

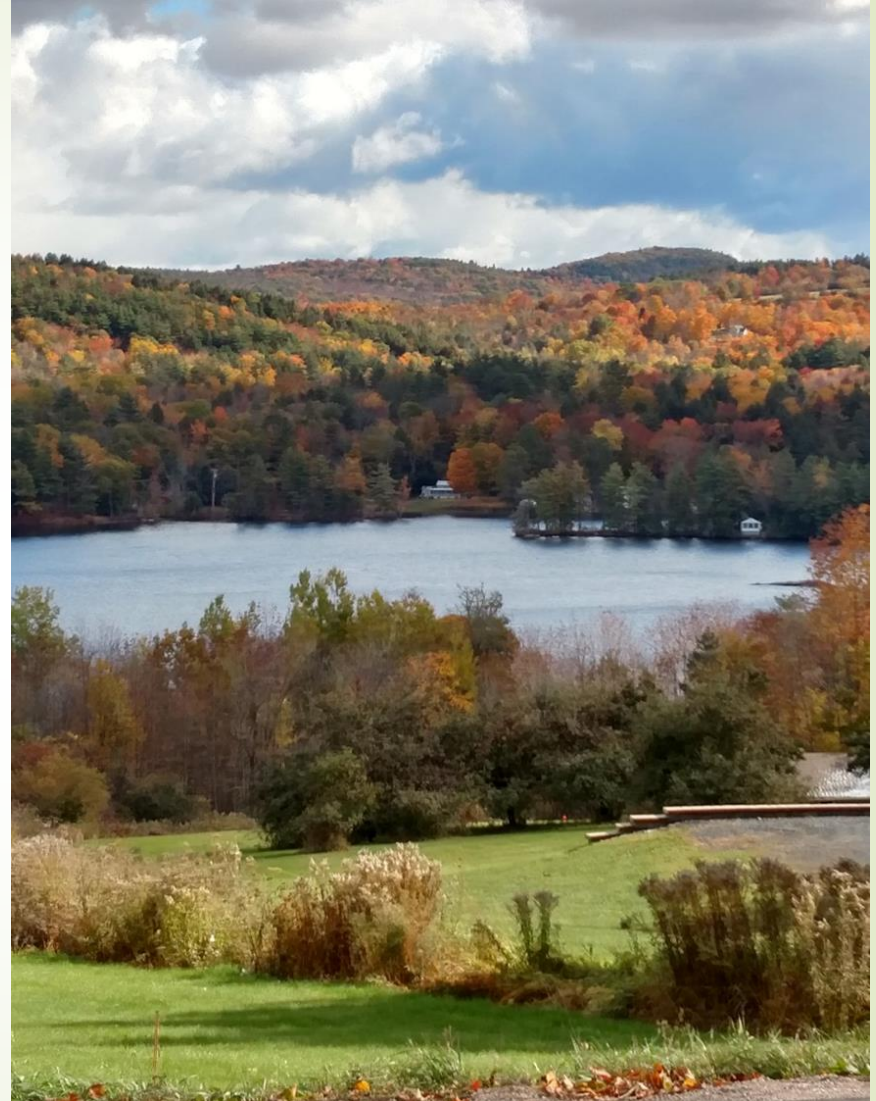


**Lake Iroquois
Association**

WWW.LAKEIROQUOIS.ORG

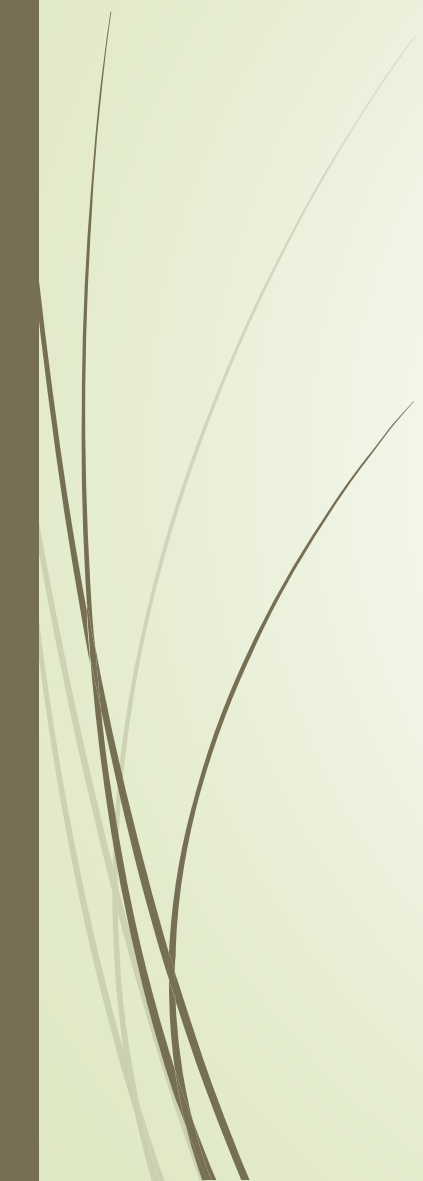
LAKE IROQUOIS

- **247-acre Lake in Chittenden County**
- **Surrounded by four towns: Williston, Hinesburg, Richmond, St. George**
- **Public beach and public boat access at the north end**





LAKE IROQUOIS ASSOCIATION

- **All-volunteer 501(c)(3) organization founded in 2007**
 - **Faced two major problems**
 - **High nutrient content with sediment visibly washing into the lake**
 - **A large and spreading Eurasian watermilfoil (EWM) infestation**
- 

LIA Projects



THE LAKE SHORE PROPERTY OWNER'S MANUAL



Lake Iroquois Association



Donate

Lake Wise Award



Lake Friendly Living

Vermont Agency of Natural Resources
www.anr.state.vt.us

www.lakeiroquois

Invasives ▾ Water Quality ▾ Enjoying the Lake ▾ News & Events ▾ How to Help ▾ About Us ▾

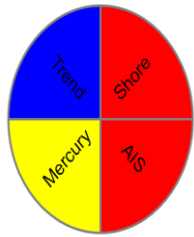


Nestled amid the rolling hills of mid-Chittenden County, Lake Iroquois is a 237-acre spring and tributary-fed body of water surrounded by the towns of Williston, Hinesburg, Richmond and St. George. The Lake Iroquois Association is a steward of this haven for recreation and wildlife and the surrounding ecosystem.

Highly Significant Decrease in Phosphorus Levels Continues

LAKE IROQUOIS

[Learn How Lakes Are Scored](#)



Lake Area:
247 acres

Basin Lake Area Ratio:
10

Max Depth:
11.3 meters

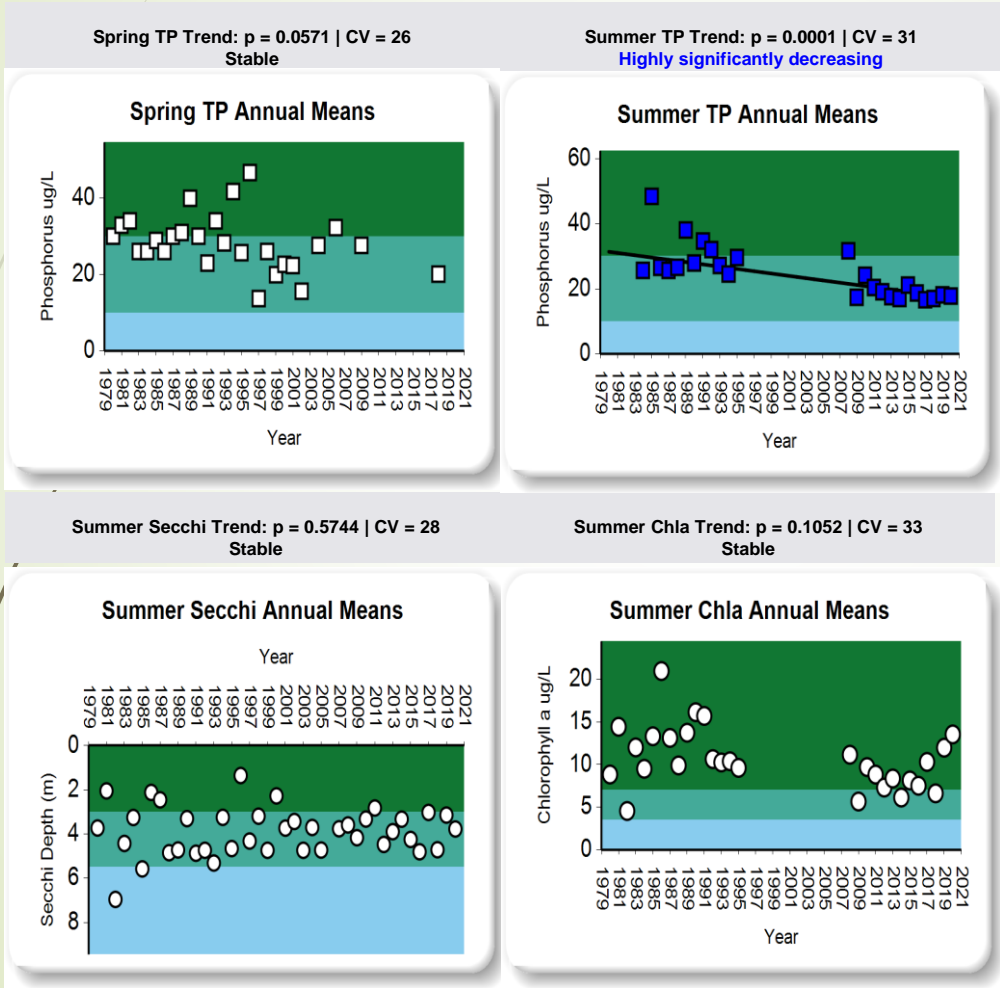
Mean Spring TP:
28.2 ug/L

Mean Summer TP:
25 ug/L

Mean Summer Chla:
10.7 ug/L

Mean Summer Secchi:
3.8 meters

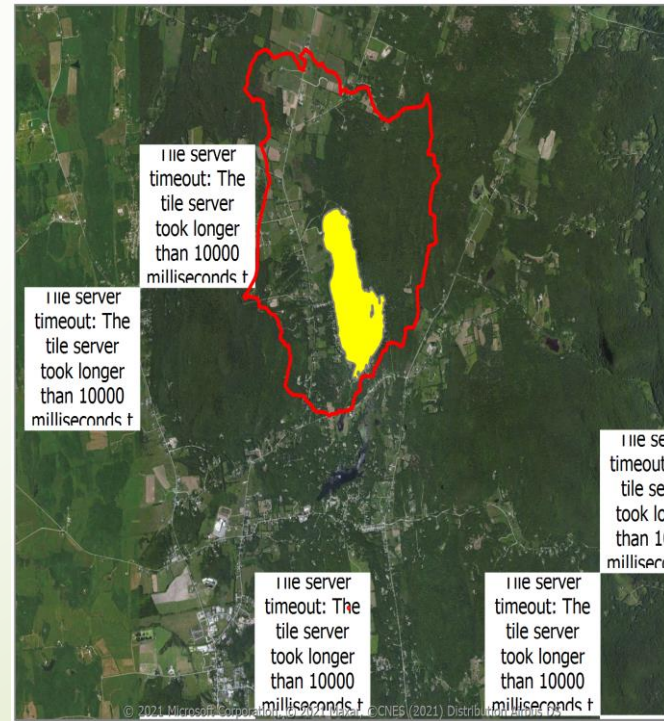
Hypereutrophic
Eutrophic
Mesotrophic
Oligotrophic



Trend Score: **Good**

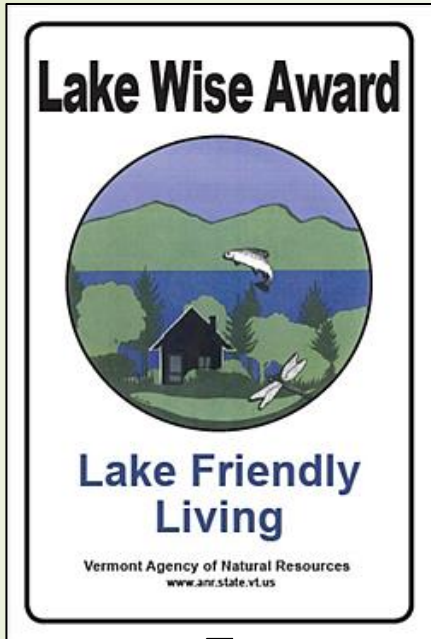
WQ Standards Status: **Stressed**

Watershed Score: **Highly Disturbed**



Stresses / Impairments

Stressed -- Phosphorus



VT DEC 2022 Lake Wise Gold Recipient

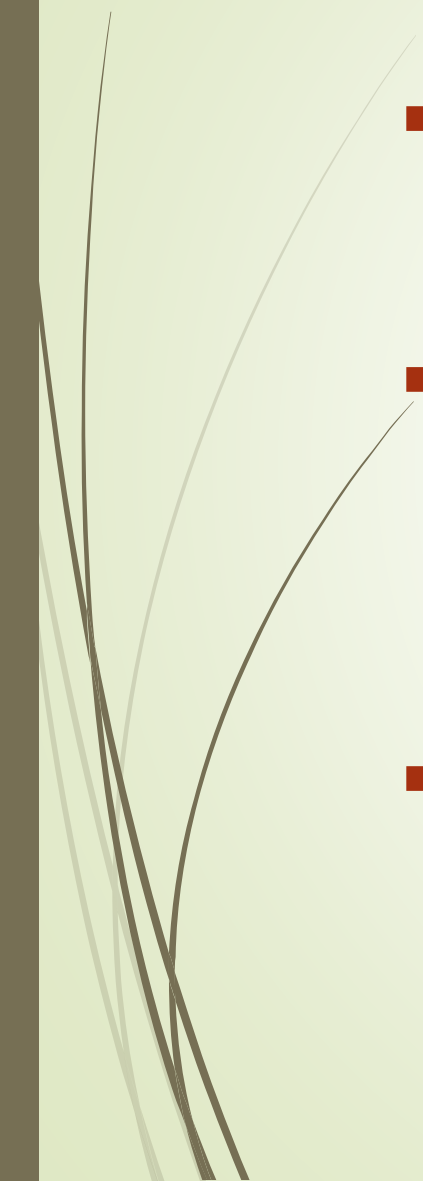
3rd Lake
Awarded in
Vermont











First Steps

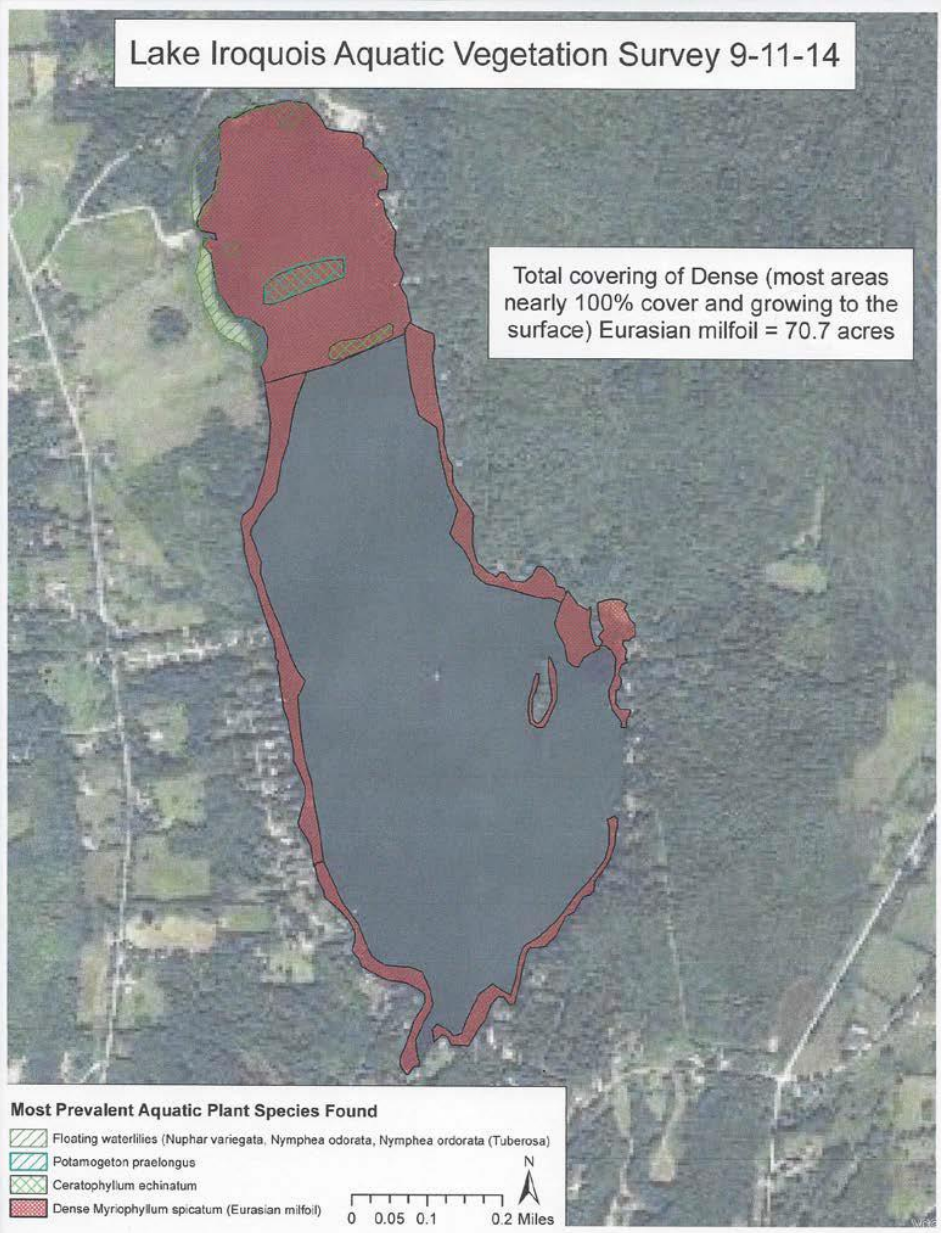
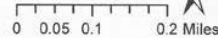
- **Quantification and tracking of the problem**
 - **Understand the problem: Review the research: How Eurasian watermilfoil (EWM): grows and spreads, its effects on ecosystems**
 - **Research options for reduction and control**
- 

Lake Iroquois Aquatic Vegetation Survey 9-11-14

Total covering of Dense (most areas nearly 100% cover and growing to the surface) Eurasian milfoil = 70.7 acres

Most Prevalent Aquatic Plant Species Found

-  Floating waterlilies (*Nuphar variegata*, *Nymphaea odorata*, *Nymphaea odorata* (Tuberosa))
-  *Potamogeton praelongus*
-  *Ceratophyllum echinatum*
-  Dense *Myriophyllum spicatum* (Eurasian milfoil)




What the Scientific Literature Says

- **Threat to biological diversity, second only to habitat loss (Wilcove et al. 1998).**
- **Has been shown to displace native species in a span of two to three years. (Lind and Cottam 1969) (Lillie and Budd 1992) (Nichols and Mori 1971)."**
- **Can alter the chemical and physical properties of water, can accelerate eutrophication by releasing nutrients, especially phosphorus (Carpenter 1980).**
- **Its decomposition and the increased respiration rates of microbes will lead to lower dissolved oxygen levels in the water column (Grace 1978, Bates 1985)**
- **Can reduce predation success of larger predator fish, such as largemouth bass, leading to a reduction in the populations of these fish (Engel 1987)**
- **Reduces spawning success by covering the spawning grounds (Newroth 1985.)**
- **Invasive species are estimated to cost \$1.4 trillion globally (Pimentel et al. 2001)**
- **Presence of Eurasian watermilfoil has been shown to have a major impact on land values (Horsch and Lewis 2009, Zhang and Boyle 2010, Rosaen et al 2012).**



Options for control of Eurasian Watermilfoil (EWM)

- **Diver-Assisted Suction Harvesting (DASH) (permit required)**
 - **Bottom barriers (benthic mats) (permit required)**
 - **Handpulling (when feasible)**
 - **Aquatic herbicide (permit required)**
- 

Diver-Assisted Suction Harvesting



- **Slow**
- **1/2 - 1 acre/week**
- **Expensive: \$6,000-\$10,000/week**
- **Danger of fragmentation**
- **Sediment disruption**
- **Suitable for clearing small areas**

What the Research shows for ProcellaCOR (florpyrauxifen-benzyl)

- **Narrowly targeted to Eurasian milfoil**
- **Effective at very low concentrations**
- **No risk to human health; noncarcinogenic and nonmutagenic (US EPA)**
- **Shown to have no adverse impact on aquatic or terrestrial life; minimal impact to narrow range of native aquatic vegetation with rapid recovery**
- **Is not a neonicotinoid**
- **Dissipates quickly – often less than 24 hours**
- **Used successfully in multiple northern tier states including New York, New Hampshire, Massachusetts, Wisconsin, Minnesota, Washington, and Vermont**

Permit Application Requirements

- **Integrated Five-Year Pest Management Plan**
- **Treatment Plan, including technical details of application process**
- **Documentation of EWM control activities**
- **Plant survey reports**
- **ProcellaCOR research, technical, and safety information**
- **Maps: detailed vegetation distribution and planned treatment areas**
- **Application forms**
- **Mail notice of application submission to all properties abutting the lake and one mile downstream.**

Requirements after Permit Issued

- 1. Complete a pre-treatment plant survey**
- 2. Submit a specific treatment plan for VT DEC review and approval**
- 3. Coordinate schedules with**
 - a) the licensed aquatic herbicide applicator for the treatment**
 - b) the Vermont Department of Agriculture pesticide inspector, who must be on site before and during the application**
 - c) the third-party consulting firm to perform the water sampling 48 & 72 hours post-treatment**
- 4. Ensure all the above had the required documentation, maps, and directions**
- 5. Mail notifications to all properties abutting the lake and for one mile downstream 30 days prior to treatment**
- 6. Have signs made announcing the treatment (at or above permit specified size)**
- 7. Post signs at every road leading to the lake, public beach, and the public boat access 30 days prior to treatment**
- 8. Purchase and create system to distribute bottled water to any household that draws water for drinking or food prep from the treated waterbody, and for any household for one mile downstream**
- 9. Schedule and conduct post-treatment plant survey**
- 10. Write and submit an annual pesticide minimization report (required of all permittees every year whether or not herbicide is used that year)**

The Results

- **No viable EWM in treatment area**
- **Scattered EWM in southern area of lake (hand pulled by LIA members)**
- **Robust re-growth for most native plants within and adjacent to treatment area**
- **Water lily leaves near treatment area showed some browning on edges immediately after treatment, but recovered by end of season.**
- **No adverse impact to water quality was and dissolved oxygen levels ranged from 8.3 to 8.6 ppm throughout the water column in the treatment area.**
- **No adverse impact to aquatic or terrestrial species**
- **No re-growth of EWM in found in Fall 2021, Spring 2022, or Fall 2022 aquatic plant surveys**



Native Plant Re-Growth

Percentage of native species found in 2021 pre- and post-treatment surveys:

- Elodea: 26.9% pre-treatment to 44.6% post-treatment
- Muskgrass: 17.9% pre-treatment to 33.8% post-treatment
- White waterlily: 7.5% pre-treatment to 15.6% post-treatment
- Largeleaf pondweed: 11.9% pre-treatment to 22.1% post-treatment
- Coontail (*Ceratophyllum demersum*): 7.8% pre-treatment to 6.5% post-treatment (Note: Fall 2022: 10.1%)

All plant surveys can be found on the LIA website:

<https://www.lakeiroquois.org/water/plant-surveys>

What Happens Now?

Continue to implement requirements of the 5-year integrated pesticide management plan

- **Monitoring and Prevention**

- Greeter Program & hot water boat wash station

- Aquatic Plant Surveys scheduled for June 2023 and August/September 2023

- Volunteer monitoring and web-based reporting mechanism to report any regrowth

- **Outreach and Education**

- **Mitigation**

- Funding programmed for any required Diver Assisted Suction Harvesting

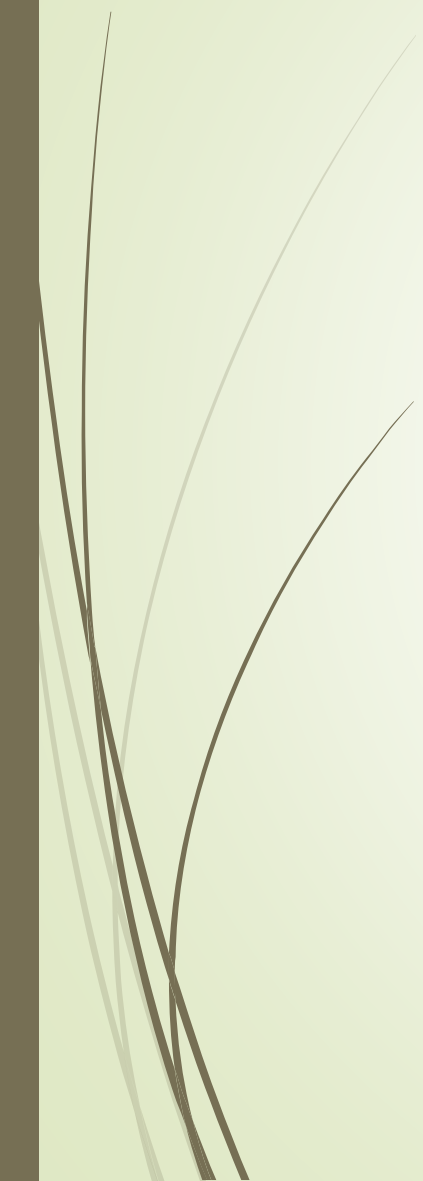
- Benthic barriers in storage for use if necessary

- Goal is to perform handpulling for any small clumps detected

All permits require permit holders to seek permission annually each year to perform DASH, emplace benthic mats, or apply aquatic herbicide-must be evidence-based



Ongoing Projects

- **Beebe Lane Stormwater Improvements**
 - **Watershed Action Plan**
 - **Education and Outreach**
 - **Lake Wise Assessments**
 - **Greeter Program**
 - **Regular Plant Surveys**
 - **Water sampling and monitoring**
- 

Summary

- **EWM is a significant threat ecologically and economically**
- **Scientific research and empirical data support this**
- **Research and data on ProcellaCOR show that it is safe and effective to control and reduce EWM**
- **The Vermont permitting process is complex, rigorous, based on actual scientific evidence and data**
- **A lengthy and indefinite moratorium has the potential to derail current and future successes in controlling the spread or resurgence of this invasive**

Additional Information

- ▶ The Lake Iroquois Association Milfoil Control Efforts.
<https://www.lakeiroquois.org/invasives/milfoil-control-efforts>
- ▶ Michigan Tech Research Institute. EWM Information and Resources. <https://www.mtu.edu/mtri/research/project-areas/environmental/water/eurasian-watermilfoil/information/>
- ▶ US Department of Agriculture Invasive Species Information Center.
<https://www.invasivespeciesinfo.gov/aquatic/plants/eurasian-watermilfoil>
- ▶ Vermont Department of Environmental Conservation. "Permitting Aquatic Herbicide Projects in Vermont"
<https://dec.vermont.gov/sites/dec/files/wsm/lakes/ANC/docs/Permitting%20Aquatic%20Herbicide%20Projects.pdf>
- ▶ VT Departmentn of Environmental Conservation.
["ProcellaCOR EC Aquatic Macrophyte Species Frequency of Occurrence Pre-and Post-Treatment Statistical Analysis "](#)

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