 Historical Hazard Occurrences and Damage Estimates

The emerald ash borer has been detected in the Village of Waddington. The emerald ash borer is able to spread two miles per year on average, making it a hazard for surrounding municipalities as well. Areas where ash trees border roadways or utility lines pose the greatest damage potential. The St. Lawrence County Soil & Water Conservation District has estimated the cost of proactive emerald ash borer management countywide at over \$820,000 per year to keep up with anticipated spread.

5.10.4 Future Potential Impacts

The entire Village of Waddington remains susceptible to an infestation event. Proactive ash tree management will be critical to reduce impacts of the emerald ash borer on the Village.

6. National Flood Insurance Program

Long-term mitigation of potential flood impacts can be best achieved through comprehensive floodplain management regulations and enforcement at a local level. The National Flood Insurance Program (NFIP), regulated by FEMA, aims to reduce the impact of flooding on private and public structures by providing affordable insurance for property owners. The program encourages local jurisdictions to adopt and enforce floodplain management regulations in order to mitigate the potential effects of flooding on new and existing infrastructure (FEMA, 2015).

Communities that participate in the NFIP adopt floodplain ordinances. If an insured structure incurs damage costs that are over 50% of its market value, the owner must comply with the local floodplain regulations when repairing or rebuilding the structure. A structure could be rebuilt at a higher elevation, or it could be acquired and demolished by the municipality or relocated outside of the floodplain. Insured structures that are located within floodplains identified on FEMA's Flood Insurance Rate Maps (FIRMs) may receive payments for structure and content losses if impacted by a flood event.

The NFIP and other flood mitigation actions are important for the protection of public and private property and public safety. Flood mitigation is valuable to communities because it:

- Creates safer environments by reducing loss of life and decreasing property damage;
- Allows individuals to minimize post-flood disaster disruptions and to recover quicker (homes built to NFIP standards generally experience less damage from flood events, and when damage does occur, the flood insurance program protects the homeowner's investment); and
- Lessens the financial impacts on individuals, communities, and other involved parties (FEMA, 2015).

The Village of Waddington currently participates in the NFIP. As of October 2021, no NFIP loss claims have been filed in the Village. There are no repetitive loss properties in the Village. The Village will continue to comply with the NFIP by enforcing floodplain management requirements and regulating new development in Special Flood Hazard Areas, among other required duties.

7. Mitigation Strategy and Prioritization

7.1 Past, Completed, and Ongoing Initiatives

The Village proposed one mitigation action in the 2015 St. Lawrence County HMP, and its status is summarized in Table 8, below. The Village’s 2015 action was not re-included for the 2021 update.

Proposed Mitigation Action	Hazard(s) Mitigated	Goals and Objectives Met	Implementing Agency	Status
Develop standards and procedures for maintaining adequate road and debris clearing capabilities.	Ice storm	1,2,3	Village of Waddington Department of Public Works	Routine responsibility of DPW as well as fire department during an emergency; adequately addressed. No formal plan in place but not a high priority at this time.

7.2 Proposed Mitigation Actions

The Village proposed three new mitigation actions to be included in the HMP update. These actions are described in Table 9, below and on worksheets included in Attachment A.

Table 9. Proposed Hazard Mitigation Actions Village of Waddington									
Action ID	Mitigation Action	Hazard(s) Mitigated	Implementing Agencies (Lead* & Support)	Planning Mechanism	Timeframe	New or Existing Development	Estimated Cost	Funding Source(s)	Priority
Waddington V1	Reconstruct dock (REDI project) as a pier-supported structure to improve resiliency.	Flood, Ice Jam	Waddington Village Board*	Comprehensive Plan	5 years	Existing	\$3 million	NYS- REDI, Village Budget	1
Waddington V2	Install generator for Civic Center	All	Waddington Village Board*	Comprehensive Plan	5 years	Existing	\$30,000	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	2
Waddington V3	Install on-demand generators for wastewater treatment plant and for all sewage pump stations.	All	Waddington DPW*	Comprehensive Plan	5 years	Existing	\$100,000	Village Budget, NYSEFC- CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities	3
Potential Funding Sources DASNY SAM: https://www.dasny.org/about-us/what-we-do/grants-administration FEMA BRIC: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities NYSEFC CWSRF: https://efc.ny.gov/CWSRF NYS REDI: https://www.governor.ny.gov/programs/lake-ontario-resiliency-and-economic-development-initiative-redi USDA RD Community Facilities: https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program									

7.3 Cost-Benefit Analysis

Each of the Village's proposed mitigation actions were evaluated and prioritized using the STAPLEE cost-benefit analysis described in Section 7.2.3 of the main body of the plan. The Village's STAPLEE analysis (Table 10) is provided in Attachment A. The STAPLEE analysis considers the following lenses of evaluation: social, technological, administrative, political, legal, economic, and environmental. It also considers the level of overall costs and benefits of the actions.

Attachment A

Mitigation Action Worksheets and STAPLEE Table

Attachment A

Mitigation Action Worksheets and STAPLEE Table

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Waddington
------------------------------	-----------------------

Mitigation Action Worksheet

Project Name:	Reconstruct dock (REDI project) as a pier-supported structure to improve resiliency.
Project ID:	Waddington V1

Risk/Vulnerability

Hazard of Concern:	Flood, Ice Jam
Description of the Problem:	The Village owns 15 public docks on the St. Lawrence River (at the end of Main Street) that have been damaged by ice jams and ice flow. The docks also experienced damage related to recent high water events.

Action of Project Intended for Implementation

Description of the Solution:	Existing docks will be replaced with floating structures that are better able to accommodate fluctuating water levels. A breakwater/wave attenuator will also be constructed to protect the docks from wave action. The Village received \$750K in REDI funding for this project.
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Is this project related to a Critical Facility? Yes _____ No X

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	High	Estimated Benefits (losses avoided):	Reduced flood/ice jam damages to boat launch
Useful Life:	Long-term		
Estimated Cost:	\$3 million		

Plan for Implementation

Prioritization:	High	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	NYS- REDI, Village Budget
Responsible Organization:	Waddington Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Replace docks in-kind with no wave attenuation	High	Improves structural integrity of docks but does not mitigate potential damages from high water/wave action
	Replace docks with floating structures and install a wave attenuator/ breakwater	\$3 million	Most comprehensive solution to protect Village docks from flood damages

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Waddington
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Mitigation Action Worksheet

Project Name:	Install generator for Civic Center
Project ID:	Waddington V2

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Civic Center is a critical community facility that lacks a backup generator, and remains vulnerable to power outages during emergencies.

Action of Project Intended for Implementation

Description of the Solution:	Install generator at Civic Center to ensure continuity of operations during emergency events with sustained power outages.
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Is this project related to a Critical Facility? Yes X No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Waddington Village Board*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Village facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the Civic Center	\$30K	Offers maximum protection for Civic Center

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

**St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan
Hazard Mitigation Action Worksheet**

Name of Jurisdiction:	Village of Waddington
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Mitigation Action Worksheet

Project Name:	Install on-demand generators for wastewater treatment plant and for all sewage pump stations.
Project ID:	Waddington V3

Risk/Vulnerability

Hazard of Concern:	All
Description of the Problem:	The Village's WWTP and pump stations currently rely on a portable generator, which requires additional coordination and planning for use during emergency events. Additionally, all facilities cannot be powered at once.

Action of Project Intended for Implementation

Description of the Solution:	Install on-demand generators at the WWTP and sewage pump stations to reduce interruptions in critical services during emergency events.
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Is this project related to a Critical Facility? Yes No

(If yes, this project must intend to protect to the 500-year flood event or the actual worst damage scenario, whichever is greater.)

Level of Protection:	Medium	Estimated Benefits (losses avoided):	Improved continuity of operations
Useful Life:	Long-term		
Estimated Cost:	\$30K		

Plan for Implementation

Prioritization:	Medium	Desired Timeframe for Implementation:	5 years
Estimated Time Required for Implementation:	5 years	Potential Funding Sources:	Village Budget, NYSEFC- CWSRF, DASNY- SAM, FEMA- BRIC, USDA RD - Community Facilities
Responsible Organization:	Waddington DPW*	Local Planning Mechanisms to be used in Implementation, if any:	Comprehensive Plan

Three Alternatives Considered (Including No Action)

	Action	Estimated Cost	Evaluation
Alternatives:	No Action	\$0	No change from existing conditions
	Purchase portable generator to share between multiple Village facilities	\$10K	More flexible option as portable units can be used at different facilities when needed, but may not power entire facility and requires more coordination for usage.
	Install on-demand generator at the WWTP and pump stations	\$100K	Offers maximum protection for sewer system facilities

Progress Report (for Plan Maintenance)

Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Table 10. STAPLEE Analysis of Proposed Mitigation Actions

Action ID	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Easily implemented?	Multiple objectives achieved?	Quickly implemented?	Overall Benefits	Overall Costs	Priority Rank
Waddington V1	+	+	+	+	+	-	+	0	+	+	High	High	1
Waddington V2	+	+	+	+	+	0	0	0	+	0	Medium	Medium	2
Waddington V3	+	+	+	+	+	-	0	0	+	0	Medium	High	3

Appendix C
Meeting Summary

Appendix C

St. Lawrence County Hazard Mitigation Plan Update Process Meeting Details

HMP Update Mitigation Planning Committee

The Mitigation Planning Committee is comprised of key County representatives, including staff from the Office of Emergency Services, Planning Office, and Highway Department, whose task is to aid the consultant team in identifying key stakeholders, distribute data, and facilitate meetings and outreach. Support from the St. Lawrence County Legislature was also instrumental during the planning stages of the project.

- Matthew Denner – Director, St. Lawrence County Office of Emergency Services
- Jason Pfothenauer – Director, St. Lawrence County Planning Office
- Heidi Ames – Grants Manager, St. Lawrence County Planning Office
- Donald Chambers – Superintendent, St. Lawrence County Department of Highways
- Ian Hazen – St. Lawrence County Department of Highways
- John Condino – Senior Project Manager, Barton & Loguidice, D.P.C.
- Johanna Duffy – Senior Managing Environmental Scientist, Barton & Loguidice, D.P.C.
- Grete Day – Staff Environmental Scientist, Barton & Loguidice, D.P.C.

The meetings held as part of the plan update process are summarized on the following pages, along with lists of attendees.

Monthly Mitigation Planning Committee Meetings

January 2021-January 2022

Zoom

The Mitigation Planning Committee met monthly from January to October 2021, and again in January 2022. Meeting dates are listed below. Minutes detailing attendees and items discussed during each meeting are provided on the following pages.

- January 14, 2021
- February 11, 2021
- March 11, 2021
- April 8, 2021
- May 13, 2021
- June 10, 2021
- July 8, 2021
- August 12, 2021
- September 9, 2021
- October 7, 2021
- January 6, 2022

St. Lawrence County Hazard Mitigation Plan Update Process

County Kick-off Meeting Minutes January 14, 2021, 1:00 PM

Attendees:

- Matthew Denner, County Emergency Services
- Heidi Ames, County Planning Department
- Jason Pfothauer, County Planning Department
- Donald Chambers, County Highway Department
- Ian Hazen, County Highway Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Project Contract
 - Matt indicated that the contract is finalized with the State.
 - It was confirmed that B&L will complete quarterly reports, and that the next report is due Friday, January 15th.
- Confirm Planning Committee Members
 - It was confirmed that the current meeting invitees will make up the Planning Committee, with the exception of Dylan Soper and Rick Johnson.
- Confirm Stakeholders
 - Jason suggested removing all County departments listed except for Planning, Emergency Services, Highway, and the Legislature/Administration. The County can coordinate with other departments throughout the HMP Update process as needed, but they won't have a large role in the project.
 - Heidi indicated that Soil & Water should also remain on the stakeholder list.
 - Jason asked whether adjacent Counties typically provide any comments on HMP updates.
 - B&L indicated that we have not received substantial comments back from adjacent Counties on other projects, however, it is a State requirement that they are included.

- It was discussed that local telecommunication companies should be added to the stakeholder list.
 - Matt indicated that St. Lawrence Gas Company is now Liberty Utilities.
 - The addition of local school districts to the stakeholder list was discussed. Since BOCES covers all school districts, it was decided that there is no need to include individual districts.
- Jurisdiction Participation
 - Don suggested that County legislators could introduce the project to each jurisdiction when they attend upcoming board meetings, before B&L begins direct outreach.
 - B&L would provide a brief introduction to the Legislature Operations Committee, and prepare materials for legislators to bring to jurisdiction board meetings.
 - It was decided that formally documenting each jurisdiction's intent to participate (or not participate) in the project would be beneficial. Completion of participation forms could be facilitated by the legislators when they attend local board meetings, or when B&L meets with each jurisdiction.
 - Jason suggested providing an example of which staff should participate on the local hazard mitigation planning teams referenced on the participation form. Members will vary by jurisdiction.
 - Johanna suggested that the form should specify that the Kickoff Meeting will be virtual.
- Jurisdiction Meeting Approach
 - It was discussed that the initial Participant/Stakeholder Kickoff Meeting, along with initial jurisdiction meetings, will be held virtually given COVID restrictions.
 - John asked whether the County was aware of any jurisdictions that do not have virtual meeting capabilities. No issues were identified.
- Hazard Analysis
 - Grete asked whether the County has completed a County Emergency Preparedness Assessment (CEPA) that could be used in lieu of the 2013 HIRA.
 - Heidi indicated that at least one CEPA has been completed since 2013. The Planning Committee agreed to reference the CEPA for the HMP Update risk assessment instead of the 2013 HIRA.
 - Grete asked whether the County would like to focus the HMP Update on natural hazards only, since FEMA and NYS DHSES only focus on natural hazards; Johanna clarified that hazard mitigation funding is only available for natural hazard-related actions, so including technological/human-caused hazards in the HMP Update does not significantly benefit the County.

- Heidi mentioned that the County does have concerns with selected technological and human-caused hazards, primarily related to agricultural activities (such as manure spills). However, such hazards may be better addressed in a separate plan, since they are more closely related to emergency response rather than hazard mitigation.
- Jason suggested removing Tsunami from the hazard list.
- Matt asked whether focusing on natural hazards for the HMP Update would affect the technological/human-caused hazards profiled in the original HMP.
 - Johanna indicated that the original HMP would remain as-is, and that we could include a brief description of technological/human-caused hazards in the HMP Update, but indicate that they were not further analyzed.
- The Planning Committee agreed that the HMP Update should focus on natural hazards.
- Grete mentioned that the County will need to request National Flood Insurance Program repetitive loss property data from FEMA.
 - Johanna indicated that severe repetitive loss data appears to be publicly accessible, however, no records are shown for St. Lawrence County.
 - Matt and Jason indicated that there are probably not many repetitive loss properties within the County.
 - Matt indicated that flooding issues are primarily associated with the St. Lawrence River and ice jams, and that the City of Ogdensburg experiences the most flood events.
 - Matt suggested that issues related to low water conditions be considered in the HMP Update.
 - Matt mentioned that he has a lot of flood-related data available that he can share with B&L.
- Project Schedule
 - The Planning Committee discussed incorporating the Legislature Operations Committee Meeting and subsequent jurisdiction board meetings into the project schedule, in advance of the initial Kickoff Meeting.
 - These meetings would add approximately two months to the proposed schedule, but the Planning Committee agreed that this addition would likely result in better local participation.
 - Johanna asked what the County's State contract deadline is, in order to determine whether the County needs to request an extension at this time. Matt indicated that he would confirm.
 - Johanna suggested holding monthly Planning Committee Meetings rather than bimonthly, given the aggressive schedule.
- Other
 - Johanna mentioned that the HMP Update process will require several press releases, and plan documents should be added to the County's website.

Action Items:

1. B&L to complete quarterly report by 1/15.
2. B&L to update stakeholder list, schedule, and jurisdiction participation form per Planning Committee comments.
3. B&L to draft an introductory letter to be sent to jurisdictions and other stakeholders.
4. Heidi to confirm when the County's last CEPA was completed.
5. Matt to confirm whether B&L can be added to the February 8th Operations Committee Meeting agenda to introduce the project.
6. B&L to provide introductory information for Operations Committee Meeting
7. Matt to confirm whether a legislator will be appointed to the project in order to provide regular updates to the Board.
8. Matt to confirm State contract deadline to determine whether an extension request is required.
9. Matt to send existing flood data to B&L.
10. B&L to review available flood data to determine what needs to be requested from FEMA.
11. Next Committee Meeting is scheduled for February 11, 2021 at 1:00 PM.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes February 11, 2021, 2:00 PM

Attendees:

- Matthew Denner, County Emergency Services
- Heidi Ames, County Planning Department
- Jason Pfothhauer, County Planning Department
- Donald Chambers, County Highway Department
- Ian Hazen, County Highway Department
- Johanna Duffy (B&L)
- Grete Day (B&L)

Items Discussed:

- Data received
 - B&L received the NYSDEC CAV/CAC data from NYS DHSES. B&L will research this data in order to see how best to incorporate it into the HMP update.
- February Operations Committee Meeting
 - Johanna and John provided a brief overview of the project at the County Legislature Operations Committee meeting on 2/8/21. Matt and Jason will continue to keep the legislators up to date on the project.
- FEMA Flood Risk Study
 - Several committee members attended the FEMA Flood Risk Study kick-off meeting held by FEMA and STARR II. It was discussed that although digital floodplain mapping would not be available to reference for the current HMP update, some of the initial information FEMA is gathering from local communities will overlap with our data needs.
 - The committee discussed potential hydraulic studies that may have been completed for REDI projects in St. Lawrence County (this came up during the flood study kick-off meeting).
 - B&L is working with the County on the REDI project in Morristown. It is unlikely that a detailed hydraulic study was completed for this project, but B&L will confirm.
 - The REDI contact for St. Lawrence County is a former legislator, so they may be able to provide more information.

- Jurisdiction Outreach Process
 - It was decided that introductory letters should be sent out before the Jurisdiction Kick-off Meeting.
 - B&L will update the draft jurisdiction outreach letter and provide to the Committee for review. The letters will be sent out via email and hard copy by the end of February.
 - Johanna indicated that the legislators asked to be kept informed of individual jurisdiction meeting dates, so that they can attend if they are able.
 - The current stakeholder list is missing some contact information – Committee to review and update as they are able.
- Jurisdiction Kick-off Meeting
 - Johanna suggested that the kick-off meeting be held over Zoom, and that we could offer two separate time slots to accommodate the most attendees.
 - The Committee selected 3/17 from 2-3pm and 3/18 from 6-7pm for the Jurisdiction Kick-off Meetings. These meeting dates and times and Zoom meeting information will be included in the jurisdiction's introductory letters.
 - Jason and Matt will let the County Legislature know of the upcoming Jurisdiction Kick-off Meeting dates during the 3/8 Operations Committee meeting.
- Stakeholder/Public Information Meeting #1
 - The Committee decided that a separate meeting should be held to introduce the project to additional stakeholders and the public. This can also be held over zoom, and will be scheduled at a later date, after the Jurisdiction Kick-off Meetings.
 - A separate mailing will be prepared for stakeholders.
 - Don indicated that the County should publish a formal public information meeting announcement in their official paper.
 - Don and Jason mentioned that we are unlikely to receive much public input. B&L agreed based on previous experiences.
 - Jason asked whether the Public Information Meeting would be held in-person or virtually. Johanna confirmed that it would be held over Zoom.
- Data Needs
 - Matt confirmed that he has the 2018 CEPA document and password, and can provide to B&L.
 - Johanna mentioned that the County will need to request the NFIP Repetitive Loss and Severe Repetitive Loss data directly from FEMA. B&L will determine the appropriate FEMA contact for the County to reach out to regarding this information. A non-disclosure agreement may be required for use of this data, per a prior discussion with Kevin Clapp (NYS DSHES).

- Quarterly Reporting
 - Johanna mentioned that B&L will prepare each quarterly report. B&L will connect with Matt before the next report is due to prepare. B&L will draft the report and provide to Matt for signature and County expenditure information additions; County to submit to DHSES.
- Other
 - Don received an email regarding Hamilton County's HMP update, and Heidi mentioned that she received a similar email in the past regarding Franklin County's HMP update.
 - Jason asked how St. Lawrence County should respond to the adjacent counties' requests.
 - Matt indicated that he coordinates closely with Hamilton County EMS agencies.
 - Johanna clarified that the adjoining counties would primarily be interested in any hazard concerns or ideas for mitigation actions along their adjoining boundaries, or information pertaining to shared services. Outreach to adjacent counties is required for the HMP update.
 - Counties adjacent to St. Lawrence are included on the Stakeholder list and will be included in future rounds of outreach.

Action Items:

1. B&L to update stakeholder letter for committee review. Committee members to provide comments. Final version to be sent out by end of February (hard copy and via email) to all jurisdictions.
2. Jason and Heidi to review and update jurisdiction and stakeholder contact information table.
3. Jason to provide legislator contact information and map of district coverage.
4. Matt to send 2018 CEPA to B&L.
5. B&L to determine the appropriate FEMA contact for NFIP Repetitive Loss/Severe Repetitive Loss data request.
6. B&L to confirm that no hydraulic modeling was completed for the Morristown REDI project.
7. Next Committee Meeting is scheduled for March 11, 2021 at 2:00 PM.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes March 11, 2021, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Heidi Ames, County Planning Department
- Jason Pfothauer, County Planning Department
- Donald Chambers, County Highway Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Progress
 - Jurisdiction letters sent out (10 participation forms received so far).
 - B&L reviewed FEMA HAZUS software; output seems limited with current software version; new version anticipated May 2021.
 - Matt and Jason discussed the upcoming jurisdiction kickoff meeting at the 3/8 Operations Committee meeting.
 - Johanna asked how the committee would like to share the kickoff meeting information with the Legislature. Matt offered to forward the original email invitations with the Zoom meeting details.
- Jurisdiction Outreach
 - B&L will begin reaching out to jurisdictions after the kickoff meeting to set up individual meetings. We will start with those who have returned their participation forms.
 - B&L will share the jurisdiction meeting schedule with the committee if any County staff would like to attend the individual meetings for particular jurisdictions.
- Jurisdiction Kickoff Meetings
 - Grete reviewed the draft meeting presentation.
 - Matt or Jason (or anyone from County) will introduce the project committee.
 - Matt suggested adding a link to the current HMP document on the County website to the presentation.

- Johanna suggested adding a list of the natural hazards to the presentation.
 - B&L will finalize the presentation and send out a PDF with Zoom meeting reminders to all jurisdictions via email by 3/16.
- Stakeholder/Public Information Meeting #1
 - The Committee decided to target the week of 4/12 or 4/19 for the stakeholder/public information meeting.
 - Johanna asked what the committee thought about how best to publicize the meeting in addition to a press release or public notice.
 - Jason suggested that we mention the upcoming stakeholder/public meeting during the jurisdiction kickoff meetings, send an email to jurisdiction/stakeholder contacts, and post the meeting information on the County website.
 - Matt confirmed that if B&L drafts a press release for the stakeholder/public meeting, the County can handle publication process.
 - Johanna asked whether the Committee would like to schedule two meetings (similar to the jurisdiction kickoff) or just one.
 - Matt suggested waiting to see what the turnout is like for the jurisdiction kickoff meetings, and go from there.
- Data Needs
 - Matt reviewed the draft FEMA data request letter and authorized B&L to send out on the County's behalf.

Action Items:

1. B&L to send FEMA NFIP data request letter on County's behalf.
2. Matt to forward kickoff meeting information to Legislature.
3. Jason or Matt to ask Ruth Doyle (County Administrator) to remind Legislature of project kickoff meetings at 3/15 Services Committee meeting.
4. B&L to finalize kickoff meeting presentation and send out with Zoom meeting reminder by 3/16.
5. B&L to draft press release for Stakeholder/Public Information Meeting.
6. County to coordinate Stakeholder/Public Information Meeting press release publication.
7. Next Committee Meeting is scheduled for April 8, 2021 at 2:00 PM.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes April 8, 2021, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Heidi Ames, County Planning Department
- Donald Chambers, County Highway Department
- Ian Hazen, County Highway Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Progress
 - Jurisdiction kickoff meetings completed and 12 individual meetings are scheduled to date.
 - FEMA NFIP data requests submitted by County and B&L – still waiting on data.
 - Johanna asked about the best approach for notifying Legislators of upcoming jurisdiction meetings within their District. The committee discussed sending an initial email (coming from the County) to all Legislators to notify them of jurisdiction meeting invitations to come.
- Jurisdiction Outreach
 - Grete reviewed the current jurisdiction meeting schedule and discussed the information to be covered during each meeting. B&L will follow up with jurisdictions after their meetings, as needed, to fill remaining data holes.
 - B&L will share the jurisdiction meeting schedule with the committee as it is updated.
- Stakeholder Kickoff/Public Information Meeting #1
 - The committee discussed holding two sessions for the stakeholder/public meeting (afternoon and evening) on the same date, to better accommodate varying work schedules. B&L will review schedules and propose potential date and time options (targeting early May).

- B&L will draft a press release and an invitation email with the Zoom meeting information once a date is chosen. Don will coordinate press release publication.
 - The committee discussed how to disseminate the Zoom meeting information in a press release. Don suggested asking the County IT department if it would be possible to set up an online registration, so people could automatically receive the meeting information after they sign up. Don will look into this option with IT.
 - B&L will coordinate with Matt to obtain a list of local fire department contacts to add to the stakeholder list.
- NYS DHSES Quarterly Report
 - Grete reviewed the DHSES quarterly report and planning activities spreadsheet with the committee.
 - Matt confirmed that he will sign the report and B&L can submit to DHSES.
- Natural Hazard Review
 - The committee reviewed the natural hazard list alongside the 2018 CEPA results, and selected natural hazards to profile for the County in the HMP update.
 - Don mentioned that Brasher has experienced ice jam issues in the past, particularly near their wastewater treatment plant. B&L will discuss this with the Town and incorporate into their annex.

Action Items:

1. Heidi to send email to Legislature to notify them of upcoming meeting invitations.
2. B&L to include Legislators on jurisdiction meeting invitations within their District.
3. B&L to send committee an updated jurisdiction meeting schedule as new meetings are scheduled.
4. B&L to request local fire department contacts from Matt.
5. B&L to propose two date options for Stakeholder/Public Information Meeting, and draft invitation email and press release.
6. Don to ask County IT department if we could set up an online registration for the Stakeholder/Public Information Meeting.
7. B&L to complete DHSES quarterly report and provide to Matt for review and signature.
8. Next Committee Meeting is scheduled for May 13, 2021 at 2:00 PM.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes May 13, 2021, 2:00 PM

Attendees:

- Jason Pfothenauer, County Planning Department
- Heidi Ames, County Planning Department
- Donald Chambers, County Highway Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Jurisdiction Participation
 - Grete and John provided a summary of jurisdiction meetings completed/scheduled to date. As of 5/13, 12 individual meetings have been completed, and 6 more are scheduled.
 - The individual meetings continue to be efficient and valuable. B&L hopes to complete the remaining meetings by the end of July.
- Stakeholder Kickoff/Public Information Meeting #1
 - The committee chose Tuesday, June 8th for the stakeholder/public information meeting sessions. Two sessions will be offered to accommodate varying schedules (2pm and 6pm).
 - The committee discussed meeting invitation strategies. Heidi suggested that we ask members of the public to contact her directly to register, rather than setting up a registration page on the County website. This information will be included in the press release and on the County website. Zoom information for both sessions will be emailed directly to stakeholder contacts (no need to pre-register).
 - B&L will modify the press release and provide to the Committee for publication (County has the press list for distribution).
 - B&L will set up the Zoom meetings and email the information to stakeholders.
 - The stakeholder/public meeting will be announced at the June 7, 2021 County Legislature meeting.

- Natural Hazard Review
 - The committee completed the natural hazard ranking exercise for the selected hazards to be profiled in the HMP update.
 - The committee discussed asking National Grid about ice accumulation threshold for overhead utility line damage/power outages. This question will be discussed with utility companies who attend the stakeholder meeting sessions.
 - The committee discussed that most flooding issues countywide are related to beaver dams.

- 2015 Data Updates
 - The committee reviewed the County's capability assessment and critical facility list from the 2015 HMP.
 - B&L will send out these documents for review, and the committee members will mark up with changes.

Action Items:

1. B&L to send committee an updated jurisdiction meeting schedule as new meetings are scheduled.
2. B&L to finalize press release and send out stakeholder meeting invitation email.
3. Don and Heidi to coordinate press release publication.
4. B&L to send County capability assessment table and critical facility list to the committee for review.
5. Matt or Jason to remind legislature of Stakeholder/Public Meeting during 6/7 Legislature Meeting.
6. Next Committee Meeting is scheduled for June 10, 2021 at 2:00 PM.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes June 10, 2021, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Jason Pfothenhauer, County Planning Department
- Heidi Ames, County Planning Department
- Donald Chambers, County Highway Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Stakeholder/Public Meeting Summary
 - Johanna provided an overview of participation and discussion at the public meetings. Attendance was better at the afternoon session. The National Weather Service (NWS) attended both sessions and provided significant input related to natural hazard analysis.
 - Don raised concerns regarding Robin McClellan's (Town of Stockholm) comments at the stakeholder meeting regarding funding potential for mitigation projects. Don suggested that we communicate clearly with jurisdictions regarding the HMP process and what to expect.
 - Heidi indicated that she followed up with Robin after the meeting; he supports the project overall. A shared services agreement with the County may be beneficial to help Stockholm and other jurisdictions make progress with mitigation projects.
 - Heidi suggested that during the HMP update process, similar mitigation actions should be tracked so that the County can better assist jurisdictions moving forward.
- Jurisdiction Participation
 - Grete provided a summary of jurisdiction meetings completed/scheduled to date. As of 6/10, 21 individual meetings have been completed, and the Town of Fowler is scheduled for 6/21.
 - Grete will continue to follow up with the remaining jurisdictions to schedule their meetings. The County offered to assist with outreach, if needed, to get jurisdictions on board with the plan update.

- Natural Hazard Analysis Review
 - During the stakeholder/public meeting sessions, the NWS suggested differentiating high wind events from severe storms/tornado events due to the difference in onset and duration. The committee discussed and elected to keep severe storm/wind/tornado as a single hazard for the purposes of ranking (severe storm should remain as the top-ranked hazard). Each type of storm event will be discussed in further detail in the HMP narrative.
 - Extreme temperature events, particularly heat waves, were discussed in detail during the stakeholder/public meeting sessions with the NWS and other attendees. The committee elected to move extreme temperatures up on the overall ranking list as it is expected that this hazard will result in more significant impacts going forward.
 - The committee discussed that extreme temperature events are likely more impactful than flooding.
 - Matt indicated that ice jams pose more issues than flooding throughout the County. Most residents are well prepared for flood events.
 - Don mentioned that beaver dams are often the cause of flooding on County roadways.
 - The committee adjusted the scores for extent, onset, impact, and frequency for several hazard events (extreme temperatures, flood, and ice jam) to update the overall hazard ranks.
- Vulnerable Populations
 - Johanna asked how the County communicates with vulnerable populations (elderly individuals, Amish).
 - Matt indicated that the Office for the Aging has a list of elderly clients, and outreach is made during extreme temperature events and other emergencies. Meals on Wheels volunteers also check in on clients. If contact cannot be made, law enforcement or EMS is asked to check on people.
 - The County has a program to provide fans to residents during heat waves if needed.
 - Matt indicated that the County also has an updated list of people who are on life support at home, so that outreach can be made if needed.
 - The committee discussed that the Town of DePeyster likely has the largest Amish population, and the Town of Lawrence is seeing an increase of Amish residents as well.
 - The County has a list of Amish Bishops for communication purposes. The County has distributed fliers to Amish populations in the past. Jason indicated that overall, the Amish are resilient (they don't have electricity). Matt mentioned that many Amish individuals also have access to cell phones.
- Heating/Cooling Center Locations
 - Johanna asked whether the County would like to include a list of designated heating/cooling center locations in the HMP update.
 - Matt indicated that the County's heating and cooling centers are same as the Red Cross emergency shelter locations. The list of sites is not shared publicly, but generally includes school facilities that have showers, bathrooms, and food supplies.

- The County currently stores beds and bedding in private storage facilities, and is looking for funding to purchase storage trailers. The trailers would be placed on municipal property throughout the County, so they would be more readily accessible.

Action Items:

1. B&L to draft meeting notes for both stakeholder/public meeting sessions.
2. Heidi to confirm whether the Town or Village of Hammond reached out to the County Planning Dept. regarding the recent HMP email from B&L.
3. B&L to send updated hazard list to committee for review.
4. County to provide list of recent (since 2015) and planned development (B&L to provide worksheet).
5. Next Committee Meeting is scheduled for July 8, 2021 at 2:00 PM.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes July 8, 2021, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Jason Pfothenhauer, County Planning Department
- Donald Chambers, County Highway Department
- Johanna Duffy (B&L)
- Grete Day (B&L)

Items Discussed:

- Jurisdiction Participation
 - Grete provided a summary of jurisdiction meetings completed/scheduled to date. As of 7/8, 23 individual meetings have been completed and one was scheduled for 7/9 (Town of Fowler).
 - Grete will continue to follow up with the remaining jurisdictions to schedule their meetings. A list of jurisdictions requiring outreach assistance from the County will be prepared for the August committee meeting.
- DHSES Quarterly Report
 - Third Quarter report due to DHSES by July 15, 2021
 - B&L to send draft report to Matt and Tammy for final review, signature, and submission
- Mitigation Actions
 - The committee reviewed the mitigation actions included for the County in the 2015 HMP and discussed status updates. The committee determined which actions should be revised and re-included for the HMP update.
 - The committee discussed documenting the Morristown Bridge REDI project in the plan update as an additional mitigation project that is underway.
 - The committee discussed the Coastal Lakeshore Economy and Resiliency (CLEAR) Initiative. St. Lawrence County will be developing a joint CLEAR Plan with Jefferson County under this program, which will take approximately 2 years to complete. The CLEAR program will be documented in the HMP update.
- Other
 - Johanna asked whether the County has received the repetitive loss and severe repetitive loss flood data from FEMA. Matt said he has not received anything yet.

Action Items:

1. Grete to send the revised 2015 mitigation action status table to the committee for review.
2. County to provide list of recent (post-2015) and planned developments.
3. Don to provide list of bridges on flood watch list that have scour concerns, overtop, flooding issues to include in new mitigation actions.
4. Next Committee Meeting is scheduled for August 12, 2021 at 2:00 PM. Focus on establishing HMP goals and discussing new mitigation actions to be proposed in HMP Update.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes August 12, 2021, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Jason Pfothenhauer, County Planning Department
- Donald Chambers, County Highway Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Jurisdiction Participation
 - Grete provided a summary of jurisdiction meetings completed/scheduled to date. As of 8/12, 26 individual meetings have been completed with two additional meetings scheduled for 8/18 (Towns of Oswegatchie and Parishville).
 - Grete will provide a list of the ten jurisdictions requiring outreach assistance from the County.
- Mitigation Actions
 - The committee reviewed the revised 2015 mitigation actions to be re-included for the plan update and discussed possible new actions to include.
 - Don and Jason mentioned that the flooding issues in the Village of Canton result from the inadequate stormwater drainage system. Multiple County buildings and nearby residences on Judson Street experience recurring flooding issues during heavy rain events.
 - Don mentioned that the stormwater outfall in the railroad right-of-way isn't routinely maintained by the railroad which may cause some issues.
 - The committee decided to include a stormwater capacity analysis (envision County taking the lead and Village of Canton assisting) as a new mitigation action. The analysis should focus on the area between Court St/Judson St and the Grass River.
 - The committee discussed including coordination with the railroad (and formal documentation of outreach) regarding stormwater outfall maintenance as a second new mitigation action. Don mentioned that the County highway

department has offered to assist with maintenance in the past, but communication can be difficult.

- The committee discussed the cross-town canal flooding issues in the Village of Potsdam, and that the Village has received some funding for improvements. The Village included improvements to the cross-town canal as one of their mitigation actions for the plan update.
- Don mentioned that most other flooding issues along County highways are related to beaver dams. The County has an agreement with the USDA Animal and Plant Health Inspection Service (APHIS) to manage beaver populations. Don mentioned the following recent improvements along County highways related to flooding issues (most recurring issues have been addressed):
 - Portions of County Route 3 and County Route 10 were raised
 - A new upsized culvert was installed on County Route 50
- Don mentioned that rockslides occasionally occur along County Route 11/Rock Island Rd. The County removed loose rock in this area a few years ago. The angle of the rock cuts facing the road would need to be reduced to mitigate this issue, which would require the County to increase their right-of-way width.
- Don mentioned that the Winthrop/Brasher area commonly has ice jams, which have impacted the Town of Brasher's WWTP and a nearby campground. Ice has also almost damaged the County Route 41 bridge.
- Matt mentioned that ice jams typically occur along the entire length of the St. Regis River including through Brasher.
- Matt indicated that the water level in Brandy Brook in the Village of Waddington was very low this year, which exposed water intake pipes.
- Jason mentioned that the state blasted ice jams last year in Colton/St. Regis River.
- Don mentioned the Maple Ridge Rd slope failure along the St. Regis River
- Don suggested including replacement of the County Route 49 bridge over the St. Regis River as a new mitigation action. The bridge is in poor condition and carries a Liberty Utilities gas main. The County would like to remove the pier and create a single-span structure. Don mentioned that the County will apply for Bridge NY funding through NYSDOT for this project.
- Don brought up flooding issues in Chippewa Bay (Hammond). A stream often floods before it reaches the culverts at State Route 12 and County Route 6.
 - Jason asked if this issue might be related to the high water levels in Chippewa Bay and if there may be potential for resiliency funding, but Don confirmed this issue was more related to storm events.
- Matt mentioned that a few Towns opened cooling centers this week. Cooling centers are more of a local coordination need, not much action to take at County level.
- Other
 - Johanna asked committee members to share any recent natural hazard-related photos to include in the plan update.
 - The committee will review mitigation goals at the September meeting.

- FEMA is offering a webinar on September 13th at 2pm to provide an update on the flood risk study.

Action Items:

1. Grete to send a list of the municipalities requiring County outreach to the committee.
2. Grete to draft worksheets detailing the revised 2015 and new County mitigation actions.
3. B&L to provide County's 2015 HMP Goals and an example of updated goals for review.
4. Next Committee Meeting is scheduled for September 9, 2021 at 2:00 PM. Focus on updating HMP goals.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes
September 9, 2021, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Heidi Ames, County Planning Department
- Donald Chambers, County Highway Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Jurisdiction Participation
 - Grete provided a summary of jurisdiction meetings completed and scheduled to date. One new meeting (Town of Lisbon) is scheduled for 9/15.
 - The committee reviewed the list of remaining jurisdictions who have not responded yet or who have made contact but have not scheduled a meeting.
 - Heidi mentioned that Larry Denesha reached out to the Village of Richville encouraging them to participate in the plan update.
 - The committee discussed that having communities adjacent to the St. Lawrence River and major tributaries is most important.
 - B&L has made contact with the City of Ogdensburg, Town of Clifton, Town of Hammond, Town of Norfolk, Town of Russell, Town of Waddington, and Village of Waddington, but no meetings have been scheduled yet. B&L will follow up with phone calls to these communities the week of 9/13.
 - If no response, the committee will ask Larry Denesha to reach out to the Towns of Clifton and Russell.
 - Matt offered to reach out to the Town and Village of Hammond if no response.
 - Don indicated that he can reach out directly to Tim White (Town of Russell Supervisor) if no response to B&L outreach.
 - Don also mentioned that the Town of Norfolk Supervisor's email was hacked recently, so it would be best to call them.
 - Heidi asked what the consequences were for communities who do not participate in the plan update. The only drawback is that non-participating municipalities would not be

eligible for Building Resilient Infrastructure and Communities (BRIC) funding from FEMA. There are no consequences for the County.

- Mitigation Action Review
 - The committee began reviewing the draft mitigation action worksheets. Discussions related to specific actions are summarized below.
 - SLC 1: Continue coordination with FEMA for digital FIRM project and disseminate new FIRM data once available.
 - Don asked what the consequences are for existing properties if their floodplain status changes due to the new FEMA study. The committee discussed that properties with active mortgages and any new development in mapped floodplains would be subject to flood insurance requirements.
 - Johanna mentioned that it is very difficult to obtain flood insurance in municipalities that do not participate in the National Flood Insurance Program (NFIP). The County may want to consider adding a mitigation action to encourage communities to join the NFIP over the next 5 years if they do not currently participate.
 - Heidi emphasized that the availability of digital floodplain mapping would be a significant benefit to the County. The floodplain extents on the existing FIRMs are difficult to interpret due to the scale at which they were developed.
 - SLC 2: Develop a plan to inspect County zones on a regular basis and complete routine debris management to proactively address problem areas.
 - Don asked if B&L has any similar plans from other communities that the County could use as an example. Johanna indicated that B&L could provide an example.
 - SLC 3: Install larger fuel tanks at the County Highway facility in the Town of Canton.
 - Don mentioned that two outpost County highway facilities are under construction (and a third facility will be built next year); could consider adding more fuel storage capacity in these locations as well. This would add backup fueling centers to take pressure off the Canton location.
 - SLC 4: Identify and replace or reinforce deficient and vulnerable bridges within the County.
 - Don mentioned that the highway department has an approved protocol in place for prioritizing bridge replacement projects.
 - Don mentioned that bridges with scour issues tend to be those built on soil without piles or on bedrock. The committee discussed re-framing this action to focus more on identifying specific structures.

- Don mentioned that two vulnerable structures are the County Route 27 bridge over the Oswegatchie River at State Highway 3 and the Furnace Street (County Route 38) bridge in Norfolk, but there are multiple complicating factors in progressing these projects, especially Furnace Street. The committee decided not to include specific actions for replacement of these structures in the plan update.

Action Items:

1. Grete to call selected municipalities (those who have responded but have not scheduled a meeting) and coordinate final outreach assistance needs with the County, if needed.
2. Grete to revise draft mitigation action worksheets based on today's discussion. Committee to review all mitigation action worksheets.
3. B&L to provide County's 2015 HMP Goals and an example of updated goals for review.
4. Next Committee Meeting is scheduled for October 7, 2021 at 2:00 PM. Focus on reviewing remaining mitigation action worksheets and updating HMP goals.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes
October 7, 2021, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Jason Pfothauer, Planning Department
- Heidi Ames, County Planning Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- Jurisdiction Participation
 - Grete provided a summary of jurisdiction meetings completed and scheduled to date. One meeting (Village of Waddington) is scheduled for 10/14.
 - John reported that he spoke with the Town of Clifton, and he will coordinate with Nancy Russell and Chuck Hooven.
 - The committee reviewed the list of remaining jurisdictions who have not responded yet or who have made contact but have not scheduled a meeting.
 - Larry Denesha reached out to the Village of Richville and Town of Lawrence to encourage them to participate in the plan update. Both municipalities expressed interested and indicated they would reach out to B&L, however, neither has responded yet (as of 10/21).
 - Grete left a voicemail for the Town of Clare supervisor after Matt spoke with him, but no response yet.
 - The Towns of Madrid and Pitcairn have not responded to any outreach efforts to date.
 - Unless meetings are scheduled while the plan is being drafted, the Towns of Clare, Clifton, Lawrence, Madrid, and Pitcairn and the Village of Richville will be considered non-participants for the plan update.
- Mitigation Actions
 - Heidi asked if the Committee should reach out to other County departments for input on mitigation actions for the plan update. She spoke with Buildings and Grounds and they didn't have any additional input.

- John asked if Ruth Doyle's office should be involved. Jason mentioned that Ruth has been involved in the process to date and she would likely defer to the HMP Committee regarding mitigation actions.
 - Jason suggested that the County public health department may have some input for the plan, though they are time-limited.
 - Heidi discussed that while FEMA doesn't view pandemic as a natural hazard to be included in the mitigation plan, there is certainly some mitigation planning to be done around this event coming out of COVID.
 - The committee discussed that while more outreach is always beneficial, there will be more opportunities for input from other County departments and the public. Another public/stakeholder information meeting will be scheduled after the draft plan is available for review.
 - Jason suggested reaching out to other County department heads once the plan is drafted to solicit comments and suggestions.
 - Heidi clarified that she was thinking other County departments may be able to provide input on structural needs, records management, and health and safety issues such as flooding. She mentioned that some County departments operate out of County-owned buildings while other offices are rented.
 - Jason and Matt indicated that they aren't aware of any other flooding issues for County buildings other than what the Committee has already discussed.
- Mitigation Goals
 - Grete reviewed the County's 2015 mitigation planning goals and the proposed new goals and objectives for the plan update.
 - The Committee agreed to keep municipal assistance (related to mitigation action implementation) in the HMP update's plan implementation section, rather than as a targeted objective for the County.
 - The Committee mentioned that the County has a mutual aid agreement with Fort Drum, and that there are multiple mutual aid agreements in place between Fire Departments, as well as shared services agreements among municipal highway and public works departments. Both County mutual aid plans are currently being updated.
 - The Committee discussed that social media, the County website, news outlets, and the NY Alert system are the primary means of public communication.
 - The Committee agreed with the proposed goals and objectives.
- Other Discussion
 - Johanna mentioned that B&L will draft the NYS DHSES Quarter 4 report for Matt's review by 10/15.
 - Johanna mentioned that updated National Flood Insurance Program (NFIP) data from FEMA is still outstanding. Matt offered to reach out to FEMA for an update.

- Johanna indicated that B&L will reach out to FEMA for a status update on the Base Level Engineering floodplain data to see if it can be incorporated into the HMP update. Matt asked that B&L copy Kevin Clapp and himself on any outreach to FEMA.
- Heidi mentioned that the County Soil & Water Conservation District indicated that FEMA's Building Resilient Infrastructure and Communities (BRIC) funding was announced. She asked whether the County would be eligible to apply for this funding based on their 2015 HMP, even though the update hasn't been completed yet.
- Johanna indicated that typically as long as the HMP update is in progress, the County should be eligible to apply for BRIC funding.
- Johanna mentioned that B&L is now focused on drafting the plan and there is not any new information that needs to be discussed with the Committee. The Committee decided not to schedule a meeting in November. B&L will reach out directly with specific questions, as needed.
- Johanna mentioned that the Committee will need to consider the platform options for the next stakeholder and public information meeting (Zoom or in person).

Action Items:

1. Grete to complete final outreach to Village of Richville and Towns of Clare, Lawrence, Madrid, Pitcairn, and Russell to confirm participation status.
2. John to continue coordination with Town of Clifton.
3. B&L to complete NYS DHSES Quarter 4 report and provide to Matt for review (due 10/15).
4. B&L to reach out to FEMA regarding BLE floodplain data status.
5. Matt to reach out to FEMA to check on status of NFIP data.
6. No Committee Meeting scheduled for November. B&L will focus on drafting the remaining plan components.

St. Lawrence County Hazard Mitigation Plan Update Process

Committee Meeting Minutes January 6, 2022, 2:00 PM

Attendees:

- Matt Denner, County Emergency Services
- Jason Pfothauer, County Planning Department
- Heidi Ames, County Planning Department
- Johanna Duffy (B&L)
- John Condino (B&L)
- Grete Day (B&L)

Items Discussed:

- **Draft HMP Discussion**
 - Grete summarized the format of the draft plan. Each municipality received their annex for review. As of 1/6, B&L heard back from 17 municipalities regarding their annex.
 - The Committee discussed their review of the draft of the Main Plan and the County's annex.
 - Heidi previously provided comments on the County annex via email.
 - Jason asked whether the County's mitigation action regarding upgraded fuel storage at the Canton highway department facility should be updated. Heidi offered to reach out to Don for his input.
 - B&L plans to complete edits and send the draft HMP to NYS DHSES by January 14th.
- **Stakeholder/Public Information Meeting for Draft Plan Review**
 - The Committee agreed to complete the next stakeholder/public meeting concurrently with NYS DHSES' review.
 - Johanna indicated that the meeting will involve a brief, high-level overview of hazard mitigation planning, the development of the HMP, and how to submit comments.
 - The Committee discussed holding the meeting virtually during the first week of February. Wednesday, February 2nd was selected as a target date for the meeting.
 - The Committee discussed holding one or two sessions for the meeting on the same day. Although attendance was better during the afternoon session for the previous stakeholder/public meeting, holding a second session later in the evening may provide a better opportunity for members of the public to attend.
 - B&L will draft a press release, set up Zoom meeting information, and send the County a copy of the updated draft plan to post on the website.

- The Committee discussed that members of the public could visit the Planning Department to review the draft plan on a laptop rather than having a hard copy available for review.
- Johanna suggested that the Zoom link for the meeting sessions could be posted to the County website, rather than having attendees register with the Planning Department.
- **Other**
 - Johanna asked whether any coordination with the County Legislature is required at this point in the process.
 - Matt and Jason can provide a brief update at the next Operations Committee Meeting. No formal update from B&L needed at this time.
 - B&L will draft the 2022 Quarter 1 report for NYS DHSES. The deadline is Saturday, January 15th (anticipate submission on Friday 1/14).
 - The Committee discussed the need for a Contract Extension Request from FEMA. Kevin Clapp has indicated that the County should request an extension to accommodate NYS DHSES and FEMA review timelines.
 - Matt indicated that the County cannot request funds to FEMA after the contract end date.
 - The Committee agreed that it makes sense to request an extension. Jason asked about timing; the Committee suggested the end of 2022 to ensure that all reviews can be completed.
 - Matt and Johanna checked the County's contract with B&L, which does not appear to have an end date.
 - Jason mentioned that the County Board of Elections may have an updated list of local elected officials (some changes in January 2022).

Action Items:

1. B&L to send reminder to jurisdictions regarding annex reviews if they have not already responded.
2. B&L to finalize Draft HMP per County and jurisdiction comments, and submit to NYS DHSES by 1/14. B&L will send hard copies to NYS DHSES the week of 1/17.
3. B&L to complete NYS DHSES 2022 Quarter 1 report and provide to Matt for review (due 1/15).
4. Matt to work with Kevin Clapp on a FEMA contract extension (the request will be identified in the NYS DHSES Quarter 1 report).
5. B&L to draft press release, set up Zoom meetings, and provide new link to Draft HMP for February Stakeholder/Public Information meeting; B&L will coordinate with Heidi for posting on the County website.
6. Jason to look for updated list of local elected officials.
7. Matt and Jason to provide brief update on the HMP during the next Operations Committee Meeting.
8. No Committee Meeting scheduled for February 2022.

Jurisdiction Kickoff Meeting Sessions

March 17 and 18, 2021

Zoom

Two kickoff meeting sessions were held to introduce the HMP update process to jurisdiction representatives. The County committee members and consultant team provided an overview of hazard mitigation planning, the HMP update process, and anticipated schedule.

St. Lawrence County HMP Update Jurisdiction Kickoff Meeting Attendees		
Session 1: March 17, 2021 at 2pm		
Name	Title	Affiliation
Mary Ann Ashley	Supervisor	Town of Canton
Darren Richards	Safety Officer	Town of Colton
George Cayey	Supervisor	Town of Colton
John Frary	Supervisor	Town of De Kalb
Jeremy Thompson	Deputy Supervisor	Town of Fine
Mark Hall	Water Superintendent	Town of Fine
Dave Spilman	Supervisor	Town of Gouverneur
Carson Gates	Deputy Road Superintendent	Town of Macomb
Frank Putman	Supervisor	Town of Morristown
Jane Powers	Supervisor	Town of Pierrepont
Butch Murray	Councilor	Town of Pierrepont
Jeff Murray	Code Enforcement Officer	Town of Potsdam
Harry Turnbull	Supervisor	Town of Rossie
Michael Dalton	Mayor	Village of Canton
Barb Lashua	Mayor	Village of Heuvelton
Fred Hanss	Planning Director	Village of Potsdam
Margery (Gail) Schneider	Councilor	Town of Louisville
Kevin Clapp	Planning Manager, Mitigation Programs	NYS DHSES
Bill Sheridan	Legislator, District 4	St. Lawrence County Board of Legislators
Larry Denesha	Legislator, District 6	St. Lawrence County Board of Legislators
Matt Denner	Director	St. Lawrence County Emergency Services
Jason Pfothauer	Director	St. Lawrence County Planning
Heidi Ames	Grants Manager	St. Lawrence County Planning
Don Chambers	Highway Superintendent	St. Lawrence County Highway
John Condino	Senior Project Manager	B&L
Johanna Duffy	Senior Managing Environmental Scientist	B&L
Grete Day	Staff Environmental Scientist	B&L

St. Lawrence County HMP Update Jurisdiction Kickoff Meeting Attendees		
Session 2: March 18, 2021 at 6pm		
Name	Title	Affiliation
Andrea Smith	Planning Director	City of Ogdensburg
Richard Pray	Board Member	Town of De Peyster
Rick Newvine	Supervisor	Town of Fowler
Michael Perry	Supervisor	Town of Hermon
Sue Wood	Supervisor	Town of Hopkinton
Bret Martin	Councilor	Town of Macomb
Tony Cooper	Supervisor	Town of Madrid
Robin McClellan	Economic Development Chair	Town of Stockholm
Torey Russell	Chief, West Stockholm Fire Dept.	Town of Stockholm
Pat O'Brien	First Assistant Chief, Massena Volunteer Fire Dept.	Village of Massena
James Blackburn	Trustee	Village of Rensselaer Falls
Kevin Clapp	Planning Manager, Mitigation Programs	NYS DHSES
Margaret Haggard	Legislator, District 10	St. Lawrence County Board of Legislators
Suzanne Fiacco	Legislator, District 11	St. Lawrence County Board of Legislators
Matt Denner	Director	St. Lawrence County Emergency Services
Jason Pfothauer	Director	St. Lawrence County Planning
Heidi Ames	Grants Manager	St. Lawrence County Planning
John Condino	Senior Project Manager	B&L
Johanna Duffy	Senior Managing Environmental Scientist	B&L
Grete Day	Staff Environmental Scientist	B&L

Stakeholder and Public Information Meeting Sessions

June 8, 2021

Zoom

The purpose of the meeting was to solicit comments and questions regarding hazard mitigation planning concerns from County residents and local, regional, state, and federal stakeholder agencies/organizations/other groups. Two sessions (2-3 pm and 6-7 pm) were offered over Zoom. The same information was presented at both sessions. B&L provided a brief overview of the HMP update process, a project status update, and facilitated discussion regarding natural hazard concerns throughout the County. Meeting notes including attendee lists for both sessions are provided on the following pages.

St. Lawrence County Hazard Mitigation Plan Update Process

Stakeholder/Public Meeting Notes – Session 1 June 8, 2021, 2:00 PM

Attendees:

- Paul Sisson, National Weather Service
- Darren Wilson, Liberty Utilities
- Mike Sutton, Brookfield Power
- Eric Burch, St. Lawrence Health
- Russ Currier, NYSDOT
- Erica Arnold, Clarkson University Environmental Health & Safety/Emergency Management
- Gary McCulloch, NYSDEC Emergency Response
- John Raymond, Herkimer County Emergency Management
- Bob MacKenzie, Lewis County Emergency Management
- Kevin Clapp, NYS DHSES
- Larry Denesha, St. Lawrence County Legislature (District 6)
- Mike Dalton, Village of Canton
- Barbara Lashua, Village of Heuvelton
- Diane Kelley, Town of Gouverneur
- Robin McClellan, Town of Stockholm
- Matt Denner, County Emergency Services
- Jason Pfothenhauer, County Planning Department
- Heidi Ames, County Planning Department
- Donald Chambers, County Highway Department
- Johanna Duffy, B&L
- John Condino, B&L
- Grete Day, B&L

Meeting Discussion:

- B&L presented a slideshow providing an overview of the hazard mitigation planning process, the project schedule, and the County's progress on the HMP update.
- Natural Hazard Concerns
 - Darren Wilson (Liberty Utilities) offered the following input:
 - Flooding is Liberty Utilities' top hazard of concern. Most utility lines are buried, but flooding still presents a concern for pipeline erosion. 8-inch diameter natural gas pipelines will float.

- Windstorms are also a concern, as underground utilities can be damaged from roots when trees fall.
 - Ice jams present a concern for utility lines on bridge crossings. A recent ice jam occurred near a pipeline bridge in Franklin County and the water encroached within inches of the pipe.
 - Liberty Utilities constantly evaluates pipeline crossings on rivers for flood issues.
 - Earthquakes are also a concern, as they have to make sure there are no utility damages from earth movement.
 - Paul Sisson (NWS) indicated that the County's hazard rankings seem reasonable, and he would be interested in seeing the County's hazard analysis. Paul offered the following input regarding natural hazard events in the County:
 - Severe storm/wind/tornado is most challenging event for NWS to get lead times out to the public. The life cycle of a severe storm ranges from an hour to minutes; they do not last long and the ability to forecast is limited. Generally 1 hour or less of warning. NWS knows about the potential for such storms, but warnings are difficult to issue well in advance.
 - Note that wind events can also occur in fall/winter/spring months that are not associated with severe storm events – may get up to 1-2 days warning on widespread high wind events.
 - The open terrain of much of St. Lawrence County leads to more severe snow issues.
 - Ice storm – St. Lawrence County is one of the top locations for freezing rain occurrences.
 - Flooding – huge concern across region (northern NY/VT) and generates some of the largest federal disaster declarations.
- Vulnerable Locations
 - Paul Sisson (NWS) offered the following information:
 - The portions of the County north and west of the U.S. Route 11 corridor are the most vulnerable to thunderstorm/wind/tornado warnings.
 - Flooding risk is more of a concern south and east of U.S. Route 11 where topography is flatter.
 - Ice storms are more of a concern closer to the St. Lawrence River, as cold air gets stuck north and west of U.S. Route 11.
- Mitigation Actions
 - Robin McClellan (Town of Stockholm) voiced concerns regarding funding for mitigation actions. Robin agreed that planning is valuable but funding is needed in order to implement projects. Stockholm in particular is limited on grant writing ability (other municipalities throughout the County experience this as well).
 - Robin McClellan mentioned that East Lake Rd needs to be raised 18" and trees need to be removed; and there is a new structure built in a floodplain that needs to be protected.
 - Johanna Duffy (B&L) mentioned that there are numerous funding programs available for hazard mitigation projects, although they can be competitive.

- Kevin Clapp (NYS DHSES) indicated that DHSES administers three federal mitigation grants (FEMA pre-disaster annual – competing nationwide; post-disaster – competing w/in state). Mitigation projects are also often fundable through other funding programs that are not necessarily hazard mitigation programs but still apply to various projects (NYSDEC, NYSDOT, etc.).
 - Kevin Clapp reiterated that it typically takes some time and effort to get a project funded. Updating the HMP is step 1, then can work with St. Lawrence County or other agencies to move projects forward.
 - Robin McClellan asked if there may be an opportunity for Towns to work with County to progress projects.
 - Kevin Clapp suggested that perhaps Towns could form a shared services agreement with one another and/or the County.
 - Heidi Ames mentioned that the County Planning Dept. could look into potential countywide funding programs that might apply.
 - Kevin Clapp reminded the group that the mitigation action list included with the HMP update should be organized in a sortable spreadsheet.
 - Kevin Clapp also indicated that generators can be included as mitigation actions, but only as 1 of the minimum 2 specific actions submitted by a municipality. Both actions cannot be generator projects.
- Other Discussion
 - B&L asked the group whether there is a known threshold for the amount of ice accumulation that starts to damage overhead utility lines?
 - Robin McClellan suggested that the HMP update considers tree damages from ice accumulation rather than a certain thickness threshold.
 - Paul Sisson mentioned that the NWS attempts to forecast ice thickness, but it is difficult to predict and measure.
 - Kevin shared the following resources with the group:
 - Hazard Mitigation Grant Program (HMP) Funding Opportunity: <http://www.dhSES.ny.gov/recovery/mitigation/DR-4567-HMGP.cfm>
 - NYS's Hazard Mitigation Planning Website: <https://mitigateny.availabs.org/>
 - NYS's statistics on St. Lawrence County: <https://mitigateny.availabs.org/m/36089>
 - NY Statewide Vulnerabilities – Vulnerable Jurisdictions in New York: <https://mitigateny.availabs.org/risk/vulnerablepopulations>

St. Lawrence County Hazard Mitigation Plan Update Process

Stakeholder/Public Meeting Notes – Session 2 June 8, 2021, 6:00 PM

Attendees:

- Scott Whittier, National Weather Service
- Kevin Clapp, NYS DHSES
- Richard Pray, Town of De Peyster
- Matt Denner, County Emergency Services
- Jason Pfothauer, County Planning Department
- Johanna Duffy, B&L
- Grete Day, B&L

Meeting Discussion:

- B&L presented a slideshow providing an overview of the hazard mitigation planning process, the project schedule, and the County's progress on the HMP update.
- Natural Hazard Concerns
 - B&L mentioned that flood analysis is limited since there is not digital floodplain data available for St. Lawrence County yet (currently in the works with FEMA). Kevin Clapp suggested checking to see if there is Q3 or BLE floodplain data available for the County. These resources provide preliminary digital floodplain mapping and would be better than interpreting FIRMs.
 - Scott Whittier (NWS) offered the following information:
 - Ice storms are definitely an issue; may not routinely see the condition we saw in 1998 (3-4" of ice accumulation); often see ½" to 1" of ice accumulation 1-2 times per year, particularly in the St. Lawrence River Valley (north and northwest of the U.S. Route 11 corridor)
 - The forecasted ice thickness from NWS is "horizontal flat surface" – in order to convert to mean radial ice accumulation (applies to tree branches, utility lines), multiply the horizontal flat surface by 0.4.
 - Overhead utility lines are rated for 0.5 to 0.75" mean radial ice load, but double check.
 - The St. Lawrence Valley has potential for more severe ice storms due to increased winds (10-15 knot cold-replenishing winds). Environmental Canada completed a study on this for St. Lawrence Valley.

- A tree limb study was completed in NH for the White National Forest. This work may provide some useful information regarding ice accumulation and tree damage.
 - Ice storms generally pose more concerns for tree damage rather than direct damage to utility lines.
 - NWS registered warnings for some storm events over the last handful of years where more utility damage was expected, but didn't occur (or wasn't reported). NWS questioned whether utility companies are being more proactive with limb clearing, or whether the data is just not getting back to them.
 - 1 event in 2018, 2 events in 2019 or so?
 - Flooding- the magnitude and rate of water level increase on waterways is not as pronounced in St. Lawrence River Valley. Generally see gradual rises; flash floods not much of an issue. There is generally enough time for evacuation if needed.
 - Extreme heat:
 - Houses are built to retain heat, so heat is more of a concern than extreme cold.
 - Vulnerable populations are at risk; not many cooling centers available.
 - We are seeing a rise in extreme heat days. Average about ten 90 degree days in Champlain Valley; but 25 days of 87 degree days – similar heat effects.
 - Consider splitting high winds from thunderstorm/tornado hazard because tornado and thunderstorms have different lead times than wind storms. If separated out, high winds should rank around Coastal Storm/nor'easter on the County's list.
- Vulnerable Locations
 - Scott Whittier offered the following information:
 - Ice storms are more of a concern north and northwest of U.S. Route 11.
 - Extreme heat concerns:
 - Going forward, increased use of air conditioning will add demand to power grids.
 - Many schools do not have central air – more occurrences of impact
 - Potential school closures – just yesterday (6/7) a school had kids on 2nd story with some health issues/dripping sweat from heat. School couldn't use fans due to COVID concerns.
 - We are seeing earlier and later occurrences of extreme heat – now hitting beginning and end of school years (more extreme heat events in the past occurred over the summer when school was out).
 - Kevin Clapp asked whether renewable energy infrastructure has been impacted by ice.
 - Jason Pfothenauer indicated that some solar projects have been built in St. Lawrence County and more are proposed. However, snow load is more of a concern for solar panels than ice load because snow covers the panels and limits electricity production.
 - Kevin Clapp asked whether wind turbine blades have heaters to melt ice.

Jurisdiction Meetings

Individual meetings were held with representatives from each participating jurisdiction to review their information from the 2015 plan and to gather new information for the HMP update. The agenda used for each jurisdiction meeting is provided on the following page. A summary of meeting dates and attendees from each jurisdiction is provided in the table below.

Date	Jurisdiction(s)	Location	Attendee(s)
4/15/2021	Town of Brasher	Zoom	Mark Peets- Supervisor Larry Hewlett- Highway Superintendent Bob Forbes - Code Enforcement Julia Rose - Planning Board Chair
4/15/2021	Village of Canton	Zoom	Mike Dalton - Mayor Marty Miller- DPW Superintendent Bob Crowe - Fire Chief Jim Santimaw - Police Chief Leigh Rodriguez - Economic Developer
4/20/2021	Town of De Kalb	Zoom	John Frary - Supervisor Wayne Holland - Highway Superintendent Bill Chambers - Code Enforcement Larry Denesha - County Legislator
4/21/2021	Town of Colton	Zoom	Darren Richards - Safety Officer George Cayey - Supervisor
4/21/2021	Town of De Peyster	Zoom	Richard Pray - Town Board Member
4/27/2021	Town of Fine	Community Center/Zoom (hybrid)	Mark Hall - Water Superintendent Jeremy Thompson - Supervisor Rick Rusaw - Fire Dept Chief Tracy Typhair - Highway Larry Denesha - County Legislator
4/27/2021	Town of Gouverneur	Zoom	Dave Spilman - Supervisor Diane Kelley - Bookkeeper Mike McQuade - Code Enforcement Eldon Conklin - Deputy Supervisor
4/28/2021	Town of Hermon	Zoom	Mike Perry - Supervisor Kathy Carpenter - Councilor John Reed - Councilor Karen Wayering - Town Clerk Brian Brunet - Highway Superintendent Mike McQuade - Code Enforcement Larry Denesha - County Legislator
4/29/2021	Town of Canton	Zoom	Mary Ann Ashley - Supervisor Calvin Rose - Highway Superintendent Michael McQuade - Code Enforcement Karin Blackburn - Town Clerk
5/3/2021	Town of Hopkinton	Municipal Building/Zoom (hybrid)	Sue Wood - Supervisor Richard Powers- Town Clerk Steve Parker - Fire Chief
5/5/2021	Town of Macomb	Town Hall/Zoom (hybrid)	Bret Martin - Town Board Carson Gates - Highway Department

Date	Jurisdiction(s)	Location	Attendee(s)
5/12/2021	Town and Village of Massena	Zoom	Patrick O'Brien - Fire Chief Aaron Hardy - Village Code Enforcement Susan Bellor - Town Board Monique Chatland - Village Clerk
5/18/2021	Town of Potsdam	Zoom	Ann Carvill - Supervisor Jeff Murray - Code Enforcement
5/19/2021	Town of Pierrepont	Town Hall/Zoom (hybrid)	Jane Powers - Supervisor Roger Murray - Deputy Supervisor John Glasgow - Councilor Laurie Hance - Court Clerk Melanie Thomas - Clerk
5/19/2021	Village of Heuvelton	Zoom	Barb Lashua - Mayor Julie Brown - Planning Board Member
5/24/2021	Town of Stockholm	Robin McClellan's Home/Zoom (hybrid)	Aaron Barrigar - County SWCD Clark Decker - Supervisor Bruce Thompson - Highway Superintendent Matt White - Town Board Member Chad Colbert - Planning Board Chair Torey Russell - West Stockholm Fire Chief Bob McCuin - Town Board Member Robin McClellan - Resident
5/24/2021	Village of Rensselaer Falls	Zoom	Mike Hammond - Mayor James Blackburn - Trustee Dallas Denny - Fire Chief Mark Basford - WWTP Operator
5/27/2021	Town of Rossie	Zoom	Harry Turnbull - Supervisor James Mandigo - Councilor Mark Phalen - Planning Board Chair
6/1/2021	Village of Potsdam	Civic Center/Zoom (hybrid)	Fred Hanss - Planning Director Greg Thompson - Village Administrator Jim Corbett - DPW Superintendent Mark Murray - Police Chief Hugo Atteman - Planning Board Member Eric Burch - CEO/COO, St. Lawrence Health Mike LeCuyer - Director of Safety and Security, St. Lawrence Health
6/9/2021	Town of Louisville	Town Hall/Zoom (hybrid)	Joanne Cameron - Town Clerk Gail Schneider - Councilor
6/21/2021	Town of Fowler	Zoom	Rick Newvine - Supervisor Tami Gale - Town Clerk Randy Durham - Highway Superintendent Jeff Andrews - Councilor Scott Cleveland - Councilor Lynn Bishop - Councilor Karen Simmons - Councilor
6/29/2021	Village of Norwood	Village Hall/Zoom (hybrid)	Tim Levison - Mayor Nancy Berger - Clerk Brianna Beaulieu - Deputy Clerk Dan McGregor - DPW Superintendent Kristin Nezezon - Trustee Matt Tebo - Trustee John Murray - Planning Board Member

Date	Jurisdiction(s)	Location	Attendee(s)
7/13/2021	Village of Gouverneur	Municipal Building/Zoom (hybrid)	Barbara Finnie - Clerk Ron McDougall- Mayor Terry Simmons- Highway Superintendent Bruce Hotaling - Chief Water/Sewer Operator Earl Meashaw - Sr. Water/Sewer Operator Kristina Ayen - Deputy Clerk
7/19/2021	Town of Morristown	Zoom	Frank Putman- Supervisor Chris Coffin - Deputy Supervisor
8/11/2021	Town of Edwards	Town Hall/Zoom (hybrid)	Jan Lennox - Supervisor
8/11/2021	Town of Piercefield	Zoom	Neil Pickering - Supervisor
8/18/2021	Town of Oswegatchie	Town Office/Zoom (hybrid)	Russ Lawrence - Code Enforcement
8/18/2021	Town of Parishville	Town Office/Zoom (hybrid)	Connie McGuire - Clerk Rod Votra- Supervisor Kari Tremper - Councilor
9/15/2021	Town of Hammond	Phone Call	Ron Bertram - Supervisor
9/15/2021	Town of Lisbon	Zoom	Bill Nelson - Supervisor
9/27/2021	City of Ogdensburg	Zoom	Andrea Smith- Director of Planning & Development Nicole Woods - Code Enforcement Ron Dulmage - Code Enforcement Shane Brown - DPW Director
9/27/2021	Town of Norfolk	Town Hall/Zoom (hybrid)	Charlie Pernice - Supervisor Jill Molnar - Town Clerk
10/6/2021	Town of Waddington	Zoom	Carol Burns - Clerk Julie McBath - Waddington Volunteer Rescue Squad Dave Putney - Highway Superintendent Kevin Sharlow - 1st Asst. Fire Chief, Waddington Volunteer Fire Dept.
10/6/2021	Village of Hammond	Zoom	Shelly Youngs - Mayor Patti Belknap - Trustee Corin Phalen - Trustee Mary Mazurkiewicz - Village Clerk
10/14/2021	Village of Waddington	Zoom	Mike Zagrobelny - Mayor
10/26/2021	Village of Lawrence	Phone Call	Tracy Villave - Town Clerk
10/27/2021	Town of Russell	Phone Call	Tess Eells -Town Clerk
10/29/2021	Town of Clifton	Zoom	Chuck Hooven - Supervisor
11/3/2021	Town of Madrid	Zoom	Tony Cooper - Supervisor
11/4/2021	Town of Pitcairn	Town Hall/Zoom (hybrid)	Sam Frank - Supervisor Jerry McIntosh - Highway Superintendent
11/10/2021	Village of Richville	Zoom	Blue Jay Fenlong - Mayor Shelley Prashaw - Clerk Tony Wood - Trustee Larry Denesha - County Legislator
11/24/2021	Town of Clare	Zoom	Francis Sharpstene - Supervisor

Stakeholder and Public Information Meeting Sessions

February 2, 2022

Zoom

The purpose of the meeting was to solicit comments and questions regarding the draft HMP update from County residents and local, regional, state, and federal stakeholder agencies/organizations/other groups. Two sessions (2-2:30 pm and 6-6:30 pm) were offered over Zoom. The same information was presented at both sessions. B&L provided a brief overview of the HMP update planning process, the draft plan layout, and an overview of the County and jurisdictions' hazard analyses and examples of mitigation actions developed as part of the plan. B&L also explained how attendees could access the draft HMP for review, and requested that comments be provided by February 25, 2022. Attendee lists for both sessions are provided on the following pages.

St. Lawrence County Hazard Mitigation Plan Update Process

Stakeholder/Public Meeting Notes – Session 1 February 2, 2022, 2:00 PM

Attendees:

- Mary Ann Ashley, Town of Canton
- Steven Smith, Town of Canton
- Heidi Smith, Town of Canton
- Bill Nelson, Town of Lisbon
- Barb Lashua, Village of Heuvelton
- Darren Richards, Town of Colton
- Robin McClellan, Town of Stockholm
- Larry Denesha, St. Lawrence County Legislature (District 6)
- Mike LeCuyer, St. Lawrence Health
- Scott Whittier, National Weather Service
- Rich Burns, National Grid
- Erica Arnold, Clarkson University
- Rachel Hunter
- D. Barringer
- Heidi Ames, County Planning Department
- Johanna Duffy, B&L
- Grete Day, B&L

Meeting Discussion:

- B&L presented a slideshow providing an overview of the hazard mitigation planning process, jurisdiction participation, County and jurisdiction hazard analyses, and examples of mitigation actions developed for the HMP update.
- B&L explained how attendees can access the draft HMP for review, and requested that comments be provided by February 25, 2022.

St. Lawrence County Hazard Mitigation Plan Update Process

Stakeholder/Public Meeting Notes – Session 2 February 2, 2022, 6:00 PM

Attendees:

- Jane Powers, Town of Pierrepont
- Roger Murray, Town of Pierrepont
- Two other attendees from Town of Pierrepont
- Ryne Martin, Liberty Utilities
- Mark Deavers, Gouverneur Rescue Squad
- Jason Pfothauer, County Planning Department
- Johanna Duffy, B&L
- Grete Day, B&L

Meeting Discussion:

- B&L presented a slideshow providing an overview of the hazard mitigation planning process, jurisdiction participation, County and jurisdiction hazard analyses, and examples of mitigation actions developed for the HMP update.
- B&L explained how attendees can access the draft HMP for review, and requested that comments be provided by February 25, 2022.

Appendix D

Sample Plan Adoption Resolution

Name of Jurisdiction: _____

**RESOLUTION
TO AUTHORIZE THE ACCEPTANCE AND ADOPTION OF THE
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE FOR
ST. LAWRENCE COUNTY, NEW YORK**

WHEREAS, the St. Lawrence County Office of Emergency Services, with assistance from Barton & Loguidice, D.P.C., has gathered information and prepared the Multi-Jurisdictional Hazard Mitigation Plan Update for St. Lawrence County, New York; and

WHEREAS, the Multi-Jurisdictional Hazard Mitigation Plan Update for St. Lawrence County, New York has been prepared in accordance with the Disaster Mitigation Act of 2000 and Title 44 Code of Federal Regulations (CFR), Part 201; and

WHEREAS, Title 44 CFR, Chapter 1, Part 201.6(c)(5) requires each local government participating in the preparation of a Multi-Jurisdictional Mitigation Plan or Plan Update to accept and adopt such plan; and

WHEREAS, the Town/Village/City of _____, has reviewed the 2022 St. Lawrence County Multi-Jurisdictional Hazard Mitigation Plan Update, has found the document to be acceptable, and as a local unit of government, has afforded its citizens an opportunity to comment and provide input regarding the Plan Update and the actions included in the Plan;

WHEREAS, the Town/Village/City of _____, will consider the St. Lawrence County HMP Update during the implementation and updating of local planning mechanisms, and will incorporate the hazard assessment data, hazard vulnerabilities, and mitigation actions in these mechanisms, where applicable;

NOW THEREFORE, BE IT RESOLVED, that the Town/Village/City of _____, as a participating jurisdiction, adopts the Multi-Jurisdictional Hazard Mitigation Plan Update for St. Lawrence County, New York, dated _____, 2022.

This resolution was thereupon declared duly adopted on _____.

(Mayor/Supervisor)

(Clerk)

Appendix E

Stakeholder Outreach Documentation

**Stakeholder invitation to June 8, 2021 Stakeholder/Public Meeting
(All stakeholder representatives were blind-copied)**

Grete L. Day

From: Grete L. Day
Sent: Thursday, May 27, 2021 12:03 PM
To: Grete L. Day
Cc: 'Denner, Matthew'; Heidi Ames; Pfothenauer, Jason; Chambers, Donald; Hazen, Ian; Johanna E. Duffy; John J. Condino
Subject: St. Lawrence County HMP Update Stakeholder and Public Information Meeting

Hello everyone,

St. Lawrence County received a Pre-Disaster Hazard Mitigation Grant from the Federal Emergency Management Agency (FEMA) to update the County's Multi-Jurisdictional Hazard Mitigation Plan (HMP). The original HMP was approved by FEMA in 2015. The purpose of hazard mitigation planning is to reduce property loss, damage to the environment, injuries, and the loss of life that have the potential to result from natural hazard events. The HMP is used to identify and implement short- and long-term mitigation strategies and actions that focus on execution at a pre-disaster level. Retaining an approved and updated HMP will allow the County and participating municipalities to remain eligible to apply for future hazard mitigation and resiliency funding from FEMA. The updated HMP also provides the County and jurisdictions with an additional tool to reference for disaster planning, land development, and funding initiatives.

A virtual Stakeholder and Public Information Meeting will be held on Tuesday, June 8, 2021. The purpose of the meeting is to solicit comments and questions regarding hazard mitigation planning concerns from County residents and stakeholders from local, regional, state, and federal agencies/organizations/groups, etc. Two sessions (2-3pm and 6-7pm) will be offered; the same information will be presented at both sessions. The Zoom meeting information for each session is provided below, including direct links and call-in information. We plan to provide a brief overview of the process, a status update of where the process currently stands, and include questions to help foster discussion and obtain information from attendees.

We look forward to receiving your input on the HMP update. Please contact me (315-457-5200 or reply to this email) or Matt Denner, St. Lawrence County Director of Emergency Services, at 315-379-2240, with any questions.

Sincerely,
Grete Day

St. Lawrence County HMP Update Stakeholder and Public Information Meeting

- Session #1: Tuesday, June 8 from 2-3pm
 - Zoom Meeting ID: 942 9196 6677
 - Passcode: 548811
 - Link to Join: <https://zoom.us/j/94291966677?pwd=ajlRMnF6UzZSbWlhZ2prR1JnWDNSUT09>

- Session #2: Tuesday, June 8 from 6-7pm
 - Zoom Meeting ID: 952 9232 5481
 - Passcode: 727784
 - Link to Join: <https://zoom.us/j/95292325481?pwd=bWkvenA1dENhTXVLZEJlQmZxZFRWUT09>

**Jurisdiction invitation to June 8, 2021 Stakeholder/Public Meeting
(All jurisdiction representatives were blind-copied)**

Grete L. Day

From: Grete L. Day
Sent: Thursday, May 27, 2021 11:27 AM
To: Grete L. Day
Cc: 'Denner, Matthew'; Heidi Ames; Pfothenauer, Jason; Chambers, Donald; Hazen, Ian; Johanna E. Duffy; John J. Condino
Subject: St. Lawrence County HMP Update Stakeholder and Public Information Meeting

Good morning,

St. Lawrence County is continuing to work on the 2015 Multi-Jurisdictional Hazard Mitigation Plan (HMP) update. Many of you attended the project kick-off meetings that were held on March 17 and 18, 2021. Additionally, many of you have met with Barton & Loguidice to discuss your jurisdiction's information for the HMP. Thank you for your continued participation in the HMP update process!

A virtual Stakeholder and Public Information Meeting for the HMP update will be held on Tuesday, June 8, 2021. The purpose of the meeting is to solicit comments and questions regarding hazard mitigation planning concerns from County residents and local, regional, state, and federal stakeholder agencies/organizations/groups, etc. Two sessions (2-3pm and 6-7pm) will be offered; the same information will be presented at both sessions. The Zoom meeting information for each session is provided below, including direct links and call-in information. We plan to provide a brief overview of the process, a status update of where the process currently stands, and include questions to help foster discussion and obtain information from attendees.

Your attendance at the Stakeholder/Public Information Meeting is not required, but you are more than welcome to join if you wish. The content will be very similar to the information that was presented at the jurisdiction kick-off meetings, which many of you attended. Please contact me (315-457-5200 or reply to this email) or Matt Denner, St. Lawrence County Director of Emergency Services, at 315-379-2240 with any questions.

Sincerely,
Grete Day

St. Lawrence County HMP Update Stakeholder and Public Information Meeting

- Session #1: Tuesday, June 8 from 2-3pm
 - Zoom Meeting ID: 942 9196 6677
 - Passcode: 548811
 - Link to Join: <https://zoom.us/j/94291966677?pwd=ajlRMnF6UzZSbWlhZ2prR1JnWDNSUT09>

- Session #2: Tuesday, June 8 from 6-7pm
 - Zoom Meeting ID: 952 9232 5481
 - Passcode: 727784
 - Link to Join: <https://zoom.us/j/95292325481?pwd=bWkvenA1dENhTXVLZEJLQmZxZFRWUT09>

- Welcome
- Planning Committee Introduction
- Hazard Mitigation Planning Overview
- Plan Components
- Progress to Date
- Stakeholder Feedback
- Project Schedule and Next Steps



- **St. Lawrence County**

- Emergency Services
 - Matt Denner
- Planning Department
 - Jason Pfothenhauer
 - Heidi Ames
- Highway Department
 - Don Chambers
 - Ian Hazen

- **Barton & Loguidice**

- Johanna Duffy
- John Condino
- Grete Day



- **St. Lawrence County Legislature & County Administrator Support**



- Phases of Emergency Management

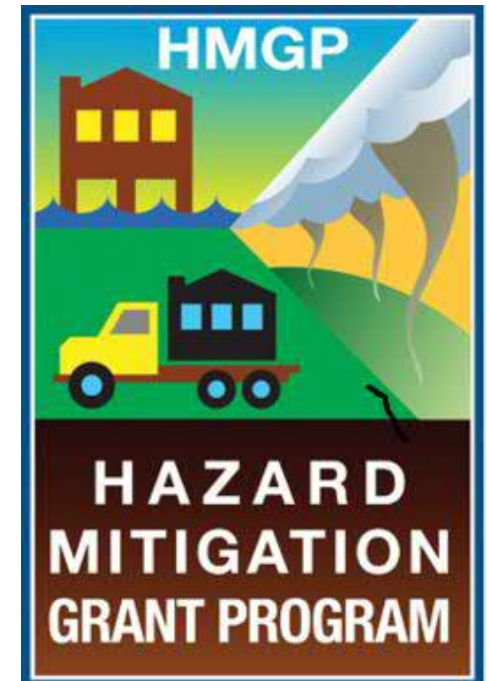
1. Preparedness
2. Response
3. Recovery
4. **Mitigation**



Hazard Mitigation Planning

Barton&Loguidice

- Disaster Mitigation Act of 2000
 - New guidelines for State multi-hazard mitigation planning
 - New requirements for local multi-hazard mitigation planning
 - Basis for Hazard Mitigation Grant Program funding
 - Emphasis on Multi-Hazard, Multi-Jurisdiction Plans
 - Planning steps outlined in 44 CFR Part 201.6



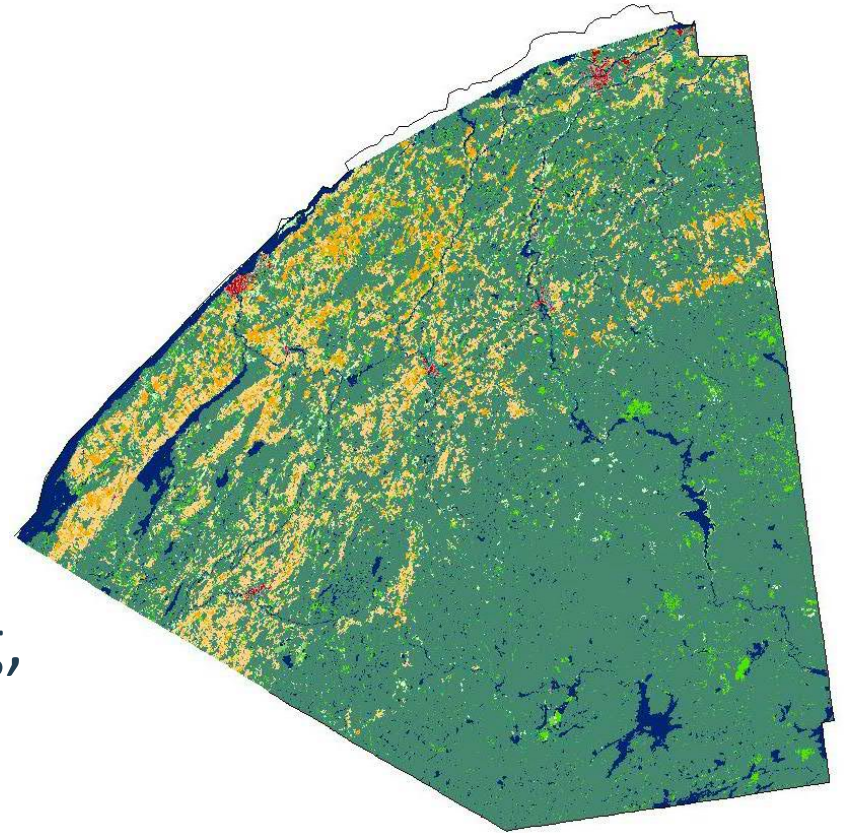
Hazard Mitigation Planning

- St. Lawrence County received a grant from FEMA to update the 2015 Multi-Jurisdictional Hazard Mitigation Plan (HMP)
 - **2015 HMP:**
<https://www.stlawco.org/sites/default/files/Planning/HazardMitigation.pdf>
- Hazard mitigation planning develops long-term actions that aim to reduce:
 - Loss of life
 - Number/severity of injuries
 - Property & natural resource damages



Plan Components

- County Profile
- Planning Process
- Risk Assessment
- Natural Hazard Profiles
- Hazard Vulnerability Assessment
- Mitigation Goals and Strategies
- Plan Implementation, Monitoring, & Maintenance
- Jurisdictional Annexes



New Plan Structure & Content

- Focus on natural hazards
 - Eligible for FEMA mitigation planning grant funding
- New information
 - Evacuation routes
 - Emergency shelters
 - Temporary and permanent housing locations
 - Floodplain review for critical infrastructure
 - New and planned development
 - High hazard potential dam risk



- Monthly meetings with County planning committee
- Jurisdiction kickoff meetings held in March 2021
- Individual jurisdiction meetings and data collection ongoing
 - 20 of 43 jurisdiction meetings completed to date
- Jurisdictional annexes in progress

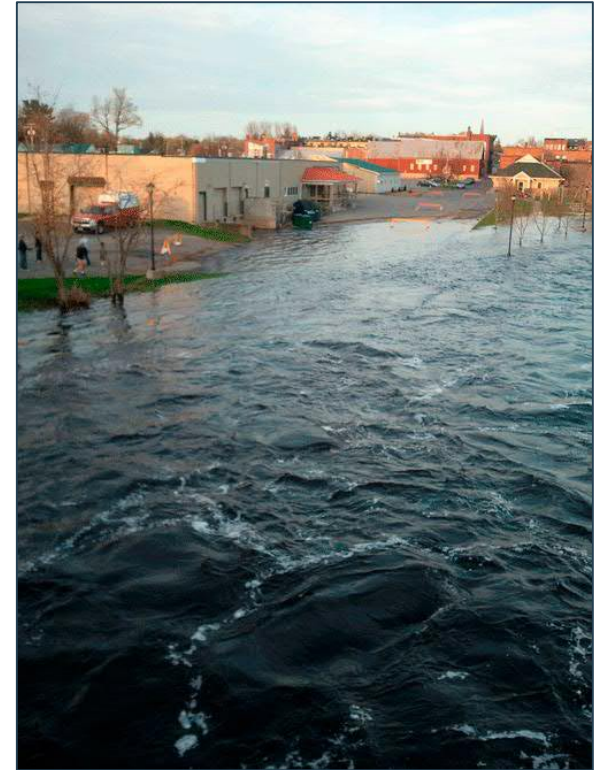


Hazard Analysis

- **St. Lawrence County 2021 hazard ranking:**
 1. Severe Thunderstorm, Wind, or Tornado
 2. Ice Storm
 3. Severe Winter Storm
 4. Flood
 5. Coastal Storm (Nor'easter)
 6. Earthquake
 7. Wildfire
 8. Extreme Temperatures
 9. Drought
 10. Ice Jam
 11. Landslide (slope failure)
 12. Infestation



- Existing assets and resources
 - Critical infrastructure
 - Emergency shelters
 - Evacuation routes
 - Communication systems
- Vulnerability
 - Hazard-prone locations
 - Condition of critical infrastructure
 - Areas of concentrated populations
 - Isolated populations



- Identify potential mitigation actions (at least 2 per jurisdiction)
 - Prevention
 - Property Protection
 - Structural Projects
 - Natural Resource Protection
 - Emergency Services
 - Public Education and Awareness
- Prepare an implementation plan for each action
 - Estimate costs, potential funding sources, involved agencies, and implementation timeframes



Example Mitigation Actions

- Acquire generators for emergency shelters and/or other critical facilities
- Elevate roadways or replace undersized culverts in flood-prone areas
- Improve municipal stormwater infrastructure to better accommodate flows during heavy precipitation events
- Develop public outreach protocol specific to hazard mitigation efforts for isolated populations
- Train code enforcement staff to adequately recognize and enforce NFIP regulations and develop floodplain ordinances



- What **natural hazards** are you most concerned about in St. Lawrence County?
- Are there any particularly **vulnerable locations or structures** that should be addressed in the HMP?
- Can you think of any **mitigation actions** that should be included in the HMP?



Project Schedule

**January-April
2021**

Organize
Resources

(Kick-off meetings)

**September-
October 2021**

Draft Plan
Compilation

**(Stakeholder/Public
Meeting #2)**

March 2022

FEMA Review
and Plan
Adoption

**April-August
2021**

Risk Assessment;
Develop Mitigation
Strategies

**(Stakeholder/
Public Meeting #1)**

**November-
January 2021**

NYS DHSES
Review



Contact Information

Barton&Loguidice

- We welcome your feedback!
 - Questions?
 - Comments?



- Contact us any time:

Matt Denner, Director
St. Lawrence County Emergency Services
Building #8
48 Court Street
Canton, NY 13617
Phone: (315) 379-2240
Email: MDenner@stlawco.org

Grete Day
Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY 13088
Phone: (315) 457-5200
Email: gday@bartonandloguidice.com



Grete L. Day

From: emergencymgnt@hamiltoncountyny.gov
Sent: Tuesday, June 8, 2021 11:12 AM
To: Grete L. Day
Subject: RE: St. Lawrence County HMP Update Stakeholder and Public Information Meeting

Follow Up Flag: Follow up
Flag Status: Completed

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Grete,

I probably won't be on the call then, and tonight is out because I am also a Town Justice and have my court on Tuesday's. As to the three bullet points, I think that "no" would be the current answer to them at this point in time.

If you need to have me participate in the future, just let me know and I will do my best to be more available than I am this particular day.

Don Purdy
Hamilton County Emergency Services
PO Box 44
102 County View Drive
Lake Pleasant, NY 12108
518.548.6223
518.774.5212 (cell)

From: Grete L. Day <gday@bartonandloguidice.com>
Sent: Tuesday, June 8, 2021 10:47 AM
To: emergencymgnt@hamiltoncountyny.gov
Subject: RE: St. Lawrence County HMP Update Stakeholder and Public Information Meeting

Good morning Don,

Thank you for reaching out. I will include your email as participation documentation for the plan update. You are not obligated to attend the meeting this afternoon, I will leave the decision up to you. A few targeted questions that we plan to ask during the meeting are below, if you have any additional thoughts. The undeveloped nature of the St. Lawrence/Hamilton County border certainly reduces hazard mitigation concerns.

- Are there any natural hazard mitigation concerns for your County that may also affect St. Lawrence County?
- Are there mitigation actions in your HMP that may involve coordination with St. Lawrence County, or actions that we should consider including for St. Lawrence County?
- Are there any needs for new or updated mutual aid agreements between your county and St. Lawrence County or its jurisdictions?

Sincerely,

Grete Day

Grete L. Day
Barton & Loguidice

The information in this message is confidential and is intended for the identified recipient(s). If you are not an intended recipient, please delete the message and notify the sender immediately. Any unauthorized use, disclosure or copying of this message is strictly forbidden and may be subject to legal action.

From: emergencymgmt@hamiltoncountyny.gov [mailto:emergencymgmt@hamiltoncountyny.gov]
Sent: Tuesday, June 8, 2021 9:53 AM
To: Grete L. Day <gday@bartonandloguidice.com>
Subject: RE: St. Lawrence County HMP Update Stakeholder and Public Information Meeting

ATTENTION --> This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Good morning,

Unfortunately, I have just had a conference call re-scheduled for 2:30 this afternoon, so my time on your St. Lawrence call would have to be short. Also, I am sure you are aware that the Hamilton County lands bordering St. Lawrence are APA classified as either Primitive or Wilderness and therefore largely untouchable, so my input for potential projects is really nil. If you desire as a matter of record, I could still call in at 2:00, and be on for a bit, but my input would most likely be nothing more than what I have just stated.

I will await your reply as to how I approach the 2:00pm hour today.

Don Purdy
Hamilton County Emergency Services
PO Box 44
102 County View Drive
Lake Pleasant, NY 12108
518.548.6223
518.774.5212 (cell)

From: Grete L. Day <gday@bartonandloguidice.com>
Sent: Thursday, May 27, 2021 12:03 PM
To: Grete L. Day <gday@bartonandloguidice.com>
Cc: Denner, Matthew <MDenner@stlawco.org>; Heidi Ames <hames@stlawco.org>; Pfothenauer, Jason <JPfothenauer@stlawco.org>; Chambers, Donald <DCChambers@stlawco.org>; Hazen, Ian <IHazen@stlawco.org>; Johanna E. Duffy <Jduffy@bartonandloguidice.com>; John J. Condino <jcondino@bartonandloguidice.com>
Subject: St. Lawrence County HMP Update Stakeholder and Public Information Meeting

Hello everyone,

St. Lawrence County received a Pre-Disaster Hazard Mitigation Grant from the Federal Emergency Management Agency (FEMA) to update the County's Multi-Jurisdictional Hazard Mitigation Plan (HMP). The original HMP was approved by FEMA in 2015. The purpose of hazard mitigation planning is to reduce property loss, damage to the environment, injuries, and the loss of life that have the potential to result from natural hazard events. The HMP is used to identify and implement short- and long-term mitigation strategies and actions that focus on execution at a pre-disaster level.

Retaining an approved and updated HMP will allow the County and participating municipalities to remain eligible to apply for future hazard mitigation and resiliency funding from FEMA. The updated HMP also provides the County and jurisdictions with an additional tool to reference for disaster planning, land development, and funding initiatives.

A virtual Stakeholder and Public Information Meeting will be held on Tuesday, June 8, 2021. The purpose of the meeting is to solicit comments and questions regarding hazard mitigation planning concerns from County residents and stakeholders from local, regional, state, and federal agencies/organizations/groups, etc. Two sessions (2-3pm and 6-7pm) will be offered; the same information will be presented at both sessions. The Zoom meeting information for each session is provided below, including direct links and call-in information. We plan to provide a brief overview of the process, a status update of where the process currently stands, and include questions to help foster discussion and obtain information from attendees.

We look forward to receiving your input on the HMP update. Please contact me (315-457-5200 or reply to this email) or Matt Denner, St. Lawrence County Director of Emergency Services, at 315-379-2240, with any questions.

Sincerely,
Grete Day

St. Lawrence County HMP Update Stakeholder and Public Information Meeting

- Session #1: Tuesday, June 8 from 2-3pm
 - Zoom Meeting ID: 942 9196 6677
 - Passcode: 548811
 - Link to Join: <https://zoom.us/j/94291966677?pwd=ajlRMnF6UzZSbWlhZ2prR1JnWDNSUT09>

- Session #2: Tuesday, June 8 from 6-7pm
 - Zoom Meeting ID: 952 9232 5481
 - Passcode: 727784
 - Link to Join: <https://zoom.us/j/95292325481?pwd=bWkvenA1dENhTXVLZEJLOmZxZFRWUT09>

Grete L. Day
Staff Environmental Scientist
Environmental

Barton & Loguidice

Office: 315.457.5200

Email: gday@bartonandloguidice.com

[Website](#) | [LinkedIn](#) | [Twitter](#) | [Facebook](#) | [Vimeo](#)

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Virtual Stakeholder and Public Information Meeting for the St. Lawrence County Hazard Mitigation Plan Update

February 2, 2022

Press Release - For Immediate Release

Virtual Stakeholder and Public Information Meeting for the St. Lawrence County Hazard Mitigation Plan Update

St. Lawrence County received a Pre-Disaster Hazard Mitigation Grant from the Federal Emergency Management Agency (FEMA) to complete an update to the County's original Multi-Jurisdictional Hazard Mitigation Plan (HMP). The purpose of hazard mitigation planning is to reduce or alleviate property loss, reduce damage to the environment, and reduce the loss of life and number and severity of injuries that have the potential to result from natural hazard events. The HMP is used to identify and implement short- and long-term mitigation strategies and actions that focus on execution at a pre-disaster level. Retaining an approved and updated HMP will allow the County and participating municipalities to remain eligible to apply for future hazard mitigation and resiliency funding from FEMA. The updated HMP also provides the County and jurisdictions with an additional tool to reference for disaster planning, land development, and funding initiatives. The Draft HMP is available for review on the County website at <https://liquidfiles.bartonandloguidice.com/link/SPmfEcXHLvUkiGO5vXNg2Y>. The Draft HMP is also available for viewing at the St. Lawrence County Planning Office, located at 48 Court Street, Building #2, Canton, NY 13617.

A virtual Stakeholder and Public Information Meeting will be held on Wednesday, February 2, 2022. The purpose of the meeting is to solicit comments and questions on the Draft HMP from County residents and stakeholders from local, state, and federal agencies. Two sessions (2-2:30pm and 6-6:30pm) will be offered; the same information will be presented at both sessions. The links for each Zoom session are provided below.

Zoom Link for 2pm Session: <https://us06web.zoom.us/j/86894531654>

Zoom Link for 6pm Session: <https://us06web.zoom.us/j/88400813907>

For questions or additional assistance needs, please contact Heidi Ames at hames@stlawco.org or 315-379-2292.

**Stakeholder and jurisdiction invitation to February 2, 2022 Stakeholder/Public Meeting
(All representatives were blind-copied)**

Grete L. Day

From: Grete L. Day
Sent: Thursday, January 27, 2022 4:32 PM
To: Grete L. Day
Subject: Stakeholder/Public Meeting for St. Lawrence County Draft HMP

Hello everyone,

St. Lawrence County received a Pre-Disaster Hazard Mitigation Grant from the Federal Emergency Management Agency (FEMA) to update the County's original Multi-Jurisdictional Hazard Mitigation Plan (HMP). The HMP is used to identify and implement short- and long-term mitigation strategies and actions that focus on execution at a pre-disaster level. Retaining an approved and updated HMP will allow the County and participating municipalities to remain eligible to apply for future hazard mitigation and resiliency funding from FEMA. The updated HMP also provides the County and jurisdictions with an additional tool to reference for disaster planning, land development, and funding initiatives. The updated HMP is drafted and is available for review on the County website at <https://stlawco.org/Departments/Planning>.

A virtual Stakeholder and Public Information Meeting will be held on Wednesday, February 2, 2022. The purpose of the meeting is to solicit comments and questions on the Draft HMP from County residents and stakeholders from local, state, and federal agencies. We will provide a broad overview of the planning process and the components of the Draft HMP. Two sessions (2-2:30pm and 6-6:30pm) will be offered; the same information will be presented at both sessions. The details for each Zoom session are provided below.

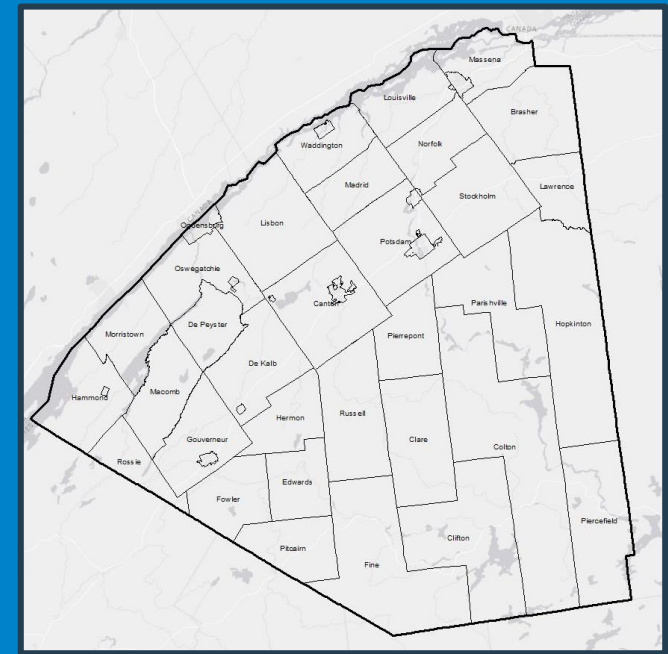
We look forward to receiving your input on the Draft HMP. Please contact me (315-457-5200 or reply to this email) or Matt Denner, St. Lawrence County Director of Emergency Services, at 315-379-2240, with any questions. Jurisdiction representatives, your Annex document is included in Appendix B of the Draft HMP. If you have additional comments on your Annex or on other elements of the HMP, please let me know. Anyone is welcome to send comments directly to me via email, even if you are unable to attend the meeting.

Sincerely,
Grete Day

St. Lawrence County HMP Update Stakeholder and Public Information Meeting

- Session #1: Wednesday, February 2 from 2-2:30pm
 - Zoom Meeting ID: 868 9453 1654
 - Link to Join: <https://us06web.zoom.us/j/86894531654>

- Session #2: Wednesday, February 2 from 6-6:30pm
 - Zoom Meeting ID: 884 0081 3907
 - Link to Join: <https://us06web.zoom.us/j/88400813907>



St. Lawrence County Hazard Mitigation Plan Update

Stakeholder and Public Information Meeting

February 2, 2022



- **St. Lawrence County**

- Emergency Services
 - Matt Denner
- Planning Department
 - Jason Pfothenhauer
 - Heidi Ames
- Highway Department
 - Don Chambers
 - Ian Hazen

- **Barton & Loguidice**

- Johanna Duffy
- John Condino
- Grete Day

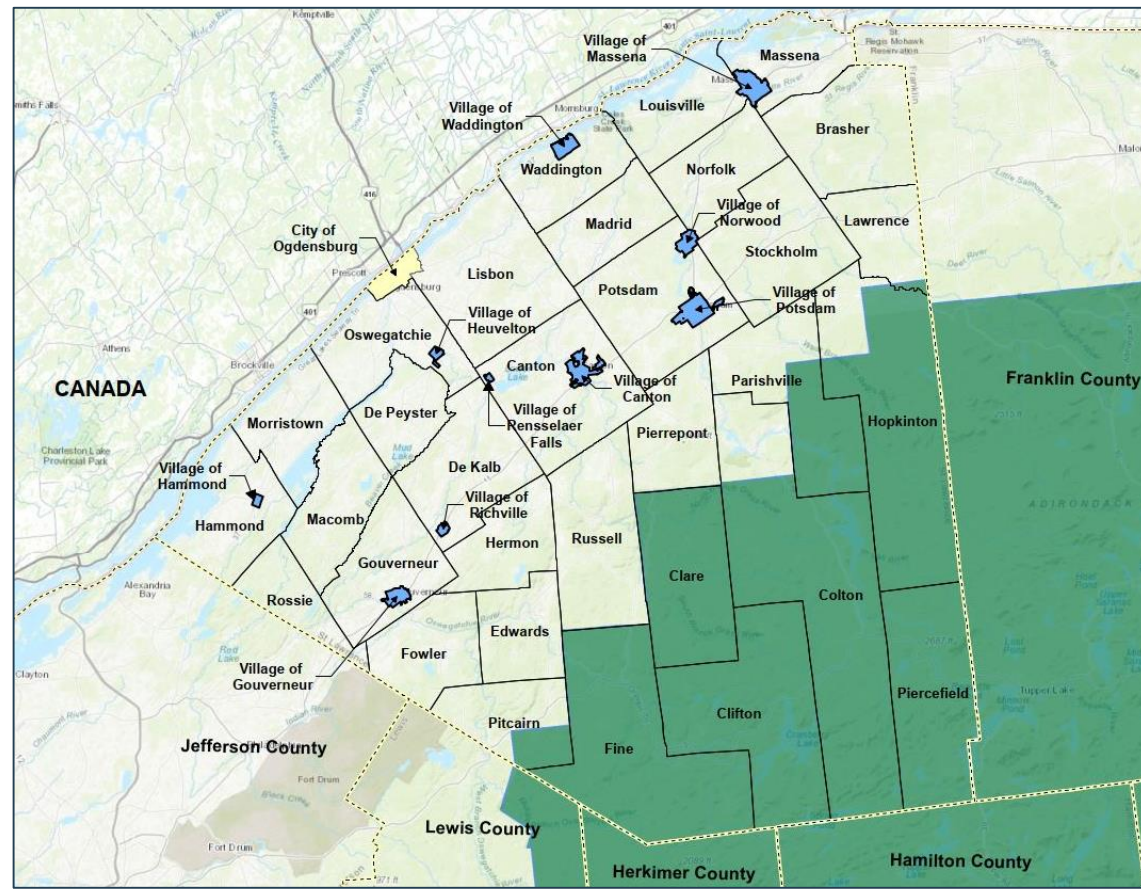


- **St. Lawrence County Legislature & County Administrator Support**



Jurisdiction Participation

- 100% jurisdiction participation (43 total)
- Jurisdiction support
 - Chief elected officials, Town/Village clerks, Town/Village board members, planning board members, highway department staff, code enforcement officers, fire department/EMS representatives, and more



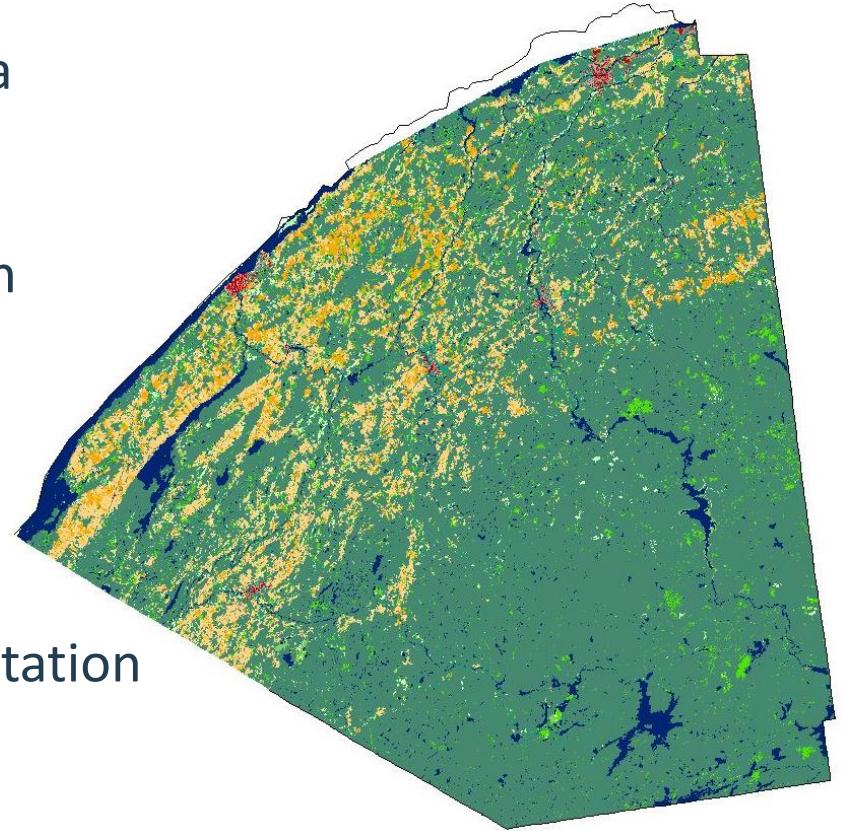
Hazard Mitigation Planning

- St. Lawrence County received a grant from FEMA to update the 2015 Multi-Jurisdictional Hazard Mitigation Plan (HMP)
- Hazard mitigation planning develops long-term actions that aim to reduce:
 - Loss of life
 - Number/severity of injuries
 - Property & natural resource damages



Plan Components

- Main Body
 - Broad overview focused on County as a whole
 - County Profile, Planning Process, Risk Assessment, Hazard Profiles, Mitigation Strategy
- Appendices
 - Jurisdictional Annexes (Appendix B)
 - Additional tables, maps
 - Meeting and public outreach documentation



Planning and Drafting Process

- January 2021-January 2022
- Data collection
 - Monthly County Planning Committee Meetings
 - Individual meetings held for each jurisdiction
 - Stakeholder/Public Information Meeting #1 – June 2021
 - Over 100 stakeholder contacts from local, state, and federal agencies and groups invited to participate
 - Adjacent Counties, St. Regis-Mohawk Tribe
 - Local fire, police, and EMS organizations
 - Regional, state, & federal agencies
 - NOAA National Weather Service
 - Utility companies
 - Hospitals
 - Educational facilities

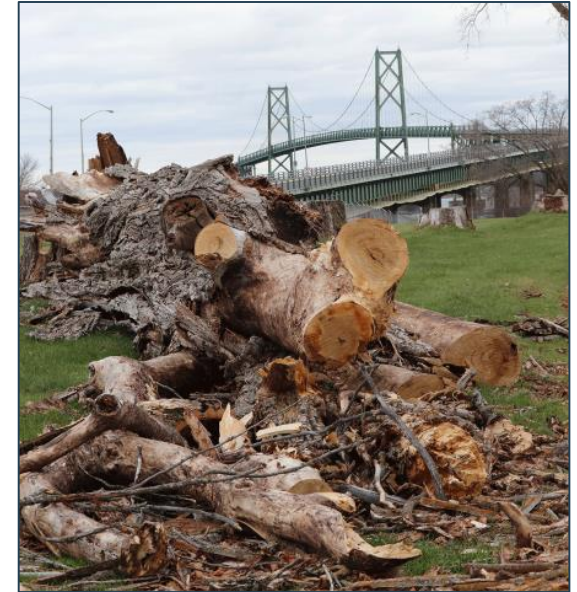


Planning and Drafting Process

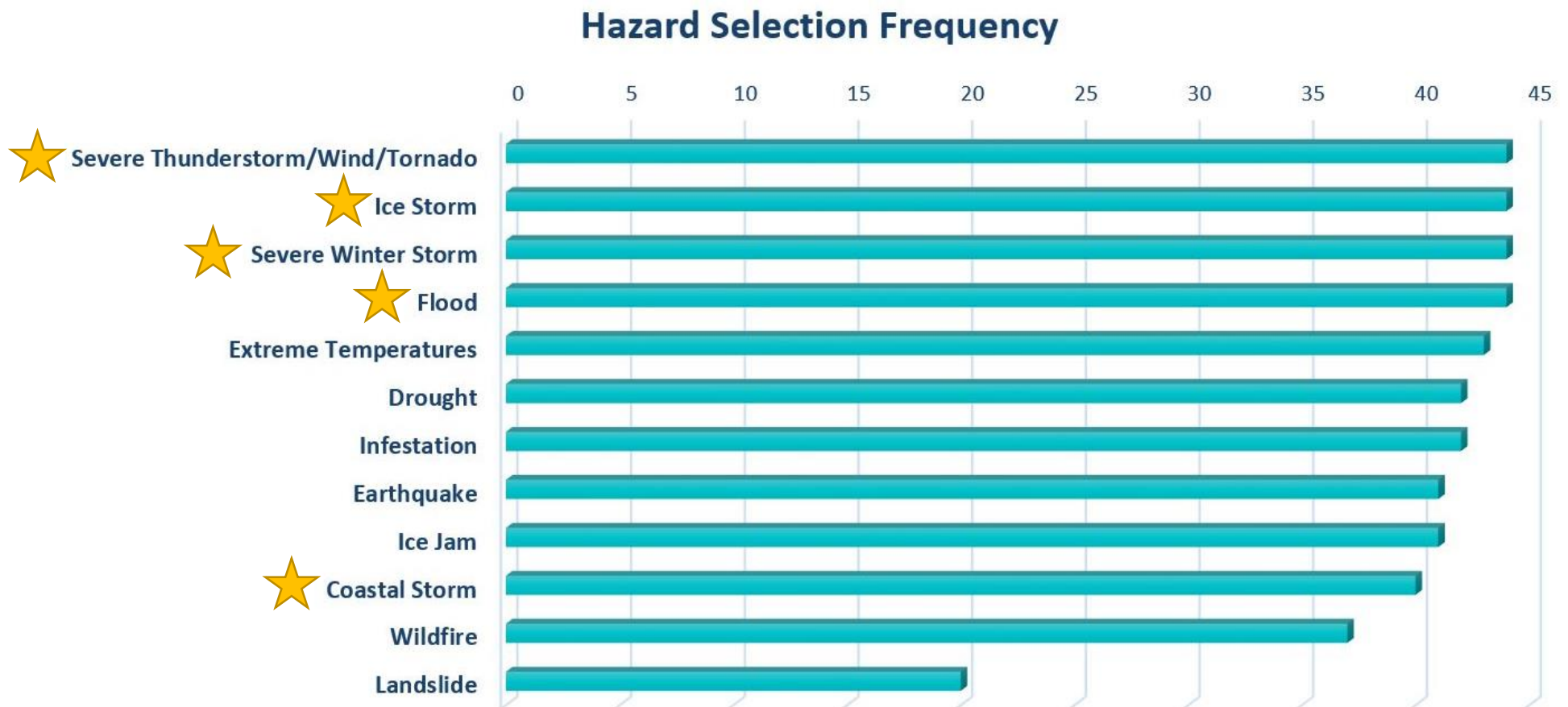
- Updates to the 2015 HMP
 - Recent hazard events
 - Changes in community capabilities (plans, regulations, staff) and hazard mitigation priorities
 - New details documented at jurisdiction level
 - Emergency shelters
 - Temporary and permanent housing locations
 - New development
 - Documented progress on 2015 mitigation actions
 - Developed new actions to include in the HMP update
 - Draft HMP reviewed by County Planning Committee
 - Annexes reviewed by jurisdiction representatives



- **St. Lawrence County 2021 hazard analysis:**
 1. Severe Thunderstorm, Wind, or Tornado
 2. Ice Storm
 3. Severe Winter Storm
 4. Coastal Storm (Nor'easter)
 5. Extreme Temperatures
 6. Ice Jam
 7. Flood
 8. Drought
 9. Earthquake
 10. Wildfire
 11. Landslide
 12. Infestation

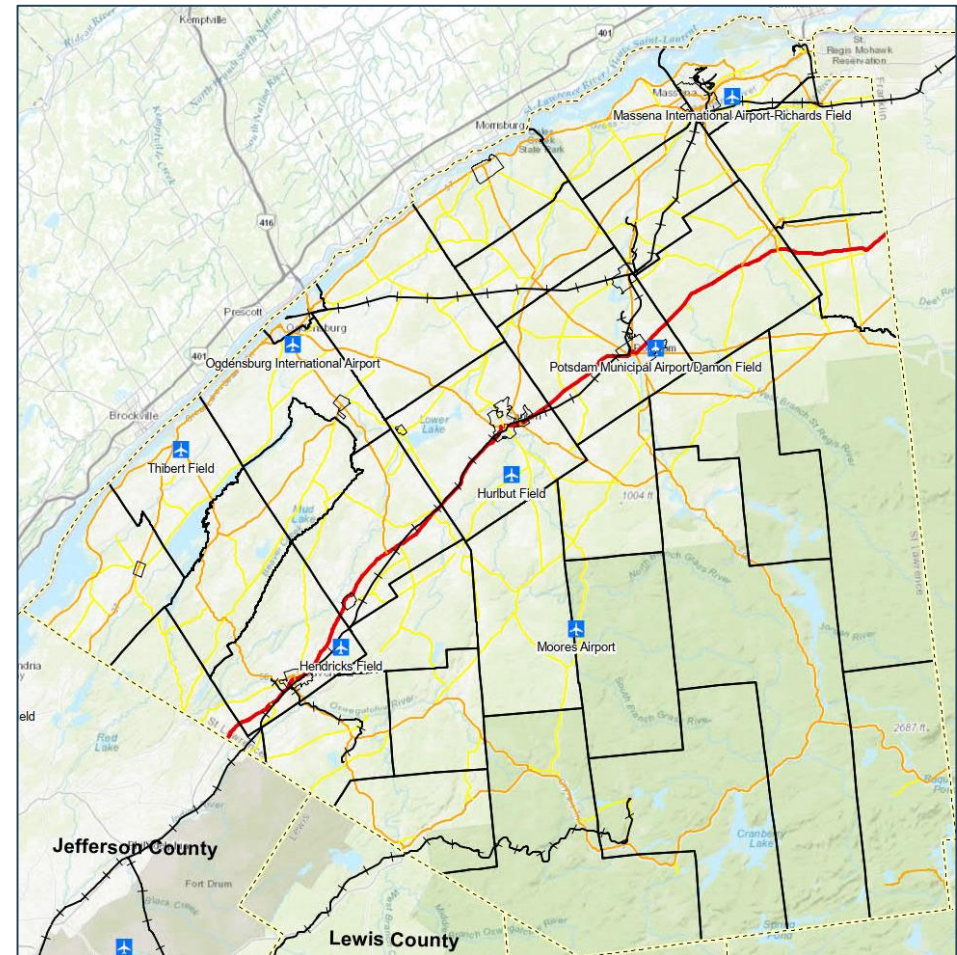


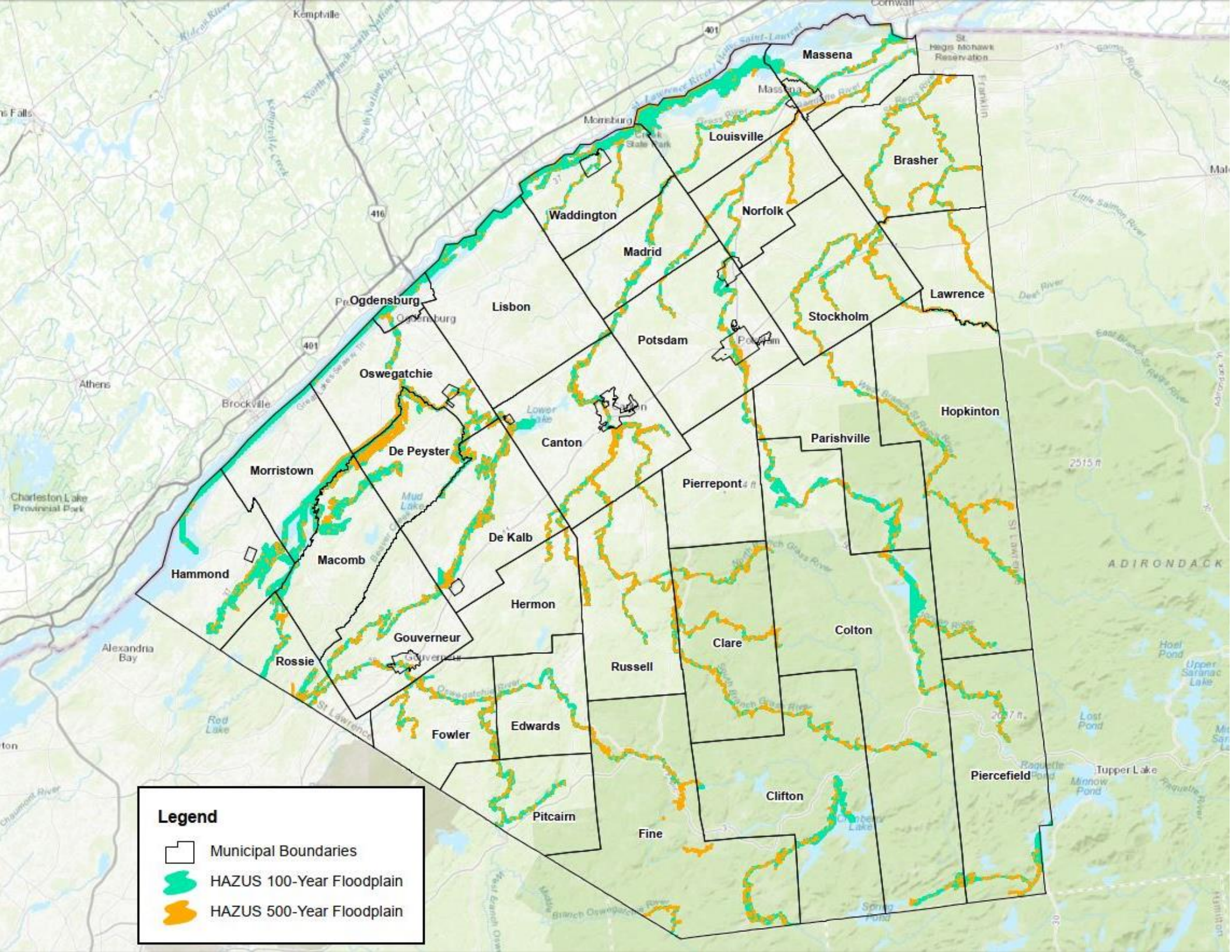
- Jurisdictions each completed an individual hazard analysis






Vulnerability Assessment

- Capability Assessment
 - Existing plans, regulations, programs, and staff
- Existing assets and resources
 - Critical infrastructure
 - Emergency shelters
 - Evacuation routes
 - Communication systems
- Vulnerability
 - Hazard-prone locations
 - Critical infrastructure condition
 - Concentrated or isolated populations





Legend

-  Municipal Boundaries
-  HAZUS 100-Year Floodplain
-  HAZUS 500-Year Floodplain

- FEMA conducting updated flood study for St. Lawrence County
- New flood insurance rate maps (FIRMs) will be generated Countywide, along with digital (GIS) floodplain data

Detailed Flood Study	Approximate Flood Study
<ul style="list-style-type: none">• St. Lawrence River• Black Lake• Portaferry Lake• Five Falls Reservoir• Portions of:<ul style="list-style-type: none">• Grass River• Oswegatchie River• Raquette River• St. Regis River• West Branch St. Regis River	<ul style="list-style-type: none">• Remaining portions of:<ul style="list-style-type: none">• Grass River• Oswegatchie River• Raquette River• St. Regis River• West Branch St. Regis River• Little River• Dead Creek• Trout Brook• North Branch Grass River• All other mapped streams

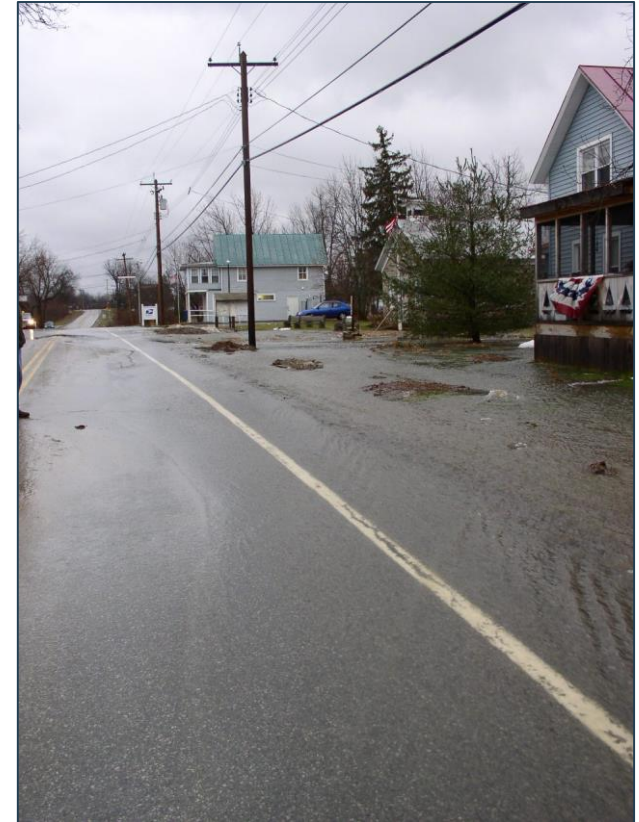


FEMA



Mitigation Actions

- The County and each jurisdiction identified at least two new mitigation actions related to:
 - Prevention
 - Property Protection
 - Structural Projects
 - Natural Resource Protection
 - Emergency Services
 - Public Education and Awareness
- Implementation plan developed for each action
 - Estimated costs, potential funding sources, involved agencies, and implementation timeframes
- Mitigation action details are provided in each jurisdictional annex



Climate Change Considerations

- Many natural hazards are likely to become more severe in the future due to climate change, including:
 - Severe thunderstorms
 - Flooding
 - Extreme heat
 - Drought
 - Wildfire
- Many jurisdictions included specific mitigation actions related to these hazards and climate projections
 - Shoreline stabilization and resiliency projects
 - Stormwater conveyance improvements
 - Update local floodplain and/or zoning regulations
 - Establish cooling centers



- The Draft HMP is available for review on the St. Lawrence County Planning Office's website:
<https://www.stlawco.org/Departments/Planning>
- The Draft HMP may be reviewed in person at the County Planning Office:
48 Court Street, 2nd Floor
Public Safety Building (Building #2)
Canton, NY 13617
- Comments due by Friday,
February 25th



Planning

Special studies for the legislature and other departments; grant writing and administration, especially in housing and local infrastructure; technical assistance to local governments and citizens on planning and zoning and environmental problems; monitor and respond to state and federal project proposals and laws; provide staff resources to County Planning Board and Environmental Management Council; staff the Fair Housing Task Force and the Agricultural and Farmland Protection Board, and the Committee on Low Level Flights; provide training to planning and zoning boards; liaison with regional and statewide agencies and organizations; develop and maintain St. Lawrence County Geographic Information System.

Draft Multi-Jurisdictional Hazard Mitigation Plan (HMP)

- St. Lawrence County received a Pre-Disaster Hazard Mitigation Grant from the Federal Emergency Management Agency (FEMA) to complete an update to the County's original Multi-Jurisdictional Hazard Mitigation Plan (HMP). The purpose of hazard mitigation planning is to reduce or alleviate property loss, reduce damage to the environment, and reduce the loss of life and number and severity of injuries that have the potential to result from natural hazard events. The HMP is used to identify and implement short- and long-term mitigation strategies and actions that focus on execution at a pre-disaster level. Retaining an approved and updated HMP will allow the County and participating municipalities to remain eligible to apply for future hazard mitigation and resiliency funding from FEMA. The updated HMP also provides the County and jurisdictions with an additional tool to reference for disaster planning, land development, and funding initiatives.

CONTACT INFORMATION



ST. LAWRENCE
COUNTY GOVERNMENT

Planning Department

48 Court Street
Bldg. #2
Canton, New York 13617

[View Map to Planning Office](#)

Ph: 315-379-2292
Fc: 315-379-2252

[Email Planning Office](#)

Jason Pfothenauer - Director

Lisa Bartalo - Office Manager

Status and Next Steps

- Draft HMP was submitted to NYS DHSES for review on January 14, 2022
- Stakeholder/Public Information Meeting - Today (February 2)
- Public comments due by February 25, 2022
- NYS DHSES review and approval
- FEMA review to designate plan “Approvable Pending Adoption”
- Adoption of HMP Update by County and each jurisdiction



- We welcome your feedback!
 - Questions?
 - Comments?



- Please submit feedback to:

Matt Denner, Director
St. Lawrence County Emergency Services
Building #8
48 Court Street
Canton, NY 13617
Phone: (315) 379-2240
Email: MDenner@stlawco.org

Grete Day
Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY 13088
Phone: (315) 457-5200
Email: gday@bartonandloguidice.com



Appendix F

Public Outreach Documentation

PURSUANT TO THE STATE OF EMERGENCY EXECUTIVE ORDER 202.1 ARTICLE 7, SUSPENSION OF LAW ALLOWING THE ATTENDANCE OF MEETINGS TELEPHONICALLY OR OTHER SIMILAR SERVICE

Members Attending: Ms. Curran, Mr. Denesha, Mr. Lightfoot, Mr. Reagen, Mr. Sheridan, and Mr. Smithers

Members Attending via Videoconference: Mr. Acres, Mr. Arquiett, Mr. Burke, Mr. Fay, Ms. Fiacco, Mr. Forsythe, Ms. Haggard, Mr. Perkins, and Ms. Terminelli

Others Attending via Videoconference: Ruth Doyle, Dylan Soper, Kelly Pearson, Stephen Button, Brooks Bigwarfe, Jason Pfothauer, Mike Cunningham, and Gary Pasqua

1. CALL TO ORDER AND APPROVAL OF AGENDA – Ms. Curran called the meeting to order at 8:34 p.m. Mr. Denesha moved to approve the agenda, seconded by Mr. Lightfoot, and carried unanimously by a voice vote with fifteen (15) yes votes.

2. APPROVAL OF MINUTES – Mr. Lightfoot moved to approve the January 11th meeting minutes, seconded by Mr. Denesha, and carried unanimously by a voice vote with fifteen (15) yes votes.

3. BARTON & LOGUIDICE HAZARD MITIGATION PLAN UPDATE – John Condino, Senior Project Manager and Johanna Duffy, Senior Managing Environmental Scientist

4. SHERIFF – BROOKS BIGWARFE

A. Modifying the 2021 Budget for the Sheriff’s Office for Forfeiture Reimbursement from a County Surplus Auction (Res) – Mr. Denesha moved to forward this resolution to Full Board, seconded by Mr. Lightfoot and Mr. Forsythe, and carried unanimously by a voice vote with fifteen (15) yes votes.

5. DISTRICT ATTORNEY – GARY PASQUA

A. Authorizing the Chair to Sign Federal Equitable Sharing Program Agreement and Annual Certification Report (Res) – Mr. Denesha moved to forward this resolution to Full Board, seconded by Mr. Reagen, and carried unanimously by a voice vote with fifteen (15) yes votes.

6. PLANNING – JASON PFOTENHAUER

- A. Lead Grant Update (Discussion) – Jason Pfothauer
- B. Broadband Survey Efforts (Discussion) – Jason Pfothauer

7. LEGISLATOR RITA CURRAN

A. Proclaiming the Month of February as Black History Month in St. Lawrence County (Res) – Mr. Denesha moved to forward this resolution to Full Board, seconded by Mr. Reagen.

Ms. Haggard, Mr. Denesha, Mr. Reagen asked to be added as a co-sponsors to this resolution.

Motion carried unanimously by a voice vote with fifteen (15) yes votes.

8. VACANCY REVIEW COMMITTEE

A. District Attorney – Mr. Pasqua requested to fill an Assistant District Attorney position (026800005) in the District Attorney’s Office.

B. Sheriff – Sheriff Bigwarfe requested to fill a Deputy Sheriff (605000027) and a Corrections Officer (603000018) positions in the Sheriff’s Office, and discussed part-time officers.

9. COUNTY ADMINISTRATOR’S REPORT

Ms. Doyle said there has been a team effort with getting the vaccine sites up and going, and she would like to thank everyone who assisted at SUNY Potsdam, the Sheriff and those at the Correctional Facility, and St. Lawrence University for all the work done at the locations around the County. The IDA has shared a staff member to work with the County on determining the logistics and locations of vaccine sites. Public Health continues to assist, along with Office for the Aging. Ms. Doyle she said she is proud of how well the efforts are going. This week the vaccine site will be held at the Dome in the City of Ogdensburg.

Ms. Doyle said a survey was initiated for employees to provide feedback and suggestions regarding working during the pandemic.

Ms. Doyle reported two transfers of funds: \$916 for Probation for an increase in the lease at the Gouverneur Office, and \$5,000 for Solid Waste for repair and maintenance.

NYSAC is conducting its legislative conference virtually. Ms. Doyle said she is the Chair of the Taxation and Finance Committee, and four (4) resolutions were considered and passed today by that Committee.

Ms. Doyle said she is working on 2021 Legislative Agenda and will schedule a work session soon.

The Town and Village of Canton requested a tour of the Human Services Center. The building will be transferred to the Village of Canton in the Year 2032.

Social Services statistics have been posted to Google Drive.

Each month through September, on the Services Committee agenda, Ms. Ackerman will give an update on Family First.

Tomorrow at 3 p.m. the Presidents of SUNY Potsdam and Clarkson will raise banners highlighting the ongoing efforts of each of the campuses to stop the spread of COVID-19.

The Health Insurance Reserve is \$750,000.

Ms. Doyle said the Shared Services Committee will meet in March.

There is no meeting scheduled next week in observance of Presidents Day.

10. COMMITTEE REPORTS

- A. Agriculture & Farmland Protection Board – Mr. Denesha
- B. Alternatives to Incarceration Board – no report
- C. Board of Trustees for Supreme Court Library – no report
- D. Emergency Medical Services Advisory Board – Ms. Curran
- E. Environmental Management Council – Ms. Terminelli
- F. Fire Advisory Board – Mr. Denesha
- G. Intercounty Legislative Committee – Ms. Curran
- H. Jury Board – no report
- I. Planning Board – Mr. Fay

11. OLD/NEW BUSINESS – There was no old/new business.

Mr. Smithers moved to go to Executive Session at 9:41 p.m. to discuss negotiations, litigation, personnel and appointments, seconded by Mr. Lightfoot, and carried unanimously by a voice vote with fifteen (15) yes votes.

12. EXECUTIVE SESSION

Mr. Denesha moved to go to Open Session at 10:17 p.m., seconded by Mr. Lightfoot, and carried unanimously by a voice vote with fifteen (15) yes votes.

13. ADJOURNMENT – Ms. Curran adjourned the February Operations Committee Meeting at 10:17 p.m., as there was no further business.

Virtual Stakeholder and Public Information Meeting for the St. Lawrence County Hazard Mitigation Plan Update

May 21, 2021

Press Release - For Immediate Release

Virtual Stakeholder and Public Information Meeting for the St. Lawrence County Hazard Mitigation Plan Update

St. Lawrence County received a Pre-Disaster Hazard Mitigation Grant from the Federal Emergency Management Agency (FEMA) to complete an update to the County's original Multi-Jurisdictional Hazard Mitigation Plan (HMP). The original HMP was approved by FEMA in 2015. The purpose of hazard mitigation planning is to reduce or alleviate property loss, reduce damage to the environment, and reduce the loss of life and number and severity of injuries that have the potential to result from natural hazard events. The HMP is used to identify and implement short- and long-term mitigation strategies and actions that focus on execution at a pre-disaster level. Retaining an approved and updated HMP will allow the County and participating municipalities to remain eligible to apply for future hazard mitigation and resiliency funding from FEMA. The updated HMP also provides the County and jurisdictions with an additional tool to reference for disaster planning, land development, and funding initiatives.

A virtual Stakeholder and Public Information Meeting will be held on Tuesday, June 8, 2021. The purpose of the meeting is to solicit comments and questions regarding hazard mitigation planning concerns from County residents and stakeholders from local, state, and federal agencies. Two sessions (2-3pm and 6-7pm) will be offered; the same information will be presented at both sessions. If you are a member of the public who wishes to attend, please contact Heidi Ames at the St. Lawrence County Planning Office at (315) 379-2292 or HAmes@stlawco.org to register. Stakeholder agency representatives do not need to pre-register. Zoom meeting information will be sent directly to stakeholders and registered County residents via email.

REGULAR BOARD MEETING
@ The Russell Town Hall @ 6:00 pm
09/21/2021

PRESENT:

Supervisor White
Councilor Burnham
Councilor Averill
Town Clerk -Tess Eells
Councilor Kerr
Councilman Whiteford- absent
Highway Superintendent White -absent

GUESTS:

Bobby Knox
Larry Trombly
Larry Denesha
Toni Trombly

Pledge:

The meeting was called to order at 6:00 pm by Supervisor White

PUBLIC DISCUSSION: None

ACCEPTANCE OF THE MINUTES:

A motion was made by Councilor Kerr and seconded by Councilor Beachard to accept the minutes from 08/17/2021 as presented by the Town Clerk.

Ayes-4 Beachard, Burnham, White, Kerr

Nays-0 motion carried.

TOWN CLERK REPORT: 09/21/2021

August Report:

5 dog licenses	26.00
Hunting licenses commission	119.91
4 Certified copies	40.00
3 Bldg Permits	75.00
3 Marriage Licenses	22.50
0 impoundment fees	.00
Fax & copy money	.00
0 donations	.00
<u>Revenue to supervisor:</u>	<u>\$283.41</u>
<u>Disbursed amounts:</u>	
Ag & Market (spay, neuter program)	7.00
NYS Department of Health	67.50
Decals	2,105.09
<u>Total Disbursed</u>	<u>\$2,463.00</u>

A motion was made by Councilor Averill
Seconded by Councilor Burnham
Ayes-4 Beachard, Burnham, White, Kerr

Nays-0 motion carried
To accept the clerk Report as presented

BALL FIELD COMMITTEE REPORT:

- Superintendent White stated that Doug, Bobby, Pete, Andy and himself met at ballfield and went over the plumbing. The pad has been poured for the bathrooms. We will get the 2x4 lumber to frame it in.
- He stated that he will get some volunteers together to work on the fence.

SUPERVISOR REPORT: Timothy White

1. Financial Report
 - Details of all income and expense transactions have been filed with the Town Clerk.
 - Account balances as of September 21, 2021 for the General Fund, Highway Fund, Capital Improvement Fund, and Street Light Fund have been filed with the Town Clerk.

RESOLUTION # 50 Budget Modification

A motion was made by Councilor Burnham and seconded by Councilor Kerr to authorize the following budget modification:

Decrease A5132.4 (garage & Pit) by \$161.99 and increase A5680.4 (transportation safety) by \$161.99 and this will balance the accounts.

Ayes – 4 Beachard, Burnham, White, Kerr

Nays – 0 Motion carried

Town Supervisor
Timothy White

A motion was made by Councilor Beachard and seconded by Councilor Burnham to accept the supervisor report as presented.

Ayes – 4 Beachard, Burnham, White, Kerr

Nays – 0 Motion carried

LEGISLATURE REPORT: Larry Denesha

- COVID- as of today there were 58 new cases 25 are hospitalized. St. Lawrence County for fully vaccinated is 52.6 %. St. Lawrence county is highest in positive rate of new cases over the 3 counties.
- COVID tests are free at the St. Lawrence Health System and Claxton. They have a rapid test machine and can do up to 80 a day.
- We passed a resolution in August authorizing to join a law suit against big Pharma's for the opioid crisis and we will get \$700 thousand over a 10 year period.
- The Bridge on County Route 27 in DeGrasse is closed.
- Regards to the Hazard Mitigation Survey; I feel someone from Russell should sit in on it. I would be willing to sit in on it also just let me know

when. Tim will set up a time with them and let Larry know when. It is important if the town needs FEMA.

- Yesterday the Operations Committee met and sent out a survey to employees about mask mandates. 52% were against the mask mandate/ we will do a recommendation. We did a resolution against the Federal/ State mandating masks. I feel it should be up to the employer to do mandates.

A motion was made by Councilor Beachard and seconded by Councilor Kerr to accept the legislature report as presented.

Ayes – 4 Beachard, Burnham, White, Kerr

Nays – 0 Motion carried

FIRE DEPARTMENT REPORT:

RUSSELL FD: Sandy and Bobby

- We are still trying to get the kitchen done; we would like it done by election day.
- We are having a Election Day dinner November 2nd.

DEGRASSE FD: N/A

A motion was made by Councilor Kerr and seconded by Councilor Beachard to accept the FD report as presented

Ayes – 4 Beachard, Burnham, White, Kerr

Nays – 0 Motion carried

HIGHWAY SUPERINTENDENT REPORT: 09/21/2021 * Larry White

We have completed our work on the seasonal section of Blanchard Hill Road.

We are now mowing roadsides for the 2nd time and have the south side nearly done.

We have sent the tractor to Cazenovia Equipment for electrical repair.

We have been grading gravel roads.

We have cut brush on the Hatch Road.

We have trucked in a gravel stockpile before the pits close to have on hand for spring.

We have helped Hermon, Edwards & Pierrepont with trucking.

We have installed 4 pipe crossings on the Blackmer Road and 1 driveway pipe on the Given Road.

We have been patching on all our roads.

We have taken the new truck to Champlain for its first service.

We are now screening sand and should be completed next week.

This has been a busy and productive month and I thank the men for a job well done.

HIGHWAY COMMITTEE REPORT: N/A

A motion was made by Councilor Burnham and seconded by Councilor Kerr to accept the HWY Superintendent and HWY Committee reports.

Ayes – 4 Beachard, Burnham, White, Kerr

Nays – 0 Motion carried

HORSE TRAILS AND BLUEWAY TRAILS REPORT: David Whiteford N/A

A motion was made by Councilor _____ and seconded by Councilor _____ to accept the report as presented.

Ayes –

Nays –

RESOLUTION # 51* Audit Report-Timothy White & Sandra Burnham

A motion was made by Councilor Burnham and seconded by Councilor Kerr to pay the following bills.

Fund	Vouchers	Total
General	186 - 206	\$14,246.07
Highway	162 - 184	\$44,909.37
Capital Improvements	-	.00
Streetlights	9	\$689.62

Ayes-4 Beachard, Burnham, White, Kerr

Nays-0 motion carried

OLD BUSINESS:

- Supervisor Tim presented a cost for a new truck for highway. Larry White was not at the meeting so Supervisor White stated we should wait until Larry is here, but Councilor Burnham stated we need to move on this to get it ordered. The plow that we have will fit on this truck.

RESOLUTION # 52 New 2022 F-Series SD

A motion was made by Councilor Kerr and seconded by Councilor Burnham:

THEREFORE, the town board authorizes ordering a new 2022 F-450 Crew w/ Dump body at the cost of \$52,581.00. They want to get it in Gray not red.

Ayes – 4 Beachard, Burnham, White, Kerr
Nays – 0 Motion carried.

NEW BUSINESS:

- Supervisor White stated the town needs a snowblower for winter and we got 3 quotes:
 1. P1724 24 inch at \$1799.00
 2. Simplicity IS24 24 inch \$1499.00
 3. Husquavana ST224 cost \$899.00

RESOLUTION # 53 New Snowblower

A motion was made by Councilor Beachard
Seconded by Councilor Kerr

THEREFORE, the town board authorizes the purchase of the Simplicity IS24 24-inch snowblower at the cost of \$1499.00.

Ayes – 4 Beachard, Burnham, White, Kerr
Nays – 0 Motion carried

The board was given the Standard Work -Day Reporting Resolution for Elected and Appointed Officials to review.

RESOLUTION: # 54 Standard work- day resolution reporting

A motion was made by Councilor Burnham and seconded by Councilor Kerr to Accept the 2021 Standard Work- Day Reporting Resolution for Elected and Appointed Officials as presented.

Ayes-4 Beachard, Burnham, White, Kerr
Nays-0 motion carried

A motion by Councilor Kerr and seconded by Councilor Burnham to adjourn at 6:33 PM.
all were in favor.

Respectfully submitted by Tess Eells-Russell Town Clerk

Regular Meeting

Due to COVID restrictions the regular meeting of the Waddington Town Board was held via zoom on Monday, September 13, 2021 @ 7PM.

Present were: Supervisor Alex Hammond and Council Members: Travis McKnight, David McBath, Scott Loomis, and Shaun Prentice.

Also present: Carol A Burns, Town Clerk, David Putney, Highway Superintendent, Tony McManaman, Code Enforcement Officer, Kevin Liddell, Sue Papasian, Tom Hunter, Michelle Patenaude, Kevin Acres, Hunter Hodgdon, Tenley Amo, Mark Scott, Audrauna Willard, Bonnie Sabatini, James Miller and Kathy Dupray, Historian.

Call to order: Supv Hammond called the meeting to order @ 7PM.

Pledge of Allegiance: The Pledge of Allegiance was recited.

Approval of Minutes: A motion was made by McBath, seconded by Loomis to approve the minutes with the modifications made. Ayes: All

Citizen's Comments:

Mark Scott invited anyone who would like to submit articles to the Waddington Recorder to have them in by October 13th.

Committee Reports:

Highway: C McKnight reported that the Highway Department has cold paved 7/10 on Allison Rd and 8/10 on Randall Rd. Trucks from Louisville, Norfolk, Madrid, Lisbon, and our own were used for 2 days. They went to Lisbon for 2 days and helped them cold pave. They have done maintenance on the trucks, set up barricades for fireworks at the beach, helped Madrid blacktop 3 days (cold paved 2 days blacktop 1 day), mowed the beach hill again, dug one cremations, and set up for the rabies clinic. Supt Putney went to Fort Dix to pick up the skid steer and to Cape Cod to pick up the F350 Dump truck. 2 trucks hauled 1A stone to Madrid for 2 days as well as hauling to our yard. They went to Louisville to blacktop for 1 day. They used Madrid's boom mower to mow behind the causeway and Coles Creek Rd guard rails and borrowed Lisbon's screen to screen sand in the yard.

Rescue Squad: C Prentice reported that COVID is causing shortages with members. The call volumes are up. The rigs have been undercoated for free by Neal Haney. They are looking for new members.

Library: C Loomis reported that last week the NCLS Consultant spoke with the library board. The working budget was presented. They sold 1000 books as of Saturday. The summer programs are completed for the kids. They had 553 people use the library. 53 people used the computers.

The Library Board requested that the Town Board appoint Mark Scott to the library board.

Resolution #64

Motioned by: Prentice

Seconded by: Loomis

RESOLVED, that the Waddington Town Board does hereby appoint Mark Scott to the Library board for a term of five (5) years ending 12/31/2026. Ayes: All

Supv Hammond reported that he had received a letter back from the Town Attorney stating that the MOU has been reviewed and that the Town Board should move forward with signing. This document will help future boards to understand the relationship between the library and Town Board.

C McBath noted that in a letter from the Town Attorney dated July 8th there was a note made about the carrying of insurance can be changed by the Town at any time. Also there was a reference on page 11 concerning legal representation. He did note that he sees that has been taken care of in the document. Bonnie stated that she will make the changes for insurance as

per the Attorney's suggestion. He noted that it was very clear that employees are employees of the library not of the town. He was concerned when Worker's Compensation and unemployment. If the town has been providing it he doesn't think the town can extend these benefits to non-town employees. More investigation will be done to confirm.

C Loomis reported that the Library would like to be put back on the solar program. Their submitted budget is pending this. If they aren't put back on they will have to increase their budget by \$1,400 to cover their electrical expenses.

Bonnie also told the board that their unexpended balance from last year is not a sustainable income and they will be reducing that in the 2022 budget. They are working on fundraising this year to help with the finances.

C Prentice asked Bonnie if they had the load information for the new air conditioning system. Bonnie noted that they did not have it yet but would get it for him as soon as she could.

Grants/Alternative Revenue: C McBath reported that he has read all the information for the SEQR paperwork for the Iroquois Dam project. He has had conversations with Tony and Jim Thew about the process. He also spoke with Kevin Smith the engineer that the board has used for several projects. Kevin noted that he doesn't do SEQR reports due to a conflict of interest with his job. C McBath has spoken with Rob Campany from Fourth Coast Inc. He takes on this type of work. He did it for our solar project. He will be in town tomorrow to talk to.

Supv Hammond noted he would contact Rob with a copy of the PowerPoint presentation and see if he can come up with a not to exceed figure. It is work done by the hour.

The RVRDA grant contract has been signed and sent in.

The HIPCAMP site is finally figured out. They can now find our site by typing in Waddington.

The paperwork side is complete. We still need 2 fireplaces and picnic tables. C McKnight noted if they bring the forms back to him they will be pouring concrete again this week and will get them completed.

Supv Hammond thanked C McBath, C McKnight, Supt Putney, and Jim Thew for all the work they did to get it up and running.

C McBath reported that he and Supt Putney met with Kevin Smith on Wednesday in the Highway Barn to discuss the proposed drainage project. The Clerk noted that the Town has received an additional \$500 in funding.

Cemeteries: C McKnight reported that the cemetery committee met. The committee consists of Dave & Tracey Putney, Sandy Wright, Al & Tenley Amo, and himself. The committee discussed tree cutting for this fall. They will request bids for this work. They have discussed fences for the cemetery. One cemetery will cost \$40,000. They were discussing different ideas. They would like to install lighted flagpoles at each cemetery. Al & Tenley Amo donated one. Sandy Wright will reach out to the Boy Scouts to restore and paint each sign. These were originally an Eagle Scout project. They discussed digitizing the cemetery maps in the Clerk's Office. This would provide a backup source. They are looking at funding sources for the projects.

C McKnight requested permission to ask the Town Attorney if the town could receive donations earmarked by individuals for the cemeteries. The board noted he could contact him.

They will hold another meeting next month. There are a lot of good ideas out there. They are also looking for more committee members.

Recreation: C Loomis reported that the Recreation Committee will be advertising for employment with the Morning Recreation Program, Beach Director, and Morning reading program. Chairman Strait has been in contact with NYPA about cameras at the beach. They would like to see road bumps on the roadway to the top of the beach hill. They have been looking for a contractor to quote for sea weed control.

There will be an Oktoberfest in Waddington on October 9th. The event is Chair is Brittnay Bush. There will be a chili cook-off, live music, pumpkin painting, and pumpkin chuckin. The event runs from 11AM- 5PM.

Gallery/Clarke House: Mark Scott reported that the Gallery would like to thank the Town for the use of the old town hall. It is a bigger safer environment to work in. They have made a \$50 donation to the town. The next exhibit will be by Bill Parmer. It will run for six months.

Supv Hammond reiterated that if you haven't been to the Clarke House you should go down and see their new wide open space. They will be open until after Christmas in Waddington.

Museum: A letter was received by James Miller, President of the Museum Board. He requested that it be read aloud at the meeting. After reading the letter Supv Hammond noted that his response was that he was appointed as the liaison to the Museum Board and has received all his information from the Mayor. He was under the assumption that there was a clear prospective that if anything was needed from the Town that they could come to him and he would bring to our board. The Village is the lead agency and would contact us when we need to provide anything. Board members noted that they were not aware that there were any issues between the Town and the Museum Board. Discussion further ensued and Supv Hammond noted he would come to the museum meetings. They will meet again next Tuesday @ 6PM.

There have been two resignations from the Library Board. Mary Hamilton, Treasurer and Donna Reagan have resigned. The Museum Board would like to appoint James Tiernan and Matt Daley to the Board. These were approved by the Village Board at their last meeting.

Resolution #65

Motioned by: McBath

Seconded by: Loomis

RESOLVED, that the Waddington Town Board does hereby accept the resignations of Mary Hamilton and Donna Reagan;

FURTHER RESOLVED, that the Waddington Town Board does hereby approve the appointment of James Tiernan and Matt Daley to the Museum Board. Ayes: All

Kathy Putney reported that the exhibit set up in the old town hall was well received. She had over 100 people attend during homecoming. She received some great feedback and heard lots of stories from people about the seaway. On August 22nd Sarah Shultz came over with the Madrid Historical Society. They have 11 members. Carrie Rutherford is the assistant historian. Rick Rikowski who is an underwater diver shared presentations of drawing and pictures he has taken of stuff left under the water when the seaway came through.

They have had four work bees packing up items at the Moore Museum. They had some kids from the High School Honor Society come last week and helped load and move things for them. She will not hold any regular hours in September. People may contact her to see the exhibit by appointment. She reported that the Museum board will meet on Tuesday, Sept 26th @ 6PM and the Historical Society on the 28th @ 7PM. C. McBath asked Kathy if the Historical Society will be a 501.C.3 organization. Kathy noted they are working on it so that they can accept donations.

Generator update: Supv Hammond reported that Mike and his crew had done some field work for the Generator hookup from the Fire Dept. to the Highway Department. It should be done by the end of next week and will put the bids out to be opened at the next Town Board meeting.

Local Government Task Force: Supv Hammond reported that the boring sample study for the marina looks good. The next step is to move forward with the permitting process. Steve Shoenwiser, NYPA will work parallel with the permitting process to get estimate. The ready grant received by the Village must be used separately from the NYPA money. It will be used for the planning that Rob Company has been doing. C Prentice asked about the overall timeline. Supv Hammond noted the groundbreaking should be in the spring.

Court Security Applications: There have been applications received for the Court Security Officer. They should be shared with C McBath, Justice Robinson, and Court Clerk Kerri O'Bryan. A meeting will be set up to review the applications. C McBath reported that an email has been sent to the Town from the County stating that there is paperwork that needs to be filled out because the job title is not on the Town's list of employees.

Charter Franchise Agreement: The Board discussed concerns with the proposed Charter Franchise Agreement. Code Enforcement Officer is concerned about the section for new development underground. He noted that Charter wants the hole open 30 days in advance

until they can get there. The company is trying to tell the municipality how it will be done. We have codes to cover this not their mandates. The board noted that they will send C McBath and Code Enforcement's concerns on to the Town Attorney. They will then set up a meeting to sit with him to discuss their next steps.

Tony updated the board on the situation in Chase Mills brought by Kathy LaForce. He reported that he went out there last Sunday. The rats were all over. He brush hogged the property and put out rat poison. He was going to bring in a 30yd container to clean it up. He will call him tomorrow to see where it stands and contact the board as soon as he does.

Old Town Hall: Supv Hammond reported that Vicki MacDonald has repaired the broken windows at the old town hall. She donated her time/materials to fix them. Bertrand's Construction has a lift in town and will look at the old town hall project. AJK still has not fixed the threshold on the back door. C McKnight will contact him again.

Cannabis Law: Supv Hammond noted that he had contacted the St Lawrence County Board of Elections. In order to have an item placed on the general election ballot it must have been submitted by August 2nd. So if the board really wants to put it to a vote it will have to be a special election in which we have to pay for all the fees. Supv Hammond noted that the board could hold a public hearing on the subject to get the public's input to opt in or out. C McBath noted he was in support of a public hearing. He also noted that if the Town decides to opt out we may not be eligible for any of the cannabis sales tax revenue collected. The other councilmembers were also in favor of a public hearing.

Mowing Contract: The Clerk read the legal notice published for the mowing contract for 2022-2023. There was one bid received from Seaway Valley Lawn Care in the amount of \$25,000 per year.

Resolution #66

Motioned by: Hammond

Seconded by: Loomis

RESOLVED, that the Waddington Town Board does hereby award the 2022-2023 mowing contract to Seaway Valley Lawn Care. Ayes: All

Fire System: The Clerk read the legal notice published for the installation of a fire alarm system in the Municipal Building Complex. One bid was received from NCC Systems, 25646 NYS Route 3, Watertown, NY 13601 in the amount of \$21,000. The board noted that this had gone up some since the last quote that they had received when applying for the grant. They discussed where the additional funding was going to come from. Supv Hammond noted that we can take it from a surplus bank account.

Resolution #67

Motioned by: Hammond

Seconded by: Prentice

RESOLVED, that the Waddington Town Board does hereby award the bid for the installation of a fire alarm system in the Municipal Building Complex to NCC Systems in the amount of \$21,000. Ayes: All

Justice Grant: The Justice Court has requested the board pass a resolution to allow them to apply for the justice grant. She will be applying for a printer and computer components.

Resolution #68

Motioned by: Hammond

Seconded by: Loomis

RESOLVED, that the Waddington Town Board does hereby authorize the Waddington Court Clerk to apply for the Justice Court Assistance Program Grant (JCAP). Ayes: All

Budget: Supv Hammond reported that he has been working with the budget. The preliminary revenues and expenditures are in a good place. He has received the library's request and is

waiting on the recreation. He would like to set up a budget workshop to review the tentative budget. The board discussed meeting dates and have set up the following:

Franchise Agreement: Monday September 27th providing the Town Attorney is available.

Budget Workshop: Thursday, September 23rd @ 7PM. Board will meet in person w/public via zoom.

Regular meeting/Cannabis public hearing pros/cons: October 11th @ 7PM. In person old town hall. Masks and social distancing will be practiced.

Tax Cap Local Law: The board discussed passing the local law to exceed the 2% tax cap if necessary.

Resolution #69

Motioned by: Hammond

Seconded by: Prentice

RESOLVED, that the Waddington Town Board will pass a local law to exceed the 2% tax cap. A public hearing will be held on Monday, October 11, 2021 @ 7PM. Ayes: All

Hazard Mitigation Plan: The St Lawrence County Hazard Mitigation plan is being reviewed.

The group doing the review would like the town to participate via zoom. The clerk will ask for a couple available dates and let everyone know.

C McKnight asked where the board was going with the zoom meetings. He feels that there is no reason the board can't meet together and put the public on zoom. Meetings are more productive when you can meet face to face. If it gets worse and we can't meet then we would have to zoom only. C Loomis agreed. Supv Hammond noted he didn't have a problem meeting in person if we are masked.

Citizen's comments:

There were no citizen comments at this time.

Bills: A motion was made by Prentice, seconded by Loomis to pay bills #21-00584 – 21-00672 in the amount of \$196,649.76. Ayes: All

Adjournment: A motion was made by McKnight, seconded by Prentice to adjourn the meeting @ 9:15PM. Ayes: All

Respectfully submitted,

Carol A. Burns, Town Clerk

Appendix G

HAZUS Data Reports

Quick Assessment Report

October 20, 2021

Study Region : StlCo

Scenario : Probabilistic

Regional Statistics

Area (Square Miles)	2,762
Number of Census Tracts	28
Number of People in the Region	111,944
General Building Stock	

<i>Occupancy</i>	<i>Building Count</i>	<i>Dollar Exposure (\$ K)</i>
Residential	45,872	9,077,710
Commercial	2,232	1,486,181
Other	1,327	1,060,206
Total	49,431	11,624,097

Scenario Results

Number of Residential Buildings Damaged

<i>Return Period</i>	<i>Minor</i>	<i>Moderate</i>	<i>Severe</i>	<i>Destruction</i>	<i>Total</i>
10	0	0	0	0	0
20	0	0	0	0	0
50	0	0	0	0	0
100	0	0	0	0	0
200	0	0	0	0	0
500	0	0	0	0	0
1000	0	69	0	0	70

Number of Buildings Damaged

<i>Return Period</i>	<i>Minor</i>	<i>Moderate</i>	<i>Severe</i>	<i>Destruction</i>	<i>Total</i>
10	0	0	0	0	0
20	0	0	0	0	0
50	0	0	0	0	0
100	0	0	0	0	0
200	0	0	0	0	0
500	0	0	0	0	0
1000	1	69	0	0	71

Shelter Requirements

<i>Return Period</i>	<i>Displaced Households (#Households)</i>	<i>Short Term Shelter (#People)</i>
10	0	0
20	0	0
50	0	0
100	0	0
200	0	0
500	0	0
1000	0	0

Economic Loss (x 1000)

ReturnPeriod	Property Damage (Capital Stock) Losses		Business Interruption (Income) Losses
	Residential	Total	
10	0	0	0
20	0	0	0
50	0	0	0
100	0	0	0
200	0	0	0
500	0	0	0
1000	5,303	5,303	88
Annualized	38	38	1

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.



RiskMAP
Increasing Resilience Together

Hazus: Hurricane Global Risk Report

Region Name: StlCo

Hurricane Scenario: Probabilistic 10-year Return Period

Print Date: Thursday, October 21, 2021

Disclaimer:

*This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.*

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,762.06 square miles and contains 28 census tracts. There are over 41 thousand households in the region and a total population of 111,944 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 million dollars (2014 dollars). Approximately 93% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 49,431 buildings in the region which have an aggregate total replacement value of 11,624 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Building Exposure by Occupancy Type

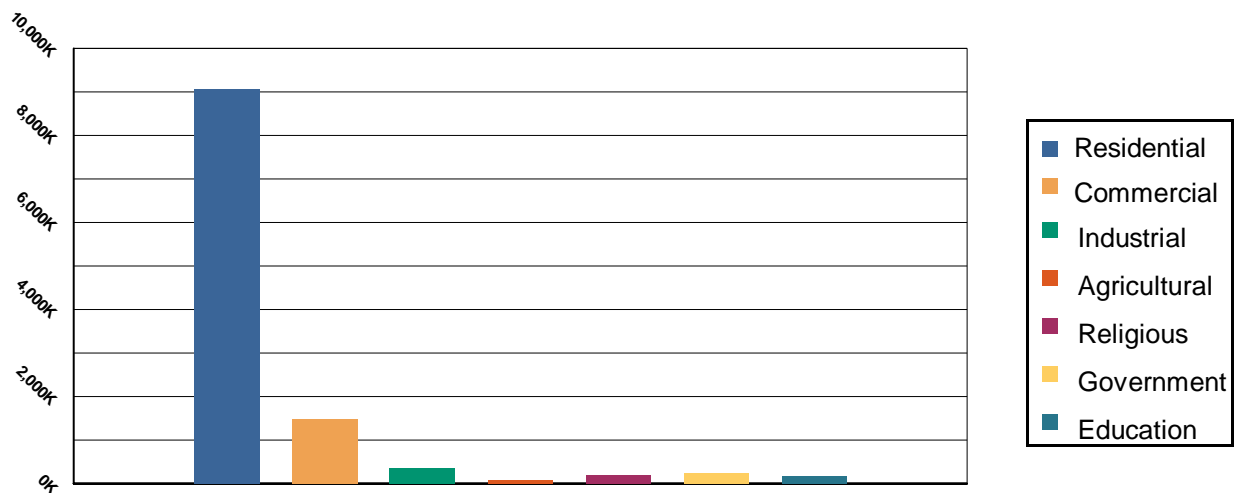


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure (\$1000)	Percent of Tot
Residential	9,077,710	78.09 %
Commercial	1,486,181	12.79%
Industrial	364,520	3.14%
Agricultural	82,118	0.71%
Religious	192,936	1.66%
Government	253,129	2.18%
Education	167,503	1.44%
Total	11,624,097	100.00%

Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities.



Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name: Probabilistic

Type: Probabilistic



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Expected Building Damage by Occupancy

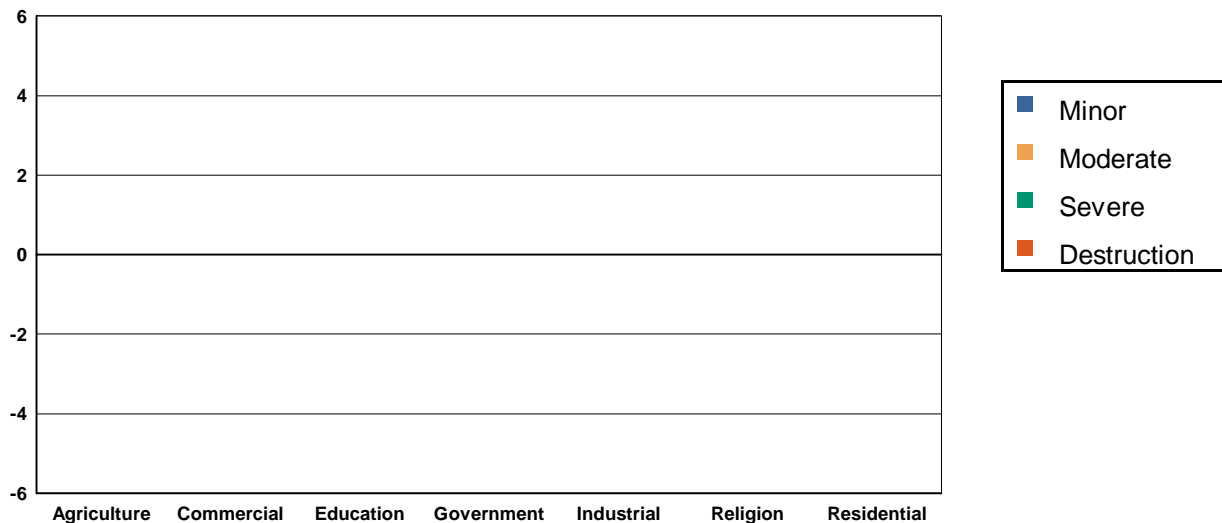


Table 2: Expected Building Damage by Occupancy : 10 - year Event

Occupancy	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	296.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	2,232.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	87.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	196.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	537.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	211.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	45,872.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	49,431.00		0.00		0.00		0.00		0.00	



Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	289	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	5,650	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	5,085	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,513	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	33,694	100.00	0	0.00	0	0.00	0	0.00	0	0.00



Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 319 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

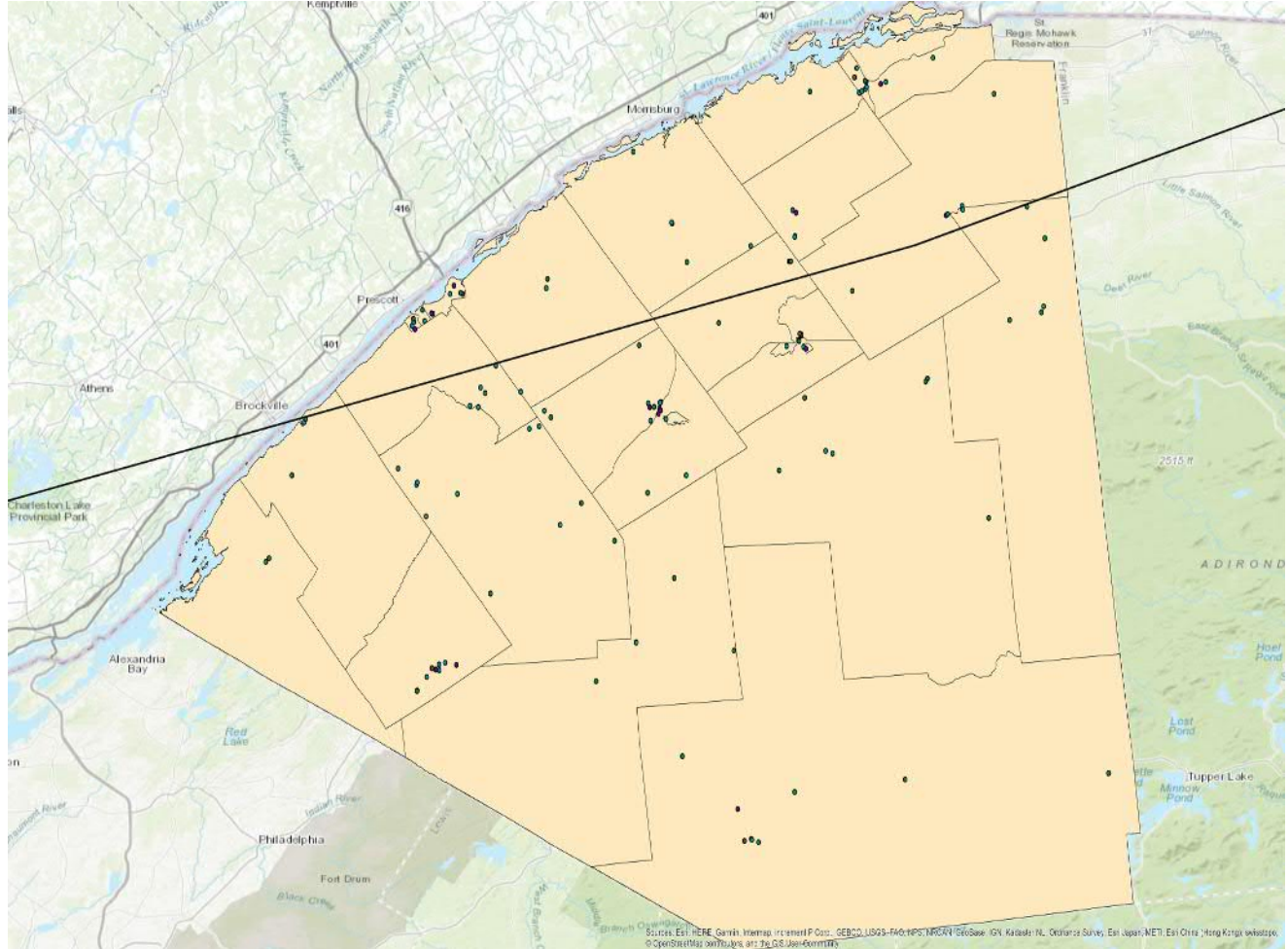


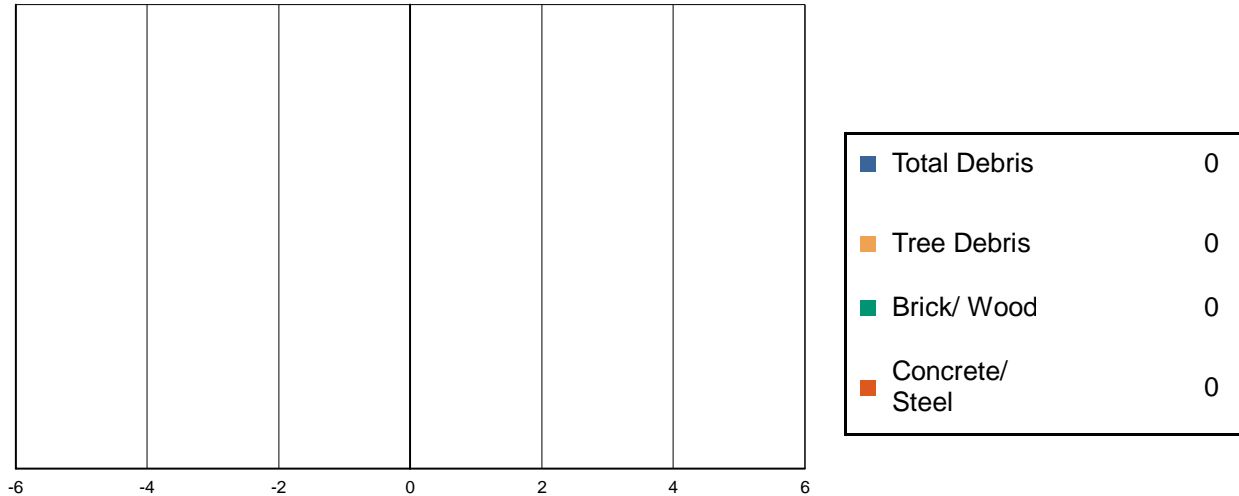
Table 4: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		Probability of at Least Moderate	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	43	0	0	43
Hospitals	6	0	0	6
Police Stations	21	0	0	21
Schools	64	0	0	64

Induced Hurricane Damage

Debris Generation

Estimated Debris (Tons)

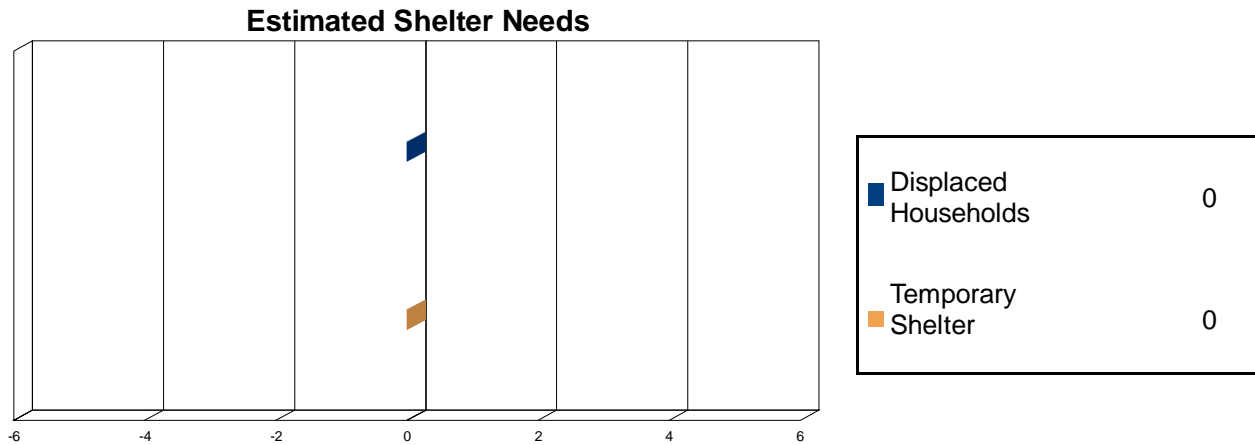


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Economic Loss

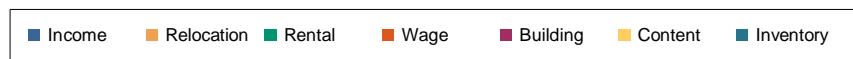
The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**



Loss Type by General Occupancy

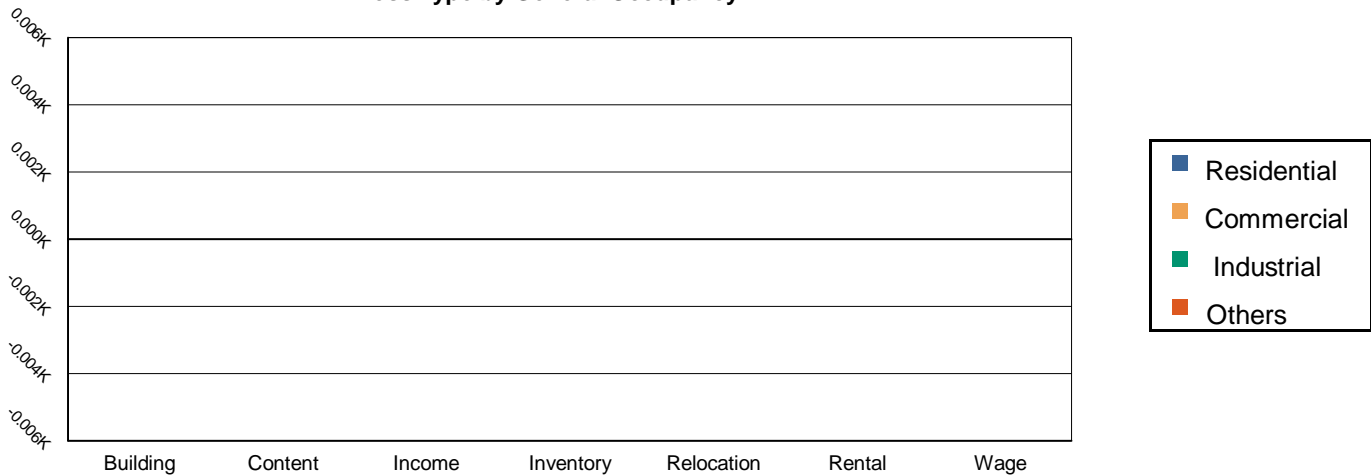


Table 5: Building-Related Economic Loss Estimates
(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00



FEMA

Total

Total	0.00	0.00	0.00	0.00	0.00
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Appendix A: County Listing for the Region

New York
- St. Lawrence



Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
New York				
St. Lawrence	111,944	9,077,710	2,546,387	11,624,097
Total	111,944	9,077,710	2,546,387	11,624,097
Study Region Total	111,944	9,077,710	2,546,387	11,624,097



FEMA

RiskMAP
Increasing Resilience Together

Hazus: Hurricane Global Risk Report

Region Name: StlCo

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Thursday, October 21, 2021

Disclaimer:

*This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.*

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,762.06 square miles and contains 28 census tracts. There are over 41 thousand households in the region and a total population of 111,944 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 million dollars (2014 dollars). Approximately 93% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 49,431 buildings in the region which have an aggregate total replacement value of 11,624 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Building Exposure by Occupancy Type

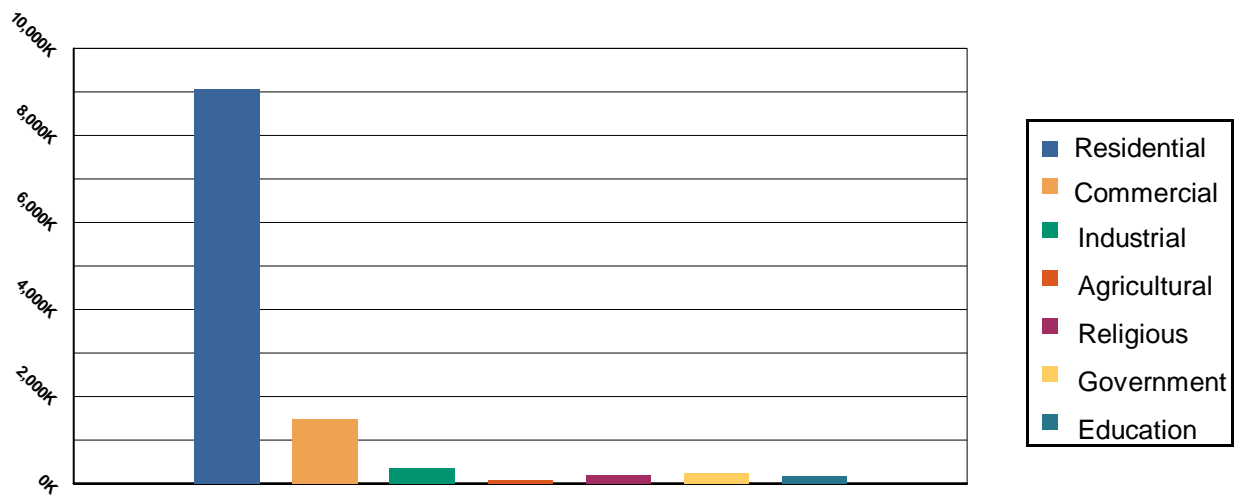


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure (\$1000)	Percent of Tot
Residential	9,077,710	78.09 %
Commercial	1,486,181	12.79%
Industrial	364,520	3.14%
Agricultural	82,118	0.71%
Religious	192,936	1.66%
Government	253,129	2.18%
Education	167,503	1.44%
Total	11,624,097	100.00%

Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities.



Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name: Probabilistic

Type: Probabilistic



Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Expected Building Damage by Occupancy

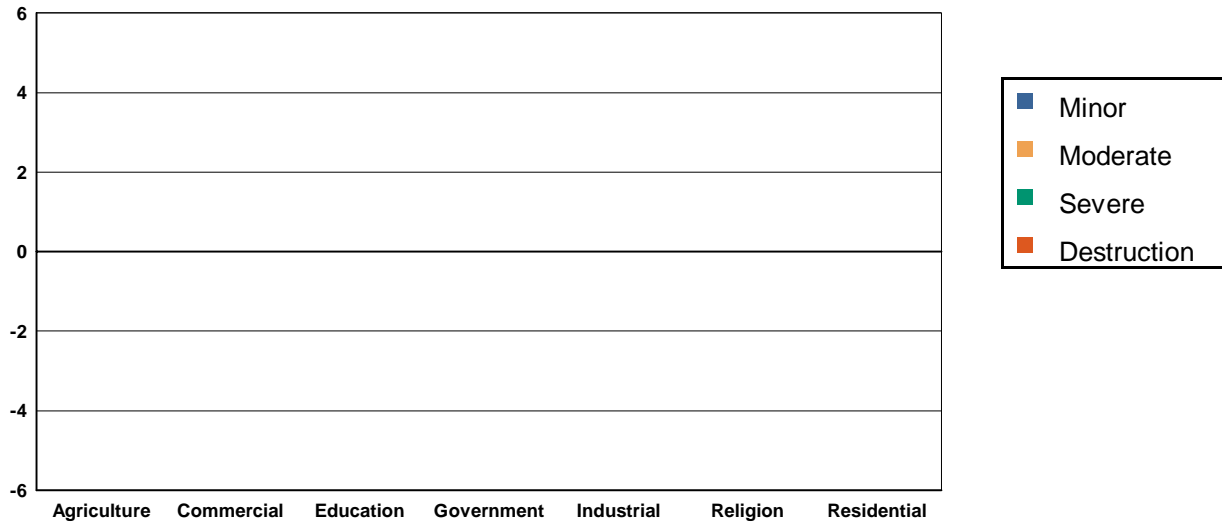


Table 2: Expected Building Damage by Occupancy : 500 - year Event

Occupancy	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	296.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	2,232.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	87.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	196.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	537.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	211.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	45,872.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	49,431.00		0.00		0.00		0.00		0.00	



Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	289	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	5,650	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	5,085	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,513	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	33,694	100.00	0	0.00	0	0.00	0	0.00	0	0.00



FEMA

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 319 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

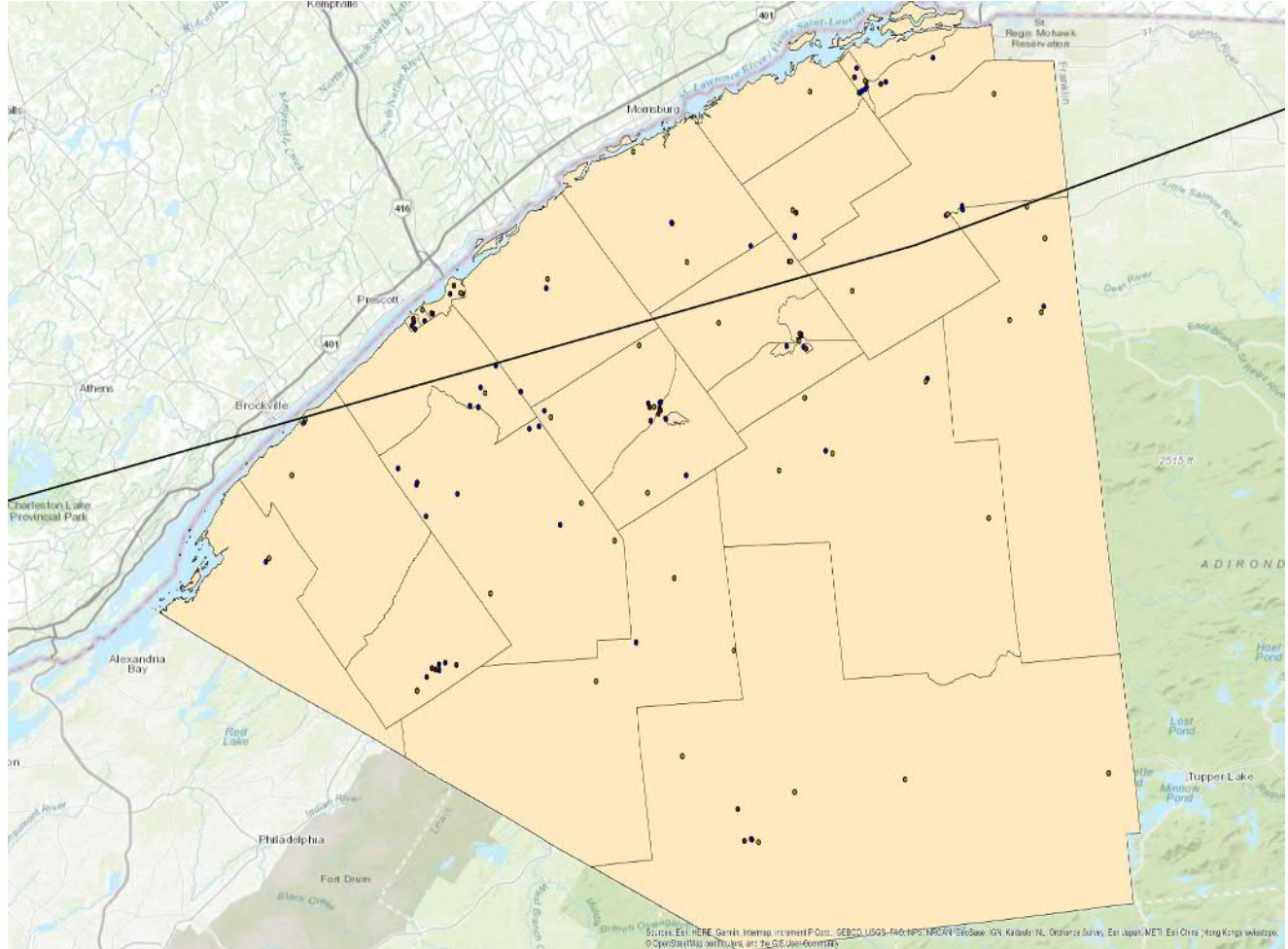


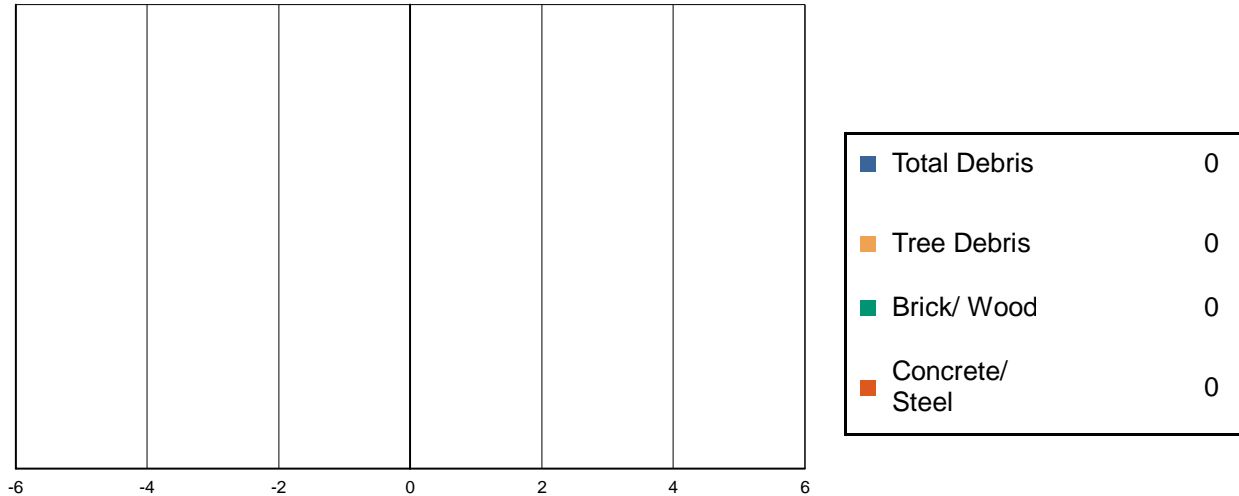
Table 4: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		Probability of at Least Moderate	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	43	0	0	43
Hospitals	6	0	0	6
Police Stations	21	0	0	21
Schools	64	0	0	64

Induced Hurricane Damage

Debris Generation

Estimated Debris (Tons)

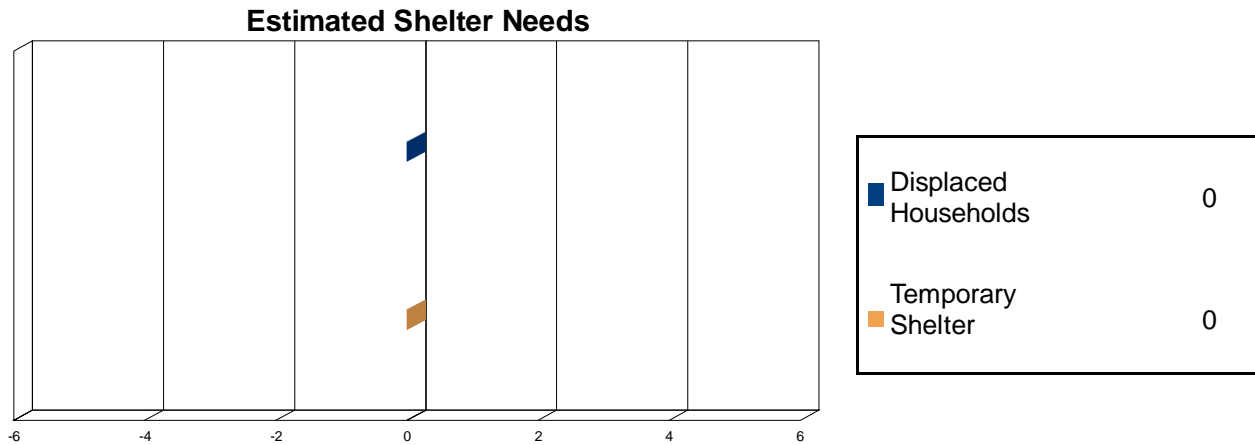


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Economic Loss

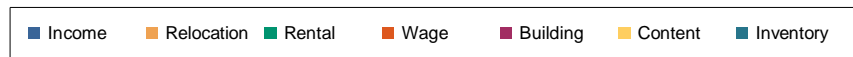
The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

**Loss by Business Interruption Type (left)
and Building Damage Type (right)**



Loss Type by General Occupancy

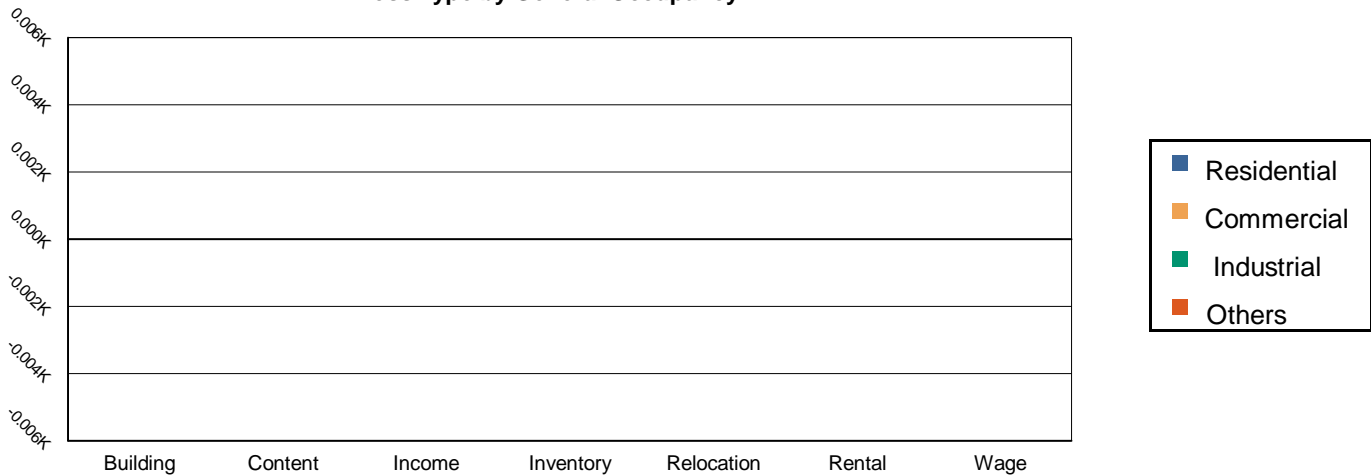


Table 5: Building-Related Economic Loss Estimates
(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00



FEMA

Total

Total	0.00	0.00	0.00	0.00	0.00
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Appendix A: County Listing for the Region

New York
- St. Lawrence



Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
New York				
St. Lawrence	111,944	9,077,710	2,546,387	11,624,097
Total	111,944	9,077,710	2,546,387	11,624,097
Study Region Total	111,944	9,077,710	2,546,387	11,624,097



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RiskMAP
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Hazus: Hurricane Global Risk Report

Region Name: StlCo

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Thursday, October 21, 2021

Disclaimer:

*This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.*

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,762.06 square miles and contains 28 census tracts. There are over 41 thousand households in the region and a total population of 111,944 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 million dollars (2014 dollars). Approximately 93% of the buildings (and 78% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 49,431 buildings in the region which have an aggregate total replacement value of 11,624 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Building Exposure by Occupancy Type

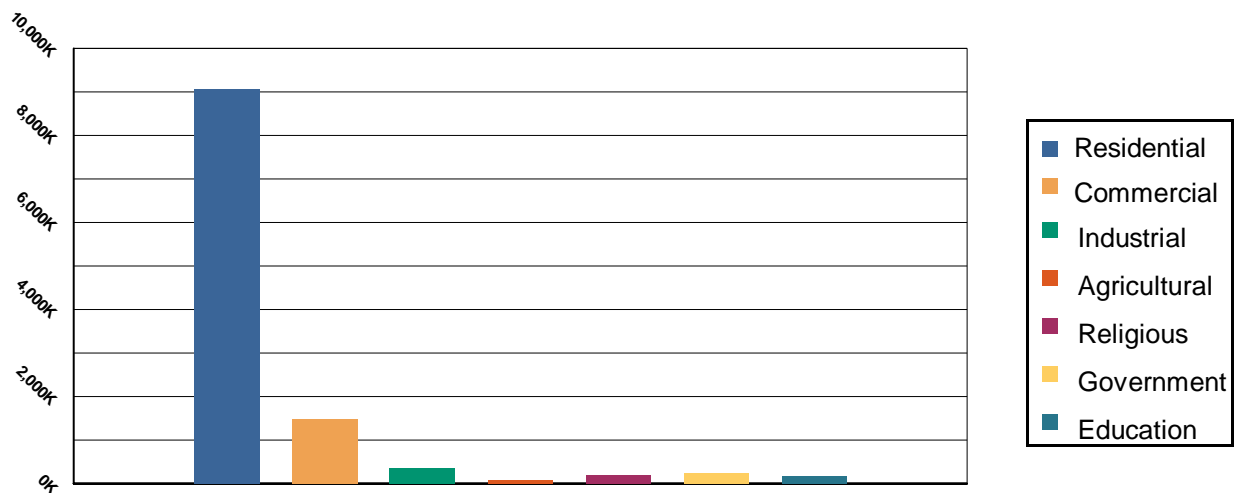


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure (\$1000)	Percent of Tot
Residential	9,077,710	78.09 %
Commercial	1,486,181	12.79%
Industrial	364,520	3.14%
Agricultural	82,118	0.71%
Religious	192,936	1.66%
Government	253,129	2.18%
Education	167,503	1.44%
Total	11,624,097	100.00%

Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities.



Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name: Probabilistic

Type: Probabilistic



Building Damage

General Building Stock Damage

Hazus estimates that about 69 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Expected Building Damage by Occupancy

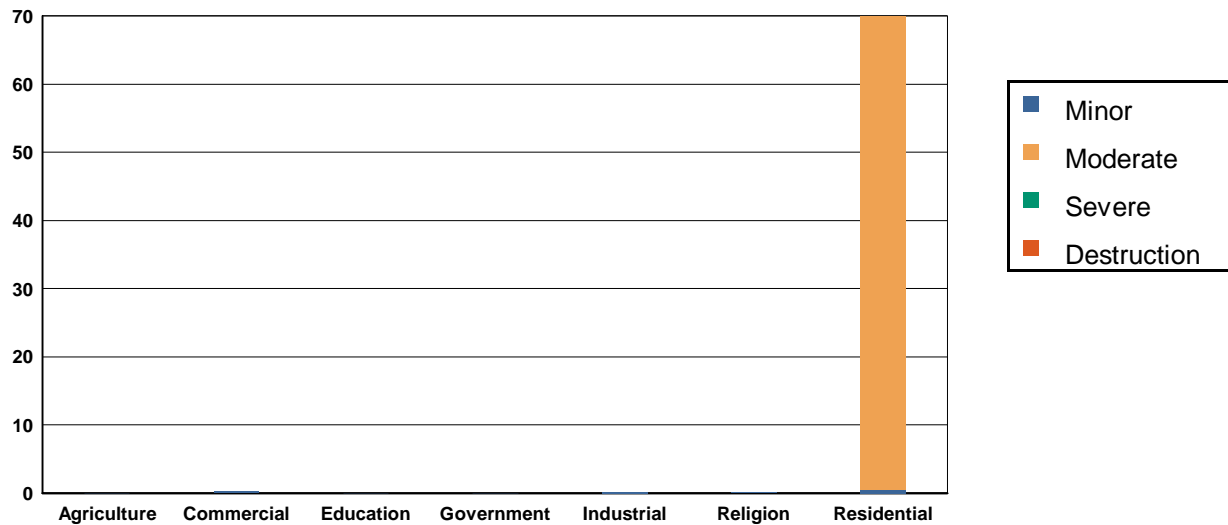


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

Occupancy	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	295.98	99.99	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	2,231.70	99.99	0.30	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Education	86.97	99.97	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Government	195.97	99.99	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	536.86	99.97	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Religion	210.97	99.98	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Residential	45,802.03	99.85	0.50	0.00	69.47	0.15	0.00	0.00	0.00	0.00
Total	49,360.48		1.04		69.47		0.00		0.00	



Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	289	99.99	0	0.01	0	0.00	0	0.00	0	0.00
Masonry	5,643	99.88	0	0.01	7	0.12	0	0.00	0	0.00
MH	5,085	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,513	99.98	0	0.02	0	0.00	0	0.00	0	0.00
Wood	33,634	99.82	0	0.00	60	0.18	0	0.00	0	0.00



Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 319 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

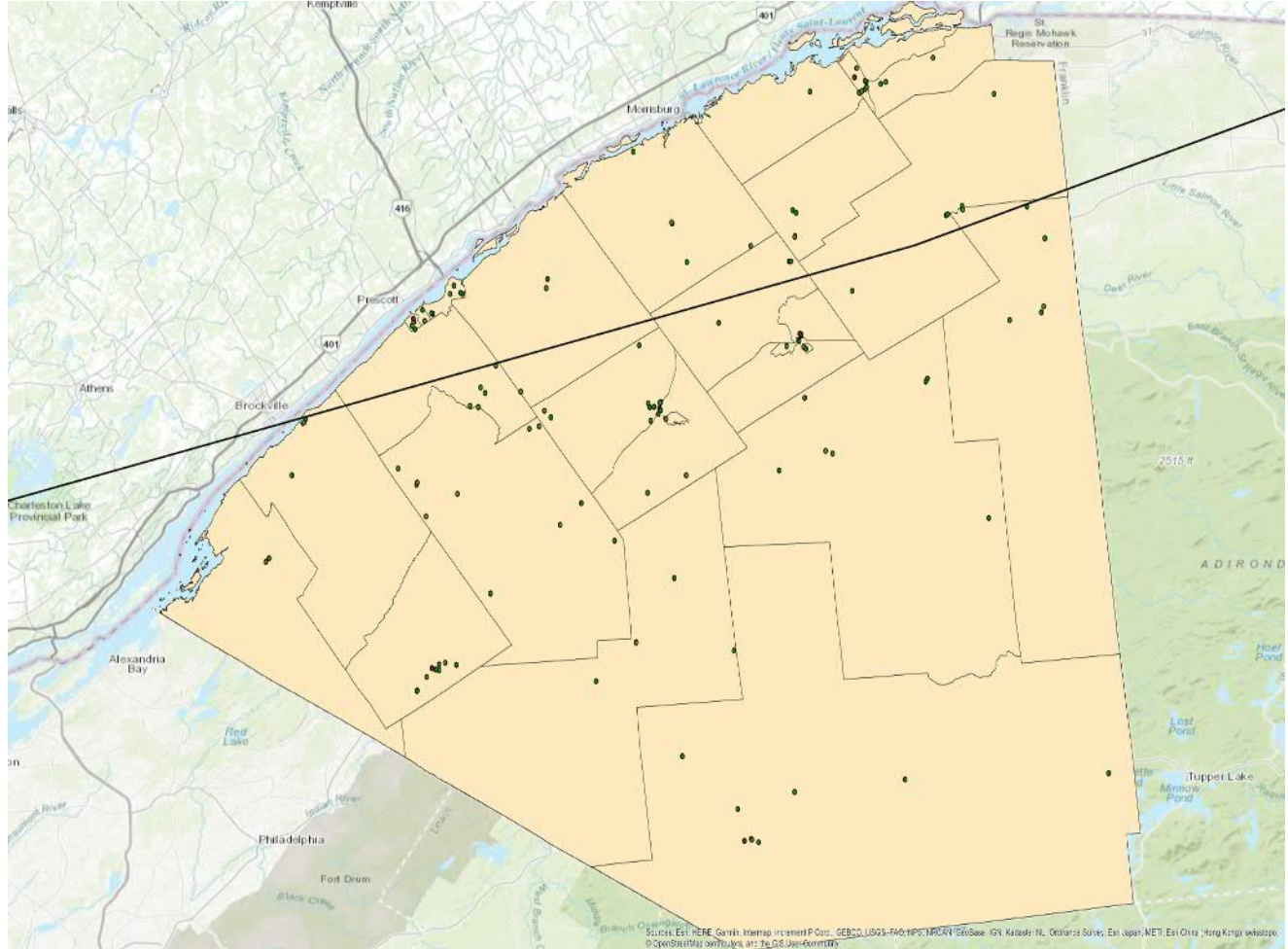


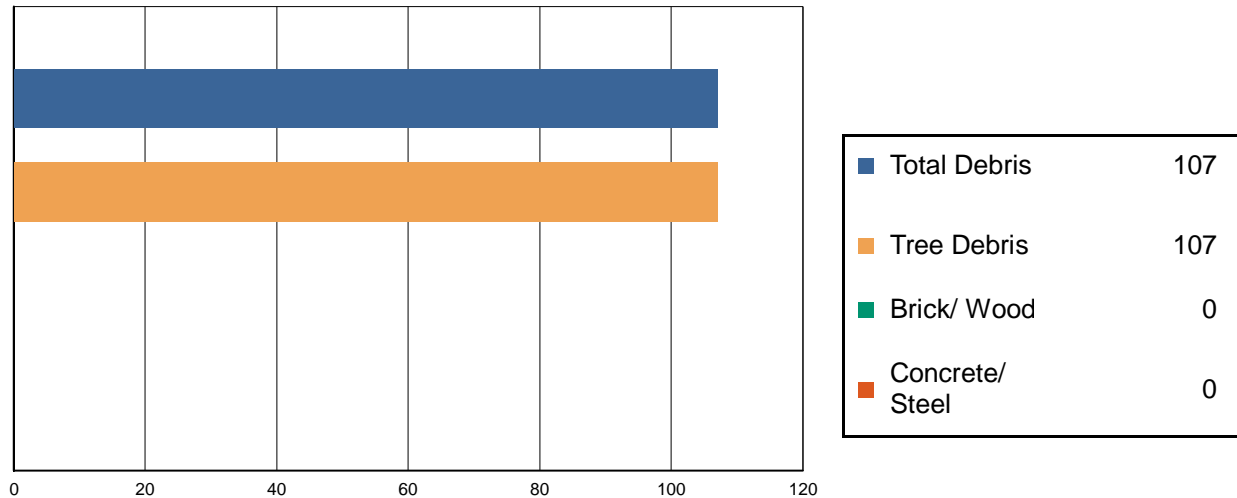
Table 4: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		Probability of at Least Moderate	Probability of Complete Damage > 50%	Expected Loss of Use < 1 day
EOCs	1	0	0	1
Fire Stations	43	0	0	43
Hospitals	6	0	0	6
Police Stations	21	0	0	21
Schools	64	0	0	64

Induced Hurricane Damage

Debris Generation

Estimated Debris (Tons)

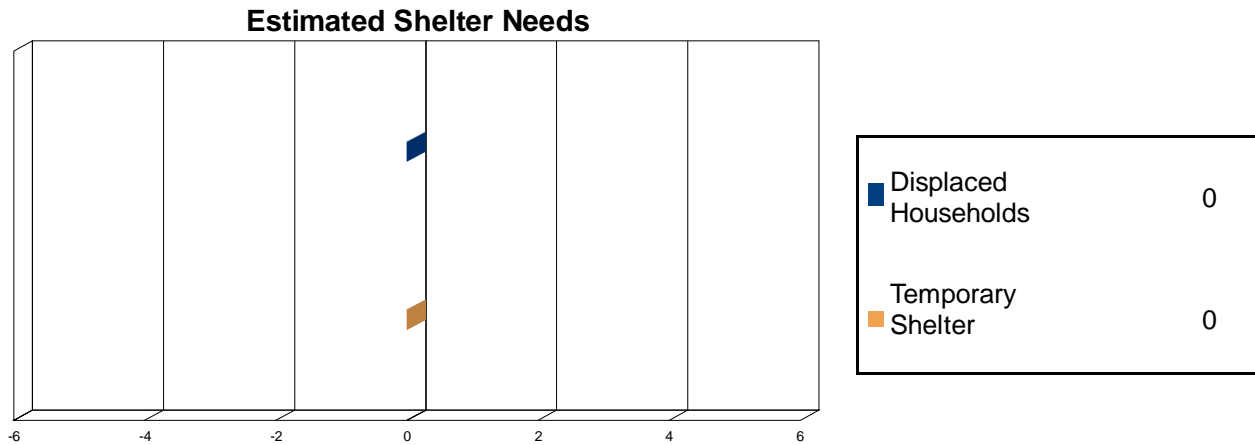


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 107 tons of debris will be generated. Of the total amount, 104 tons (97%) is Other Tree Debris. Of the remaining 3 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Economic Loss

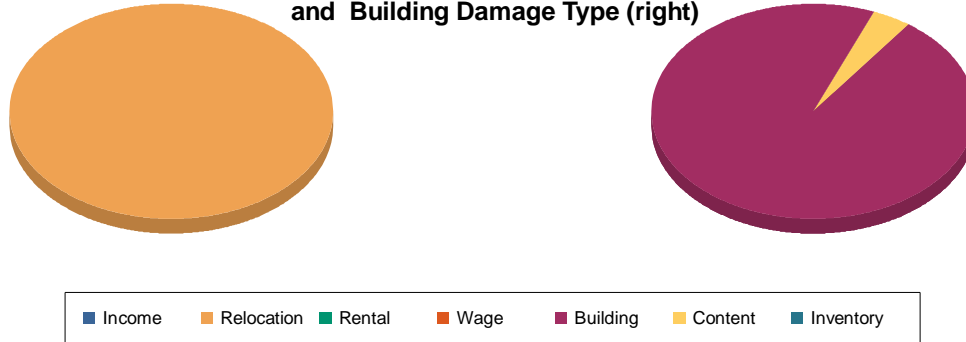
The total economic loss estimated for the hurricane is 5.4 million dollars, which represents 0.05 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 5 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy



Table 5: Building-Related Economic Loss Estimates
(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,092.72	0.00	0.00	0.00	5,092.72
	Content	209.83	0.00	0.00	0.00	209.83
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	5,302.55	0.00	0.00	0.00	5,302.55
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	88.37	0.00	0.00	0.00	88.37
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	88.37	0.00	0.00	0.00	88.37



FEMA

Total

Total	5,390.92	0.00	0.00	0.00	5,390.92
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Appendix A: County Listing for the Region

New York
- St. Lawrence



Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
New York				
St. Lawrence	111,944	9,077,710	2,546,387	11,624,097
Total	111,944	9,077,710	2,546,387	11,624,097
Study Region Total	111,944	9,077,710	2,546,387	11,624,097



Hazus: Flood Global Risk Report

Region Name: StlCo

Flood Scenario: TEST_25_rev

Print Date: Tuesday, October 19, 2021

Disclaimer:

*This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.*

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2,762 square miles and contains 7,009 census blocks. The region contains over 42 thousand households and has a total population of 111,944 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 49,431 buildings in the region with a total building replacement value (excluding contents) of 11,624 million dollars. Approximately 92.80% of the buildings (and 78.09% of the building value) are associated with residential housing.



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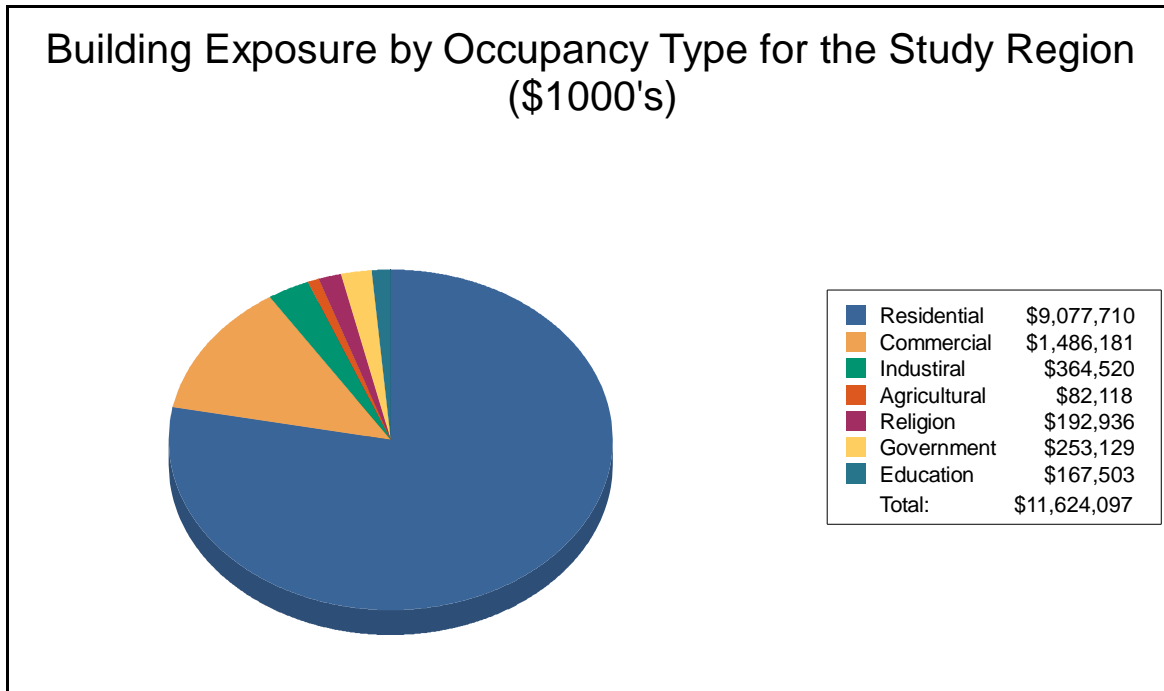
Building Inventory

General Building Stock

Hazus estimates that there are 49,431 buildings in the region which have an aggregate total replacement value of 11,624 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	9,077,710	78.1%
Commercial	1,486,181	12.8%
Industrial	364,520	3.1%
Agricultural	82,118	0.7%
Religion	192,936	1.7%
Government	253,129	2.2%
Education	167,503	1.4%
Total	11,624,097	100%



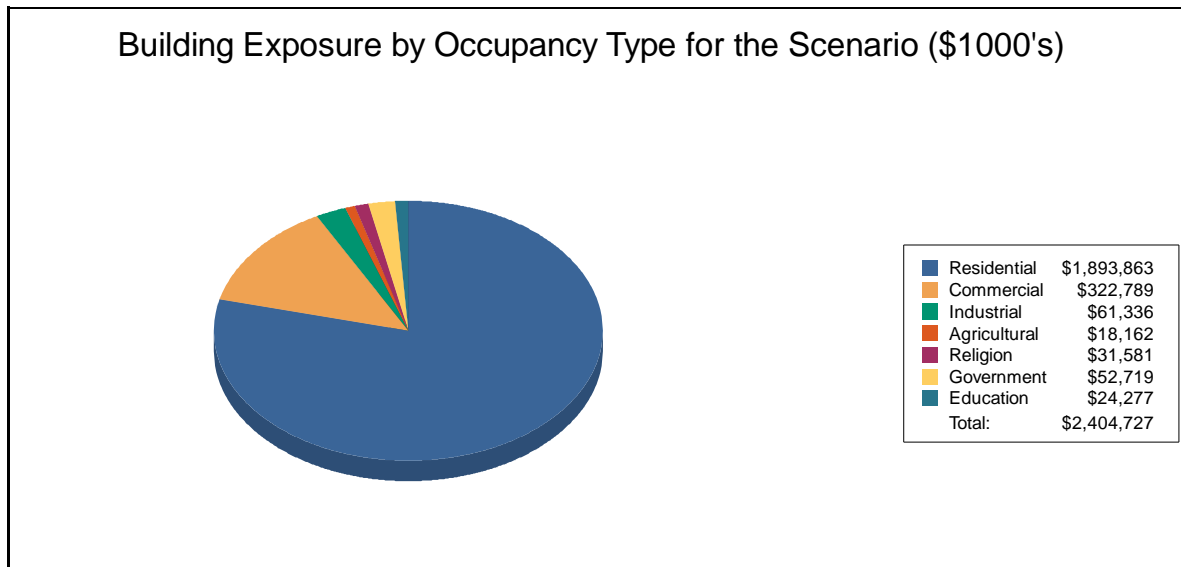
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**Table 2
Building Exposure by Occupancy Type for the Scenario**

Occupancy	Exposure (\$1000)	Percent of Total
Residential	1,893,863	78.8%
Commercial	322,789	13.4%
Industrial	61,336	2.6%
Agricultural	18,162	0.8%
Religion	31,581	1.3%
Government	52,719	2.2%
Education	24,277	1.0%
Total	2,404,727	100%



Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation center.



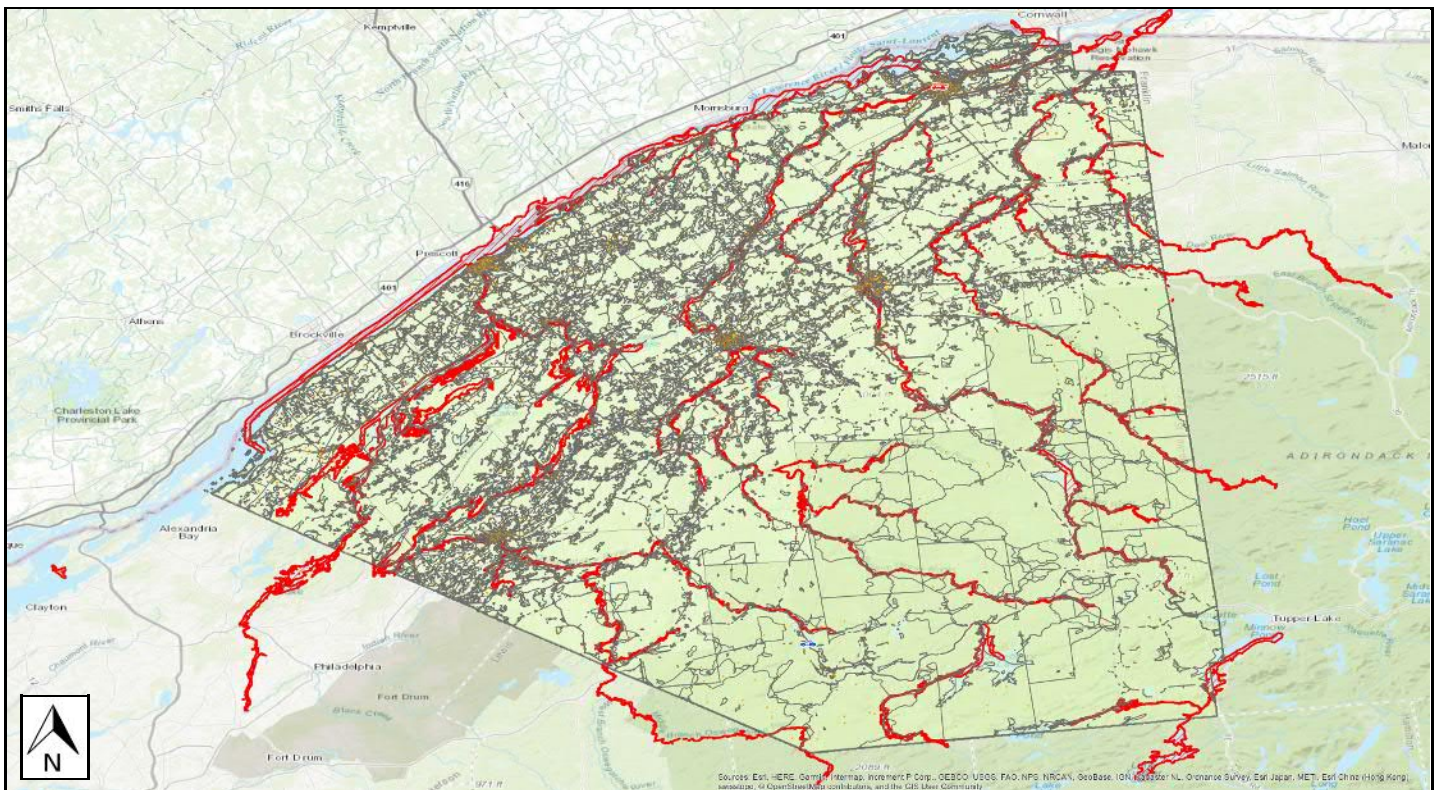
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	StlCo
Scenario Name:	TEST_25_rev
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure





Building Damage

General Building Stock Damage

Hazus estimates that about 209 buildings will be at least moderately damaged. This is over 66% of the total number of buildings in the scenario. There are an estimated 28 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map

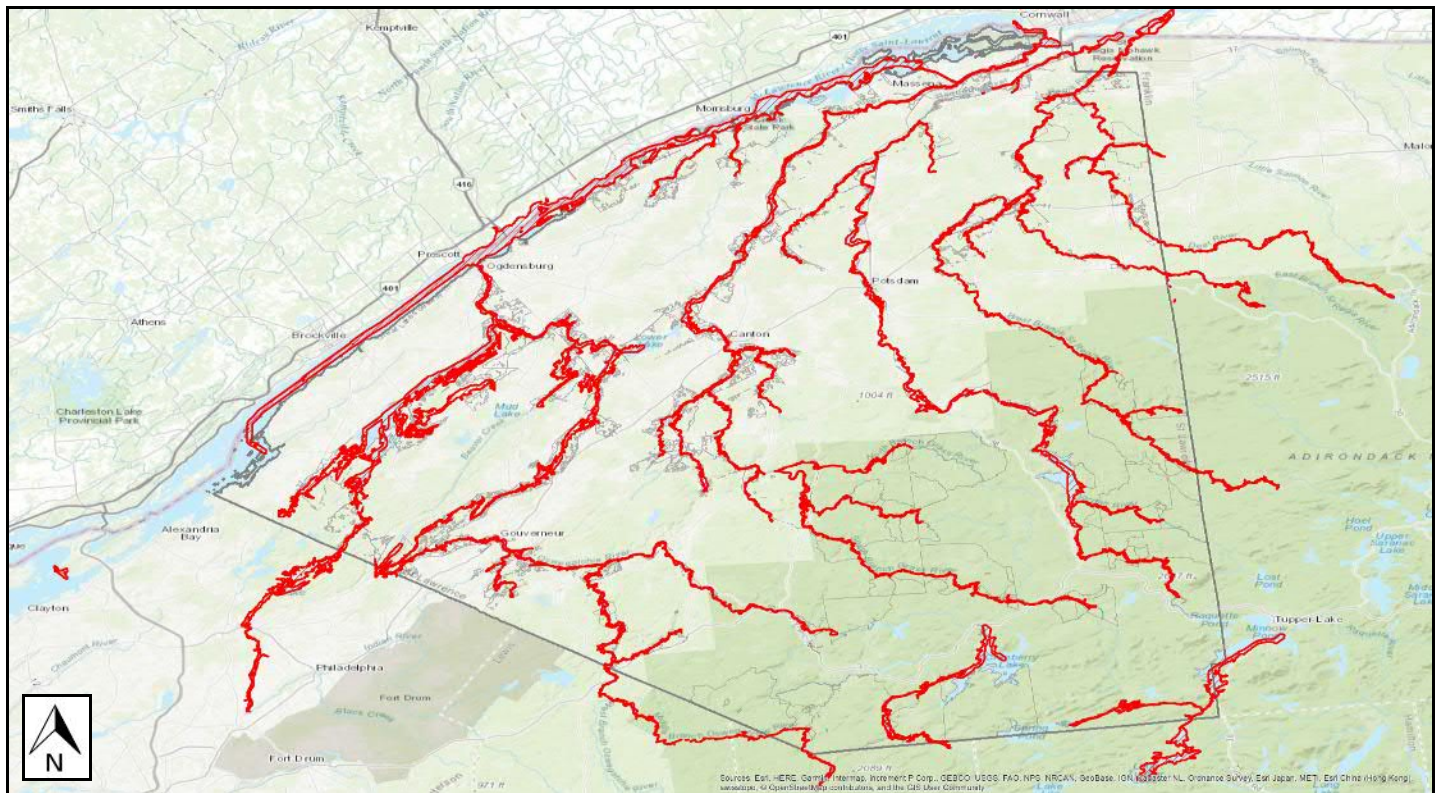
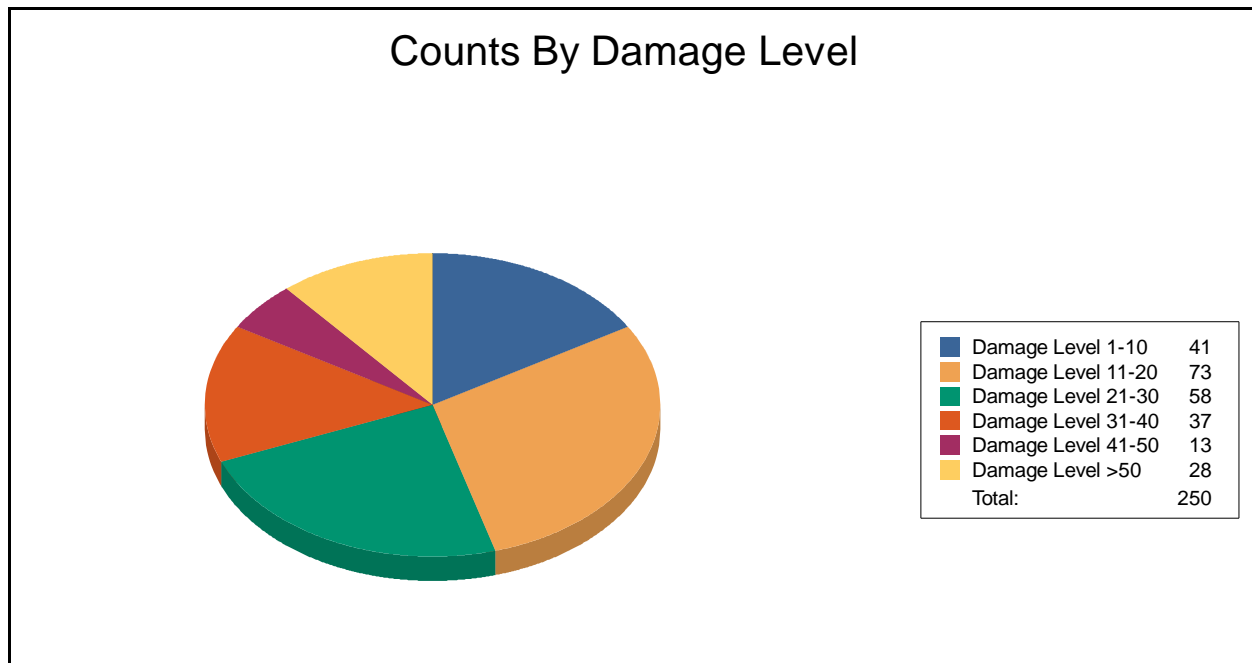




Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	41	16	73	29	58	23	37	15	13	5	28	11
Total	41		73		58		37		13		28	



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Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	15	100
Masonry	3	19	5	31	4	25	3	19	1	6	0	0
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	37	17	68	31	54	25	34	16	12	6	13	6



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Essential Facility Damage

Before the flood analyzed in this scenario, the region had 319 hospital beds available for use. On the day of the scenario flood event, the model estimates that 319 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	# Facilities			
	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	43	1	0	1
Hospitals	6	0	0	0
Police Stations	21	0	0	0
Schools	64	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.



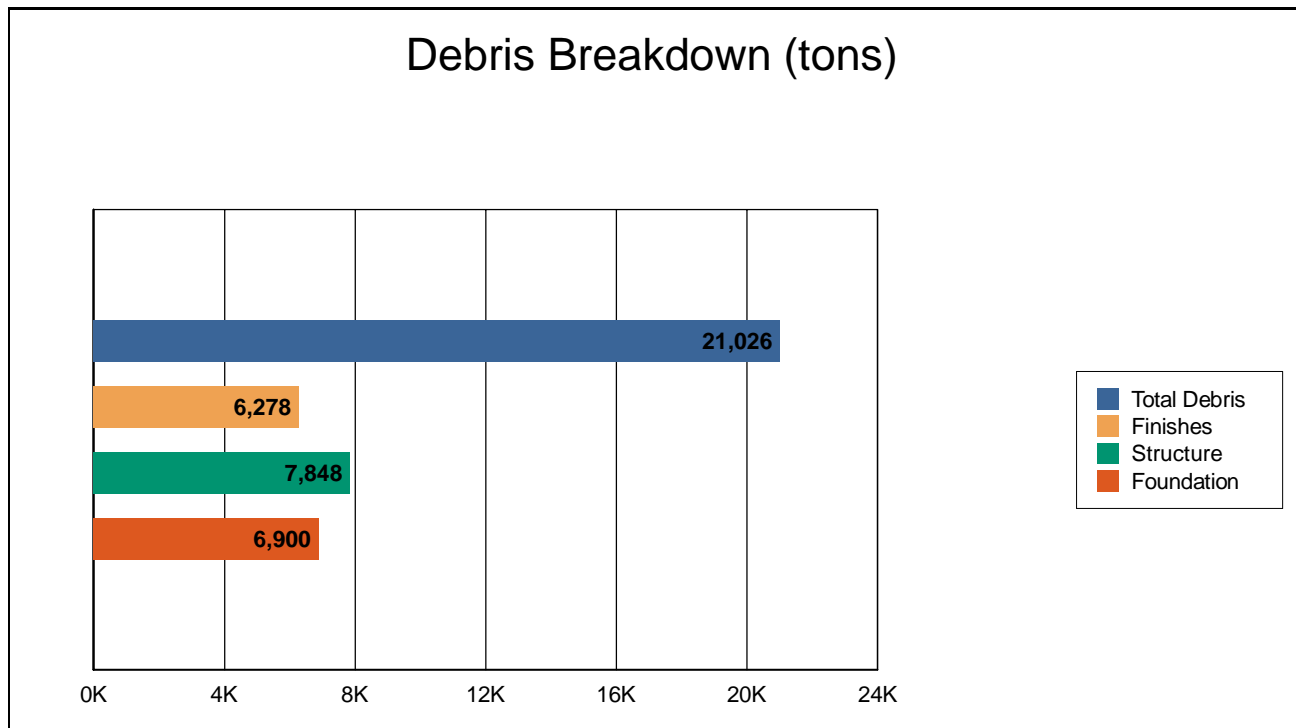
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Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



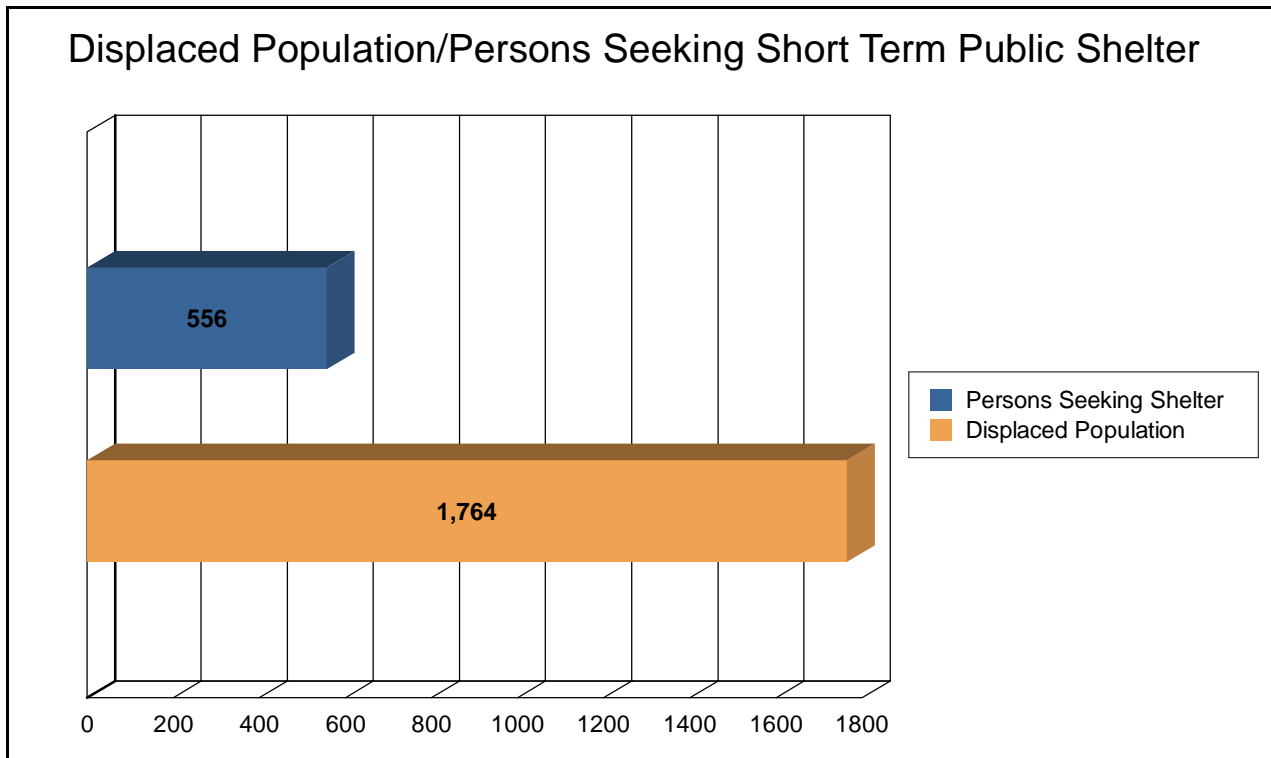
The model estimates that a total of 21,026 tons of debris will be generated. Of the total amount, Finishes comprises 30% of the total, Structure comprises 37% of the total, and Foundation comprises 33%. If the debris tonnage is converted into an estimated number of truckloads, it will require 842 truckloads (@25 tons/truck) to remove the debris generated by the flood.



Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 588 households (or 1,764 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 556 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



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Economic Loss

The total economic loss estimated for the flood is 252.52 million dollars, which represents 10.50 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 114.48 million dollars. 55% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 34.22% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

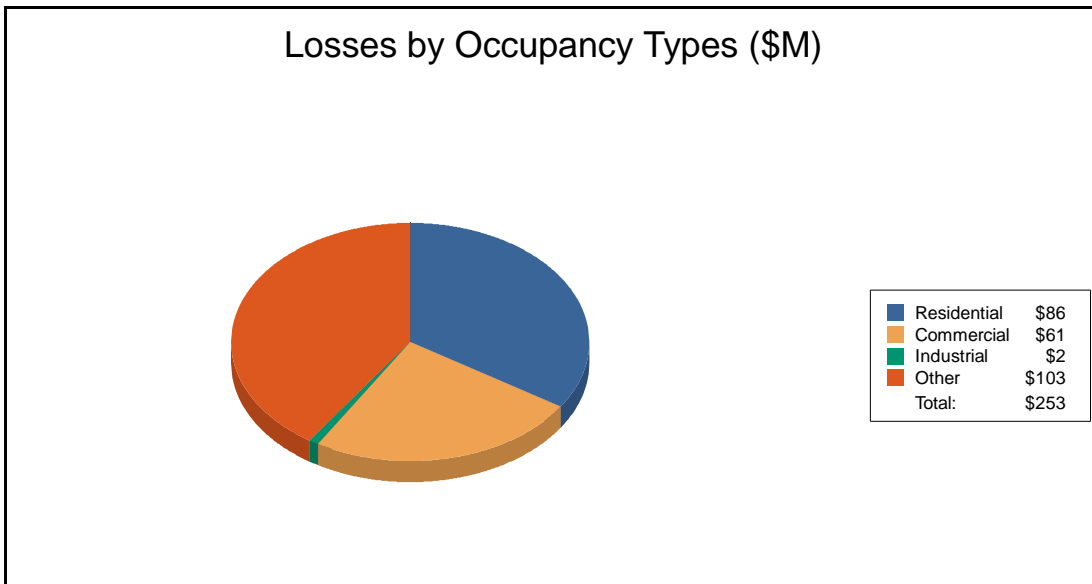


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Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	43.60	9.09	0.56	2.69	55.93
	Content	25.11	20.69	1.19	10.75	57.74
	Inventory	0.00	0.60	0.18	0.02	0.80
	Subtotal	68.71	30.39	1.92	13.45	114.48
Business Interruption						
	Income	0.79	11.35	0.03	1.67	13.84
	Relocation	10.60	3.35	0.03	1.40	15.37
	Rental Income	4.41	2.34	0.01	0.18	6.94
	Wage	1.89	13.97	0.05	85.99	101.90
	Subtotal	17.69	31.01	0.10	89.24	138.05
ALL	Total	86.40	61.40	2.03	102.69	252.52



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Appendix A: County Listing for the Region

New York

- St. Lawrence



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Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
New York				
St. Lawrence	111,944	9,077,710	2,546,387	11,624,097
Total	111,944	9,077,710	2,546,387	11,624,097
Total Study Region	111,944	9,077,710	2,546,387	11,624,097



Hazus: Flood Global Risk Report

Region Name: StlCo

Flood Scenario: TEST_25_rev

Print Date: Tuesday, October 19, 2021

Disclaimer:

*This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.*

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.



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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is approximately 2,762 square miles and contains 7,009 census blocks. The region contains over 42 thousand households and has a total population of 111,944 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 49,431 buildings in the region with a total building replacement value (excluding contents) of 11,624 million dollars. Approximately 92.80% of the buildings (and 78.09% of the building value) are associated with residential housing.



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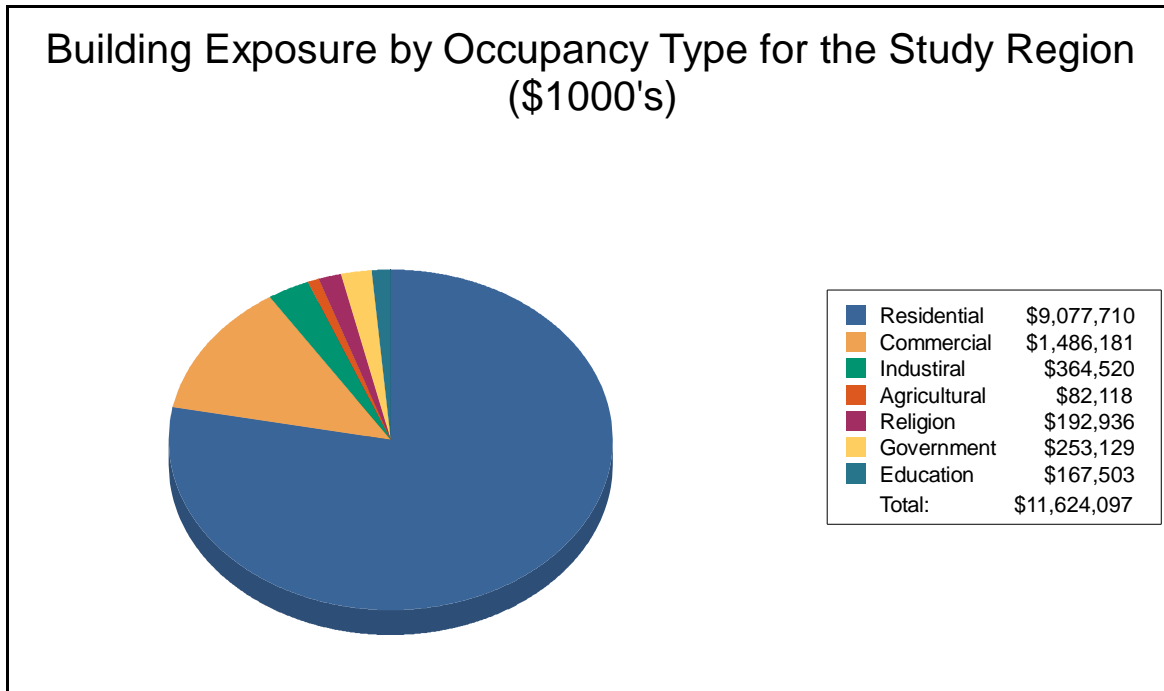
Building Inventory

General Building Stock

Hazus estimates that there are 49,431 buildings in the region which have an aggregate total replacement value of 11,624 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	9,077,710	78.1%
Commercial	1,486,181	12.8%
Industrial	364,520	3.1%
Agricultural	82,118	0.7%
Religion	192,936	1.7%
Government	253,129	2.2%
Education	167,503	1.4%
Total	11,624,097	100%



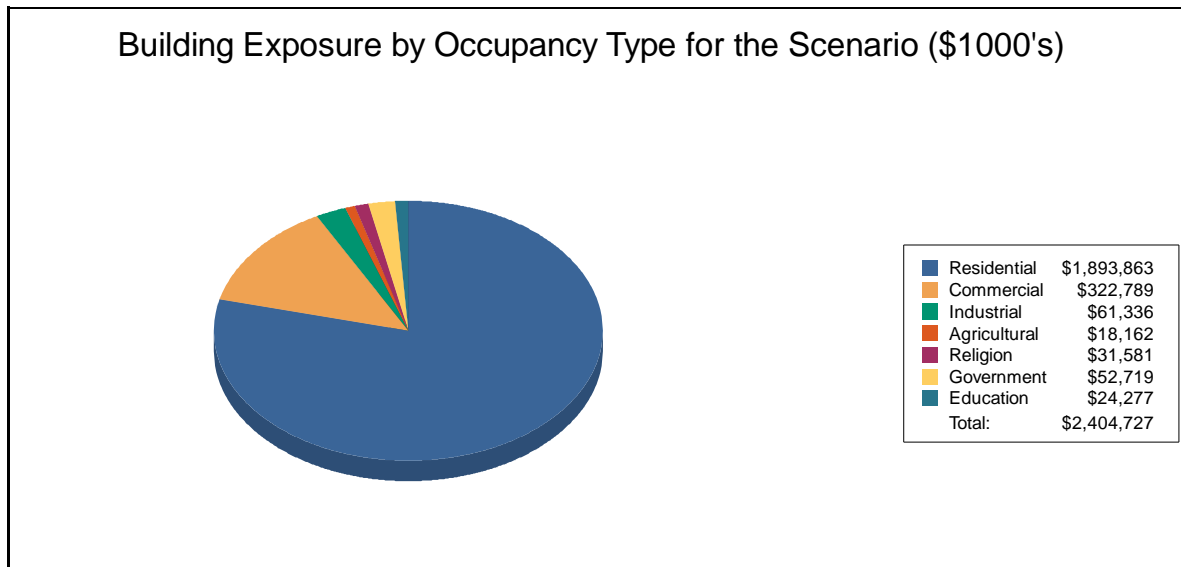
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**Table 2
Building Exposure by Occupancy Type for the Scenario**

Occupancy	Exposure (\$1000)	Percent of Total
Residential	1,893,863	78.8%
Commercial	322,789	13.4%
Industrial	61,336	2.6%
Agricultural	18,162	0.8%
Religion	31,581	1.3%
Government	52,719	2.2%
Education	24,277	1.0%
Total	2,404,727	100%



Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation center.



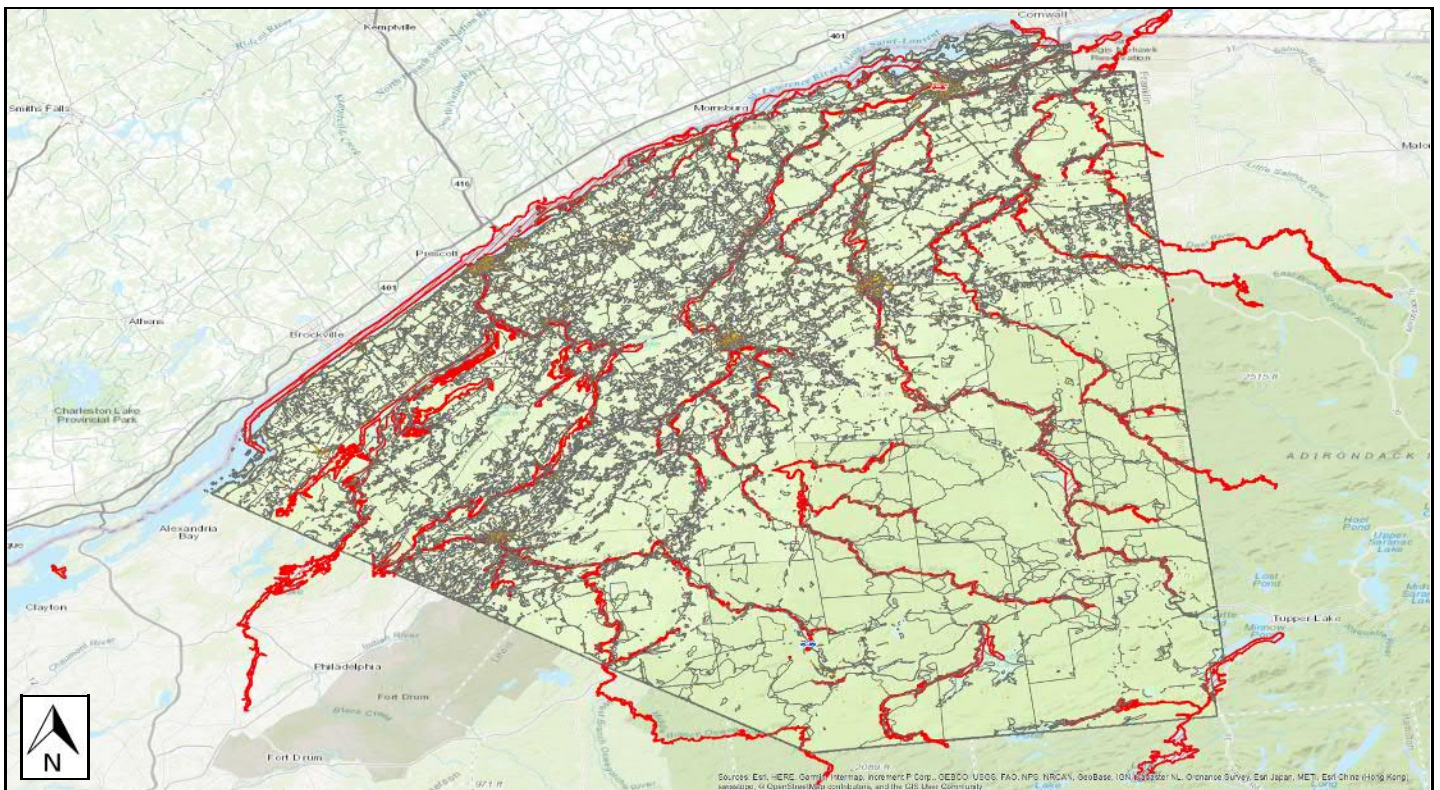
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	StlCo
Scenario Name:	TEST_25_rev
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure





Building Damage

General Building Stock Damage

Hazus estimates that about 244 buildings will be at least moderately damaged. This is over 62% of the total number of buildings in the scenario. There are an estimated 35 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map

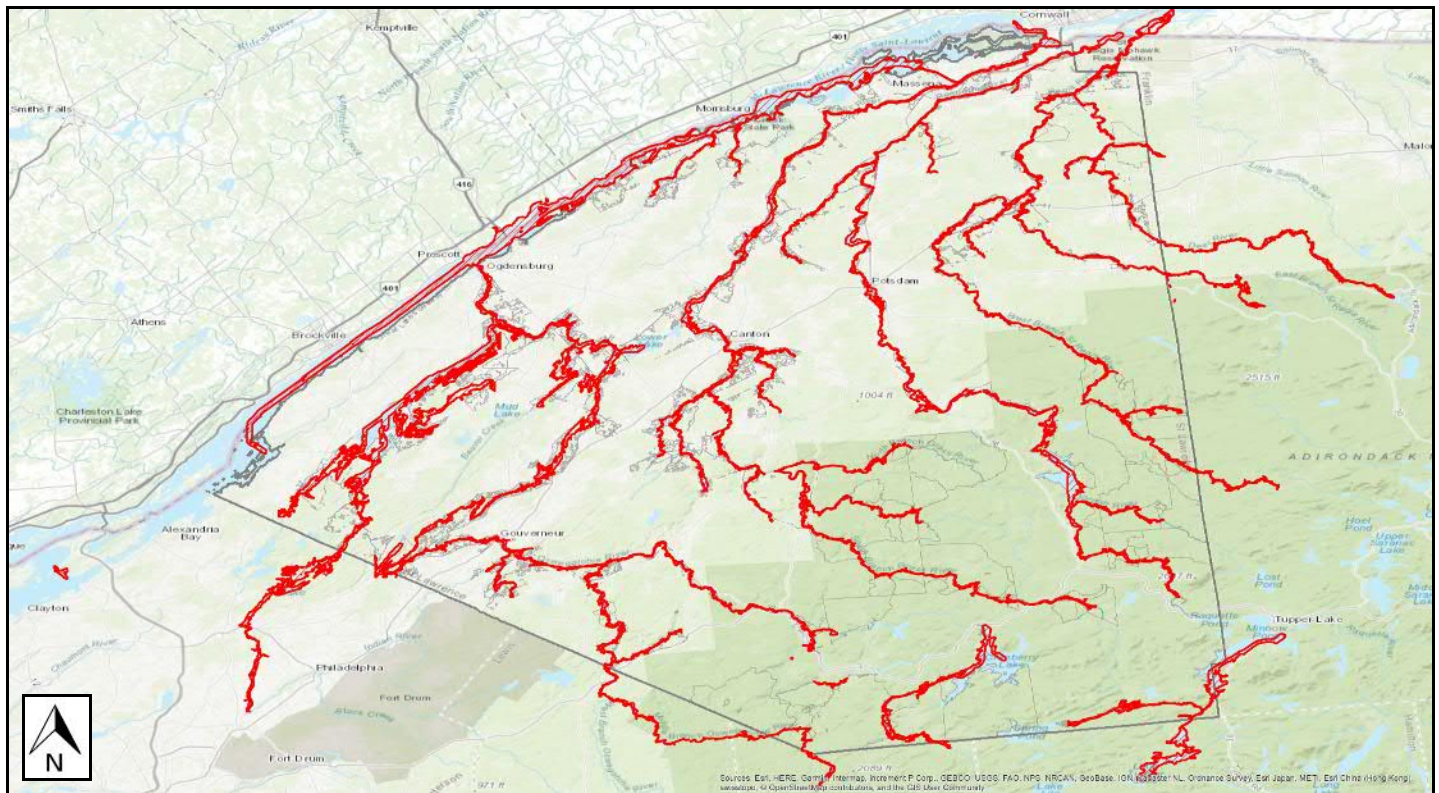
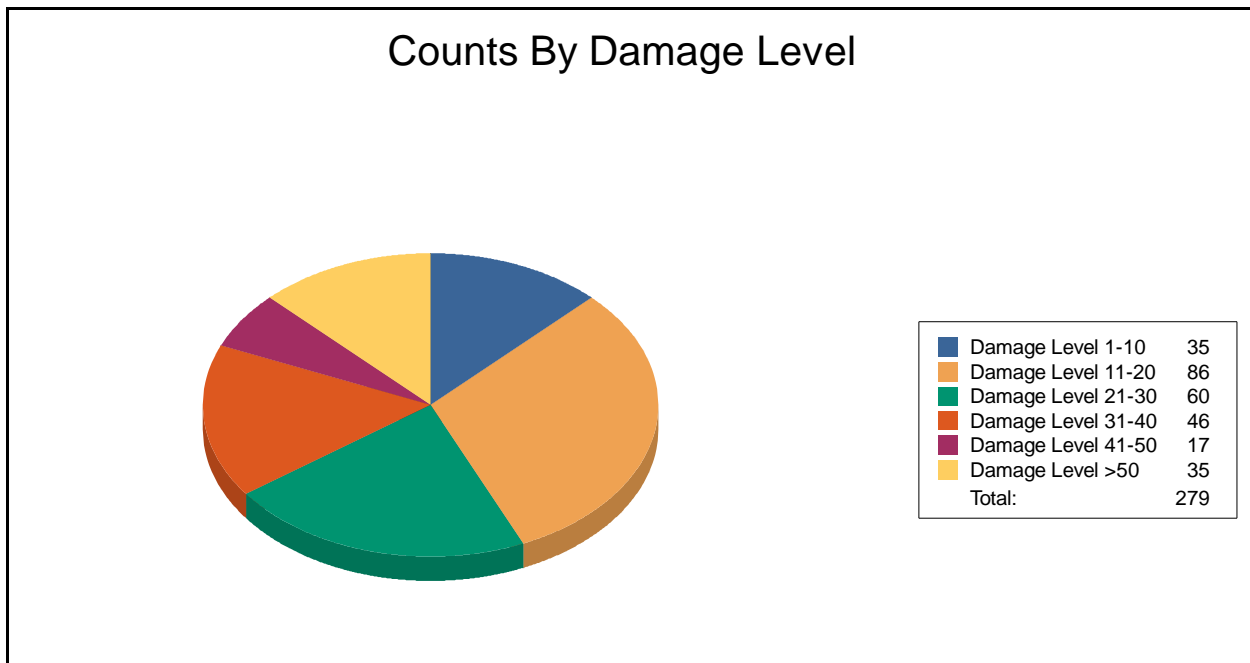




Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	1	100	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	34	12	86	31	60	22	46	17	17	6	35	13
Total	35		86		60		46		17		35	



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Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	18	100
Masonry	3	14	6	27	4	18	4	18	4	18	1	5
Steel	0	0	0	0	0	0	0	0	0	0	0	0
Wood	31	13	80	34	56	24	42	18	13	5	16	7



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Essential Facility Damage

Before the flood analyzed in this scenario, the region had 319 hospital beds available for use. On the day of the scenario flood event, the model estimates that 319 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	# Facilities			
	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	43	1	0	1
Hospitals	6	0	0	0
Police Stations	21	1	0	0
Schools	64	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.



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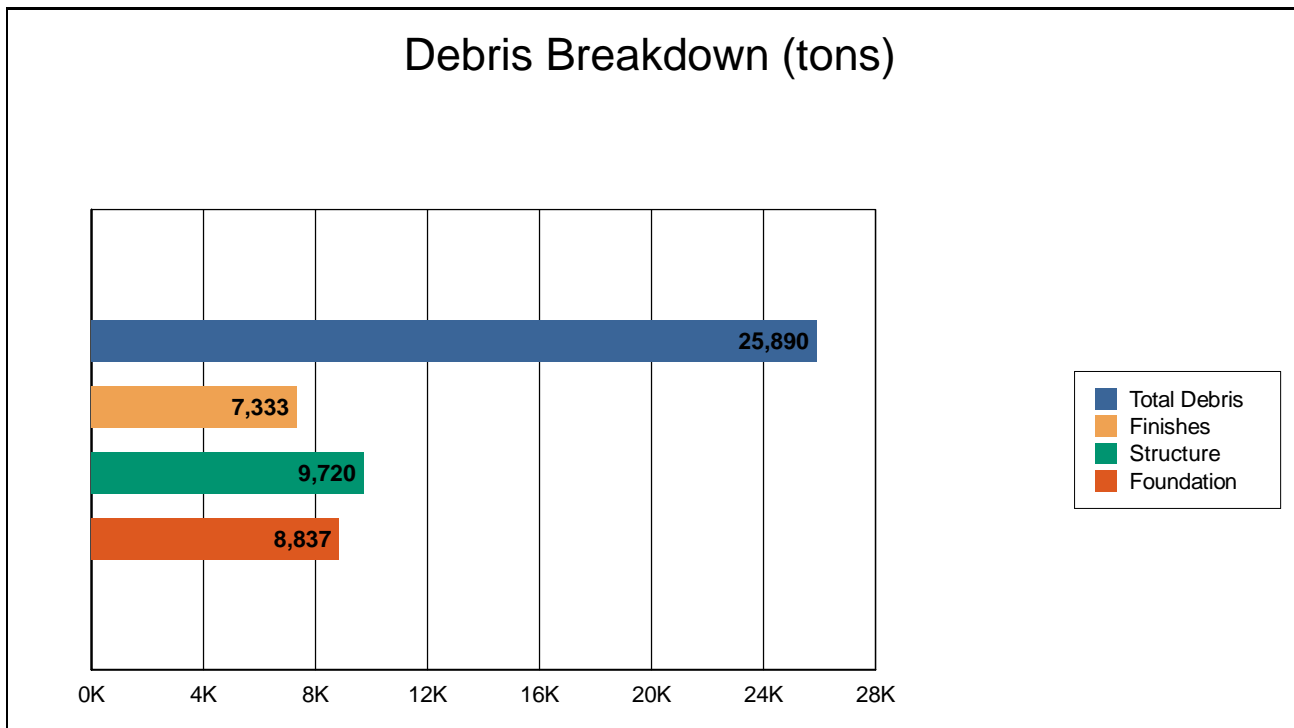
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Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



The model estimates that a total of 25,890 tons of debris will be generated. Of the total amount, Finishes comprises 28% of the total, Structure comprises 38% of the total, and Foundation comprises 34%. If the debris tonnage is converted into an estimated number of truckloads, it will require 1036 truckloads (@25 tons/truck) to remove the debris generated by the flood.



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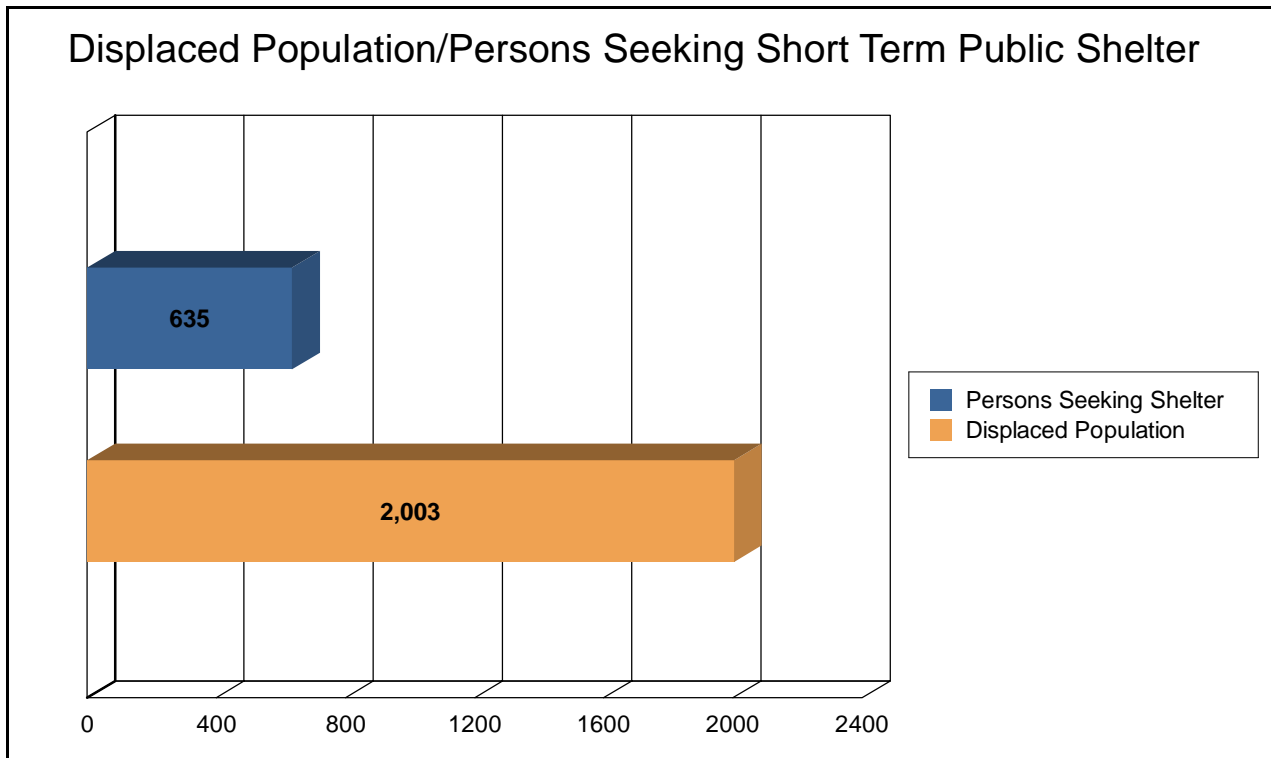
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Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 668 households (or 2,003 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 635 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



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Economic Loss

The total economic loss estimated for the flood is 280.45 million dollars, which represents 11.66 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 132.45 million dollars. 53% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 35.76% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.



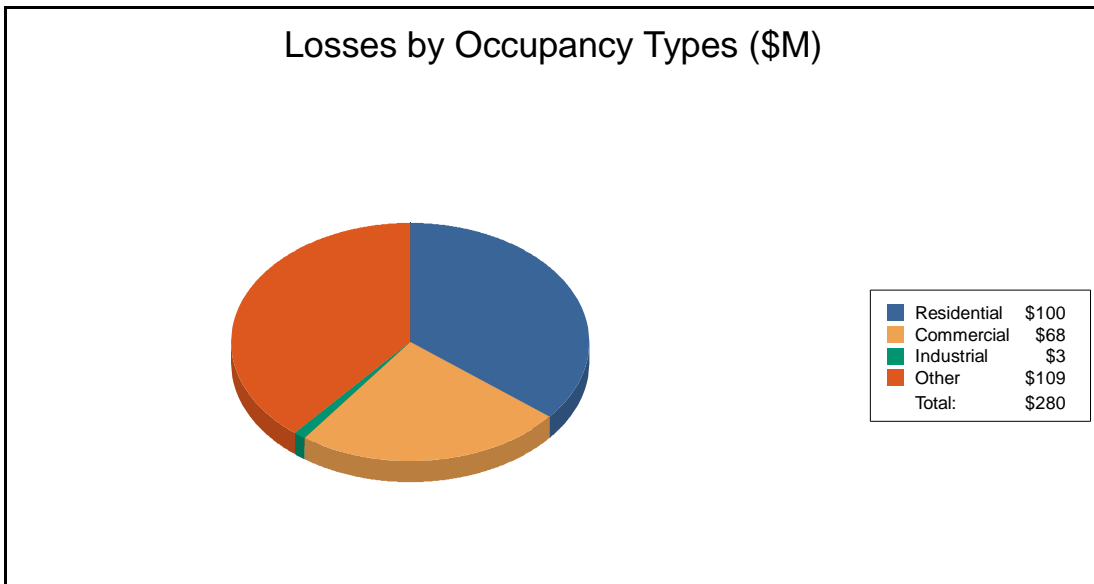
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Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	51.34	10.44	0.69	3.14	65.60
	Content	29.33	23.30	1.54	11.77	65.93
	Inventory	0.00	0.67	0.24	0.02	0.93
	Subtotal	80.66	34.40	2.47	14.92	132.45
Business Interruption						
	Income	0.85	12.57	0.03	1.79	15.25
	Relocation	11.83	3.53	0.03	1.46	16.85
	Rental Income	4.90	2.47	0.01	0.19	7.57
	Wage	2.04	15.36	0.05	90.89	108.34
	Subtotal	19.63	33.94	0.12	94.32	148.00
ALL	Total	100.29	68.34	2.58	109.25	280.45



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Appendix A: County Listing for the Region

New York

- St. Lawrence



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Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
New York				
St. Lawrence	111,944	9,077,710	2,546,387	11,624,097
Total	111,944	9,077,710	2,546,387	11,624,097
Total Study Region	111,944	9,077,710	2,546,387	11,624,097



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Hazus: Earthquake Global Risk Report

Region Name: StlCo

Earthquake Scenario: 100yr_5

Print Date: November 11, 2021

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,761.34 square miles and contains 28 census tracts. There are over 41 thousand households in the region which has a total population of 111,944 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 (millions of dollars). Approximately 93.00 % of the buildings (and 78.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 6,279 and 9,807 (millions of dollars) , respectively.



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Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 49 thousand buildings in the region which have an aggregate total replacement value of 11,624 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 48 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 16,086.00 (millions of dollars). This inventory includes over 568.55 miles of highways, 315 bridges, 13,327.79 miles of pipes.

Table 1: Transportation System Lifeline Inventory

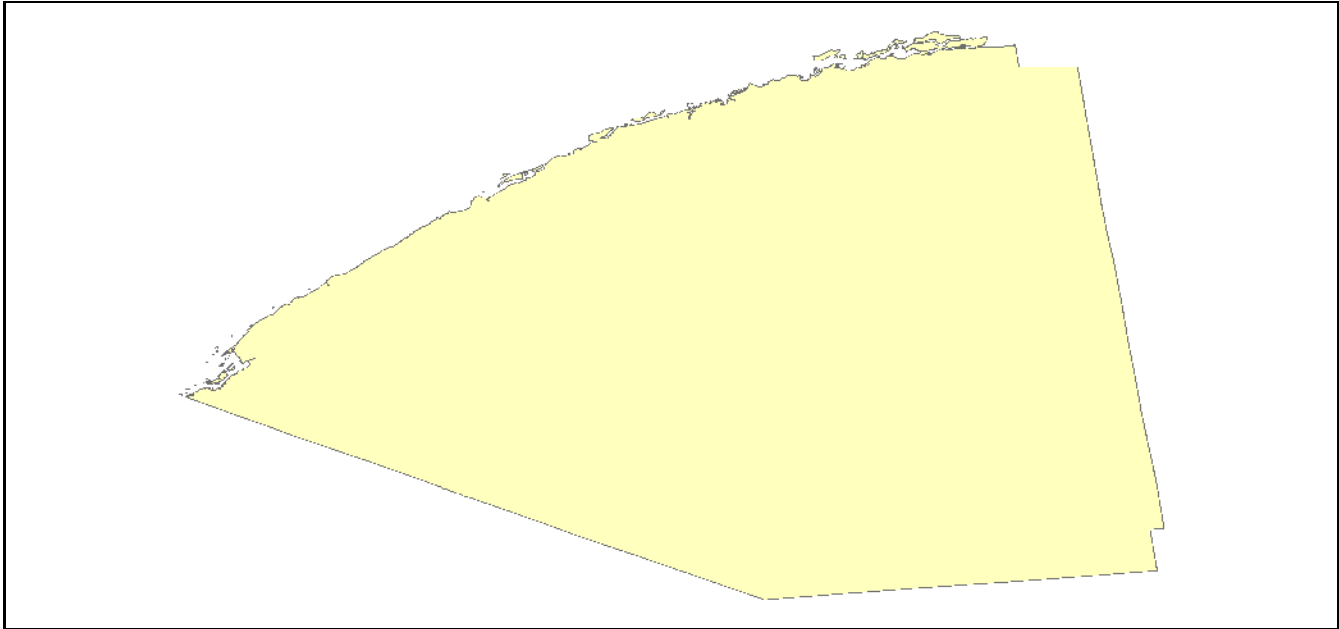
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	315	809.7394
	Segments	145	4233.9613
	Tunnels	0	0.0000
	Subtotal		5043.7007
Railways	Bridges	102	540.5177
	Facilities	0	0.0000
	Segments	160	429.1790
	Tunnels	0	0.0000
	Subtotal		969.6967
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	8	13.5659
	Subtotal		13.5659
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	4	13.3963
	Subtotal		13.3963
Airport	Facilities	4	29.2515
	Runways	5	209.7442
	Subtotal		238.9957
		Total	6,279.40

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	264.5671
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	264.5671
Waste Water	Distribution Lines	NA	158.7402
	Facilities	44	6668.5051
	Pipelines	0	0.0000
		Subtotal	6827.2453
Natural Gas	Distribution Lines	NA	105.8268
	Facilities	0	0.0000
	Pipelines	371	205.8673
		Subtotal	311.6941
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	9	2402.6543
		Subtotal	2402.6543
Communication	Facilities	15	1.7700
		Subtotal	1.7700
		Total	9,807.90

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	100yr_5
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	100.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 148 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

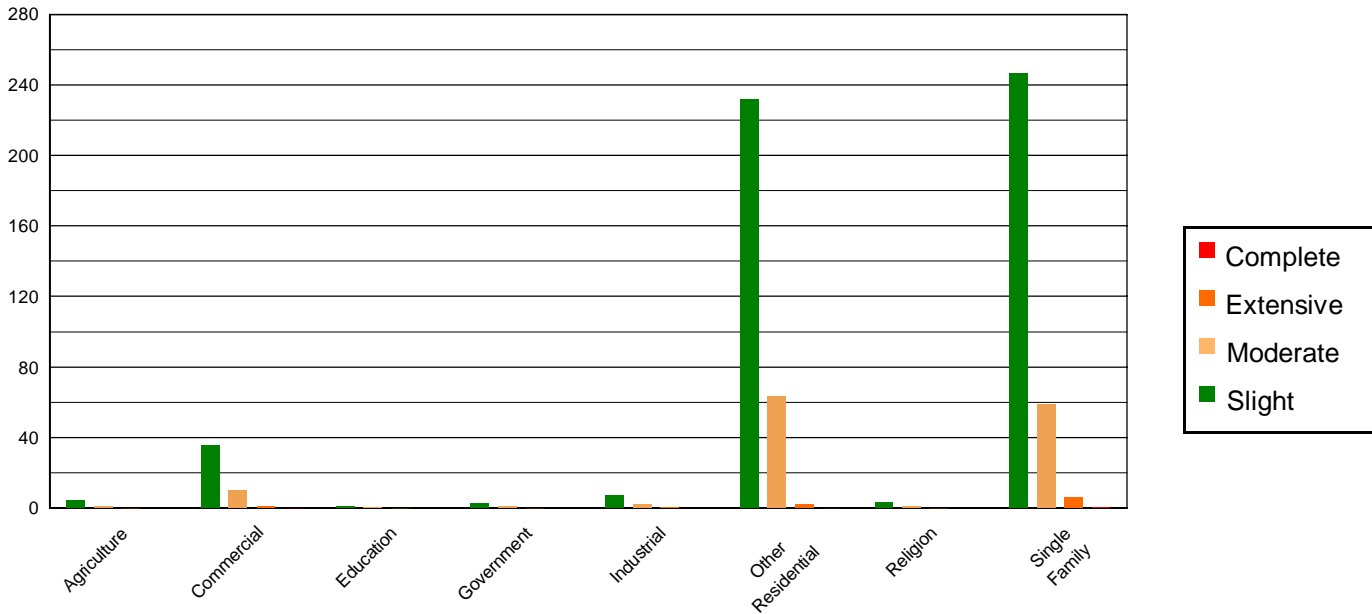


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	290.97	0.60	3.97	0.75	0.95	0.69	0.10	1.05	0.00	0.58
Commercial	2185.32	4.48	35.32	6.65	10.16	7.37	1.14	11.59	0.06	8.53
Education	85.51	0.18	1.14	0.22	0.31	0.23	0.03	0.34	0.00	0.31
Government	192.48	0.39	2.70	0.51	0.74	0.54	0.08	0.78	0.00	0.48
Industrial	527.27	1.08	7.43	1.40	2.08	1.51	0.22	2.21	0.01	1.33
Other Residential	8720.90	17.89	231.54	43.56	63.69	46.21	1.79	18.19	0.07	10.11
Religion	206.75	0.42	3.11	0.59	1.01	0.73	0.12	1.22	0.01	1.20
Single Family	36541.89	74.96	246.34	46.34	58.88	42.72	6.36	64.63	0.54	77.46
Total	48,751		532		138		10		1	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	33362.32	68.43	109.46	20.59	8.80	6.38	0.00	0.00	0.00	0.00
Steel	1667.73	3.42	19.51	3.67	4.74	3.44	0.39	3.99	0.00	0.00
Concrete	716.40	1.47	9.73	1.83	1.89	1.37	0.09	0.94	0.00	0.00
Precast	128.16	0.26	2.71	0.51	1.36	0.99	0.19	1.91	0.00	0.00
RM	486.85	1.00	6.16	1.16	2.44	1.77	0.27	2.75	0.00	0.00
URM	6169.61	12.66	181.84	34.21	63.56	46.12	8.10	82.24	0.69	100.00
MH	6220.02	12.76	202.15	38.03	55.03	39.93	0.80	8.17	0.00	0.00
Total	48,751		532		138		10		1	

*Note:

RM Reinforced Masonry
 URM Unreinforced Masonry
 MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 319 hospital beds available for use. On the day of the earthquake, the model estimates that only 302 hospital beds (95.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 98.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	6	0	0	6
Schools	64	0	0	64
EOCs	1	0	0	1
PoliceStations	21	0	0	21
FireStations	43	0	0	43

Transportation Lifeline Damage

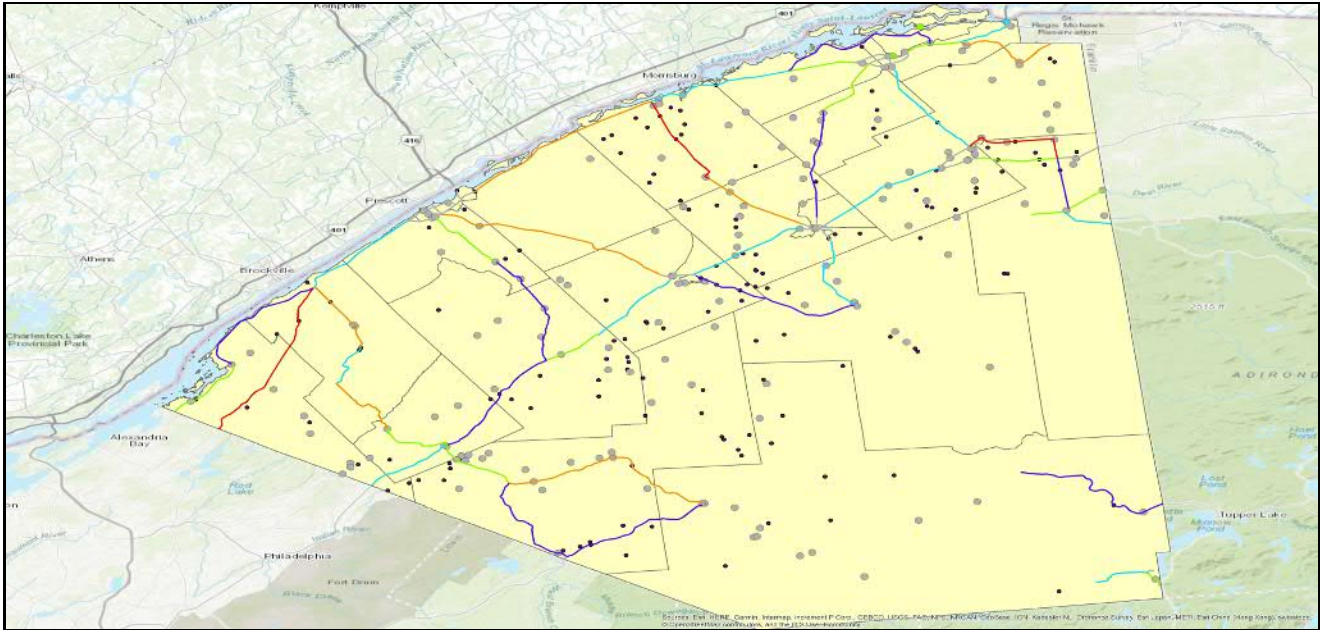


Table 6: Expected Damage to the Transportation Systems

System	Component	Locations/ Segments	Number of Locations			
			With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	145	0	0	145	145
	Bridges	315	0	0	315	315
	Tunnels	0	0	0	0	0
Railways	Segments	160	0	0	160	160
	Bridges	102	0	0	102	102
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	8	0	0	8	8
Ferry	Facilities	0	0	0	0	0
Port	Facilities	4	0	0	4	4
Airport	Facilities	4	0	0	4	4
	Runways	5	0	0	5	5

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	44	0	0	44	44
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	9	0	0	9	9
Communication	15	0	0	15	15

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	8,220	3	1
Waste Water	4,932	2	0
Natural Gas	177	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	41,605	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

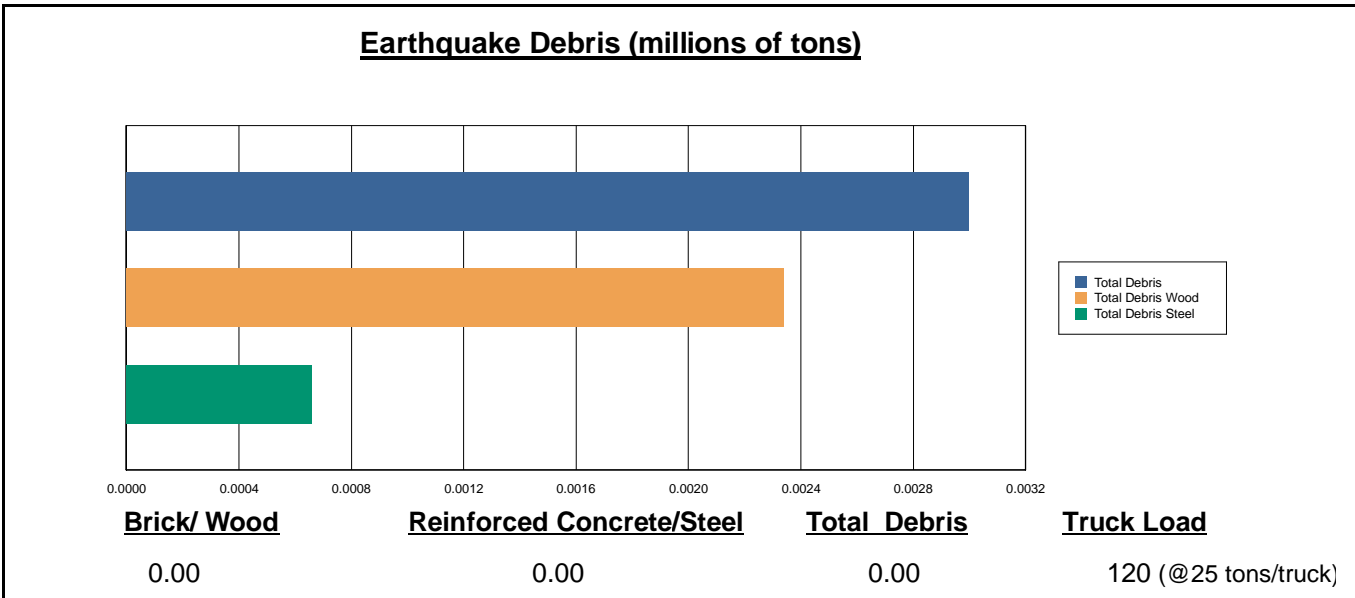
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

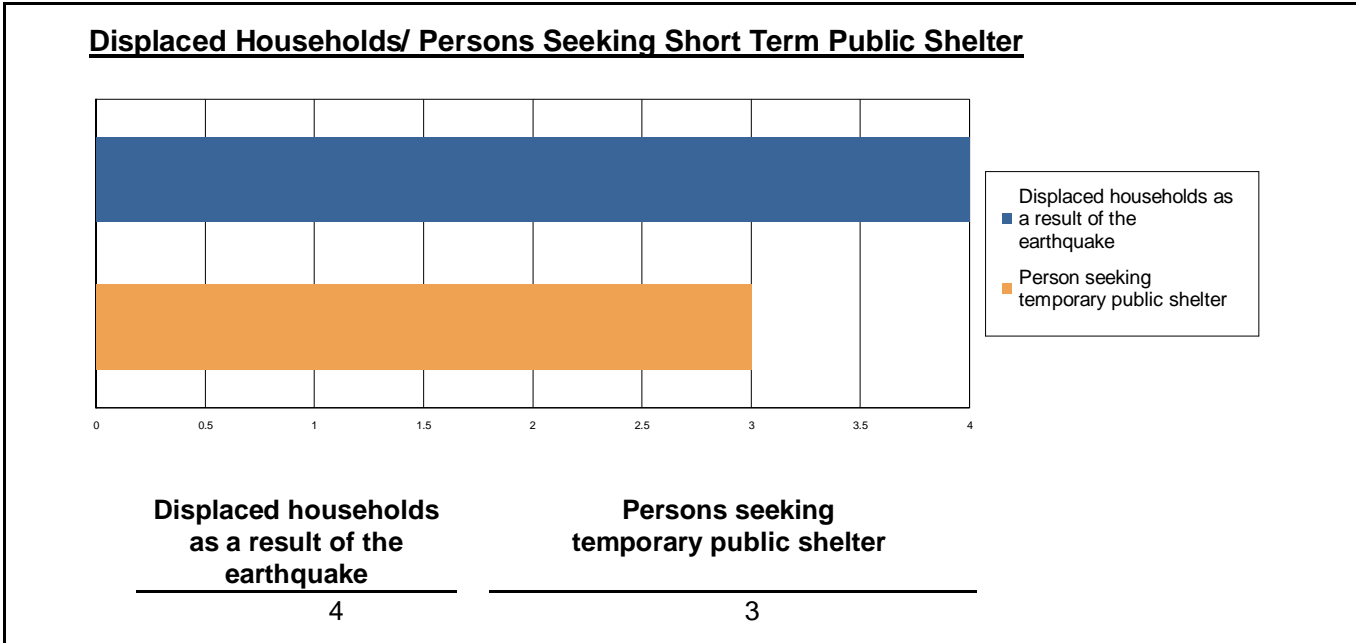
The model estimates that a total of 3,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 78.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 120 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 4 households to be displaced due to the earthquake. Of these, 3 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.02	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.02	0.00	0.00	0.00
	Other-Residential	1.11	0.11	0.01	0.01
	Single Family	1.08	0.13	0.01	0.02
	Total	2	0	0	0
2 PM	Commercial	1.44	0.16	0.01	0.02
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.61	0.07	0.00	0.01
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.13	0.01	0.00	0.00
	Other-Residential	0.23	0.02	0.00	0.00
	Single Family	0.26	0.03	0.00	0.00
	Total	3	0	0	0
5 PM	Commercial	1.05	0.12	0.01	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.13	0.01	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.08	0.01	0.00	0.00
	Other-Residential	0.42	0.04	0.00	0.00
	Single Family	0.43	0.05	0.00	0.01
	Total	2	0	0	0



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Economic Loss

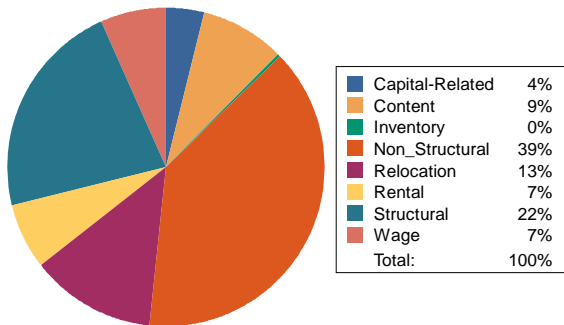
The total economic loss estimated for the earthquake is 13.99 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 7.15 (millions of dollars); 30 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 62 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type (\$ millions)



Earthquake Losses by Occupancy Type (\$ millions)

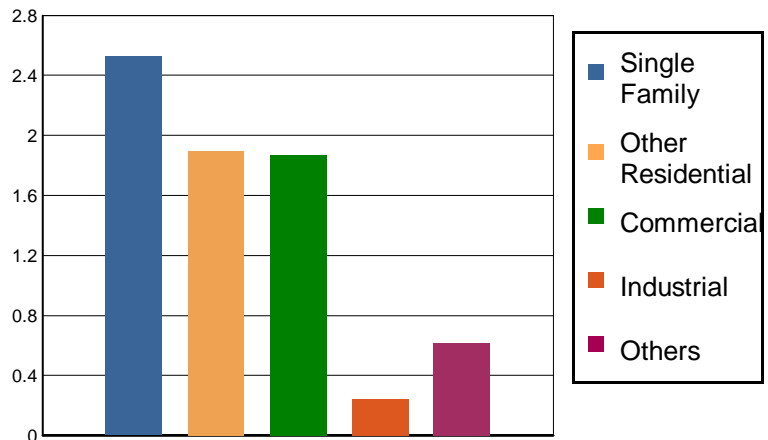


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0680	0.3110	0.0067	0.0974	0.4831
	Capital-Related	0.0000	0.0288	0.2444	0.0046	0.0068	0.2846
	Rental	0.1088	0.1867	0.1745	0.0037	0.0160	0.4897
	Relocation	0.3760	0.1731	0.2313	0.0213	0.1040	0.9057
	Subtotal	0.4848	0.4566	0.9612	0.0363	0.2242	2.1631
Capital Stock Losses							
	Structural	0.6105	0.4691	0.3054	0.0602	0.1325	1.5777
	Non_Structural	1.2038	0.8617	0.4435	0.0886	0.1890	2.7866
	Content	0.2249	0.1116	0.1566	0.0507	0.0683	0.6121
	Inventory	0.0000	0.0000	0.0038	0.0075	0.0008	0.0121
	Subtotal	2.0392	1.4424	0.9093	0.2070	0.3906	4.9885
	Total	2.52	1.90	1.87	0.24	0.61	7.15

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	4233.9613	0.0000	0.00
	Bridges	809.7394	0.0006	0.00
	Tunnels	0.0000	0.0000	0.00
	Subtotal	5043.7007	0.0006	
Railways	Segments	429.1790	0.0000	0.00
	Bridges	540.5177	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	969.6967	0.0000	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	13.5659	0.1064	0.78
	Subtotal	13.5659	0.1064	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	13.3963	0.0441	0.33
	Subtotal	13.3963	0.0441	
Airport	Facilities	29.2515	0.3205	1.10
	Runways	209.7442	0.0000	0.00
	Subtotal	238.9957	0.3205	
Total		6,279.36	0.47	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	264.5671	0.0155	0.01
	Subtotal	264.5671	0.0155	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	6668.5051	3.8586	0.06
	Distribution Line	158.7402	0.0078	0.00
	Subtotal	6827.2453	3.8664	
Natural Gas	Pipelines	205.8673	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	105.8268	0.0027	0.00
	Subtotal	311.6941	0.0027	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	2402.6543	2.4787	0.10
	Subtotal	2402.6543	2.4787	
Communication	Facilities	1.7700	0.0009	0.05
	Subtotal	1.7700	0.0009	
	Total	9,807.93	6.36	



FEMA

Appendix A: County Listing for the Region

St. Lawrence, NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York	St. Lawrence	111,944	9,077	2,546	11,624
Total Region		111,944	9,077	2,546	11,624



FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: StlCo

Earthquake Scenario: 1000yr_5

Print Date: November 11, 2021

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data



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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,761.34 square miles and contains 28 census tracts. There are over 41 thousand households in the region which has a total population of 111,944 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 (millions of dollars). Approximately 93.00 % of the buildings (and 78.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 6,279 and 9,807 (millions of dollars) , respectively.



FEMA

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 49 thousand buildings in the region which have an aggregate total replacement value of 11,624 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 48 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 16,086.00 (millions of dollars). This inventory includes over 568.55 miles of highways, 315 bridges, 13,327.79 miles of pipes.

Table 1: Transportation System Lifeline Inventory

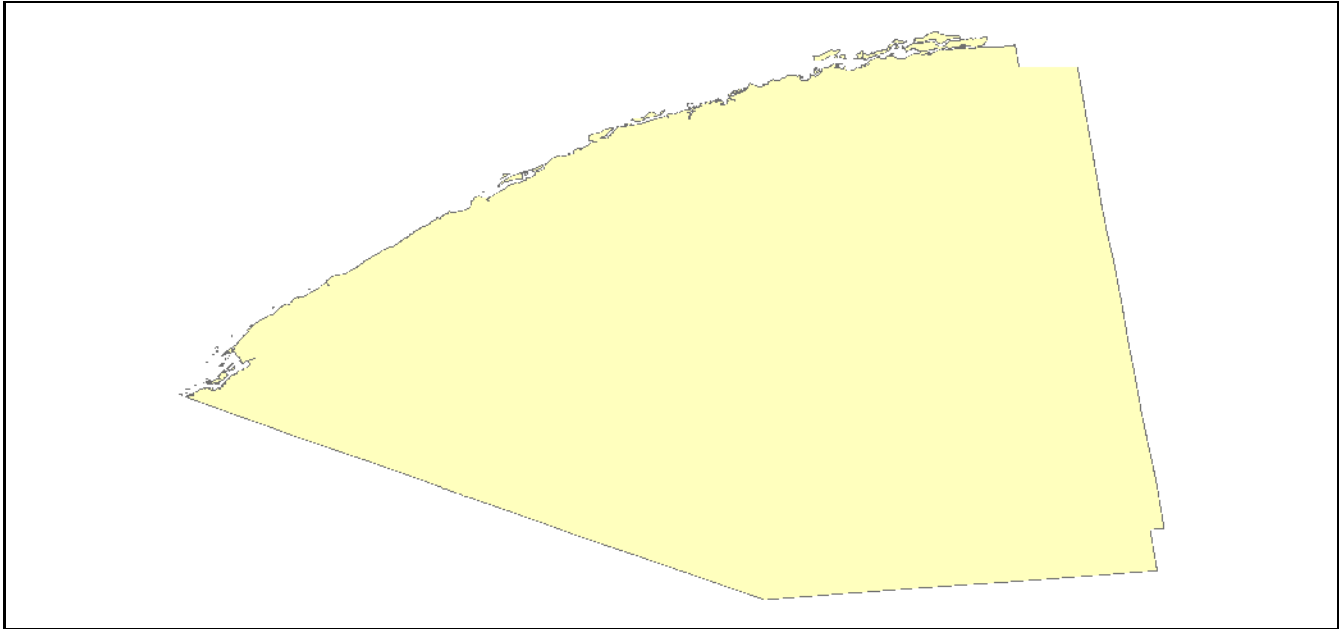
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	315	809.7394
	Segments	145	4233.9613
	Tunnels	0	0.0000
	Subtotal		5043.7007
Railways	Bridges	102	540.5177
	Facilities	0	0.0000
	Segments	160	429.1790
	Tunnels	0	0.0000
	Subtotal		969.6967
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	8	13.5659
	Subtotal		13.5659
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	4	13.3963
	Subtotal		13.3963
Airport	Facilities	4	29.2515
	Runways	5	209.7442
	Subtotal		238.9957
		Total	6,279.40

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	264.5671
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	264.5671
Waste Water	Distribution Lines	NA	158.7402
	Facilities	44	6668.5051
	Pipelines	0	0.0000
		Subtotal	6827.2453
Natural Gas	Distribution Lines	NA	105.8268
	Facilities	0	0.0000
	Pipelines	371	205.8673
		Subtotal	311.6941
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	9	2402.6543
		Subtotal	2402.6543
Communication	Facilities	15	1.7700
		Subtotal	1.7700
		Total	9,807.90

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	1000yr_5
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	1,000.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 2,925 buildings will be at least moderately damaged. This is over 6.00 % of the buildings in the region. There are an estimated 42 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

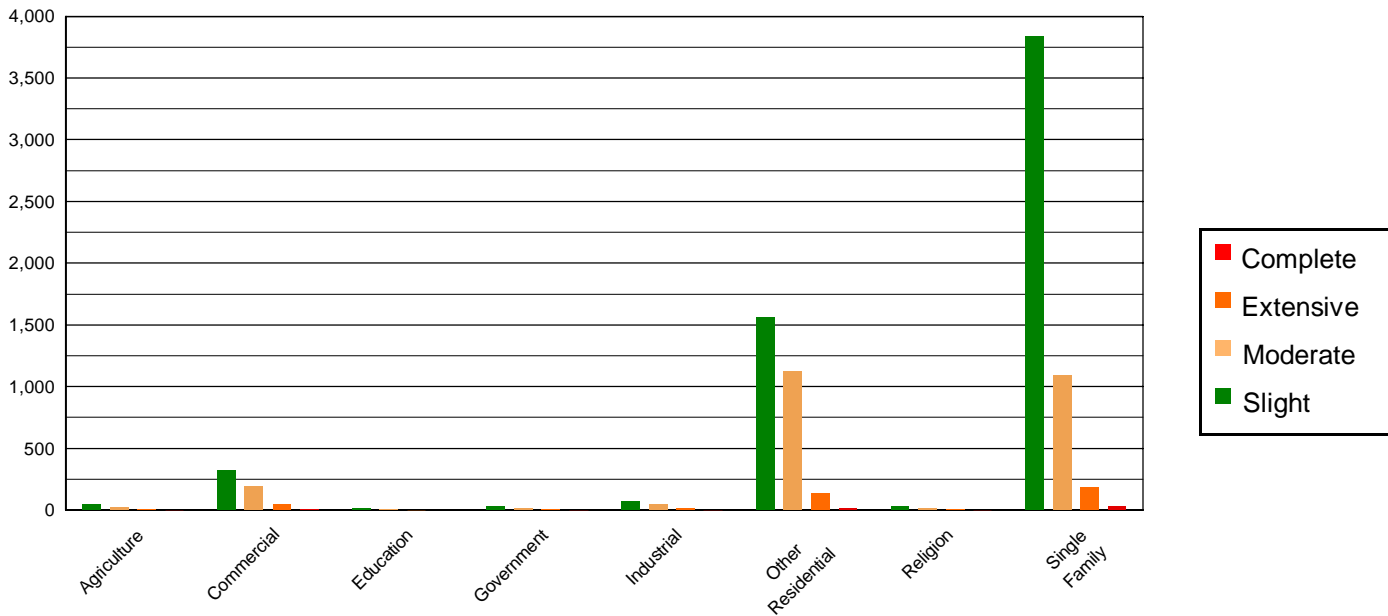


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	230.04	0.57	42.26	0.72	19.45	0.78	3.94	1.04	0.32	0.76
Commercial	1682.30	4.14	317.05	5.38	187.68	7.50	40.68	10.73	4.29	10.20
Education	68.49	0.17	10.97	0.19	6.23	0.25	1.17	0.31	0.14	0.33
Government	150.12	0.37	25.92	0.44	16.33	0.65	3.29	0.87	0.33	0.78
Industrial	411.38	1.01	70.68	1.20	44.82	1.79	9.25	2.44	0.86	2.05
Other Residential	6189.86	15.24	1559.38	26.48	1124.76	44.92	134.80	35.55	9.20	21.87
Religion	166.99	0.41	26.15	0.44	14.14	0.56	3.28	0.87	0.43	1.03
Single Family	31718.63	78.09	3835.63	65.14	1090.43	43.55	182.82	48.21	26.50	62.98
Total	40,618		5,888		2,504		379		42	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	29649.45	73.00	3204.57	54.43	586.22	23.41	39.17	10.33	1.17	2.78
Steel	1305.68	3.21	212.95	3.62	144.55	5.77	27.18	7.17	2.00	4.76
Concrete	543.51	1.34	104.54	1.78	68.35	2.73	11.15	2.94	0.55	1.32
Precast	92.73	0.23	16.47	0.28	17.17	0.69	5.83	1.54	0.22	0.52
RM	391.31	0.96	48.52	0.82	43.59	1.74	12.11	3.19	0.19	0.45
URM	4495.86	11.07	1054.43	17.91	662.12	26.44	178.88	47.17	32.52	77.30
MH	4139.27	10.19	1246.56	21.17	981.84	39.21	104.91	27.66	5.42	12.87
Total	40,618		5,888		2,504		379		42	

*Note:

- RM Reinforced Masonry
- URM Unreinforced Masonry
- MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 319 hospital beds available for use. On the day of the earthquake, the model estimates that only 207 hospital beds (65.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 83.00% of the beds will be back in service. By 30 days, 96.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	6	0	0	6
Schools	64	0	0	61
EOCs	1	0	0	1
PoliceStations	21	0	0	21
FireStations	43	0	0	43

Transportation Lifeline Damage

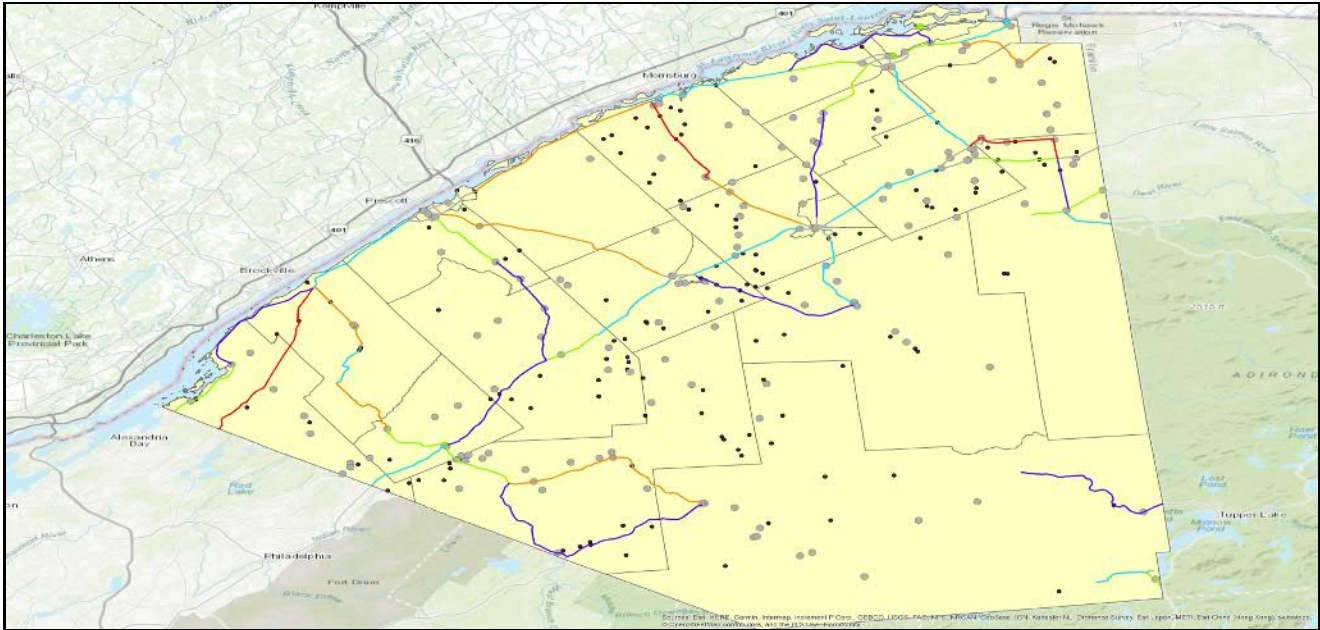


Table 6: Expected Damage to the Transportation Systems

System	Component	Locations/ Segments	Number of Locations			
			With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	145	0	0	145	145
	Bridges	315	0	0	315	315
	Tunnels	0	0	0	0	0
Railways	Segments	160	0	0	160	160
	Bridges	102	0	0	102	102
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	8	0	0	8	8
Ferry	Facilities	0	0	0	0	0
Port	Facilities	4	0	0	4	4
Airport	Facilities	4	0	0	4	4
	Runways	5	0	0	5	5

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	44	0	0	30	44
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	9	0	0	9	9
Communication	15	0	0	15	15

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	8,220	99	25
Waste Water	4,932	50	12
Natural Gas	177	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	41,605	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

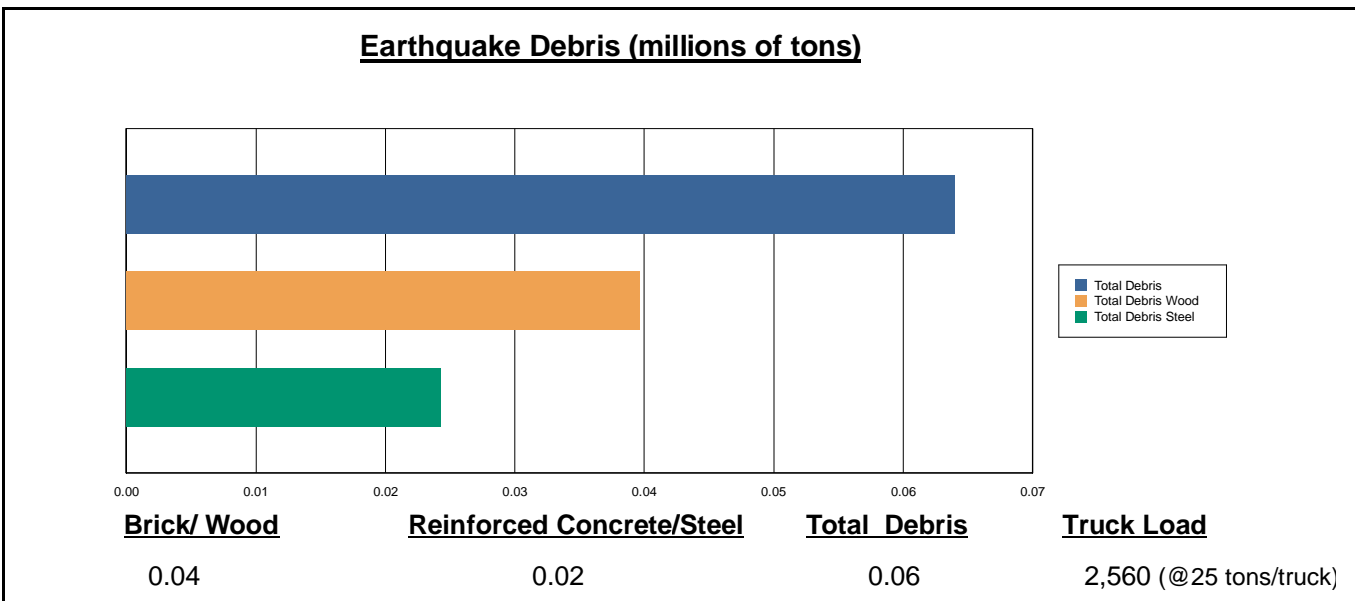
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

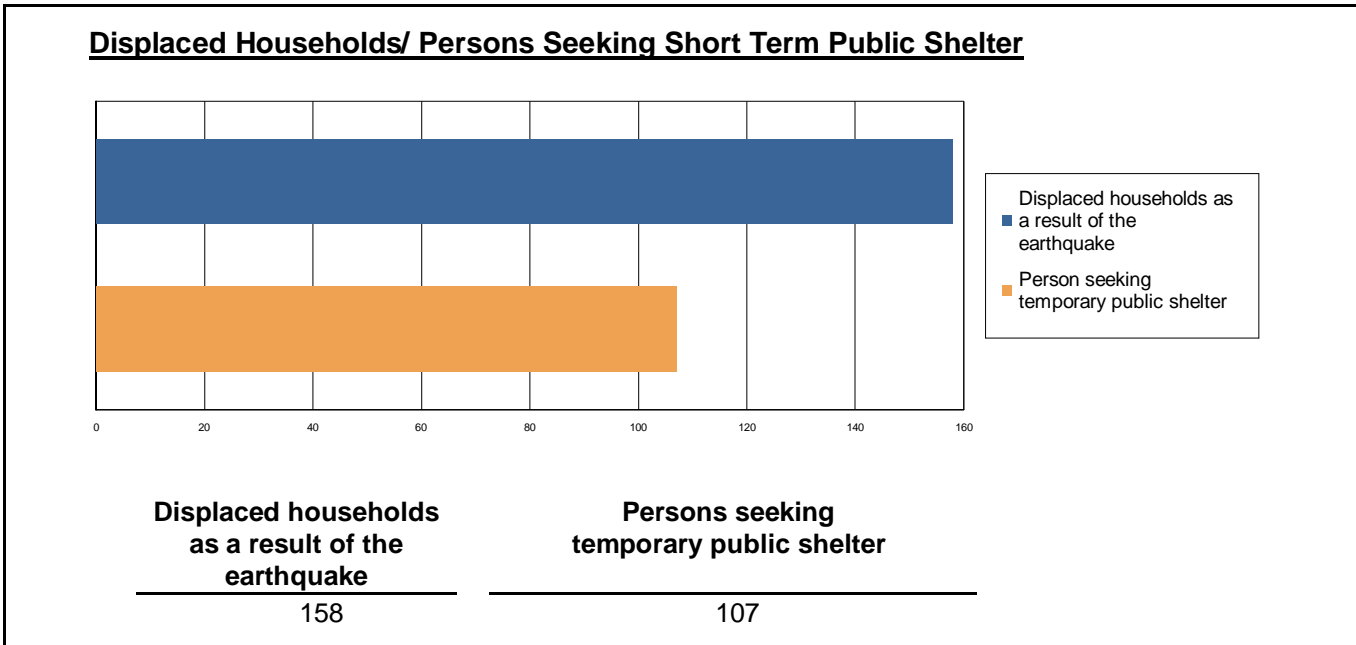
The model estimates that a total of 64,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 62.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 2,560 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 158 households to be displaced due to the earthquake. Of these, 107 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.55	0.09	0.01	0.02
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.47	0.08	0.01	0.01
	Other-Residential	23.10	3.48	0.30	0.58
	Single Family	24.73	3.93	0.42	0.82
	Total	49	8	1	1
2 PM	Commercial	33.97	5.58	0.57	1.09
	Commuting	0.00	0.00	0.00	0.00
	Educational	14.49	2.44	0.26	0.50
	Hotels	0.00	0.00	0.00	0.00
	Industrial	3.50	0.56	0.05	0.10
	Other-Residential	4.78	0.73	0.07	0.12
	Single Family	5.87	0.97	0.11	0.20
	Total	63	10	1	2
5 PM	Commercial	24.93	4.12	0.42	0.81
	Commuting	0.02	0.02	0.03	0.01
	Educational	3.15	0.53	0.06	0.11
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.19	0.35	0.03	0.06
	Other-Residential	8.84	1.37	0.13	0.24
	Single Family	9.78	1.61	0.18	0.34
	Total	49	8	1	2



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Economic Loss

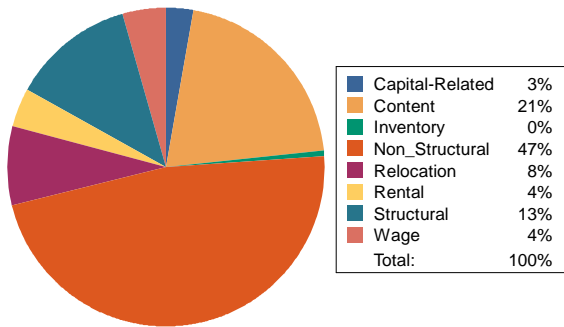
The total economic loss estimated for the earthquake is 829.49 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 256.46 (millions of dollars); 19 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 63 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type (\$ millions)



Earthquake Losses by Occupancy Type (\$ millions)

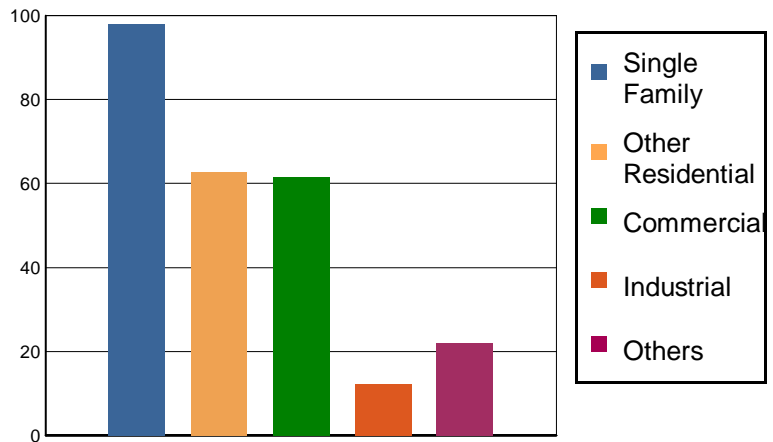


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.9943	7.2365	0.1761	1.7164	11.1233
	Capital-Related	0.0000	0.8457	5.7791	0.1232	0.1230	6.8710
	Rental	2.3296	3.8676	3.4190	0.0842	0.3784	10.0788
	Relocation	8.1197	3.5941	5.4225	0.5356	2.4813	20.1532
	Subtotal	10.4493	10.3017	21.8571	0.9191	4.6991	48.2263
Capital Stock Losses							
	Structural	12.6796	8.9461	6.6755	1.3955	2.8449	32.5416
	Non_Structural	53.4226	33.8156	20.1868	5.4865	8.5611	121.4726
	Content	21.4729	9.5954	12.4979	3.8903	5.7810	53.2375
	Inventory	0.0000	0.0000	0.3122	0.5929	0.0737	0.9788
	Subtotal	87.5751	52.3571	39.6724	11.3652	17.2607	208.2305
	Total	98.02	62.66	61.53	12.28	21.96	256.46

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	4233.9613	0.0000	0.00
	Bridges	809.7394	0.8506	0.11
	Tunnels	0.0000	0.0000	0.00
	Subtotal	5043.7007	0.8506	
Railways	Segments	429.1790	0.0000	0.00
	Bridges	540.5177	0.0126	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	969.6967	0.0126	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	13.5659	1.7282	12.74
	Subtotal	13.5659	1.7282	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	13.3963	0.9299	6.94
	Subtotal	13.3963	0.9299	
Airport	Facilities	29.2515	4.3073	14.73
	Runways	209.7442	0.0000	0.00
	Subtotal	238.9957	4.3073	
Total		6,279.36	7.83	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	264.5671	0.4444	0.17
	Subtotal	264.5671	0.4444	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	6668.5051	381.7780	5.73
	Distribution Line	158.7402	0.2233	0.14
	Subtotal	6827.2453	382.0013	
Natural Gas	Pipelines	205.8673	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	105.8268	0.0765	0.07
	Subtotal	311.6941	0.0765	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	2402.6543	182.5806	7.60
	Subtotal	2402.6543	182.5806	
Communication	Facilities	1.7700	0.0959	5.42
	Subtotal	1.7700	0.0959	
	Total	9,807.93	565.20	



FEMA

Appendix A: County Listing for the Region

St. Lawrence, NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York	St. Lawrence	111,944	9,077	2,546	11,624
Total Region		111,944	9,077	2,546	11,624



FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: StlCo

Earthquake Scenario: 2000yr_5

Print Date: November 15, 2021

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data



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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,761.34 square miles and contains 28 census tracts. There are over 41 thousand households in the region which has a total population of 111,944 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 (millions of dollars). Approximately 93.00 % of the buildings (and 78.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 6,279 and 9,807 (millions of dollars) , respectively.



FEMA

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 49 thousand buildings in the region which have an aggregate total replacement value of 11,624 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 48 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 16,086.00 (millions of dollars). This inventory includes over 568.55 miles of highways, 315 bridges, 13,327.79 miles of pipes.

Table 1: Transportation System Lifeline Inventory

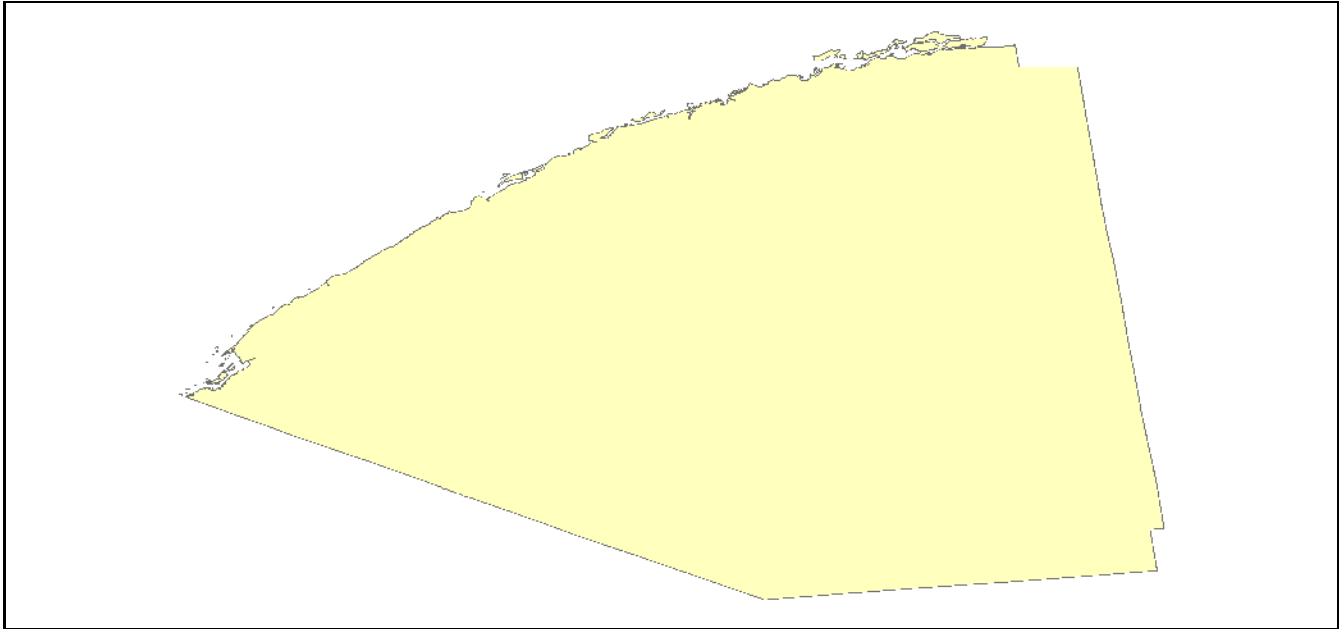
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	315	809.7394
	Segments	145	4233.9613
	Tunnels	0	0.0000
	Subtotal		5043.7007
Railways	Bridges	102	540.5177
	Facilities	0	0.0000
	Segments	160	429.1790
	Tunnels	0	0.0000
	Subtotal		969.6967
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	8	13.5659
	Subtotal		13.5659
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	4	13.3963
	Subtotal		13.3963
Airport	Facilities	4	29.2515
	Runways	5	209.7442
	Subtotal		238.9957
		Total	6,279.40

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	264.5671
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	264.5671
Waste Water	Distribution Lines	NA	158.7402
	Facilities	44	6668.5051
	Pipelines	0	0.0000
		Subtotal	6827.2453
Natural Gas	Distribution Lines	NA	105.8268
	Facilities	0	0.0000
	Pipelines	371	205.8673
		Subtotal	311.6941
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	9	2402.6543
		Subtotal	2402.6543
Communication	Facilities	15	1.7700
		Subtotal	1.7700
		Total	9,807.90

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	2000yr_5
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	2,000.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 5,691 buildings will be at least moderately damaged. This is over 12.00 % of the buildings in the region. There are an estimated 141 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

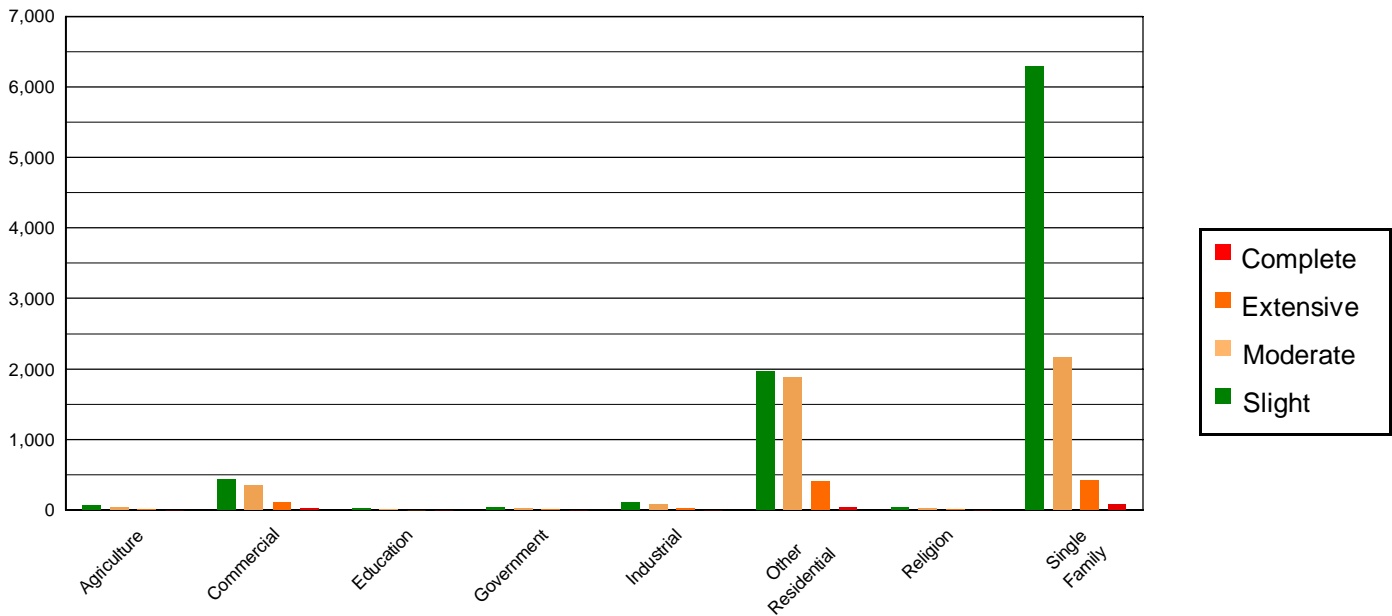


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	183.97	0.53	62.59	0.70	38.50	0.84	9.73	1.00	1.22	0.86
Commercial	1324.56	3.81	439.73	4.92	350.01	7.64	101.94	10.52	15.77	11.14
Education	55.44	0.16	15.79	0.18	12.17	0.27	3.11	0.32	0.49	0.34
Government	118.58	0.34	36.09	0.40	31.22	0.68	8.82	0.91	1.30	0.92
Industrial	325.87	0.94	98.41	1.10	85.03	1.86	24.28	2.51	3.41	2.41
Other Residential	4743.28	13.63	1962.77	21.96	1874.91	40.94	397.08	40.96	39.96	28.21
Religion	139.30	0.40	37.47	0.42	25.16	0.55	7.72	0.80	1.35	0.96
Single Family	27910.60	80.20	6285.47	70.32	2163.15	47.23	416.64	42.98	78.15	55.17
Total	34,802		8,938		4,580		969		142	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	26376.43	75.79	5574.29	62.36	1402.96	30.63	121.20	12.50	5.70	4.03
Steel	1027.46	2.95	296.86	3.32	282.09	6.16	76.22	7.86	9.74	6.88
Concrete	420.26	1.21	140.58	1.57	130.71	2.85	33.72	3.48	2.84	2.00
Precast	68.99	0.20	20.39	0.23	28.11	0.61	13.76	1.42	1.16	0.82
RM	310.68	0.89	67.63	0.76	82.22	1.80	33.80	3.49	1.38	0.97
URM	3577.24	10.28	1343.50	15.03	1043.69	22.79	366.21	37.78	93.16	65.77
MH	3020.54	8.68	1495.06	16.73	1610.34	35.16	324.40	33.47	27.66	19.53
Total	34,802		8,938		4,580		969		142	

*Note:

- RM Reinforced Masonry
- URM Unreinforced Masonry
- MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 319 hospital beds available for use. On the day of the earthquake, the model estimates that only 156 hospital beds (49.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 71.00% of the beds will be back in service. By 30 days, 90.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	6	0	0	3
Schools	64	0	0	44
EOCs	1	0	0	1
PoliceStations	21	0	0	14
FireStations	43	0	0	28

Transportation Lifeline Damage

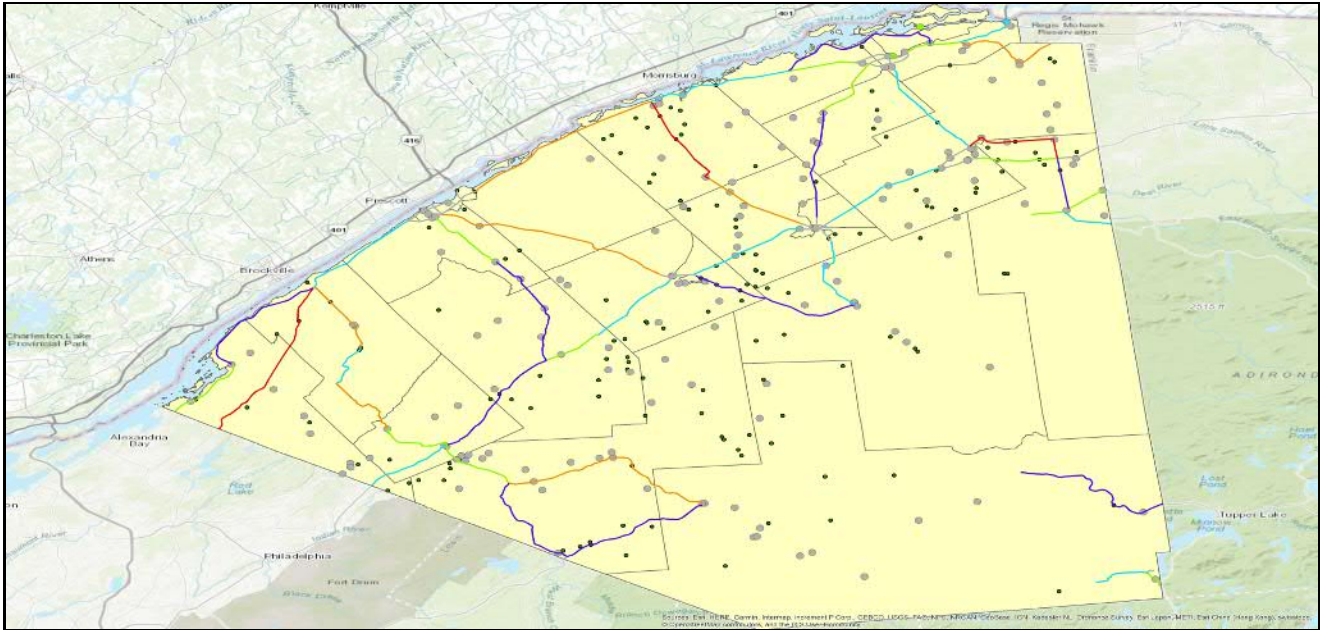


Table 6: Expected Damage to the Transportation Systems

System	Component	Locations/ Segments	Number of Locations			
			With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	145	0	0	145	145
	Bridges	315	0	0	315	315
	Tunnels	0	0	0	0	0
Railways	Segments	160	0	0	160	160
	Bridges	102	0	0	102	102
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	8	0	0	8	8
Ferry	Facilities	0	0	0	0	0
Port	Facilities	4	0	0	4	4
Airport	Facilities	4	0	0	4	4
	Runways	5	0	0	5	5

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	44	8	0	8	44
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	9	2	0	9	9
Communication	15	4	0	15	15

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	8,220	230	58
Waste Water	4,932	116	29
Natural Gas	177	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	41,605	0	0	0	0	0
Electric Power		6,850	3,374	881	101	10

Induced Earthquake Damage

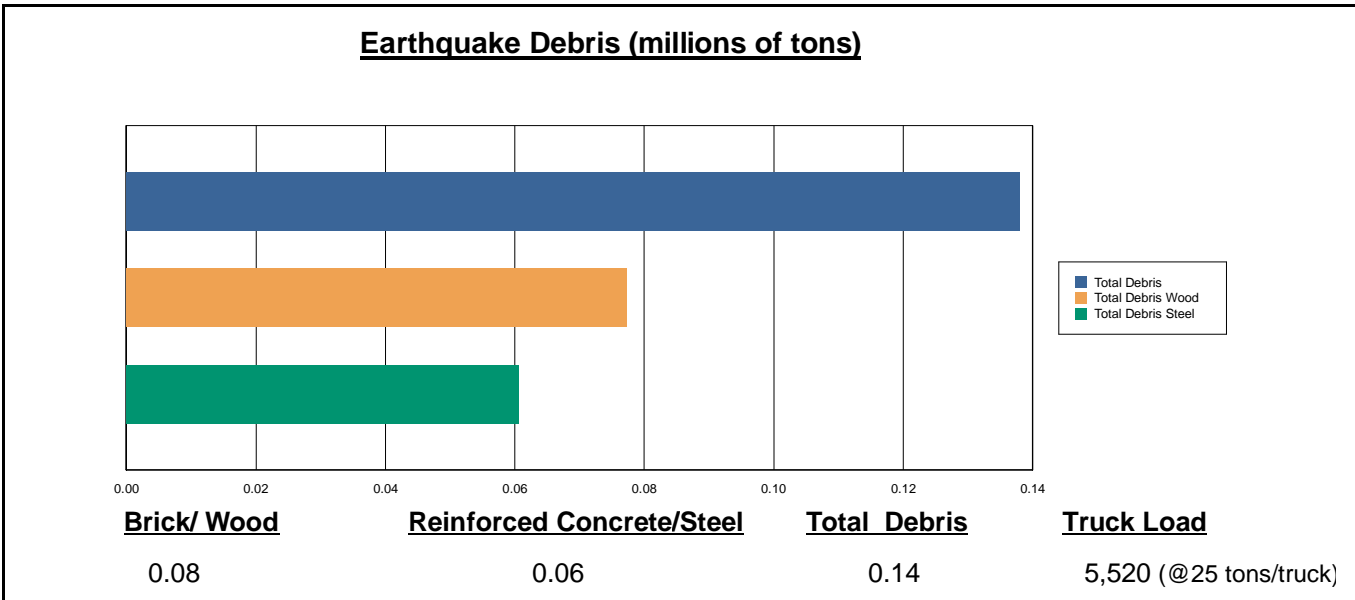
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

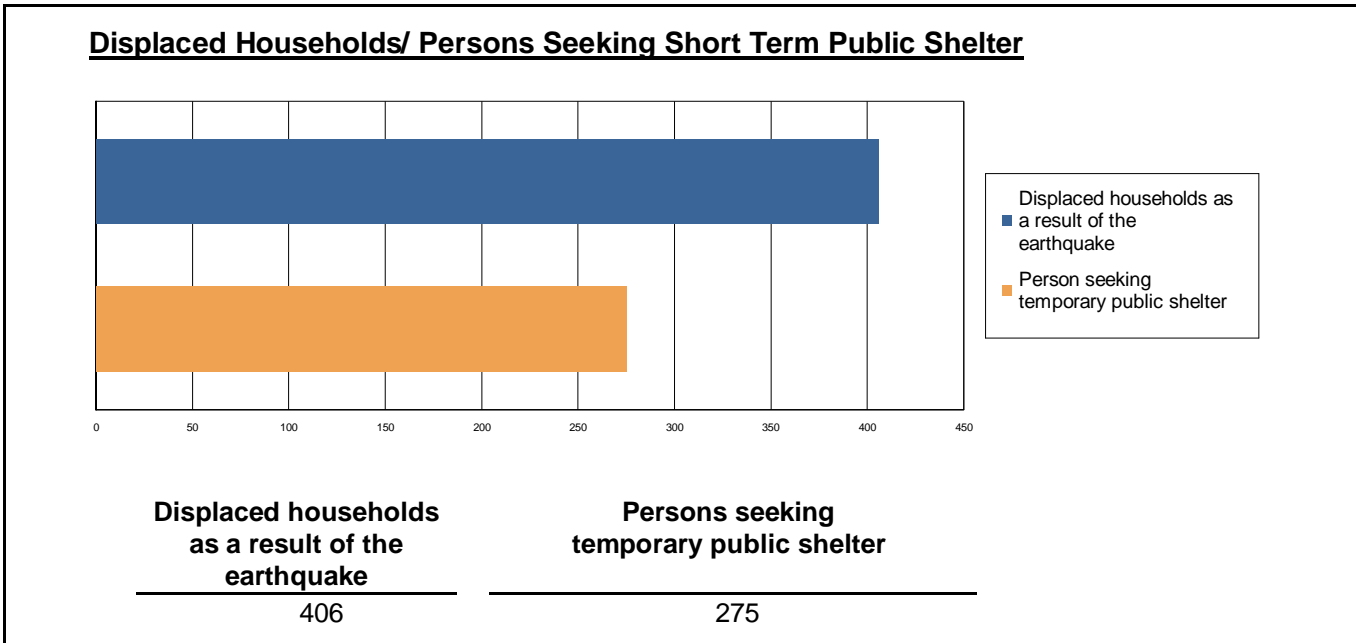
The model estimates that a total of 138,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 56.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 5,520 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 406 households to be displaced due to the earthquake. Of these, 275 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.36	0.26	0.03	0.06
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.20	0.23	0.03	0.05
	Other-Residential	53.59	9.52	0.98	1.90
	Single Family	55.61	10.16	1.20	2.34
	Total	112	20	2	4
2 PM	Commercial	83.37	16.15	1.90	3.68
	Commuting	0.01	0.01	0.01	0.00
	Educational	35.83	7.05	0.87	1.67
	Hotels	0.00	0.00	0.00	0.00
	Industrial	8.90	1.70	0.20	0.38
	Other-Residential	11.09	2.01	0.21	0.40
	Single Family	13.23	2.50	0.31	0.58
	Total	152	29	4	7
5 PM	Commercial	61.16	11.90	1.42	2.71
	Commuting	0.10	0.12	0.22	0.04
	Educational	7.68	1.49	0.18	0.35
	Hotels	0.00	0.00	0.00	0.00
	Industrial	5.57	1.06	0.12	0.24
	Other-Residential	20.56	3.75	0.41	0.76
	Single Family	22.06	4.18	0.52	0.97
	Total	117	23	3	5



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Economic Loss

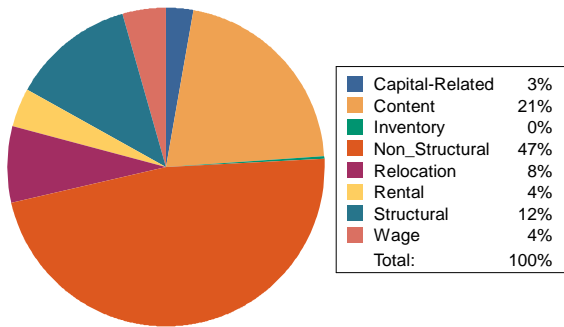
The total economic loss estimated for the earthquake is 1,694.91 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 559.36 (millions of dollars); 19 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 63 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type (\$ millions)



Earthquake Losses by Occupancy Type (\$ millions)

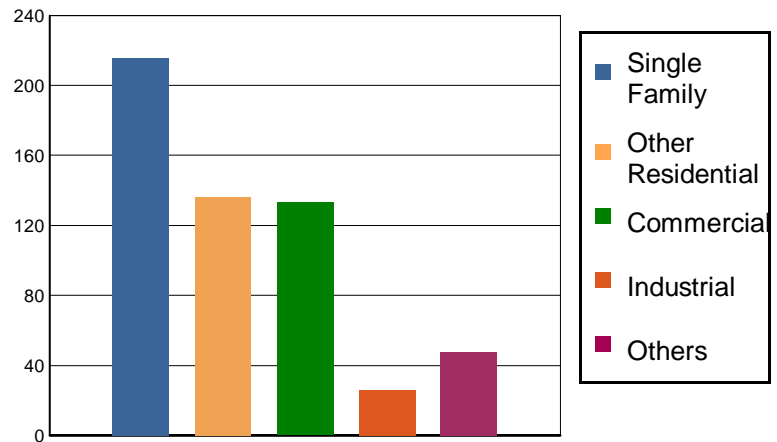


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.8953	15.8380	0.4047	3.5765	24.7145
	Capital-Related	0.0000	2.0759	12.6884	0.2832	0.2641	15.3116
	Rental	4.9312	8.4268	7.1734	0.1819	0.8569	21.5702
	Relocation	17.3382	7.3096	11.8064	1.1419	5.5902	43.1863
	Subtotal	22.2694	22.7076	47.5062	2.0117	10.2877	104.7826
Capital Stock Losses							
	Structural	26.1593	19.1207	15.0325	3.1649	6.3800	69.8574
	Non_Structural	117.1998	73.6242	43.5221	11.4591	18.6763	264.4815
	Content	49.9581	21.1105	26.4208	8.2136	12.4610	118.1640
	Inventory	0.0000	0.0000	0.6604	1.2545	0.1559	2.0708
	Subtotal	193.3172	113.8554	85.6358	24.0921	37.6732	454.5737
	Total	215.59	136.56	133.14	26.10	47.96	559.36

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	4233.9613	0.0000	0.00
	Bridges	809.7394	2.9577	0.37
	Tunnels	0.0000	0.0000	0.00
	Subtotal	5043.7007	2.9577	
Railways	Segments	429.1790	0.0000	0.00
	Bridges	540.5177	0.1226	0.02
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	969.6967	0.1226	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	13.5659	2.8139	20.74
	Subtotal	13.5659	2.8139	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	13.3963	1.5635	11.67
	Subtotal	13.3963	1.5635	
Airport	Facilities	29.2515	6.7878	23.20
	Runways	209.7442	0.0000	0.00
	Subtotal	238.9957	6.7878	
Total		6,279.36	14.25	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	264.5671	1.0359	0.39
	Subtotal	264.5671	1.0359	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	6668.5051	768.4634	11.52
	Distribution Line	158.7402	0.5203	0.33
	Subtotal	6827.2453	768.9837	
Natural Gas	Pipelines	205.8673	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	105.8268	0.1783	0.17
	Subtotal	311.6941	0.1783	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	2402.6543	350.9129	14.61
	Subtotal	2402.6543	350.9129	
Communication	Facilities	1.7700	0.1972	11.14
	Subtotal	1.7700	0.1972	
	Total	9,807.93	1,121.31	



FEMA

Appendix A: County Listing for the Region

St. Lawrence, NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York	St. Lawrence	111,944	9,077	2,546	11,624
Total Region		111,944	9,077	2,546	11,624



FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: StlCo

Earthquake Scenario: 2500yr_5

Print Date: November 15, 2021

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data



FEMA

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,761.34 square miles and contains 28 census tracts. There are over 41 thousand households in the region which has a total population of 111,944 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 (millions of dollars). Approximately 93.00 % of the buildings (and 78.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 6,279 and 9,807 (millions of dollars) , respectively.



FEMA

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 49 thousand buildings in the region which have an aggregate total replacement value of 11,624 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 48 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 16,086.00 (millions of dollars). This inventory includes over 568.55 miles of highways, 315 bridges, 13,327.79 miles of pipes.

Table 1: Transportation System Lifeline Inventory

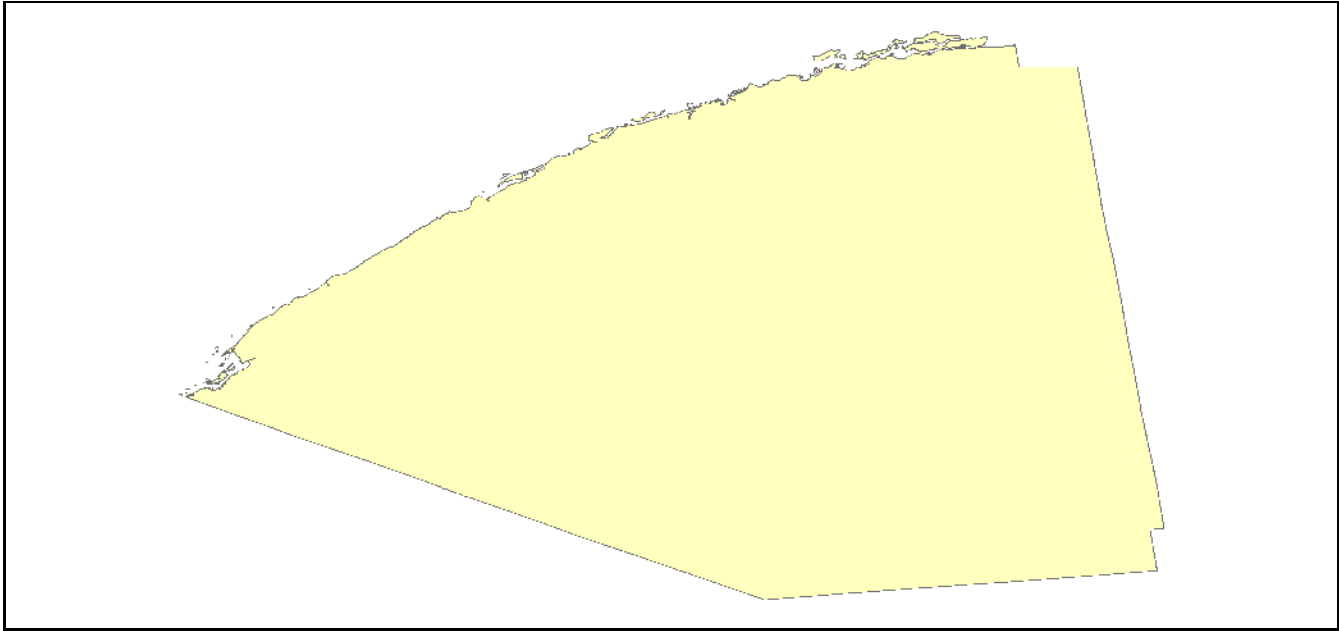
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	315	809.7394
	Segments	145	4233.9613
	Tunnels	0	0.0000
	Subtotal		5043.7007
Railways	Bridges	102	540.5177
	Facilities	0	0.0000
	Segments	160	429.1790
	Tunnels	0	0.0000
	Subtotal		969.6967
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	8	13.5659
	Subtotal		13.5659
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	4	13.3963
	Subtotal		13.3963
Airport	Facilities	4	29.2515
	Runways	5	209.7442
	Subtotal		238.9957
		Total	6,279.40

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	264.5671
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	264.5671
Waste Water	Distribution Lines	NA	158.7402
	Facilities	44	6668.5051
	Pipelines	0	0.0000
		Subtotal	6827.2453
Natural Gas	Distribution Lines	NA	105.8268
	Facilities	0	0.0000
	Pipelines	371	205.8673
		Subtotal	311.6941
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	0.0000
Electrical Power	Facilities	9	2402.6543
		Subtotal	2402.6543
Communication	Facilities	15	1.7700
		Subtotal	1.7700
		Total	9,807.90

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	2500yr_5
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	2,500.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 6,906 buildings will be at least moderately damaged. This is over 14.00 % of the buildings in the region. There are an estimated 212 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

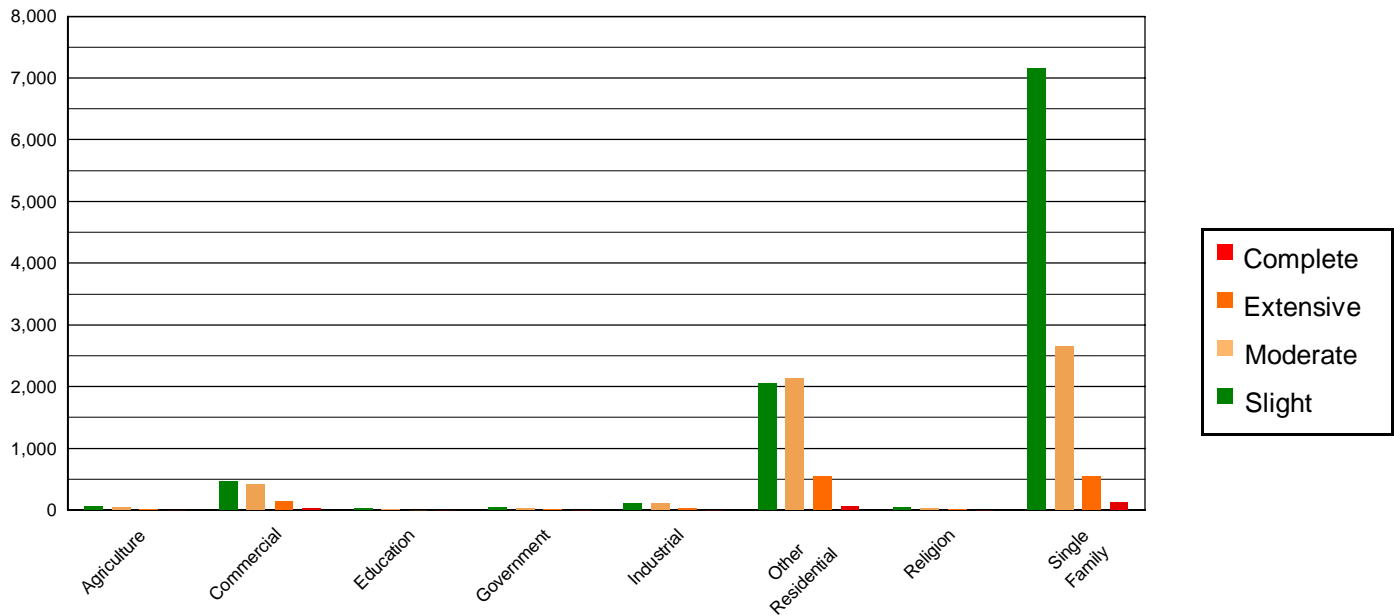


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	167.28	0.51	67.97	0.68	46.24	0.86	12.65	0.98	1.86	0.88
Commercial	1195.26	3.67	468.18	4.72	411.71	7.61	132.94	10.34	23.92	11.26
Education	50.57	0.16	17.03	0.17	14.52	0.27	4.15	0.32	0.73	0.34
Government	107.18	0.33	38.37	0.39	36.79	0.68	11.66	0.91	2.00	0.94
Industrial	294.82	0.90	104.77	1.06	100.18	1.85	31.99	2.49	5.25	2.47
Other Residential	4250.54	13.04	2038.55	20.53	2123.14	39.26	541.55	42.11	64.21	30.22
Religion	128.83	0.40	40.79	0.41	29.45	0.54	9.95	0.77	1.98	0.93
Single Family	26402.22	81.00	7152.31	72.04	2645.63	48.92	541.30	42.09	112.54	52.96
Total	32,597		9,928		5,408		1,286		212	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	25068.19	76.90	6437.05	64.84	1795.55	33.20	170.95	13.29	8.84	4.16
Steel	927.33	2.84	314.66	3.17	333.07	6.16	101.80	7.92	15.51	7.30
Concrete	378.20	1.16	147.26	1.48	152.66	2.82	45.40	3.53	4.59	2.16
Precast	61.24	0.19	20.88	0.21	31.38	0.58	17.11	1.33	1.81	0.85
RM	282.18	0.87	71.79	0.72	95.49	1.77	43.93	3.42	2.34	1.10
URM	3227.81	9.90	1413.32	14.24	1189.36	21.99	459.91	35.76	133.40	62.78
MH	2651.75	8.14	1523.01	15.34	1810.15	33.47	447.08	34.76	46.01	21.65
Total	32,597		9,928		5,408		1,286		212	

*Note:

RM Reinforced Masonry
 URM Unreinforced Masonry
 MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 319 hospital beds available for use. On the day of the earthquake, the model estimates that only 138 hospital beds (43.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 66.00% of the beds will be back in service. By 30 days, 88.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	6	1	0	2
Schools	64	5	0	23
EOCs	1	0	0	0
PoliceStations	21	1	0	6
FireStations	43	2	0	22

Transportation Lifeline Damage

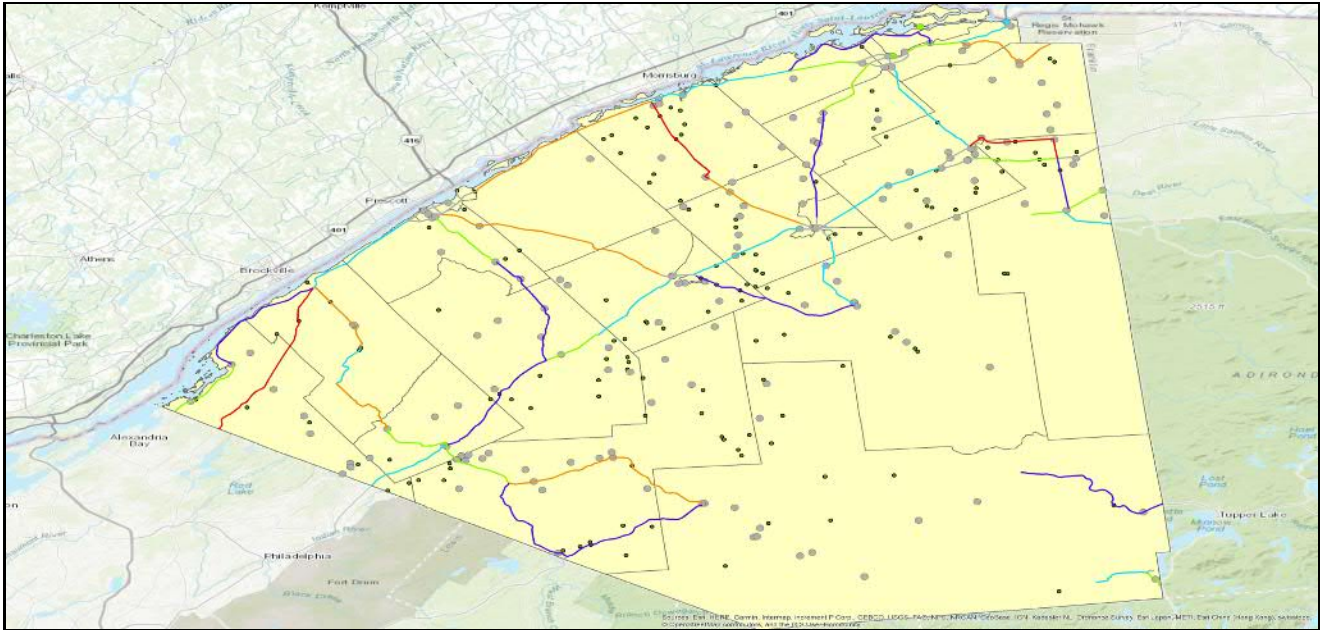


Table 6: Expected Damage to the Transportation Systems

System	Component	Locations/ Segments	Number of Locations			
			With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	145	0	0	145	145
	Bridges	315	0	0	315	315
	Tunnels	0	0	0	0	0
Railways	Segments	160	0	0	160	160
	Bridges	102	0	0	102	102
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	8	0	0	8	8
Ferry	Facilities	0	0	0	0	0
Port	Facilities	4	0	0	4	4
Airport	Facilities	4	0	0	4	4
	Runways	5	0	0	5	5

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	44	18	0	4	44
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	9	4	0	7	9
Communication	15	6	0	15	15

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	8,220	300	75
Waste Water	4,932	151	38
Natural Gas	177	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	41,605	7	0	0	0	0
Electric Power		13,162	6,808	1,923	243	19

Induced Earthquake Damage

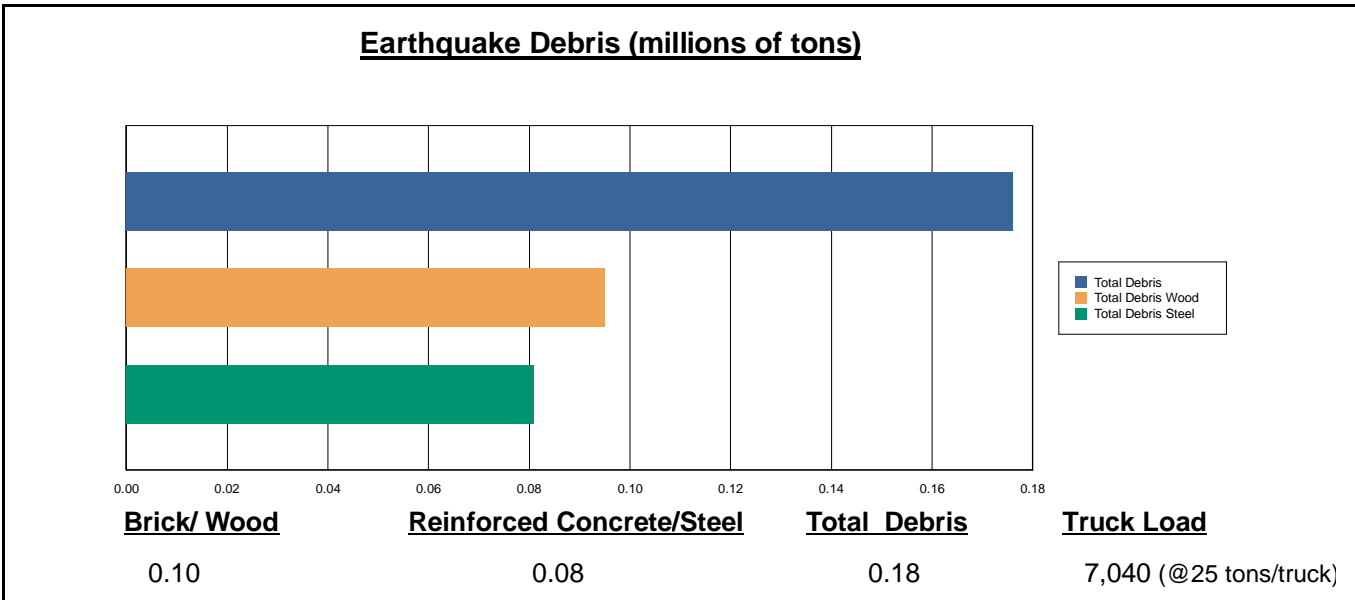
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

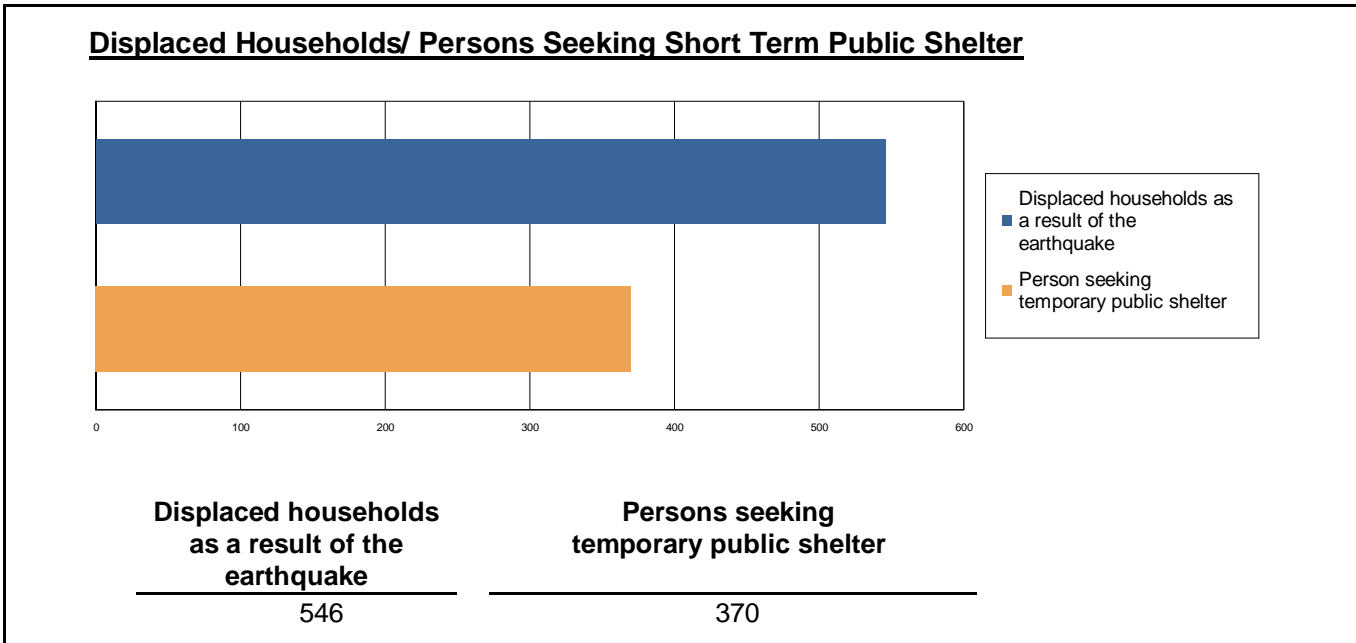
The model estimates that a total of 176,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 54.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 7,040 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 546 households to be displaced due to the earthquake. Of these, 370 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.82	0.37	0.05	0.09
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.63	0.33	0.04	0.08
	Other-Residential	71.05	13.41	1.46	2.83
	Single Family	73.00	14.06	1.72	3.36
	Total	148	28	3	6
2 PM	Commercial	111.93	22.95	2.83	5.49
	Commuting	0.01	0.01	0.02	0.00
	Educational	48.37	10.07	1.30	2.50
	Hotels	0.00	0.00	0.00	0.00
	Industrial	12.04	2.44	0.30	0.58
	Other-Residential	14.69	2.82	0.32	0.59
	Single Family	17.38	3.46	0.44	0.83
	Total	204	42	5	10
5 PM	Commercial	82.12	16.92	2.11	4.04
	Commuting	0.16	0.20	0.35	0.07
	Educational	10.37	2.13	0.27	0.52
	Hotels	0.00	0.00	0.00	0.00
	Industrial	7.52	1.53	0.19	0.36
	Other-Residential	27.29	5.29	0.61	1.13
	Single Family	29.02	5.79	0.74	1.39
	Total	156	32	4	8



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Economic Loss

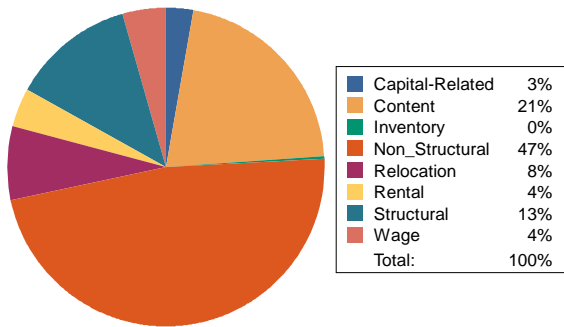
The total economic loss estimated for the earthquake is 2,096.85 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 707.12 (millions of dollars); 19 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 63 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type (\$ millions)



Earthquake Losses by Occupancy Type (\$ millions)

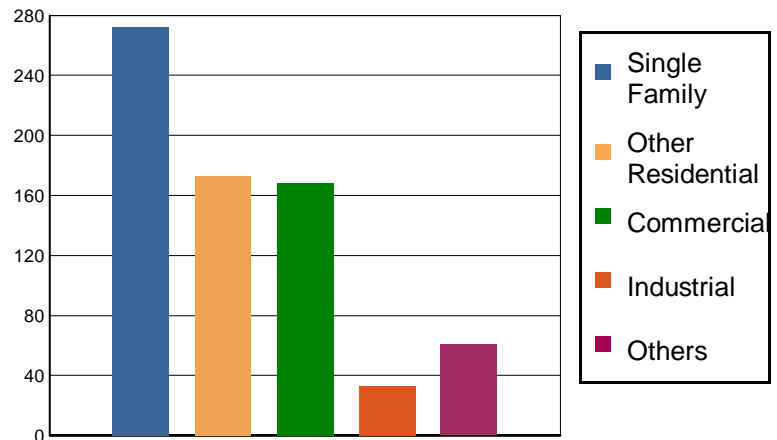


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	6.3936	19.9542	0.5172	4.4625	31.3275
	Capital-Related	0.0000	2.7112	15.9959	0.3620	0.3338	19.4029
	Rental	6.2390	10.6678	8.9282	0.2275	1.0912	27.1537
	Relocation	21.9722	9.0277	14.8066	1.4142	7.1115	54.3322
	Subtotal	28.2112	28.8003	59.6849	2.5209	12.9990	132.2163
Capital Stock Losses							
	Structural	32.8797	24.1749	19.2222	4.0467	8.1537	88.4772
	Non_Structural	147.8528	93.4181	55.2498	14.3919	23.7346	334.6472
	Content	63.3924	26.6122	33.1756	10.3174	15.6773	149.1749
	Inventory	0.0000	0.0000	0.8295	1.5771	0.1950	2.6016
	Subtotal	244.1249	144.2052	108.4771	30.3331	47.7606	574.9009
	Total	272.34	173.01	168.16	32.85	60.76	707.12

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	4233.9613	0.0000	0.00
	Bridges	809.7394	4.1847	0.52
	Tunnels	0.0000	0.0000	0.00
	Subtotal	5043.7007	4.1847	
Railways	Segments	429.1790	0.0000	0.00
	Bridges	540.5177	0.2197	0.04
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	969.6967	0.2197	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	13.5659	3.2740	24.13
	Subtotal	13.5659	3.2740	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	13.3963	1.8157	13.55
	Subtotal	13.3963	1.8157	
Airport	Facilities	29.2515	7.7864	26.62
	Runways	209.7442	0.0000	0.00
	Subtotal	238.9957	7.7864	
Total		6,279.36	17.28	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	264.5671	1.3496	0.51
	Subtotal	264.5671	1.3496	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	6668.5051	942.1522	14.13
	Distribution Line	158.7402	0.6780	0.43
	Subtotal	6827.2453	942.8302	
Natural Gas	Pipelines	205.8673	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	105.8268	0.2323	0.22
	Subtotal	311.6941	0.2323	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	2402.6543	427.7903	17.80
	Subtotal	2402.6543	427.7903	
Communication	Facilities	1.7700	0.2437	13.77
	Subtotal	1.7700	0.2437	
	Total	9,807.93	1,372.45	



FEMA

Appendix A: County Listing for the Region

St. Lawrence, NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York	St. Lawrence	111,944	9,077	2,546	11,624
Total Region		111,944	9,077	2,546	11,624



FEMA

RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: StlCo

Earthquake Scenario: AnnualizedLoss

Print Date: October 21, 2021

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data



FEMA

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,761.34 square miles and contains 28 census tracts. There are over 41 thousand households in the region which has a total population of 111,944 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 49 thousand buildings in the region with a total building replacement value (excluding contents) of 11,624 (millions of dollars). Approximately 93.00 % of the buildings (and 78.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 6,279 and 9,807 (millions of dollars) , respectively.



FEMA

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 49 thousand buildings in the region which have an aggregate total replacement value of 11,624 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 319 beds. There are 64 schools, 43 fire stations, 21 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 48 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 16,086.00 (millions of dollars). This inventory includes over 568.55 miles of highways, 315 bridges, 13,327.79 miles of pipes.

Table 1: Transportation System Lifeline Inventory

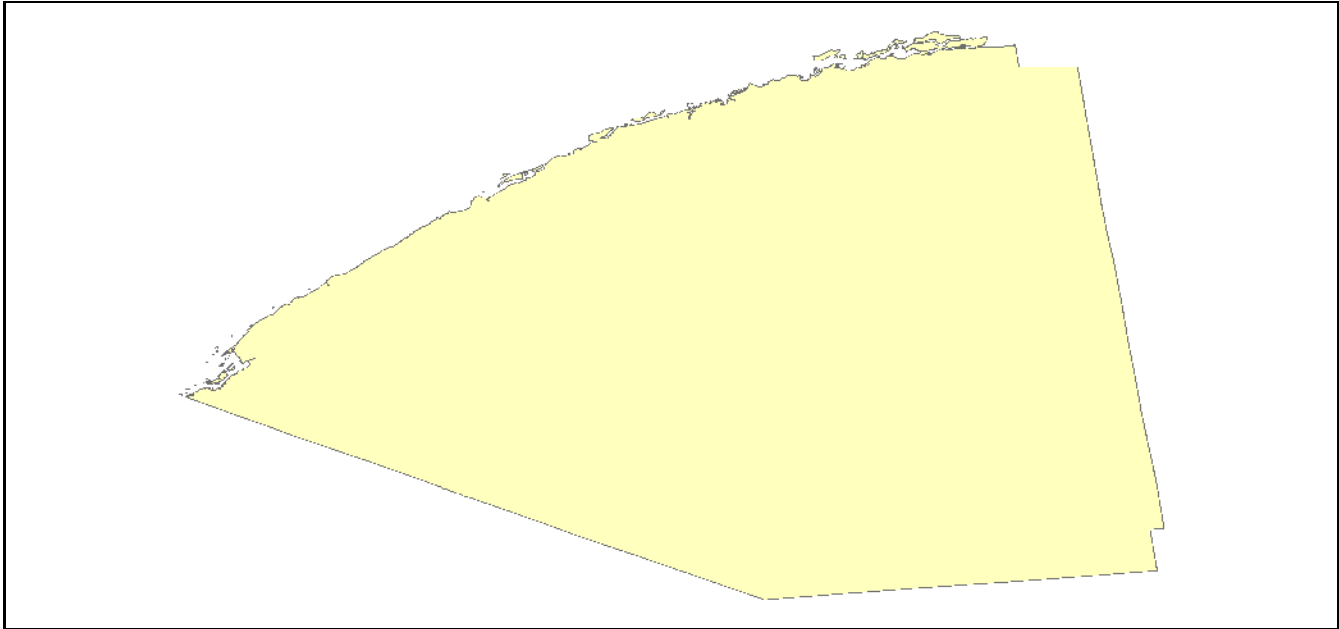
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	315	809.7394
	Segments	145	4233.9613
	Tunnels	0	0.0000
	Subtotal		5043.7007
Railways	Bridges	102	540.5177
	Facilities	0	0.0000
	Segments	160	429.1790
	Tunnels	0	0.0000
	Subtotal		969.6967
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
	Subtotal		0.0000
Bus	Facilities	8	13.5659
	Subtotal		13.5659
Ferry	Facilities	0	0.0000
	Subtotal		0.0000
Port	Facilities	4	13.3963
	Subtotal		13.3963
Airport	Facilities	4	29.2515
	Runways	5	209.7442
	Subtotal		238.9957
		Total	6,279.40

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	264.5671
	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		264.5671
Waste Water	Distribution Lines	NA	158.7402
	Facilities	44	6668.5051
	Pipelines	0	0.0000
	Subtotal		6827.2453
Natural Gas	Distribution Lines	NA	105.8268
	Facilities	0	0.0000
	Pipelines	371	205.8673
	Subtotal		311.6941
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		0.0000
Electrical Power	Facilities	9	2402.6543
	Subtotal		2402.6543
Communication	Facilities	15	1.7700
	Subtotal		1.7700
		Total	9,807.90

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	AnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 69 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

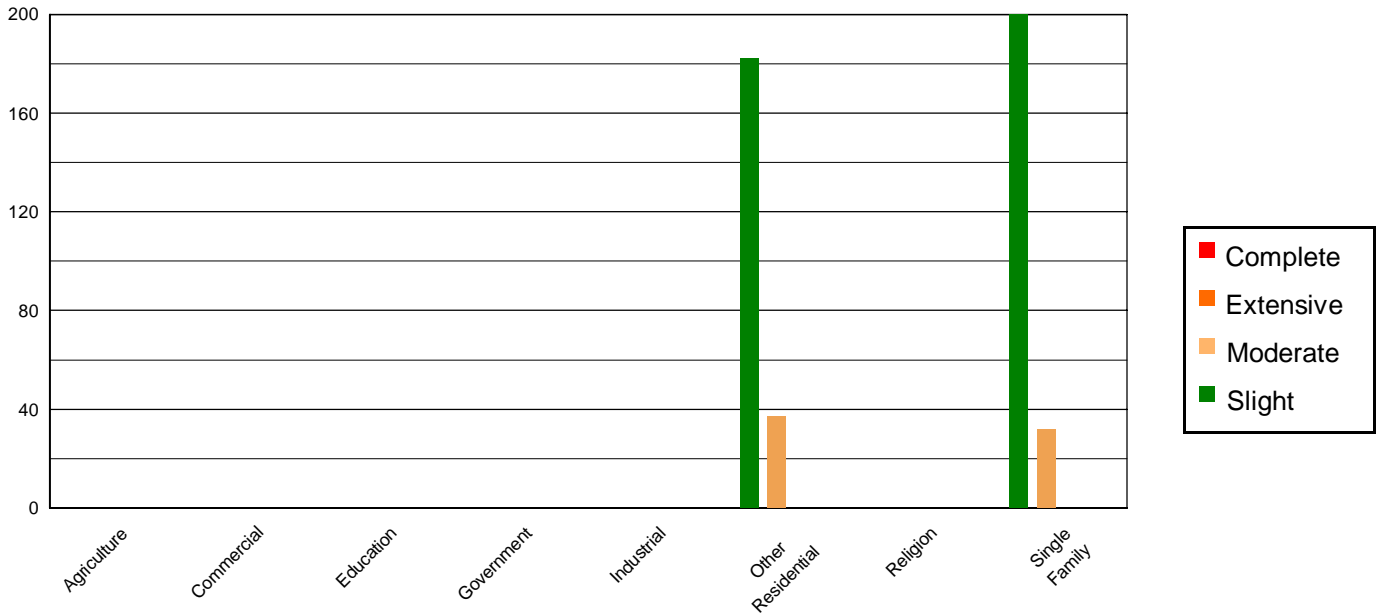


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	168.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1010.00	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	33.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	135.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Residential	8179.00	17.73	182.00	47.64	37.00	53.62	0.00	0.00	0.00	0.00
Religion	106.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single Family	36491.00	79.12	200.00	52.36	32.00	46.38	0.00	0.00	0.00	0.00
Total	46,122		382		69		0		0	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	33017.00	71.59	85.00	22.25	0.00	0.00	0.00	0.00	0.00	0.00
Steel	626.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete	414.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Precast	10.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RM	119.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
URM	5738.00	12.44	116.00	30.37	32.00	46.38	0.00	0.00	0.00	0.00
MH	6198.00	13.44	181.00	47.38	37.00	53.62	0.00	0.00	0.00	0.00
Total	46,122		382		69		0		0	

*Note:

RM Reinforced Masonry
 URM Unreinforced Masonry
 MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 319 hospital beds available for use. On the day of the earthquake, the model estimates that only 302 hospital beds (95.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 98.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	6	0	0	6
Schools	64	0	0	64
EOCs	1	0	0	1
PoliceStations	21	0	0	21
FireStations	43	0	0	43

Table 6: Expected Damage to the Transportation Systems

System	Component	Locations/ Segments	Number of Locations			
			With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	145	0	0	145	145
	Bridges	315	0	0	315	315
	Tunnels	0	0	0	0	0
Railways	Segments	160	0	0	160	160
	Bridges	102	0	0	102	102
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	8	0	0	8	8
Ferry	Facilities	0	0	0	0	0
Port	Facilities	4	0	0	4	4
Airport	Facilities	4	0	0	4	4
	Runways	5	0	0	5	5

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	44	0	0	44	44
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	9	0	0	9	9
Communication	15	0	0	15	15

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	8,220	3	1
Waste Water	4,932	2	0
Natural Gas	177	0	0
Oil	0	0	0

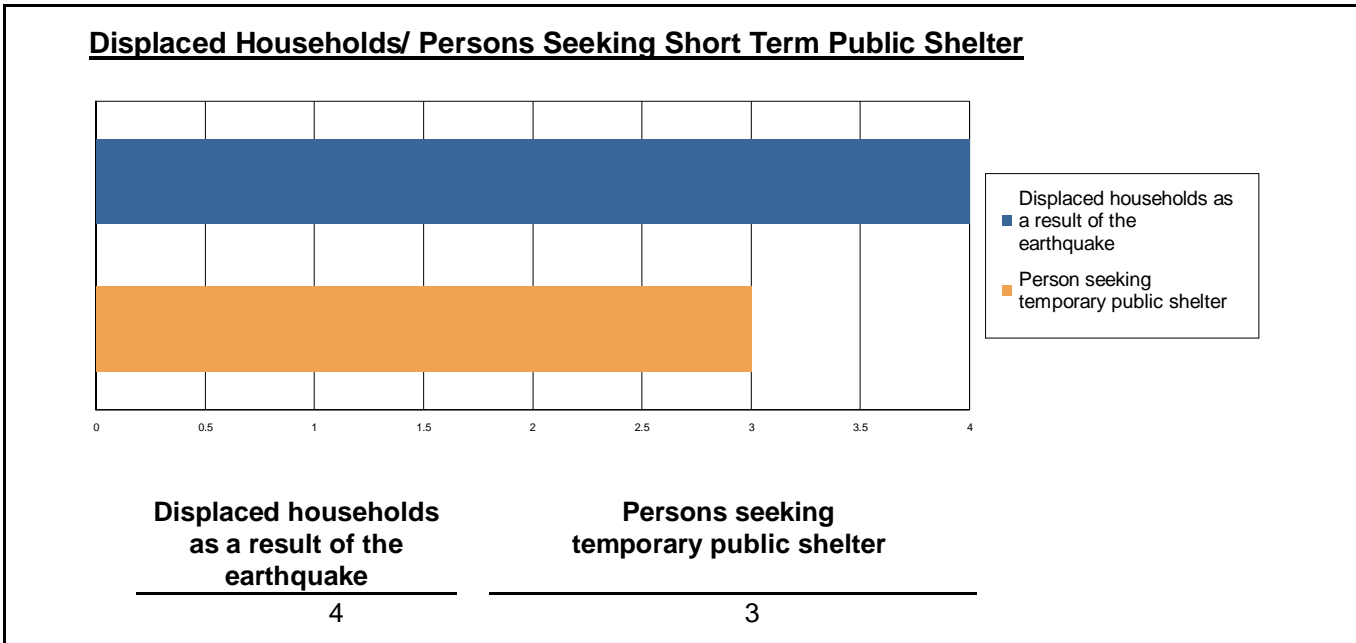
Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	41,605	0	0	0	0	0
Electric Power		0	0	0	0	0

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 4 households to be displaced due to the earthquake. Of these, 3 people (out of a total population of 111,944) will seek temporary shelter in public shelters.



Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.00	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.00	0.00	0.00	0.00
	Other-Residential	0.12	0.02	0.00	0.00
	Single Family	0.12	0.02	0.00	0.00
	Total	0	0	0	0
2 PM	Commercial	0.19	0.04	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.08	0.02	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.02	0.00	0.00	0.00
	Other-Residential	0.03	0.00	0.00	0.00
	Single Family	0.03	0.01	0.00	0.00
	Total	0	0	0	0
5 PM	Commercial	0.14	0.03	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.02	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.01	0.00	0.00	0.00
	Other-Residential	0.05	0.01	0.00	0.00
	Single Family	0.05	0.01	0.00	0.00
	Total	0	0	0	0



FEMA

Economic Loss

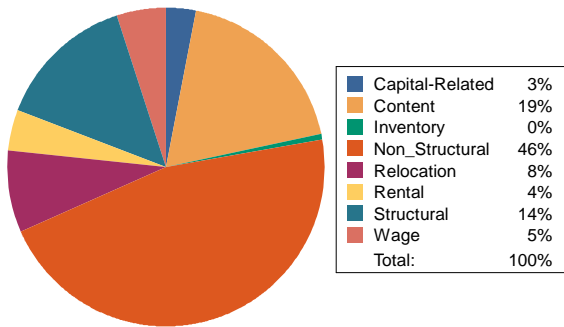
The total economic loss estimated for the earthquake is 7.93 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1.09 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 61 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type (\$ millions)



Earthquake Losses by Occupancy Type (\$ millions)

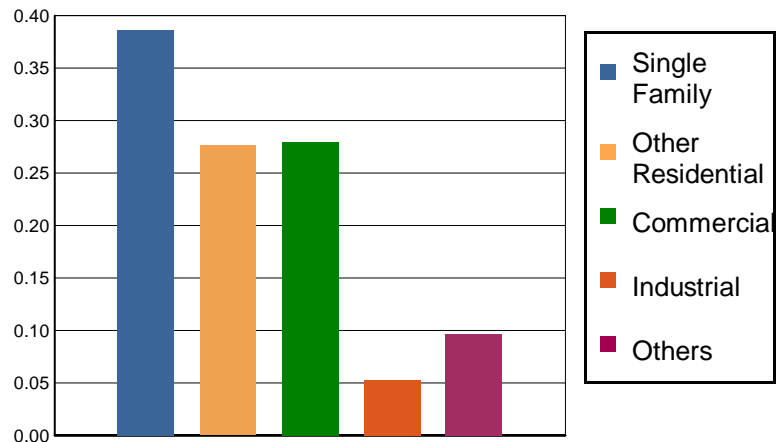


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0105	0.0351	0.0008	0.0083	0.0547
	Capital-Related	0.0000	0.0044	0.0280	0.0006	0.0005	0.0335
	Rental	0.0100	0.0185	0.0163	0.0003	0.0018	0.0469
	Relocation	0.0350	0.0164	0.0260	0.0024	0.0121	0.0919
	Subtotal	0.0450	0.0498	0.1054	0.0041	0.0227	0.2270
Capital Stock Losses							
	Structural	0.0547	0.0435	0.0339	0.0071	0.0142	0.1534
	Non_Structural	0.2080	0.1457	0.0895	0.0232	0.0374	0.5038
	Content	0.0788	0.0369	0.0498	0.0158	0.0226	0.2039
	Inventory	0.0000	0.0000	0.0012	0.0024	0.0002	0.0038
	Subtotal	0.3415	0.2261	0.1744	0.0485	0.0744	0.8649
	Total	0.39	0.28	0.28	0.05	0.10	1.09

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	4233.9613	0.0000	0.00
	Bridges	809.7394	0.0006	0.00
	Tunnels	0.0000	0.0000	0.00
	Subtotal	5043.7007	0.0006	
Railways	Segments	429.1790	0.0000	0.00
	Bridges	540.5177	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	969.6967	0.0000	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Bus	Facilities	13.5659	0.1064	0.78
	Subtotal	13.5659	0.1064	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Port	Facilities	13.3963	0.0441	0.33
	Subtotal	13.3963	0.0441	
Airport	Facilities	29.2515	0.3205	1.10
	Runways	209.7442	0.0000	0.00
	Subtotal	238.9957	0.3205	
Total		6,279.36	0.47	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	264.5671	0.0155	0.01
	Subtotal	264.5671	0.0155	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	6668.5051	3.8586	0.06
	Distribution Line	158.7402	0.0078	0.00
	Subtotal	6827.2453	3.8664	
Natural Gas	Pipelines	205.8673	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Line	105.8268	0.0027	0.00
	Subtotal	311.6941	0.0027	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	2402.6543	2.4787	0.10
	Subtotal	2402.6543	2.4787	
Communication	Facilities	1.7700	0.0009	0.05
	Subtotal	1.7700	0.0009	
	Total	9,807.93	6.36	



FEMA

Appendix A: County Listing for the Region

St. Lawrence, NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York	St. Lawrence	111,944	9,077	2,546	11,624
Total Region		111,944	9,077	2,546	11,624

Appendix H

Recent Hazard Documentation

St. Lawrence County Soil & Water Conservation District
Right-of-Way Ash and Hazard Tree Assessment Report

St. Lawrence County Right-of-Way Ash and Hazard Tree Assessment Project

Project Description

The purpose of the ash and hazard tree inventory along St. Lawrence County road right-of-way's (ROW's) is to create a database of ash trees that will become a hazard to public safety and a liability to municipalities after the inevitable infestation of the emerald ash borer. All species of ash trees are susceptible to EAB with a 99.8% mortality rate. Once ash trees are infested, they become extremely hazardous very quickly, losing 80% of their structural integrity within 3-5 years. Infested ash trees are also susceptible to catastrophic failure or "Ash Snap" in which the entire tree has the potential to snap off at the base and collapse. Because of this, it is important to take a prioritized, preemptive approach in removing ash trees before they become too dangerous to do so. The inventory will help facilitate realistic management of EAB by prioritizing removals, identifying trees to potentially treat, and budgeting requirements for either treatment or removal.

The roadside inventory took place in the summer months of June-August 2019 to allow for proper tree health assessment and hazard level allocation. The inventory was completed by personnel with dendrology or equivalent tree identification training and hazard tree assessment experience. Data was collected by visual inspection and ocular estimations to the nearest 2-inch DBH (Diameter at breast height) Class and recorded on a laptop using QGIS software and a BU-353S4 USB powered GPS.

Project Goal

Preemptively mitigate impacts of the Emerald Ash Borer for public safety and accessibility along 574 miles of County Routes in St. Lawrence County. Inventory ash trees and hazard trees that occur along county right-of-way's and/or are within striking distance of roadways to create a database of future and current hazardous trees. From the information collected, develop a response plan based on hazard assessments, future budget requirements, prioritized scheduled removals, treatment, etc.

Data was collected on all ash trees and dead/dying trees within county right of ways (ROW's) and within striking distance of county routes. Data was generated for individual trees under the parameters of:

Single Tree Data Collection (Point Shapefile)

Data Collected:

- **Location**
(Latitude, longitude in decimal degrees)
- **Species** (only fill in if something other than ash species, otherwise leave blank `NULL`)
- **DBH** (ocular estimation from vehicle to the nearest 2-inch diameter class)

- **Hazard Rating** (8 points)
Failure potential: (*low-1, medium-2, high-3, severe-4*) a healthy ash tree within striking distance would receive a medium (2) failure potential rating

Size of tree (DBH): (*<6''-1, 6-18''-2, 18-30''-3, >30''-4*)
- **Is the tree near powerlines?**
(*yes-1, no-leave blank `NULL`*)
- **Is the tree near a house?**
(*yes-1, no- leave blank `NULL`*)
- **Hazard Level** (Total points)
(*out of 10 possible points = hazard rating/need for removal*)
- **Comments**
e.g. (dead, 50% dieback, lean, uprooted, etc.)

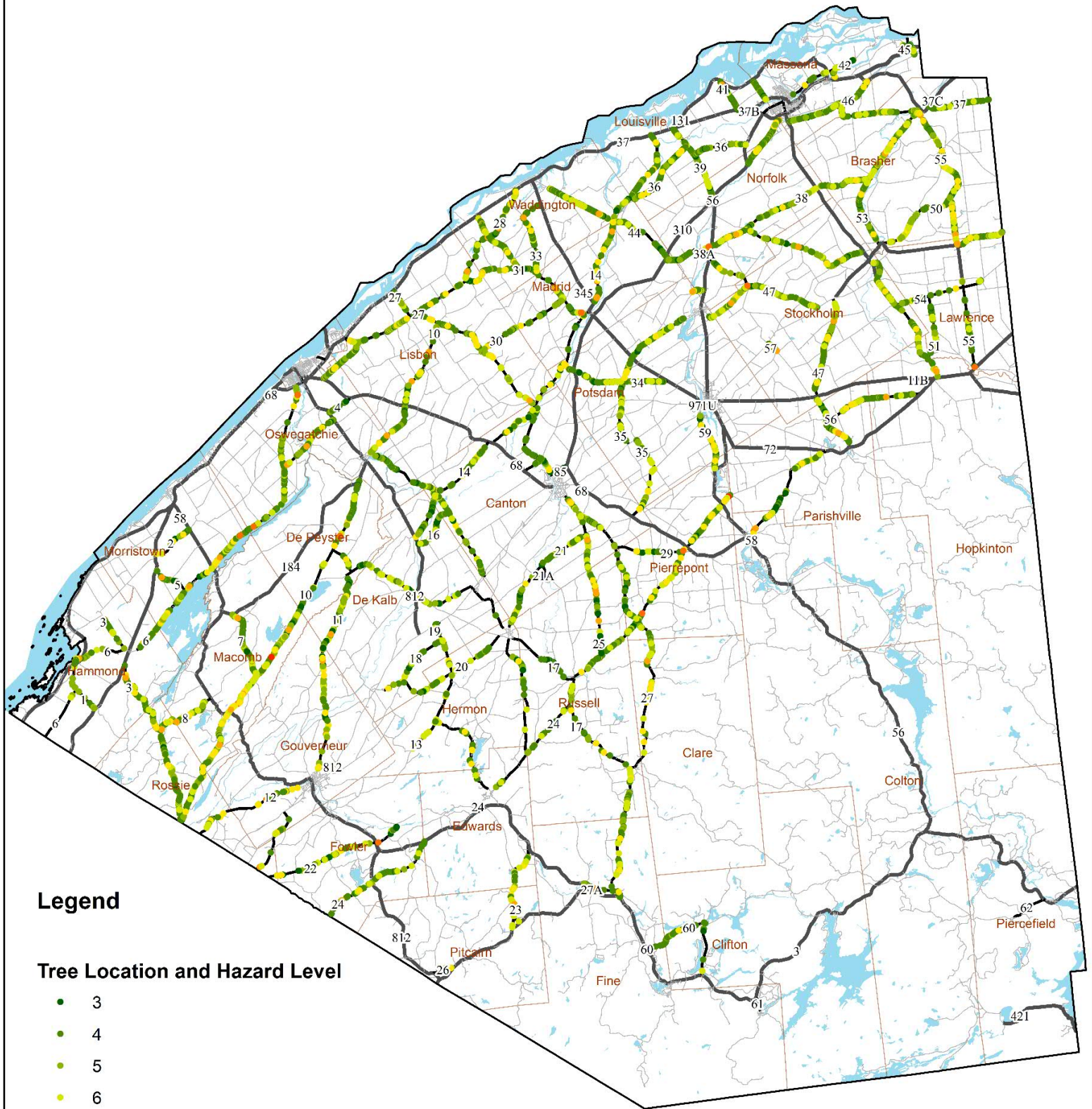
Project Results

A total of **14,630 trees** were found to be ash and/or hazard trees on 571 miles of county routes within St. Lawrence County. These are trees that will be a hazard after becoming infested or are currently a hazard due to dead or dying status. These trees occur on an average of **25.6 trees per mile**, covering approx. 1,950 square miles of land mass in St. Lawrence County. Removal of these trees would be an estimated **\$9,374.13 per mile**. The project inventoried 571 miles of 3,120 total miles of roadways in St. Lawrence County. This is a 18.3% sample with a 99% confidence interval and a 4.87% margin of error. The inventory took 229 hours to complete with a total of 2,217 miles traveled, averaging **2.5 hours per mile** inventoried.

Ash Trees occurred at a rate of 20.7 trees per mile totaling 11,856 trees, while hazard trees occurred at a rate of 5.5 trees per mile, with a total of 3,144 trees either dead or dying. From an ecological perspective, the 11,856 ash trees would supply an estimated 1.9 million sq. ft of phloem area for EAB and could produce 18.5 million adult beetles.

Additional information and breakdowns of inventoried trees are as follows:

St. Lawrence County Right of Way Ash and Hazard Tree Inventory



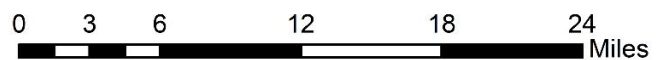
Legend

Tree Location and Hazard Level

- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

Map by: SLC SWCD 8/14/2019

1 inch = 8 miles



Number of Dead/Dying Trees: **3,144**

Number of Trees Per Hazard Level

Hazard Level	Number of trees
10	3
9	28
8	141
7	565
6	1,645
5	2,339
4	9,237
3	672

Number of Trees Near Powerlines and Buildings

Powerlines	Building/House
1,004	529

Number of Dead, Dying, Damaged Trees

Dead 50% dieback

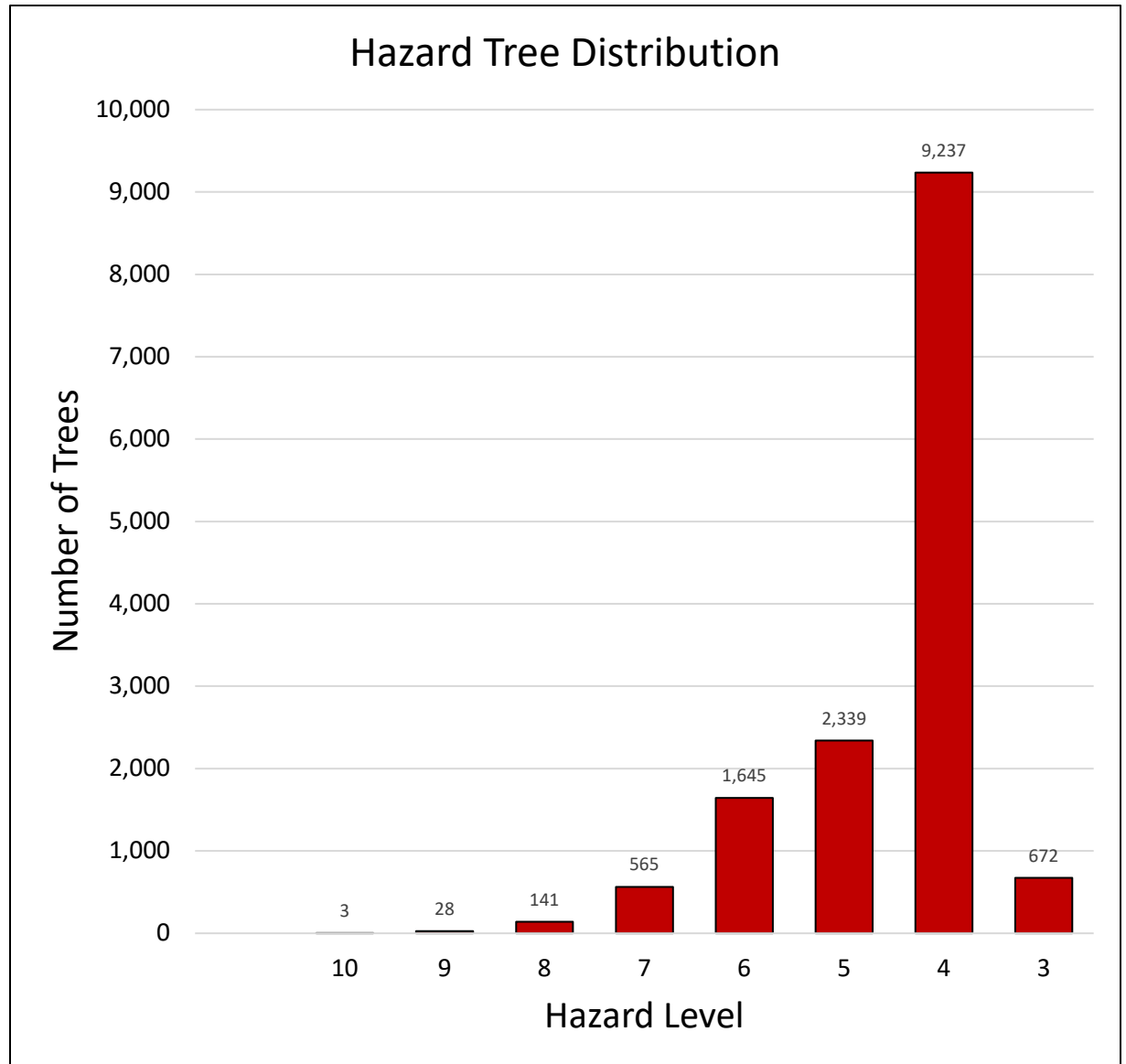
2,952 182

Infested Uprooted

6 2

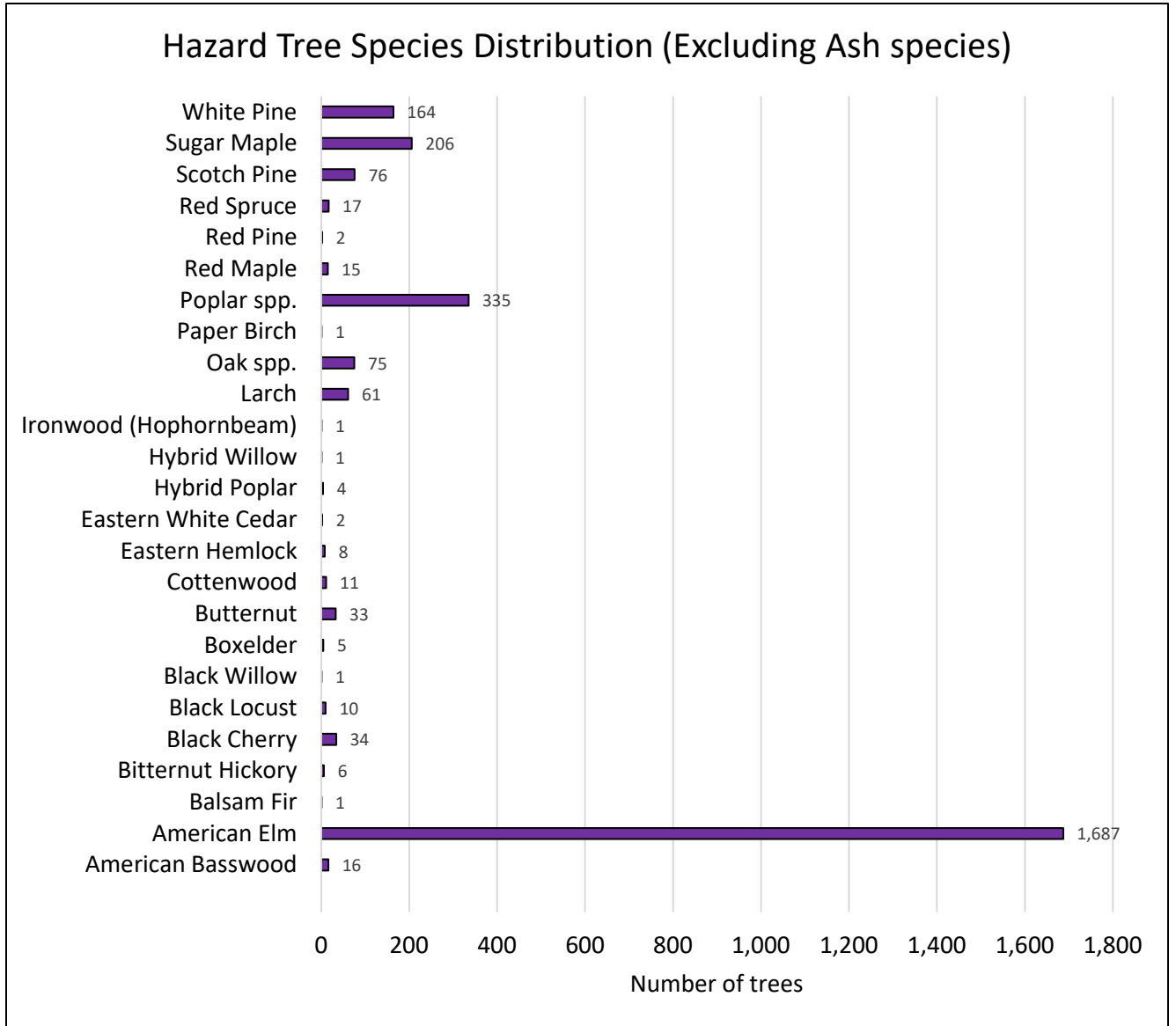
Struck by Lighting

2



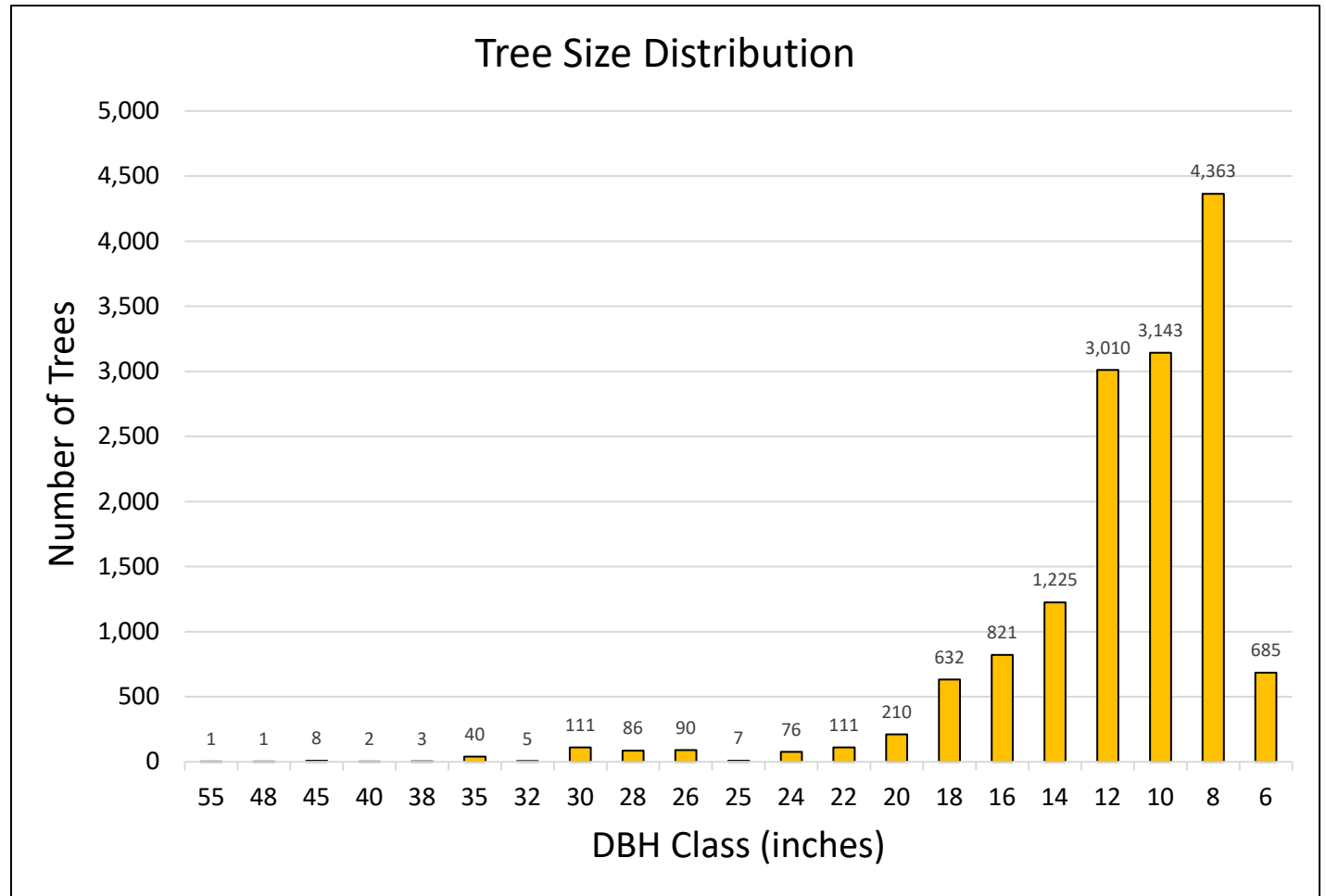
Species Distribution

Tree Species	Number of Trees
American Basswood	16
American Elm	1,687
Balsam Fir	1
Bitternut Hickory	6
Black Cherry	34
Black Locust	10
Black Willow	1
Boxelder	5
Butternut	33
Cottonwood	11
Eastern Hemlock	8
Eastern White Cedar	2
Hybrid Poplar	4
Hybrid Willow	1
Ironwood (Hophornbeam)	1
Larch	61
Oak spp.	75
Paper Birch	1
Poplar spp.	335
Red Maple	15
Red Pine	2
Red Spruce	17
Scotch Pine	76
Sugar Maple	206
White Pine	164
Total:	2,772
Total Ash spp.	11,856



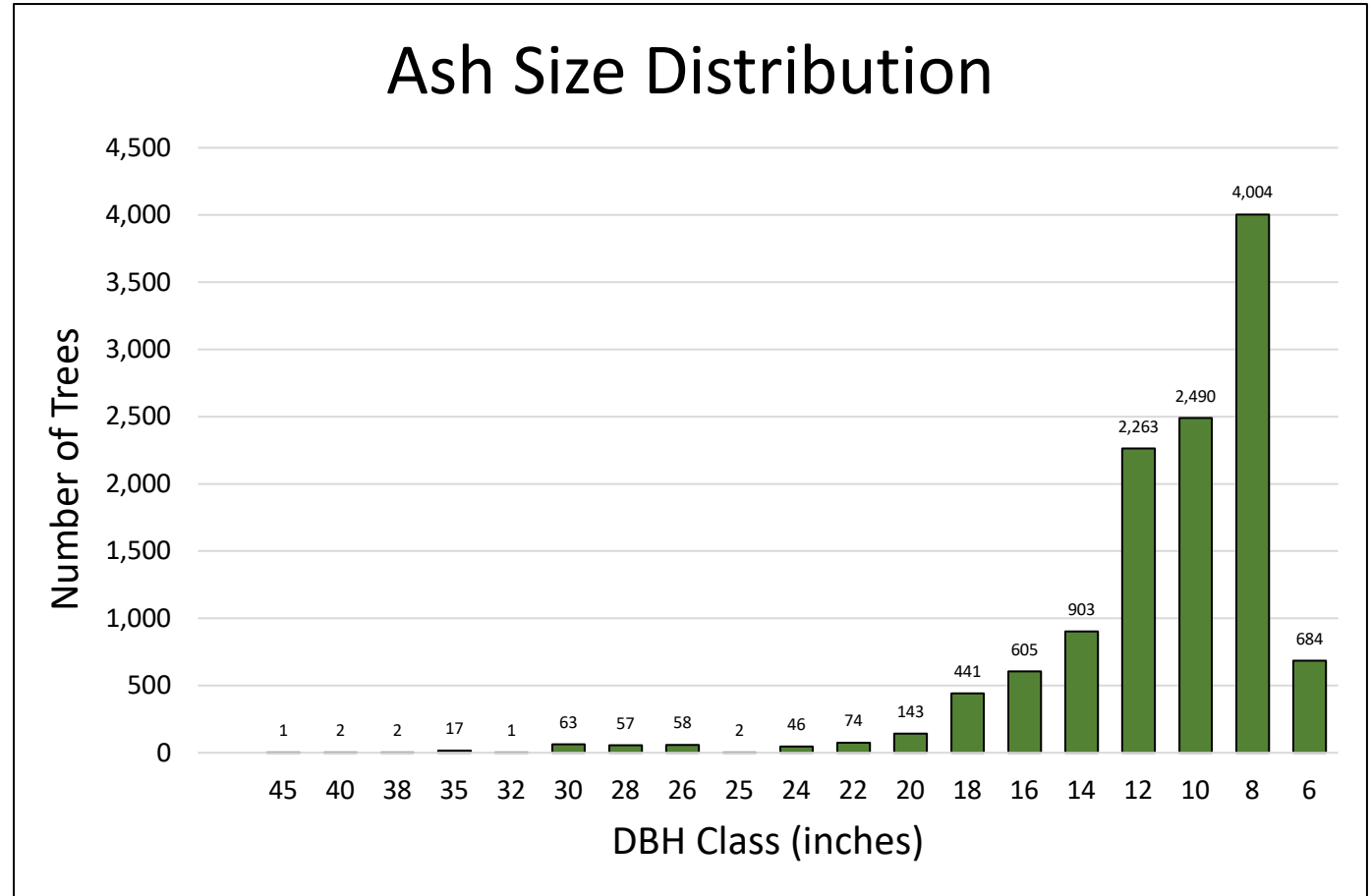
Average DBH: **11.4**

Number of Trees Per DBH Class	
DBH Class	Number of Trees
55	1
48	1
45	8
40	2
38	3
35	40
32	5
30	111
28	86
26	90
25	7
24	76
22	111
20	210
18	632
16	821
14	1,225
12	3,010
10	3,143
8	4,363
6	685



Total Number of Ash: **11,856**

Number of Trees Per DBH Class	
DBH Class	Number of Trees
45	1
40	2
38	2
35	17
32	1
30	63
28	57
26	58
25	2
24	46
22	74
20	143
18	441
16	605
14	903
12	2,263
10	2,490
8	4,004
6	684



*Ash species account for over 80% of all trees surveyed

Number of Trees Per DBH Class		Arbor Pro Estimate Estimated Removal Cost:	Urban Tree Alliance Estimate Estimated Removal Cost:
DBH Class	Number of Trees		
55	1	\$1,850.00	\$4,964.00
48	1	\$1,850.00	\$4,025.00
45	8	\$14,800.00	\$29,152.00
40	2	\$2,940.00	\$6,080.00
38	3	\$4,410.00	\$8,427.00
35	40	\$45,600.00	\$99,000.00
32	5	\$5,700.00	\$10,780.00
30	111	\$93,795.00	\$216,672.00
28	86	\$72,670.00	\$150,930.00
26	90	\$76,050.00	\$140,940.00
25	7	\$5,915.00	\$10,318.00
24	76	\$39,900.00	\$105,184.00
22	111	\$58,275.00	\$134,310.00
20	210	\$110,250.00	\$219,450.00
18	632	\$224,360.00	\$561,848.00
16	821	\$291,455.00	\$608,361.00
14	1,225	\$434,875.00	\$738,675.00
12	3,010	\$662,200.00	\$1,432,760.00
10	3,143	\$691,460.00	\$1,128,337.00
8	4,363	\$959,860.00	\$1,112,565.00
6	685	\$71,925.00	\$112,340.00
		\$3,870,140.00	\$6,835,118.00

Average Total Removal Cost:

\$5,352,629.00

Known Locations of EAB in St. Lawrence County



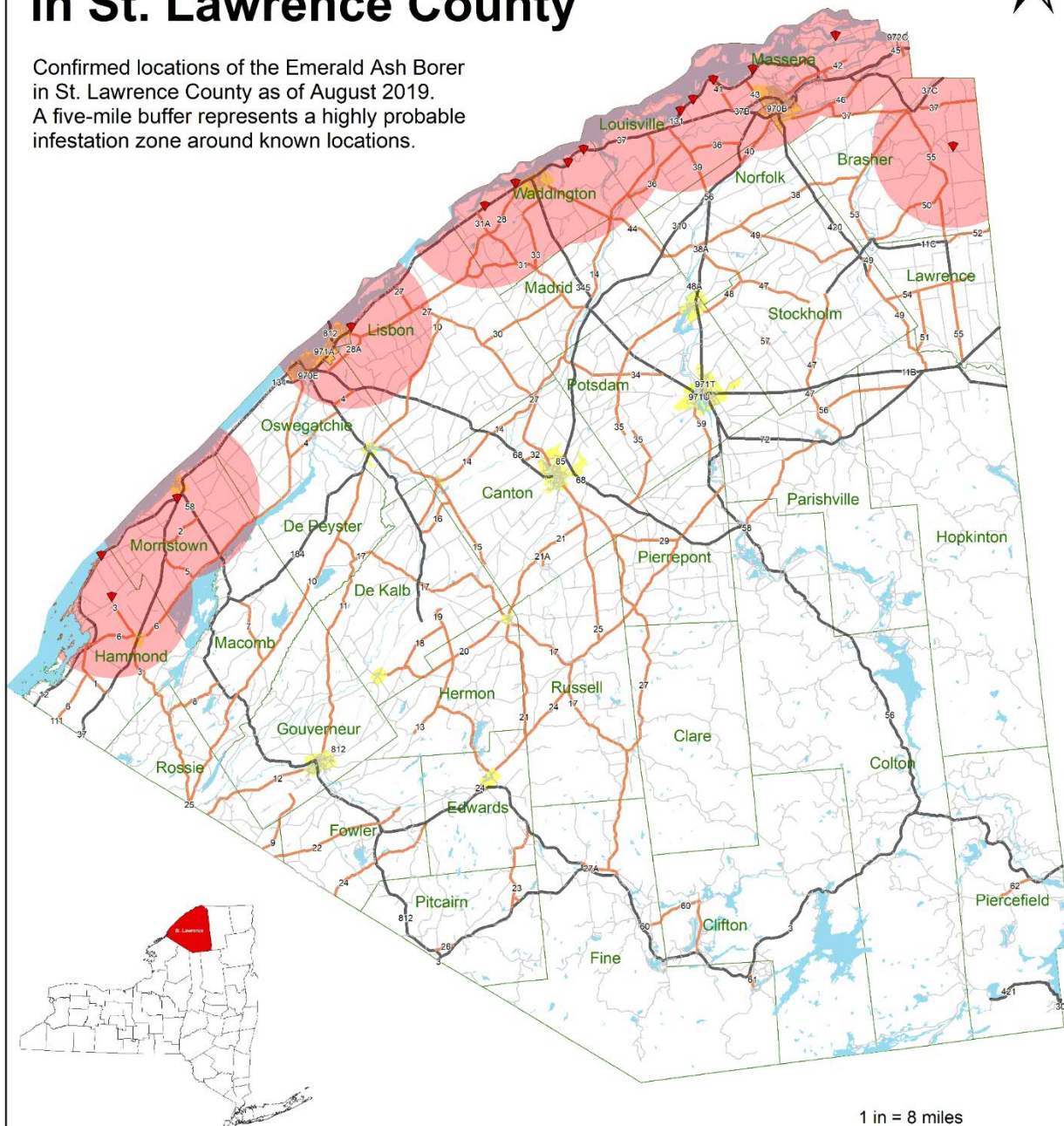
Prioritizing Actions/Removals

In order to prioritize removals and attempt to stay ahead of EAB, removals would need to be focused around known EAB infestations.

EAB can naturally spread anywhere from ½ mile to 3 miles per year depending on Ash density, EAB population size, topography, etc. Ash trees die within 3-5 years after infestation depending on EAB population density, tree vigor, site conditions, etc.

Because removing trees before they become infested is the safest option, trees would need to be removed 2 miles away from known EAB infestations to account for the annual spread of EAB and tree mortality.

Confirmed locations of the Emerald Ash Borer in St. Lawrence County as of August 2019. A five-mile buffer represents a highly probable infestation zone around known locations.

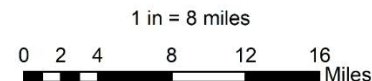


Legend

- ▼ EAB
- Local Roads
- County Route
- EAB Locations
- Villages
- State Highway



Map by: St. Lawrence County Soil and Water Conservation District
 Data source: iMap Invasives
www.imapinvasives.org/



The data provided on this map is for informational and planning purposes only. All information on this map is subject to such variations and corrections as might result from a complete title search and/or accurate field survey.

Priority Removals (2 Mile Buffer/Year)



Year	Number of Trees	Removal Cost
Year 1 (2020)	1,914	\$726,371.00
Year 2 (2021)	2,720	\$1,039,648.00
Year 3 (2022)	1,893	\$702,625.00

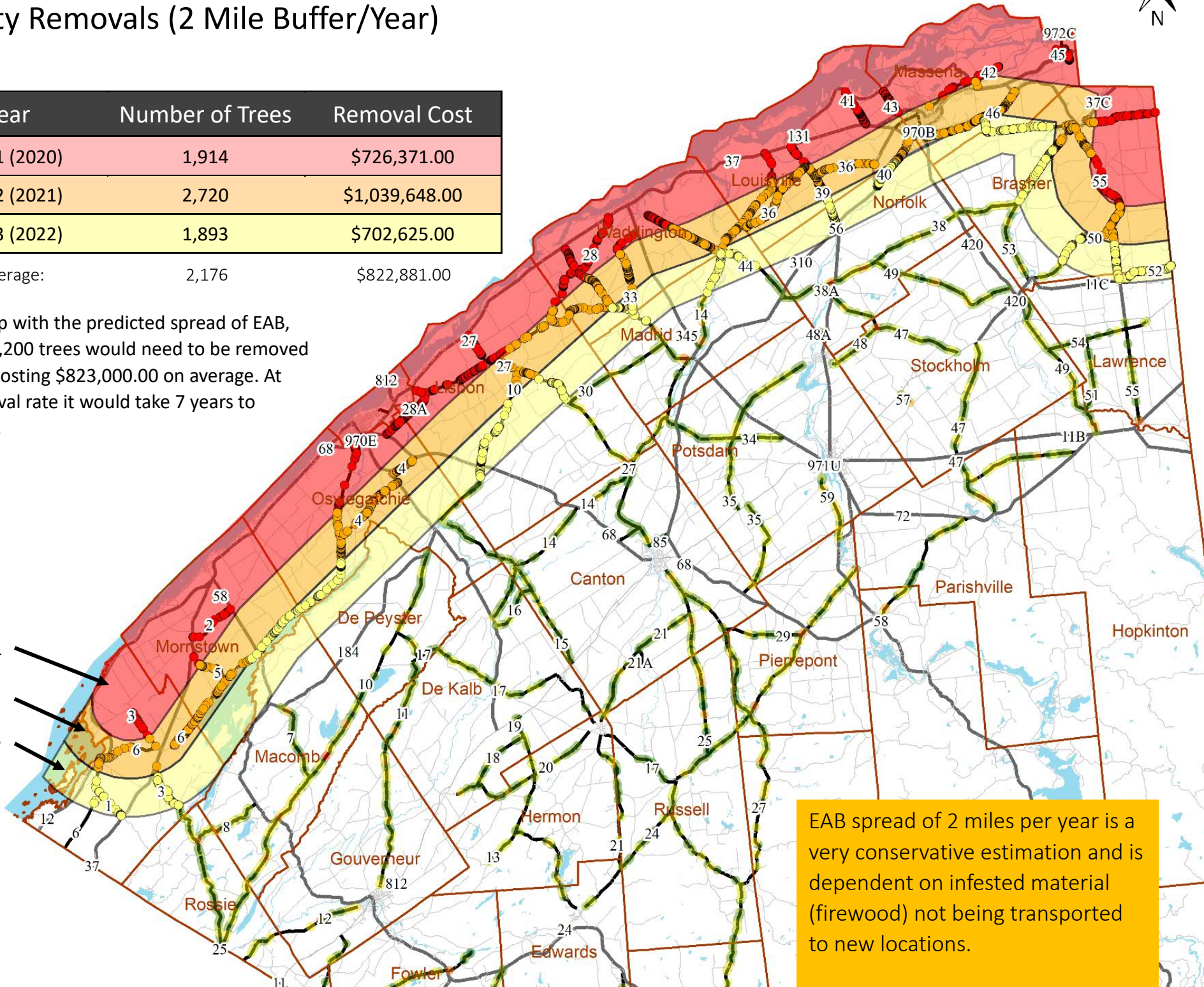
Average: 2,176 trees, \$822,881.00

To keep up with the predicted spread of EAB, Approx. 2,200 trees would need to be removed per year costing \$823,000.00 on average. At this removal rate it would take 7 years to complete.

Year 1
Year 2
Year 3

Legend

- Year 3
- Year 2
- Year 1



EAB spread of 2 miles per year is a very conservative estimation and is dependent on infested material (firewood) not being transported to new locations.

Black Lake Eurasian Watermilfoil Management Plan



Black Lake Eurasian Watermilfoil Management Plan



Photo courtesy of Black Lake Chamber of Commerce

Prepared for:

**Black Lake Invasive Weeds Committee
Hammond, NY**

Prepared by:

**Quantitative Environmental Analysis, LLC
Liverpool, NY**

July 14, 2008

Black Lake Eurasian Watermilfoil Management Plan

Prepared for:

**Black Lake Invasive Weeds Committee
Hammond, NY**

Prepared by:

**Quantitative Environmental Analysis, LLC
Liverpool, NY**

Job Number:

BLKmil:130

July 14, 2008

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Appendix A. Selected Eurasian Watermilfoil Experience in New York State.

EXECUTIVE SUMMARY

This Black Lake aquatic nuisance species management plan was developed by Quantitative Environmental Analysis, LLC (QEA) of Liverpool, NY on behalf of the Black Lake Invasive Weed Committee. This management plan focuses on the methods of eradicating Eurasian watermilfoil from Black Lake and returning its designated uses of swimming, boating, and fishing to levels experienced prior to the invasion of this exotic plant species. This management plan has been developed in accordance with New York State Department of Environmental Conservation (NYSDEC) protocols described in the *Primer on Aquatic Plant Management in New York State* (NYSDEC 2005).

Black Lake is a 7,761 acre lake located in the Towns of Hammond, Morristown, Oswegatchie, Macomb, Rossie, and DePeyster in the St. Lawrence River region of New York State. Seasonal camps and 27 tourist cottage, cabin, and campground businesses occupy the lake shoreline, and its waters are used heavily for recreational fishing, boating, and swimming. Tourism generated approximately \$7 million in the Black Lake area in 2005. However, the recreational quality of the lake has declined in recent years due to increasing areal distribution and density of macrophyte species, specifically Eurasian watermilfoil (*Myriophyllum spicatum*). This species quickly grows to the water surface early in the growing season, forming a canopy that shades out beneficial native species. Declining recreational quality in the lake has begun negatively impacted tourism in the area.

Removal of Eurasian watermilfoil from the lake will take a concerted multi-year effort and will affect large areas of the lake due to its current widespread distribution. To effectively remove the species from Black Lake, while maintaining native aquatic macrophyte habitat for fish, an integrated treatment approach is required, employing three methods: hand harvesting, suction harvesting, and benthic barriers. These removal efforts should be prioritized to achieve the most benefit for the fisheries and for the recreational use of the lake. Cost for total removal of all Eurasian watermilfoil in Black Lake is estimated at \$20 to \$30 million. Finally, monitoring of aquatic macrophytes (density and distribution) and the fisheries should be conducted to assess the efficacy and utility of the management program.

SECTION 1 INTRODUCTION

This Black Lake aquatic nuisance species management plan was developed by Quantitative Environmental Analysis, LLC (QEA) of Liverpool, NY on behalf of the Black Lake Invasive Weed Committee. This management plan focuses on the methods of eradicating Eurasian watermilfoil from Black Lake and returning its designated uses of swimming, boating, and fishing to levels experienced prior to the invasion of this exotic plant species. This management plan has been developed in accordance with New York State Department of Environmental Conservation (NYSDEC) protocols described in the *Primer on Aquatic Plant Management in New York State* (NYSDEC 2005).

1.1 BACKGROUND

Black Lake is a 7,761 acre lake located in the Towns of Hammond, Morristown, Oswegatchie, Macomb, Rossie, and DePeyster in the St. Lawrence River region of New York State (Figure 1-1). The lake is 19.5 miles long, 2.7 miles wide at its widest point, and has an average depth of 8 feet (NYSDEC 2008a). The lake is classified by the NYSDEC as a Class B waters suitable for primary and secondary contact recreation, fishing, and fish propagation. The lake is a linear, fluvial system with many shallow bays and islands at its southern end. Black Lake is fed primarily by the Indian River, in addition to several creeks, at its southwestern end. The outlet of the lake, located at its northeastern terminus, discharges into the Oswegatchie River. Twenty-seven tourist cottage and campground operations and many private camps occupy the lake shoreline, and its waters are used heavily for recreational fishing, boating, and swimming. Tourism revenues generated by Black Lake businesses were estimated at approximately \$7 million by the Black Lake Association in 2005 (Dashnaw 2008a).

While Black Lake remains a prime, natural, sport fishery, the recreational quality of the lake has declined in recent years due to the increasing areal distribution and density of macrophyte species, specifically Eurasian watermilfoil (*Myriophyllum spicatum*). Moreover, the recent invasion of zebra mussels (*Dreissena polymorpha*; NYSDEC 2007) has exacerbated the

macrophyte problem in Black Lake. Zebra mussels filter phytoplankton and other waterborne particulates resulting in higher water clarity and increased light penetration which allows macrophytes to grow at greater water depths than they would in the absence of zebra mussels.

1.2 HISTORY OF INVASIVE PLANT GROWTH

Eurasian watermilfoil is the only invasive aquatic plant species currently identified in Black Lake. This species was identified in the lake during plant surveys completed as part of the Citizens Statewide Lake Assessment Program (CSLAP) in 1990 and 1991, which was the last time plant surveys were performed in the lake (NYSDEC 2007). The qualitative weed growth and recreational assessments for Black Lake in 2006, performed as part of the CSLAP program, were the least favorable since the mid-1990s (NYSDEC 2007). These metrics assess the density of aquatic macrophytes and the recreational quality of the lake, respectively. Currently, Eurasian watermilfoil occupies approximately 3,235 acres in the lake (Dashnaw 2008b); either in combination with other species or as a monoculture. Preliminary distribution and percent cover information are displayed in Figures 1-2a and 1-2b. Of the 3,235 acres of Eurasian watermilfoil beds in the lake, 1,864 acres are identified as having 60% cover by this species and 1,371 acres are identified as having 90 to 100% cover.

Eurasian watermilfoil is a submersed aquatic macrophyte with a well developed root system and finely dissected leaves (Figure 1-3). This species, native to Europe, Asia, and northern Africa, was introduced to North America possibly as early as 1885, but perhaps as late as the 1940s. Since its introduction, this species has spread across much of the continent, growing to nuisance proportions in many of the lakes where it has become established and is most abundant in eutrophic water bodies (Madsen et al. 1991). Eurasian watermilfoil is essentially evergreen with a large number of overwintering stems. This large overwintering biomass allows the species to reach the water surface before other macrophytes. Once shoots reach the surface they branch profusely to form a dense canopy, shading the area below. Eurasian watermilfoil grows across wide ranges of depth (1 to 10 m) and water clarity. In turbid waters, the species is limited to shallow areas where it survives by photosynthesizing in its surface canopy. This species reproduces almost exclusively by vegetative propagation in North

America both by stem fragmentation and stolon (horizontal stem) formation. Eurasian watermilfoil is spread between lakes largely by transport of fragments on recreational boats (Smith and Barko 1990).

1.3 IMPAIRED LAKE USES

Primary and secondary contact recreation within Black Lake has been inhibited by the presence of dense beds of Eurasian watermilfoil. During periods of high aquatic vegetation density, recreational uses, including boating, swimming, and fishing have been impeded (NYSDEC 2007). Activity at camps and businesses surrounding the lake was reportedly reduced by 25% in 2007 due to the high density of aquatic vegetation, which made it difficult or impossible to boat or fish in some areas of the lake (St. Lawrence County Fisheries Advisory Board 2007). Reduced recreational quality is a great concern to the surrounding communities because of the large tourism revenue (approximately \$7 million in 2005) generated by users of the Lake (Dashnaw 2008a). Fewer visits to Black Lake mean less money flowing into the North Country economy.

The effects of Eurasian watermilfoil on the plant and fish communities of Black Lake are mixed. While Black Lake continues to support a diverse fish community (VanMaaren 2008), the expansion of Eurasian watermilfoil in Black Lake has the potential to displace more beneficial native plant species. Eurasian watermilfoil would not be expected to have a significant negative impact on the fish community unless its arrival caused a significant change in total plant biomass or covered gravel spawning beds used by salmonid and centrarchid species (Smith and Barko 1990); this does not appear to be the case in Black Lake. However, the expansion of Eurasian watermilfoil in Black Lake has the potential to displace more beneficial native plant species. Specifically, the plastic growth form and high overwintering biomass of Eurasian watermilfoil allows it to overtop and shade out other aquatic species in a wide range of depths and water clarity (Smith and Barko 1990; Madsen et al. 1991).

1.4 EVALUATION OF ENDANGERED, THREATENED, SPECIES OF CONCERN

There are two state threatened fish species known to populate Black Lake: lake sturgeon (*Acipenser fulvescens*) and mooneye (*Hiodon tergisus*). Lake sturgeon is classified as threatened by the American Fisheries Society in all of the states where they occur (NYSDEC 2008b). There is a remnant population of lake sturgeon in Black Lake and the Oswegatchie River. Moreover, NYSDEC stocked juveniles from hatcheries in the system in 2000. There currently is no evidence that lake sturgeon reproduce in Black Lake, although adults are observed occasionally and the stocked juveniles are observed annually. Some of the juveniles released in 2000 had grown to 40 inches in length by 2003 (Zollweg et al. 2003).

Mooneye has been recorded from Black Lake in limited numbers. This species is on the decline statewide, possibly due to competition from introduced species (NYSDEC 2008c).

1.5 FISHERIES

Black Lake has been a popular sport fishing location for many years. Numerous game species are found in Black Lake including largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), walleye (*Sander vitreus*), northern pike (*Esox lucius*), black crappie (*Pomoxis nigromaculatus*), yellow perch (*Perca flavescens*), bluegill (*Lepomis macrochirus*), rock bass (*Ambloplites rupestris*), muskellunge (*Esox masquinongy*), brown bullhead (*Ameiurus nebulosus*), longnose gar (*Lepisosteus osseus*), redhorse sucker (*Moxostoma valenciennesi*), bowfin (*Amia calva*), and channel catfish (*Ictalurus punctatus*). Walleye were almost extirpated from the lake by the late 1970s, but stocking programs have helped to increase their numbers in recent years (Black Lake, NY Chamber of Commerce 2008). Creel surveys, in 1996 and 2004, and periodic gill netting conducted in Black Lake by the NYSDEC indicate that the Lake fishery remains diverse and healthy. The average size of fish caught increased and the population of largemouth and smallmouth bass increased during the period between the two creel surveys (VanMaaren 2008).

SECTION 2 MANAGEMENT HISTORY AND OBJECTIVES

2.1 MANAGEMENT HISTORY

Past management efforts in Black Lake have been limited to mechanical harvesting (New York State Federation of Lake Associations and NYSDEC 2005). The Black Lake Association and other community groups organized large mechanical harvesting efforts in the 1970s and 1980s, with smaller-scale, homeowner-led harvesting efforts taking place in recent years (Beschle 2008). Mechanical harvesting provides short-term relief from high density macrophyte canopy cover; long-term reduction in canopy density is now desired.

Currently, there is no formal management plan for Black Lake; however, the lake is managed in accordance with the recreational uses of the lake, through fish community monitoring and enforcement of catch size limits by the NYSDEC (VanMaaren 2008) and Eurasian watermilfoil harvesting efforts by the community (Beschle 2008). This aquatic nuisance species management plan focuses on the management of the lake for recreational uses including swimming, boating, fishing, and aesthetics while maintaining or improving the ecological health of the lake. It has been developed in accordance with NYSDEC protocols described in the *Primer on Aquatic Plant Management in New York State* (NYSDEC 2005). The Black Lake Invasive Weed Committee, which is comprised of multiple public and private entities, is the primary group involved with the development of this management plan.

2.2 MANAGEMENT OBJECTIVES

2.2.1 Extent of Preferred Management

The preferred management method(s) for Eurasian watermilfoil growth should be applied to the entire area of Black Lake to reduce the potential for recolonization of treated areas. Removal of Eurasian watermilfoil from the lake will take a concerted multi-year effort and will

affect large areas of the lake due to its current widespread distribution. Total removal of Eurasian watermilfoil is desired from each target area to reduce the ability of the plant to reestablish from adjacent untreated areas. However, the removal methods used should be selective in removing only the target species, leaving native aquatic macrophytes undisturbed wherever possible. Due to the nature of plant growth, removal should be targeted for the late spring and summer months for several years until a large proportion (or all) of the plants are removed. Maintenance monitoring will likely be required in subsequent years to prevent future reestablishment.

2.2.2 Expected Use Benefits

Removing Eurasian watermilfoil from Black Lake should improve boating, fishing, and swimming conditions and the aesthetic qualities for lakeshore residents and other recreational users of the lake. Habitat quality for native aquatic macrophytes should improve as the extent of Eurasian watermilfoil decreases, benefiting the fisheries.

2.2.3 Critical Areas to Protect

Due to the importance of macrophyte cover to the lake fishery, Eurasian watermilfoil removal method(s) should be selective in nature. That is, removal methods should target Eurasian watermilfoil plants only. Nonselective removal methods may unnecessarily impact the fisheries of the lake by removing important cover for juvenile fish and potentially impact their growth and survival.

SECTION 3 MANAGEMENT ALTERNATIVES

There are multiple physical, mechanical, chemical, and biological control methods that are commonly used to control nuisance aquatic plant populations such as Eurasian watermilfoil. The sub-sections below evaluate available control methods in relation to the unique characteristics of Black Lake and Eurasian watermilfoil. The advantages and disadvantages of each method are summarized in Table 3-1 after the method summaries. At the end of this section, the preferred management control method(s) will be outlined. Information on individual control alternatives, unless otherwise noted, has been summarized from *A Primer on Aquatic Plant Management in New York State* (NYSDEC 2005).

3.1 PHYSICAL CONTROL

3.1.1 Hand Harvesting

Hand harvesting is essentially underwater weeding. This is the most selective method for Eurasian watermilfoil removal, preserving the majority of native aquatic macrophyte species. The entire plant, including the roots, is removed, as opposed to other methods, which remove the upper portion only or leave the root system intact. Hand harvesting also has the lowest equipment expenses of any method. The disadvantages to hand harvesting are that it is very labor intensive and harvesting dense beds can be difficult and time consuming. The largest expense in hand harvesting is labor and total costs are estimated to be \$400 to \$1,000 per acre. In their Eurasian watermilfoil management plan, the Lake George Park Commission (LGPC) estimated labor costs for hand harvesting at \$70 per hour (ENSR International 2005).

3.1.2 Suction Harvesting

In suction harvesting, a SCUBA diver uses a barge-mounted hydraulic dredge to suck up stems, roots, and surficial sediments. This method is selective, though less so than hand

harvesting, and can be more efficient than hand harvesting in dense beds. The primary disadvantage of suction harvesting is that it is more labor intensive than methods that do not require a SCUBA diver, although it is faster than hand harvesting. Suction harvesting does not remove the root system of all the plants, requiring limited hand harvesting in subsequent seasons. Suction harvesting also causes more disruption to the benthic environment than hand harvesting (ENSR International 2005). Costs are higher for suction harvesting due to equipment expenses and the need for an additional SCUBA diver and personnel on the boat to dispose of plant materials. Suction harvesting equipment cost ranges from \$20,000 to \$30,000 and operations and disposal ranges from \$1,000 to \$25,000 per acre. The LGPC indicated that suction harvesting equipment can cost up to \$50,000, not including purchase of a boat on which it can operate (ENSR International 2005).

3.1.3 Benthic Barriers

Benthic barriers are sheets of non-transparent materials used to shade out entire beds of aquatic macrophytes. This method is partially selective in that barriers can cover specific areas, but they will eliminate all of the vegetation in the patch to which they are applied. This management method is best used to non-invasively eliminate dense monoculture beds of invasive species. Elimination of vegetation beneath the benthic barrier takes approximately one month (ENSR International 2005). The method is also non-toxic, and will therefore, not harm the fisheries. The disadvantage of benthic barriers is that they can eliminate some species of benthic invertebrates and inhibit spawning of warm-water fish. Cost of materials and difficulty of installation preclude its use over large areas; however, areas up to 1 acre have been treated using benthic barriers in Lake George, NY (ENSR International 2005). Additionally, barriers must be removed or cleaned each year, requiring additional labor. Professional installation of benthic barriers with SCUBA divers can range from \$10,000 to \$25,000 per acre. However, in shallow littoral areas (<6 ft.), tarps can be applied without the aid of SCUBA divers, using readily available materials much more cheaply. Care must be taken to install barriers properly to avoid ballooning or detachment from the bottom.

3.1.4 Drawdown

Drawdown involves lowering the water level in the lake to expose bottom sediments, and thereby kill aquatic macrophytes. Drawdown is a non-toxic method for removal of invasive aquatic plants and can be useful for smaller, hydraulically controlled water bodies. Black Lake does not have a water control structure, making this method inapplicable. Additionally, such a measure would be a severe stressor to the fish community in the lake and would impede recreational boating, swimming, or fishing during the draw down period.

3.2 MECHANICAL CONTROL

3.2.1 Rotovating/Hydroraking

Rotovating, similar to rototilling a field, involves tilling the bottom sediments and removing the invasive plants and their root structures. This method can target specific beds in an area; however, all species in a targeted bed will be removed. In addition, this method disturbs the sediments and can greatly alter the benthic invertebrate and macrophyte community. Disturbance to the sediments also can promote the establishment of disturbance-adapted macrophytes, including Eurasian watermilfoil after treatment. In a fluvial lake, such as Black Lake, the fragmentation caused by this method also could lead to the spread of Eurasian watermilfoil to currently unimpacted areas of the lake. Finally, this method results in high local turbidity levels potentially causing an aesthetic problem for lake-shore residents. If professional services are engaged, cost for this method is approximately \$1,500 per acre. If community services are used, equipment purchase costs range from \$100,000 to \$200,000 and operating costs range from \$200 to \$300 per acre.

3.2.2 Dredging

Dredging removes the plants and the sediment to a specified depth. Dredging can be useful in removing nutrient-rich sediments in targeted areas along with the entire bed of nuisance plants and may improve boating and fishing conditions by increasing the water depth in areas

that may be too shallow for navigation. However, dredging would not be a viable option for removing nuisance populations of Eurasian watermilfoil over the large area occupied in Black Lake. Dredging would remove all plants and benthic organisms in a given area, regardless of species, removing the habitat and food source for fish. Eurasian watermilfoil also grows over a wide depth range depending on water clarity; therefore, small changes in water depth may not affect its future distribution. Dredging would greatly disturb sediments creating habitat for disturbance-adapted invasive species, such as Eurasian watermilfoil. Finally, dredging if performed improperly could cause high turbidity, nutrient release, algal blooms, and fish kills due to increased oxygen demand caused by sediment resuspension. Costs for dredging vary greatly between \$1,000 and \$40,000 per acre depending on the depth of excavation, the ease of access, nature of the sediment (i.e., contaminated or not), and the disposal method. If sediments need to be disposed of off-site, costs increase toward the upper end of the range.

3.2.3 Mechanical Harvesting

Mechanical harvesting removes the top portion of aquatic plants, leaving behind the roots and lower vegetative portion of the plant. Consequently, the plants can regenerate and the harvest must be repeated multiple times in a season to maintain the benefits for boating and swimming. This method leaves the benthic community intact and provides habitat for fish. Fragmentation of aquatic plants is the most severe disadvantage of mechanical harvesting. Even though cut plants are collected and removed, fragments may be missed. Eurasian watermilfoil reproduces primarily by vegetative propagules (fragments) meaning that this control method could actually increase the problem rather than decrease it. Equipment costs in 2005 ranged between \$100,000 and \$200,000 dollars for a harvester and shore conveyer. Operation costs were \$200 to \$300 per acre.

3.3 BIOLOGICAL CONTROL

3.3.1 Herbivorous Insects

Introduction of herbivorous insects is a non-toxic, unobtrusive form of management for Eurasian watermilfoil. The two insects known to target Eurasian watermilfoil, milfoil weevil (*Euhrychiopsis lecontei*), and an aquatic moth (*Acentria ephemerella*) cause minimal damage to other species of macrophytes and the slow reduction in plant biomass reduces the chance of oxygen reduction due to decomposing vegetation. Additionally, these species are native to the region and would, therefore, not pose an additional invasive species risk. Insect herbivory is much slower than the other methods and will not provide immediate relief from dense beds of Eurasian watermilfoil. Further, results of insect herbivory are not always dramatic and many efforts to use either of these insects for control produced little or no results at all. Stocking efforts to date have cost approximately \$1,000 per acre (\$1 per insect).

3.3.2 Grass Carp

Grass carp (*Ctenopharyngodon idella*) herbivory is another biological method for removing Eurasian watermilfoil. The benefits of using grass carp are that it involves very little physical labor and the carp are efficient at removing vegetation given time. The primary disadvantage of this method is that grass carp will remove all vegetation in a system over time and actually do not prefer Eurasian watermilfoil as forage, removing more desirable species first. Such a control method would be a detriment to the fish community in the lake. Grass carp prefer moving water and quickly migrate to it when possible, presenting an additional problem for introduction to Black Lake where there is no control structure at the inlet or outlet to prevent migration from the lake. NYSDEC will not issue a permit for stocking this species in any waters where isolation of the grass carp to that waterbody is not guaranteed. Even in lakes where control of the carp is guaranteed, a full environmental impact statement is required. Costs for this control method average between \$50 and \$100 per acre based on the standard stocking rate allowed by the NYSDEC of 10 to 15 fish per acre.

3.4 CHEMICAL CONTROL

3.4.1 Aquatic Herbicides

Aquatic herbicides are commonly used to eliminate nuisance macrophyte populations in smaller waterbodies. This method can provide both immediate and long-term control of nuisance species depending on the product chosen and the timing of the application. Herbicides also have been shown to be effective on Eurasian watermilfoil. Unfortunately, because aquatic herbicides are not completely species-specific they can have a detrimental affect on other, desirable aquatic macrophytes. Decomposition of the affected plants, if not removed after treatment, can deplete dissolved oxygen in the lake and the release of nutrients can cause algal blooms that will negatively impact both the fish community and the recreational quality of the lake. Use restrictions on the lake after treatment can extend to as much as 30 days, which during the recreational season would be a significant disadvantage. Herbicide application typically costs between \$200 and \$400 per acre.

3.4.2 Shading Chemicals

Shading chemicals are dyes added the lake surface waters to reduce light penetration, thereby shading out the aquatic macrophytes. These chemicals are non-toxic to humans and most aquatic organisms and have the potential to treat the entire lake in a single year. However, this treatment method is not applicable for removing Eurasian watermilfoil from Black Lake due to the species' growth characteristics. Eurasian watermilfoil is less light sensitive than many other species, forming a surface canopy in low-light conditions and may survive the dye treatment. Moreover, these chemicals may be flushed from Black Lake due to its fluvial nature, and would, therefore, require multiple treatments to maintain the shading effect. Additionally, because these chemicals are very water soluble they must be applied to the entire lake, and would shade out other more desirable (native) species. Chemical dyes for this application are approximately \$12.50 per acre-foot of water.

3.4.3 No Action

If no action is taken to remove Eurasian watermilfoil from Black Lake, conditions are not expected to improve. Herbivory by aquatic insects could occur naturally if aquatic moths or milfoil weevil are present in the lake, but can not be guaranteed. Recreational conditions could conceivably become much worse as Eurasian watermilfoil continues to spread under current conditions and zebra mussels continue to increase water clarity, allowing the plant to spread into deeper waters of the Lake than they currently occupy.

Table 3-1. Comparison of methods for removing Eurasian watermilfoil from Black Lake, NY.

Class	Method	Advantages	Disadvantages	Costs
Physical	Hand harvesting	Removes only target plants; low equipment costs	Very labor intensive; harvesting dense beds is inefficient	\$400 - \$1,000 per acre
Physical	Suction harvesting	Removes only target plants; more effective in medium density beds	Labor intensive; added equipment costs; some difficulty with very dense beds	\$20,000 - \$30,000 for equipment and \$1,000 - \$25,000 per acre for operations and disposal of harvested plants
Physical	Benthic barrier	Effective at treating very dense beds	Eliminates some non-target species; may interrupt spawning of some warm-water fish; may eliminate some benthic invertebrates	\$10,000 - \$20,000 per acre for professional installation
Physical	Drawdown	Can be very effective for smaller water bodies with control structures	Black Lake does not have a control structure.; drawdown would negatively impact the ecosystem and recreational use of the lake	N/A
Mechanical	Rotovating	Both stem and roots are removed	Severe disturbance to sediments can lead to recolonization by invasive species; fragmentation of Eurasian watermilfoil can lead to colonization of new areas	\$100,000 - \$200,000 for equipment and \$200 - \$300 per acre for operations; or \$1,500 per acre to hire professional service
Mechanical	Mechanical harvesting	Provides habitat for fish; leaves benthic community intact	May have to be repeated more than once each year; fragmentation of Eurasian watermilfoil can lead to colonization of new areas	\$100,000 - \$200,000 for equipment and \$200 - \$300 per acre for operations

Class	Method	Advantages	Disadvantages	Costs
Mechanical	Dredging	Removes nutrient-rich sediments with target plants; also deepens areas that may be too shallow for navigation	Removes non-target plants and benthic invertebrates; sediment disturbance can lead to recolonization by invasive species; can cause high turbidity	\$1,000 - \$40,000 per acre depending on chemical nature of sediment and need for off-site disposal
Biological	Herbivorous insects	Milfoil weevil the aquatic moth target only Eurasian watermilfoil and are native species; slow reduction in plant biomass minimizes chance of increased eutrophication	Slow method; results from introduction are inconsistent	Stocking costs approximately \$1,000 per acre
Biological	Grass carp	Very little labor involved; very effective at removing vegetation given time	Removal of non-target species; grass carp prefer moving water and are very likely to migrate from the lake; highly regulated	Stocking costs \$50 - \$100 per acre
Chemical	Aquatic herbicides	Effective on Eurasian watermilfoil; can provide short- and long-term control	Removal of non-target species; decomposing vegetation can reduce dissolved oxygen and cause algal blooms; use restrictions may be placed on the lake after application	\$200 - \$400 per acre
Chemical	Shading chemicals	Could treat the whole lake at the same time	Multiple treatments would probably be needed; removal of non-target species; may not be effective on Eurasian watermilfoil	\$12.50 per acre-foot of water

3.5 RECOMMENDED ALTERNATIVE(S)

To effectively remove Eurasian watermilfoil from Black Lake, while maintaining native aquatic macrophyte habitat for fish, an integrated treatment approach is required, employing three methods: hand harvesting, suction harvesting, and benthic barriers. Hand harvesting should be performed on lower density beds, where there are fewer than 500 plants per acre. Hand harvesting at this level of density has been shown to be effective for other lakes (Mattson et al. 2004). Suction harvesting should be used on beds of intermediate density or dense beds where concern needs to be taken to preserve non-target species. Suction harvesting is recommended on beds less than 0.25 acres (Mattson et al. 2004). The suction harvesting

equipment can also be used as an aid during hand harvesting for removal of pulled plants. Benthic barriers should be applied to dense monospecific beds of Eurasian watermilfoil where non-target species are not a consideration or can be avoided during application. Benthic barriers have been used on areas up to one acre in Lake George (ENSR International 2005). Follow-up hand harvesting may be needed for some sites treated by benthic barriers or suction harvesting, to remove plants surviving the first treatment. These recommendations are consistent with other successful Eurasian watermilfoil management efforts in New York State (Appendix A).

Given the large areal extent of Eurasian watermilfoil growth in the Lake full eradication may be difficult. Removal efforts will need to take place over multiple years and should be prioritized to achieve the most benefit for the fisheries and for the recreational use of the lake. Removal should occur first in areas of high boat traffic to reduce fragmentation and spread of Eurasian watermilfoil and in areas that would most benefit the fish, such as spawning beds. Specific plans for removal can only be made after more detailed mapping of distribution and density of macrophytes has been completed. To help limit recolonization of Eurasian watermilfoil, removal should be followed by planting of native species, either seeds or tubers. Harvested areas should be monitored and treated again if reinvasion occurs. In addition, a comprehensive watershed management plan should be developed that would help reduce eutrophication in the Lake, thereby reducing its suitability for Eurasian watermilfoil.

3.5.1 Estimated Costs for Recommended Alternative

Costs for the selected alternative vary considerably depending on the total acreage harvested using each method. Purchase of suction harvesting equipment is a one-time expense (\$20,000 to \$50,000) and benthic barrier materials can be reused for multiple beds if maintained properly. Costs for a boat to support the harvesting efforts are approximately \$35,000. Harvested plant materials can be composted and used as a soil additive, but transport and composting will incur additional costs. Table 3-2 outlines the estimated costs for total eradication of Eurasian watermilfoil using the selected remedy. These estimates do not include the capital expenditures required to buy harvesting equipment or a boat. The acreages for hand harvesting assume that half of the area displayed as “60%” cover in Figures 1-2a and 1-2b would

be harvestable by hand. All of the areas displayed with greater than 90% cover were assumed to be too dense for hand or suction harvesting. The costs for benthic barrier installation assume professional installation. Costs per acre will be lower if barriers are installed using volunteer labor in shallow areas.

Table 3-2. Cost planning estimates for total removal of Eurasian watermilfoil from Black Lake, NY.

Treatment Method	Acres to be Treated	Cost per Acre Range	Assumed Cost per Acre	Estimated Cost ¹
Hand harvesting	932	\$400 - \$1,000	\$700	\$652,400
Suction harvesting	932	\$1,000 - \$25,000	\$13,000	\$12,116,000
Benthic barrier - professional installation	1371	\$10,000 - \$25,000	\$10,000 ²	\$13,710,000
Total	3235			\$26,478,400
			Say	\$20-30 MM

Notes:

¹The cost per acre was estimated using the median cost for hand and suction harvesting and the lower end of the cost range for benthic barrier installation.

²The lower end of the cost range for benthic barrier was assumed because barrier materials can be reused, defraying some costs.

3.5.2 Permits Required for Recommended Alternative

Some permits may need to be obtained to perform these management activities. Hand harvesting is not a regulated activity in most of the State, though some NYSDEC regional offices may require a permit or approval for large scale removal. Suction harvesting regulations are similar to those for dredging operations and will require a permit from the NYSDEC and possibly from the United States Army Corps of Engineers. Benthic barriers are not a regulated activity in most of the state, although some NYSDEC regional offices may require a permit or approval for disruption of fish habitat or covering large areas of the lake bottom. Additionally, because there is a large area of forested wetland on the southern shore of Black Lake a wetland permit will be needed if disturbance of the wetland is anticipated (NYSDEC 2005).

SECTION 4 PRE-, DURING- AND POST-TREATMENT ACTIONS PLANNED

4.1 MONITORING (ONGOING AND FUTURE)

4.1.1 Aquatic Plants

Aquatic plant growth has been monitored, in some form, as part of the CSLAP program since 1988. Macrophyte growth is qualitatively measured annually, where macrophyte growth is categorized as not visible, below surface, at surface, dense at the surface, or present in all shallow areas. Additionally, qualitative plant surveys were conducted in parts of Black Lake in 1990 and 1991 to determine the dominant macrophyte species in the lake (NYSDEC 2007).

The distribution of Eurasian watermilfoil and other macrophytes within Black Lake needs to be established to plan specific removal actions and for use as a baseline against which future distributions can be compared. Plant surveys should be integrated into the CSLAP program. The extent of aquatic vegetation beds in the lake should be mapped, with the species in each bed indicated, and a qualitative assessment of density (e.g., trace, sparse, medium, or dense) provided. An environmental professional trained in the identification of aquatic plants may be required to train the volunteers initially. This mapping process should be repeated each year, as part of the CSLAP program, during the period of maximum macrophyte growth to track the growth of Eurasian watermilfoil lakewide. Volunteers should note the presence of Eurasian watermilfoil wherever it occurs, whether it is an individual plant or bed, so that removal actions may be undertaken. Additionally, personnel involved in harvesting activities should make quantitative assessments of Eurasian watermilfoil density during harvesting and follow-up visits. One 0.25 m² quadrat should be sampled per acre and the number of Eurasian watermilfoil stems per quadrat and the coordinates of the quadrat should be recorded. This information can then be used to quantitatively determine the efficacy of the harvesting program in treated areas.

4.1.2 Water Quality

The trophic status of the lake is currently monitored by volunteers as part of the CSLAP, including: water temperature; clarity (secchi depth); conductivity; pH; color; phosphorus; nitrogen; chlorophyll-a; and calcium. In addition, qualitative water quality assessments of the lake are conducted, classifying the lake according to the following categories (NYSDEC 2007):

- crystal clear;
- not quite crystal clear;
- definite greenness;
- high algae; or
- severe high algae.

These parameters should be sufficient to assess whether the water quality of the lake is being negatively affected by Eurasian watermilfoil management activities. Participation in the CSLAP program should continue in the future.

4.2 EARLY RESPONSE

During and after management, it will be essential to quickly respond to newly established populations of Eurasian watermilfoil. The first key to early response is the education of residents and users of the lake on the identification of this plant. Second, the new population must be quickly removed, to prevent further spread of the plant.

4.2.1 Educational Program

Lake-side residents and users of the lake should be educated on the identification of Eurasian watermilfoil. The easiest way to non-resident users of the lake is to place signs and pamphlets at boat ramps with pictures of milfoil in its various growth forms and its leaf morphology along with information on its detrimental effects on the lake environment. Lake-side residents can be informed by delivering the same pamphlets to their residences. These

pamphlets could also be left in public areas of rental properties to inform other short-term visitors who may not use boat launches.

4.2.2 Removal - Hand Pulling

Whenever a new Eurasian watermilfoil location is identified, whether single plants or small beds, that location should be slated for hand pulling during that year. Using hand pulling to eliminate new beds has been a mainstay of the Lake George Park Commission's Eurasian watermilfoil management strategy and can be the most effective way to prevent further spread to new, or previously cleared, areas of the lake (ENSR International 2005). Identification of new beds can be performed by volunteers in the CSLAP program or by users of the lake informing the Black Lake Association.

4.3 SOURCE MANAGEMENT

Users of the lake should be educated on the deleterious effects of Eurasian watermilfoil on the lake environment and the various ways it is introduced to lakes. Signs and pamphlets will be placed at boat ramps with pictures of milfoil in its various growth forms and its leaf morphology, along with information on its detrimental effects on the lake environment. These materials will prompt users to voluntarily inspect their boats and props for the presence of plants from previous lakes they may have visited. Water hoses should be provided at boat launches and marinas so that any plant materials can be washed off on land before the boat enters the water.

4.4 EVALUATION OF EFFICACY

The efficacy of the program should be assessed annually to determine if management efforts should continue. The primary assessment should be whether Eurasian watermilfoil is being effectively managed by the methods chosen. This can be determined by the plant monitoring methods identified previously and evaluating if Eurasian watermilfoil beds have been eliminated or reduced in density. The fisheries should be evaluated each year to determine if the

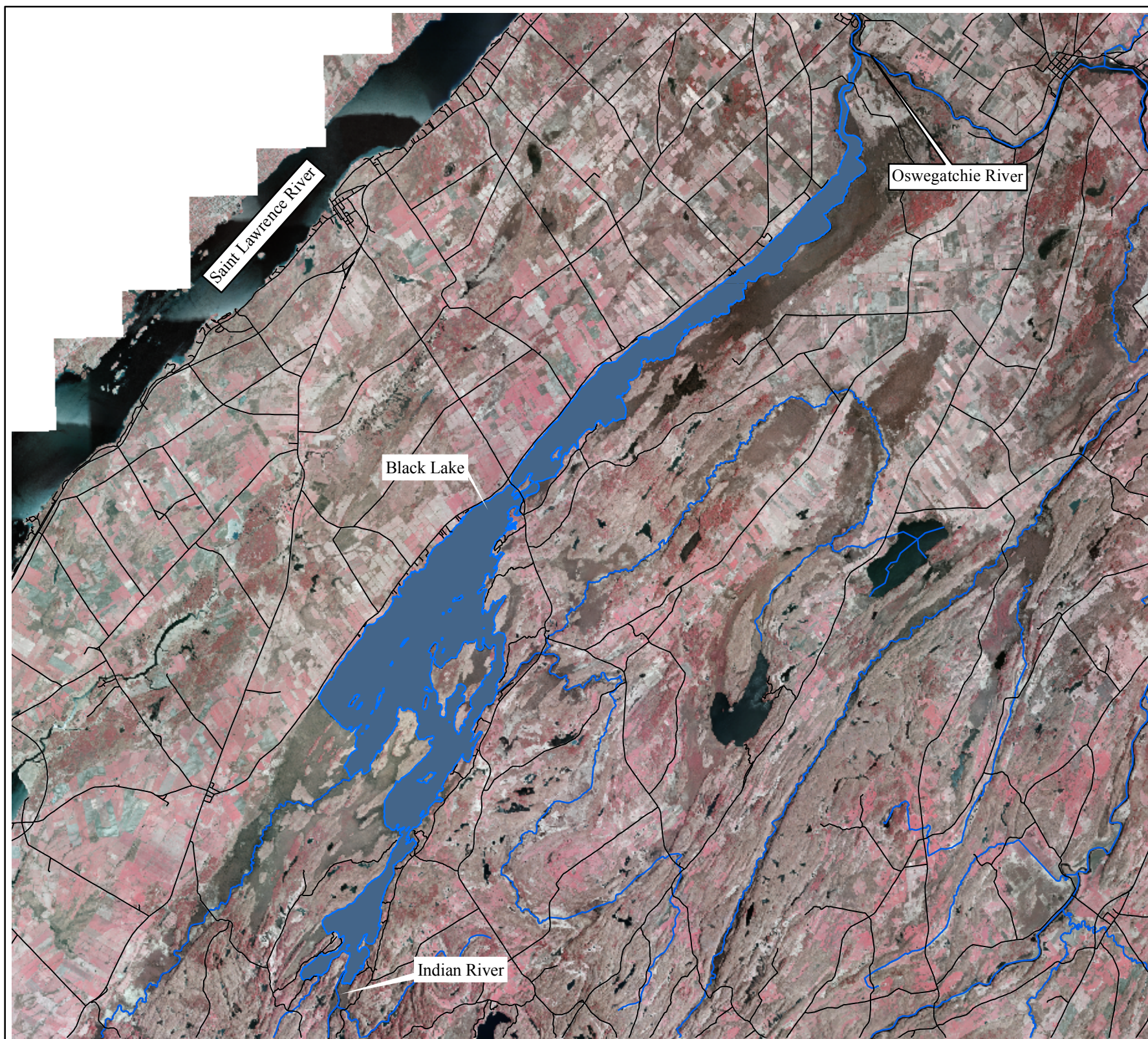
management is having effects, positive or negative, on fish populations. A simple approach can be taken initially, involving angler diaries in which the users of the lake will indicate their fishing location, the number of anglers, the species caught, and the number of each species. This information can be used to track changes in the sport fish population. Finally, user surveys can be used to evaluate whether people perceive an improvement in the recreational quality of the lake in treated areas. The angler and user surveys can be left in the same locations as the informational materials, with a box for their deposition upon return. The results of these efficacy assessments should be reported to the NYSDEC regional office to inform them of the current status of the lake.

SECTION 5 REFERENCES

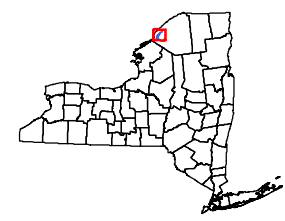
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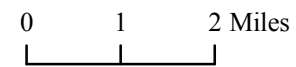
FIGURES



LOCATOR



SCALE



LEGEND

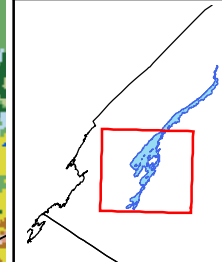
- Roads
- Black Lake
- NHD Hydrography

Note: Aerial photos are color infrared photography taken in 2003.

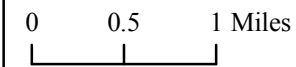
Figure 1-1.
Black Lake, NY
Regional Location



LOCATOR



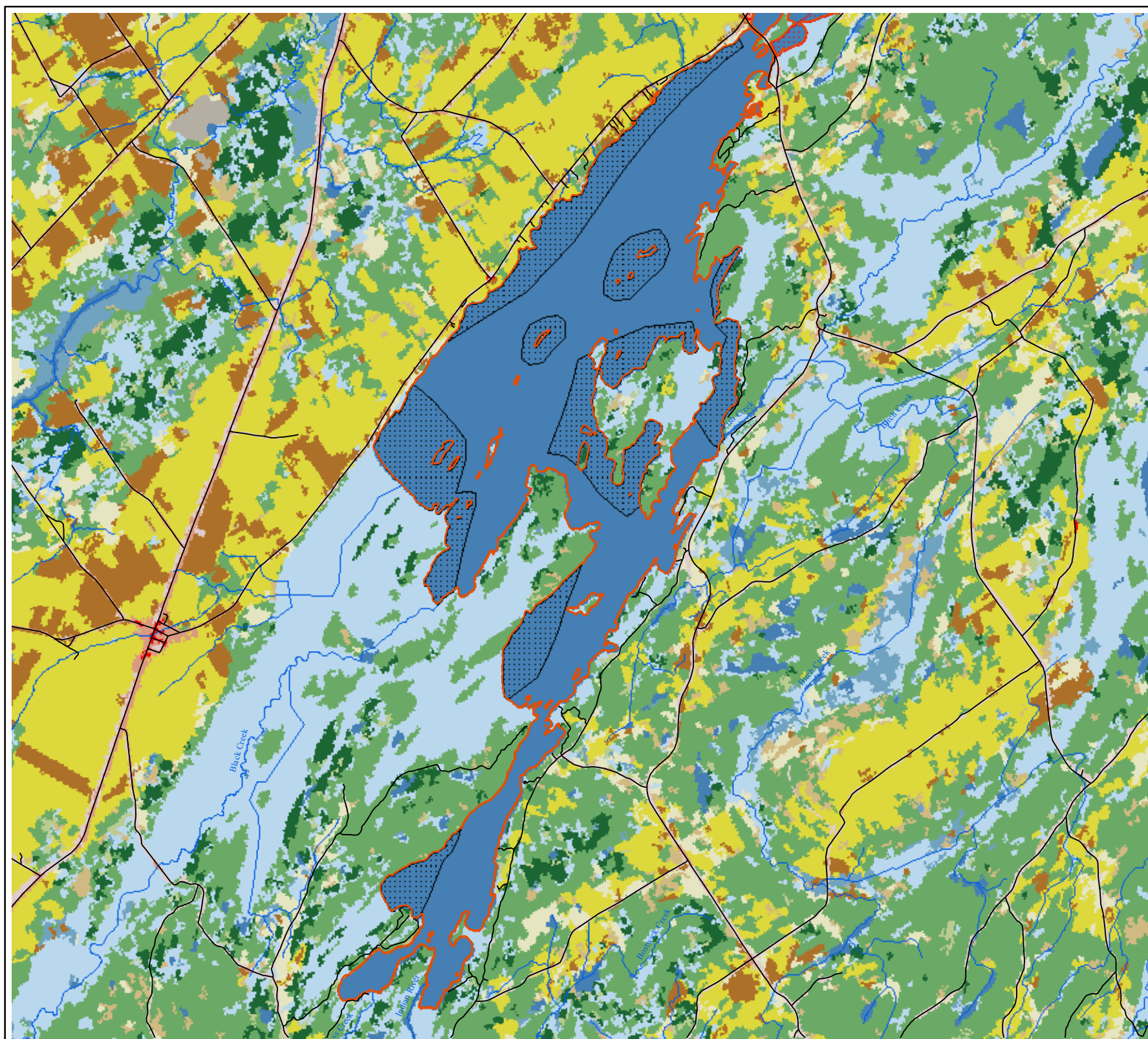
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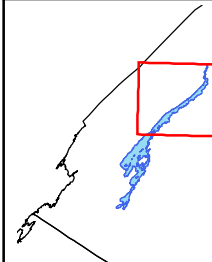
LEGEND

- Roads
- NHD Hydrography
- ▭ Black Lake
- Eurasian watermilfoil Percent Cover
 - ▭ 60%
 - ▭ > 90%
- NLCD Landcover
 - ▭ open water
 - ▭ developed, vacant land
 - ▭ low intensity urban
 - ▭ medium intensity urban
 - ▭ high intensity urban
 - ▭ barren land
 - ▭ deciduous forest
 - ▭ evergreen forest
 - ▭ mixed forest
 - ▭ scrub/shrub
 - ▭ grassland
 - ▭ pasture
 - ▭ cultivated crops
 - ▭ woody wetland
 - ▭ herbaceous wetland

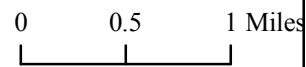
Figure 1-2a.
Eurasian watermilfoil distribution in Black Lake and surrounding land-use: south



LOCATOR



SCALE



LEGEND

- Roads
- NHD Hydrography
- ▭ Black Lake
- Eurasian watermilfoil
Percent Cover
- ▨ 60%
- ▨ > 90%
- NLCD Landcover
- ▭ open water
- ▭ developed, vacant land
- ▭ low intensity urban
- ▭ medium intensity urban
- ▭ high intensity urban
- ▭ barren land
- ▭ deciduous forest
- ▭ evergreen forest
- ▭ mixed forest
- ▭ scrub/shrub
- ▭ grassland
- ▭ pasture
- ▭ cultivated crops
- ▭ woody wetland
- ▭ herbaceous wetland

Figure 1-2b.
Eurasian watermilfoil
distribution in Black Lake
and surrounding land-use:
north



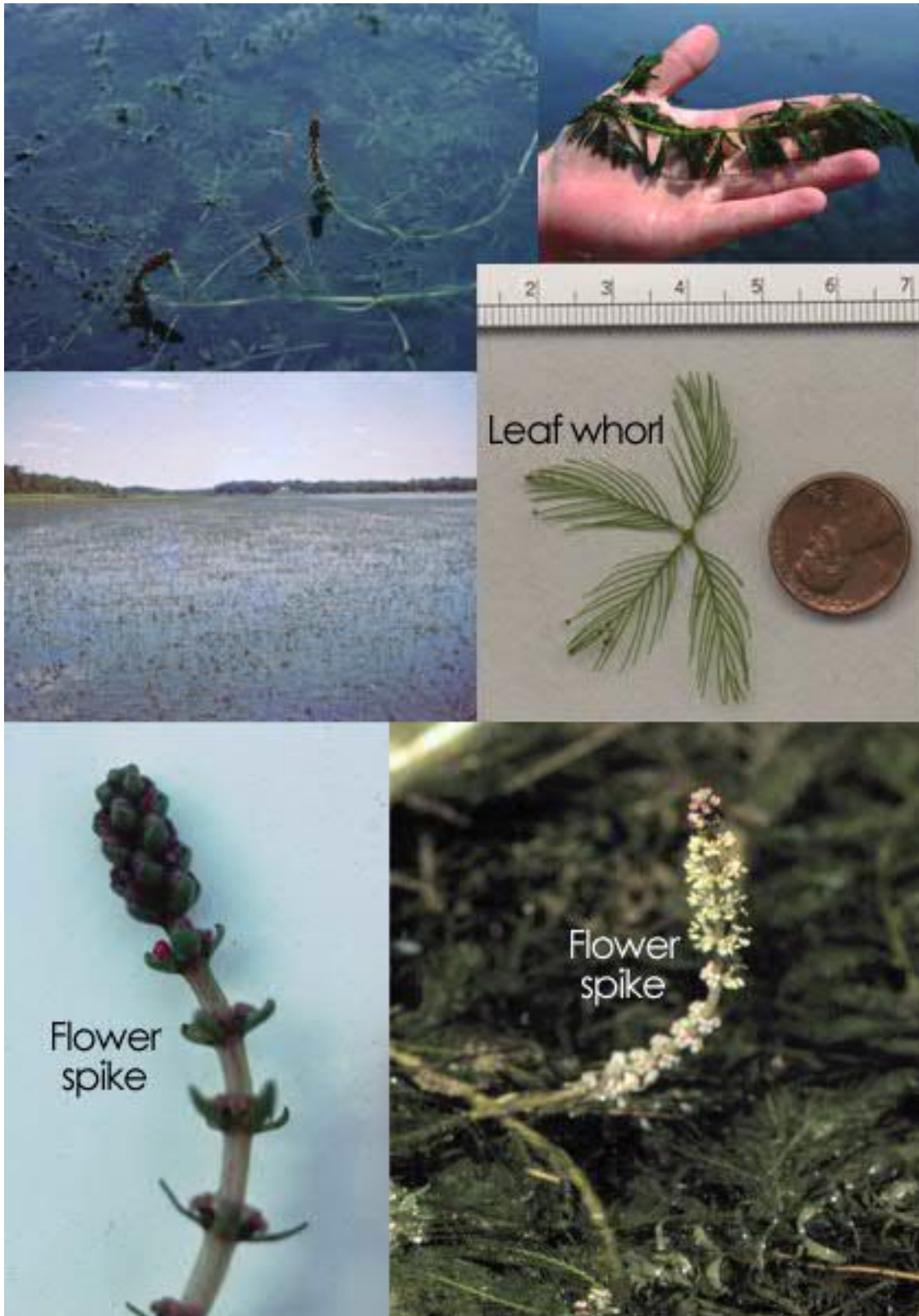


Figure 1-3. Schematic showing the growth form and physical characteristics of Eurasian watermilfoil (Maryland DNR 2008).

APPENDIX A
SELECTED EURASIAN WATERMILFOIL EXPERIENCE IN NEW YORK STATE

APPENDIX A
SELECTED EURASIAN WATERMILFOIL EXPERIENCE IN NEW YORK STATE

Lake George, New York State

Lake George is located in the southeastern corner of the Adirondack Park. Its overall length is 31.7 miles, maximum depth is 190.3 ft. and average depth is 59.1 ft. Eurasian watermilfoil was first detected in Lake George in 1985. Management of the species began in 1987 after it became clear that the plant was spreading rapidly and could become a problem. The approach taken in Lake George has been a combination of hand harvesting in low density areas; suction harvesting in mid-density areas; and benthic barriers in areas of high density, monospecific milfoil growth. The Lake George Park Commission also had originally proposed the use of the herbicide Sonar[®] in its current management plan, but this was rejected due to concern about possible impacts on protected plant species. To date, 148 Eurasian watermilfoil sites have been identified in Lake George, 136 have been managed, and 112 of these have been cleared (ENSR International 2005).

Fulton Chain of Lakes, New York State

The Fulton Chain of Lakes, in Herkimer and Hamilton Counties in the Adirondack Park, has dense growths of Eurasian watermilfoil in Fifth, Sixth, and Seventh Lakes. The Fulton Chain of Lakes Association, the Towns of Inlet and Webb, and the two counties have been combating its growth in the three lakes since 2006 using hand and suction harvesting. Their efforts have succeeded at reducing density of Eurasian watermilfoil in harvested beds by 90% between 2006 and 2007. The coalition of groups has received a matching fund grant from New York State for 2008-2010 (Smith and Stafford 2008).

Recent Hazard-Related Press Releases

Wanakena residents lose a treasure, for now

Jan 17, 2014 —



Wanakena resident Bill King looks at the Oswegatchie River from his window. As of Wednesday, the river was still mostly covered by jagged ice. Photo: Zach Hirsch

Jan 17, 2014 — On Monday, an ice jam in Wanakena caused floods, and severe damage to a historic footbridge. Nobody was physically hurt, but the physical damage has caused some emotional bruises.

The section of the Oswegatchie river that passes through Wanakena barely resembles a river. Right now, it looks more like a field of giant, jagged shards ice. On top of those shards sits a twisted, white cable bridge.

"I don't think it's sunk in all the way yet, with people," said Rick Kovacs, who owns the general store in Wanakena. "When they see it, especially the seasonal folks, when they come back and see it, I think it's going to make them feel pretty sad."



loading...

Photo: Zach Hirsch

Along with the rest of the community, Kovacs says it's upsetting to see the footbridge in this condition.

"So a good question is, is it more striking for people to see the damaged bridge? Or to see a space where the bridge used to be," Kovacs said. "I think it could go either way in that regard."

Wanakena isn't even big enough to be called a hamlet. Basically, the downtown consists of Kovac's general store and the footbridge.

And in case you can't hear it in Kovac's voice, this wasn't just any old walkway to the people who live, work, and visit here. It's a quintessential icon - even an emotional anchor for them.

"Well in the old days, that was the absolute way of getting across the river, back at the turn of the 20th century," he said. "A hundred years later, it's still favorite. People will walk across it just to say that they've walked across it. It's part of the fabric of the town."

Last week, the weather was like a rollercoaster, soaring from the zero's into the 40s. So, first, a lot of ice built up on the river. Then, when melt water flowed into the Oswegatchie, it created pressure that dislodged the ice. It all came roaring downstream. Wanakena native Bill King saw the whole thing.

"They call me 'Bo' here," King said. "I was up doing firewood up at Rick's, up at the lodge. I heard the sound, almost of a train coming down the river, somewhat, and it

was shaped like a tsunami. Which I've never seen on this river, not like that. And it was ripping by – probably a good, twenty-something miles an hour.”

King says Wanakena has had ice jams before, but this is the worst one he's ever seen. When all that ice slammed into the footbridge, it didn't just knock over the walkway. The ice also smashed one of the bridge's supporting towers, which gave it structural stability. Now it's beyond repair.

But King says he has other things to worry about at the moment. His house is only a few hundred feet from the bridge - in a low spot, right on the river.

“We got a foot and a half of water in here. And it stinks in here. You can see the water line,” he said. “I only had seconds. Only seconds to get my power tools off the floor. And then it bombarded the back of the house, here. Just like getting hit with canons. You can hear it – boom! Boom! Boom! And then it was only, 15, maybe 30 seconds, the house filled up with water.”

King says he'll be busy in the coming weeks, cleaning up his and his neighbors' homes. Only about eight houses were affected by the flooding, though. Most of the community is focused on what will happen with the treasured cable bridge.

Just down the road, I'm about to start interviewing Town Supervisor Mark Hall when another Wanakena native, Carol Cassidy, breaks in.

“It's certainly an emotional situation,” Hall said. “And that's great, because that's what's really going to put the focus behind this and make sure it gets done.”

It's still too early to tell how much the restoration will cost, or how long it will take. Hall is telling people they should brace for a summer without the footbridge.

And while Hall deliberates with other officials over the logistics of the rebuild, the local Historical Association is collecting donations for the restoration effort.

ADVERTISEMENT

North country digs out from nor'easter



By [Emily Griffin](#)

Updated: Feb. 3, 2021 at 5:11 PM EST



WEST CARTHAGE, N.Y. (WWNY) - People around the north country are dealing with the snow by working in it and playing in it. We went to West Carthage to check in with folks to see what they're doing.

"I'm so used to it, I've been here since 1978."

To Abe Garcia, this snowfall is no big deal.

"Carthage has been getting blasted here every week so it's kinda normal now," he said

ADVERTISEMENT

But while Abe's legs aren't covered, just about everything else is - the trees, the homes, the cars.

With big snowfall comes big snow banks. But most folks will tell you, dealing with the winter weather is just part of living in the north country.

"My husband's not crazy about it. He keeps saying we're moving, but I like the winter! So it's fine by me," said Ruth Huntley, who was shoveling.

Although managing a snowfall this heavy is a lot of work, it can also be a lot of fun.

"Give it a chance. Find something to do outside. Enjoy it," said a snowshoer.

It's a good thing people generally have a good attitude about the winter because Punxsutawney Phil has predicted more is to come.

"He's right! We always get six weeks," said Huntley.

As for the rest of the tri-county region, Winthrop in St. Lawrence County reported 14 inches of snow and Watertown in Jefferson County had 11.7 inches as of late Wednesday morning.

The Lewis County village of Croghan got a foot of snow as of Tuesday evening, according to a report from the National Weather Service.

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Evacuees remain in Plattsburgh shelter, more ice jam flooding may be ahead

Jan 18, 2018 —

Residents of a mobile home park in Plattsburgh haven't been able to return home yet. The Underwood Estates community evacuated this week because...



Deep layers of slush and ice remain around many of the homes in Underwood Mobile Home Park, impeding the ability to safely access and assess structures, water and electrical systems. Photo: Clinton County OES

Jan 18, 2018 — Residents of a mobile home park in Plattsburgh haven't been able to return home yet. The Underwood Estates community evacuated this week because of an ice jam and flooding on the Saranac River.

20 to 30 residents spent the last couple of days at a Red Cross shelter at the American Legion in the town of Plattsburgh, some of them staying overnight. Today, the Red Cross may move the shelter to a new location closer to the Underwood park and better suited for longer stays.

In Fort Covington, in Franklin County, four houses were still without power and inaccessible because of floodwater yesterday afternoon. Officials have extended a state of emergency through Sunday.

There have also been evacuations in Massena, Brasher, and Sanfordville in St. Lawrence County because of recent flooding. Emergency officials across the region say rivers are receding — but the warm weather this weekend could bring more ice jams and flooding.

NCPR is supported by:



National Grid supports St. Lawrence County Emerald Ash Borer Task Force

To the Editor:

I would like to recognize National Grid for their tremendous support of the St. Lawrence County Emerald Ash Borer (EAB) Task Force again this year.

It was thanks to National Grid line crew volunteers, especially Shawn Reed and John Payton, that we first discovered EAB in St. Lawrence County more than one year ago. The same group came through again in 2018, deploying 20 EAB traps throughout St. Lawrence County, and diligently collecting samples every 2 weeks to be sent to the NYSDEC Forest Health Lab.

The EAB Task Force is a non-governmental group of concerned citizens, educators, researchers, municipal leaders, DPW Superintendents, and others whose aim is to help area residents and municipalities prepare as the current EAB infestation intensifies over the next 5-7 years.

At this time, the NYSDEC is still compiling data from the monitoring traps, but there are indications the numbers of EAB are up significantly compared to 2017.

We would still be in the dark, so to speak, about EAB in the North Country if it were not for National Grid. Thanks again!

For more information on EAB, contact your local NYSDEC or Cornell Extension office, or email ph59@cornell.edu.

Paul Hetzler

Cornell Cooperative Extension of St. Lawrence County horticulture and natural resources educator

View Full Story at: <https://www.northcountrynow.com/letters/national-grid-supports-st-lawrence-county-emerald-ash-borer-task-force-0243271>
(<https://www.northcountrynow.com/letters/national-grid-supports-st-lawrence-county-emerald-ash-borer-task-force-0243271>)

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Sunday: north country dodges an (ice) bullet

WATERTOWN, N.Y. (WWNY) - Sunday morning dawned calm and quiet across northern New York.

Police in all three counties reported no major icing problems, and National Grid showed no power outages.

A St. Lawrence County dispatcher said there was some icing in the county, but few calls associated with it. Jefferson County dispatch reported no icing at all, nor did Lewis County.

An ice storm warning remained in effect for upper St. Lawrence County until 1 PM Sunday, with a mix of freezing rain, sleet and eventually snow forecast, though not a lot of any of it.

The ice storm warning was lifted for Jefferson County, but there was a high wind advisory for Sunday morning - gusts up to 50 miles per hour - along with a winter weather advisory, with the possibility of more freezing rain north of Watertown.

There's also a flood watch for Jefferson and Lewis counties.

So what happened? The National Weather Service had forecast significant icing for both Jefferson and St. Lawrence counties overnight, with anywhere from half an inch to an inch of ice predicted along the St. Lawrence River resort communities and up to Massena. We expected to wake up to serious problems Sunday - power outages, downed trees. The various models weather forecasters (including us) use to predict ice showed the same thing.

But according to an early morning forecast discussion from the Weather Service, what happened was good news - the storm system that was bringing rain, winds and ice moved faster and a little further south than anticipated. In other words, it mostly missed us.

All the above said, there was some icing overnight. Another 20 churches in St. Lawrence and northern Jefferson counties cancelled services early Sunday morning - the people calling in cancellations said there was just enough ice to make things slick.

Find the complete list of closings [here](#).

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Potsdam to seek funds to continue refurbishing old crosstown drainage canal

BY CRAIG FREILICH
North Country This Week

POTSDAM – The village is seeking grant funds to move forward with its examining and rebuilding of the century-old crosstown drainage canal.

The Board of Trustees approved a resolution authorizing Mayor Ron Tischler to submit a proposal through the state Consolidated Funding Application process for \$250,000 for the Cross-town Canal Resiliency Project.

The village has secured \$250,000 in matching funds for the multi-year, multimillion dollar project, including \$150,000 from the village's general fund and a \$100,000 pledge from Clarkson University for their participation in the project, according to the resolution approved by the board at their meeting Monday night.

The university is seeking a grant for their share, which they would use to purchase a crawling robot with cameras and GPS capability to allow further investigation of the canal to provide a new assessment of its condition and to spot particular areas where work would be required, according to the village's Director of Planning and Development Fred Hanss.

The next planned work on the canal is at the river end, where the canal drains surface water from east of the river through the village. Brush, trees and sediment are restricting the flow there.

Hanss also said another phase of the work would include extending the canal inlet behind St. Mary's Church and the public schools to "add some retention capacity" aimed at easing the flow of storm water which has plagued some downtown neighborhoods.

Being able to use the robot Clarkson wants to acquire would be "a critical step" in designing and carrying out the work needed to improve the canal, Hanss said.

It has been estimated that \$15 million worth of work in several phases will be required to bring the canal up to its desired capacity.

One major step was achieved in 2017 when a clog that had been restricting flow was removed. Since it was first built, water and sewer lines had been put in that interfered with the canal, and those lines were reset.

In 2010, a serious storm that was preceded by 28 days of measurable rainfall led to widespread flooding affecting about 50 homes in the Leroy and Clinton street neighborhood and around Pleasant Street between Waverly and Market streets, shedding light on what had been a growing problem.

Residents of the area said that was the worst of the flooding, but that the area was and continues to be susceptible to flooding.

St. Lawrence County especially hard hit by storm

ST. LAWRENCE COUNTY, New York (WWNY) - Cleanup and power restoration continued Wednesday in St. Lawrence County. Tuesday's storm cut a wide swath of damage.

Trees felled in front of Norwood Municipal Hall. Power knocked out in locations across the county. And there's a video on Facebook showing a rotating funnel cloud off County Route 55 near Helena.

"I noticed it was starting to get lower and there was some rotation in it. And it seemed to start building. And I realized I should probably get moving," said Matthew Jock, Madrid resident.

Jock's Facebook post garnered 19,000 views by afternoon. The National Weather Service in Burlington says it looks to be a funnel cloud with rotation. In some cases, they can be a precursor to a tornado.

"Those reports are very helpful to us to determine how strong the storms are," said Paul Sisson, National Weather Service Burlington meteorologist in charge.

The NWS received another report putting wind speed at Ogdensburg airport at 63 miles-per-hour. Joe Murray says it felt that way on Cherry Street in Potsdam, too.

"All of sudden we just heard a crash, and it was just a roar, like, and we looked out and it was just gray coming straight coming down – and, like, crazy," said Murray, Potsdam resident.

Crews were still cleaning up there in the morning. On Lower Pine Street, National Grid crews were getting power restored. During and right after the storm, St. Lawrence County dispatch received 100 calls.

"We did receive an overabundance of 911 calls all in short period of time," said Matt Denner, St. Lawrence County Emergency Services director.

A request went out to staff all fire stations. National Grid had 160 crews ready to go in the north country. Power outages peaked at about 9,000 in St. Lawrence County on Tuesday.

Norwood, Potsdam, West Stockholm, Parishville, and Ogdensburg appeared to see the heaviest storm damage.

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WWTI - InformNNY.com

Isabella Colello

REDI project complete at Ogdensburg's historic Fort de la Presentation

by:

Posted: Oct 25, 2021 / 11:48 AM EDT / Updated: Oct 25, 2021 / 11:48 AM EDT



Historic Fort de la Présentation site, Ogdensburg, N.Y. (photo: Clarkson University)

OGDENSBURG, N.Y. (WWTI) — A resiliency project is complete at Fort de la Presentation in Ogdensburg.

Through the New York State Resiliency and Economic Development Initiative, crews worked to complete shoreline stabilization efforts and trail improvements at the historic site. This was a part of a \$1.3 million resiliency project awarded to the Fort de la Presentation Association in St. Lawrence County.

According to the Association, the Fort de La Presentation site, which is located in the city

of Ogdensburg, was once used during previous wars by American, Canadian, Native American, French and British people for worship, trade, and protection. Now, the site is used for the War of 1812 military reenactments and community recreation.

However, the site is located on a peninsula at the intersection of St. Lawrence and Oswegatchie rivers and has experienced extensive erosion and flooding in recent years. Through REDI funding, the Association rebuilt shorelines and trails damaged from flooding and redesigned the area to be more resilient in the event of future incidents.

"Like so many communities along the shores of Lake Ontario and the St. Lawrence River, the city of Ogdensburg is no stranger to devastating flooding and that's why New York State's REDI effort is leading the way with historic investments to help communities build back better, smarter, and more resilient," Governor Hochul said in a press release. "The Fort de la Presentation project in the city of Ogdensburg will help mitigate flooding and combat erosion, helping to maintain this historic gem for future generations while enhancing local wildlife habitat."

Specifically, the project at Fort de La Presentation stabilized shoreline on the Oswegatchie River using riprap with live stake plantings and toe wood or toe rock installations, stabilized the St. Lawrence River shoreline with rock sill stabilization with soil lifts, natural stone slab steps for access to the river, and native plantings along the shoreline and raised a portion of the Abbe Piquet Trail above flood elevation and building a new resilient overlook deck platform.

To commemorate the project's completion on October 22, local lawmakers and representatives visited the site to cut the ribbon to new trails. This included State Senator Patty Ritchie and St. Lawrence County Chairman William Sheridan.

"Fort de La Presentation is an important part of our history, which makes it critical to both preserve and protect it. In recent years, we've seen the toll record high water has taken on the Fort's property," Senator Ritchie said. "Through this project, we are ensuring it will be more resilient if faced with future flooding and in addition, are making enhancements that will allow people to better enjoy this important historical site for generations to come."

"Through these infrastructure investments, New York State is helping to ensure that the region's tourist industry remains intact," Chairman Sheridan added. "The Fort de la Presentation historic site is a treasure among community members and a favorite destination for visitors from across the state and Canada, and we are pleased to see this important project complete."

The New York State REDI program was created in the Spring of 2019. Since then, 134 REDI funded local and regional projects are underway, including 85 projects in the design phase, 21 projects in the construction phase, and 28 projects completed.

FORESTRY

St. Lawrence County Public Ash Tree Replacement Assistance Program

In partnership with the Village of Potsdam Department of Public Works, the SLC SWCD assisted the Village of Potsdam with ash tree replacement this past November.

This tree planting event arose from concerns surrounding ash trees within the village that would be lost to the invasive beetle, the Emerald Ash Borer and would need to be replaced. With the help of Potsdam's DPW, 25 new trees were planted to replace ash trees that were preemptively removed along streets and parking lots throughout the village. A variety of native tree species were selected to replace the ash trees including Kentucky Coffee tree, Northern Hackberry, Adirondack Crabapple, and Apple Service-berry. These species were selected for their tolerance to high soil pH, salt spray from roadways, and drought resistance.

These new trees will aid in diversifying the city's urban tree population, increase local stormwater runoff capacity, and help beautify roadways and parking lots within the village.

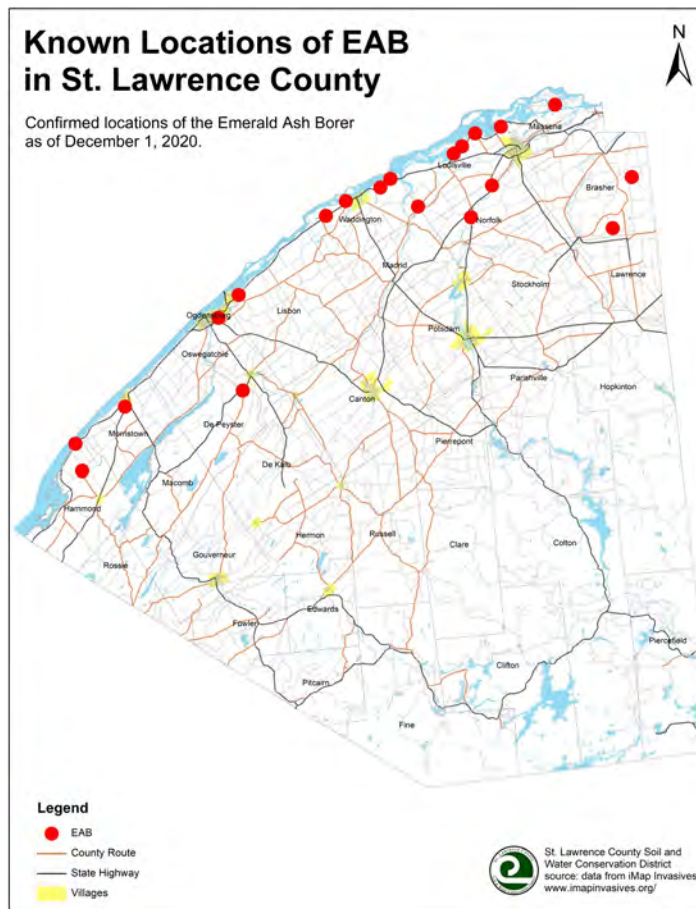


Emerald Ash Borer Update

The invasive beetle, the Emerald Ash Borer (EAB) has now been detected in St. Lawrence County in the towns of Hammond, Morristown, Oswegatchie, Depeyster, Lisbon, Waddington, Louisville, Norfolk, Massena, and Brasher. These findings are a result of the combined efforts of the St. Lawrence County EAB Taskforce, the NYS DEC Division of Forest Health and Protection, National Grid, the Saint Regis Mohawk Tribe Environment Division, and Franklin and St. Lawrence County SWCD's through detection methods utilizing green funnel traps and sentinel trees placed across the county. With its presence in St. Lawrence County, woodlot owners, homeowners, and municipalities alike will need to plan and prepare for the destructive force this forest pest presents.

EAB infested ash trees quickly decline within 3 to 5 years and lose almost all of their structural integrity, making them very likely to fall/collapse which makes them extremely hazardous. In many cases, this creates overwhelming costs and liability issues for many homeowners and municipalities in a very short period of time. Planning ahead is critical, conducting tree inventories, surveying for EAB, budgeting for tree removals, insecticide treatments, and replacement plantings all factor into management strategies for EAB.

St. Lawrence County residents and municipalities are encouraged to reach out to the St. Lawrence County Soil and Water Conservation District for guidance on preparing for EAB and the resources that are available. Please contact Aaron Barrigar at (315) 386-3582 for more information.



St. Lawrence County Soil & Water Conservation District

2021 Annual Newsletter



AGRICULTURE

Cover Crops

In 2020, the St. Lawrence County Soil & Water Conservation District was able to secure funding to help cost-share the implementation of around 250 acres of cover crops in fields that were currently in row crops and will be in row crops in 2021. The fields were successfully planted in September and October with winter rye and showed signs of growth by November.

Planting cover crops is a very beneficial practice for soil health and productivity. Cover Crops help to improve crop diversity, reduce wind and water erosion, build stable soil aggregates, build or improve organic matter, support beneficial insects and break pest insect cycles, nutrient cycling, nitrogen fixation, adjust carbon/nitrogen ratios, livestock integration, and can also be beneficial to wildlife in winter.

There is potential for funding in 2021 but it is not guaranteed. If you are interested in participating call or email our office and we will add you to the 2021 call list if funding becomes available. Priority will be given to producers that have not previously participated in the cover crop program with us before. Participation in our Agriculture Environmental Program (AEM) is required.

Below are photos of different stages of cover crops from this fall!



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John Burke

Patrick Smith

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Raeanne Dulanski
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Aaron Barrigar
District Forester

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District Technician

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Secretary/Assistant Treasurer

USDA-NRCS Staff

Kent Frary
District Conservationist

OFFICE UPDATE

The St. Lawrence County SWCD Office is still currently closed to the public at this time. Staff is doing their best to make accommodations and are monitoring voicemails and emails as quickly as possible to continue to meet our mission and help serve the local community. If necessary, appointments may be able to be arranged off-site following county COVID-19 protocols of wearing a mask and keeping a safe distance. We will continue to post updates on our website, Facebook, and voicemail to keep everyone informed about the office status when changes occur. Stay Safe and Enjoy the New Year!

COMMUNITY PROGRAMS

Agricultural Value Assessments - Possible Tax Reductions!

The St. Lawrence County SWCD continues to assist landowners interested in the Ag Value Assessment Program by preparing the soil group worksheets required for the applications. If you own or rent land that is used for agricultural purposes, you may qualify for an agricultural assessment. This program generates a report based on the productivity of the soil types on your property. This report is just part of the full application that will be handed in to your assessor. Your tax assessor then uses the information to determine whether you qualify for a reduction in property taxes. It's important to remember that only land used in agricultural practices qualifies for the assessment and a reduction in taxes is not guaranteed. It's suggested to talk to your assessor first to determine whether you qualify for an assessment. More information can be found by going to tax.ny.gov click on 'Property owners' and then on 'Agricultural assessments'.

Applications for the program are due to your assessor by March 1st. It may take the Soil and Water Conservation District some time to do the necessary paperwork and with the office being closed to the public additional time may be needed to work out the logistics of getting the required information to complete and return the worksheets, so please start the process early. There is a fee of \$30 for each tax parcel and a late fee of \$10 for each parcel submitted after February 15th.



Agricultural Environmental Management

AEM is a voluntary, incentive-based program that helps farmers make environmentally sound and economically viable decisions. The primary goal is to protect and enhance the environment while maintaining the viability of agriculture in New York. The program coordinates agricultural and environmental conservation agencies and programs as well as consultants to provide the most up to date information and create site-specific plans.

All information collected for this program is confidential, state law protects the confidentiality of AEM plans, on-farm surveys, and assessments.

Common conservation and best management practices planned to address resource concerns include but are not limited to: Barnyard Water Management Systems, Nutrient Management Planning, Waste Storage Facilities, Prescribed Grazing, Soil Management and Erosion Control

Most recent plans from our office include prescribed grazing plans, nutrient management plans and nutrient management plan up-

How does AEM work?

AEM uses a 5-tiered approach to develop and implement comprehensive, site-specific plans

- * Tier 1: Short questionnaire to identify current activities and future plans
- * Tier 2: On-site farm visit to documenting current activities, environmental stewardship and identifying and prioritizing potential environmental concerns
- * Tier 3: A site-specific plan is designed with the farm's mission, goals and objectives in mind to help provide solutions to environmental concerns
- * Tier 4: Coordinating with Environmental and Agricultural agencies and consultants to provide technical, educational and financial assistance to implement Best Management Practices (BMP's)
- * Tier 5: Ongoing evaluations to keep plans and farmers updated and help protect both the farm business and the environment.



FORESTRY



Trail Maintenance with Boy Scout Troop 41

Trail maintenance was recently completed on county reforestation land in Hopkinton with help from the Boy Scouts of America, Massena Troop 41.

The Boy Scouts assisted with clearing brush and woody debris, pruning branches, and installing foot trail markers and maps. Downed trees were cleared and intermittent stream crossings were repaired to allow passage along the 2.2-mile hiking trail.

This trail leads hikers down to the west branch of the St. Regis River for scenic river views and back up through stands of hemlocks and rock outcrop formations.

Thanks to the hard work of Troop 41, the trail is now well marked, cleared, and ready to be hiked and enjoyed by all!



The SLC SWCD would like to thank Boy Scout Troop 41 for all of their time and hard work on this project!



Appendix I

Plan Update Checklist

**St. Lawrence County
Multi-Jurisdiction Hazard Mitigation Plan
Monitoring, Evaluation and Update Checklist**

Steps to be completed, at a minimum, at the end of Years 1, 2, 3, and 4:

Meeting

- Identify members of the Mitigation Planning Committee (may need to be revised year-to-year)
- Set a meeting date and notify Mitigation Planning Committee members
 - Members should come prepared to specifically discuss status and details of pre-disaster mitigation projects or actions executed by their respective agency/organization
- Hold meeting – discuss hazard events that have occurred since last meeting or Plan Update, including:
 - Type of hazard event
 - Damages incurred
 - Cost of repairs
 - Hazard response
 - Hazard duration and recovery time
- Discuss how the HMP actions, strategies, and other information has been incorporated into local planning mechanisms and agency efforts over the past year (if applicable)
- Discuss potential municipality support needs to secure funding for or otherwise progress identified mitigation actions
- Evaluate the HMP Update by assessing:
 - Whether the goals and objectives address current and expected conditions
 - Whether the nature, magnitude, and/or type of risks have changed
 - Whether the current resources are appropriate for implementing the plan
 - Whether there are implementation problems or coordination issues with other agencies
 - Whether the outcomes, thus far, have occurred as expected
- Update the HMP by addendum if any significant changes are needed

Documentation

- St. Lawrence County Office of Emergency Services to prepare annual summary of collected information, hazard occurrences and damages, completed mitigation actions and costs, and other applicable information
- Post annual summary on County website for public review and keep in files for next formal HMP Update process

Steps to be completed end of Year 3/early in Year 4:

Grant Funding

- Submit application to FEMA for grant funding to complete next HMP Update

Steps to be completed in early/mid-way Year 4:

Plan Document

- Determine who will be the primary author of Plan Update (Consultant or In-house)

Meeting

- Inform Executive Committee members of first meeting to begin formal Plan Update process

Risk Assessment (if needed)

- Send email to participants with date and time of risk assessment event
- Complete risk assessment program with NYS DHSES facilitation

Steps to be completed in Year 5:

Plan Document

- Update pertinent sections of the Plan, Jurisdictional Annexes, and other Appendices
- Add-in hazard related details that were collected during annual Mitigation Planning Committee meetings

Meetings

- Hold Mitigation Planning Committee meeting(s) to discuss and revise Plan Update
- Hold meetings and discussions with participating jurisdictions to update information relevant to each jurisdiction and revise each jurisdiction's previous risk assessment
 - Discuss how the HMP actions, strategies, and other information has been incorporated into local planning mechanisms since the last Plan Update
- Hold public information meeting(s) to solicit comments on Plan Update

Plan Approval Process

- Submit final draft to NYS DHSES for review
- Complete NYS DHSES revisions and respond to comments, if necessary, and submit Plan Update to NYS DHSES and FEMA for pre-approval
- Complete FEMA comments, if necessary, and re-submit
- County and participating jurisdictions pass resolutions accepting the Plan Update – include resolutions in Appendix D

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