LAKE DEMONTREVILLE, WASHINGTON COUNTY: 2023 AQUATIC VEGETATION REPORT

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

Lake: DeMontreville (DOW# 82010100)

Lake Surface Area: 158 acres

Littoral Area: 142.62 acres

County: Washington

Survey Type: Point-intercept

Date of Survey (most recent): September 8, 2023

Observer[s]: Jenna Nelson (MNDNR)
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2023 Summary:

A Minnesota Department of Natural Resources (MN DNR) aquatic vegetation point intercept survey of Lake DeMontreville (DOW #82010100) was completed on September 8, 2023. Submersed plants were present throughout the lake to a depth of 4.3 meters (14 feet). Within the littoral zone (area in the lake from the 0 – 15-foot depth range [0 – 4.5 meters]), 84% of the sampled points contained native submersed taxa. The average number of native submersed taxa per sample point was 1.9, and a total of 11 submersed plant species were documented during the survey. In the fall of 2022, a whole lake fluridone treatment was administered to Lake DeMontreville for Eurasian watermilfoil control. Historical point intercept surveys have been completed by BARR Engineering and organized by the Valley Branch Watershed District (VBWD).

Summary Table. Summary of aquatic submersed plants in Lake DeMontreville, Washington County, Minnesota (DOW# 82010100) as indicated by the results of point-intercept surveys. Aquatic plant survey data from 2012- 2023 were collected by BARR Engineering and presented by VBWD. Data collected in September 2023 by the MN DNR.

YEAR	MONTH	% Frequency of EWM	# Submersed Taxa
2012	JUN	4	23
2013	JUN	33	24
2014	JUN	19	23
2015	JUN	17	25
2016	JUN	16	20
2017	JUN	14	23
2018	JUL	12	21
2019	JUN	4	20
2020	JUN	9	19
2021	JUN	3	16
2022	JUN	2	19
2023	JUN	-	18
2023*	SEP	-	11

*Data collected by the MN DNR

Lake Description:

Lake DeMontreville is a 158-acre lake located near Lake Elmo, 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 7.3 meters (24 feet). Approximately 90% of the lake is littoral (water depth zone from 0 – 15 feet where aquatic plants are likely to be found). Average yearly water clarity in Lake DeMontreville has remained stable; May through September from 2017 – 2022.

More information on Lake DeMontreville 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/82-0101-00-207 and https://arcgis.dnr.state.mn.us/ewr/whaflakes/.

Management History:

Historically, management and lake health improvement projects have been implemented by Valley Branch Watershed District (VBWD). The watershed district contracts BARR Engineering to develop management plans for several Washington and Ramsey County lakes including Lake DeMontreville. Eurasian watermilfoil (EWM) was first observed in Lake DeMontreville in 2007. From 2015 to 2022 targeted EWM spot treatments were completed using both a systemic auxin-mimic herbicide (2,4-D) and a contact herbicide (Diquat). According to VBWD survey reports, EWM increased more than 65% from June 2020 to May 2021 per early season delineation surveys conducted by BARR Engineering. In 2022, given the abundance of EWM detected, a variance was granted to treat the whole lake using Fluridone in the fall (see **Table 1 – Invasive Plant Management Summary** for a recent history of herbicide treatments). No invasive plant management was conducted in 2023. Full VBWD reports available upon request.

Table 1 – Invasive Plant Management Summary. Characteristics and history of herbicide treatment for Lake DeMontreville, Washington County (DOW# 82010100, total acres: 158, littoral acres: 142.62, 15% littoral acres: 21.39).

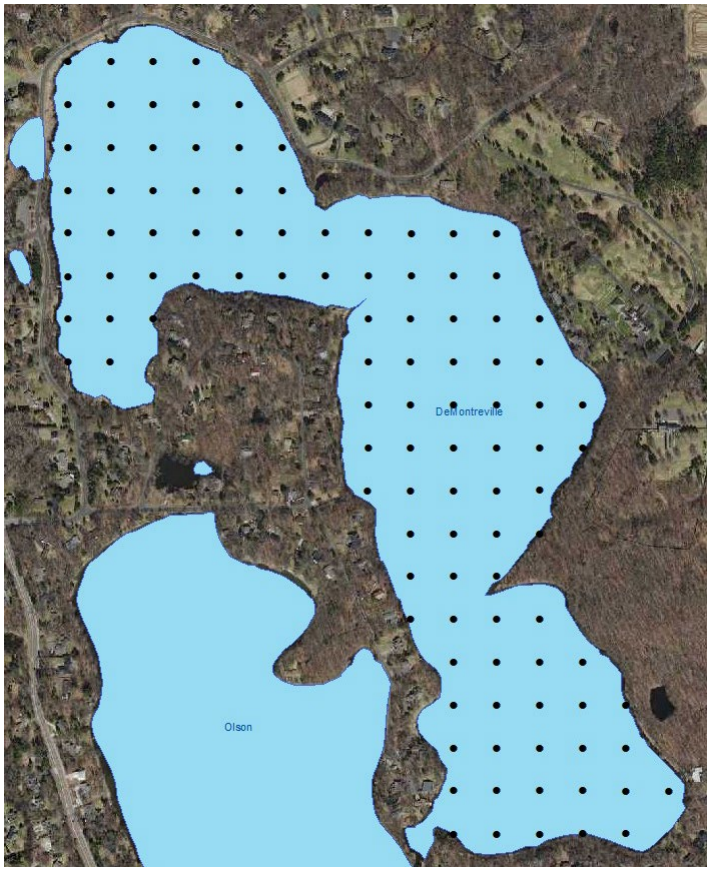
Date	Treatment [W, P, N]	Target Species	Total Acres Treated	Herbicide	Licensed Commercial Applicator
2015	P	EWM	14	2, 4-D	PLM Lake & Land Management
2016	P	EWM	14.3	2, 4-D	PLM Lake & Land Management
2017	P	EWM	12.3	2, 4-D	PLM Lake & Land Management
2018	P	EWM	16	Diquat	PLM Lake & Land Management
2019	P	EWM	8.4	Diquat	PLM Lake & Land Management
2020	P	EWM	15.3	Diquat	PLM Lake & Land Management
2021	P	EWM	13.2	Diquat	PLM Lake & Land Management
2022	P	EWM	14.3	Diquat	PLM Lake & Land Management
	W	EWM	158.0	Fluridone	PLM Lake & Land Management
2023	N	-	-	-	-

Treatment: W (whole lake), P (partial lake), N (no treatment)
EWM is an abbreviation for Eurasian watermilfoil

Survey Objectives:

Point-intercept surveys were used to assess the distribution of aquatic plants in Lake DeMontreville. 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 Minnesota Department of Natural Resources and our partners monitor native plant communities and evaluate possible responses to 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 75 meters apart using a Geographic Information System (GIS). This spacing allowed for the placement of 111 points. Plant samples were collected by throwing and dragging a double-sided rake along the lake bottom at each point. Plant samples were assessed on the boat to determine species and rake fullness as a surrogate for abundance (scale of zero [no plants] to 3 [dense, matted on the surface]). 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:

In the September 2023 survey conducted by the Minnesota Department of Natural Resources (MN DNR), eleven total aquatic plant species were observed: ten native species and one invasive species. A total of 103 points were sampled throughout the lake, with 86 points falling within the littoral zone (0 – 15 feet). The mean submersed native taxa per sampling point was 1.9, and 84% of the sampled points contained native submersed taxa.

Although VBWD point-intercept plant surveys have documented good plant diversity in Lake DeMontreville from 2012 through 2020, diversity has consistently declined since 2019 (see **Summary Table**). Additionally, since 2019 there have been observable declines in coontail and Canadian waterweed. Macroalga were the most dominant submersed taxa observed in the MN DNR survey, which includes Chara spp. (Muskgrass) and Nitella spp. (Stonewort). Leafy pondweed, Robbins' pondweed, and wild celery were also observed between 20% and 26% frequency of occurrence (FOO; see **Table 2 – Plant Frequency of Occurrence**). In the past five years, frequencies in three pondweeds have had observable increases (Robbin's, large-leaf, and leafy).

Curly-leaf pondweed (CLP) was observed at 10% FOO, most likely detecting fall growth from turions (CLP modified seeds). Eurasian watermilfoil was not detected in the fall MN DNR survey.

For historical survey observations, please reference the aquatic plant point intercept surveys conducted by Barr Engineering, contracted by the Valley Branch Watershed District: https://vbwd.org/education/aquatic_plant_management/index.php

Photos 1 & 2. Left (1): Curly leaf pondweed sampled during a rake toss on Lake DeMontreville during the MN DNR point intercept survey in September 2023. Right (2): Healthy curly leaf pondweed observed in early September 2023 in Lake DeMontreville, Washington County, Minnesota (DOW# 82010100).

Table 2 – Plant Frequency of Occurrence. Historic percent frequency of occurrence for submersed vegetation within the littoral zone (0 – 15 feet) in Lake DeMontreville, Washington County, Minnesota (DOW# 82010100). Aquatic plant survey data from 2012- 2023 was collected by BARR Engineering and presented by VBWD. Data collected in September 2023 by the MN DNR.

Taxonomic Name SUBMERSED PLANTS	Common Name	JUN 2012	JUN 2013	JUN 2014	JUN 2015	JUN 2016	JUN 2017	JUL 2018	JUN 2019	JUN 2020	JUN 2021	JUN 2022	JUN 2023	SEPT 2023
*Potamogeton crispus**	Curly-leaf pondweed	49	42	10	31	2	17	-	12	P	6	6	16	10
Myriophyllum spicatum*	Eurasian watermilfoil	4	33	19	17	16	1	12	4	9	3	2	-	-
Ceratophyllum demersum	Coontail	38	50	61	61	70	53	49	25	8	8	4	1	5
Chara spp.	Muskgrass	6	5	10	13	30	35	45	48	60	61	77	42	52
Elodea canadensis	Canadian waterweed	8	22	32	30	68	64	24	10	7	-	5	-	-
Heteranthera dubia	Water stargrass	5	7	7	2	4	1	1	1	-	-	-	2	9
Myriophyllum sibiricum	Northern watermilfoil	5	12	13	1	-	-	-	-	-	-	-	-	-
Najas spp.	Naiad	2	2	5	14	22	17	9	4	1	1	-	-	-
Nitella spp.	Stonewort	11	3	3	6	11	10	4	26	25	8	12	3	43
Potamogeton amplifolius	Large-leaved pondweed	4	3	3	6	-	1	1	2	5	5	8	3	13
Potamogeton illinoensis	Illinois pondweed	9	7	7	6	6	3	3	4	2	-	-	-	-
Potamogeton pusillus	Small pondweed	41	30	25	18	5	13	24	21	19	44	32	13	26
Potamogeton robbinsii	Robbins' pondweed	12	26	19	17	4	4	5	6	8	9	5	8	20
Potamogeton zosteriformis	Flat-stem pondweed	50	48	39	45	12	2	3	3	P	1	1	P	-
Ranunculus aquatilis	White-water crowfoot	4	5	3	5	3	5	-	-	-	-	P	-	-
Vallisneria americana	Wild celery	4	2	7	12	14	18	21	12	17	16	6	8	21

Floating, free-floating & emergent plants observed: Aquatic moss, *Eleocharis acicularis* (needle spikerush), *Eleocharis palustris* (common spikerush), Filamentous algae, *Iris pseudacorus* (yellow iris)*, *Iris versicolor* (Northern blue flag), *Lemna minor* (common duckweed), *Lemna trisulca* (star duckweed), *Lythrum salicaria* (purple loosestrife)*, *Nymphaea odorata* (white water lily), *Phalaris arundinacea* (reed canary grass)*, *Polygonum amphibium* (water smartweed), *Sagittaria graminea* (grass-leaved arrowhead), *Schoenoplectus acutus* (hardstem bulrush), *Schoenoplectus tabernaemontani* (softstem bulrush), *Spirodela polyrhiza* (greater duckweed), *Typha angustifolia* (narrowleaf cattail)*, *Typha latifolia* (broadleaf cattail),*Typha glauca* (hybrid cattail), and *Wolffia columbiana* (columbiana watermeal)

Less common (< 5% frequency) submersed vegetation observed: *Isoetes echinospora* (spiny quillwort) in 2015, *Lychnothamnus barbatus* (Characeae stoneworts) in 2023, *Potamogeton friesii* (Fries' pondweed) in 2013, 2014, *Potamogeton foliosus* (leafy pondweed) in 2022, *Potamogeton nodosus* (Long-leaf pondweed) in 2020, 2021, 2023, and *Stuckenia pectinata* (Sago pondweed) in 2013, 2018

* Denotes invasive aquatic plant

P = Present - Observed but not collected on the sampling rake

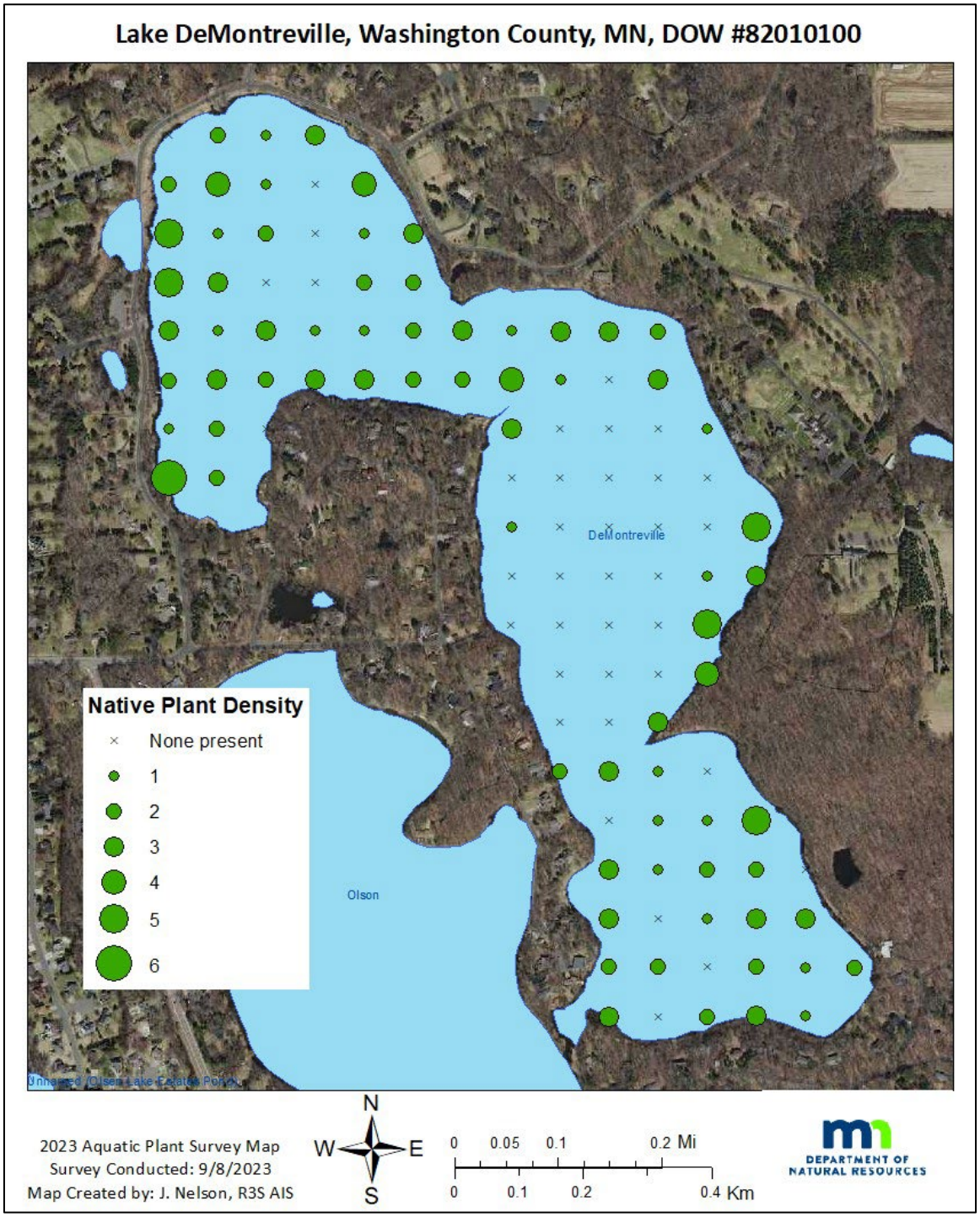


Figure 1 – Native Plant Density. Spatial distribution and species richness (# of native taxa per sample point) of all submersed aquatic plant species from Minnesota Department of Natural Resources point intercept surveys (2023). Lake DeMontreville, Washington County, Minnesota (DOW# 82010100).

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