
TURTLE LAKE, RAMSEY COUNTY: 2025 AQUATIC VEGETATION REPORT

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

Lake: Turtle (DOW# 62006100)

Lake Surface Area: 454 acres

Littoral Area: 284 acres

County: Ramsey

Survey Type: Point-intercept

Date of Survey (most recent): July 17, 2025

Observer[s]: Garrett Miller (MN DNR)

Ashley Halverson (CCMI)

Report updated: October 27, 2025

Author[s]: Garrett Miller

Email: garrett.miller@state.mn.us

Phone: 651.259.5729



2025 Summary:

The most recent aquatic vegetation point-intercept survey on Turtle Lake (DOW# 62006100) was completed on July 17, 2025. Submerged plants were identified out to a maximum 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]), 50% of sampled points contained native submersed taxa. The average number of native submersed taxa per sample point was 2.3. Twelve submersed plant species were documented during the 2025 survey including one invasive plant species, curly-leaf pondweed. Offshore herbicide treatments targeting Eurasian watermilfoil have been organized since 2002 by the Turtle Lake Homeowners Association.

Summary Table. Summary of aquatic submersed plants in Turtle Lake, Ramsey County, Minnesota (DOW# 62006100) as indicated by the results of point-intercept surveys. Values were calculated from littoral depth range (0 – 15 feet).

PI Survey Date	% Frequency of EWM*	Max Depth of Growth in feet [95%] [†]	% Points w/ Native Submersed Taxa	Mean Native Submersed Taxa/ Point	# Submersed Taxa
JUN 2 2010	5	-	-	-	14
JUN 4 2014	3	-	-	-	17
JUL 12 2016	5	12	54	1.2	19
JUL 13 2017	5	11	70	1.6	15
JUL 23 2018	3	11	72	1.9	14
JUL 21 2022	-	8	49	1.3	13
JUL 19 2023	16	10	57	1.7	14
JUL 17 2025	-	14	50	2.3	12

*EWM is short for Eurasian watermilfoil

†95th percentile calculated based on all vegetated sampling points

Taxa refers to groups of submersed aquatic plant species or genera

Lake Description:

Turtle Lake is a 454-acre lake located in Shoreview, Minnesota and contains one public access. 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 8.5 meters (28 feet). Approximately 63% of the lake is littoral (water depth zone from 0 – 15 feet where aquatic plants are likely to be found). Turtle Lake is mesotrophic and contains a moderate level of nutrients. For more information on Turtle Lake water quality: <https://webapp.pca.state.mn.us/surface-water/station/62-0061-00-100> and <https://whaf-lakes.dnr.state.mn.us/>.

Management History:

Pre-treatment delineation surveys and management coordination have been conducted by Freshwater Scientific Services and the Turtle Lake Homeowners Association, respectively. Treatment size has ranged from 5 to 42 acres in the past ten years using four different herbicides, with 2,4-D being historically used to target EWM in Turtle Lake (2012 – 2018). In the three following seasons (2020-2022) a combination treatment using Diquat and ProcellaCOR was used. In 2023, with an increased abundance of EWM, a whole-lake treatment with Fluridone was implemented. Following the 2023 fluridone treatment, no EWM management was needed in 2024. In 2025, minimal EWM regrowth was observed, which resulted in 18.5 acres being treated with diquat. See **Table 2-Invasive Plant Management Summary** below for more information on invasive plant management activities. Non-native Phragmites (an invasive emergent reed) have been historically managed by mechanical, and herbicide means, treating <1 acre from 2014-2016, and in 2023. Additional information available upon request.

Table 2-Invasive Plant Management Summary. Characteristics and history of herbicide treatment for Turtle Lake, Ramsey County, Minnesota (DOW# 62006100, total acres: 454.0, littoral acres: 284.2, 15% littoral acres: 42.6).

Date	Treatment [W, P, N]	Target Species	Total Acres Treated	Herbicide	Licensed Commercial Applicator
2012	P	EWM	20	2,4-D	Midwest Aquacare
2013	P	EWM	25	2,4-D	Midwest Aquacare
2014	P	EWM	5	2,4-D	Midwest Aquacare
2015	P	EWM	25	2,4-D	Midwest Aquacare
2016	P	EWM	8.9	2,4-D	Midwest Aquacare
2017	P	EWM	9.7	2,4-D	Lake Management
2018	P	EWM	21.8	2,4-D	PLM Lake & Land Mgmnt
2019	P	EWM	8.3	Diquat	PLM Lake & Land Mgmnt
2022	P	EWM	16.6	ProcellaCOR, Diquat	PLM Lake & Land Mgmnt
2021	P	EWM	31.4	ProcellaCOR, Diquat	PLM Lake & Land Mgmnt
2022	P	EWM	42.6	ProcellaCOR, Diquat	PLM Lake & Land Mgmnt
2023	W	EWM	454	Fluridone	PLM Lake & Land Mgmnt
2025	P	EWM	18.5	Diquat	PLM Lake & Land Mgmnt

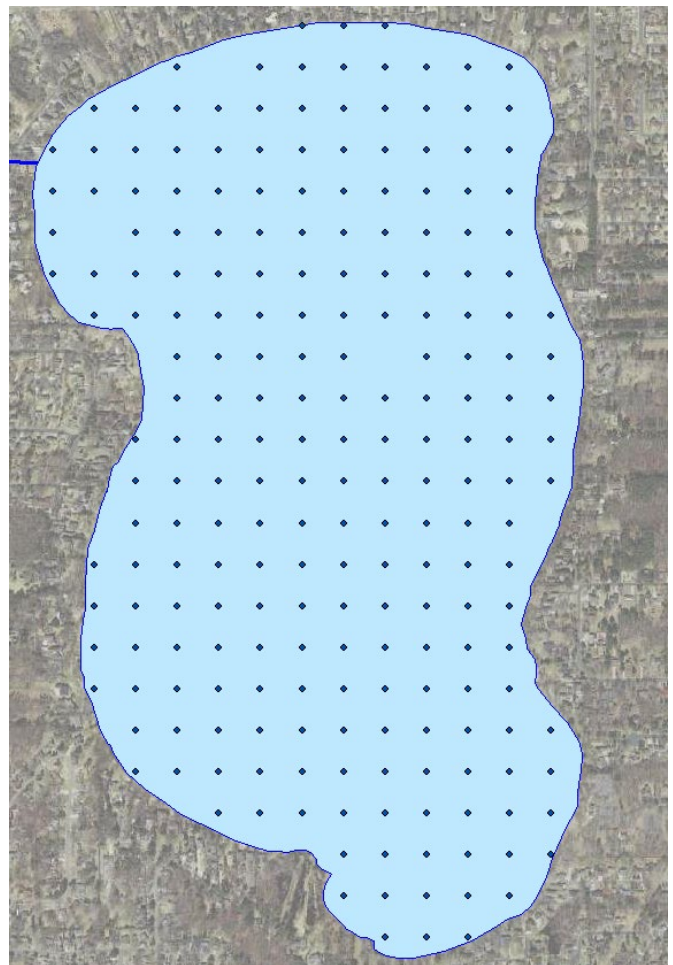
Treatment: W (whole lake), P (partial lake), N (no treatment)
EWM is an abbreviation for Eurasian watermilfoil

Survey Objectives:

Point-intercept surveys were used to assess the distribution of aquatic plants in Turtle 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 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 historically placed 70 meters apart using a Geographic Information System (GIS). This spacing allowed for placement of 335 points in years prior to 2022. In 2022, and subsequent years, a new grid was created where survey points were placed 90 meters apart allowing for placement of 225 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 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 is less than 15 feet in depth).



Survey Observations:

The Minnesota Department of Natural Resources (MN DNR) Invasive Species Program conducted point-intercept surveys on Turtle Lake in 2016, 2017, 2018, 2022, 2023, and 2025. Maximum depth of rooted vegetation remains relatively consistent from 2016 to 2023 (between 2.4 – 3.6 meters [8 – 12 feet]; see **Table 3 – Point Intercept Metrics** for historical point-intercept survey calculations). During the 2025 survey, growth was observed at 14 ft (4.27 meters), two feet deeper than the previous deepest observation in 2016. In total, eleven native submerged aquatic plant species were observed in 2025. In addition, plant diversity has remained constant, with six out of the eight surveys ranging from 12 to 15 species (including two surveys conducted by the Ramsey Conservation District).

The most common native taxa included macroalgae, clasping-leaf pondweed, flat-stem pondweed, water stargrass, naiad, and water celery (see **Table 4 – Plant Frequency Occurrence** for historical plant frequency observations). Native plant frequency has stayed relatively consistent from 2010 to 2025 with macroalgae and naiads peak frequencies occurring in 2010 and 2014, while water stargrass, first observed in 2022, has increased each year since.

Eurasian watermilfoil and Northern watermilfoil were not detected in the most recent survey. Both pure genetic Eurasian watermilfoil and northern watermilfoil strains have been previously recorded in Turtle Lake. Genetic testing from 2017 indicates these two strains have crossbred resulting in the presence of hybrid Eurasian watermilfoil. The strain of hybrid EWM was indicated by lab results to have a sensitivity to 2,4-D and fluridone. The Turtle Lake Homeowners Association has been managing Eurasian watermilfoil since as early as 2002 (see **Table 2-Invasive Plant Management Summary** for full history of management).

The Ramsey Conservation District (RCD) & Ramsey County Public Works Environmental Resources (RCPW) have aquatic plant data from surveys conducted in June of 2010 and 2014. All other point intercept survey conducted between 2016 and 2025 were performed by the MNDNR (see **Table 3 – Point Intercept Metrics**). More information from either survey source can be provided upon request.

Table 3 – Point Intercept Metrics. Summary of point intercepts metrics for Turtle Lake, Ramsey County, Minnesota (DOW # 62006100). Shaded values were calculated from littoral depth range (0 – 15ft).

Survey Metrics	JUN 2 2010	JUN 4 2014	JUL 12 2016	JUL 13 2017	JUL 23 2018	JUL 21 2022	JUL 19 2023	JUL 17 2025
Treated (Y/N)	-	Y	Y	Y	Y	Y	Y	Y
Surveyor	RCD	RCD	MN DNR	MN DNR	MN DNR	MNDNR	MNDNR	MNDNR
Total # Points Sampled	110	336	332	335	300	170	112	122
Max Depth of Growth (95%) in feet	-	-	12	11	11	8	10	14
# Point in Max Depth Range	-	-	156	164	168	100	99	118
# Points in Littoral (0-15 feet)	-	-	182	191	189	136	112	121
% Points w/ Submersed Native Taxa	-	-	54	70	72	49	57	50
Mean Submersed Native Taxa/ Point	-	-	1.2	1.6	1.9	1.3	1.8	2.3
# Submersed Native Taxa	12	15	18	14	13	13	13	11
# Submersed Non-Native Taxa	2	2	1	1	1	-	1	1

Table 4 – Plant Frequency Occurrence. Historic percent frequency of occurrence for submersed vegetation within the littoral zone (0 – 15 feet) in Turtle Lake, Ramsey County, Minnesota (DOW # 62006100). 2010 and 2014 surveys were conducted by the Ramsey Conservation District & Ramsey County Public Works Environmental Resources. Surveys in 2016-2018, 2022, 2023, and 2025 were conducted by Minnesota Department of Natural Resources.

Taxonomic Name SUBMERSED PLANTS	Common Name	JUN 2 2010	JUN 4 2014	JUL 12 2016	JUL 13 2017	JUL 23 2018	JUL 21 2022	JUL 19 2023	JUL 17 2025
<i>Myriophyllum spicatum</i> *	Eurasian watermilfoil*	5	3	5	5	3	-	16	-
<i>Ceratophyllum demersum</i>	Coontail	2	3	2	2	7	3	7	2
<i>Elodea canadensis</i>	Canada waterweed	9	2	1	2	4	2	4	-
<i>Heteranthera dubia</i>	Water stargrass	-	-	-	-	-	1	5	8
<i>Macroalgae</i>	Muskgrass and Stonewort	59	70	27	36	39	29	50	43
<i>Myriophyllum sibiricum</i>	Northern watermilfoil	8	8	2	2	1	7	1	-
<i>Najas spp.</i>	Naiad	54	51	13	11	33	17	17	7
<i>Potamogeton amplifolius</i>	Large-leaf pondweed	18	5	1	-	-	3	5	2
<i>Potamogeton gramineus</i>	Variable-leaf pondweed	-	-	7	4	14	2	11	4
<i>Potamogeton illinoensis</i>	Illinois pondweed	1	11	7	5	6	11	9	6
<i>Potamogeton praelongus</i>	White-stem pondweed	-	32	4	9	6	1	2	-
<i>Potamogeton richardsonii</i>	Clasping-leaf pondweed	15	5	5	12	15	14	30	18
<i>Potamogeton zosteriformis</i>	Flat-stem pondweed	-	2	2	3	4	7	20	15
<i>Stuckenia pectinata</i>	Sago pondweed	-	7	1	1	2	-	-	1
<i>Vallisneria americana</i>	Water celery	4	3	3	3	2	10	13	7

*Denotes invasive aquatic plant

Floating, free-floating & emergent plants observed: *Phragmites australis subsp. Australis* (non-native common reed) and *Phragmites australis subsp. Americanus* (native common reed), *Nymphaea odorata* (white waterlily), *Nuphar variegata* (yellow pond-lily), *Sagittaria spp.* (arrowhead)

Less common (< 5% frequency) submersed vegetation observed: *Potamogeton crispus* (curly-leaf pondweed) in 2010, 2014, and 2025, *Eleocharis acicularis* (needle spikerush) in 2017 and 2018, *Heteranthera dubia* (water stargrass) in 2022, *Myriophyllum tenellum* (dwarf watermilfoil) in 2017, *Potamogeton foliosus* (leafy pondweed) in 2016, *Potamogeton pusillus* (small pondweed) in 2016, *Potamogeton robbinsii* (fern-leaf pondweed) in 2016, *Potamogeton strictifolius* (narrowleaf pondweed) in 2017, *Ranunculus aquatilis* (white water crowfoot) in 2010, and *Utricularia macrorhiza* (common bladderwort) in 2016.



Photo 1 (left): Rake of aquatic vegetation (primarily coontail) from point intercept survey conducted on July 17, 2025. **Photo 2 (right):** Abundant flat-stem pondweed (*Potamogeton zosteriformis*) found during the July 19, 2023, survey. Both images were taken by the MNDNR at Turtle Lake, Ramsey County, Minnesota (DOW # 62006100).

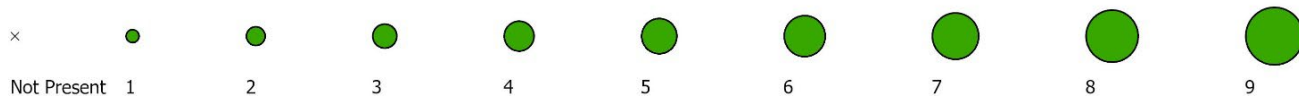
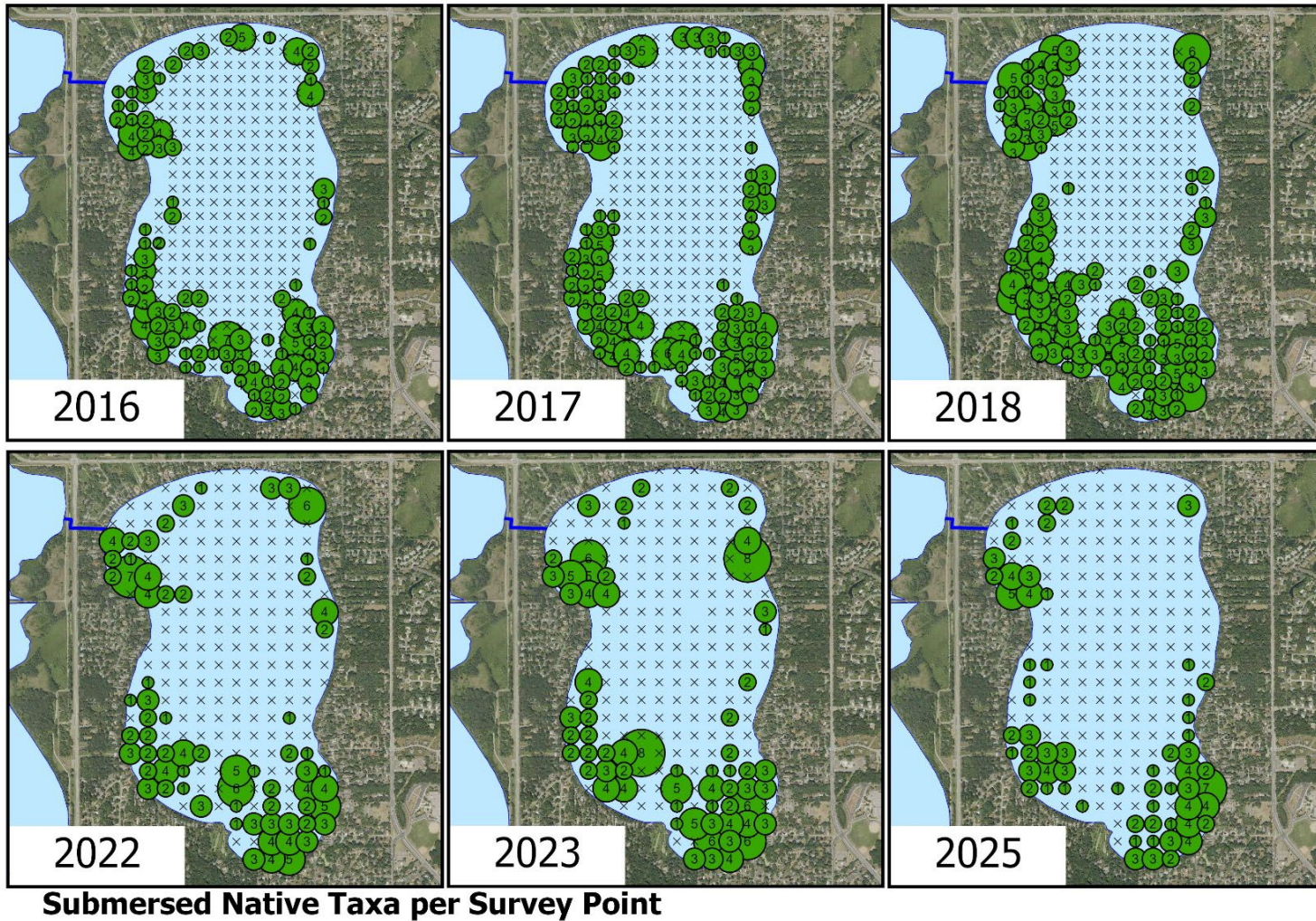


Figure 1 – Native Species Taxa Density. Spatial distribution and species richness (# of native species per sample point) of all submersed plant species from 2016-2018, 2022, 2023, and 2025 surveys in Turtle Lake, Ramsey County, Minnesota (DOW#62006100). Surveys conducted in 2016 – 2018 used 300 to 335 sampling points, 170 points were sampled in 2022, 112 points were sampled in 2023, and 122 in 2025.

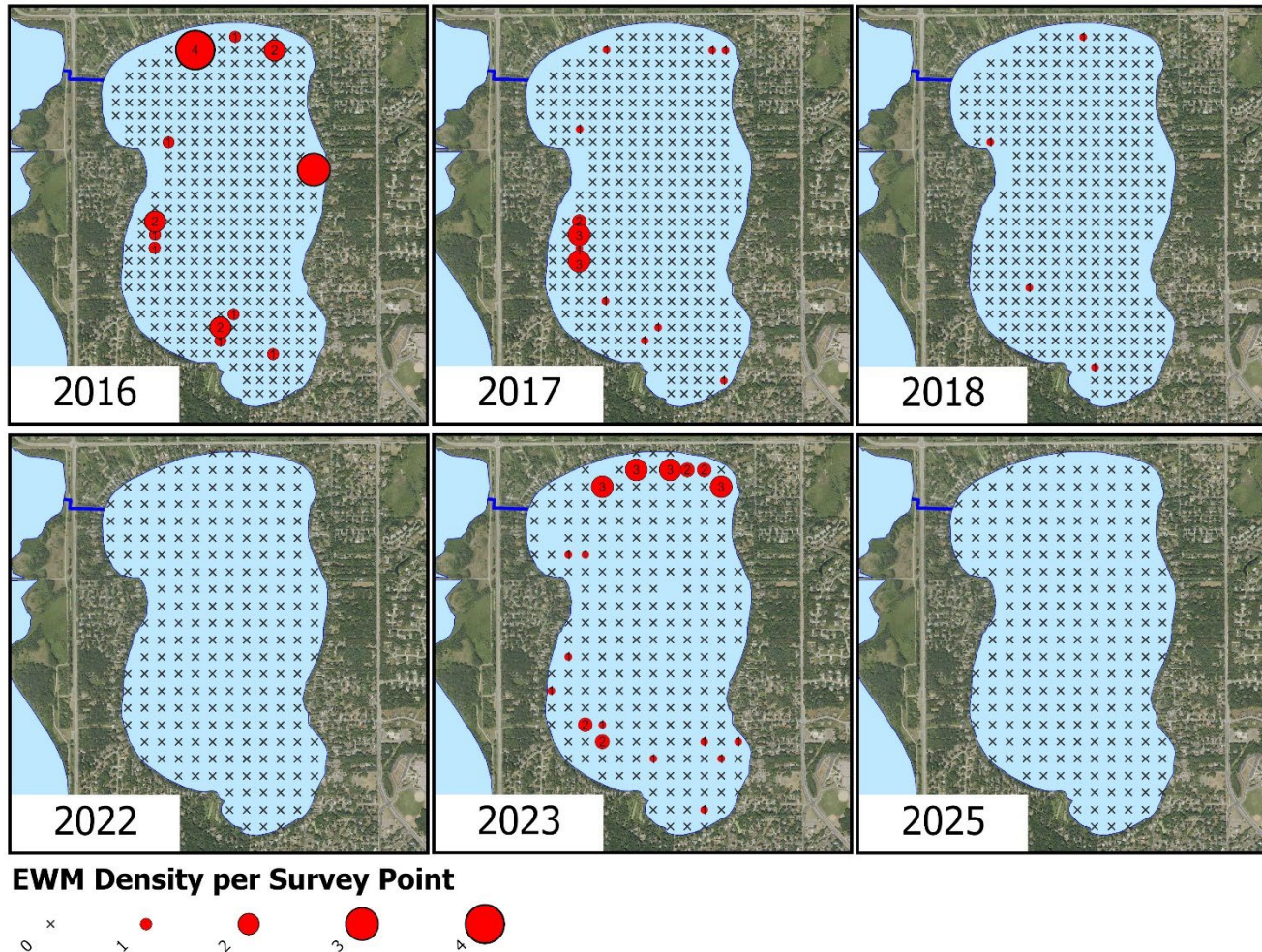


Figure 2 – Eurasian Watermilfoil Density Spatial distribution and rake density rating per sample point of Eurasian watermilfoil. The July 2018 map displays point intercept survey data following a spring Triclopyr treatment. The July 2022 map displays point intercept survey data following a spring ProcettaCOR and Diquat combination treatment; no Eurasian watermilfoil was observed. The July 2023 map displays point intercept survey data following a spring fluridone treatment. The July 2025 map displays point intercept survey data following a summer diquat treatment for EWM. Dot sizes are based on a 1-3 density rake rating. Turtle Lake, Ramsey County, Minnesota (DOW# 62006100).

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.