St. Lawrence County Environmental Management Council
49½ Court Street
Canton, New York 13617-1169
Phone: (315) 379-2292 Fax: (315) 379-2252
E-mail: **Planning@stlawco.org**
Web Site: https://www.stlawco.org/Departments/Planning/AdvisoryBoards/EnvironmentalManagementCouncil

MEETING MINUTES

Wednesday July 21, 2021 6:00 PM
2nd-Floor Conference Room, Public Safety Complex
49½ Court Street, Canton, NY

Action items in bold italics / Motions underlined

1. **Call to Order:** In the absence of the Chair, Vice-Chair Rau called the meeting order at 8:06pm.

2. **Roll Call, Determination of Quorum:** ***A quorum was NOT present.***
Members present: Dustin Bowman; Herb Bullock; Sue Rau, Vice-Chair; Lance Rudiger; Tiernan Smith; Nicole Terminelli, BOL Liaison; Rod Tozzi; Brian Washburn.
Members absent: Catherine Bennett, Chair; Joseph Brant; Lucas Hanss; Steve Manders; Richard Marshall; Pat Whalen, Secretary.
Guests: Susan Powers (Clarkson); Lee Wilbanks.
Staff: Dakota Casserly; John Tenbusch.

3. **Acceptance of Order of Business, Items for New Business, Items for Unfinished Business**
   a. Tenbusch and Casserly discussed a few new items that will be addressed later in the agenda.

4. **Approval of the Minutes of the May 2021 EMC Meeting**
   a. A quorum was not present. Therefore minutes were not approved. There was not an EMC meeting during June.

5. **Hearings, Comments from the Public**:

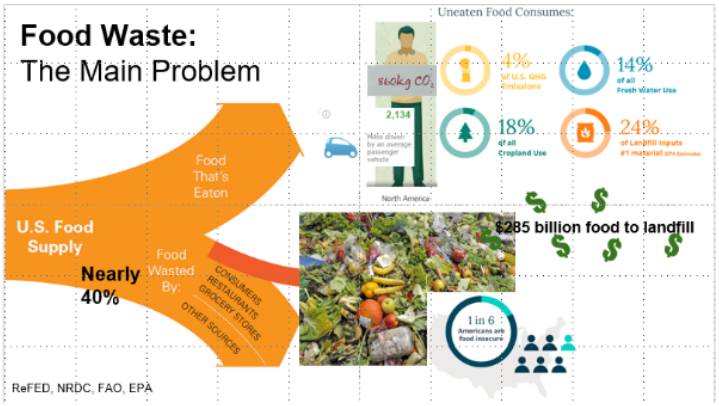
The speaker for this EMC meeting was Dr. Susan Powers, the Spence Professor of Sustainable Environmental Systems, and the Director of the Institute for a Sustainable Environment, at Clarkson University.

Dr. Powers presented her project to "increase community awareness and stakeholder engagement in order to develop a plan for a community-scale food waste management program in Potsdam."

Power presented a series of slides that she has used for community workshops in the area. The project is coordinated through the Potsdam Climate Smart Communities Task Force, which is comprised of individuals from Clarkson University, SUNY Potsdam, and the Potsdam community.

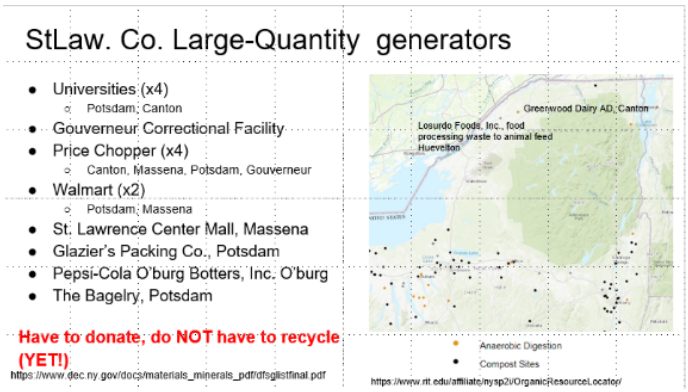
EMC: Everybody Must Care!

Exploring and understanding the scale of food waste management is the goal of this project. In the US, 40% of the food supply is wasted, and just 15% of this waste could feed around 25 million people. Also, if food waste was a country it would be the 3rd highest GHG emitter, behind China and the US. Lastly, food waste from the average US household is roughly 6.5 lbs./week.



Part of their focus is on the large-scale food generators in the area i.e., supermarkets, restaurants, and wholesalers (commercial). These generators produce almost 50% of the all food waste. Of this waste, 50% ends up in the landfill and they are working on solutions to divert waste from landfills to other uses like: composting, digesters, etc.

The NYS Food Donation and Food Scraps Recycling Law will take effect in January 2022. It will "require business and institutions that generate 2 tons of wasted food per week to donate excess edible food and recycle remaining food scraps it they are within 25 miles of an organics recycler (composting facility, anaerobic digester, etc.)." Some of the large generators in the County are: the 4 universities, Price Chopper(s), Gouverneur Correctional facility, and multiple Walmart(s).



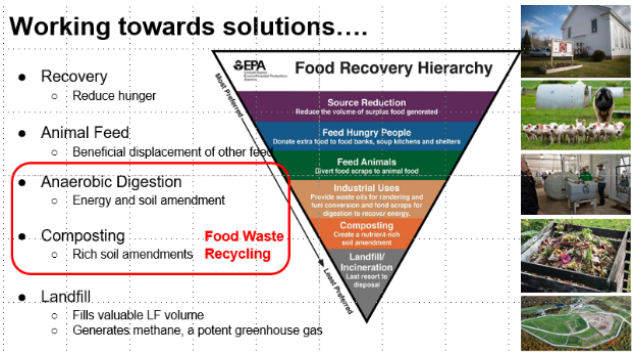
Currently, there are no facilities in the County to handle their food waste, causing exemptions for the aforementioned generators. It's worth noting that St. Lawrence University and the Village of Canton have a composting partnership on University-owned land. Further, there is a digester at the Greenwood Dairy, and Losurdo Foods in Heuvelton accepts food waste, however the scale and operations are not fully understood.

Powers and her group are looking at this law for potential opportunities. For example, assisting in the development of large- and small-scale composting facilities and connecting edible food waste to those in need. Both are challenging, however there is opportunity for new composting businesses.

In addition, making the connection to get food to those in need is a challenge because there is really no formal organization among food panty type facilities in this part of NYS. There were some questions about the shortcomings of the law, however there is hope that the law will drive the business development needed to accomplish its intent.

Powers talked about the food recovery hierarchy, which intends to: reduce surplus food generation, feed hungry people, feed animals, create industrial energy uses, increase composting, and avoid landfills. Her group sees a lot of opportunity in the area for composting; one possible option is low cost loans from the IDA for small farmers to build small-scale composting facilities.

There is a need for improved organization among all stakeholders involved with composting/food waste. They are planning a pilot project in Potsdam that they hope can scale countywide. More publicity and workshops are in the plans on this very important topic



A small-scale composting operation in Saranac Lake was shared with the EMC: Blue Line Compost.

Presentation discussion:

- Terminelli talked about the Massena municipal waste operation, where residents need to separate their waste.
- Powers talked about the possibility of Casella taking food waste.
- Bowman talked about Vermont initiatives, the State is encouraging this in many ways for small and large players.
- Bowman talked about how we recycle glass and why can't we do the same with food waste.
- Smith talked about the opportunities, if there's a way to make money, someone will do it.
- Tenbusch talked about County school composting programs, Colton and Hermon-DeKalb (tumbler, designed by Clarkson).
- Smith talked about the Onondaga Lake remediation project and how compost generated from County was used to reconstruct lands around the lake.
- Powers said that this is not a new technology; it just needs drivers to push it.

6. Report by the Representative of the Board of Legislators (Nicole Terminelli)

a. Terminelli talked about the ongoing public comment period for the Lake Ontario maritime park, ***she will share a link for draft***.

i. Bullock suggested the EMC draft a letter of support.

1. ***Tenbusch said staff will draft a letter for approval at the August meeting***.

7. Report of the Committees

a. **Conservation of Resources Committee:** See attached.

i. Casserly gave the report.

ii. Tenbusch talked about the Nicandri Nature Center in Massena as a possible location for holding a future meeting.

b. **Environment and the Economy Committee:** See attached.

i. Casserly and Smith gave the report.

ii. Smith talked about a DEC program that connects hunters with organizations that take donated venison.

c. **Invasive Species Committee:** See attached.
   i. Washburn gave the report.
   ii. Rudiger talked about historical funding for Black Lake remediation. A report was generated, but there is no account of remediation. Also, he questioned the funding request allocation being split more evenly among the County and Towns.
   iii. Washburn reminded the Board about an AWI (Adirondack Watershed Institute) webinar about milfoil management. Also, he expressed the need of a lake management plan for Black Lake.
   iv. Smith asked about using a portion of land assessment funds for Black Lake management for waterfront owners.
   v. Rudiger talked about contaminated waterbodies upriver from Black Lake and their potential impact to down river waterbodies
      1. Tenbusch expressed the need of a lake management plan.
   vi. Terminelli and Bullock asked, if a plan is developed, how do we know it would be implemented.
      1. Rau replied that all of the stakeholders need to be on the same page to make it happen.
   vii. Tenbusch talked about how the EMC can help bring cohesion with all groups in the development of a plan. SUNY Oneonta's Lake Management Program is a resource for this type of thing. The Planning Office could do a "desk" study as well.
   viii. The EMC, agreed by consensus, to send a letter of support to Legislators Lightfoot and Reagan with regards to the Black Lake Association's request for funds for milfoil management.

d. **Watershed Management Committee:** See attached.
   i. Washburn gave the report.

8. Report of the Staff: None.

9. Unfinished Business: None.

10. New Business: None.

11. Announcements:
   a. Casserly talked about environmental news that is sent to EMC members.
   b. Casserly talked about upcoming phone call with Dick McDonald, DEC Biologist, to talk about fishways on the Oswegatchie River.
   c. Tenbusch talked about the August meeting, 8/18, at the Waddington Town Beach, food at 5pm, sign-up in advance, $5 per household, and bring a dish to share. There will be a short business meeting.

12. Message to Board of Legislators: None.

13. **Next Meeting:** August 18, 2021 for the 19th Annual EMC Picnic at the Waddington Town Beach.

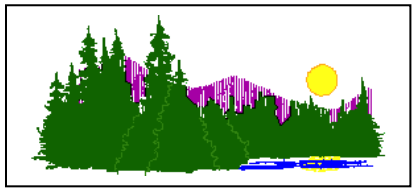
14. **Adjournment**: The meeting adjourned at 8:37 pm by consensus.

Respectfully submitted by:

Patrick Whalen

Patrick Whalen, Secretary

Minutes drafted by Dakota Casserly



SLC EMC Action Item Agenda for Conservation of Resources Committee

Members: P. Whalen, chair; C. Bennett; R. Marshall; S. Rau; T. Smith.
STAFF: Dakota Casserly **Guest:**
Meeting Date: Wednesday July 14, 2021 at **4:45 PM** via Conference Call

Time	Item	Outcome	Responsibility	Next Steps
4:45pm	Meeting starts	Committee members to call in: 1-605-475-2090 Access Code: 1197050#	Committee members	
4:50	Review Report of last meeting	Mtg Report 5.12.2021		
4:55	Discuss Priority Projects For 2021	• Report on working with Youth Advisory Board on green-energy projects and future projects • Wise use of resources – Progress with Trashpresso – Growing hemp as an alternative to wood – How to measure personal consumption • Conservation of flora/fauna – Blandings/other turtles – Spruce Grouse • Climate Crisis – Analysis of Biden's climate plan	All	See below
5:20	Discuss speakers for EMC meetings	This Committee will provide at least 3 speakers per year on CR topics for EMC meetings • Large-scale composting, Bowdish and/or French • Methane digester	All	• Cat Bennett - January • See below
5:25	Discuss ideas for EMC Public Service Announcements	This Committee will develop 3 PSAs per year on CR topics	All	TBD
5:30	Set date/time for next mtg.	**Next mtg: August 11, 2021**		
5:30pm	Adjourn			

Attendance: S. Rau, L Hans, D. Casserly, D. Bowman
Absent: P. Whalen, R. Marshall, T. Smith

Discussion (Action items in **bold)**

May reports

- Report on working with Youth Advisory Board on green-energy projects and future projects
  - Rau felt the organization of the event was well done.
  - Additional events to suggest, Bowman, trail cleanups, Rau, Hazardous waste cleanup coordination with YAB
    - Canton Heritage Park cleanup, community gardens, invasive plant pulls, SLU trails (replace invasives with natives), etc.
    - Hans suggested wildflower planting, Bowman suggest some potential sites (lasagna gardening (no dig, no till)).
      - Sites will need mowing coordination, event will need visibility vests.
    - **Bowman will share a Google Doc to share with the Committee to gather ideas.**
  - Rau and Hans talked about a free tree giveaway event
    - County Soil and Water and District tree resources (**Bowman will check)**
    - NYS DEC Trees for Tribs program.
    - Rau mentioned a past EMC project.
  - **Casserly will contact YAB for operation details and coordination best practices.**
- Wise use of resources
  - Progress with Trashpresso
    - Tabled, until we have an update from C. Bennett.
  - Growing hemp as an alternative to wood
    - Hans mentioned other uses for hemp.
    - Bowman asked, what are the economics of planting hemp as a cash crop and then compare this to corn and soy.
    - Hans mentioned a local company: Grasse River Hemp.
    - **Rau will call CCE for info on hemp**.
  - How to measure personal consumption
    - Rau mentioned electric consumption calculators and thinks they are all very similar.
    - Possible Marshal project.
    - Bowman talked about a mapping project to show businesses that are using less plastics, reusable containers, etc.
      - Hans talked about the coffee house example during covid. Also, he suggested a grading scale for rating businesses.
      - Possible joint project with the YAB
      - Hans suggested a certificate for businesses.
      - Bowman talked about a potential slogan: “less plastic, more community.”
      - Bowman talked about incentives for business to reduce plastic use.
      - **Winter project, Bowman is interested in leading.**

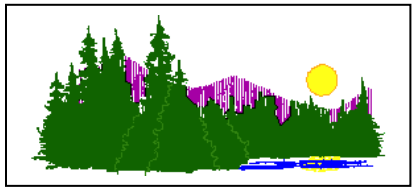
- Conservation of flora/fauna
  - Blandings/other turtles
  - Spruce Grouse
    - G Johnson (SUNY Potsdam prof.) researches both.
  - Natural pollinators, Aswini Pai (SLU Biology prof.), a possible presenter.
  - **Rau will check with the Nature Center in Massena about flora/fauna topics**
- Climate Crisis
  - Analysis of Biden's climate plan
    - Tabled.

Speaker: SUNY Potsdam Profs: G Johnson (turtles, grouse), Jess Rogers (invasive species), Ray Bowdish (composting).

- Rogers presented to the EMC 3/17/21.
- **Hans will contact G. Johnson.**

Next Meeting: 8/11

Adjourn: 5:30pm



SLC EMC: Action Item Agenda for Environment + Economy Committee

Members: T. Smith, Rod Tozzi,
Staff: D. Casserly **Guest(s)**:
Meeting Date: Monday, July 12, 2021 **at 5:00 PM** via Conference Call

Time	Item	Outcome	Responsibility	Next Steps
5:00 PM	Meeting starts	Call 1-605-475-2090 Access: 1197050#	Committee members MUST CALL IN	
5:05	Review Report of Last Committee mtg	• See Meeting Report from May	All	
5:30	Priority Projects for 2021	1. Fish Ladders/Passage Project on the Grasse and Oswegatchie Rivers. 2. TLAS Conference Call (Smith) 3. PSA (see below) 4. SMRT fish studies update (Smith) 5. Ogdensburg dam FERC relicensing update (Casserly) 6. New projects	All	Confirm project details with DEC contact (J Lantry) Waiting on discussion with TLAS New project: examine deer nuisance program and possible connection with food banks
5:45	Discuss speakers for EMC meetings		All	DEC deer nuisance program expert
5:50	Develop Pub. Service Announcements	This Committee will develop 3 PSAs per year on E+E topics (at least 1)	All	
5:55	Set date/time for next meeting	**August 8, 2021 @ 5pm**		
6:00	Adjourn			

Discussion:
Attendance: Herb Bullock, Rod Tozzi, Dakota Casserly
Absent: Tiernan Smith

Rubric for evaluating waterbody funding, ask for Black Lake milfoil
- Where does this stand, check with B. Washburn,

May report, no questions.

Priority projects

1. Fish
    a. Ladder, what is the hesitancy from the Madrid location, Ogdensburg opportunity will be considered during FERC relicensing.
    b. Tozzi, feels that we need to move on this or drop it.
    c. Do we go to BOL with our eventually PSA, yes and release it via local news outlets.
    d. We need to confirm our questions to the DEC about introducing Atlantic salmon, what are the issues, physiological, biological, etc..
        i. **Casserly will draft, share with the committee, then send on to Jana Lantry at DEC.**
    e. Bullock and Tozzi suggest that we contact Lantry with questions for her to confirm per Atlantic salmon.
    i. We will present the same questions to TLAS.
2. TLAS
    a. No response yet.
    b. Tozzi and Bullock would still like hear from them in-person.
    c. Smith is still working on coordinating a call.
3. PSA
    a. Paused until steps above are complete.
4. SMRT - No discussion
5. Ogdensburg FERC - **Casserly will get the details**
6. New Projects
    a. Tozzi asked about deer tags to farmers (dairy) to take deer out of season, 125/farm, Tozzi thinks this number is high. Questions for DEC, specifics of this program, what is the sweet spot among DEC, farmers, hunters, to trim deer population to protect crops. What is the connection, if any to food banks for the meat.
        i. Bullock referenced nuisance permit.
        ii. How could hunters salvage nuisance deer instead of letting them lie.
        iii. How do food banks handle deer meat
        iv. DEC contact for nuisance deer program. **Casserly will investigate.**
            1. Joe Lydon, joseph.lydon@dec.ny.gov, 315.274.3346 (email sent)

Speakers: DEC deer nuisance expert

Pub Service Announcement

Adjourn: 6pm

St. Lawrence County Environmental Management Council
Invasive Species Committee / Watershed Management Committee
Joint Meeting
Tuesday July 13, 2021

Meeting started at 1:05 PM.

Present: Sue Rau, Chair, ISC; Brian Washburn, Chair, WMC; Lucas Hanss. Dakota Casserly and John Tenbusch attended as staff.

Review Previous Committee Meeting Reports. No comments.

Review Activities re Milfoil at Black Lake

- There was a discussion about the meeting held May 14th with Michelle Gallagher and Mike Kotash of the Black Lake Association. See attached report.
- Casserly reported on subsequent communications with M. Gallagher.
- Washburn reported that he had filled out for Black Lake his Draft Rubric for Financial Assistance by St. Lawrence County – Invasive Species Control for Waterbodies.
    - Washburn's rubric gave Black Lake a score of 13 out of 20 points. See attached.
- There was significant discussion about what should be the next steps for the EMC regarding the request by the Black Lake Association for financial assistance from the SLC Board of Legislators to conduct milfoil remediation this year.
    - It was noted that the EMC was asked by Legislators Lightfoot and Reagen to get involved in this project. It seems appropriate to respond directly to them.
    - Tenbusch proposed that he will draft a letter, addressed to Lightfoot and Reagen, that
        - Reports on the EMC's activities re: the Back Lake project,
        - Recommends that the BOL assist this year's milfoil remediation program,
        - Commits staff and EMC committee efforts to update the Black Lake Milfoil Management Plan. See attached.

The meeting ended at 1:30 PM.

Tenbusch, John

From: Tenbusch, John
Sent: Friday, May 14, 2021 4:38 PM
To: Lightfoot, Joseph (Hon.); Reagen, James (Hon.)
Cc: a-Jason; Nicole Terminelli
Subject: EMC: Report of meeting today with Michelle Gallagher and Mike Kotash, Black Lake Ass'n

Good afternoon.

I wanted to let you both know that Dakota Casserly and I held a meeting today with Michelle Gallagher and Mike Kotash, of the Black Lake Association. Also present were Sue Rau and Brian Washburn; Sue is the Chair of the EMC's Invasive Species Committee, while Brian chairs the EMC's Watershed Management Committee.

The meeting started at 10 AM and lasted approx. 1½ hrs. Michelle and Mike described the recent efforts by the Black Lake Association to make progress on the problem of increasing infestation of the Lake by Eurasian Watermilfoil. They provided some background information about earlier efforts to control milfoil.

There was discussion about the recommendations found in the Black Lake Eurasian Watermilfoil Management Plan, released in 2008 (http://blacklakeny.com/wp-content/uploads/2018/09/FINAL_Black_Lake_milfoil_plan_07_14_08-1.pdf), and about how the management methods recommended in that Plan do not seem to be practical today.

Discussion then turned to objectives: Immediate; Near-Term; and Long-Term.

- The Immediate objective is to find funding to support harvesting of milfoil in the Lake in 2021 (potential cost: ~ $30,000.) Michelle Gallagher has written at least three grant applications asking for funds; evidently, she has talked with Mr. Lightfoot about possible BOL support. It was suggested that she approach the six towns that surround Black Lake and ask them to make some contribution to this operation; it was felt that a stronger argument could be made to the County if the surrounding towns are participating, and it would make a stronger argument to the towns if the County is participating.

- A Medium Term objective is to update the Black Lake Milfoil Management Plan. This is where the EMC and the County Planning Office can be of assistance. We can help to find (an) appropriate funding source(s) for this planning effort; we can participate throughout the process. Mike Kotash will be contacting SUNY Oneonta about their Lake Management Program.

- Finally, the Long-term objective will be to implement the recommendations of this updated Management Plan. Again, the County Planning Office and the EMC can assist the Black Lake Association to begin this process. Over the longer term, the BLA and the Black Lake communities will need to work independently.

To summarize: the Black Lake Association is seeking funds to support milfoil harvesting this summer. Then a Management Plan will be developed; this Plan can be the foundation for future funding requests to NYS and other agencies to underwrite longer term objectives.

We will meet again after July 4th, to reassess current plans and progress, and to see what new issues may have arisen.

Please feel free to contact me with any questions.

Black Lake Association Request for Financial Assistance by St. Lawrence County

Invasive Species Control for Waterbodies

The following draft rubric has been developed to assist the St. Lawrence County Board of Legislators in reviewing requests for funding to control invasive species.

Is the waterbody surrounded by private lands, the watershed of the waterbody contained within the private lands and there is no public access? If yes do not proceed any further if no record a 1	1
Has the waterbody received support from SLC in the past? If yes record a 1 if no record a 0	1
Have other local organizations with interest in the waterbody been identified? If yes record a 1 if no record a 0	1
Are there letters of support for SLC funding from other local organizations and all local governments the waterbody is within their boundaries? If yes record a 1 if no record a 0.	1
Has any financial assistance from the above been obtained or promised? If yes record a 1 if no record a 0.	0
Has financial assistance from other sources been applied for or has been granted? If yes record a 1 if no record a 0.	1
Is the waterbody bound by NYSDEC forests or WMA's? If yes record a 1 if no record a 0	0
Is the public access constructed and maintained by SLC, a local government, government authority, organization, or NYSDEC? If yes record a 1 if no record a 0.	1
Has annual usage statistics of public access been provided? If yes record a 1 if no record a 0	0
Is the waterbody on the NYSDEC WI/PWI listing? If yes, record a 1 if no record a 0.	1
Has the latest WI/PWI report been provided? If yes record a 1 if no record a 0.	0
Is there a lake association? If yes record a 1 if no record a 0.	1
If there is a lake association, is the membership percentage of shoreline property owners that are active members to the association greater than 75%? If yes record a 1 if no record a 0.	0
Is the lake association an active member of NYSFOLA? If yes record a 1 if no record a 0.	1
If a member of NYSFOLA has the association participated in CSLAP? If yes record a 1 if no record a 0.	1
If the lake association is a member of NYSFOLA and has participated in CSLAP are the CSLAP reports current? If yes record a 1 if no record a 0.	0
Has an invasive species management plan or a watershed management plan been developed? If yes record a 1 if no record a 0.	1

If an invasive species management plan or a watershed management plan has been developed have any of the priority recommendations of the plan(s) been implemented? If yes record a 1 if no record a 0.	0
Are there any active research programs currently assessing the water body for the problem identified or other potential problems? If yes record a 1 if no record a 0.	1
If the water body has public access has the economic impact of the public access been evaluated? If yes record a 1 if no record a 0.	1
Score Total	13/20

The organization applying for financial support from St. Lawrence County to control an invasive species should use the rubric as a guide in the preparation of the request. The rubric contains questions which the Environmental Management Council has deemed relevant to the evaluation of a request for aquatic invasive species control funding by the Board of Legislators.

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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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:
[1]The 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.
[2]The 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 m^2 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

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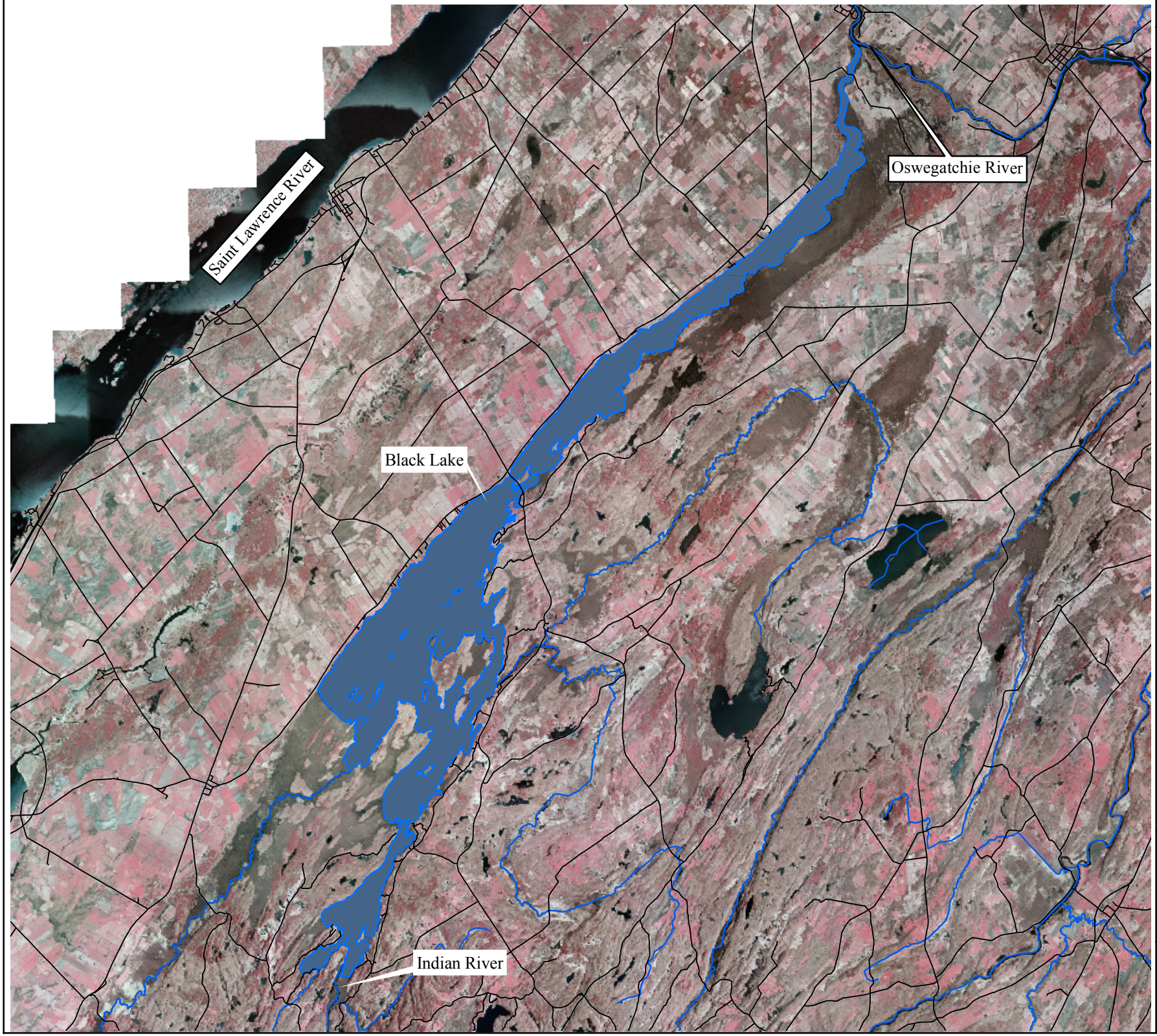

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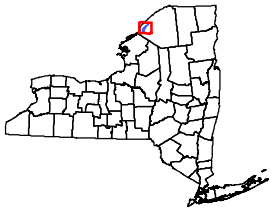

SCALE

0 1 2 Miles

LEGEND

- Roads
- Black Lake
- NHD Hydrography

Note: Aerial photos are color infrared photography taken in 2003.

Figure 1-1.
Black Lake, NY
Regional Location

QEA
Quantitative Environmental Analysis, LLC

BLKmil July 2008

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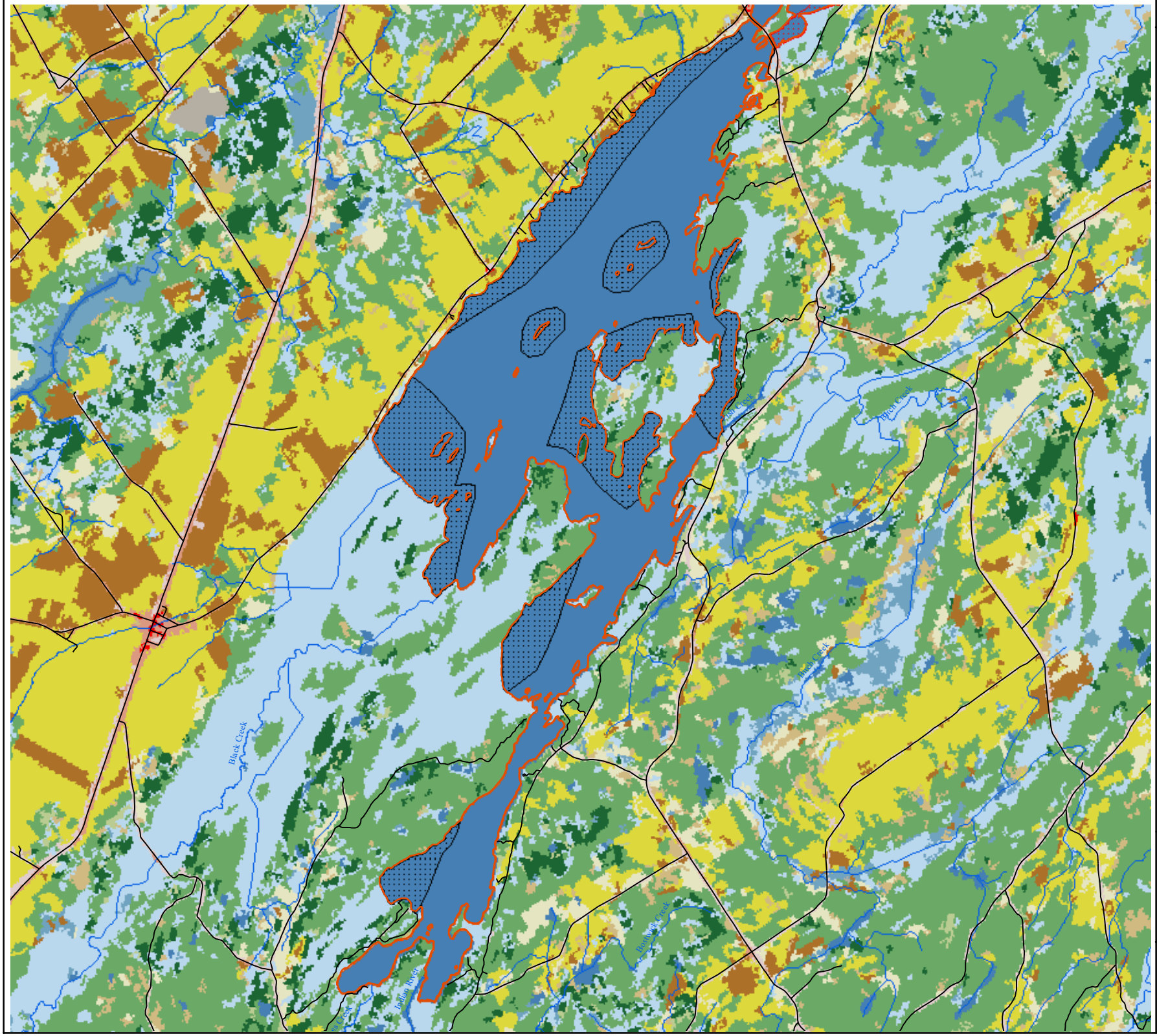

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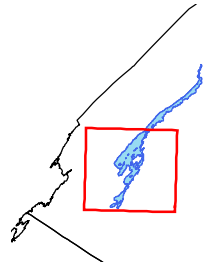

SCALE

0 0.5 1 Miles

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

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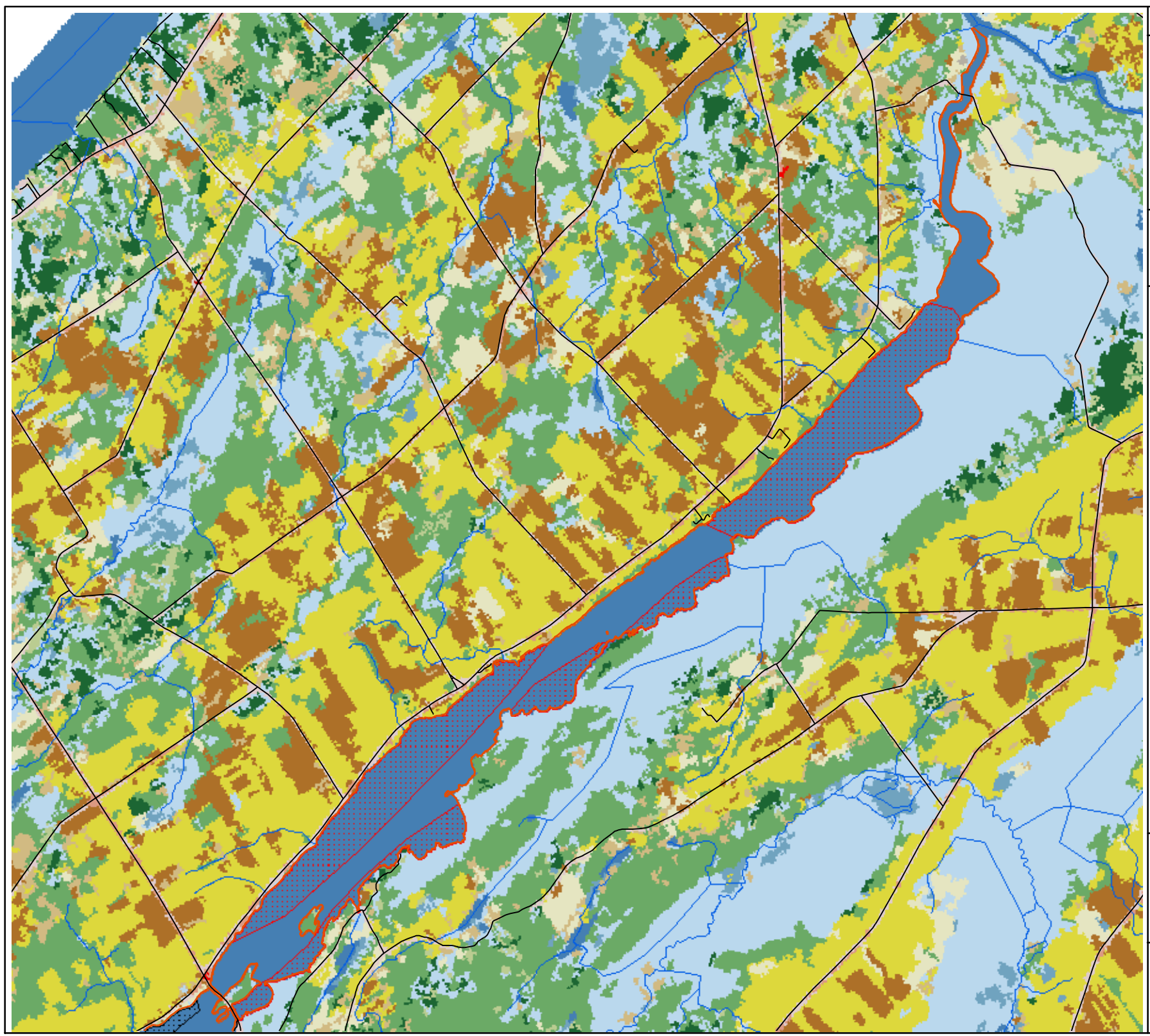

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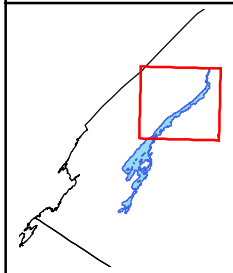

SCALE

0 0.5 1 Miles

LEGEND

- Roads
- NHD Hydrography
- Black Lake

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- grassland
- pasture
- cultivated crops
- woody wetland
- herbaceous wetland

Figure 1-2b. Eurasian watermilfoil distribution in Black Lake and surrounding land-use: north

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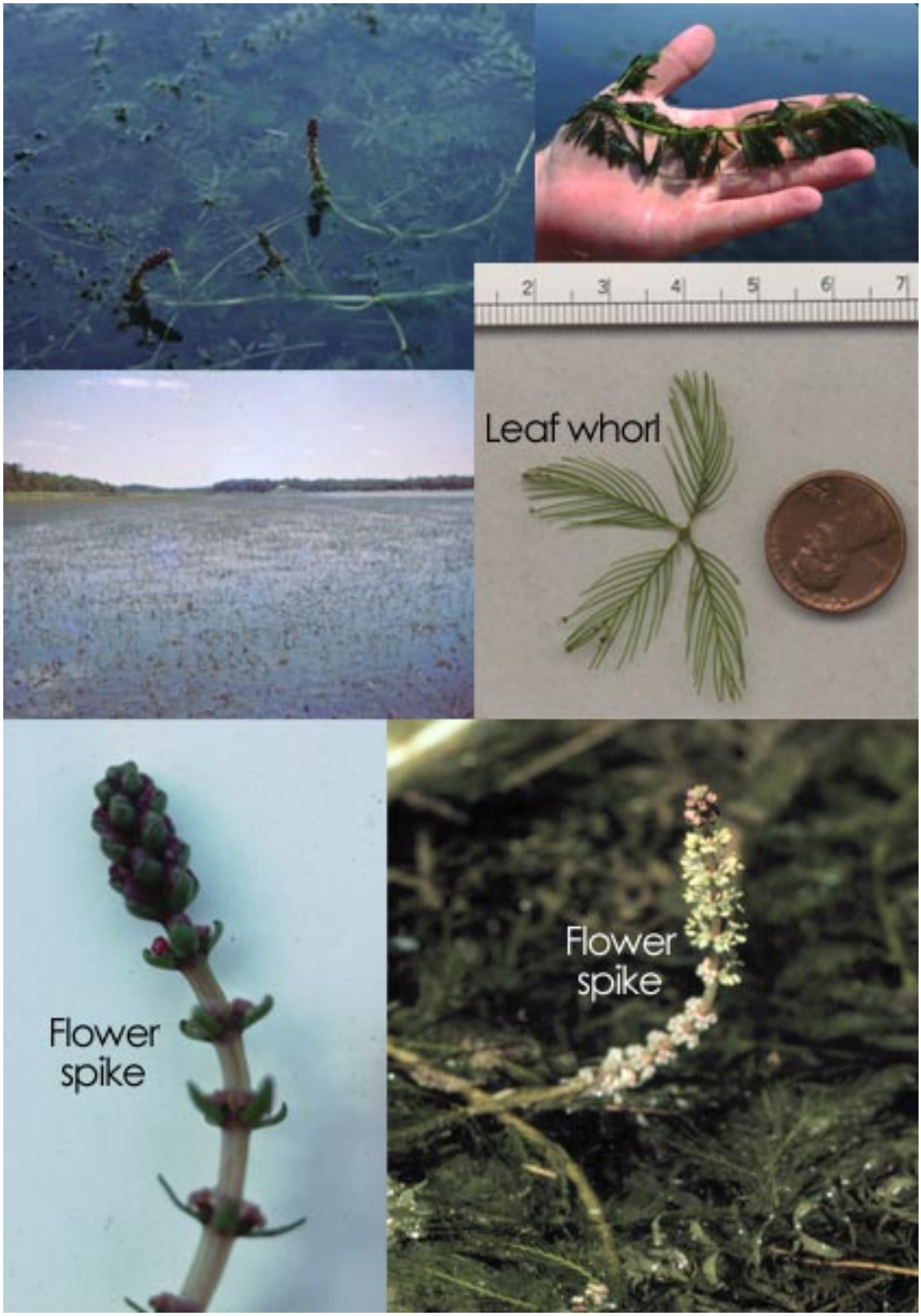

Figure 1-3. Schematic showing the growth form and physical characteristics of Eurasian watermilfoil (Maryland DNR 2008).

APPENDIX A
SELECTED EURASIAN WATERMILFOIL EXPERIENCE IN NEW YORK STATE

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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).