

Interim Report on the Aquatic Vegetation of Lake Iroquois, Chittenden County, Vermont

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1. Background.

At the request of the Lake Iroquois Association, Spring quantitative aquatic plant surveys were undertaken for Lake Iroquois, Vermont. The surveys occurred two-years after aquatic plant management efforts employing the herbicide ProcellaCOR EC in 2024 for Eurasian watermilfoil control. The survey largely duplicated prior efforts in 2017 through 2024 conducted by the author (Eichler 2017, 2019, 2021, 2022, 2023 and 2024). Frequency of occurrence and relative abundance data were recorded for all aquatic plant species present in points distributed throughout the lake. The Point-Intercept Rake Toss method presently used by the US Army Corps of Engineers and others was employed. The assessment ultimately will include the distribution and density of existing aquatic plant communities, the extent of exotic species infestation and a review of ongoing management efforts to control Eurasian watermilfoil (*Myriophyllum spicatum*).

2. Methods

2a. Species List and Herbarium Specimens. As the lake was surveyed, the occurrence of each aquatic plant species observed in the lake was recorded and herbarium specimens collected where necessary. Herbarium specimens were pressed, dried, and mounted (Hellquist 1993); and became part of the permanent collection at the Darrin Fresh Water Institute Laboratory in Bolton Landing, NY. All taxonomy is based on Crow & Hellquist, 2000.

2b. Point Intercept. The frequency and diversity of aquatic plant species were evaluated using a point intercept method (Madsen 1999). At each grid point intersection, all species located at that point were recorded, as well as water depth. Species were located by a visual inspection of the point and by deploying a rake to the bottom, and examining the plants retrieved. A total of 78 points were surveyed for Lake Iroquois, based on a 100 m grid. A global positioning system (GPS) was used to navigate to each point for the survey observation. Point intercept plant frequencies were surveyed on June 9, 2026 to provide two-year post-treatment data. Data presented in the summary are on a whole lake basis and have not been adjusted for the littoral zone only.

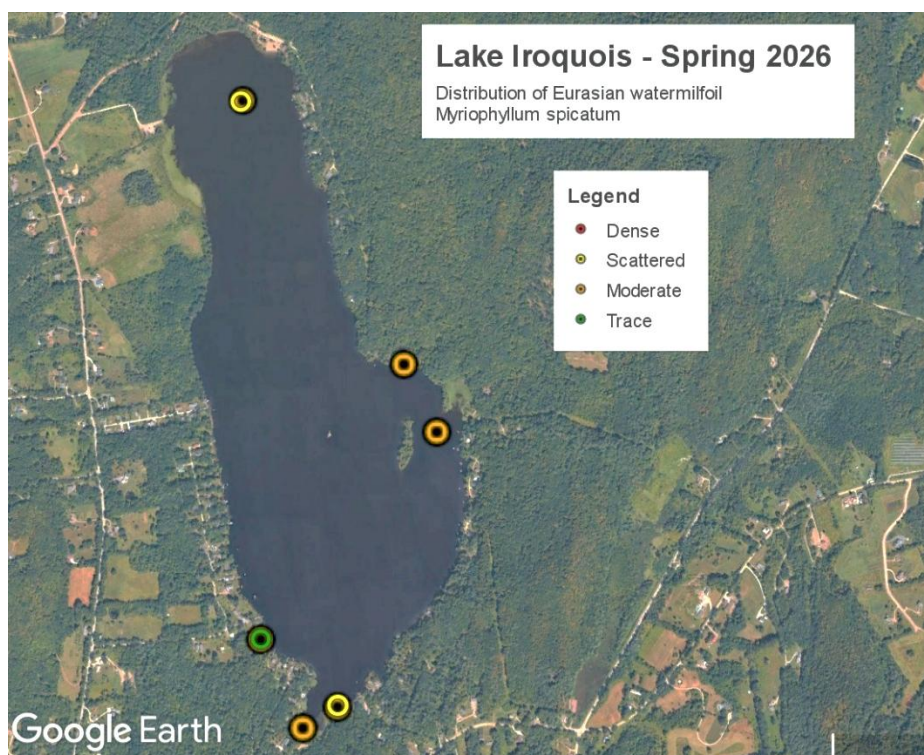
3. Results

3a. Species List. A total of 34 species of aquatic plants have been observed in Lake Iroquois (Table 1). The aquatic plant community of Lake Iroquois included twenty-four submersed species, three floating-leaved species, one floating species and six emergent species. Twenty-one species were reported for the Spring 2026 survey. This number of species exceeds the 15 species typically reported for moderately productive lakes in our region and indicates good water quality and a variety of habitat types. Two of the species present in Lake Iroquois, Humped

Bladderwort (*Utricularia gibba*) and White Watercrowfoot (*Ranunculus longirostris*) are found on Vermont's rare plant list (VT DEC 2022).

3b. Species Frequency. Species richness in Lake Iroquois remains high, with a number of species occurring in more than 5% of survey points (Table 2). For the June, two-year post-treatment survey, muskgrass (*Chara* sp.) was the most common plant (46% of survey points). Eurasian watermilfoil (*Myriophyllum spicatum*) was present in 8% of the survey points (Figure 1). Curly-leaf Pondweed, another invasive species, was present in 13% of survey points (Figure 2). Common native species in the June 2026 survey for Lake Iroquois included *Elodea canadensis* (39% of survey points), *Potamogeton zosteriformis* (24%), *Zosterella dubia* (23%), *Potamogeton amplifolius* (19%), *Potamogeton foliosus* (12%), *Potamogeton praelongus* (10%), *Ceratophyllum demersum* (8%), *Nymphaea odorata* (6%), and *Eleocharis acicularis* (6%).

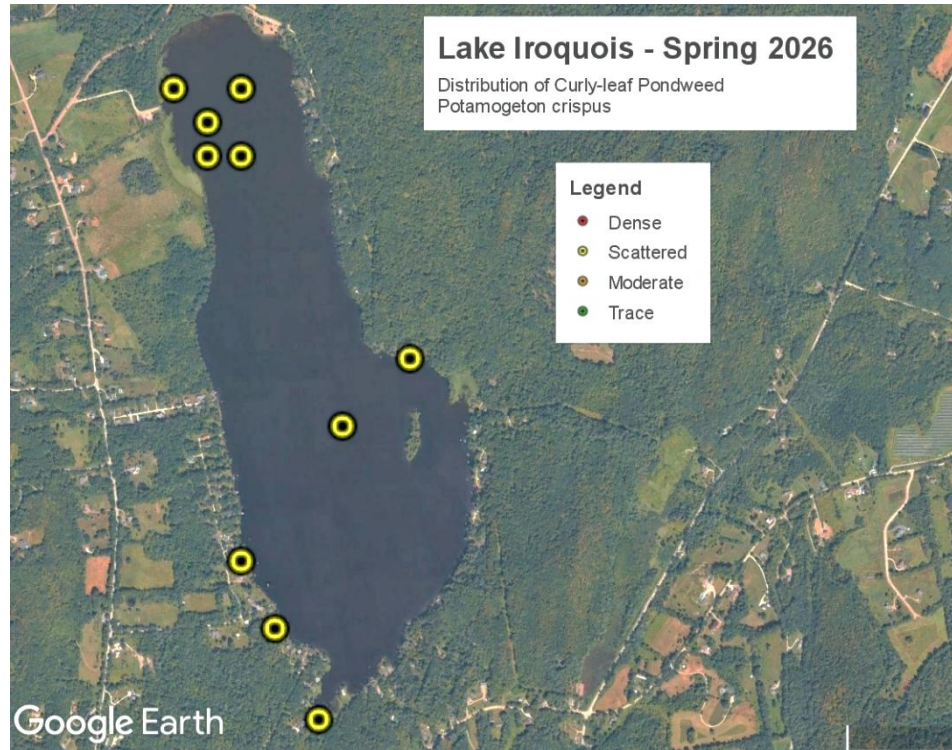
Figure 1. Distribution of Eurasian watermilfoil (*Myriophyllum spicatum*) in Lake Iroquois in June 2026.



3c. Distribution of Eurasian watermilfoil. Eurasian watermilfoil was observed at six locations in the 2026 Spring survey. Moderate growth of Eurasian watermilfoil was found at two locations in of Loon Bay and at the southern end of the lake. Scattered Eurasian watermilfoil growth occurred at the south and north ends of the lake. Trace Eurasian watermilfoil growth was found at the southwest end of the lake (Figure 1). Eurasian watermilfoil was absent from all survey points post-treatment in September of 2021 and June of 2022. In June of 2023, Eurasian watermilfoil was reported at 2 survey points (3%) at the south end of the lake. By the Spring 2024 survey, Eurasian watermilfoil had expanded to 28% of survey from a minimum depth of 2 feet (0.5 m) to a maximum

depth of 11 feet (3.5 m). Following a Procella COR treatment in 2024, Eurasian watermilfoil declined to 3% of survey points in the Spring of 2025. An increase to 8% of survey points was observed in the Spring of 2026.

Figure 2. Distribution of Curly-leaf Pondweed (*Potamogeton crispus*) in Lake Iroquois in June 2026.



A second invasive species, Curly-leaf Pondweed (*Potamogeton crispus*) was present in Lake Iroquois in the Spring 2026 survey. Reported in 13% of survey points, results indicate a slight decrease from the 14% of survey points reported in 2025, 22% reported in 2024, 19% reported in 2023 and 16% reported in 2022. This species was found lake-wide, but most commonly at the north end of the lake (Figure 2). Curly-leaf Pondweed typically dominates early season samples but completes its life cycle by mid-July and dies back.

4. References

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www.vtfishandwildlife.com/.../List_of_Rare_and_Uncommon_Native_Plants_of_Vermont.pdf

Table 1. Species list for Lake Iroquois.

Species Name	Common Name	Lake Iroquois
<i>Brasenia schreberi</i>	water shield	fl
<i>Ceratophyllum demersum</i> L.	coontail	s
<i>Chara</i> sp.	muskgrass, chara	s
<i>Eleocharis acicularis</i> (L.) Roemer & Schultes	needle spike-rush	e
<i>Elodea canadensis</i> Michx.	elodea	s
<i>Isoetes echinospora</i> Dur.	quillwort	e
<i>Lemna minor</i> L.	duckweed	f
<i>Lemna trisulca</i> L.	duckweed	s
<i>Megalodonta (Bidens) beckii</i> Torr.	water marigold	s
<i>Myriophyllum spicatum</i> L.	Eurasian watermilfoil	s
<i>Najas flexilis</i> (Willd.) Rostk. & Schmidt.	bushy pondweed	s
<i>Najas guadalupensis</i> L.	southern naiad	s
<i>Nuphar variegata</i>	yellow pondlily	fl
<i>Nymphaea odorata</i> Ait.	white waterlily	fl
<i>Polygonum amphibium</i>	Smartweed	e
<i>Pontederia cordata</i> L.	pickerelweed	e
<i>Potamogeton amplifolius</i> Tuckerm.	largeleaf pondweed	s
<i>Potamogeton crispus</i> L.	curlyleaf pondweed	s
<i>Potamogeton foliosus</i> Raf.	Pondweed	s
<i>Potamogeton natans</i> L.	floating-leaf pondweed	s
<i>Potamogeton perfoliatus</i> L.	clasping-leaf pondweed	s
<i>Potamogeton praelongus</i> Wulfen	white-stem pondweed	s
<i>Potamogeton pusillus</i> L.	small pondweed	s
<i>Potamogeton richardsonii</i> Oakes	Richardsons' pondweed	s
<i>Potamogeton spirillus</i> Tuckerm.	pondweed	s
<i>Potamogeton zosteriformis</i> Fern.	flat-stem pondweed	s
<i>Ranunculus longirostris</i> Godron	white watercrowfoot	s
<i>Sagittaria graminea</i>	arrowhead	s
<i>Sparganium</i> sp.	burreed	e
<i>Typha</i> sp.	cattail	e
<i>Utricularia gibba</i> L.	humped bladderwort	s
<i>Utricularia vulgaris</i> L.	great bladderwort	s
<i>Vallisneria americana</i> L.	wild celery	s
<i>Zosterella dubia</i> (Jacq.) Small	water stargrass	s

fl=floating leaved f=free floating e=emergent s=submersed

Table 2. Aquatic plant percent frequency by species for surveys of Lake Iroquois.

Species Name	Common Name	Spring 2023	Spring 2024	Spring 2025	Spring 2026
<i>Ceratophyllum demersum</i> L.	coontail	6.8%	9.2%	6.4%	7.7%
<i>Chara</i> sp.	muskgrass, chara	37.0%	36.8%	38.5%	46.2%
<i>Eleocharis acicularis</i> (L.) Roemer & Schultes	needle spike-rush	6.8%	6.6%	6.4%	6.4%
<i>Elodea canadensis</i> Michx.	elodea	27.4%	44.7%	42.3%	38.5%
<i>Isoetes echinospora</i> Dur.	quillwort	2.7%	1.3%		
<i>Lemna trisulca</i> L.	duckweed	5.5%	1.3%	3.0%	
<i>Myriophyllum spicatum</i> L.	Eurasian watermilfoil	2.7%	27.6%	2.6%	7.7%
<i>Nuphar variegata</i>	yellow waterlily		1.3%	2.6%	1.3%
<i>Nymphaea odorata</i> Ait.	white waterlily	9.6%	7.9%	7.7%	6.4%
<i>Polygonum amphibium</i>	smartweed	1.4%	1.3%	1.3%	1.3%
<i>Potamogeton amplifolius</i> Tuckerm.	large-leaf pondweed	9.6%	11.8%	10.3%	19.2%
<i>Potamogeton crispus</i> L.	curly-leaf pondweed	19.2%	22.4%	14.1%	12.8%
<i>Potamogeton foliosus</i> Raf.	pondweed	13.0%	10.5%	10.3%	11.5%
<i>Potamogeton perfoliatus</i> L.	clasping-leaf pondweed		2.6%		
<i>Potamogeton praelongus</i> Wulfen	white-stem pondweed	12.3%	7.9%	6.4%	10.3%
<i>Potamogeton zosteriformis</i> Fern.	flat-stem pondweed	12.3%	14.5%	21.8%	24.4%
<i>Ranunculus longirostris</i> Godron	white watercrowfoot	2.7%	3.9%	5.1%	1.3%
<i>Sagittaria graminea</i>	arrowhead				3.8%
<i>Sparganium</i> sp.	burreed	6.8%	1.3%	7.7%	6.4%
<i>Typha</i> sp.	cattail	1.4%	1.3%	1.3%	1.3%
<i>Utricularia vulgaris</i> L.	great bladderwort	2.7%	1.3%	3.8%	2.6%
<i>Vallisneria americana</i> L.	wild celery	19.2%	3.9%	2.6%	1.3%
<i>Zosterella dubia</i> (Jacq.) Small	water stargrass	9.6%	25.0%	21.8%	23.1%