
HAM LAKE, ANOKA COUNTY: 2025 AQUATIC VEGETATION REPORT

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

Lake: Ham (DOW# 02005300)

Lake Surface Area: 203 acres

Littoral Area: 190.5 acres

County: Anoka

Survey Type: Point-intercept

Date of Survey (most recent): August 11, 2025

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2025 Summary:

The most recent aquatic vegetation point-intercept survey of Ham Lake (DOW# 02005300) was completed on August 11, 2025. Plants were present throughout the lake to a maximum depth of 3.0 meters (10 feet). Within the littoral zone (zone in the lake from the 0-15 foot depth range (0-4.5 meters), 75% of sampling points contained native submersed taxa. The average number of native submersed taxa per sample point was 2.9. Twenty-one submersed plant species were documented, including one invasive plant species, curly-leaf pondweed. Management efforts to control the invasive plant hybrid watermilfoil on Ham Lake began in 2014, one year after the initial discovery. Various herbicide formulations have been used to target invasive milfoils: DMA-4 (2,4-D), Renovate OTF (granular triclopyr), Tribune (diquat), ProcellaCOR (Florpyrauxifen-benzyl) since 2014, and fluridone in the fall of 2020 and 2024.

Summary - Table 1. Summary of aquatic submersed plants in Ham Lake, Anoka County, Minnesota (DOW# 02005300) as indicated by results of point-intercept surveys. Values were calculated from the littoral depth range (0-15 feet).

PI Survey Date	% Frequency of HWM*	Max Depth of Growth in feet [95%] [†]	% Points w/ Native Submersed Taxa	Mean Native Submersed Taxa/ Point	# Submersed Taxa
2014 JUL 24	22	13	87	2.7	17
2015 SEPT 14	7	13	94	2.8	19
2016 JUL 20	14	11	72	1.4	13
2017 JUL 19	10	8	59	1.1	13
2018 AUG 8	36	11	77	1.8	15
2019 JUL 10	6	13	87	1.7	17
2020 JUL 23	16	10	63	2	22
2021 JUL 22	0	10	64	1.5	14
2022 JUL 11	0	10	64	1.5	15
2025 AUG 11	0	10	75	2.9	21

*HWM 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:

Ham Lake is a 203-acre lake located in the city of Ham Lake, Minnesota. It has two invasive aquatic plant species: Hybrid watermilfoil (*Myriophyllum spicatum* x *Myriophyllum sibiricum*, abbreviated as HWM) and curly-leaf pondweed (*Potamogeton crispus*, abbreviated as CLP). The maximum depth of water is 6.7 meters (22 feet). Approximately 94% of the lake is littoral (the littoral zone is the area where aquatic plants are likely to be found due to light penetration). Ham Lake contains a moderate level of nutrients and is considered a mesotrophic lake. Overall, seasonal water clarity has remained constant in recent years. For more information concerning Ham Lake water quality see:

<https://webapp.pca.state.mn.us/surface-water/station/02-0053-00-451> or <https://whaf-lakes.dnr.state.mn.us/lakedetails/02005300/topic/quality>.

Management History:

Historically, efforts to manage spots of invasive hybrid watermilfoil (HWM) have included: the use of auxin-mimic herbicide (2,4-D in 2014) which was reported to be largely ineffective according to the herbicide applicator, granular triclopyr in 2015 which showed significant lake-wide reductions, and finally, targeting small patches of HWM using diquat in the fall of 2016. Impacts to floating leaf species such as white waterlily and yellow pond lily were observed following the larger-scale granular triclopyr treatment (2015); however, according to PI surveys, floating leaf species have returned to pre-treatment levels. No treatment of HWM occurred in 2017 as HWM nuisance areas were small and did not surface mat. ProcellaCOR, a newly registered herbicide by the EPA in 2018, was applied on July 18 and later in September of 2018. The first treatment's dosage in 2018 was inadequate, so the pesticide applicator re-applied later in the season which offered two years of control in treated areas. A list of both curly-leaf pondweed (CLP) and HWM treatments is provided in Table 2.

Herbicides have been used to treat HWM spatially at a level below the 15% littoral limit (28.56 acres). However, a variance to treat more than 15% littoral limit was granted in 2020/2021 to allow for whole-lake control of HWM using fluridone, which can be selective at lower doses. In 2020, low-dose fluridone was applied in October before ice cover and re-applied in the spring of 2021 following ice-off. Fluridone for HWM control is generally applied in early spring, but a novel approach was used in Ham Lake. Herbicides were not needed in 2022 as HWM was not detected in the spring delineation. This same treatment approach was tested again in the fall of 2024. An evaluation of this fall/winter treatment method will be needed to determine its efficacy in managing HWM and native plants.

Table 2 - Invasive Plant Management Summary. Characteristics and history of herbicide treatment for Ham Lake (DOW# 02005300, Total acres: 203, Littoral acres: 190.5, 15% Littoral acres: 28.56).

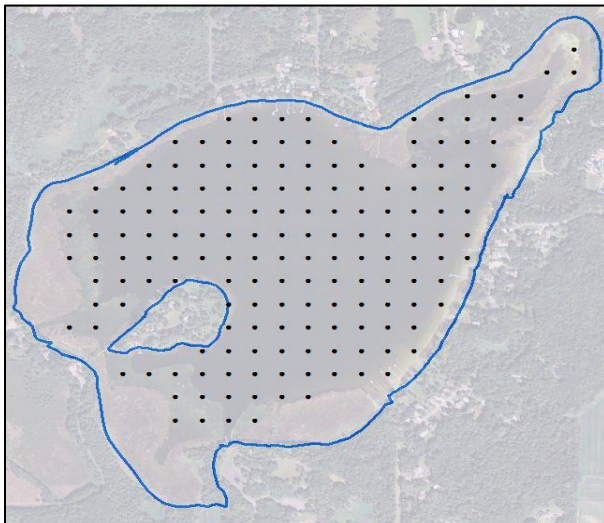
Year	Month	Treatment [W,P,N]	Target Species	Total Acres Treated	Herbicide	Licensed Commercial Applicator
2014	JUL	P	HWM	6.1	2,4-D	PLM Lake and Land Management Corp.
2015	JUN	P	HWM	19.4	Tricolpyr (granular)	PLM Lake and Land Management Corp.
2016	APRIL	P	CLP	13.5	Endothall	PLM Lake and Land Management Corp.
	OCT	P	HWM	11.3	Diquat	PLM Lake and Land Management Corp.
2017	MAY	P	CLP	13.5	Endothall	PLM Lake and Land Management Corp.
2018	JUL	P	HWM	5.5	ProcellaCOR	PLM Lake and Land Management Corp.
	SEPT	P		13.3	ProcellaCOR & diquat	PLM Lake and Land Management Corp.
2020	OCT	W	HWM	119	Fluridone	PLM Lake and Land Management Corp.
2024	OCT	W	HWM	119	Fluridone	PLM Lake and Land Management Corp.

Treatment: W (whole lake), P (partial lake), N (no treatment)
HWM is an abbreviation for hybrid watermilfoil
CLP is an abbreviation for Curly-leaf pondweed

Survey Objectives:

Point-intercept surveys were used to assess the distribution of aquatic plants in Ham 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 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 from 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 60 meters apart using a Geographic Information System (GIS). This spacing allowed for the placement of 166 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 density

(scale of zero [no plants] to 4 [dense, matted on the surface] was used in 2012-2017 and a zero to 3 scale in 2018 and subsequent years). 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:

During the most recent survey, 75% of points contained native taxa, with 20 species documented —the highest recorded since the 2020 survey. In addition, the mean native submersed taxa per point reached its peak in 2025 at 2.9 species per survey point (See **Table 3- Point Intercept Metrics, Figure 1**).

Macroalgae and coontail remain the most dominant species in Ham Lake and have been since 2014, although flat-stem pondweed has also become dominant since 2021 (See **Photo 1**). Additional species include water stargrass, several types of bladderworts, and wild celery. Overall, native submerged plant abundance and species richness have remained constant, though Canadian waterweed has declined since whole-lake fluridone treatments began in 2020, possibly due to some sensitivity (see Table 4 - **Plant Frequency Occurrence**).

Hybrid watermilfoil has been managed by the Ham Lake Association for over a decade. Historically, management has consisted of spot treatments using a variety of herbicides including 2,4-D, Tricolpyr, Diquat, and ProcellaCOR. Between 2014 and 2020, these spot treatments reduced HWM populations to between 7% and 36% FOO, providing seasonal relief but never reducing it to below detection levels. However, following the October 2020 fluridone treatment, multi-year control of HWM was achieved with no treatments needed between 2021 and 2023. Some regrowth was observed in early 2024, which prompted another whole lake fluridone treatment. Hybrid watermilfoil has not been observed in the 2021 and 2022 surveys and in only one location in the 2025 survey, indicating fluridone treatments are providing effective multiyear control (see **Figure 2**).



Photo 1 (Left Image): Rake toss showing abundant *Lychnothamnus barbatus* (macroalgae) and flat-stem pondweed (*Potamogeton zosteriformis*) growth.

Photo 2 (Right Image): White Egrets and abundant white water lily (*Nymphaea odorata*) growth. Photos were taken by MNDNR staff on August 11, 2025, in Ham Lake, Anoka County.

Table 3 - Point Intercept Metrics. Summary of point intercepts metrics for Ham Lake, Anoka County (DOW# 02005300). Shaded values were calculated from the littoral depth range.

Survey Metrics	JUL 24 2014	SEPT 14 2015	JUL 20 2016	JUL 19 2017	AUG 8 2018	JUL 10 2019	JUL 23 2020	JUL 22 2021	JUL 11 2022	Aug 11, 2025
Treated (Y/N)	Y	Y	Y	Y	Y	N	Y	N	N	Y
Surveyor	MN DNR	MN DNR	MN DNR	MN DNR	MN DNR	U of M	MN DNR	MN DNR	MN DNR	MN DNR
Total # Points Sampled	153	159	148	158	162	161	148	137	136	142
Max Depth of Growth (95%) in feet	13	13	11	8	11	13	10	10	10	10
# Point in Max Depth Range	107	114	92	83	107	114	88	83	83	105
# Points in Littoral (0-15 feet)	129	124	128	143	142	129	142	133	131	139
% Points w/ Submersed Native Taxa	87	94	72	59	77	87	63	64	64	75
Mean Submersed Native Taxa/ Point	2.7	2.8	1.4	1.1	1.8	1.7	2	1.5	1.5	2.9
# Submersed Native Taxa	15	17	11	11	15	15	20	14	14	20
# Submersed Non-Native Taxa	2	2	2	2	2	2	2	0	1	1

Table 4 - Plant Frequency Occurrence. Historic percent frequency of occurrence for submersed vegetation within the littoral zone (0-15 feet) in Ham Lake, Anoka County (DOW# 02005300).

Taxonomic Name	Common Name	JUL 24 2014	SEPT 14 2015	JUL 20 2016	JUL 19 2017	AUG 8 2018	JUL 10 2019	JUL 23 2020	JUL 22 2021	JUL 11 2022	Aug 11 2025
<i>Myriophyllum spicatum</i> x <i>M. sibiricum</i> *	Hybrid watermilfoil*	22	7	14	10	36	6	16	-	-	-
<i>Potamogeton crispus</i> *	Curly-leaf pondweed*	2	2	2	3	6	34	7	-	19	1
<i>Ceratophyllum demersum</i>	Coontail	67	79	58	43	63	69	46	47	46	60
<i>Eleocharis acicularis</i>	Needle spikerush	13	-	1	-	-	-	-	-	-	1
<i>Elodea canadensis</i>	Canadian waterweed	-	29	27	11	10	32	18	-	-	1
<i>Heteranthera dubia</i>	Water stargrass	-	3	-	1	2	-	3	3	3	11
<i>Macroalgae</i>	Muskgrass and Stonewort	17	21	23	15	28	38	29	34	27	
<i>Chara spp.</i>	Muskgrass										17
<i>Nitella spp.</i>	Stonewort										14
<i>Myriophyllum sibiricum</i>	Northern watermilfoil	22	6	-	2	-	6	-	-	-	1
<i>Najas spp.</i>	Naiad	8	4	2	1	2	-	3	-	3	1
<i>Potamogeton amplifolius</i>	Large-leaf pondweed	9	16	-	-	2	5	2	10	6	4
<i>Potamogeton foliosus</i>	Leafy pondweed	-	-	-	-	-	-	8	-	2	-
<i>Potamogeton friesii</i>	Fries' pondweed	-	-	-	-	1	-	11	-	-	-
<i>Potamogeton illinoensis</i>	Illinois pondweed	-	6	2	-	3	-	6	2	-	1
<i>Potamogeton praelongus</i>	White-stem pondweed	12	3	-	1	-	-	1	-	-	-
<i>Potamogeton pusillus</i>	Small pondweed	18	-	-	-	-	-	2	2	1	1
<i>Potamogeton robbinsii</i>	Fern pondweed	3	10	1	-	-	-	-	-	-	1
<i>Potamogeton zosteriformis</i>	Flat-stem pondweed	60	49	2	4	4	1	15	24	37	50
<i>Ranunculus aquatilis</i>	White water crowfoot	2	-	9	-	-	-	-	-	-	-
<i>Stuckenia pectinata</i>	Sago pondweed	2	6	-	4	10	6	10	9	5	2
<i>Utricularia gibba</i>	Creeping bladderwort	-	-	-	-	26	-	4	4	-	8
<i>Utricularia macrorhiza</i>	Common bladderwort	32	26	9	16	24	42	19	6	5	22
<i>Utricularia minor</i>	Small bladderwort	-	8	1	-	-	-	4	-	-	-
<i>Vallisneria americana</i>	Water celery	-	9	5	4	5	7	15	12	7	12

Floating, Free-floating & Emergent plants observed: *Nuphar advena* (Yellow pond lily), *Nuphar variegata* (Bullhead pond lily), *Nymphaea odorata* (White water lily), *Lemna trisulca* (Star duckweed), *Spirodela polyrhiza* (Greater duckweed), *Potamogeton natans* (Floating pondweed), *Typha sp.* (Cattail), *Schoenoplectus subterminalis* (Water bulrush).

Less common (< 5% frequency) submersed vegetation observed: *Potamogeton gramineus* (Variable-leaf pondweed) in 2014-2015, 2018- 2021, *Potamogeton richardsonii* (Clasping-leaf pondweed) in 2015-2016, 2019 and 2020, *Utricularia intermedia* (Flat-leaf bladderwort) in 2018 and 2025, *Ceratophyllum echinatum* (Spiny hornwort) in 2021, and *Potamogeton strictifolius* (straight-leaved pondweed) in 2022, Tolypella (stonewort genus) in 2025, and *Najas guadalupensis* (Naiad spp.) in 2025.

*denotes aquatic invasive species

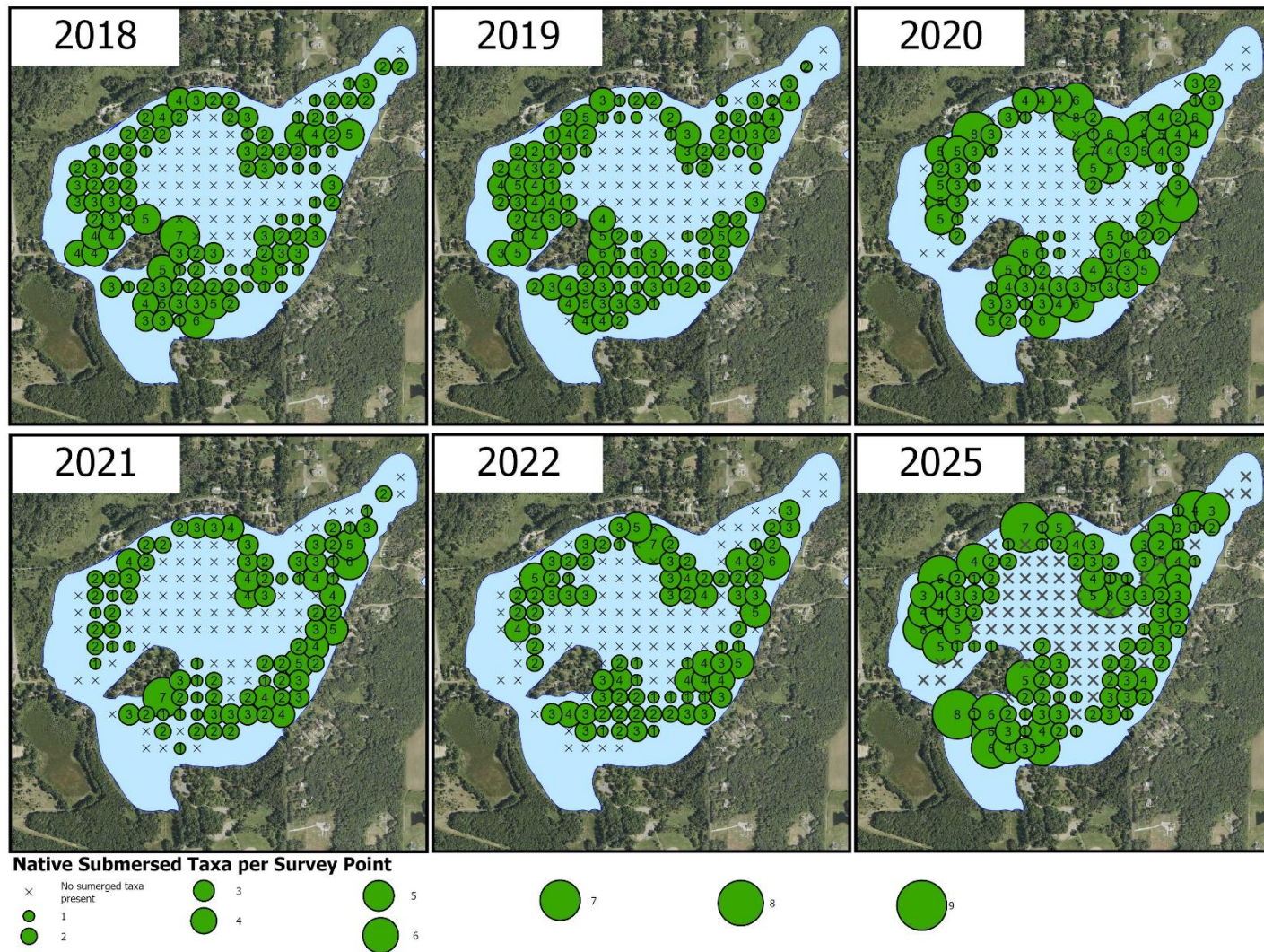


Figure 1. Spatial distribution and species richness (# of native species per sample point) of all native submersed plant species from DNR PI surveys (2018-2022). Ham Lake, Anoka County (DOW# 02005300).

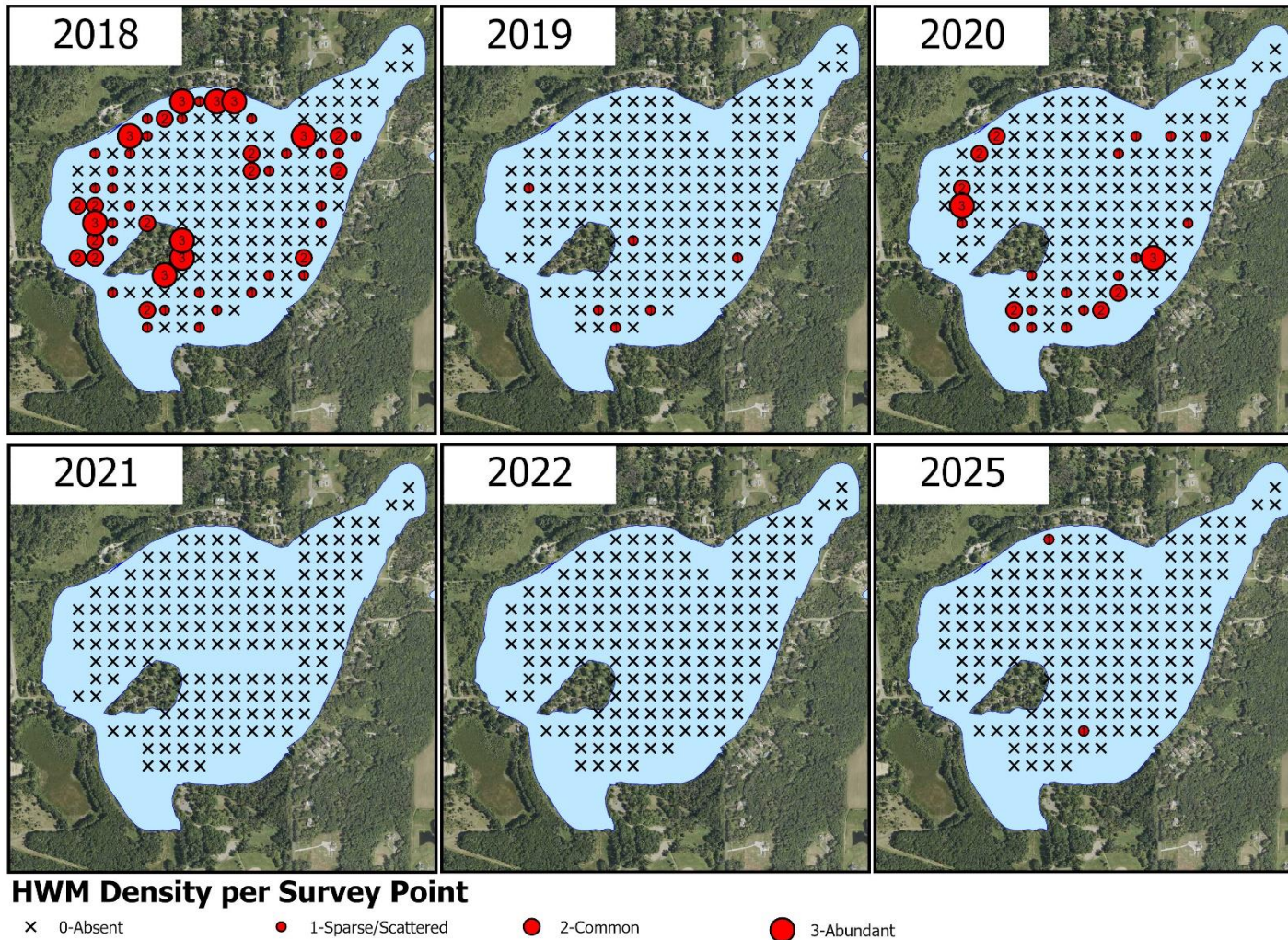


Figure 2. Spatial distribution and rake density rating of Hybrid watermilfoil from DNR PI surveys (2017-2022), Ham Lake, Anoka County (DOW # 02005300). In years 2021 and 2022 no HWM was observed.

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