



Peppermill Lake

Adams County

Point-Intercept Aquatic Plant Survey

July 18, 2024

Peppermill Lake District,

Adams County Land and Water Conservation Department completed a point-intercept aquatic plant survey (PI survey) at Peppermill Lake on July 18th, 2024 as requested by the Peppermill Lake District. A PI survey provides a full snapshot of the plant community in your lake at the time the survey was conducted; including the presence and absence of native and invasive species, their density, and location. This data can be compared with years prior to observe shifts in the plant community, track the spread of invasive species, measure the progress of removing invasive species, and allow Wisconsin Department of Natural Resources staff to understand your lake and what best management practices should be implemented, and how your lake is reacting to current management. A PI survey should be kept up-to-date within 3 years and especially when large management decisions are being considered. Keeping record of the aquatic plant community is akin to putting a pulse on your lake's health.

A note on aquatic plants

The natural plants in your lake are an integral part of the ecosystem; providing food, shelter, and oxygen to aquatic life. They help protect against wave action, erosion, and stabilize the lake bed. Aquatic plants bolster the lake against aquatic invasive species (AIS), as a robust and healthy plant community may be viewed as a "living immune system", keeping undesirable species at bay or preventing them from becoming established. Aquatic plants will also uptake nutrients like phosphorus and nitrogen that may be used to produce algae blooms or feed AIS.

Aquatic Invasive Species

Aquatic invasive species (AIS) are plants and animals found outside their natural range and aggressively take advantage of their new surroundings by not having environmental checks like predators or competition that would keep them in balance. These species tend to tolerate ecosystem disturbance better than native species can; thriving while the natural community is degraded. AIS disrupt food chains, degrade habitat, and impact fish and wildlife populations. AIS can also cause economic damage and impede navigation or recreation in a lake. AIS impacts can vary lake to lake. One lake may be aggressively taken over and another the AIS integrated into the plant community and cause no negative effects. Factors that can help protect your lake include having a robust native plant community in the lake, maintaining healthy riparian corridors around the lake, and addressing excessive nutrient inputs from shoreline erosion, human development, and the greater watershed. Of course, prevention is the best cure, and efforts should be made to educate lake residents and visitors about AIS and how to prevent their spread.

What is a Point Intercept Survey?

PI surveys are completed by traveling to predetermined GPS points across the lake that are generated by WI DNR. The amount of points a lake has is based on its surface area. Points have an even distribution throughout the lake, allowing surveyors to collect a representative sample of plants throughout the entire lake.

Peppermill Lake contains 208 sample points, of which 176 sample points were able to be sampled. Of the 176 sampled sites, 169 had vegetation. 32 of the sites were not able to be sampled due to them being located in non-navigable areas of the lake.

At each point, a two-sided rake is used to sample roughly a one foot area of the lake bottom. Sediment type (sand, rock or muck), water depth in half foot increments and the aquatic plant community are recorded. The overall fullness of plants on the rake is rated a "one, two or three".

Beyond overall rake fullness, individual species are ranked using "one,two or three." Plants seen within six feet of the sample point are recorded as a "visual".

It should be noted that GPS devices are accurate only within twenty feet and plant communities can shift, so there may be variance in the plant community from one year to another.

Table 1. Plant Community Observed

Common Name	Scientific Name	Plant Niche	% Littoral Frequency of Occurrence*
Muskgrass	<i>Chara spp.</i>	Submergent	78.70
Eurasian Watermilfoil (AIS)	<i>Myriophyllum spicatum</i>	Submergent	27.81
Illinois Pondweed	<i>Potamogeton illinoensis</i>	Submergent	18.34
White Water Lily	<i>Nymphaea odorata</i>	Floating	11.83
Slender Naiad	<i>Najas flexilis</i>	Submergent	11.24
White Water Crowfoot	<i>Ranunculus aquatilis</i>	Submergent	10.65
Northern Watermilfoil	<i>Myriophyllum sibiricum</i>	Submergent	10.06
Spatterdock	<i>Nuphar variegata</i>	Floating	4.14
Flat Stem Pondweed	<i>Potamogeton zosteriformis</i>	Submergent	4.14
Fries' Pondweed	<i>Potamogeton friesii</i>	Submergent	2.96
Variable Pondweed	<i>Potamogeton gramineus</i>	Submergent	2.96
Floating Leaf Pondweed	<i>Potamogeton natans</i>	Floating	2.96
Small Pondweed	<i>Potamogeton pusillus</i>	Submergent	1.78
Sago Pondweed	<i>Stuckenia pectinata</i>	Submergent	1.78
Common Bladderwort	<i>Utricularia vulgaris</i>	Submergent	1.18
Water Stargrass	<i>Heteranthera dubia</i>	Submergent	0.59

Curly-Leaf Pondweed (AIS) *	<i>Potamogeton crispus</i>	Submergent	0.59
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Note: % Littoral frequency of occurrence: This is calculated by taking the total number of times a species is recorded divided by the total number of points in the lake where plant growth is possible.

** Note on Curly-Leaf Pondweed (CLP): CLP has a preference for cold-water and reaches peak mass in late spring or early summer before dying back. To best assess CLP in your lake, a survey during the aforementioned time period would be required.*

Table 2. Lake Assessment Stats

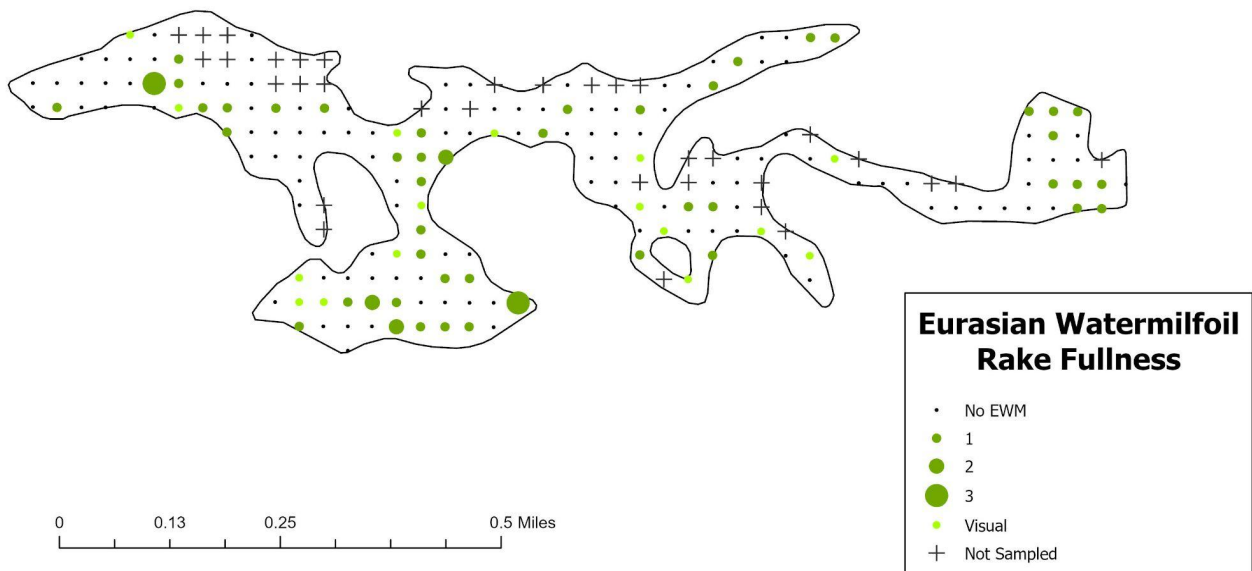
	Peppermill Lake (2024)	Statewide Average	North Central Hardwoods Ecoregion Average
Total # of Sites Visited	176		
Total # of Site with Vegetation	169		
Maximum Depth of plants (feet)	9		
Species Richness	17 (20 including visual sightings)	13	14
Floristic Quality Index (FQI) *	24.27	22.2	20.9

** Floristic Quality Index (FQI) is the ranking of plants in the lake and how they compare to an undisturbed lake. Individual species carry a number based on how sensitive they are to environmental disturbance. The more sensitive species found, the higher the FQI will be. The higher the FQI the closer the plant community is to that of an undisturbed system.*

Maps

Figure 1. EWM Presence and Density

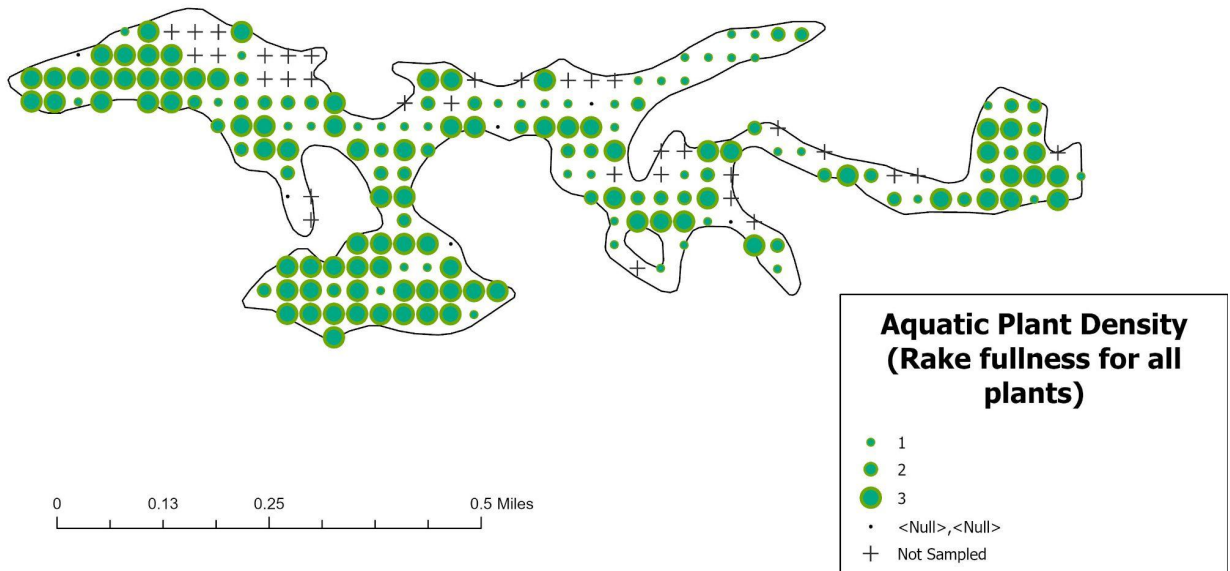
Peppermill Lake, Adams Co.
07/18/2024



** It should be noted that the survey was conducted several weeks after Peppermill Lake District purchased and began operating their own aquatic plant harvester.*

Map 2. Density and location of all plants

Peppermill Lake, Adams Co. 07/18/2024



*If you have questions regarding your survey results please
contact the Adams County Lakes Specialist, Keifer Sroka,
keifer.sroka@co.adams.wi.us (608)-474-0699*