
LAKE OLSON, WASHINGTON COUNTY: 2023 AQUATIC VEGETATION REPORT

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

Lake: Olson (DOW# 82010300)

Lake Surface Area: 88 acres

Littoral Area: 87.13 acres

County: Washington

Survey Type: Point-intercept

Date of Survey (most recent): September 6, 2023

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2023 Summary:

A Minnesota Department of Natural Resources (MN DNR) aquatic vegetation point intercept survey of Olson Lake (DOW #82010300) was completed on September 6, 2023. Submersed plants were present throughout the lake to a depth of 4.6 meters (15 feet). Within the littoral zone (area in the lake from the 0 – 15-foot depth range [0 – 4.5 meters]), 87% of the sampled points contained native submersed taxa. The average number of native submersed taxa per sample point was 2.5, and a total of 14 submersed plant species were documented during the survey (**Summary Table**). In the fall of 2022, a whole lake fluridone treatment was administered to Lake Olson 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 Olson, Washington County, Minnesota (DOW# 82010300) as indicated by the results of point-intercept surveys. 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.

YEAR	MONTH	% Frequency of EWM	# Submersed Taxa
2012	JUN	3	22
2013	JUN	5	22
2014	JUN	28	25
2015	JUN	28	26
2016	JUN	19	24
2017	JUN	25	25
2018	JUL	10	22
2019	JUN	3	23
2020	JUN	2	23
2021	JUN	13	23
2022	JUN	4	20
2023	JUN	1	20
2023*	SEP	-	14

*Data collected by the MN DNR

Lake Description:

Lake Olson is an 88-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 4.6 meters (15 feet). Approximately 99% 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 Olson has remained stable; May through September from 2017 – 2022.

More information on Lake Olson 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/82-0103-00-204> 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 Olson. From 2017 to 2021 targeted Eurasian watermilfoil spot treatments were completed using both a systemic auxin-mimic herbicide (2,4-D) and a contact herbicide (Diquat). In 2022, given the abundance of Eurasian watermilfoil, a variance was granted to treat the whole lake using Fluridone (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 Olson, Washington County (DOW# 82010300, total acres: 88, littoral acres: 87.13, 15% littoral acres: 13.11).

Date	Treatment [W, P, N]	Target Species	Total Acres Treated	Herbicide	Licensed Commercial Applicator
2017	P	EWM	8.7	2, 4-D	PLM Lake & Land Management
2018	P	EWM	8.5	Diquat	PLM Lake & Land Management
2019	P	EWM	6.6	Diquat	PLM Lake & Land Management
2020	P	EWM	9.0	Diquat	PLM Lake & Land Management
2021	P	EWM	9.2	Diquat	PLM Lake & Land Management
2022	P	EWM	9.2	Diquat	PLM Lake & Land Management
	W	EWM	88.0	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 Olson. 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 55 meters apart using a Geographic Information System (GIS). This spacing allowed for the placement of 120 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 less than 15 feet in depth).

Survey Observations:

In the September 2023 survey conducted by the Minnesota Department of Natural Resources (MN DNR), fourteen total aquatic plant species were observed. A total of 99 points were sampled throughout the lake, with all 99 points falling within the littoral zone (0 – 15 feet). The mean submersed native taxa per sampling point was 2.5, and 87% of the sampled points contained native submersed taxa.

Plant diversity in Lake Olson has remained consistently high over the past 12 years for a Twin Cities area lake. *Chara spp.* (muskgrass) was the most dominate submersed aquatic taxa, with Robbins’ pondweed, water celery, coontail, water stargrass, and large-leaved pondweed being observed at less frequencies (see **Table 2 – Plant Frequency of Occurrence**) during the fall 2023 MN DNR plant survey. *Najas spp.* (Naiad), Canadian waterweed, and Illinois pondweed abundances appear to be in decline over the past eight years. Alternatively, large-leaf pondweed, Robbins’ pondweed, and water celery species appear to be on the uprise. Northern watermilfoil hasn’t been sampled in the lake since 2015.

Neither Eurasian watermilfoil nor curly-leaf pondweed were observed in the fall 2023 MN DNR survey. The absence of CLP is most likely due to the timing of the survey and the plants natural senescence in July.

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): Large-leaf and Richardson's pondweed sampled during a rake toss on Lake Olson while conducting an aquatic plant point intercept survey in 2023. Right (2): Bearded stonewort (*Lychnothamnus barbatus*) observed in September 2023 on Lake Olson, Washington County, Minnesota (DOW: 82010300).

Table 2 – Plant Frequency of Occurrence. Historic percent frequency of occurrence for submersed vegetation within the littoral zone (0 – 15 feet) in Lake Olson, 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
<i>Myriophyllum spicatum</i> *	Eurasian watermilfoil	3	5	28	28	19	25	10	3	2	13	4	1	-
<i>Potamogeton crispus</i> *	Curly-leaf pondweed	28	43	3	5	1	5	-	7	P	3	8	-	-
<i>Ceratophyllum demersum</i>	Coontail	27	38	57	37	50	58	48	38	22	21	25	24	32
<i>Chara spp.</i>	Muskgrass	25	10	25	38	53	55	53	53	65	66	63	69	61
<i>Elodea canadensis</i>	Canadian waterweed	11	11	23	23	67	58	30	15	17	19	16	9	-
<i>Heteranthera dubia</i>	Water stargrass	16	12	24	6	4	1	1	2	1	2	-	3	25
<i>Myriophyllum sibiricum</i>	Northern watermilfoil	12	10	8	2	-	-	-	-	-	-	-	-	-
<i>Najas spp.</i>	Naiad	3	13	13	12	12	16	18	5	3	2	4	7	2
<i>Nitella spp.</i>	Stonewort	12	6	4	7	9	9	6	17	13	8	10	9	-
<i>Potamogeton amplifolius</i>	Large-leaved pondweed	10	7	1	3	-	2	1	1	2	8	8	13	24
<i>Potamogeton gramineus</i>	Variable pondweed	-	-	-	-	-	-	-	-	3	1	-	-	5
<i>Potamogeton illinoensis</i>	Illinois pondweed	23	17	13	13	8	17	-	4	3	1	-	P	4
<i>Potamogeton pusillus</i>	Small pondweed	30	25	22	6	3	2	10	18	20	32	31	8	-
<i>Potamogeton robbinsii</i>	Robbins' pondweed	10	7	10	21	8	10	8	21	22	24	26	32	41
<i>Potamogeton zosteriformis</i>	Flat-stem pondweed	19	21	17	15	6	3	4	3	1	4	5	7	13
<i>Vallisneria americana</i>	Water celery	2	-	3	5	6	10	22	16	19	16	10	17	36

Floating, free-floating & emergent plants observed: Aquatic moss, *Calamagrostis canadensis* (Canadian reedgrass), *Eleocharis acicularis* (needle spikerush), *Eleocharis palustris* (common spikerush), Filamentous algae, *Iris pseudacorus* (yellow iris)*, *Iris virginica* (Virginia blueflag), *Iris virginica var. shrevei* (Southern blue flag iris), *Lemna trisulca* (star duckweed), *Lythrum salicaria* (purple loosestrife)*, *Nymphaea odorata* (white water lily), *Phalaris arundinacea* (reed canary grass)*, *Polygonum amphibium* (water smartweed), *Sagittaria cristata* (crested arrowhead), *Sagittaria graminea* (grass-leaved arrowhead), *Schoenoplectus acutus* (hardstem bulrush), *Schoenoplectus tabernaemontani* (softstem bulrush), *Typha angustifolia* (narrowleaf cattail)*, and *Typha glauca* (hybrid cattail)*.

Less common (< 5% frequency) submersed vegetation observed: *Eleocharis acicularis* (least spikerush) in 2023, *Isoetes echinospora* (spiny quillwort) in 2014, *Lychnothamnus barbatus* (Characeae stoneworts) in 2019-2023, *Potamogeton foliosus* (Leafy pondweed) in 2021-2023, *Potamogeton nodosus* (Long-leaf pondweed) in 2015-2023, *Ranunculus aquatilis* (White-water crowfoot) in 2012-2017, 2019, and *Stuckenia pectinata* (Sago pondweed) in 2013-2018.

* Denotes invasive aquatic plant

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

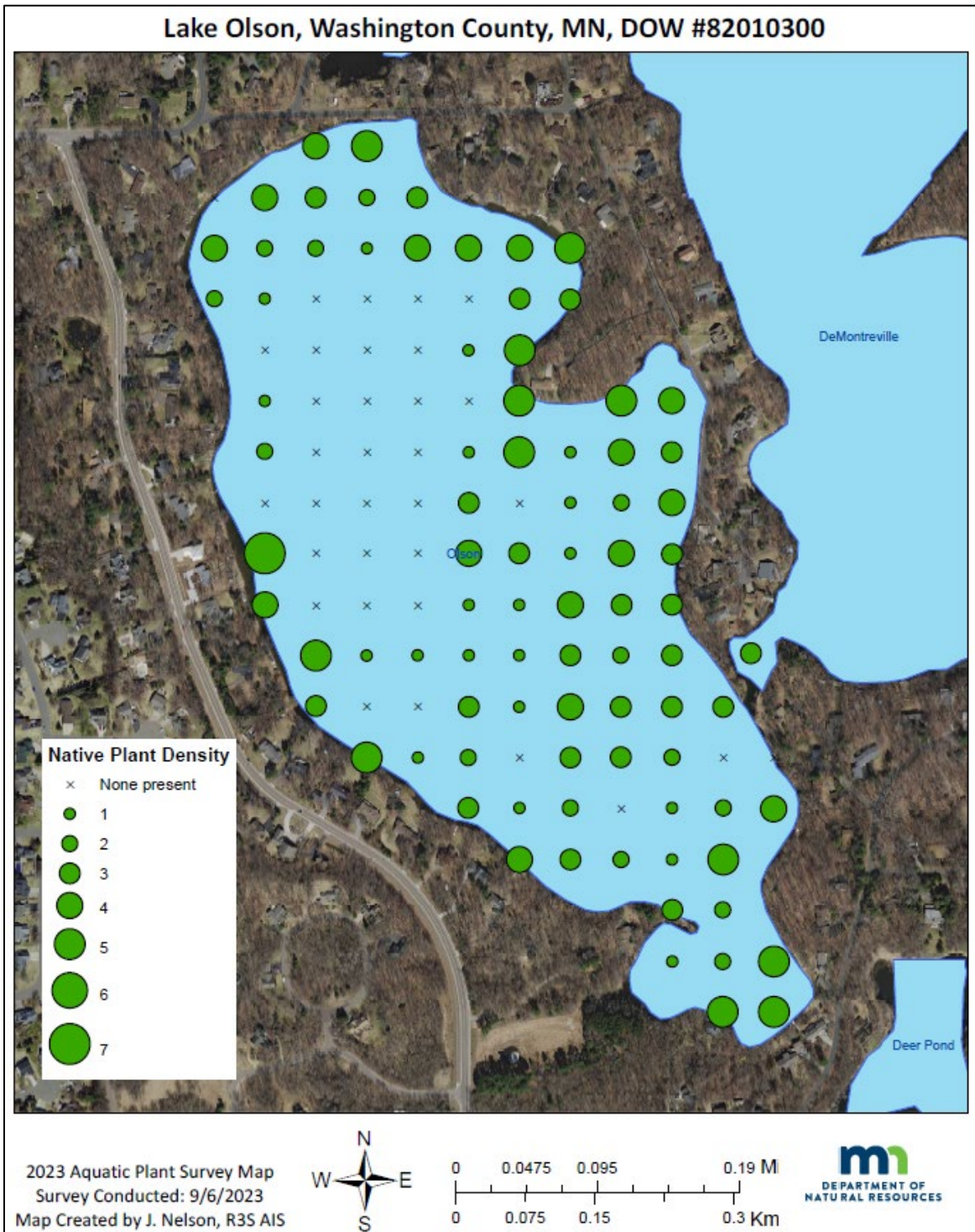


Figure 1 – Native Plant Density. Spatial distribution and species richness (# of native taxa per sample point) of all submersed aquatic plant species from Minnesota Department of Natural Resources point intercept surveys (2023). Lake Olson, Washington County, Minnesota (DOW# 82010300).

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.