
CENTERVILLE LAKE, ANOKA COUNTY: 2023 AQUATIC VEGETATION REPORT

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

Lake: Centerville (DOW #2000600)

Lake Surface Area: 474 acres

Littoral Area: 276 acres

County: Anoka

Survey Type: Point-intercept

Date of Survey (most recent): September 7, 2022

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2023 Summary:

The most recent aquatic vegetation point-intercept survey of Centerville Lake (DOW #2000600) was completed on September 7, 2023. Submersed plants were identified out to a maximum depth of 2.1 meters (6.9 feet). Within the littoral zone [zone in the lake from the 0 – 15-foot depth range (0 – 4.5 meters)], 34% of sampled points contained native submersed taxa. The average number of native submersed taxa per sample point was 0.58. Ten native submersed plant species were observed during the 2023 survey. Offshore herbicide treatments targeting curly-leaf pondweed (invasive aquatic plant) were organized by the Centerville Lake Association Inc.

Summary Table. Summary of aquatic submersed plants in Centerville Lake, Anoka County, Minnesota (DOW# 2000600) as indicated by results of point-intercept surveys. Values were calculated from littoral depth range (0 – 15 feet).

PI Survey Date	% Frequency of CLP*	Max Depth of Growth in feet [95%] [†]	% Points w/ Native Submersed Taxa	Mean Native Submersed Taxa/ Point	# Submersed Taxa	AVG Secchi Depth [m]
JUNE 2019	4	13	38	0.5	4	2.0
AUG 2019	68	6	54	1.0	10	2.0
AUG 2022	-	5	49	0.6	7	0.8
SEPT 2023	12	7	34	0.6	12	1.1

*CLP is short for curly-leaf pondweed

[†]95th percentile calculated based on all vegetated sampling points

Taxa refer to groups of submersed aquatic plant species or genera

AVG: Average Secchi depth (water clarity measurement) from May – September

Lake Description:

Centerville Lake is a 474-acre 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 13.4 meters (44 feet).

Approximately 58% of the lake is littoral (the littoral zone [0 – 15 feet] is the area where aquatic plants are most likely to be found).

More information on Centerville Lake water quality can be obtained by contacting your local governmental unit (watershed district, county, city) or by visiting:

<https://webapp.pca.state.mn.us/surface-water/station/02-0006-00-202> and

<https://arcgis.dnr.state.mn.us/ewr/whaflakes/>.

Management History:

The most recent herbicide treatment (40.81 acres) targeted curly-leaf pondweed using Diquat. The treatment area was delineated by Blue Water Science. Eurasian Watermilfoil was not the main target for 2023 treatments but may have been impacted. Curly-leaf pondweed has been managed with Diquat since 2020 with treatment size ranging from 40 to 40.81 acres. Invasive plant treatments have been organized by the Centerville Lake Association Inc. and Rice Creek Watershed District. (see below **Table 1 – Invasive Plant Management Summary** for a recent history of herbicide treatments).

Table 1 – Invasive Plant Management Summary. Characteristics and history of herbicide treatments for Centerville Lake, Anoka County, Minnesota (DOW # 2000600; total acres: 474, littoral acres: 276, 15% littoral acres: 41.25).

Date	Treatment [W, P, N]	Target Species	Total Acres Treated	Herbicide	Licensed Commercial Applicator
2019	N	CLP	-	-	-
AUG 2020	P	CLP	40	Diquat (Tribune)	Lake Management Inc.
AUG 2021	P	CLP	40.64	Diquat (Tribune)	PLM Lake & Land Mgmt
JUN 2022	P	CLP	40.76	Diquat (Tribune)	Lake Management Inc.
JUN 2023	P	CLP	40.81	Diquat (Tribune)	Lake Management Inc.

Treatment: W (whole lake), P (partial lake), N (no treatment)

CLP is an abbreviation for curly-leaf pondweed.

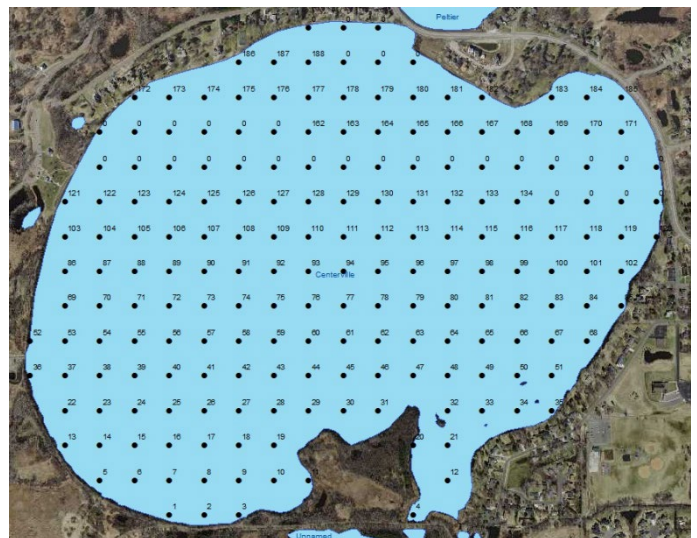
EWM is an abbreviation for Eurasian watermilfoil

Survey Objectives:

Point-intercept surveys were used to assess the distribution of aquatic plants in Centerville 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 (using plant presence and spatial location). Moreover, this survey will help the Minnesota Department of Natural Resources 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.

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). This spacing allowed for the placement of 194 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 species and rake fullness as a surrogate for abundance (a zero to 3 scale). Frequency 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:

The maximum depth of rooted aquatic vegetation was 2.1 meters (6.9 feet) in 2023 (see **Table 2 – Point Intercept Metrics**). Native plant diversity was 0.58 mean submersed taxa/point and 34% frequency of occurrence (FOO) (**Table 3 – Plant Frequency of Occurrence**).

In the 2023 survey, ten native plants were observed. The most common native taxa included coontail, muskgrass, naiad, and star duckweed (**See Table 3**). In 2019 and 2022, the most common native taxa were muskgrass, star duckweed, and leafy pondweed.

Two invasive plants were observed during the 2023 survey (Eurasian watermilfoil <1% and curly-leaf pondweed 12%; see **Table 3**). Curly-leaf pondweed was also seen in 2019 with a much greater abundance (68% of sampled points in August 2019), although late summer surveys do not capture active curly-leaf pondweed growth.

Table 2 – Point Intercept Metrics. Summary of point intercept metrics for Centerville Lake, Anoka County, Minnesota (DOW # # 2000600). Shaded values were calculated from the littoral depth range (0 – 15 feet).

Survey Metrics	JUNE 2019	AUG 2019	AUG 2022	SEPT 2023
Treated (Y/N)	N	N	Y	Y
Surveyor	Blue Water Science	Blue Water Science	Blue Water Science	MN DNR
Total # Points Sampled	133	76	71	114
Max Depth of Growth (95%) in feet	13	6	5	6.9
# Point in Max Depth Range	100	53	46	51
# Points in Littoral (0-15 feet)	122	76	71	114
% Points w/ Submersed Native Taxa	38	54	49	34
Mean Submersed Native Taxa/ Point	0.46	0.95	0.61	0.59
# Submersed Native Taxa	3	9	7	9
# Submersed Non-Native Taxa	1	1	-	2

Table 3 – Plant Frequency of Occurrence. Historic percent frequency of occurrence for submersed vegetation within the littoral zone (0 – 15 feet) in Centerville Lake, Anoka County, Minnesota (DOW # 2000600).

Taxonomic Name SUBMERSED PLANTS	Common Name	JUNE 2019	AUG 2019	AUG 2022	SEP 2023
<i>Potamogeton crispus</i> *	Curly-leaf pondweed	4	68	-	12
<i>Ceratophyllum demersum</i>	Coontail	9	3	10	18
<i>Chara spp.</i>	Muskgrass	28	20	31	19
<i>Heteranthera dubia</i>	Water stargrass	8	-	-	3
<i>Stuckenia pectinata</i>	Sago pondweed	8	-	1	2
<i>Lemna trisulca</i>	Star duckweed	41	8	23	17
<i>Najas spp.</i>	Naiad	7	-	1	6
<i>Nitella spp.</i>	Stonewort	8	-	-	-
<i>Potamogeton foliosus</i>	Leafy Pondweed	12	20	11	3
<i>Potamogeton zosteriformis</i>	Flat-stemmed pondweed	14	-	4	2

Floating, free-floating & emergent plants observed: *Lemna trisulca* (Star duckweed) in 2019, 2022, 2023, and *Wolffia columbiana* (Columbian watermeal) in 2022.

Less common (< 5% frequency) submersed vegetation observed: *Myriophyllum spicatum** (Eurasian watermilfoil) in 2023, *Potamogeton friesii* (Fries' pondweed) in 2019 and 2023, and *Vallisneria americana* (Wild celery) in 2022, 2023.

* Denotes invasive aquatic plant

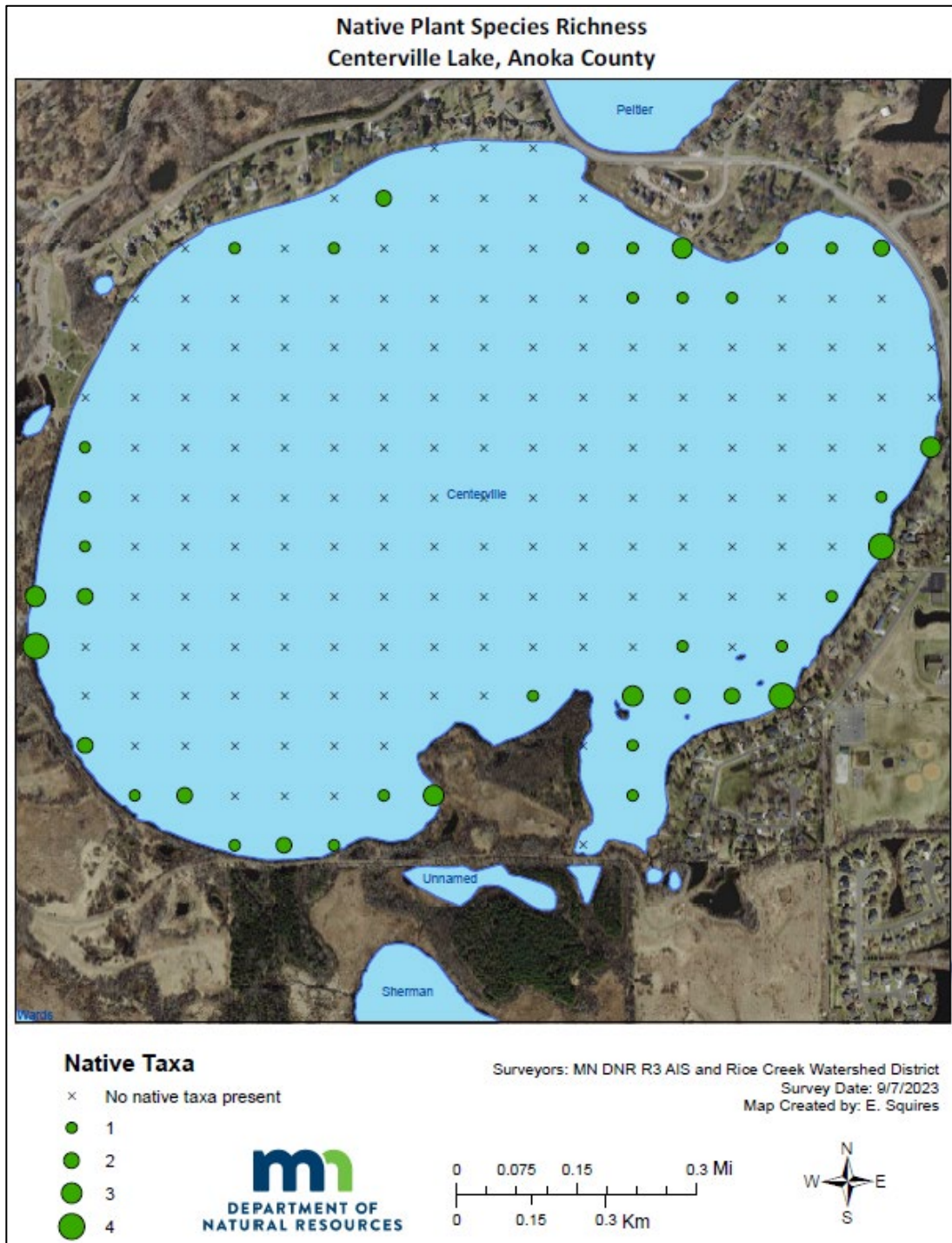


Figure 1 – Native Taxa Density. Spatial distribution and species richness (# of native species per sample point) of all submersed plant species from a point intercept survey conducted in September 2023 Centerville Lake, Anoka County, Minnesota (DOW #2000600).

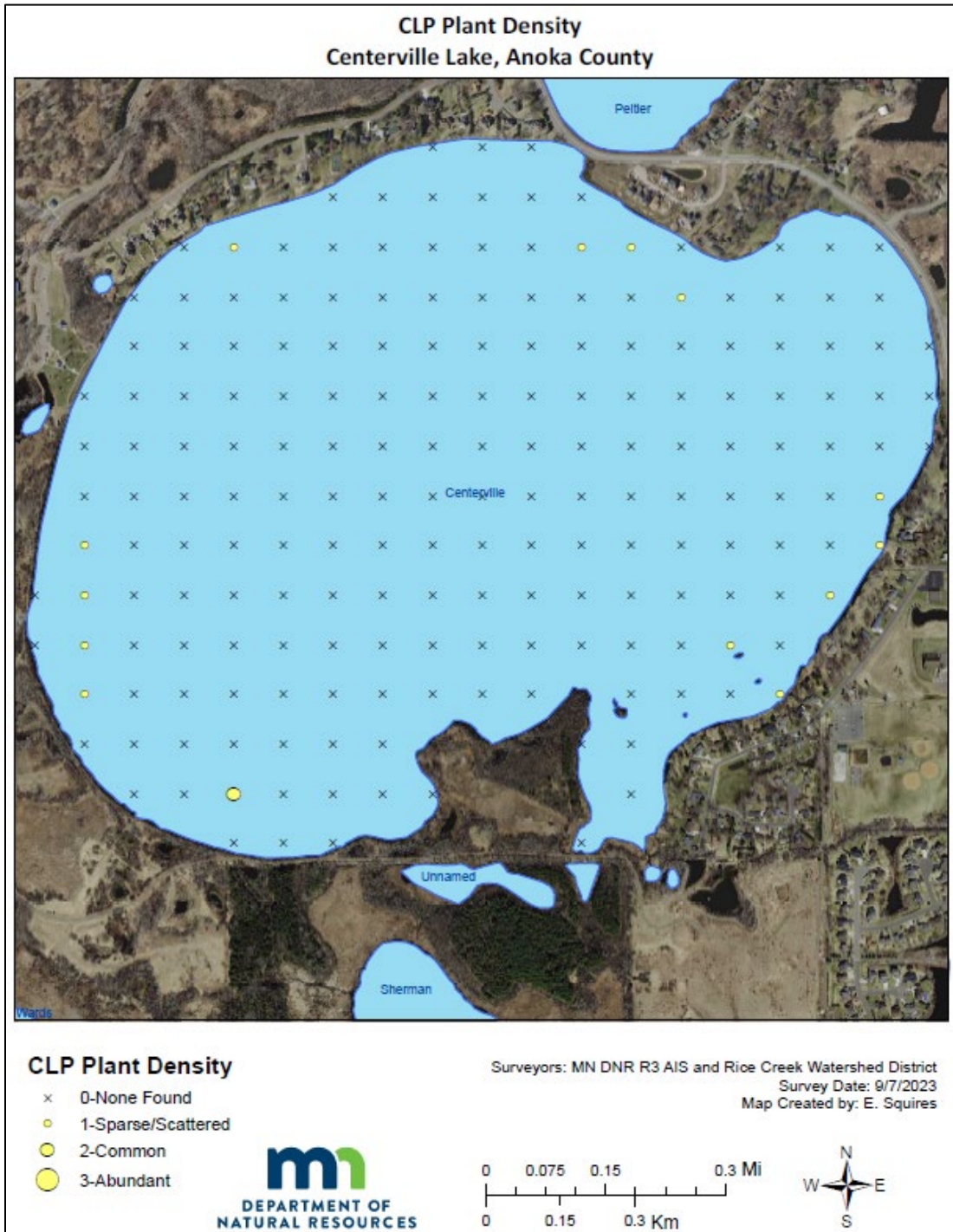


Figure 2 – Curly-leaf Pondweed Density. Spatial distribution and rake density rating per sample point of curly-leaf pondweed from a point intercept survey conducted in September 2023. Centerville Lake, Anoka County, Minnesota (DOW #2000600).

This information can be made available in alternative formats such as large print, braille, or audiotape by emailing info.dnr@state.mn.us or by calling 651-259-5016.