

Aquatic Plant Survey and Invasive Species Detection Report

Prepared for the Fish Hook Lake Association

Survey by Aquatic Survey Professionals – MN DNR Certified Aquatic Plant Surveyors

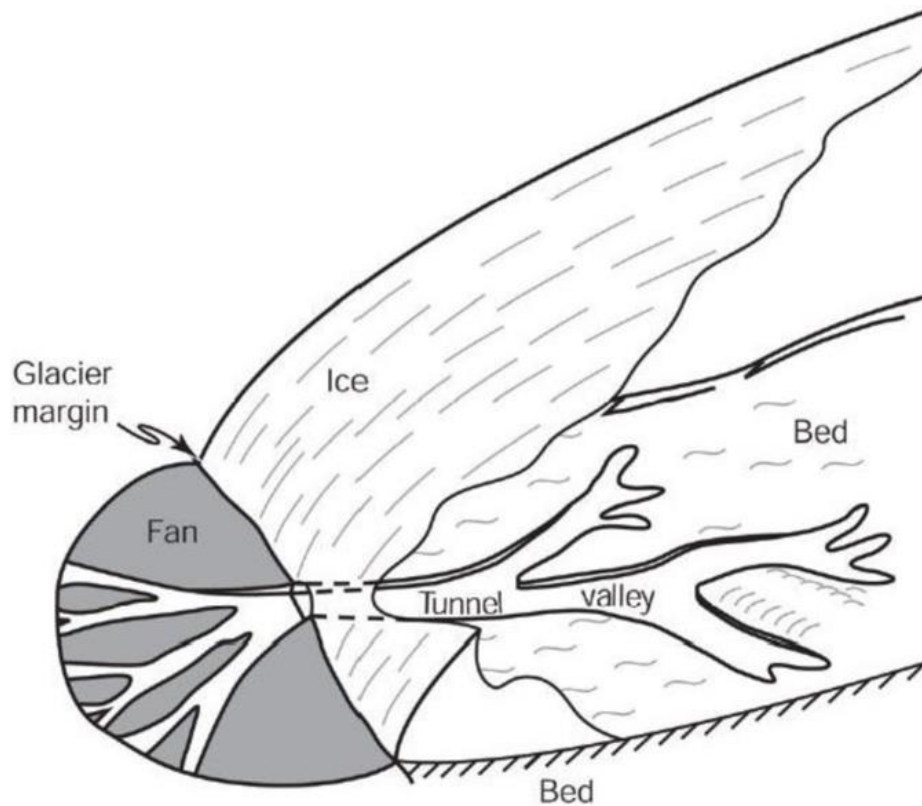
Survey Dates June 29th 2025

Report by Aquatic Survey Professionals – Steve Henry

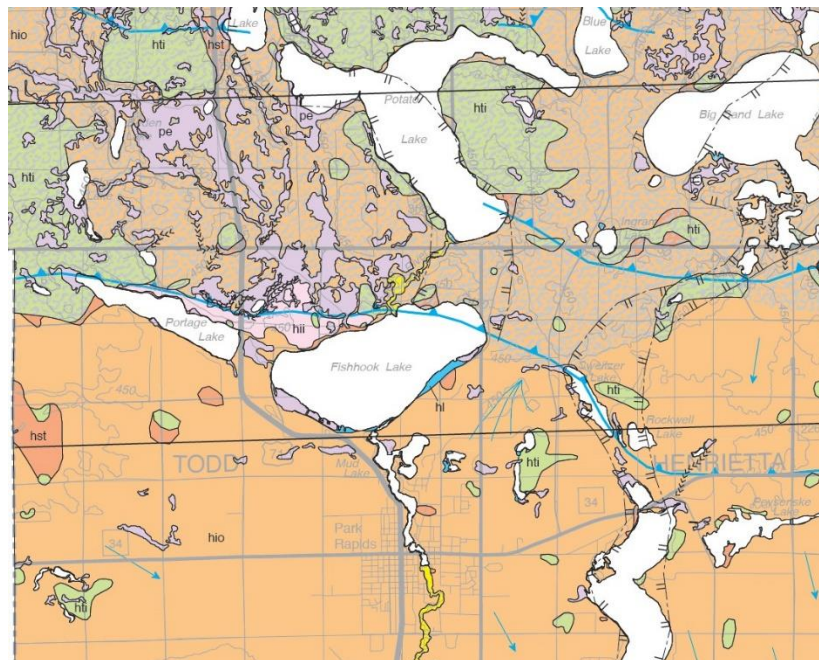
Lake and Watershed Characteristics

Fish Hook Lake is in Hubbard County Minnesota just north of Park Rapids and east of State Highway 71. Fish Hook Lake is known for it's excellent fishing, especially for walleye and panfish. With it's location along State Highway 71 and adjacent to Park Rapids the lake is extensively utilized for recreational activities. Stretching 4.6 miles in length east-west and 2 miles north-south the lake covers 1497 surface acres and is a significant recreational and fisheries resource for the area. Recreational use of Fish Hook Lake started immediately once roads reached this area and the lake's proximity to the early railroad provided a means for resorters to reach the lake. Many resorts existed on Fish Hook Lake in the early 1900's and some of those small cabins are still visible along the shoreline. Access to Fish Hook Lake is provided by a MN DNR public water access on the south side immediately off of State Highway 71. This access has an estimated 16 parking spaces for vehicles with trailers but an indication of the significant use the lake receives. Access is also possible from the Fish Hook River where an access is located within Park Rapids at Heartland Park. Boaters can travel upstream from here to Fish Hook Lake.

Fish Hook Lake is in the Pine Moraines and Outwash Plains subsection of the Northern Lakes and Forest ecoregion where White and Red Pines dominate the forests and deep sandy soils limit runoff by collecting rainfall into groundwater aquifers. This ecoregion features deep coarse textured soils connected to groundwater networks that feed numerous lakes, streams, and rivers. Many lakes in this ecoregion occupy kettle depressions left behind by the drainage of meltwater from glaciers where ice blocks were deeply buried then melted later and the overlying sediments collapsed. Fish Hook Lake lies on the very edge of an ice margin created as the Itasca glacial lobe melted back to the north and drained to the south, this drainage water scoured out the deep channel occupied by the lake and left an outwash fan of sorted sediments both south of and surrounding the lake. Sections of Fish Hook Lake's northern shoreline feature large pine trees on the steep slopes of an moraine that was deposited underneath the stalled glacier. Potato, Blue, and Eagle Lakes all lie within the collapsed tunnel valley scoured out by highly pressurized glacial meltwater.



Sketch of a tunnel valley in relation to glacial margin. (From Hooke and Jennings 2006)



The surficial geology of the Fish Hook Lake area from the County Geologic Atlas. The blue hatch line represents a glacial margin and the dashed lines with ticks represent collapsed

tunnel valleys. The nested arrows represent an esker. The fan shaped blue line represents an outwash fan deposit noticeable on the land surface. The entire area is covered in outwash sand and gravels shown in orange. Unmodified glacial till is in green. North of the lake the outwash was deposited onto ice and collapsed as that ice melted. This area is marked with a stipple overlay.

High quality aquatic plant communities are present throughout Fish Hook Lake with pockets of very high diversity in some areas. Diversity is lower in some areas due to the low fertility of the lake, significant wave action, and consistent sandy gravel bottom type. Even within the lower diversity communities some small areas have higher levels of lake bottom fertility (silt) and support more diverse plant communities. One unique plant community present in Fish Hook Lake is a rare carnivorous plant Bladderwort which was observed growing abundantly in many areas of the lake but particularly out in front of the access. The Chara genus is widespread within Fish Hook Lake and helps protect the lake's clarity by absorbing and storing any excess nutrients while also oxygenating the deep waters and limiting the internal release of stored nutrients. The diverse and unique aquatic plants and the high quality fish community have resulted in the lake being ranked as having outstanding biological significance by the Minnesota DNR.

The water quality in Fish Hook Lake is considered mesotrophic, with moderate fertility and average clarity. The lake has above average fertility when compared with other lakes in this area. Minnesota Pollution Control notes there is 'no evidence that the lake's clarity has been changing' but there appears to have been a slight decline with recent observations lower than the observations before 2010. Since 2010 clarity measurements have occurred less often which may skew any observed trends. Visit [Surface Water \(state.mn.us\)](https://surfacewater.state.mn.us) to review the water quality data specific to your lake.

Fish Hook Lake is fed by a very large 154,848 acre watershed that drains to the lake via the creeks from Potato and Portage Lakes. The lake's watershed has a significant amount of natural cover which provides natural protection to the water quality and lake health. Around 61% of the watershed is forested, 16% is wetlands, and 5% is developed or agricultural. The State of Minnesota has done water quality modeling which indicates that watersheds with over 75% natural land cover can maintain their water quality and Fish Hook Lake could possibly achieve this protection level. The increase in runoff, erosion, nutrient loading, and human traffic associated with higher levels of development disturbs the lake's natural community and is associated with an increased risk of invasive species establishing in a lake. Maintaining the existing natural landscape is key to preserving the quality of Fish Hook Lake.

The Fish Hook Lake Association's members work to preserve the quality of the lake with numerous programs to protect the fishery and loon population while preventing Aquatic Invasive Species (AIS) from impacting the lake users. This aquatic plant survey was implemented to detect any invasive species so rapid response efforts can be implemented to control them. Increased water temperatures, longer growing seasons, erratic precipitation, and increases in

colored dissolved organic matter are combining to change the diversity, density, and distribution of plants in the lake and other characteristics of lakes across Minnesota. Long term monitoring is essential to provide an understanding of how these environmental changes will affect the future of Minnesota's lakes.

Lake Area	Area 15' deep or less	Maximum Depth	Shoreline Length	10 yr. Average Water Clarity
1642 acres	661 acres	75'	9 miles	8.5'

Survey Design

The aquatic plant survey used a 100 meter spacing to establish sample sites across the littoral zone, where plants grow, of Fish Hook Lake. This resulted in a total of 262 sample locations. While on the lake the sonar was monitored and 74 additional sample locations were established where we felt Curly Leaf Pondweed might be likely or when plant growth was observed on the sonar and spacing was correct for a sample point to occur. Prior to the survey the public access and resort areas were mapped and intensive survey sample sites established around them. The sample locations created were uploaded to a chart plotter GPS unit on our survey boat. Once on the water the boat was navigated to each sampling site and a double headed weighted garden rake attached to 50 feet of rope was used to collect a sample of the aquatic vegetation. Visual and sonar observations were also used to ensure the plants gathered fully reflected the vegetation present at each site. The plants sampled with the rake were examined and all species sampled were identified and their abundance was ranked using a 1 to 3 scale with 1 being sparse, 2 being common, and 3 being abundant. Species abundance was calculated as the total number of species at each sample site. The frequency of occurrence is the number of sites where a species was observed divided by the total number of sampling sites. Additionally, all samples are extensively examined for the presence of aquatic invasive plants, fish, and mollusks. This final report was developed that outlines all the plant species encountered, the frequency of each species, and their average growth density. Maps are developed for the report that show the locations where each species that occurred was encountered and that species density at each of those points.

Survey Objectives

This survey examines and physically samples the aquatic plant community of Fish Hook Lake to:

1. Identify any invasive species present in the lake and determine their distribution.
2. Identify the native species present in the lake, their distribution, and growth density.
3. Determine the number of species present in the lake.
4. Determine the percentage of the lake occupied by vegetation.
5. Develop distribution and density maps for the common native species, unique native species, and any invasive plant species encountered.
6. Collect and voucher plant specimens for submission to the Bell Museum.

Survey Results – Full Lake

The weather was good for surveying with moderate winds generally from the northwest which increased throughout the day and got fairly strong by afternoon. Visibility was very good with observations of the lake bottom exceeding 7 feet depths in some areas. The survey day regularly featured temps over 80 degrees while the morning temperatures were in the 70s. Wave activity rarely impacted survey activity and we were able to proceed quite efficiently with boat traffic being a greater obstacle to our progress than winds.

During the survey vegetation was observed at 283 of the 336 sample points which is 84.2% of sites. This represents a very well distributed community. Many lakes are seeing increased density, distribution, and diversity of aquatic vegetation in the past few years but that trend could not be detected in Fish Hook Lake where very little vegetation was growing to nuisance levels or beyond it's expected distribution. Vegetation was found as deep as 20 feet of water which is above average for Minnesota lakes but close to what has been observed in other lakes in this watershed. The average number of species per sample was 3.3 when comparing all sites and the maximum number of species at any one site was 9. These are very good numbers compared to most Minnesota lakes and reflect the diverse and well distributed aquatic plant community of the lake. The most common species observed were Chara Spp at 63.4% of sites, Bladderwort at 33.9%, and Claspig Leaf Pondweed at 19.3%. **Curly Leaf Pondweed** an invasive aquatic plant was found at one sample site, additional sample sites were established around that detection but no additional sites with Curly Leaf were found. There were two rare species observed during the survey Nitella Spp and Greater Bladderwort. Bladderwort is unique among aquatic plants in that it captures algae and zooplankton from the lake inside small bladders along the leaflets and digests them for additional nutrients. This species has a very fine leaf pattern almost a mesh and appears as a round tube along the lake bottom. Nitella, like Chara species, absorbs nutrients from the water column and help reduce algae blooms. A total of 26 species were observed in the lake with variable distribution see the following pages for more information.



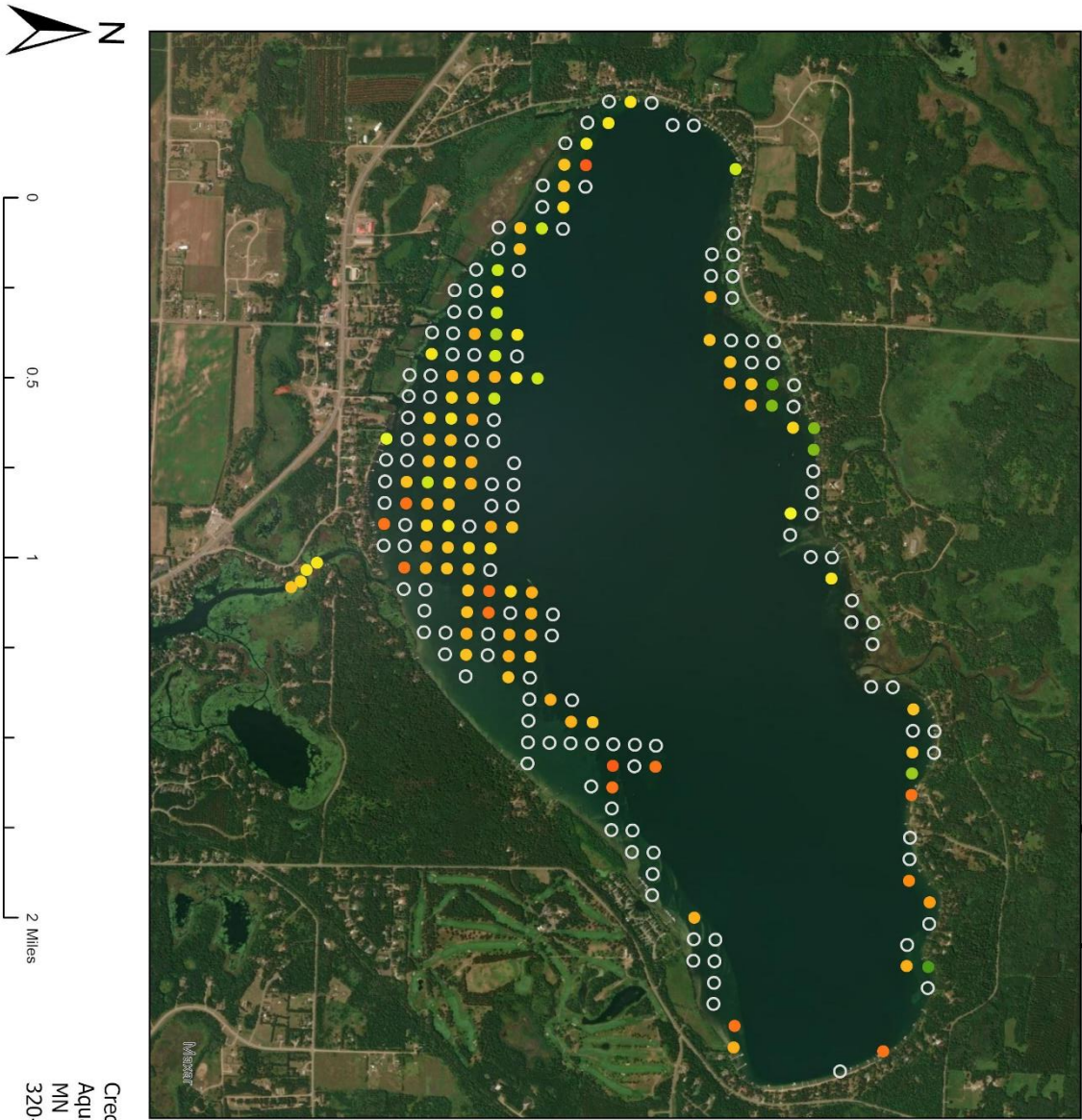
Curly Leaf Pondweed found in Fish Hook Lake.

Assessment - Floristic Quality Index

The State of Minnesota uses floristic quality index as a measure to evaluate aquatic plant communities in lakes to gauge if degradation is occurring. The FQI score is used as a means for prioritizing lakes for protection or restoration through the States One Watershed One Plan process. “The floristic quality index has been proposed as a tool to assess anthropogenic effects of plant communities” Radmoski, Perleberg [Application of a versatile aquatic macrophyte integrity index for Minnesota lakes - ScienceDirect](#)

The average FQI score of lakes in the same watershed as Fish Hook Lake is 24. The range of values documented by MN DNR in this watershed is from 16 to 32. The result of this survey is an FQI of 30 indicating an exceptional aquatic plant community.

Fishhook Lake - Floristic Quality



Legend

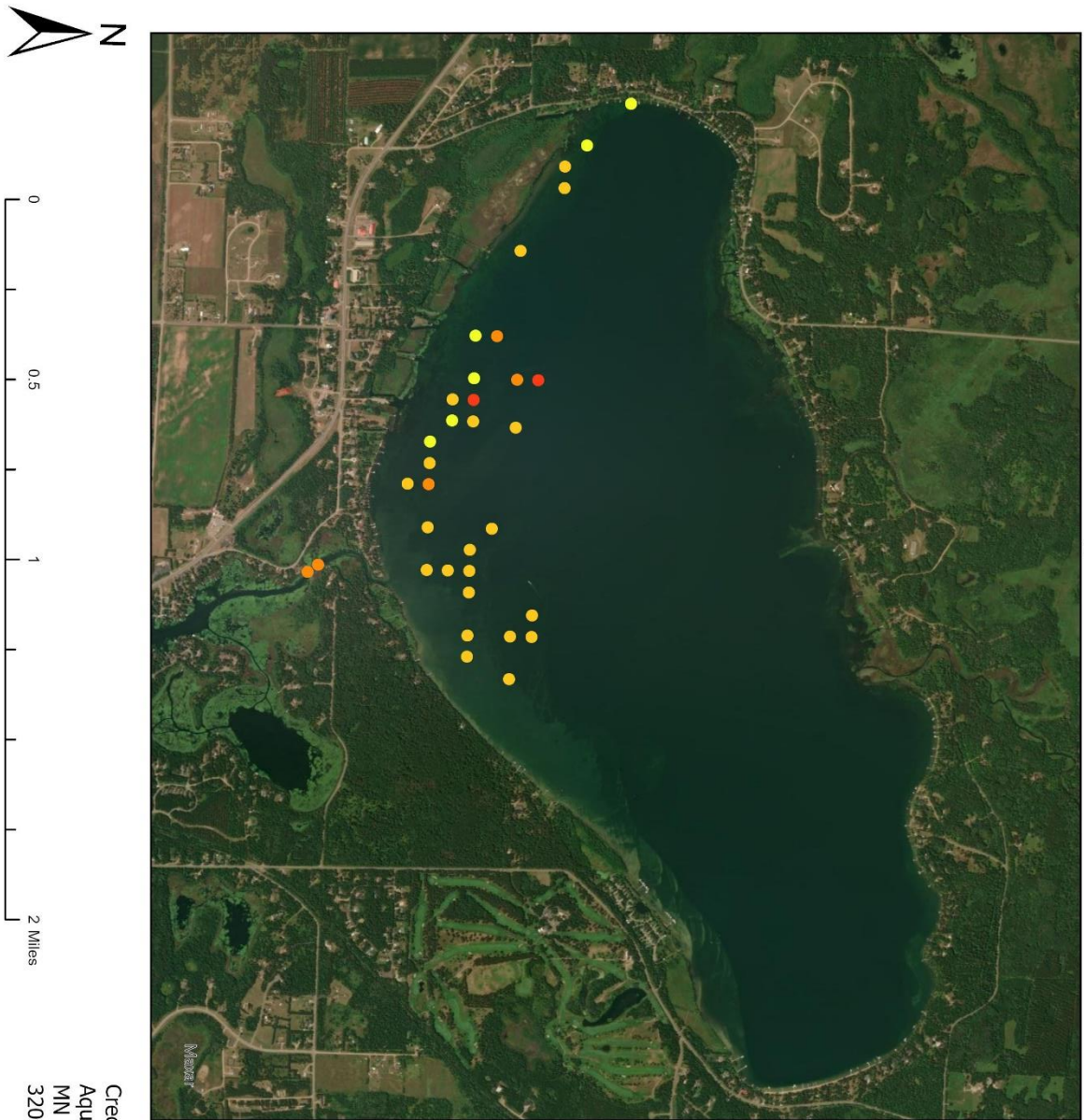
FQI_Point	
0	0
0.57735026919	
1	
1.1547005384	
1.4142135624	
1.6666666667	
1.889822365	
10	
2	
2.0412414523	
2.2360679775	
2.5	
2.8867513459	
3.1304951685	
3.5	
3.5355339059	
5	

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Assessment – Eurasian Water Milfoil Risk

Research has identified which aquatic plants are often found co-located with Eurasian Water Milfoil. Some aquatic plants are found growing with Eurasian Water Milfoil much more often than would be expected if distribution was simply random. The co-location factor for certain species is up to three times what would be expected. This research has also identified which aquatic plants are less likely to be observed growing with Eurasian Water Milfoil. An additional factor identified is species that are associated with disturbance which favors the establishment of invasive species. Utilizing this research Aquatic Survey Professionals has developed a risk evaluation model that incorporates all three of these factors to establish a Risk Index for each survey sample point based on the native aquatic species observed. The output is useful for future targeted Eurasian Water Milfoil detection efforts.

Fishhook Lake - High Risk Eurasian Milfoil



Legend

- E_Overall
- 3
 - 6
 - 9
 - 12

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Species Observed, Frequency, and Distribution

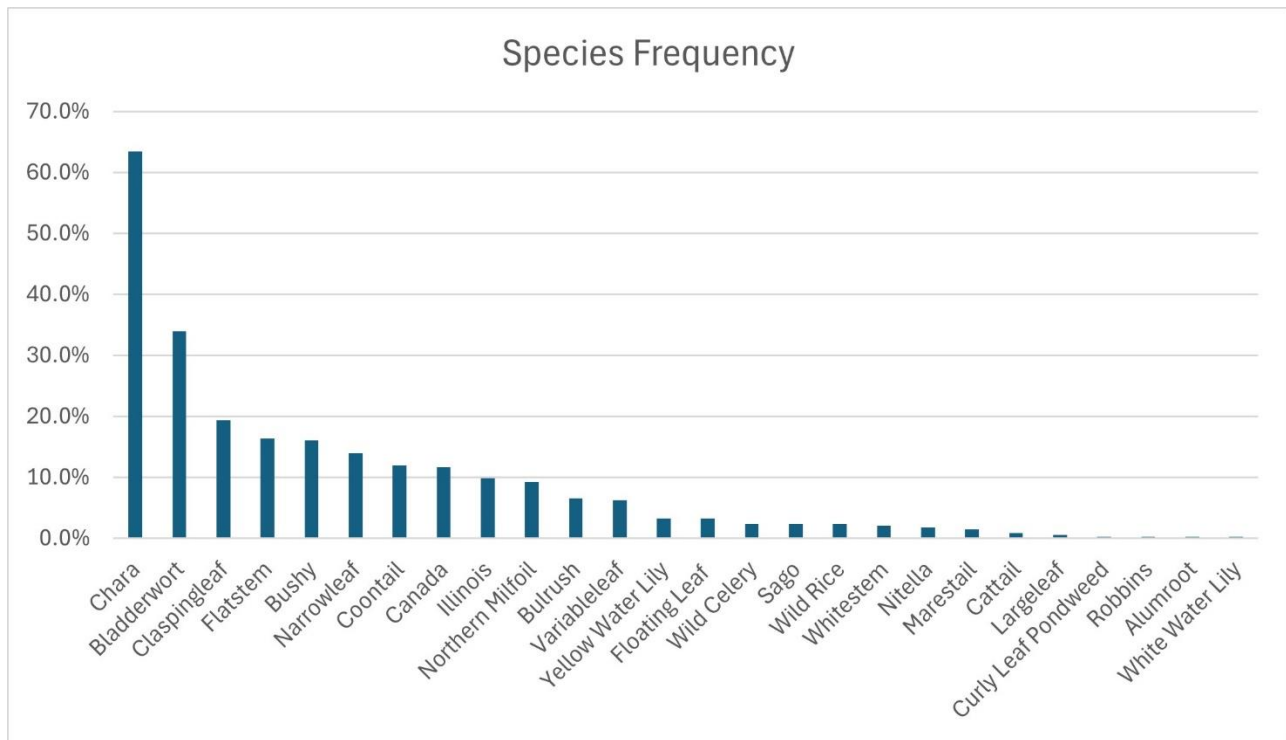
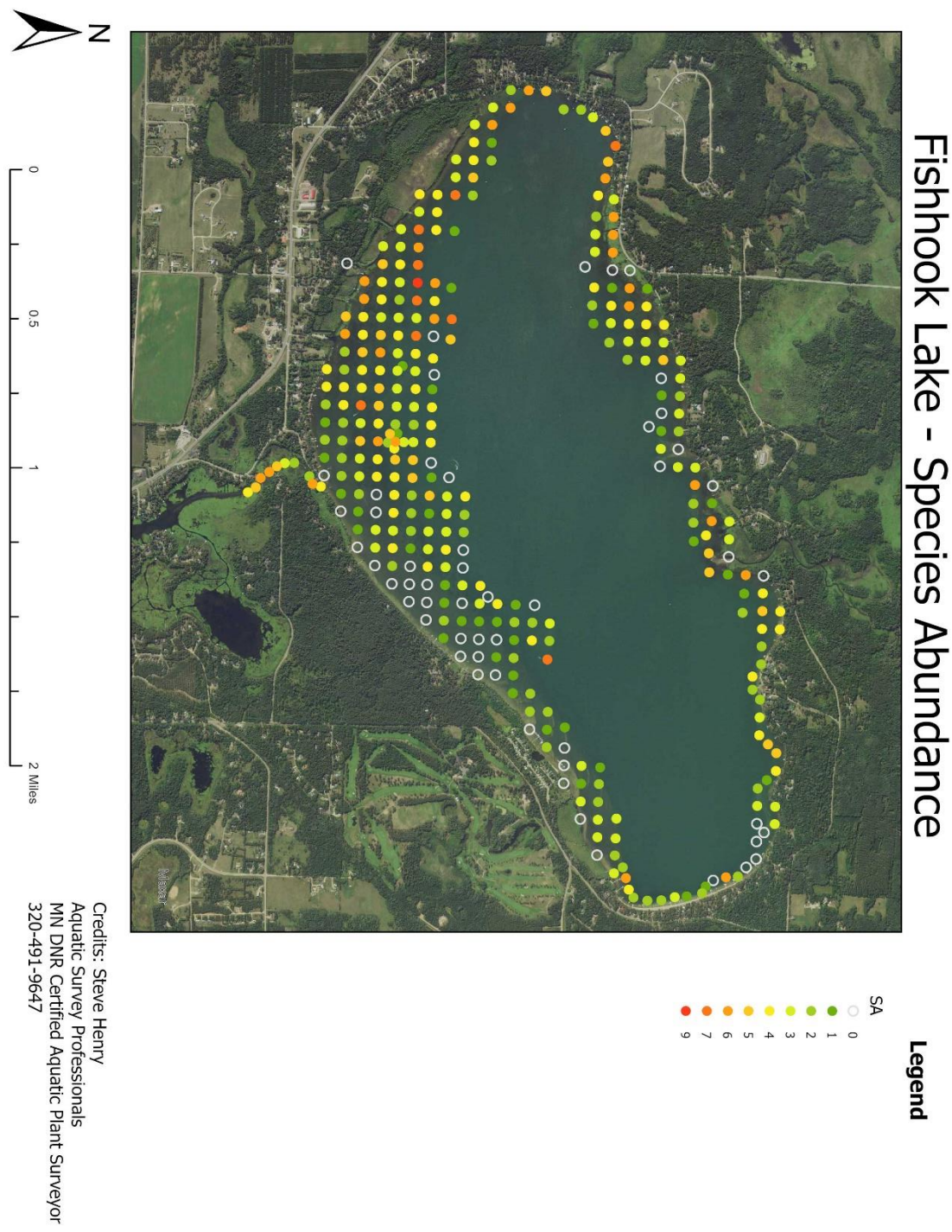


Table of Species and Occurrence

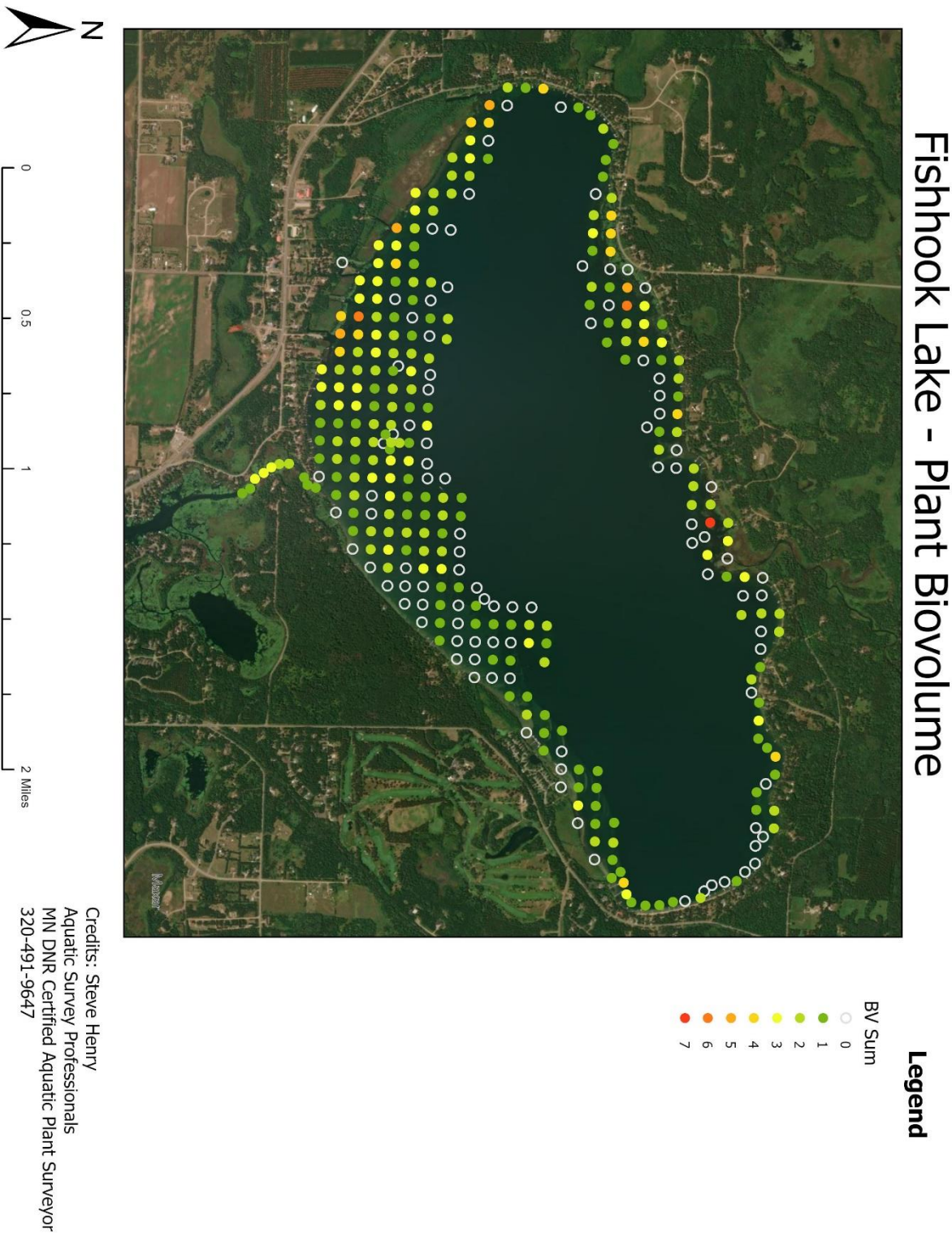
Emergent Species	% Occurrence	Count of Occurrence	Density When Present
Bulrush	6.5%	22	1.3
Cattail	0.9%	3	1.3
Floating Leaf Species	% Occurrence	Count of Occurrence	Density When Present
Yellow Water Lily	3.3%	11	1.3
Floating Leaf	3.3%	11	1
White Water Lily	0.3%	1	1
Submerged Species	% Occurrence	Count of Occurrence	Density When Present
Chara	63.4%	213	1.4
Bladderwort	33.9%	114	1.1
Claspingleaf	19.3%	65	1.0
Flatstem	16.4%	55	1.0
Bushy	16.1%	54	1.1
Narrowleaf	14.0%	47	1.0

Coontail	11.9%	40	1.1
Canada	11.6%	39	1.1
Illinois	9.8%	33	1.0
Northern Milfoil	9.2%	31	1.0
Variableleaf	6.3%	21	1.0
Wild Celery	2.4%	8	1.0
Sago	2.4%	8	1.0
Wild Rice	2.4%	8	1.0
Whitestem	2.1%	7	1.0
Nitella	1.8%	6	1.2
Marestail	1.5%	5	1.0
Largeleaf	0.6%	2	1.0
Curly Leaf Pondweed	0.3%	1	2.0
Robbins	0.3%	1	1.0
Alumroot	0.3%	1	1.0
	Total Occurrences	937	

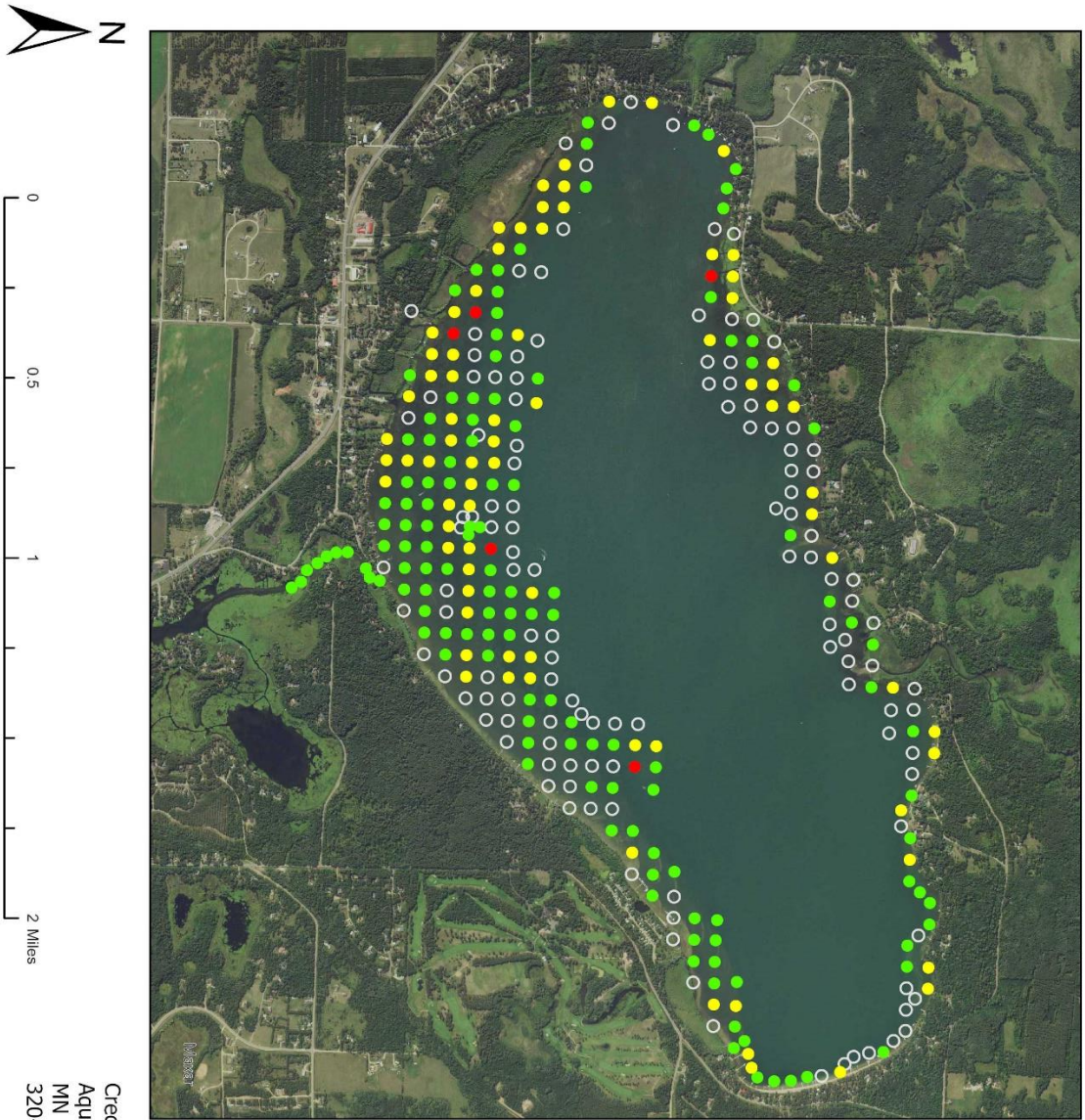
Abundance of Species – Whole Lake



Observed Biovolume of Plants on the Rake Sample



Fishhook Lake - Chara

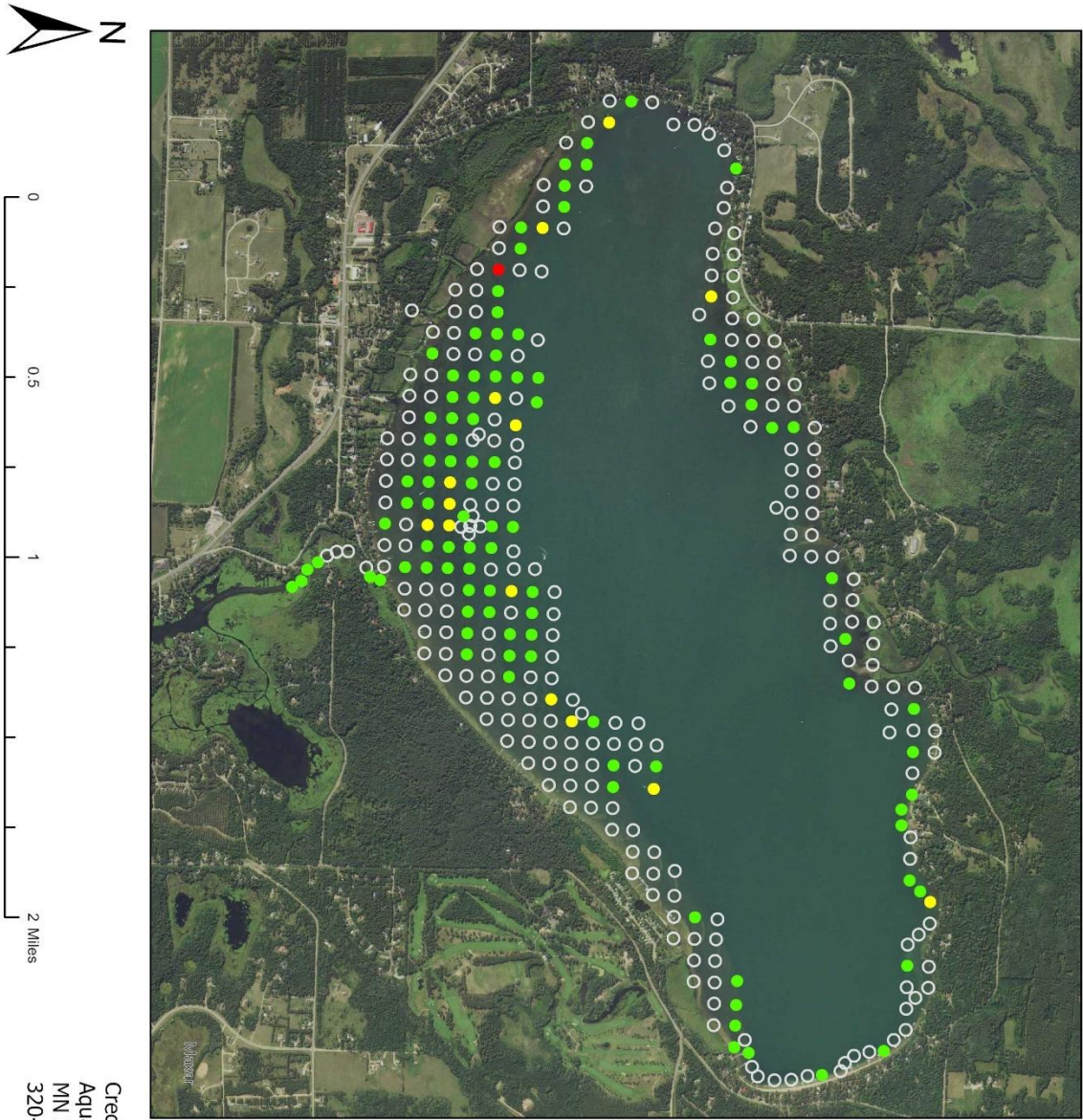


Legend

- Chara
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Bladdervort

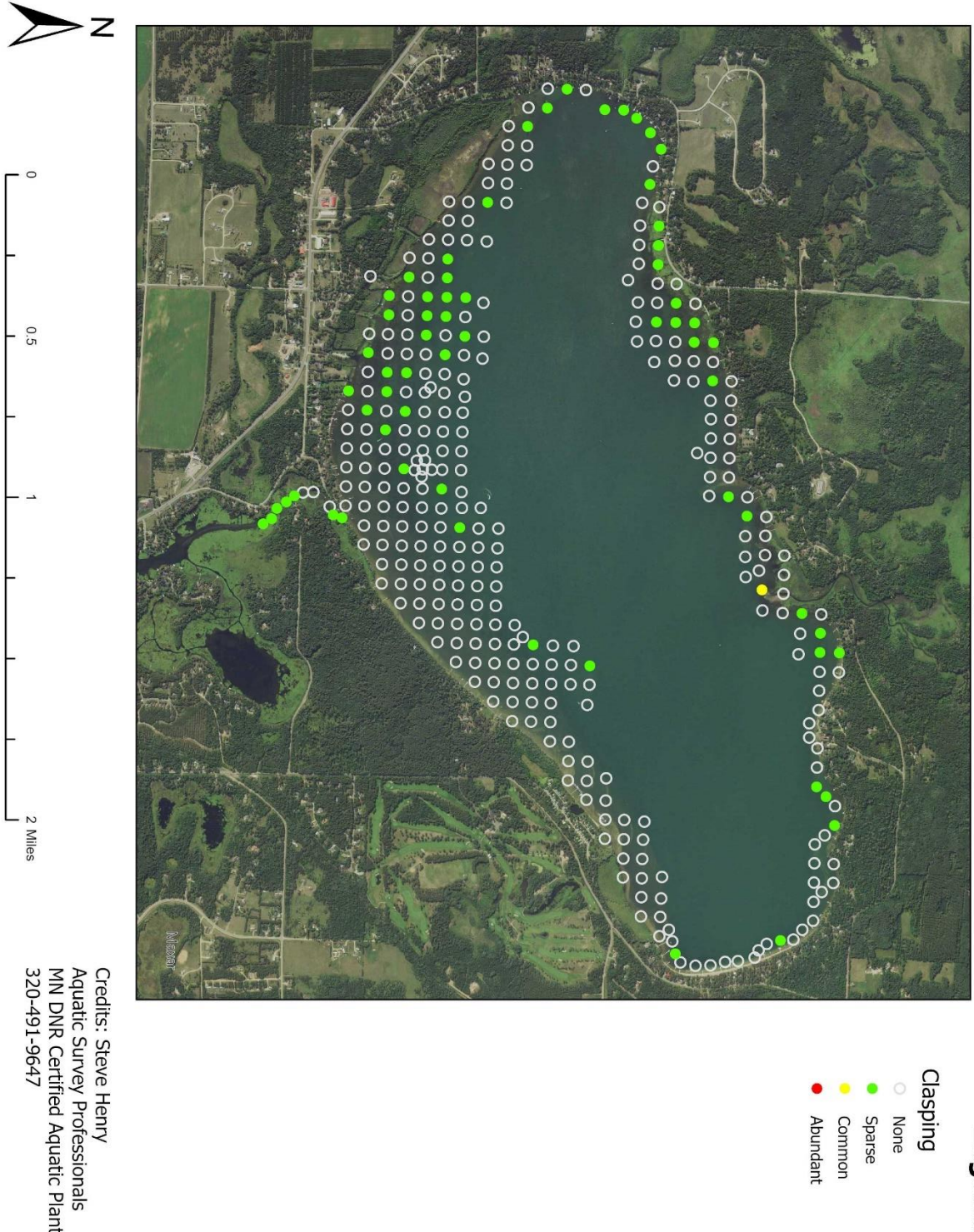


Legend

- Bladdervort**
- None
 - Sparse
 - Common
 - Abundant

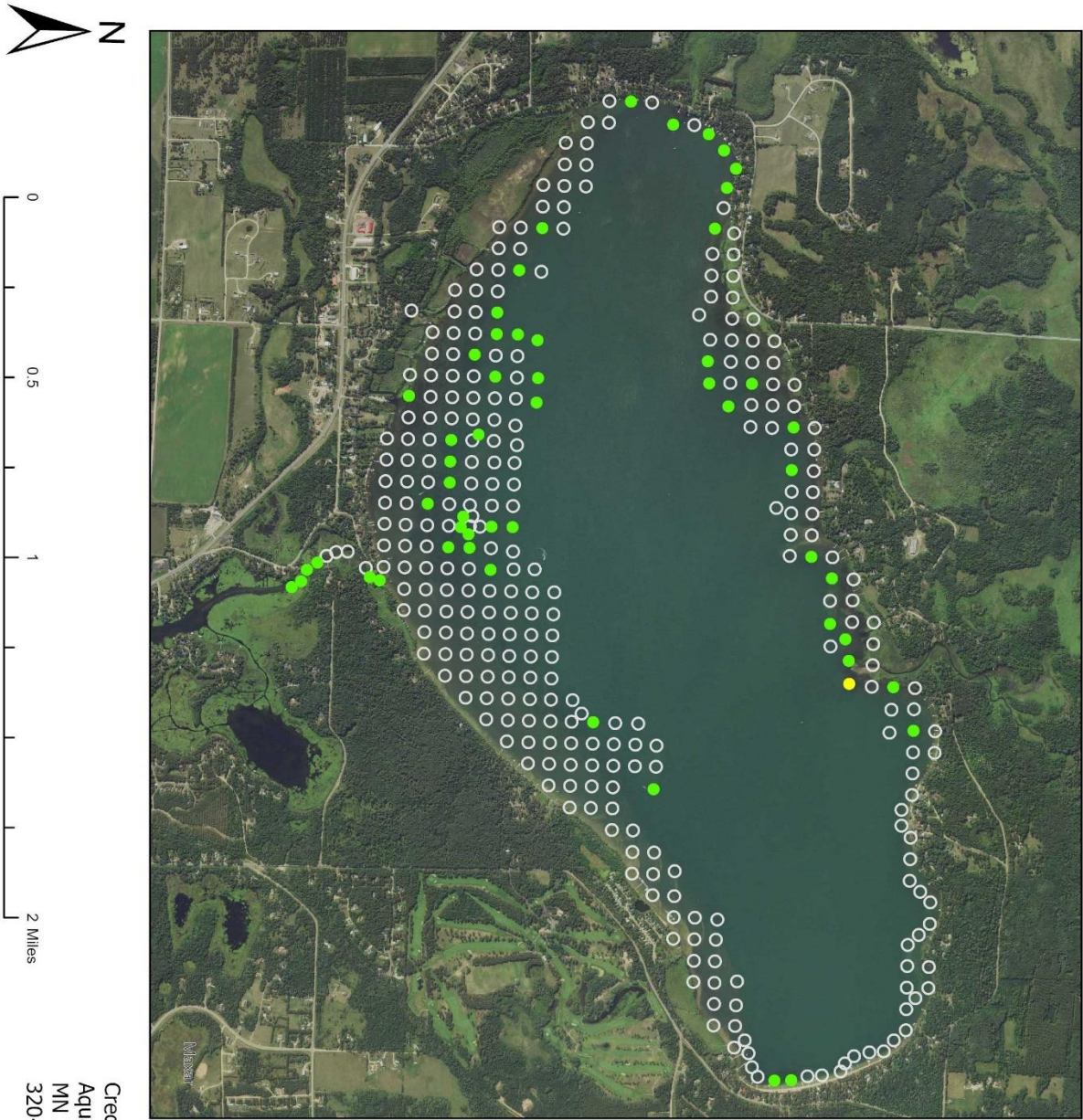
Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Claspingleaf Pondweed



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Flatstem Pondweed

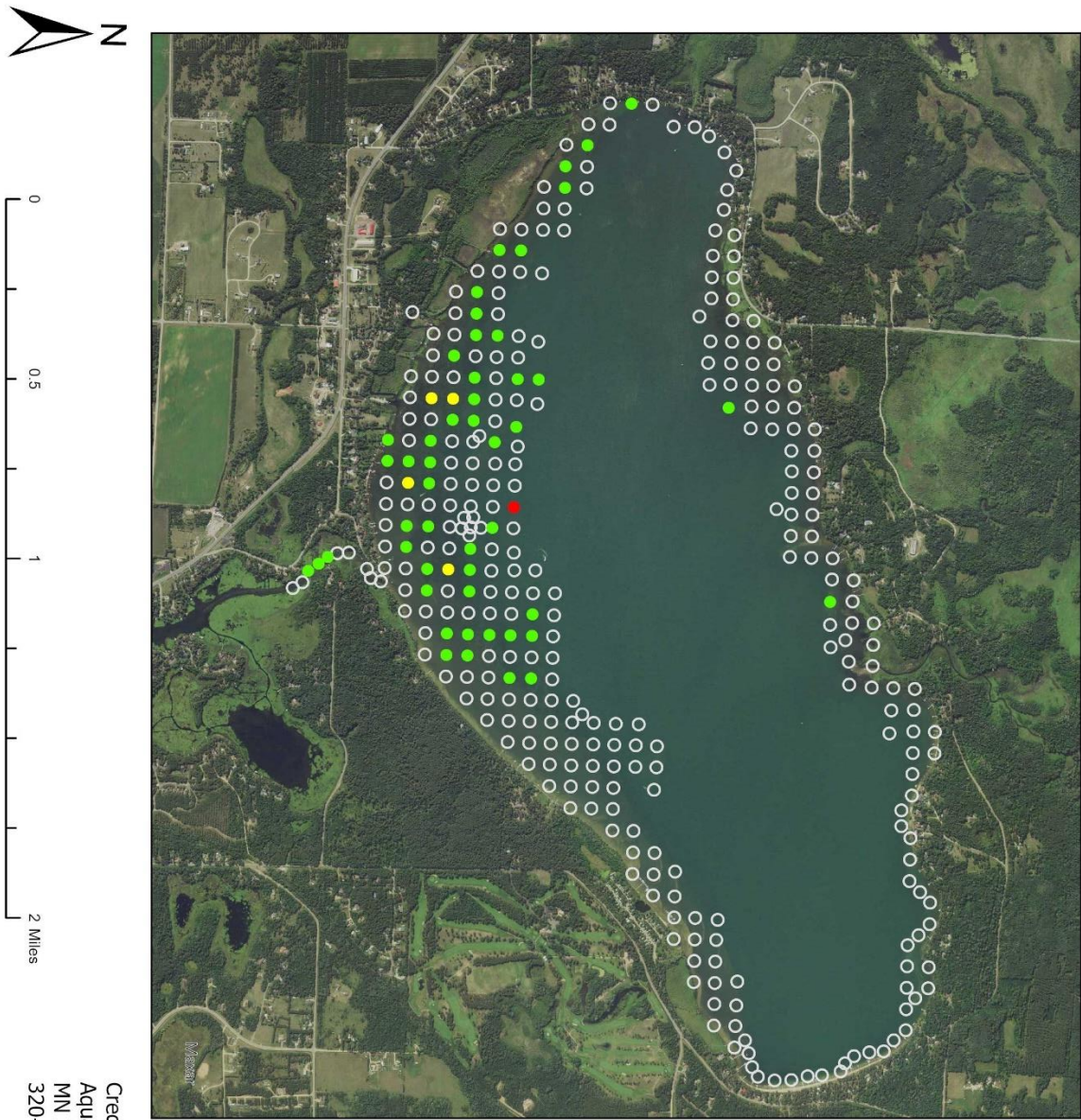


Legend

- Flatstem
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Bushy Pondweed

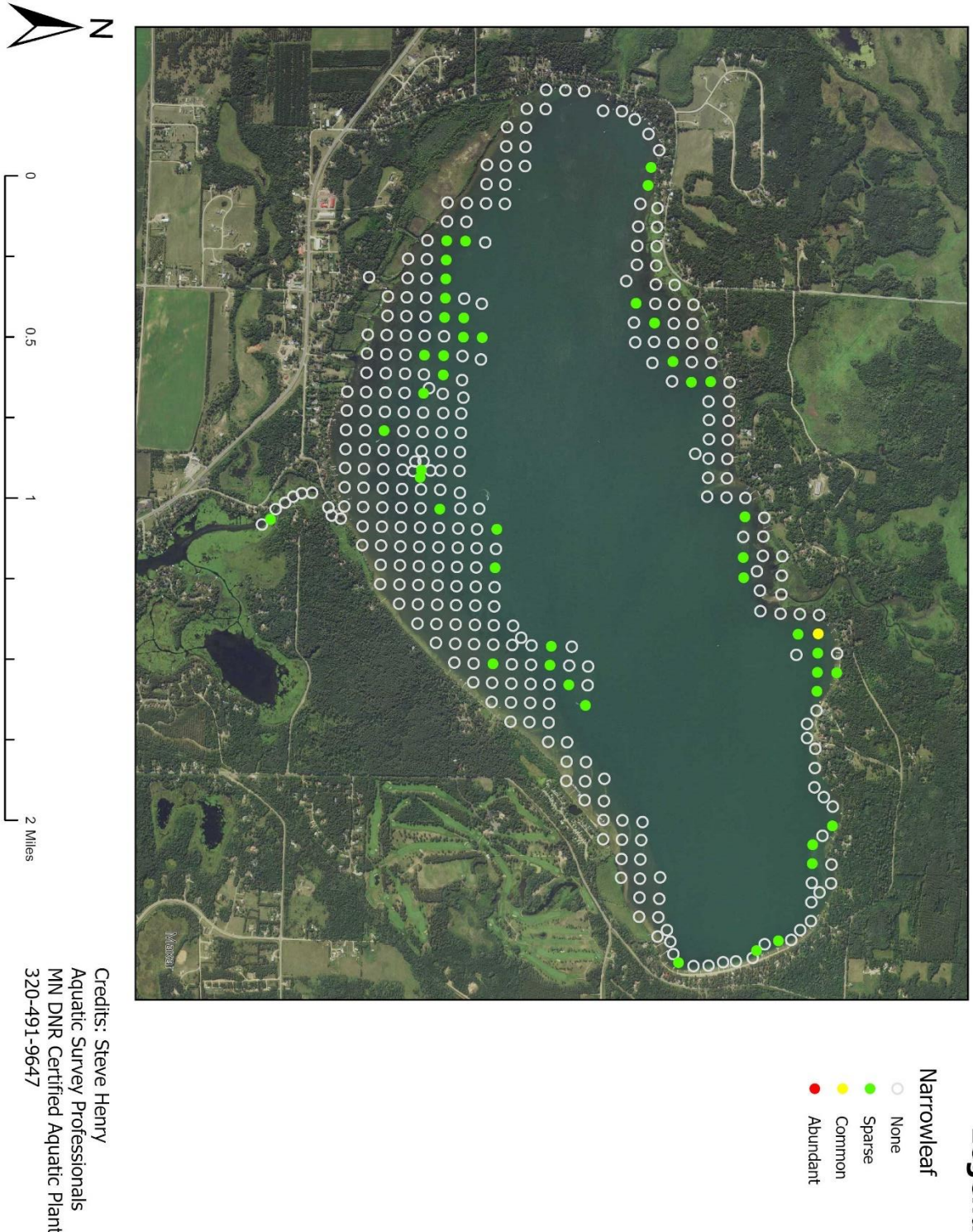


Legend

- Bushy**
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Narrowleaf Pondweed

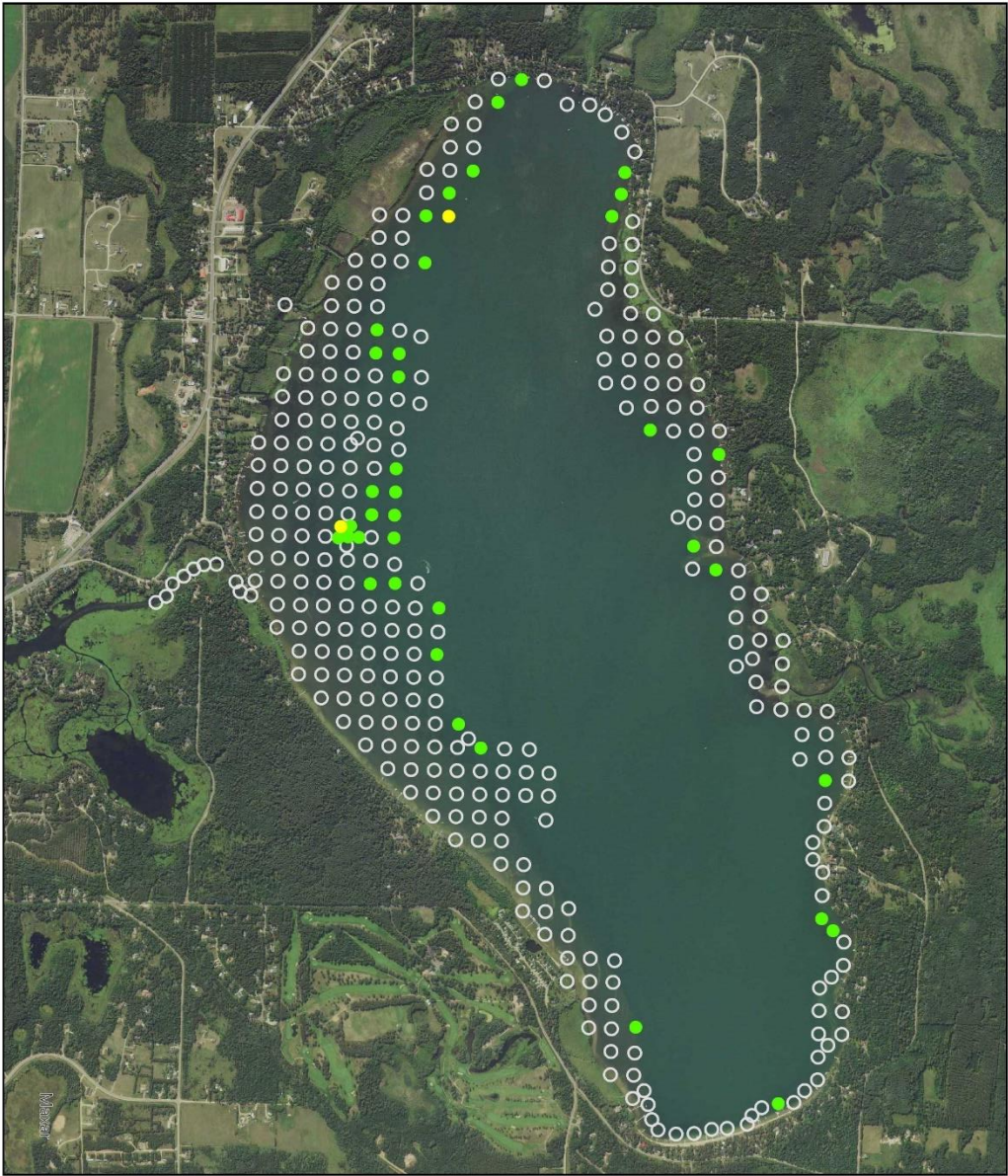


Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Coontail

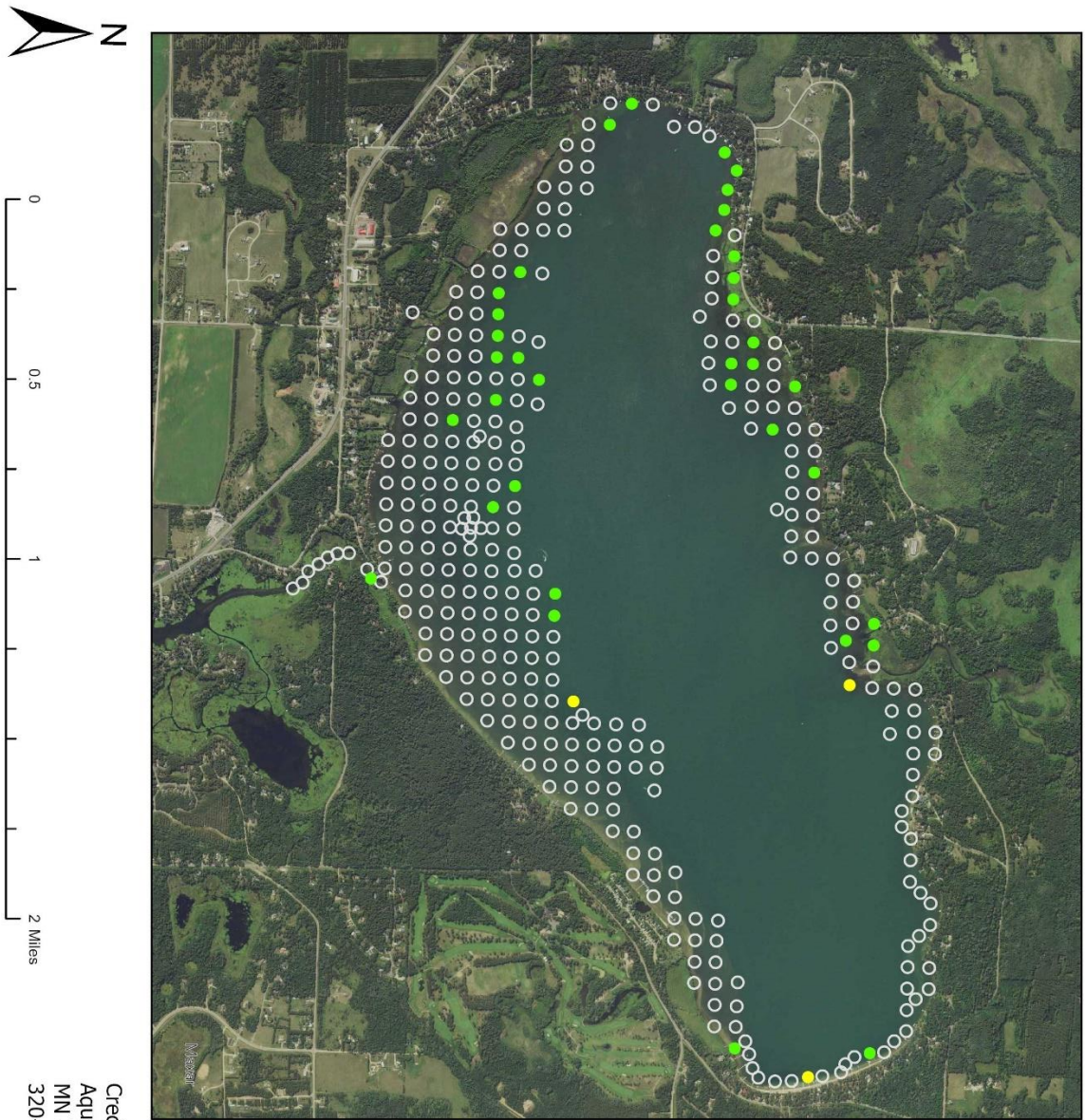
Legend

- Coontail
- None
 - Sparse
 - Common
 - Abundant



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Canada Waterweed

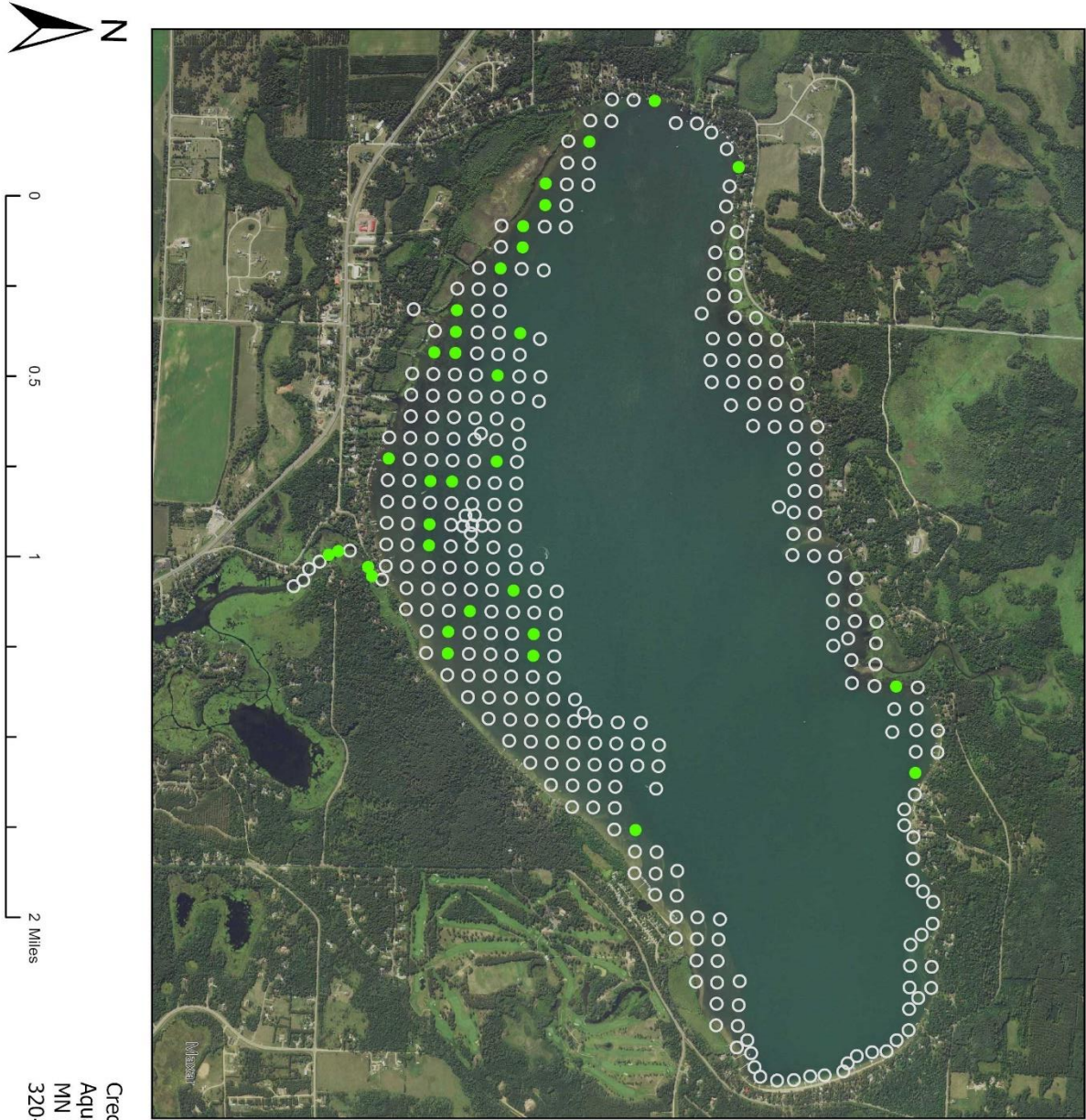


Legend

- Canada
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Illinois Pondweed



Legend

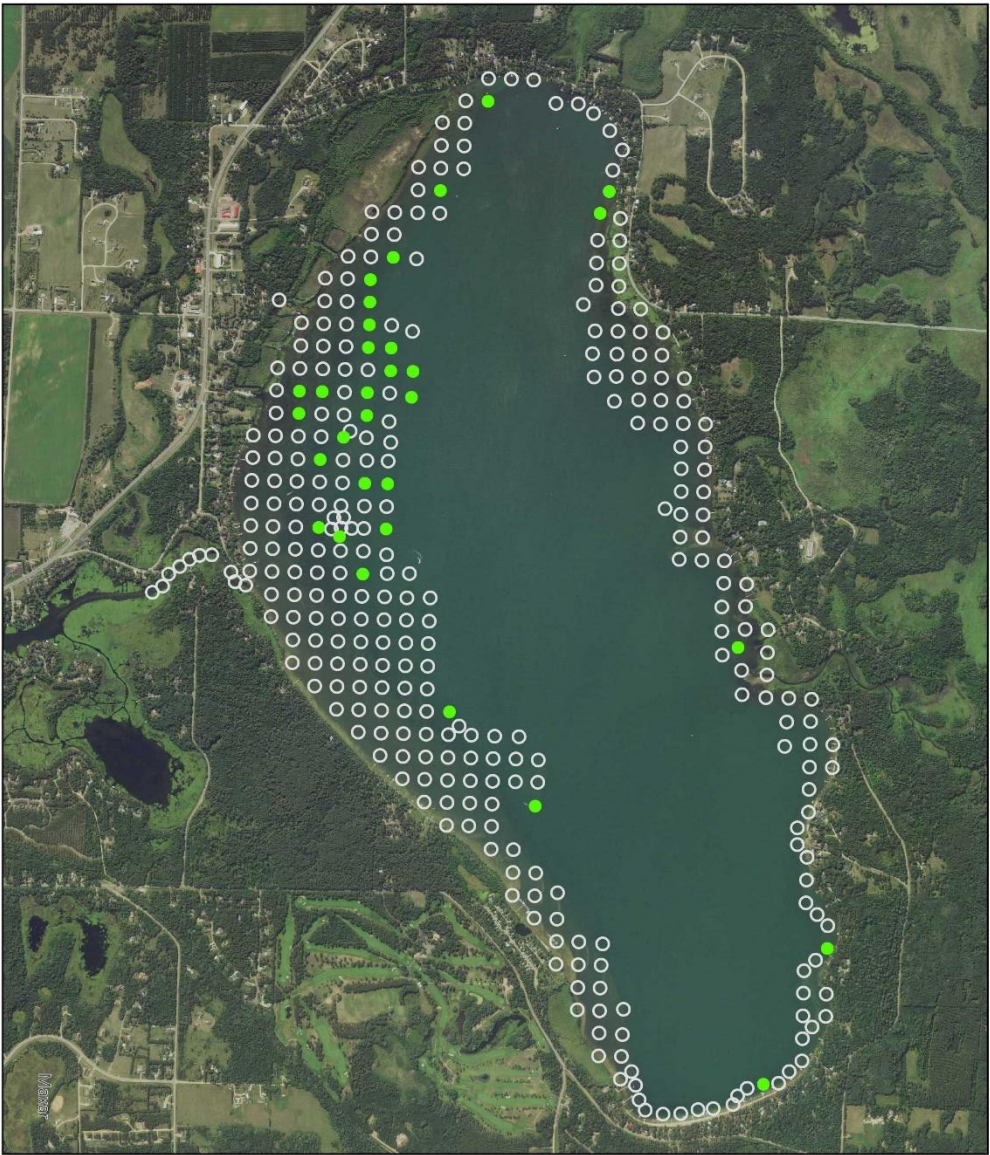
- Illinois
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Northern (Native) Milfoil

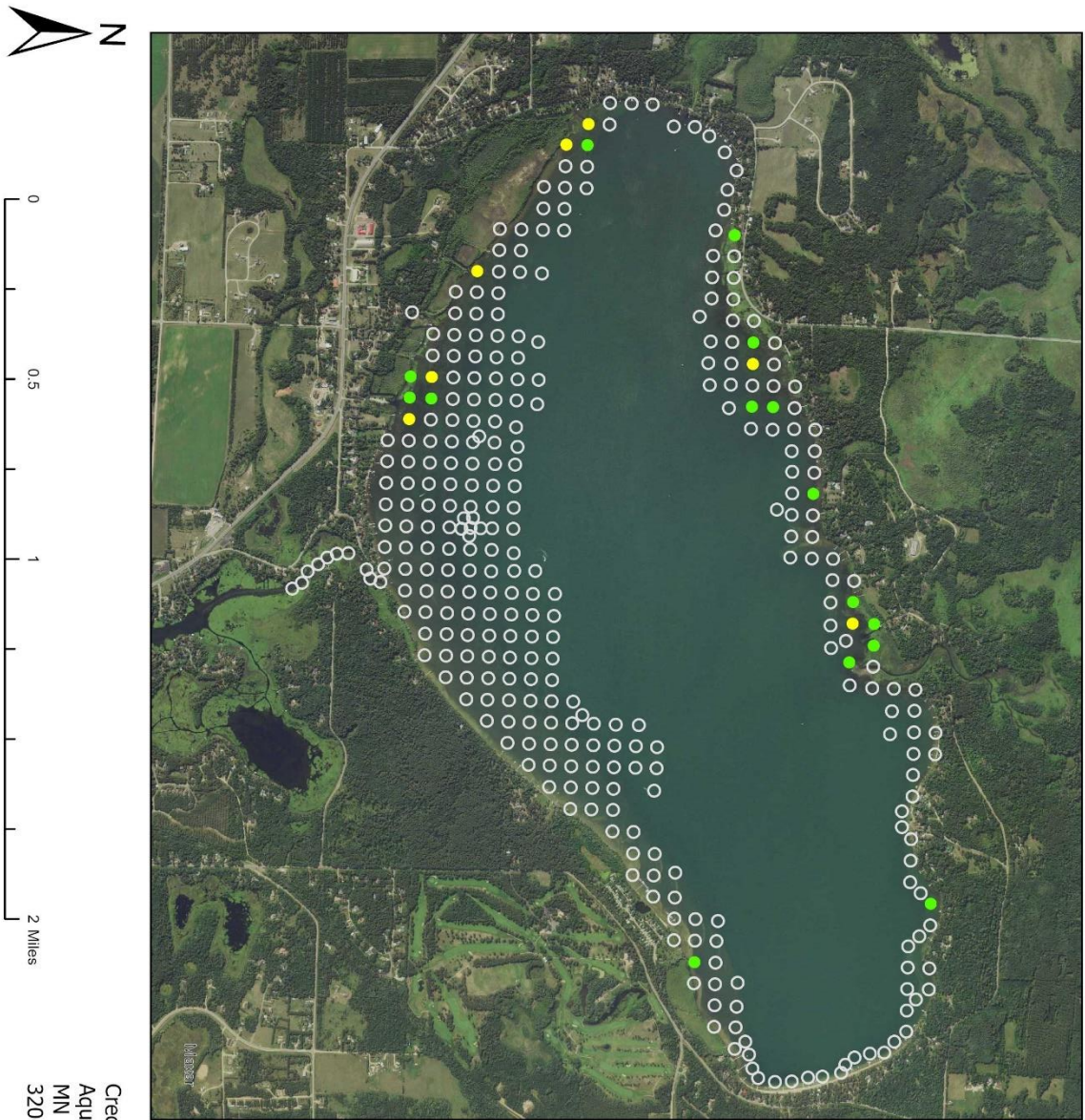
Legend

- Northern
- None
 - Sparse
 - Common
 - Abundant



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

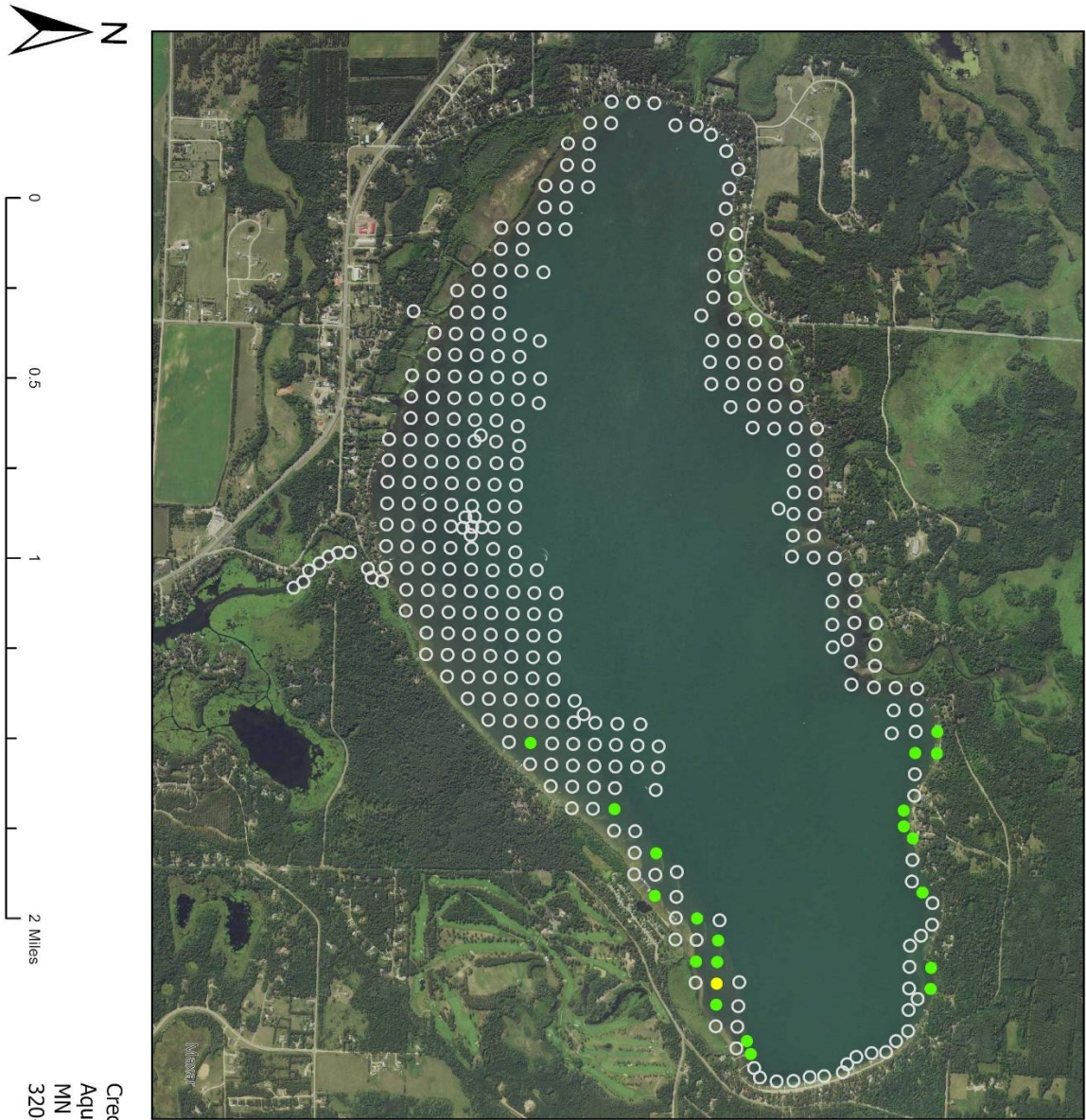
Fishhook Lake - Bulrush



- Legend**
- Bulrush**
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Variable Pondweed

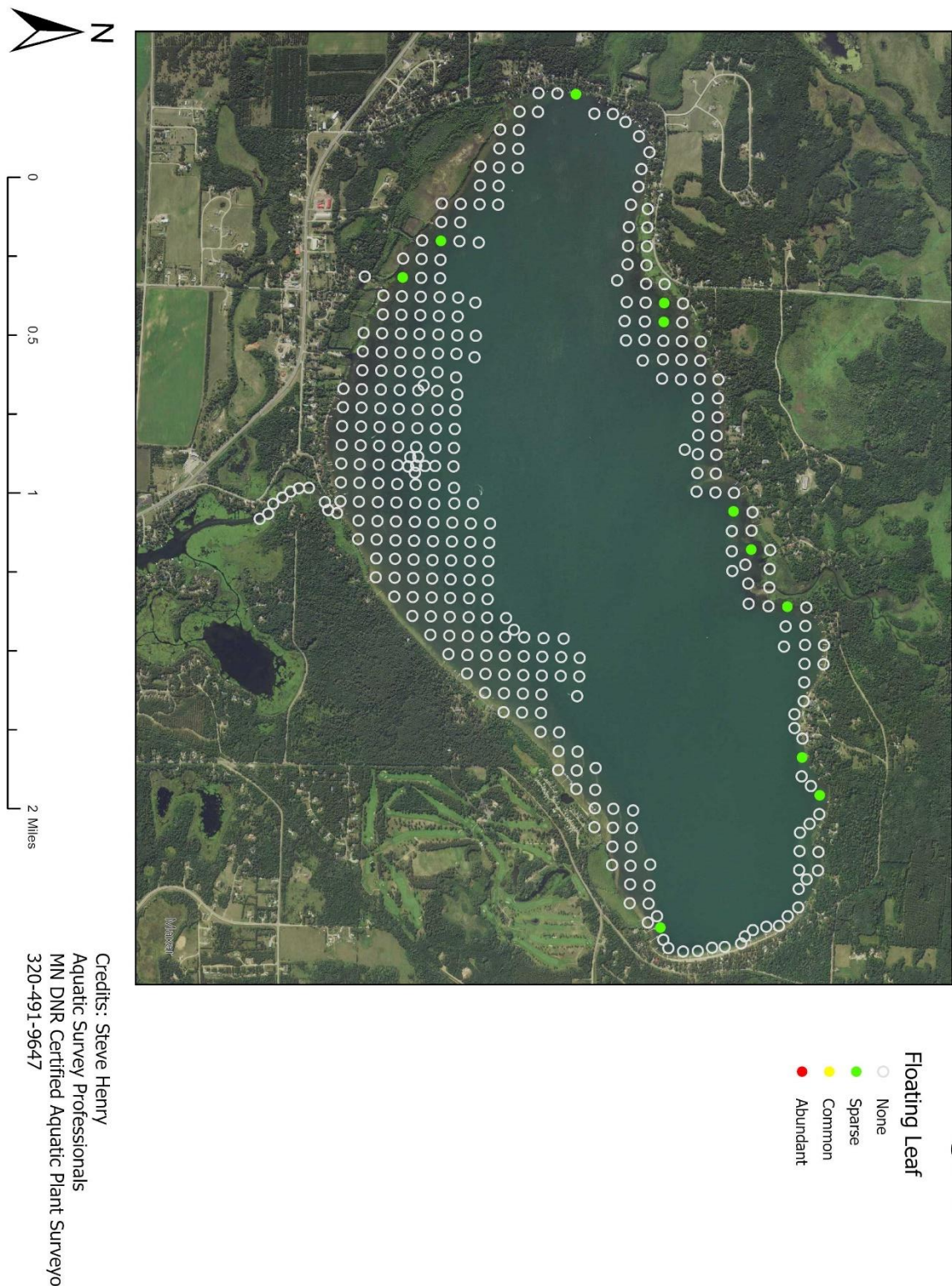


Legend

- Variable
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Floating Leaf Pondweed

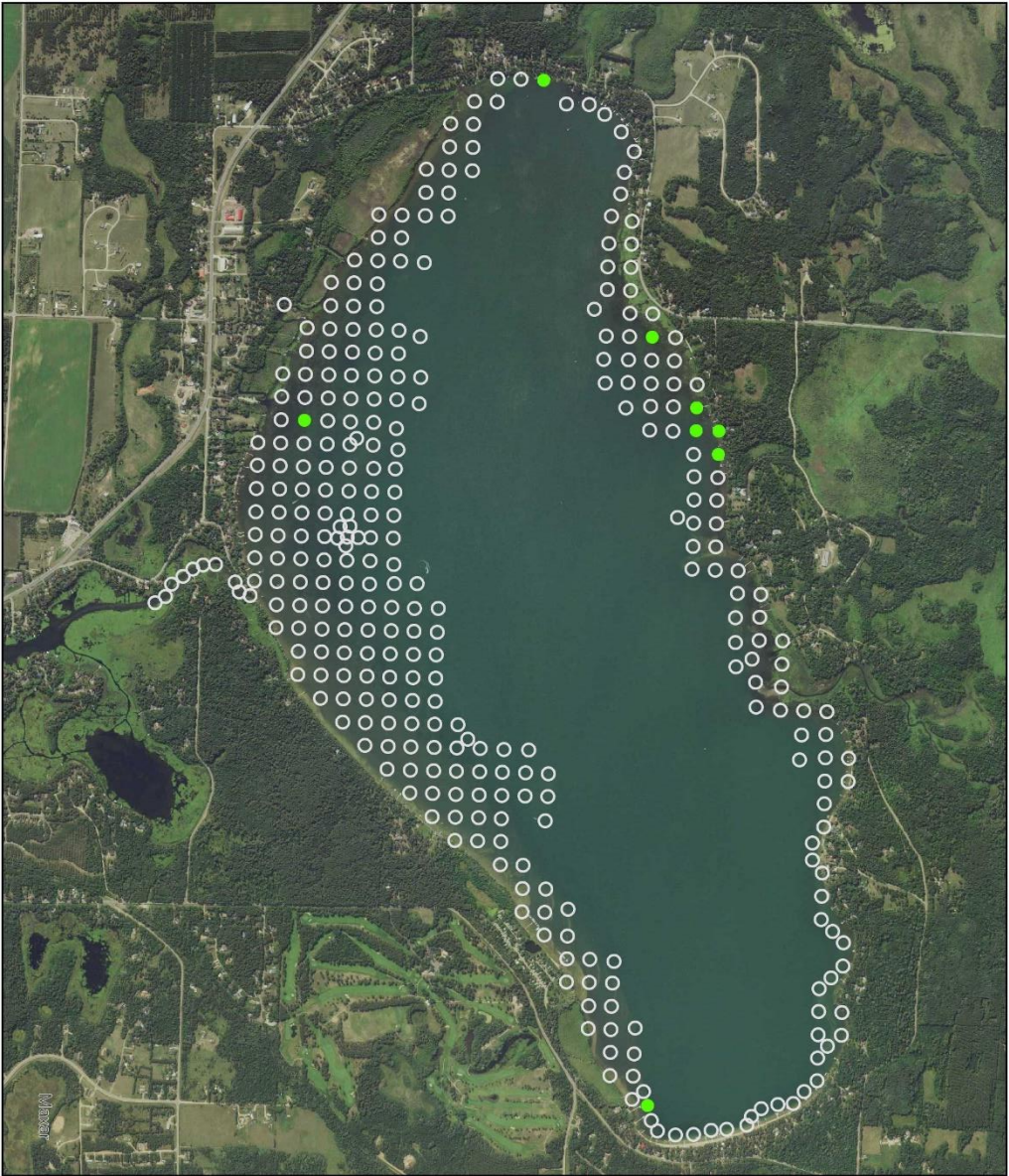


Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Wild Celery

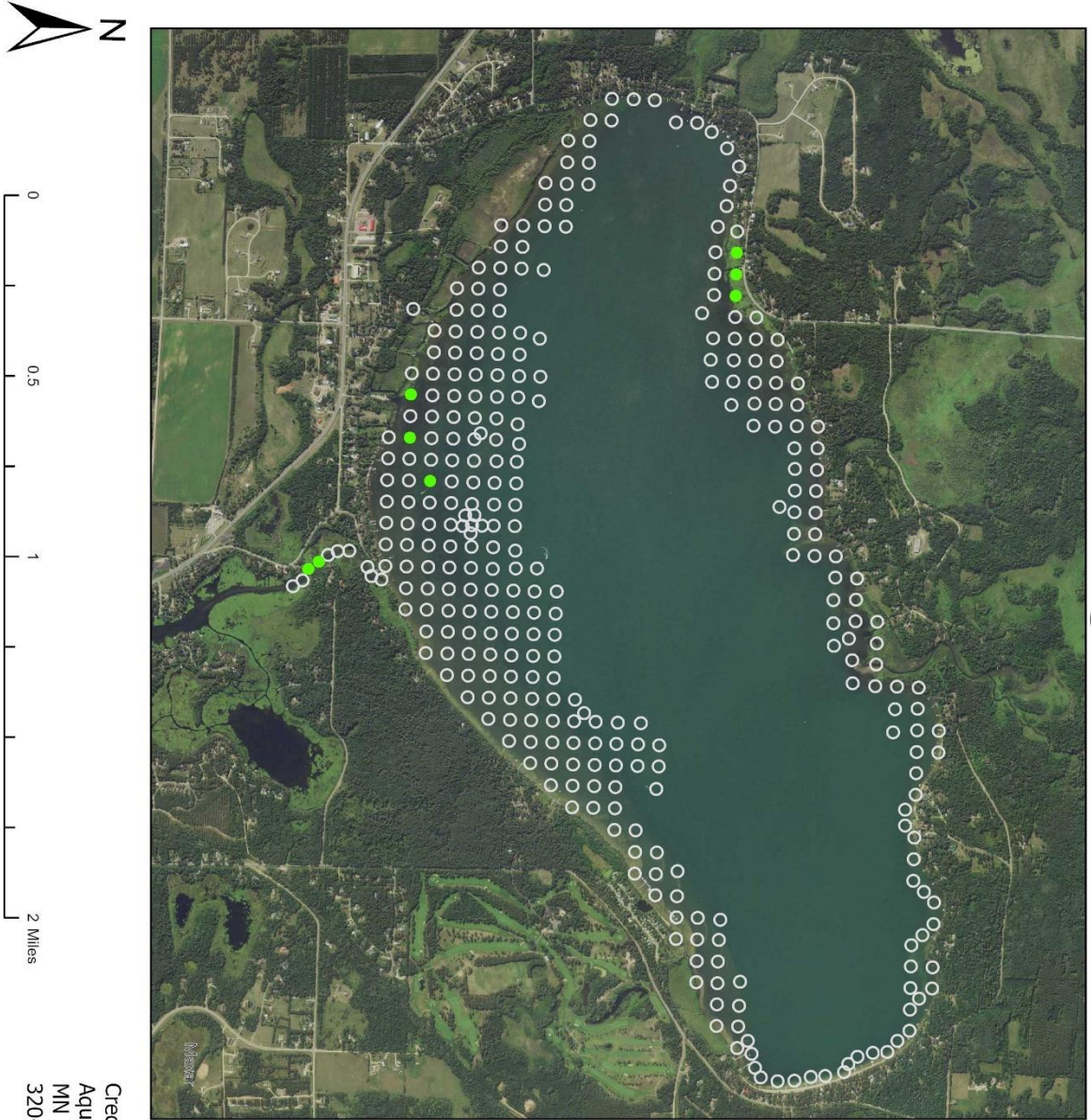
Legend

- Wild Celery
- None
 - Sparse
 - Common
 - Abundant



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Sago Pondweed

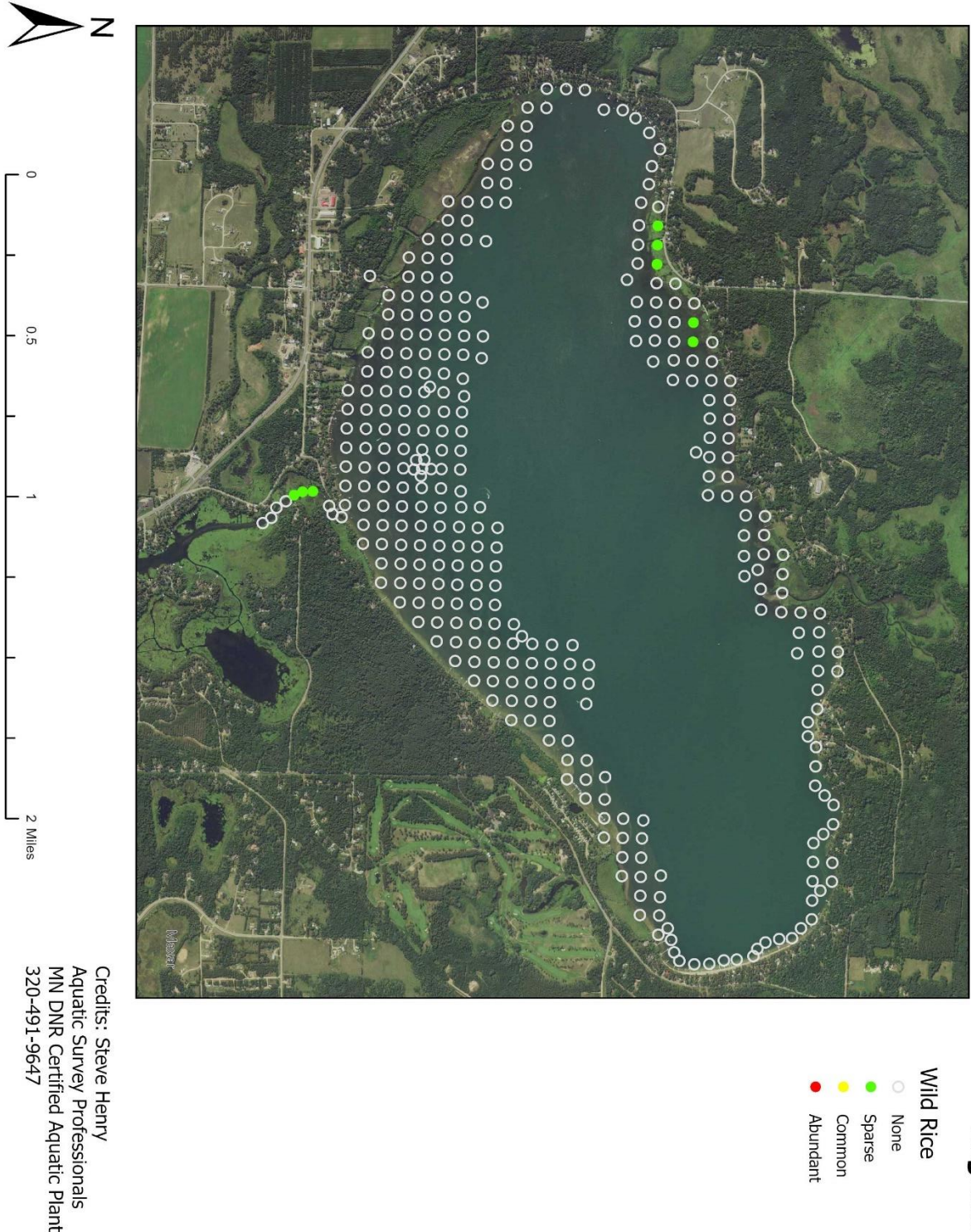


Legend

- Sago
- None
 - Sparse
 - Common
 - Abundant

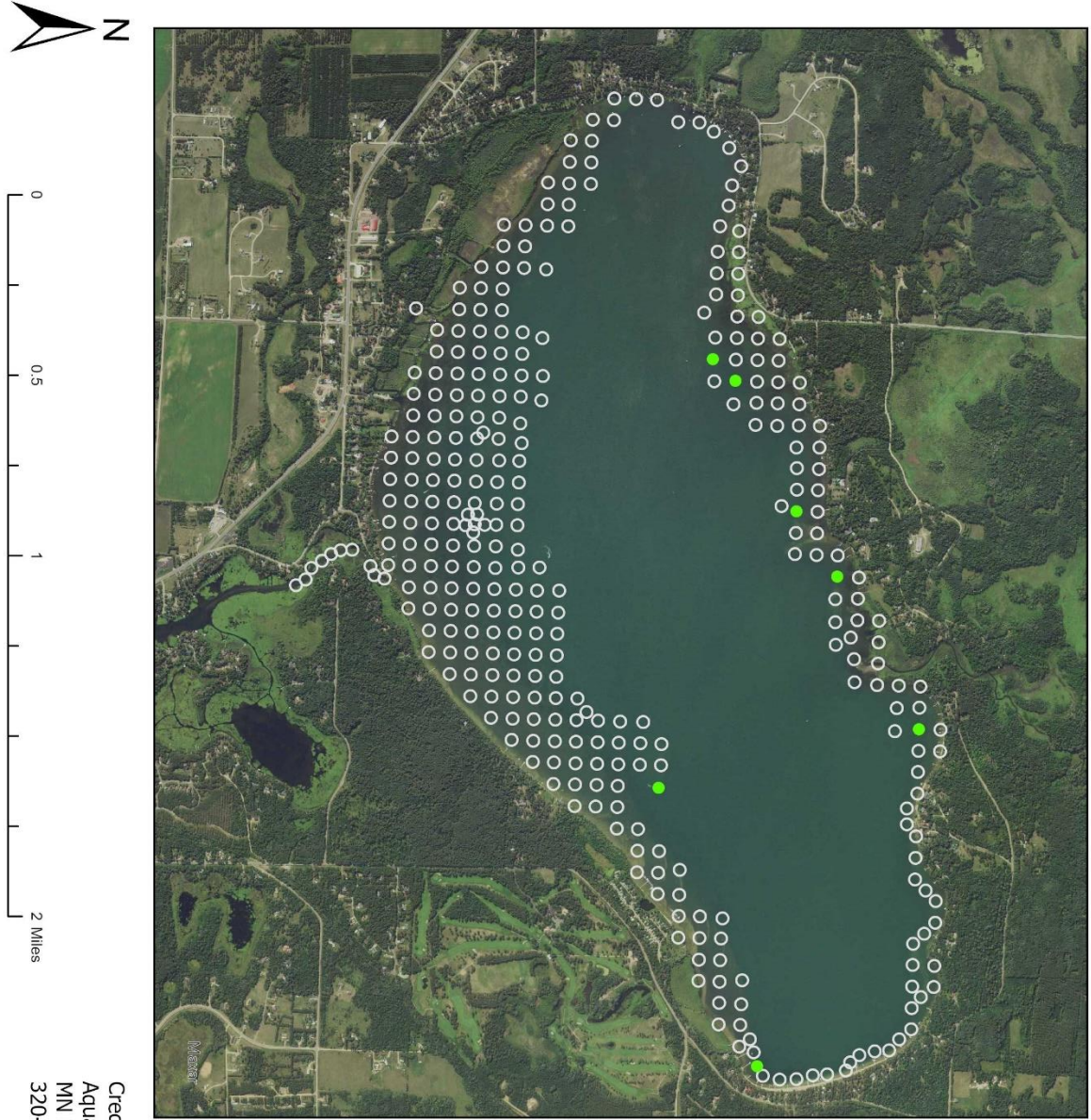
Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Wild Rice



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Whitestem Pondweed

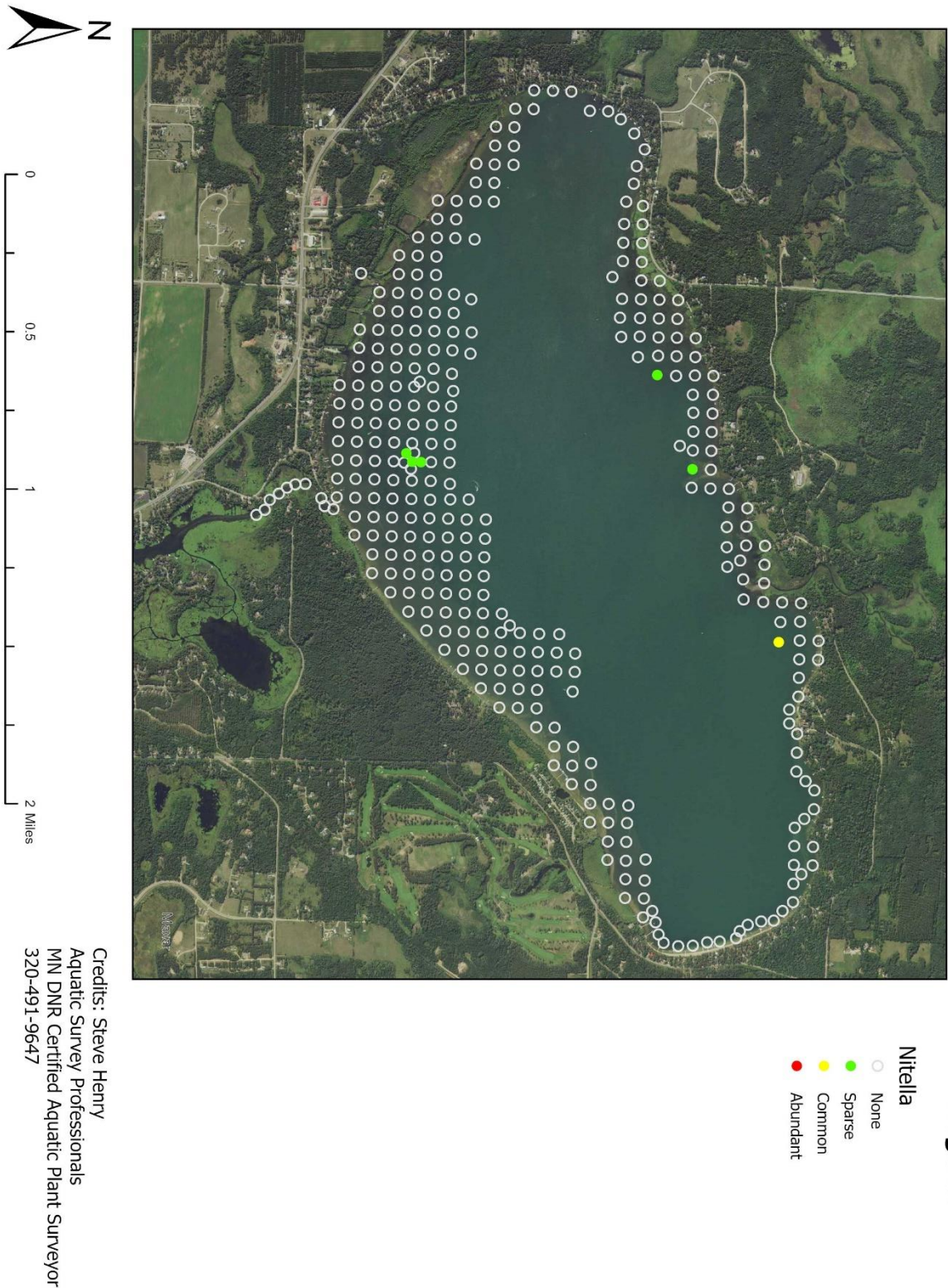


Legend

- Whitestem
- None
 - Sparse
 - Common
 - Abundant

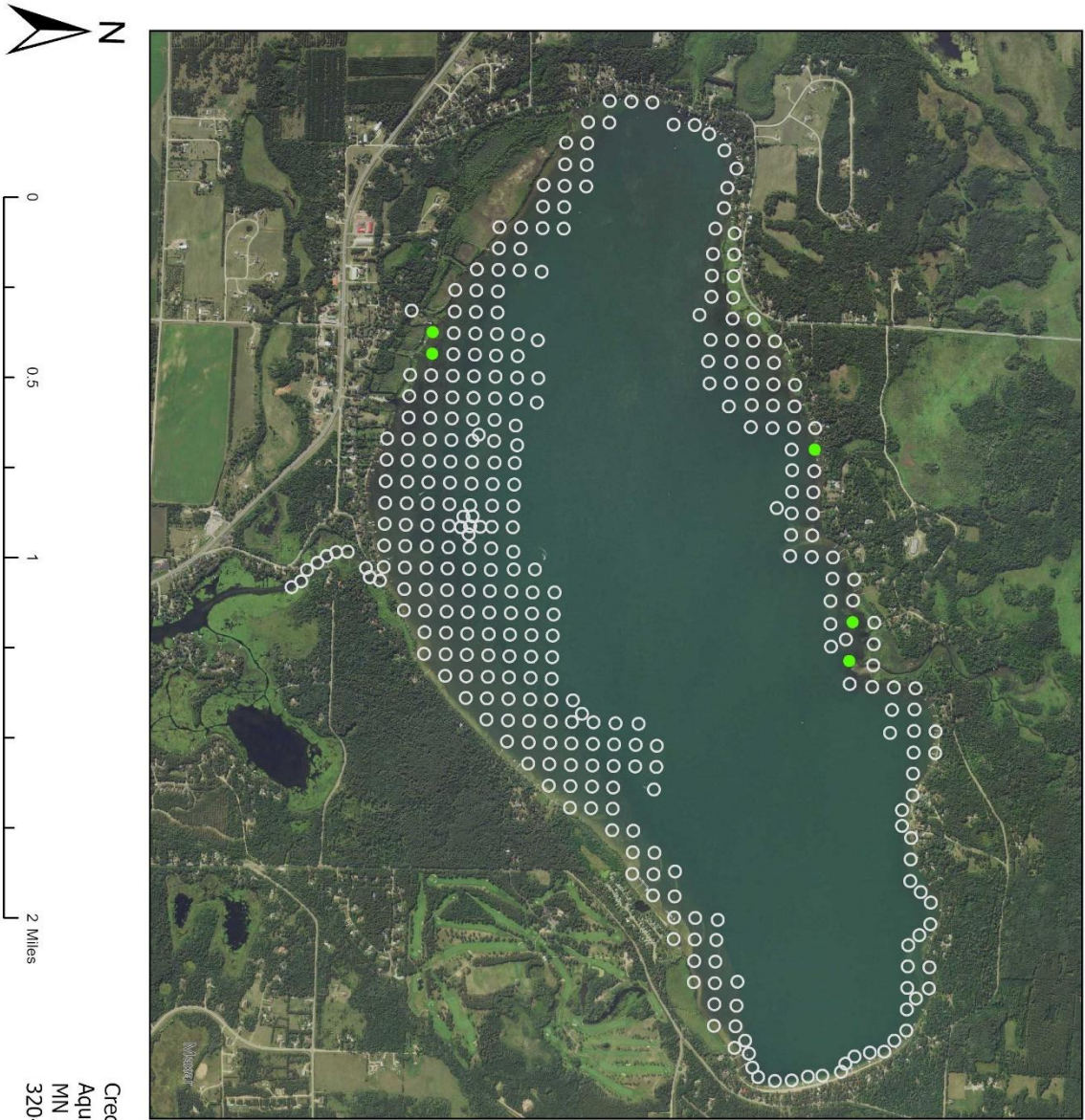
Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Nitella



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

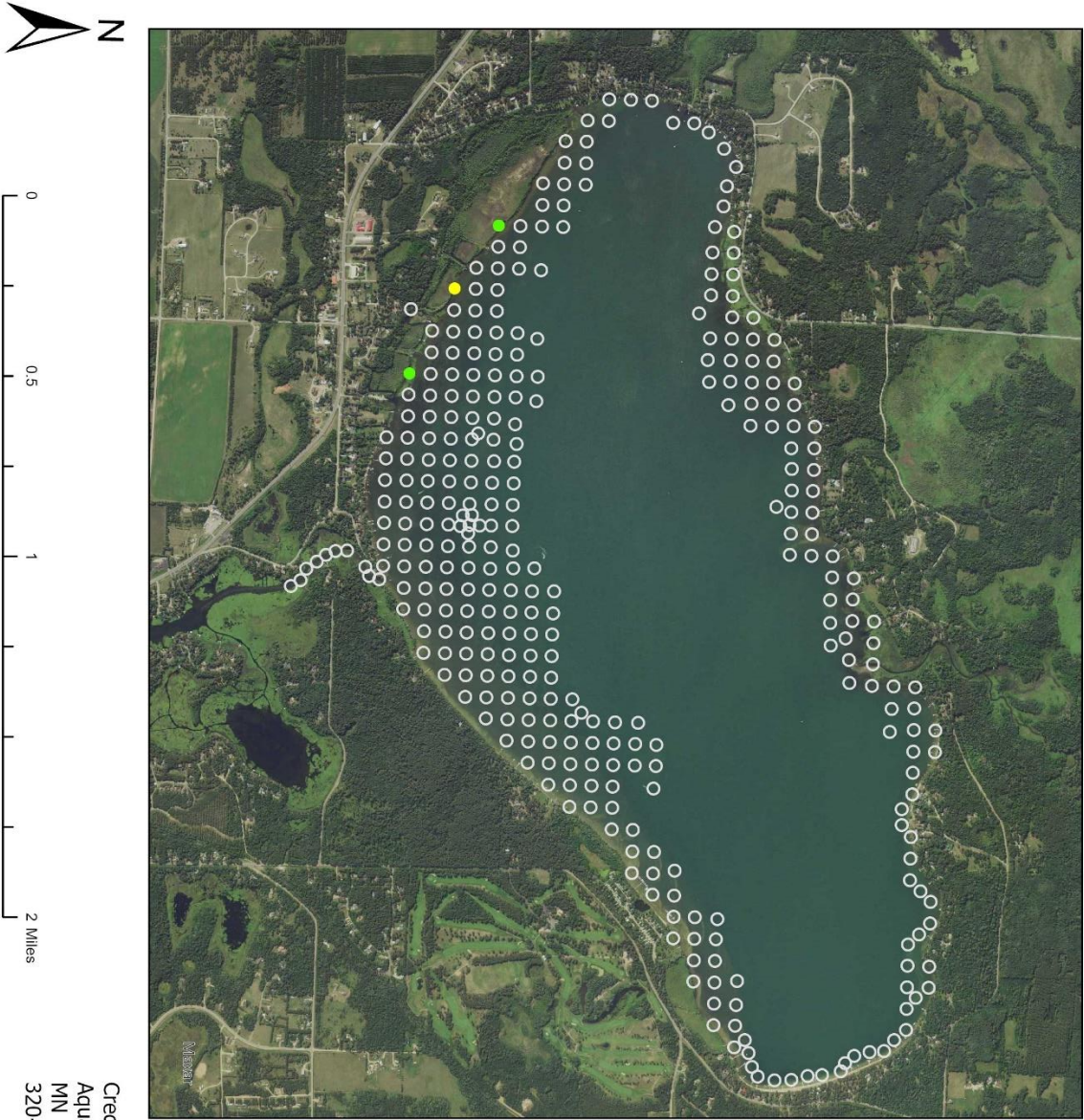
Fishhook Lake - Marestalk



- Legend**
- Marestalk**
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Cattail

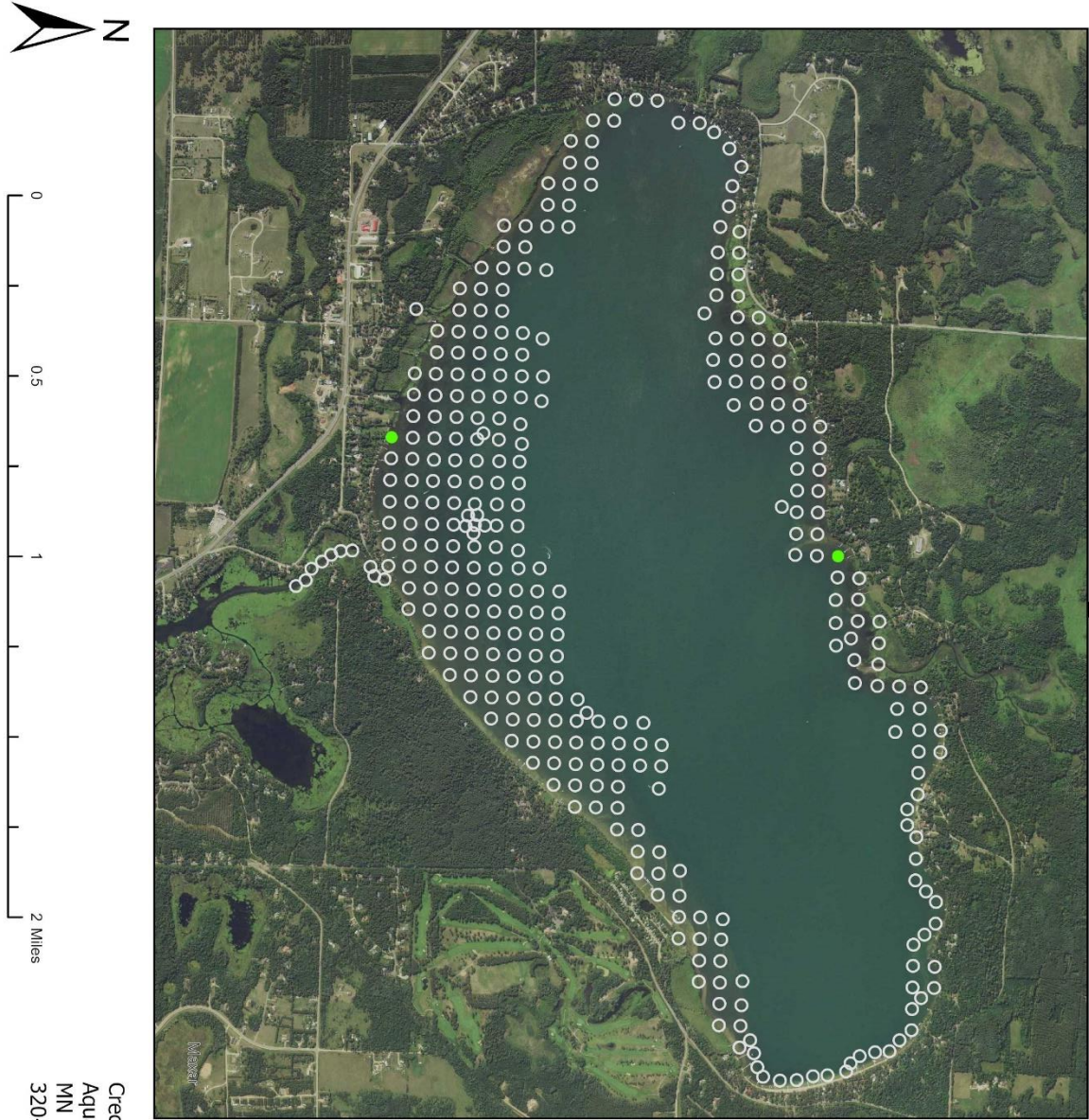


Legend

- Cattail**
- None
 - Sparse
 - Common
 - Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

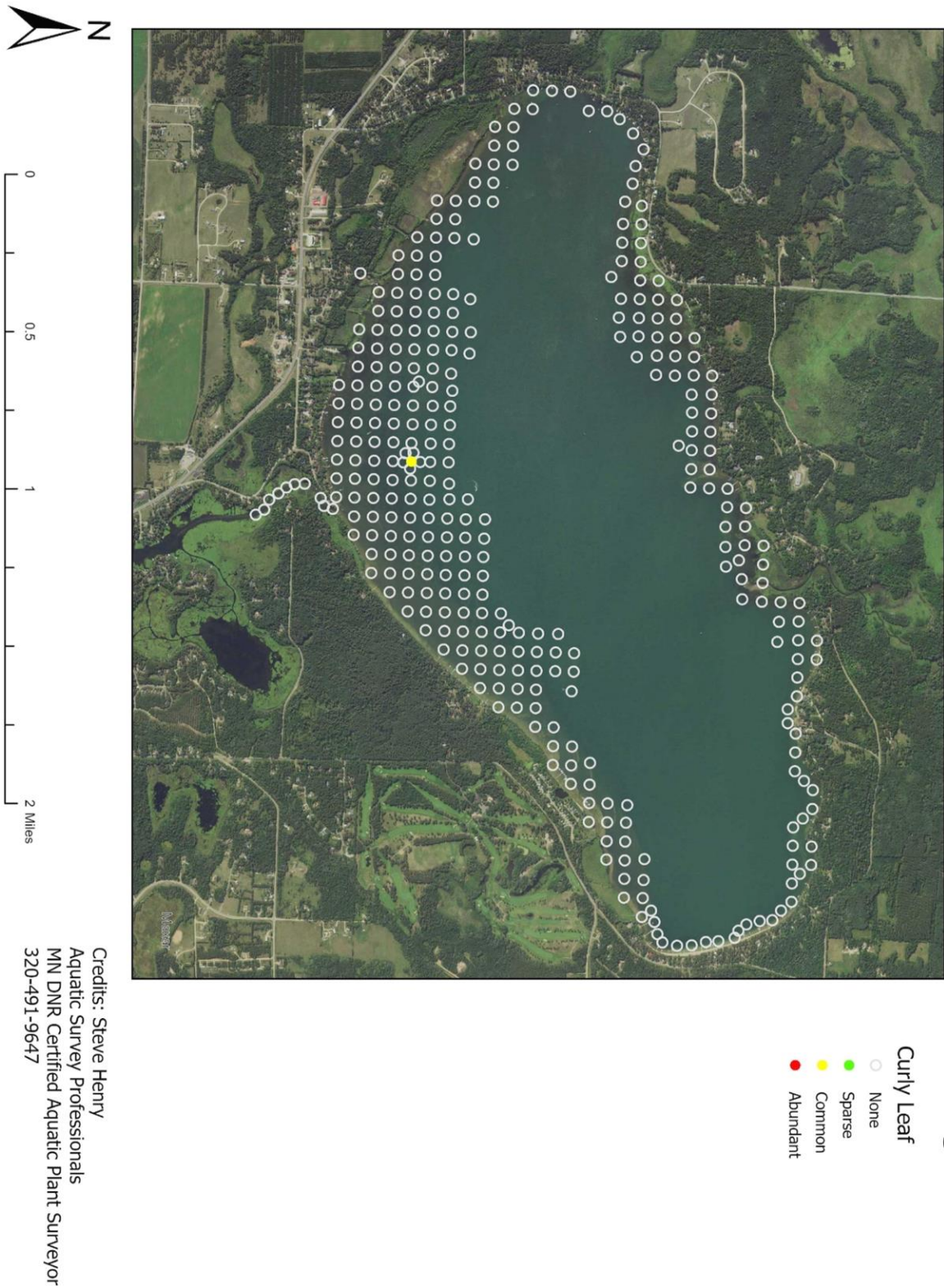
Fishhook Lake - Largeleaf Pondweed



- Legend**
- Largeleaf**
- None
 - Sparse
 - Common
 - Abundant

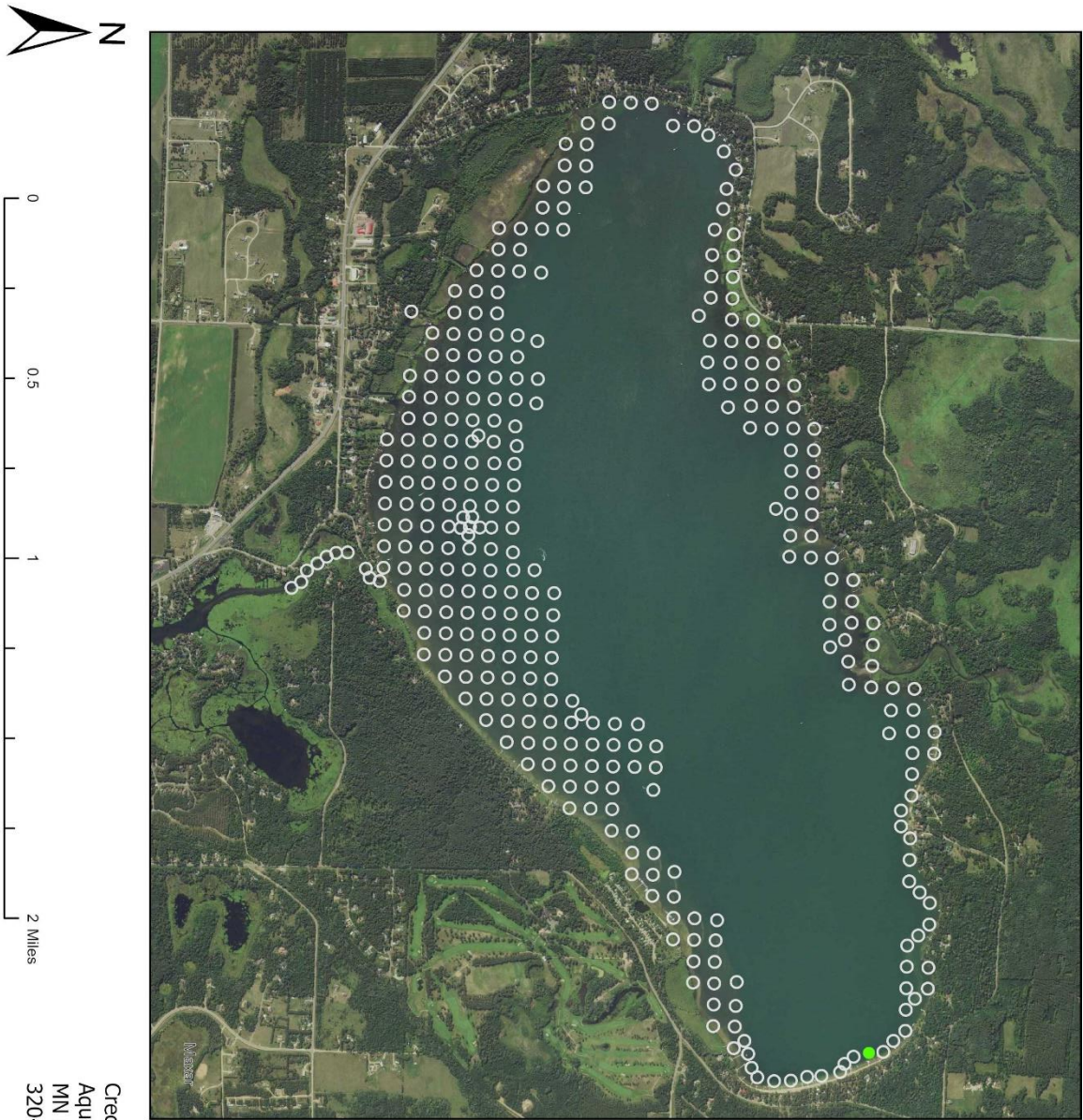
Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Curly Leaf Pondweed



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Robbins Pondweed



Legend

Robbins

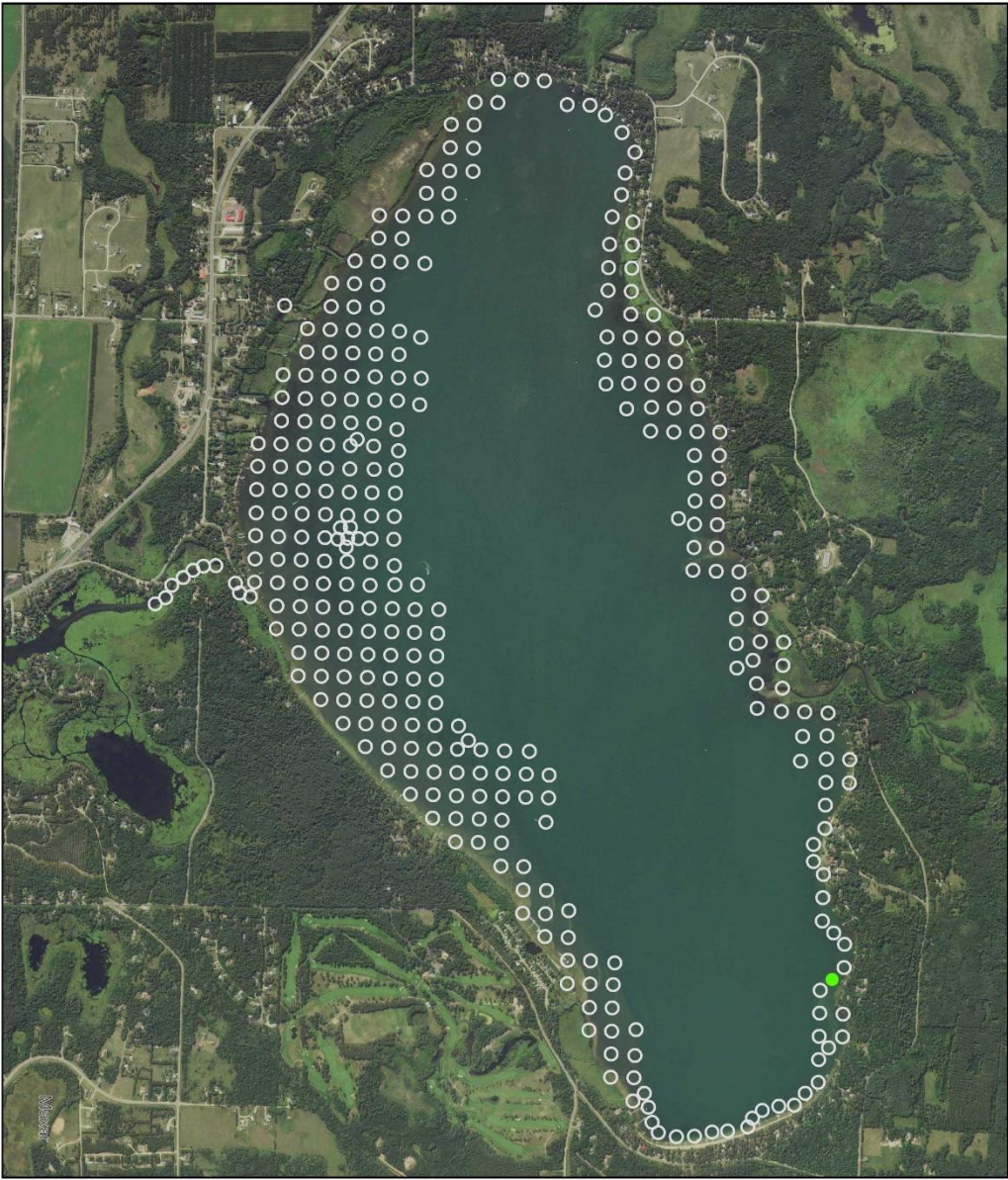
- None
- Sparse
- Common
- Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - Alumroot

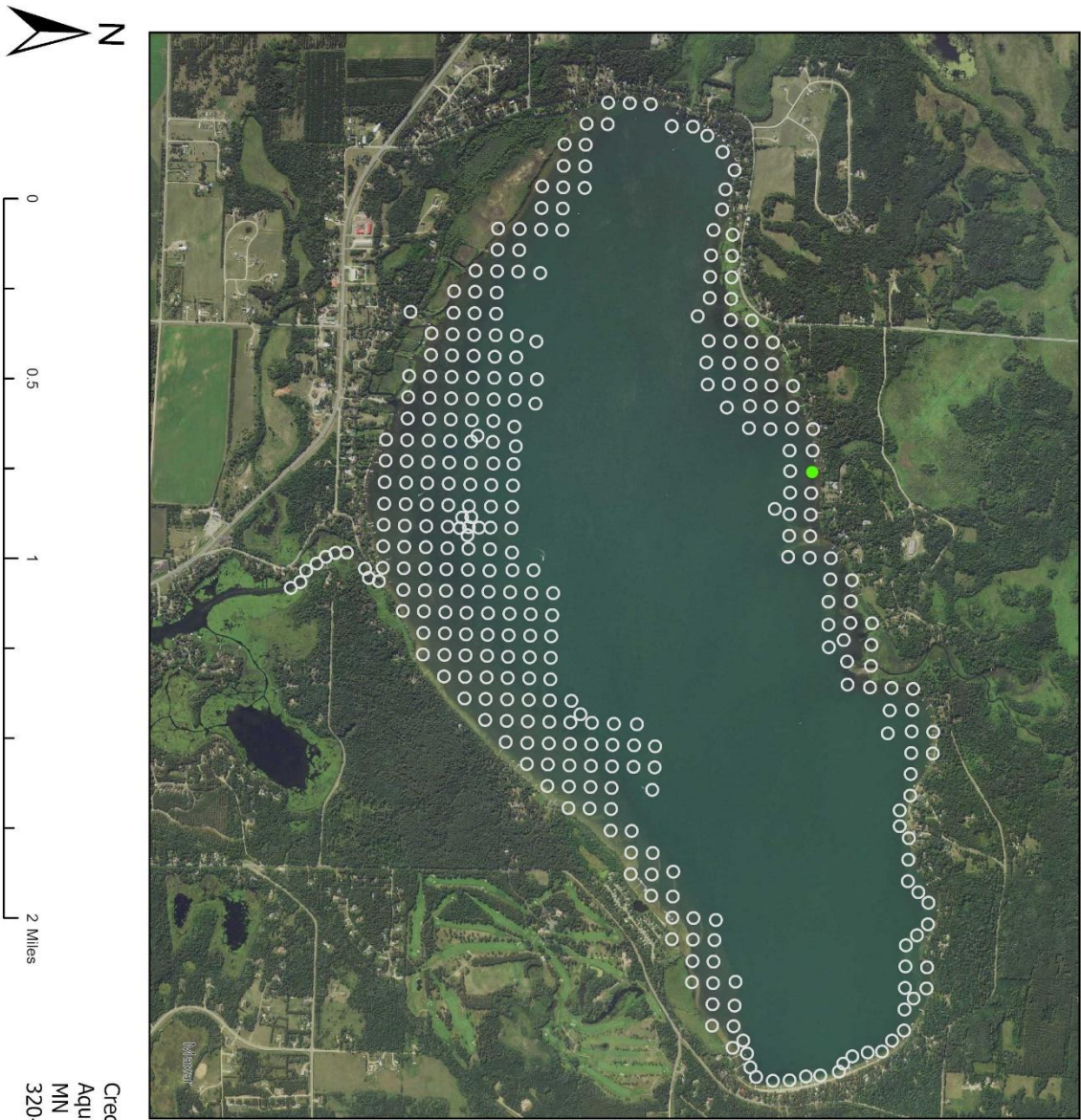
Legend

- Alumroot
- None
 - Sparse
 - Common
 - Abundant



Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

Fishhook Lake - White Water Lily



Legend

White WL

- None
- Sparse
- Common
- Abundant

Credits: Steve Henry
Aquatic Survey Professionals
MN DNR Certified Aquatic Plant Surveyor
320-491-9647

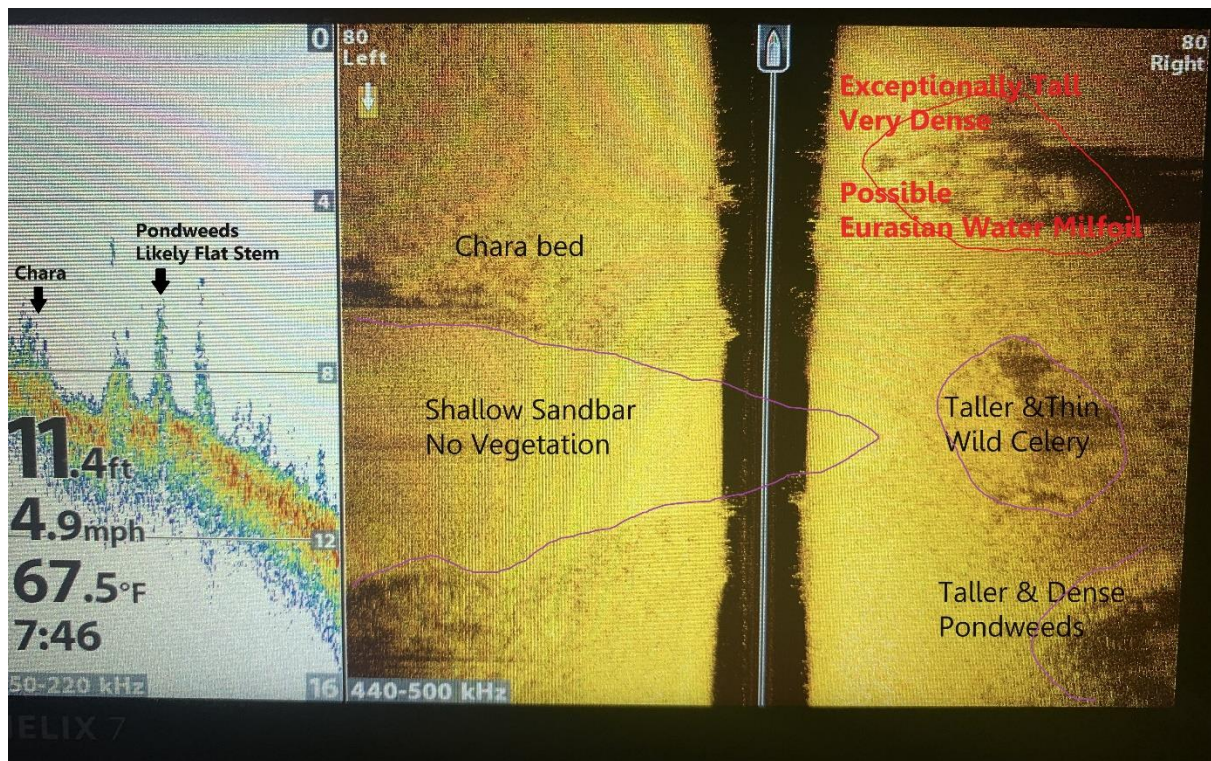
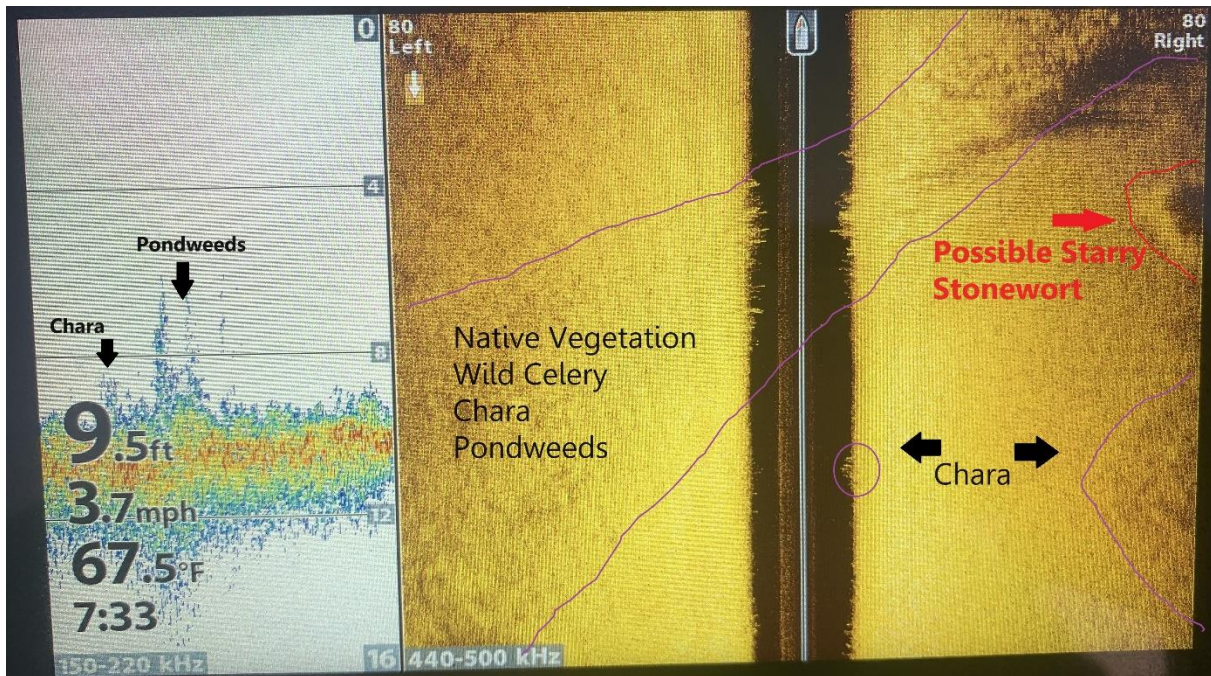
Down and Side Scanning Sonar for Aquatic Invasive Species Detection

As technology has improved aquatic plant survey techniques have adjusted to incorporate those improvements. Until recently aquatic plant surveys were based solely on using a sample rake to document the plants at pre-established survey points. Those survey points were spaced 200 feet or further apart in an even grid across the lake providing only a limited snapshot of the plant community. In 2020 Minnesota DNR approved a new Standard Operating Procedure for Invasive Species Delineations that utilizes sonar and visual observations to continuously document the lake's plant community as the surveyor navigates around the lake. Aquatic Survey Professionals combines these two survey techniques to provide our clients with a data set comparable to their previous surveys while also continuously examining the lake bottom to detect any newly introduced invasive species.

Sonar images can appear grainy and coarse, seemingly of limited value in documenting a lake's plant community. Aquatic surveyors gain hundreds of hours of experience monitoring these sonar images alongside thousands of rake obtained plant samples. Over time surveyors learn that each species has a distinctive appearance that changes over the season. Eurasian Water Milfoil is taller and denser than most native species in spring returning images with a different color pattern. By mid-summer Eurasian Water Milfoil develops a dense head over moderate stems often in tall patches that are slightly open near the bottom with a unique appearance on the sonar images. Starry Stonewort is referred to as 'Super Chara' by researchers which matches it's sonar appearance. Starry Stonewort is taller and denser than Chara but generally shorter than other native species. Starry Stonewort grows very dense and usually in well-defined patches with no natives intermixed, it's appearance on sonar is distinctive. Eventually surveyors learn how to 'calibrate' each lake's plant community to the sonar images within 30 minutes of starting their survey on that lake. This allows surveyors to detect unusual sonar images, drop a new waypoint on top of that location, and carefully examine that unusual growth with multiple rake tosses and visually.

Side scanning sonar covers both sides of the boat track and has an adjustable scan width. Up to 200 feet in each direction can be displayed on the sonar unit which covers a track width of 400 feet. Normally the side scanning is set closer to 100 feet to keep the image clarity high, this increases the survey coverage from one small point every 200 feet to a continuous swath of observations 200 feet wide tracking back and forth across the lake. Combined with visual observations made continuously as the boat tracks the lake the 'density' of observations sky rockets compared with traditional point surveys. See the example images on the next page.

These images were produced with side scan set to 80 feet allowing the surveyor to see that far to each side of the boat track. The black area represents the water below the boat, the black area is equal to the water depth. Sample waypoints can be dropped on this screen to mark suspicious sites. Those waypoints are correctly offset to the side and behind the boat exactly on top of the suspicious growth allowing the surveyor to navigate back for additional sampling.



Lake Health Stats – From MN DNR





[Explore Watershed Lakes: Minnesota Department of Natural Resources \(state.mn.us\)](https://state.mn.us)

Minnesota DNR has developed a new lake health evaluation framework that draws together the results from numerous programs implemented through their various divisions. This framework is meant to be more comprehensive and informative while still stimulating the interest of lake residents in how each evaluation is performed and ranked. Following the link above will lead you to information on each evaluation and descriptions of the ranking system.

Informative Ranking added by Aquatic Survey Professionals Excellent ★ Good + Fair ● Poor ■

Lake Health Score	65 +
Lake Health Grade	B +
Major Watershed Lake Health Mean Score	66
Major Watershed Lake Health Minimum Score	45
Major Watershed Lake Health Maximum Score	90
Water Quality Score	52 ●
Major Watershed Water Quality Mean Score	55
Major Watershed Water Quality Minimum Score	25
Major Watershed Water Quality Maximum Score	94
Phosphorus Score	70 +
Major Watershed Phosphorus Mean Score	69
Major Watershed Phosphorus Minimum Score	35
Major Watershed Phosphorus Maximum Score	92
Total Phosphorus (µg/l)	16
Total Phosphorus Regional Goal (µg/l)	30
Total Phosphorus Percent Deviation from Goal	19
Total Phosphorus Goal Status	At or Above Goal
TP Sensitivity Index (inches)	1
TP Sensitivity Significance Priority Class	Higher
Water Clarity Score	34 ●
Major Watershed Water Clarity Mean Score	42
Major Watershed Water Clarity Minimum Score	2
Major Watershed Water Clarity Maximum Score	97
Five-year mean Water Clarity Meters	3
Water Clarity Regional Goal	2
Water Clarity Percent Deviation from Goal	64
Water Clarity Goal Status	At or Above Goal
Water Clarity ID for Lake Browser	29024200
Impairments	Mercury in fish
Biology Score	63 +

Major Watershed Biology Mean Score	50
Major Watershed Biology Minimum Score	27
Major Watershed Biology Maximum Score	74
Fish Community Quality	82 ★
Major Watershed Fish Community Quality Mean Score	68
Major Watershed Fish Community Quality Minimum Score	27
Major Watershed Fish Community Quality Maximum Score	100
Fish IBI Score	72 ★
Fish IBI Threshold	45
Fish IBI Lake Type	Deep lakes with complex shorelines
Fish IBI % Deviation From Threshold	60
Fish IBI Status	At or Above Threshold
Fish IBI Aquatic Life Use Judgement	Full Support
Lake Plant Community Quality	44 🟢
Major Watershed Lake Plant Community Quality Mean Score	43
Major Watershed Lake Plant Community Quality Minimum Score	27
Major Watershed Lake Plant Community Quality Maximum Score	67
Plant FQI Score	30 ★
Plant FQI Threshold	20
Plant FQI Ecoregion	3Bw
Plant FQI % Deviation From Threshold	48
Plant FQI Status	At or Above Threshold
Biological Significance Class	Outstanding
Hydrology Score	77
Major Watershed Hydrology Mean Score	88
Major Watershed Hydrology Minimum Score	62
Major Watershed Hydrology Maximum Score	100
Lake Watershed Health Index	95
Major Watershed Lake Watershed Health Index Mean	92
Major Watershed Lake Watershed Health Index Minimum	59
Major Watershed Lake Watershed Health Index Maximum	100
Lake Watershed Transport Capacity Class	7
Percent Disturbed	5 🟢
Watershed to Lake Area Ratio	94.3
Watershed to Lake Area Class	More than 10

Score the Shore	59 
Major Watershed Score the Shore Mean	76
Major Watershed Score the Shore Minimum	53
Major Watershed Score the Shore Maximum	90
Shoreland Zone Score	18
Shoreline Zone Score	18
Aquatic Zone Score	23
Score the Shore Rating	Low 
Stewardship	Not Scored
Benefit to Cost Assessment Class	High
Percent Forested	61 
Percent Grass and Shrub	4
Percent Wetland	16
Percent Pasture and Hay	5
Predicted Total Phosphorus Load (pounds/year)	9,080
Phosphorus Load Reduction Goal (pounds/year)	450  A very large goal to achieve.

Status of the Fishery

Fish Hook Lake is located two miles north of Park Rapids in west-central Hubbard County. Fish Hook has a surface area of 1,643 acres and a maximum depth of 76 feet. A DNR owned public access is located on the west shore of the lake off US-71. Access is also available from the Fish Hook River, with a county access in Heartland Park. Fish Hook is a very popular lake for fishing and recreation during the summer and winter. Fish Hook provides angling opportunities for Walleye, Northern Pike, Largemouth Bass and panfish.

The Minnesota Department of Natural Resources (DNR) has classified Minnesota's lakes into 43 different types based on physical, chemical, and other characteristics. Fish Hook is in class 27. Class 27 lakes are generally very large, deep, have very hard water and are regularly shaped. Other class 27 lakes in the work area include: Garfield, George, and Upper Bottle.

Walleye abundance was in line with recent surveys, and above the management goal. Most adult fish were spread out from 8 - 23 inches, with a strong class of 14 - 16 inch Walleye for anglers. Walleye sampled had an average length of 15.5 inches with fish measuring up to 26.4 inches. Yellow Perch, an important forage species for

Walleye were sampled in average numbers, but very few were large enough for anglers to target.

Largemouth Bass were sampled in good numbers again in 2022, with fish averaging just over 11 inches. The longest Largemouth Bass sampled was 19 inches in length. Smallmouth bass have been sampled in the past, but none were sampled in 2022. Northern Pike abundance was down, but still in moderate numbers for this lake class. Anglers will find most northern from 18 - 24 inches in length, with fish up to 38 inches. Northern Pike sampled had an average length of 21.7 inches and weighed 2.3 pounds.

Only a few crappies were sampled in this survey, with the largest at 11 inches. Fish Hook also provides fishing for Bluegill and Pumpkinseed; with some nicer fish up to 8.5 inches.

Curly-leaf Pondweed is an aquatic invasive species (AIS) that has been identified in Fish Hook Lake. To avoid spreading AIS, lake users are required to remove all aquatic plants or animals from their watercraft and drain all water from their boat before leaving the access.

For More Information

Park Rapids Area Fisheries Supervisor
301 S Grove Ave
Park Rapids, MN

Phone: 218-552-2311

Email: ParkRapids.Fisheries@state.mn.us

[Website](#)