COON LAKE (East Basin), ANOKA COUNTY: 2025 AQUATIC VEGETATION REPORT

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

Lake: Coon (DOW# 02004200)

Lake Surface Area: 1,985 acres

Littoral Area: 1,332 acres

County: Anoka

Survey Type: Point-intercept

Date of Survey (most recent): August 21, 2025

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2025 Summary:

The 2025 aquatic vegetation point-intercept survey of Coon Lake (DOW #02004200) was completed in the East basin only on August 21, 2025. Plants were present to a maximum depth of 14 feet (4.3 meters) and 72% of 105 sampled points contained native submersed vegetation. The Coon Lake Improvement District (CLID) has been managing the invasive plants curly-leaf pondweed (CLP) and Eurasian watermilfoil (EWM) for over 15 years below the 15% littoral limit in both the East and West basin (199.8 acres combined). Due to an increase in nuisance Eurasian watermilfoil observed in the West basin, a variance was issued to allow basin-wide use of fluridone in the spring of 2019. Low-dose fluridone treatments can be an effective EWM management strategy and may provide more than three years of control. Since 2019, both the East and West basins have conducted annual spot treatments for CLP and/or EWM (**Table 2. Invasive Plant Management Summary)**.

Table 1. Summary Table East Basin. Summary of aquatic submersed plants in Coon Lake **(**East Basin**),** Anoka County, Minnesota (DOW# 2004200) as indicated by results of point-intercept surveys. Values were calculated from the 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
AUG 2010	12	9	64	1.2	7
AUG 2011	16	13	68	1.5	10
AUG/SEPT 2012	14	12	76	1.8	10
SEPT 2013	6	10.5	69	1.7	15
SEPT 2014	16	10	70	1.8	16
AUG 2018	17	8	79	2.6	15
AUG 2022	20	9	92	3.3	15
AUG 2025	0	14	72	2.6	20

*EWM is short for Eurasian watermilfoil
†95th percentile calculated based on all vegetated sampling points
Taxa refers to groups of submerged aquatic plant species or genera

Lake Description:

Coon Lake is a 1,985-acre mesotrophic (moderately nutrient-rich) lake located in East Bethel in Anoka County, Minnesota. The lake is composed of three basins, but for management purposes it is grouped into East Basin and West Basin, which represent the main recreational bodies for the lake (see maps in *Survey Methods* section).Both basins of Coon Lake are infested with two invasive aquatic plants: Eurasian watermilfoil (*Myriophyllum spicatum*, abbreviated as EWM) and curly-leaf pondweed (*Potamogeton crispus*, abbreviated as CLP). The maximum water depth is located in the East Basin at 27 feet (8.2 meters). Approximately 67% of the lake is littoral (water depth zone from 0-15 feet where aquatic plants are likely to be found). The Minnesota Pollution Control Agency's (MPCA) transparency trend has remained unchanged from 1971 to 2024. Transparency data collected for the MPCA were from a variety of sampling locations in both basins. These data were collected by Citizen Monitoring Groups. For more information concerning Coon Lake water quality, see https://webapp.pca.state.mn.us/surface-water/impairment/02-0042-00.

Management History:

The most recent herbicide treatment was organized by the Coon Lake Improvement District (CLID) (see below **Table 2-Invasive Plant Management Summary** for a recent history of herbicide treatments in Coon Lake – East Basin). In 2025, the spot treatments in the East basin targeted curly-leaf pondweed (33.5 acres using Flumioxazin) and Eurasian watermilfoil (43 acres using a combination treatment of diquat and ProcellaCOR) at two different times, based on plant growth. Historically, Coon Lake has managed both invasive plant species under the 15% littoral limit with separate herbicide spot treatments to control nuisance areas of invasive plant growth (predominantly endothall or Diquat for CLP and 2,4-D for EWM). A variance was issued to allow for the use of fluridone in the West Basin in 2019. Fluridone is a selective herbicide that is applied at a low-dose (2-4 parts per billion) throughout the growing season (>60 days of exposure; whole- bay treatment) to the West Basin. Due to this mechanism, a slow breakdown of Eurasian watermilfoil is often observed, with the plant collapsing in August. Additional management data for either bay is available upon request.

Table 2. Invasive Plant Management Summary. Characteristics and history of herbicide treatments for Coon Lake East Basin (Coon Lake, DOW# 02004200, Total acres: 1,984.7, Littoral acres: 1,331.9, 15% Littoral acres: 199.8).

Date	Treatment by Basin	Target Species	Acres Treated	Herbicide	Applicator
2019	P[E]	EWM	32.4	Diquat (Tribune) and ProcellaCOR	PLM Lake and Land Management Corp.
2019	P[E]	CLP	28.6	Diquat	PLM Lake and Land Management Corp.
2020	P[E]	CLP	14.4	Diquat (Tribune)	PLM Lake and Land Management Corp.
2021	P[E]	CLP	9.2	Diquat (Tribune)	PLM Lake and Land Management Corp.
2021	P[E]	EWM	22.8	Diquat (Tribune)	PLM Lake and Land Management Corp.
2022	P[E]	CLP	18.2	Diquat (Tribune)	PLM Lake and Land Management Corp.
2022	P[E]	EWM	10.8	Diquat (Tribune), ProcellaCOR	PLM Lake and Land Management Corp.
2023	p[E]	EWM	60	Diquat (Tribune) and ProcellaCOR	PLM Lake and Land Management Corp.
2024	p[E]	CLP	39.4	Diquat (Tribune)	PLM Lake and Land Management Corp.
2025	P[E]	CLP	33.5	Flumioxazin	PLM Lake and Land Management Corp.
2025	p[E]	EWM	43	Diquat (Tribune), ProcellaCOR	PLM Lake and Land Management Corp.

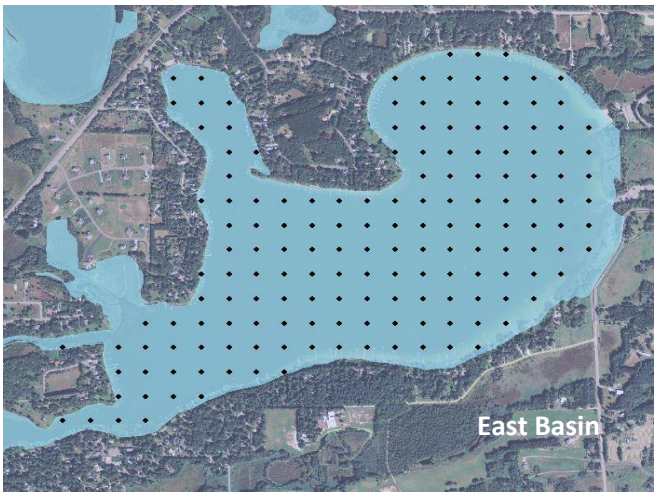
Treatment: W (whole lake), P (partial lake), N (no treatment) *LVMP year, [E] East Basin only,
CLP is an abbreviation for curly-leaf pondweed, EWM is an abbreviation for Eurasian watermilfoil

Survey Objectives:

Point-intercept surveys were used to assess the distribution of aquatic plants in Coon Lake East Basin. 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 DNR 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 of 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 (East basin) and 150 meters (West basin) apart using a Geographic Information System (GIS). Note: surveys from 2010 were 175 meters apart, respectively. This spacing allowed for the placement of 162-170 points, depending on basin and year. 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 density (scale of zero [no plants] to 4 [dense, matted on the surface] was used in 2012-2014 and a zero to 3 scale from 2018 to current). 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 East Basin's most recent point intercept survey was completed on August 21, 2025. The 2025 survey data showed a maximum depth of rooted vegetation was observed at 14 feet but historically has been observed growing up to 15 feet (**Table 3; Figure 1**). Native plant distribution (frequency of occurrence - FOO) has remained consistent from 2010 to 2025 (Range: 64% - 92% FOO, Average: 74% FOO), with a peak observed in 2022 (92% FOO). Within the same time period, the mean native submersed taxa per point have increased, peaking again in 2022 (3.3 species per point). Over the past fifteen years, species-specific FOOs have been variable. Most notably, in the 2025 survey, some of the lowest FOO were reported, including Canadian waterweed at 1% and naiad at 14%. Alternatively, water celery (54% FOO) and muskgrass (35% FOO) hit their highest recorded FOOs in the same survey. It is important to note that annual FOO variations are common, and trends can only be determined over time. Lastly, the 2025 survey recorded the highest number of native species at 19; the next highest was 2014, with 15 species observed.

As part of a University of Minnesota/MAISRC study, hybrid milfoil (*Myriophyllum spicatum* [EWM] x *Myriophyllum sibiricum* [Northern watermilfoil]) was confirmed in Coon Lake back in 2018. Since 2019, management of Eurasian watermilfoil has been effective at keeping late-season abundances at or below 1% FOO in the East Basin. No significant CLP observations were found in the point intercept surveys, as would be expected as CLP typically senesces by mid-summer.

Table 3. Point Intercept Metrics East Basin. Summary of point intercepts metrics for Coon Lake (East basin), Anoka County (DOW# 02004200). Values shaded in blue were calculated from littoral depth range (0-15 ft).

Survey Metrics	AUG 2010	AUG 2011	AUG/SEPT 2012	SEPT 2013	SEPT 2014	AUG 2018	AUG 2022	AUG 2025
Treated (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y
Surveyor	MN DNR	MN DNR	MN DNR	MN DNR	MN DNR	MNDNR	MNDNR	MNDNR
Total # Points Sampled	33	163	164	164	162	162	88	105
Max Depth of Growth (95%) in feet	9	11	9	8	10	8	9	14
# Point in Max Depth Range	22	78	78	88	82	82	78	101
# Points in Littoral (0-15 feet)	33	100	98	119	105	107	88	105
% Points w/ Native Taxa	52	69	77	68	76	79	92	72
Mean Native Taxa/ Point	1.1	1.5	1.8	1.7	1.8	2.6	3.3	2.6
# Native Taxa	6	9	9	13	15	14	14	19
# Non-Native Taxa	1	1	1	2	1	1	1	1

Table 4. Plant Frequency Occurrence East Basin. Percent frequency of occurrence for submersed vegetation within the littoral zone (0-15 feet) in Coon Lake (East basin), Anoka County (DOW# 02004200).

Taxonomic Name SUBMERSED PLANTS	Common Name	AUG 2010	AUG 2011	AUG/SEPT 2012	SEPT 2013	SEPT 2014	AUG 2018	AUG 2022	AUG 2025
*Myriophyllum spicatum**	Eurasian watermilfoil*	12	16	14	6	17	17	20	-
*Potamogeton crispus**	Curlyleaf pondweed*	0	0	0	1	0	0	0	1
Ceratophyllum demersum	Coontail	21	13	21	34	32	50	60	17
Macroalgae	Muskgrass and Stonewort	24	24	20	7	10	21	30	
Chara spp.	Muskgrass								35
Nitella spp.	Stonewort								10
Elodea canadensis	Canadian waterweed	15	26	27	11	7	12	27	1
Heteranthera dubia	Water stargrass	0	0	0	4	7	5	3	0
Myriophyllum sibiricum	Northern watermilfoil	0	2	0	0	3	0	0	1
Najas sp	Naiad	33	51	59	54	58	50	47	14
Potamogeton amplifolius	Large-leaf pondweed	0	2	0	3	0	6	20	11
Potamogeton foliosus	Leafy pondweed	0	0	0	0	0	0	20	4
Potamogeton gramineus	Variable-leaf pondweed	0	0	3	2	4	14	5	7
Potamogeton illinoensis	Illinois pondweed	3	2	9	15	14	13	13	7
Potamogeton praelongus	White-stem pondweed	0	0	0	6	0	1	0	2
Potamogeton richardsonii	Clasping-leaf pondweed	0	0	1	0	6	12	14	1
Potamogeton zosteriformis	Flat-stem pondweed	0	0	0	1	1	32	32	13
Stuckenia pectinata	Sago pondweed	0	2	3	5	2	0	0	0
Vallisneria americana	Water celery	9	24	32	27	36	42	50	54

Floating and emergent plants observed: *Brasenia schrebri* (Watershield), *Lemna spp.* (Duckweeds), *Nuphar advena* (Yellow pond lily), *Nuphar variegata* (Bullhead pond lily), *Nymphaea odorata* (White water lily), *Sagittaria spp.* (Arrowheads), *Scirpus acutus* (Hardstem bulrush), *Scirpus americanas* (Olney's three-square bulrush), *Typha spp.* (Cattail).

Less common (<5% frequency) submersed vegetation observed: *Eleocharis acicularis* (Needle spikerush) in 2013 and 2025, *Myriophyllum tenellum* (Slender watermilfoil), *Ranunculus aquatilis* (White water crowfoot), *Utricularia gibba* (Humped bladderwort) in 2025, *Utricularia macrorhiza* (Common bladderwort) in 2014, *Potamogeton pusillus* (Small pondweed) in 2025, *Potamogeton robbinsii* (Robbins' pondweed) in 2022 and 2025, and *Stuckenia pectinata* (Sago pondweed) in 2022, Water moss in 2025.

*Denotes aquatic invasive species

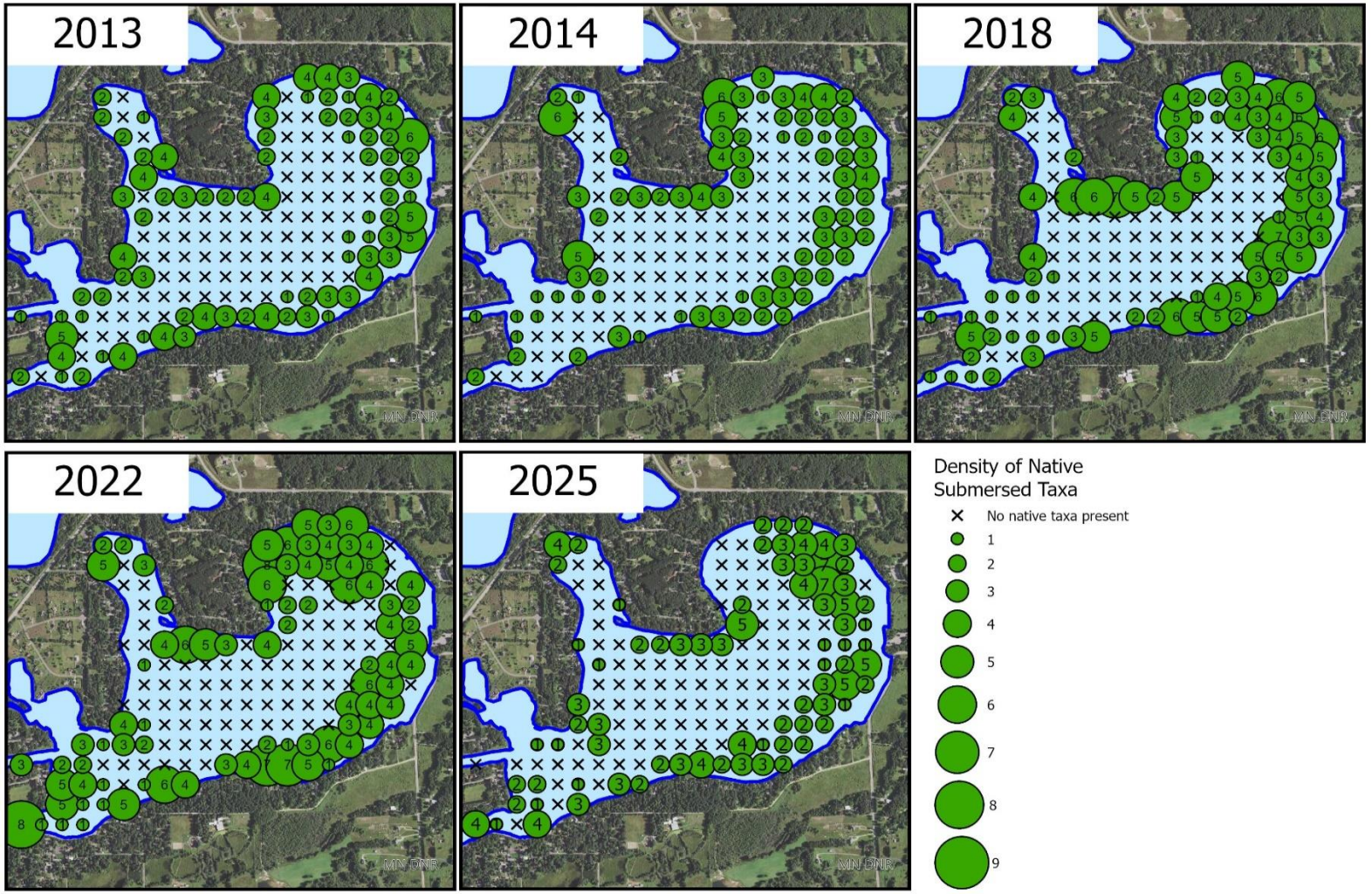


Figure 1. Native Species Taxa Density East Basin. Spatial distribution and species richness (# of native submersed taxa per sample point) in the East Basin. Years 2013-2014 were surveyed on a 1-4 density rake rating scale while 2018 and beyond were rated on a 1-3 density rake rating. Coon Lake, Anoka County (DOW # 02004200).

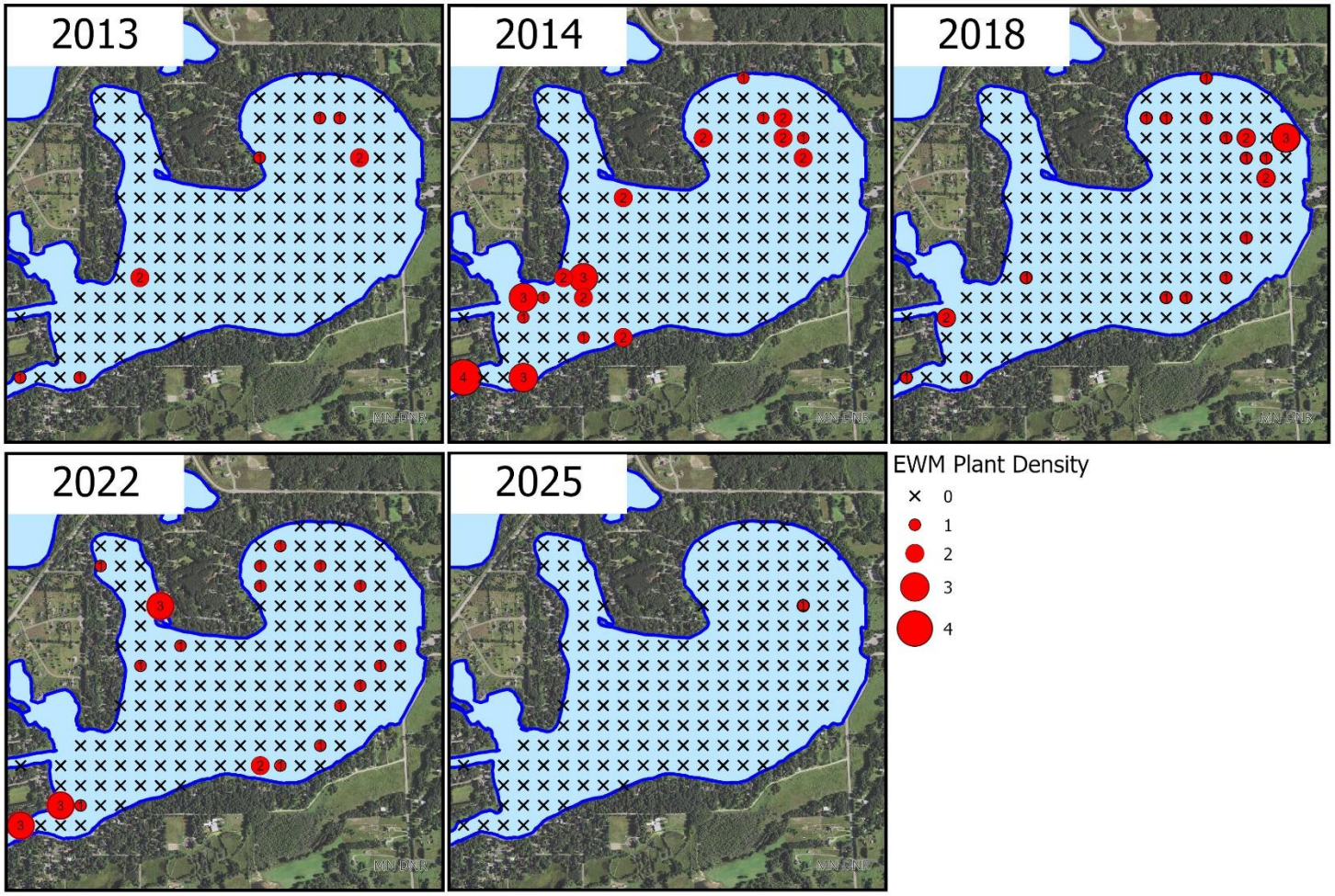


Figure 2. EWM Density East Basin. Spatial distribution and species richness (density of Eurasian watermilfoil per sample point) in the East Basin. Years 2013-2014 were surveyed on a 1-4 density rake rating scale while 2018 and beyond were rated on a 1-3 density rake rating. Coon Lake, Anoka County (DOW # 02004200).

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