CENTERVILLE LAKE, ANOKA COUNTY: 2024 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): June 27, 2024

Observer[s]: April Londo (MNDNR)
Ashley Halverson (CCMI)

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

2024 Summary:

The most recent aquatic vegetation point-intercept survey of Centerville Lake (DOW #2000600) was completed on June 27, 2024. Submersed plants were identified out to a maximum depth of 2.9 meters (9.8 feet). Within the littoral zone [zone 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 0.63. Ten native submersed plant species were observed during the 2024 survey. Offshore herbicide treatments targeting curly-leaf pondweed (invasive aquatic plant) have been 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
JUNE 2019	4	13	38	0.5	4
AUG 2019	68	6	54	1.0	10
AUG 2022	0	5	49	0.6	7
SEPT 2023	12	7	34	0.6	12
JUNE 2024	39	10	37	0.6	11

*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 (42.49 acres) targeted curly-leaf pondweed using Diquat. The treatment area was delineated by Blue Water Science. Curly-leaf pondweed has been managed with Diquat since 2020 with treatment size ranging from 40 to 42.49 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: 43.3).

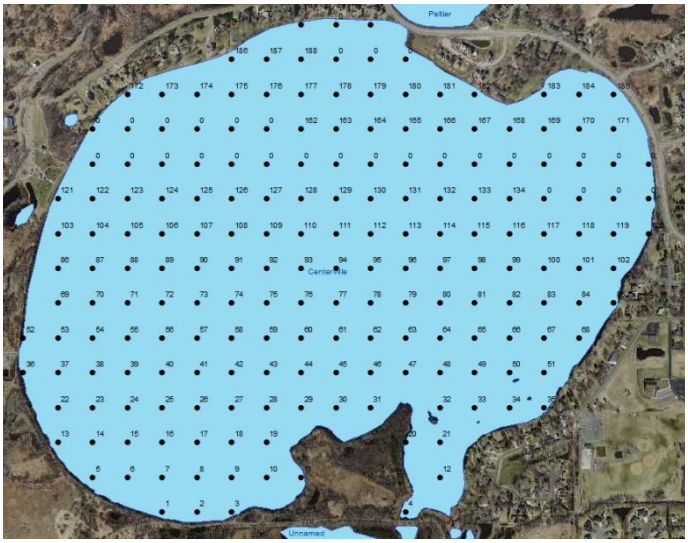
Date	Treatment [W,P,N]	Target Species	Total Acres Treated	Herbicide	Licensed Commercial Applicator
2019	N	CLP	-	-	-
2020	P	CLP	40	Diquat (Tribune)	Lake Management Inc.
2021	P	CLP	40.64	Diquat (Tribune)	PLM Lake & Land Mgmt.
2022	P	CLP	40.76	Diquat (Tribune)	Lake Management Inc.
2023	P	CLP	40.81	Diquat (Tribune)	Lake Management Inc.
2024	P	CLP	42.49	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 2.9 meters (9.8 feet) in 2024 which is the highest since the start of surveying Centerville Lake (see **Table 2 – Point Intercept Metrics**). Native plant diversity was 0.63 mean submersed taxa/point and 37% frequency of occurrence (FOO) (**Table 3 – Plant Frequency of Occurrence**). Mean submersed taxa/point has ranged from 0.46 and 0.95.

In the 2024 survey, ten submersed native plants were observed. The most common native taxa included muskgrass, coontail and sago pondweed (**See Table 3**). Similarly, in 2022 and 2023, the most common native taxa were muskgrass and coontail. Lesser abundant plants included Canadian Elodea, northern watermilfoil, small pondweeds (Fries', leafy and small pondweed) in the 2024 survey.

One invasive plant was observed during the 2024 survey (curly-leaf pondweed 39%; see **Table 3**). Curly-leaf pondweed was also observed in 2023 with less abundance (12% of sampled points in September 2023), although late summer surveys do not capture active curly-leaf pondweed growth.

Survey `Metrics	JUNE 2019	AUG 2019	AUG 2022	SEPT 2023	JUNE 2024
Treated (Y/N)	N	N	Y	Y	Y
Surveyor	Blue Water Science	Blue Water Science	Blue Water Science	MN DNR	MN DNR
Total # Points Sampled	133	76	71	114	131
Max Depth of Growth (95%) in feet	13	6	5	6.9	9.8
# Point in Max Depth Range	100	53	46	51	77
# Points in Littoral (0-15 feet)	122	76	71	114	131
% Points w/ Submersed Native Taxa	38	54	49	34	37
Mean Submersed Native Taxa/ Point	0.46	0.95	0.61	0.59	0.63
# Submersed Native Taxa	3	9	7	9	10
# Submersed Non-Native Taxa	1	1	0	2	1

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)

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	JUNE 2024
*Potamogeton crispus**	Curly-leaf pondweed	4	68	0	12	39
Ceratophyllum demersum	Coontail	9	3	10	18	11
Chara	Muskgrass (genus)	28	20	31	19	25
Heteranthera dubia	Water stargrass	8	0	0	3	1
Stuckenia pectinata	Sago pondweed	8	0	1	2	10
Lemna trisulca	Star duckweed	41	8	23	17	8
Najas spp.	Naiad	7	0	1	6	0
Stonewort genus	Nitella	8	0	0	0	0
Potomogeton foliosis	Leafy Pondweed	12	20	11	3	0
Potamogeton zosteriformis	Flat-stemmed pondweed	14	0	4	2	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: *Elodea canadensis (Canadian elodea) in 2024, Myriophyllum sibiricum (Northern watermilfoil) in 2024, Myriophyllum spicatum* (Eurasian watermilfoil) in 2023, Potamogeton foliosus (Leafy pondweed) in 2024, Potamogeton friesii (Fries' pondweed) in 2019, 2023 and 2024, Potamogeton pusillus (Small pondweed) in 2024, Vallisneria americana (Wild celery) in 2022 and 2023, and Wolffia columbiana (Columbian watermeal) in 2022*
* Denotes invasive aquatic plant

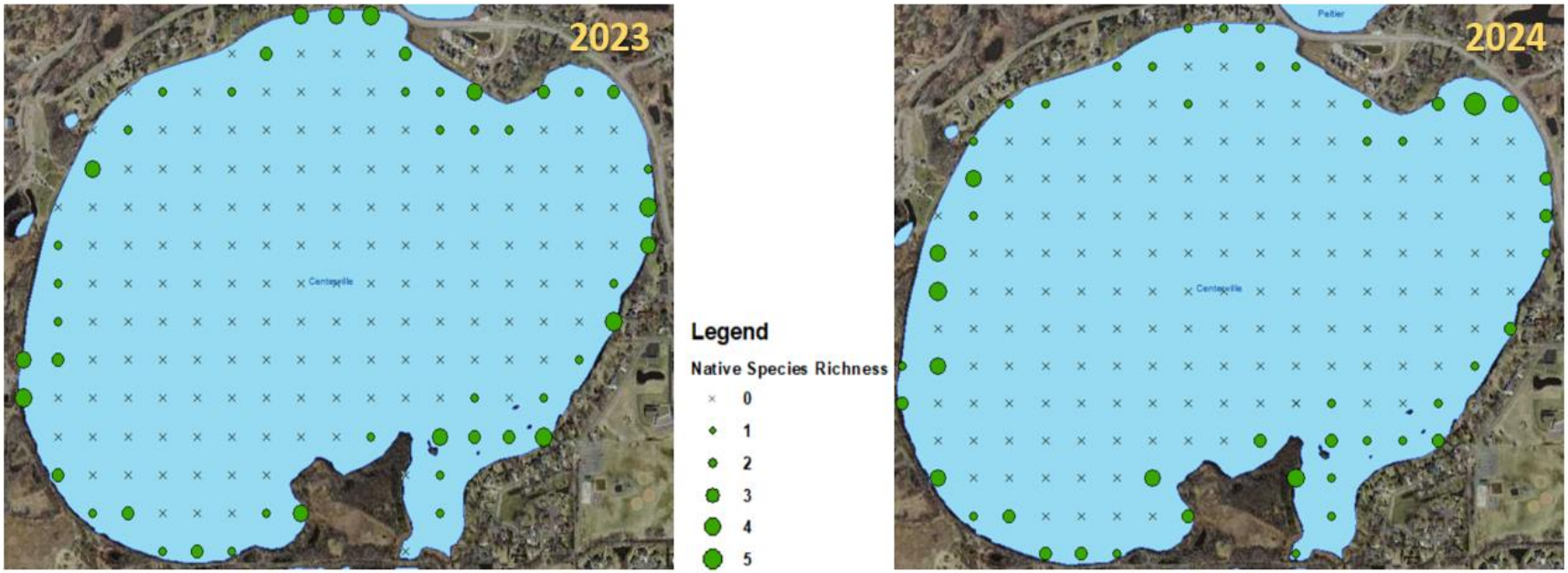


Figure 1 – Native Taxa Density. Spatial distribution and species richness (# of native species per sample point) of all submersed native plant species sampled during point intercept surveys conducted in September 2023 and June 2024. Surveys were conducted by the Minnesota Department of Natural Resources (MNDNR). Centerville Lake, Anoka County, Minnesota (DOW #2000600).

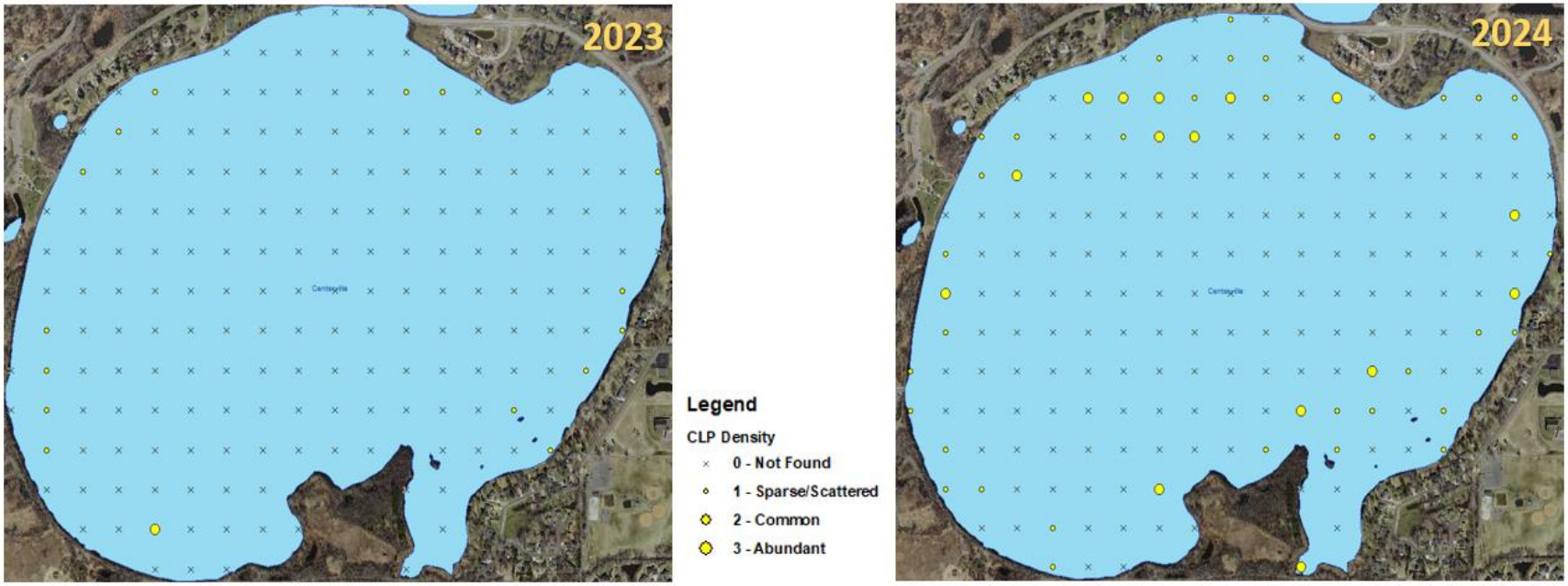


Figure 2 – Curly-leaf Pondweed Density. Spatial distribution and rake density rating per sample point of curly-leaf pondweed from point intercept surveys conducted in September 2023 and June 2024. Surveys were conducted by the Minnesota Department of Natural Resources (MNDNR). Centerville Lake, Anoka 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.