PELTIER LAKE, ANOKA COUNTY:
2022 AQUATIC VEGETATION REPORT

Report by the Invasive Species Program – Division of Ecological and Water Resources
Minnesota Department of Natural Resources

Lake: Peltier (DOW# 2000400)

Lake Surface Area: 929 acres

Littoral Area: 515 acres

County: Anoka

Survey Type: Point-intercept

Date of Survey (most recent): June 21st, 2022

Observer[s]: April Londo (MNDNR)
Keegan Lund (MNDNR)
Matt Kocian (RCWD)

Report updated: March 22nd, 2023

Author[s]: April Londo
Email: April.londo@state.mn.us
Phone: 651.259.5861

2022 Summary:

The most recent aquatic vegetation point-intercept survey of Peltier Lake (DOW #2000400) was completed on June 21, 2022, by the Minnesota Department of Natural Resources (MNDNR) and Rice Creek Watershed District (RCWD). Submersed plants were identified out to a maximum depth of 2.4 meters (8 feet). Within the littoral zone (area in the lake from the 0 – 15-foot depth range [0 – 4.5 meters]), 37% of sampled points contained native submersed taxa. The average number of native submersed taxa per sample point was 0.74. Eleven native submersed plant species were observed during the 2022 survey, two of which are non-native to Minnesota. Offshore herbicide treatments and mechanical treatments targeting curly-leaf pondweed have been organized by the Peltier Lake Association and Peltier Youth Development group.

Lake Description:

Peltier Lake is a 929.54-acre eutrophic lake located near Centerville, Minnesota. It has two invasive aquatic plant species: Eurasian watermilfoil (*Myriophyllum spicatum*, abbreviated as EWM) and curly-leaf pondweed (*Potamogeton crispus*, abbreviated as CLP). The maximum depth of water is 4.88 meters (16 feet). Peltier Lake has a Minnesota Department of Natural Resources (MNDNR) shoreline classification of a natural environment lake, restricting the use of pesticides in these waterbodies. Approximately 55% of the lake is littoral. For more information on Peltier Lake water quality see https://webapp.pca.state.mn.us/surface-water/station/02-0004-00-451

Management History:

Historically, mechanical harvesting has been used to manage nuisance CLP growth due to the lake's MNDNR shoreline classification. In 2022, a variance was issued from the MNDNR to use herbicide targeting CLP in Peltier Lake. The most recent herbicide treatment (36.51 acres) targeted CLP using diquat and was organized by the Peltier Lake Association. The treatment area was delineated by Blue Water Science.

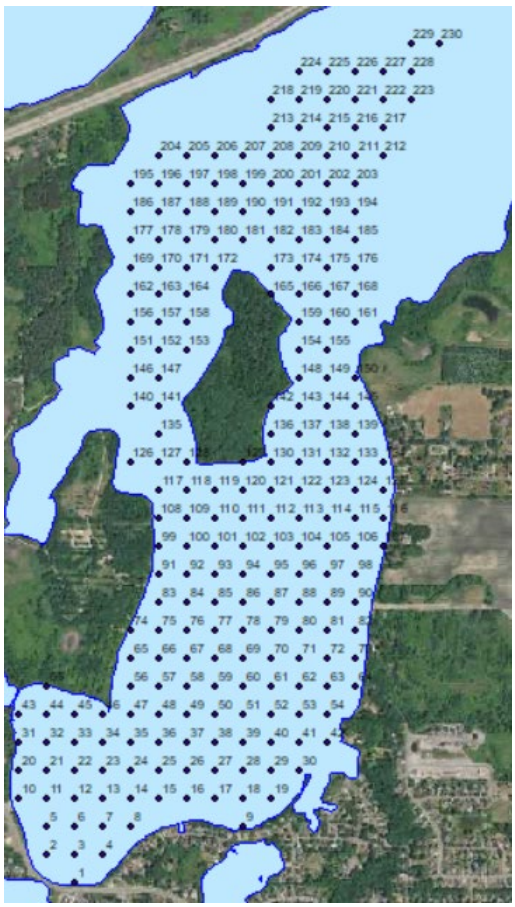
Survey Objectives:

Point-intercept surveys were used to assess the distribution of aquatic plants in Peltier Lake. The primary purpose for this type of survey is to 1) develop baseline knowledge of the current plant community in a lake, and over time, 2) compare year-to-year plant variation (in plant presence and spatial location). Moreover, this survey will help the MNDNR and our partners monitor native plant communities and evaluate possible responses from invasive aquatic plant management efforts. It is important to note that distributions of aquatic plants may vary from year to year due to effects such as differences in weather, as well as the effects from plant and water quality management.

DEPARTMENT OF NATURAL RESOURCES

Survey Methods:

We used a point intercept survey method developed by John Madsen in "Aquatic Plant Control Technical Note MI-02, 1999". Survey points were placed 100 meters apart using a Geographic Information System (GIS), allowing for placement of 230 total points. Plant samples were collected by throwing and dragging a double-sided rake along the lake bottom at each point for approximately 3 meters. Plant samples were assessed on the boat to determine plant species and rake fullness was used as a surrogate for density (scale of zero [no plants] to 4 [dense plants, matted on the surface] was used in 2012 – 2017, and a zero to 3 scale in 2018 and all years thereafter). Frequencies of occurrence percentages (i.e. how often a plant species was found in the lake) were calculated based on the littoral zone (the portion of the lake that is less than 15 feet in depth).



Survey Observations:

In the 2022 survey, the maximum depth of rooted vegetation was 2.4 meters (8 feet). Native plant diversity and frequency was 0.74 mean submersed native taxa/point and 37% native frequency of occurrence (FOO) respectively (**Table 1 – Plant Frequency Occurrence**).

Nine native plants were observed during the June 2022 survey. It should be noted however, six rows and 35 points in the northern littoral bay, were not surveyed due to low water conditions and could have impacted our diversity and FOO calculations by excluding species with abundant canopy growth. A visual observation from a distance revealed heavy aquatic plant growth throughout the unsampled area. The plant community is dominated by coontail, Canadian waterweed and curly-leaf pondweed.

Two invasive plants were observed during the 2022 survey (Eurasian watermilfoil 2% and curly leaf pondweed 33% FOO; see Table 1). Eurasian watermilfoil has stayed consistently under 10% FOO and below recreational nuisance levels. Curly-leaf pondweed was observed at its highest frequency in 2016 (**Figure 2**) but should be monitored.

Table 1 – Plant Frequency Occurrence. Historic percent frequency of occurrence for submersed vegetation within the littoral zone (0 – 15 feet) in Peltier Lake, Anoka County, Minnesota (DOW# 2000400). Surveys in 2016, 2018 and 2020 were conducted by Bluewater Scientific while the 2022 survey was conducted by the Minnesota Department of Natural Resources.

Taxonomic Name SUBMERSED PLANTS	Common Name	Aug 2016	May 2018	Aug 2020	June 2022
Myriophyllum spicatum*	Eurasian watermilfoil	7	0	5	2
Potamogeton crispus	Curly-leaf pondweed	*58	*49	*48	33
Ceratophyllum demersum	Coontail	49	43	47	27
Elodea canadensis	Canadian waterweed	25	20	23	21
Potamogeton foliosus	Stringy pondweed	0	13	3	10
Potamogeton zosteriformis	Flat-stem pondweed	5	25	23	8
Ranunculus aquatilis	White Water-crowfoot	0	0	5	5
Stuckenia pectinata	Sago pondweed	3	8	0	2
Heteranthera dubia	Water Stargrass	0	0	1	1
Utricularia sp.	Bladderwort Species	0	4	0	0
Macroalgae	Chara	0	0	0	2
Najas spp.	Naiad	0	0	0	1

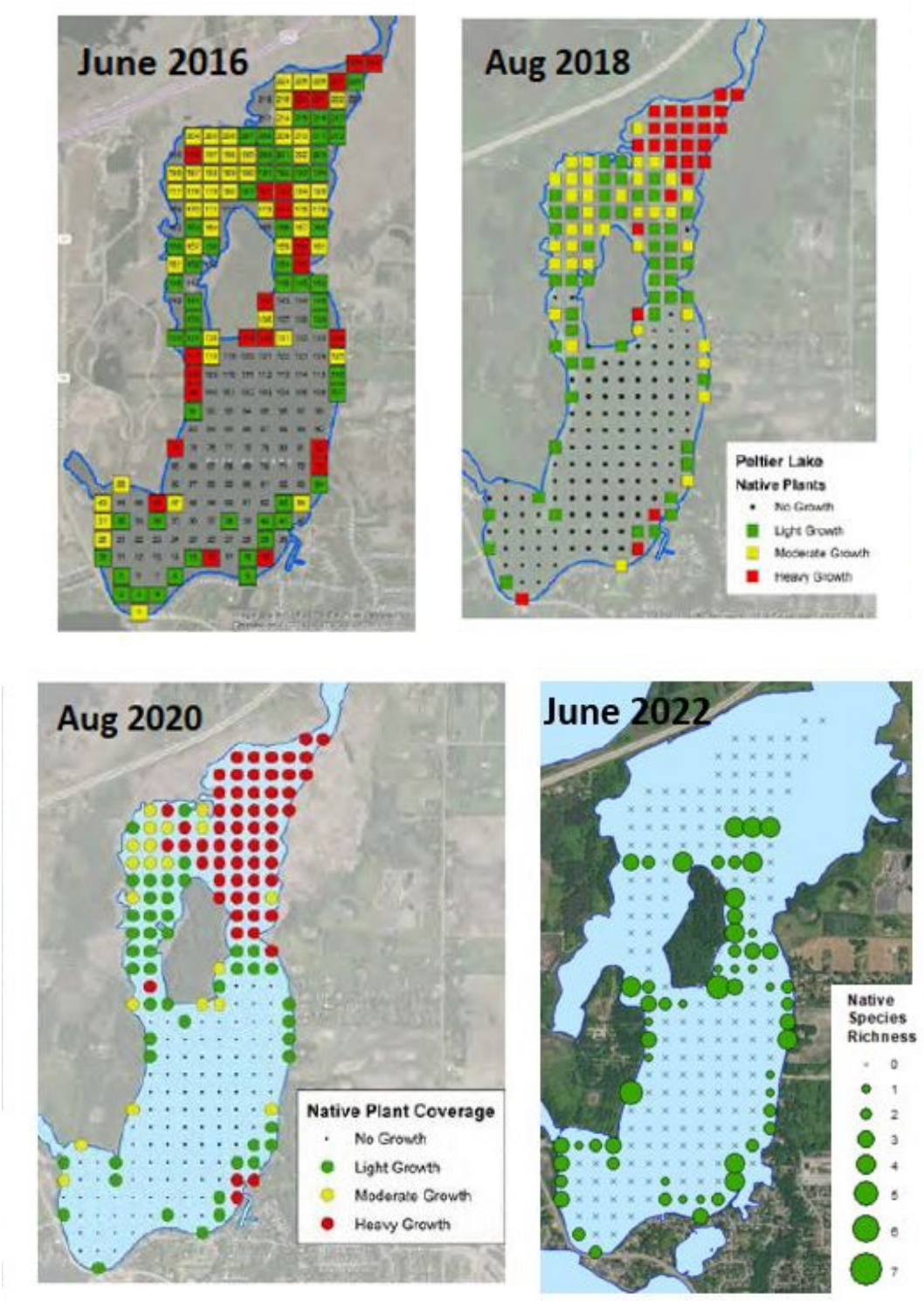


Figure 1 – Native Species Taxa Density. Blue Water Science conducted the 2016, 2018 and 2020 surveys. Their maps show spatial distribution and native plant abundance (light, moderate and heavy growth). The Minnesota Department of Natural Resources conducted the 2022 survey. Spatial distribution and species richness (# of native submersed taxa per sample point) for Peltier Lake, Anoka County, Minnesota (DOW # 2000400).

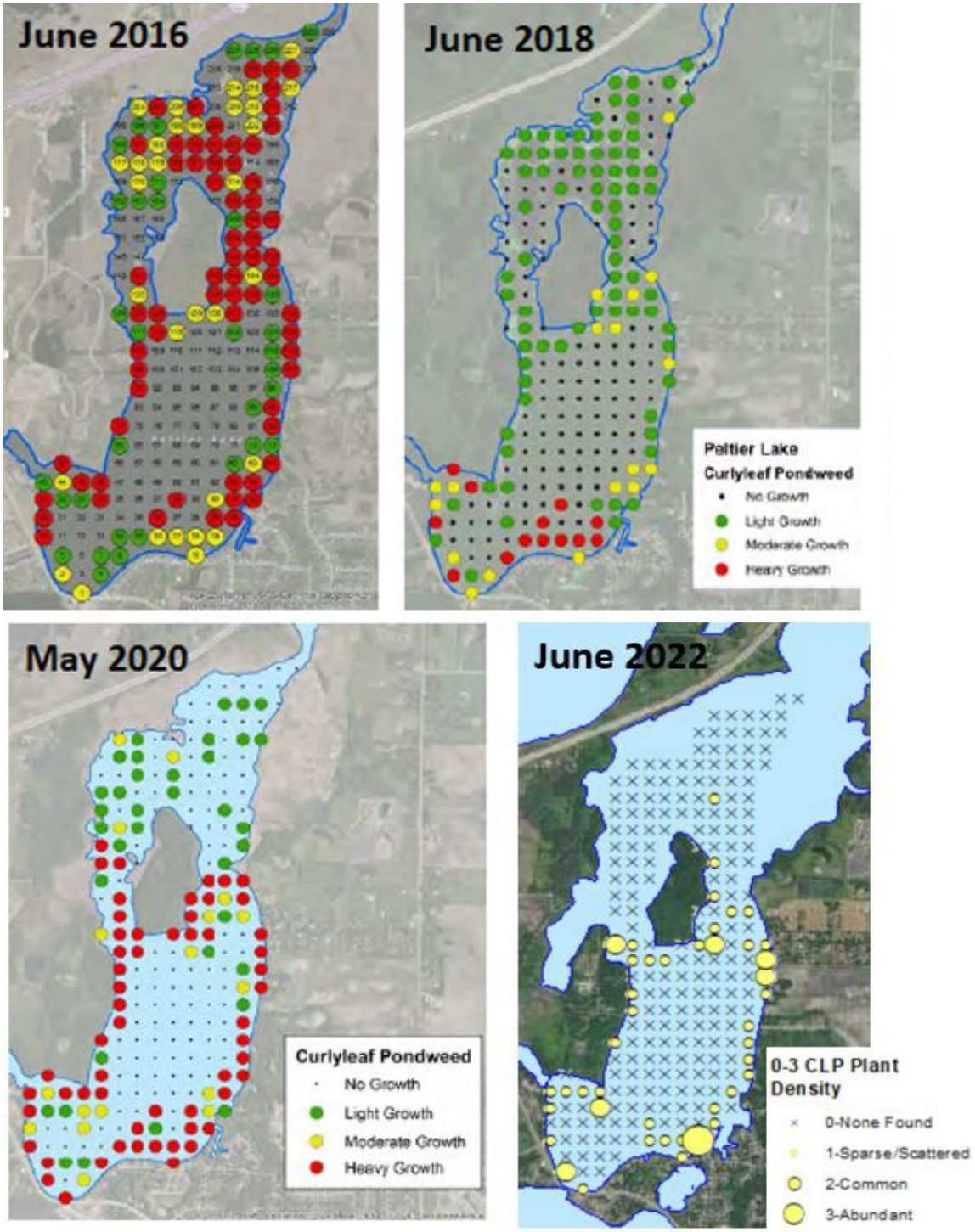


Figure 2 – Curly Leaf Pondweed Density. Blue Water Science conducted the 2016, 2018 and 2020 surveys. Their maps show spatial distribution and curly leaf pondweed abundance (light, moderate and heavy growth). The Minnesota Department of Natural Resources conducted the 2022 survey. Spatial distribution and curly leaf pondweed richness (# of native submersed taxa per sample point) for Peltier Lake, Anoka County, Minnesota (DOW # 2000400).