

SAUK RIVER CHAIN OF LAKES



AQUATIC PLANT MANAGEMENT END-OF-YEAR REPORT 2023

*Sauk River Chain of Lakes
Aquatic Plant Management
End-of-Year Report 2023*

Management Activities Overview:

5/24/2023—Curlyleaf pondweed Aquathol K treatment (Limnopro)
6/2/2023—Curlyleaf pondweed meandering survey in support of harvesting permit (Limnopro)
6/2-30/2023—Curlyleaf pondweed mechanical harvesting (Weeds Up)
7/13/2023—Hybrid watermilfoil ProcellaCOR treatment (Black Lagoon)
9/21/2023—Hybrid watermilfoil ProcellaCOR post treatment survey (Limnopro)
9/22/2023—Flowering rush survey upstream from Horseshoe Lake (Limnopro)
9/1-10/1/2023—Point intercept /meandering delineation survey (Limnopro)
10/10/2023—Hybrid watermilfoil 2,4D treatment (Limnopro)

Report Date: December 21, 2023

Report Authors: Dan McEwen and Ethan Hosey



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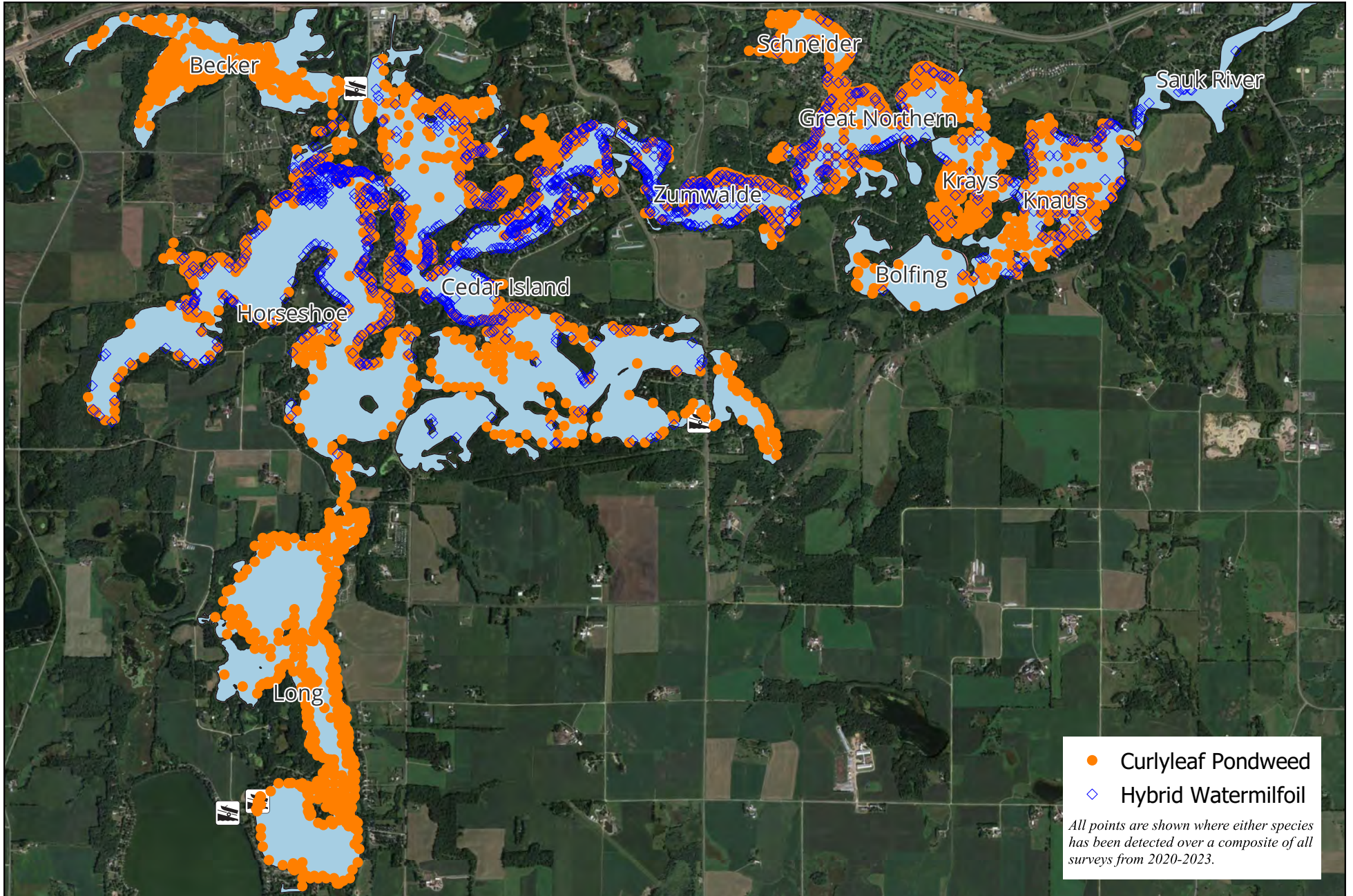
SAUK RIVER CHAIN OF LAKES AQUATIC PLANT MANAGEMENT END-OF-YEAR REPORT 2023

Dan McEwen and Ethan Hosey
Limnopro Aquatic Science, Inc., 1848 3rd St. N., St. Cloud, MN 56303

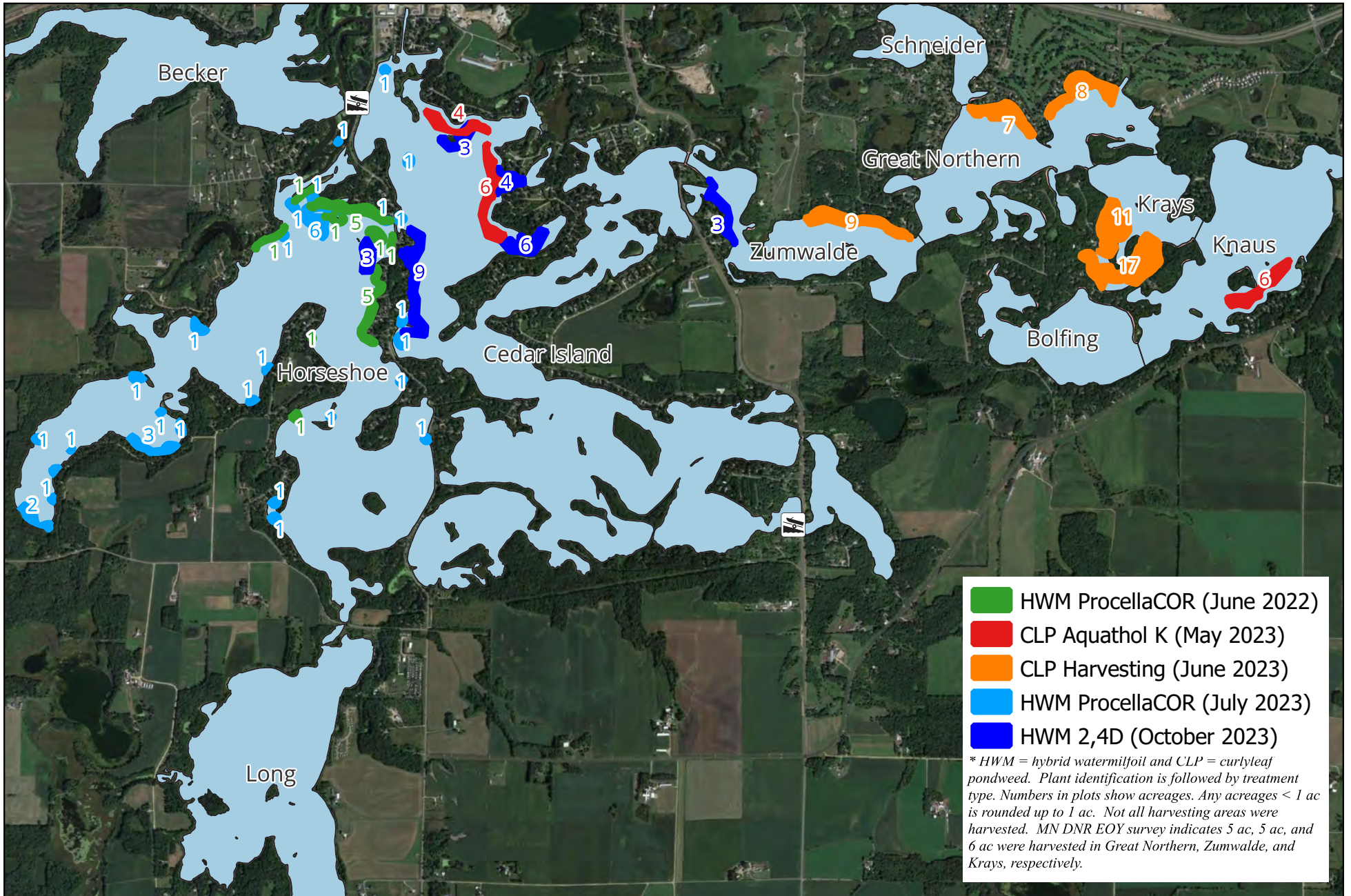
EXECUTIVE SUMMARY

Aquatic plant management activities for 2023 on the Sauk River Chain of Lakes included surveys and both chemical and mechanical control of nuisance plants. Curlyleaf pondweed was treated at areas on Cedar Island and Knaus Lake using Aquathol K on May 24. Prior years' surveys were used and approved by MN DNR for the chemical treatment, but a new meandering survey was required for mechanical treatment, which was completed by Limnopro on June 2. The MN DNR approved areas for harvesting curlyleaf pondweed removal on Zumwalde, Great Northern, and Krays Lake. A total of 52 acres were approved, but only 16 acres were harvested during June on two separate occasions by the company Weeds Up. A total of 81 acres of hybrid watermilfoil were treated on Horseshoe, Cedar Island and Zumwalde by Black Lagoon using ProcellaCOR on July 13. Ten weeks after this treatment, on September 21, a post treatment survey was done by Limnopro revisiting a randomly selected 66 points that had hybrid watermilfoil prior to treatment. Only 4/66 points still had living hybrid watermilfoil giving a 10 week after treatment (WAT) kill rate of 94% from the ProcellaCOR. A survey was performed by Limnopro on September 22 by boating about two miles upstream from Horseshoe to look for flowering rush, another invasive species that is in the Sauk River near Melrose, MN. No instances of flowering rush were discovered during that survey. Between the months of September and October, a comprehensive full community survey was done on all of the lakes, principally to determine the extent of coverage with hybrid watermilfoil but also to look for other invasives and map native plants. Both curlyleaf pondweed and hybrid watermilfoil as well as zebra mussels are now well established in the system. As of the completion of this season of field work, there was no evidence of starry stonewort in the system, but it remains nearby and a threat. Finally, a herbicide treatment was done on new areas discovered during the Limnopro surveys with hybrid watermilfoil. These treatments used 2,4D (rather than ProcellaCOR) at two separate rates experimentally to determine their efficacy at controlling hybrid watermilfoil over 25 acres. ProcellaCOR is a relatively new chemical that seems to work well on hybrid watermilfoil, but it costs much more than the traditional applications of 2,4D. Some research seems to indicate 2,4D does not work well on some strains of hybrid watermilfoil. This treatment will provide some useful data to compare the two chemicals on the hybrid watermilfoil strain. Recommendations for 2024 aquatic plant management are to continue with control of curlyleaf pondweed and hybrid watermilfoil as budget allows. One potential management option is to select areas for treatment that have both curlyleaf pondweed and hybrid watermilfoil overlapping. An Aquathol K application will have an impact on both of those species. Given the experimental nature of the hybrid watermilfoil treatments, follow up surveys of treated areas are recommended for plots treated with both ProcellaCOR and 2,4D. Additional surveys might look for continued expansion of hybrid watermilfoil. Of particular importance would be surveys at potential contact areas for new introduction of AIS around public access sites for the lakes and upstream into the Sauk River. Given the expansion dynamics of both hybrid watermilfoil and zebra mussels, it is likely the Horseshoe public launch area was the introduction point. High probability introduction points would be at Horseshoe, Cedar Island (Mud), and Long Lake public access launch areas. All three launch areas are at the top of the lakedshed for the remaining lakes in the system.

Sauk River Chain of Lakes AQUATIC INVASIVE SPECIES LOCATIONS 2020-2023



Sauk River Chain of Lakes Aquatic Invasive Species Management June 2022 - October 2023

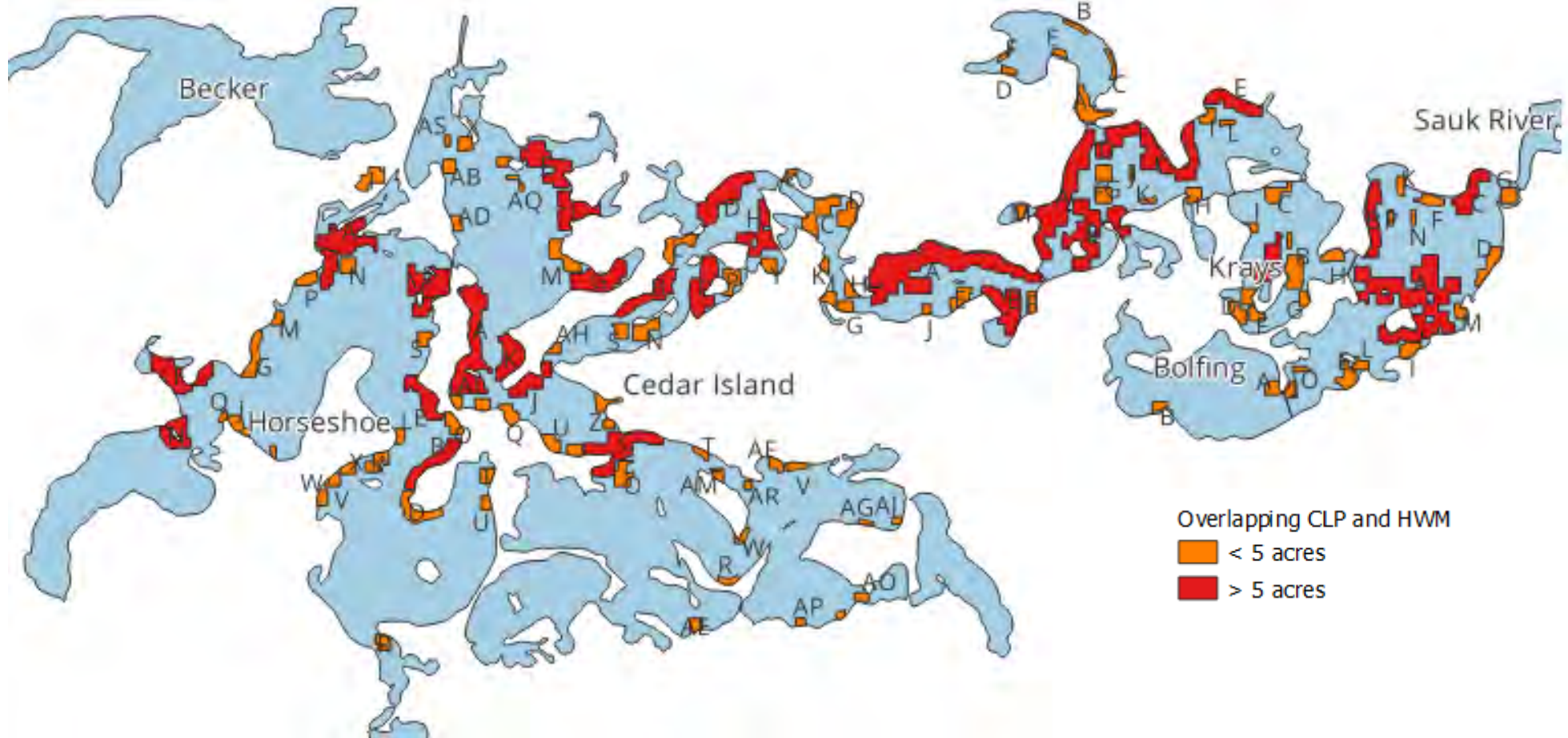


Sauk River Chain of Lakes

Overlapping Curlyleaf Pondweed and Hybrid Watermilfoil Composite (All Surveys 2020-2023)

Note: The chemical you use (Aquathol K) for curlyleaf pondweed also controls hybrid watermilfoil, although it is a contact rather than systematic herbicides such as ProcellaCOR. If you choose curlyleaf pondweed plots for spring herbicide treatment that overlap with hybrid watermilfoil, you will get some control of both. Plots shown in this map are where curlyleaf pondweed and hybrid watermilfoil overlap based on historical surveys we (Limnopro) has done. They are divided into plots with contiguous sizes larger and smaller than 5 acres. This is because according to the distributor of Aquathol K, control of areas less than 5 acres in size tend to not get enough contact time for good kill and as such they tend to recommend diquat for areas less than 5 acres. At the same time, we commonly get some control in smaller areas. The table summarizes, by lake, total areas shown. There is more area to treat than you can with herbicide. By law, without an LVMP, you are restricted to a maximum of 15% of the littoral zone for treatment, which is shown.

Lake	Littoral Acreage	Max Herbicide Acreage	Area (ac)	Depth (ft)	Vol (ac ft)
Bolfing	67.4	10.1	2.6	7.1	18.7
Cedar Island	735.9	110.4	146.9	3.4	498.5
Great Northern	185.4	27.8	67.5	5.9	397.4
Horseshoe	358.0	53.7	85.5	3.9	330.6
Knaus	209.8	31.5	66.3	5.3	348.8
Krays	87.0	13.0	19.8	5.1	99.9
Schneider	25.1	3.8	8.6	5.8	49.6
Zumwalde	118.7	17.8	58.5	5.3	309.5
Grand Total	1787.4	268.1	455.8	4.5	2052.9



Aquatic Point Intercept Overview

Following are results from an aquatic point intercept survey that took place during September and October of 2023 over 2,997 points in all 10 lakes within the Sauk River Chain of Lakes. The primary purpose of the survey was to determine the extent of coverage for hybrid watermilfoil, which was first discovered to exist in the chain at a Horseshoe Lake location during October 2020 and since spread through the chain. While surveying for hybrid watermilfoil, data were also collected on the rest of the plant community. What follows are general patterns in plant coverage in the Chain during the early fall period and should reflect the general condition of the lake during most of the summer use period. The survey followed standard point intercept protocol. In short, prior to getting on the lake, coordinates were loaded to an onboard GPS sonar with a spacing of either 1 point per half acre or 1 point per acre. After navigating the boat to each point, a double-sided rake attached to a rope was tossed off the port side of the boat and dragged with four distinct pulling motions over an area of approximately three-meter (10 ft) length. All plants brought to the surface were identified to species and ranked on a density scale from 0 (no plant) to 3 (overflowing with plants). Mapping and geostatistical analyses were performed using a geographic information system (QGIS 3.32). Over the entire chain, 30 different species were detected, including two invasives: curlyleaf pondweed and hybrid watermilfoil. Over 60% of all plant mass collected came from four species: coontail, filamentous algae, duckweed and watermeal. Overall, 80% of locations sampled had at least one plant.

Contents

Pages 5-16: Table Summaries and Bar Graphs

Summaries by lake for both density and occurrence (or occupancy) for each plant species collected during the October 2023 aquatic plant point intercept survey on the Sauk River Chain of Lakes are provided. As shown in each page, “density” is the total fraction of plant mass collected during the survey that was associated with a given species. The sum total of the density column is equal to 100%. “Occurrence”, which is also named “Occupancy” is the total fraction of sites sampled with at least one representative of a given species. The occurrence column does not equal 100% because more several species can occupy more than a given percentage of sites. For example, coontail might occupy 75% of sampled sites while filamentous algae might occupy 80% of sites.

Pages 17-47: Plant Species Maps

A series of maps showing locations and densities of each species identified during the point intercept survey done October 2023.

Sauk River Chain of Lakes Aquatic Point Intercept Survey Summary September -October 2023

Summary of average metrics collected during an aquatic plant point intercept survey during October 2023 on the Sauk River Chain of Lakes. See description below table for explanation of fields.

Lake	CC	Rake Density	Plant Coverage	Total Species	Species / Point	CLP Coverage	HWM Coverage	ZM Coverage
Becker	3.7	43%	95%	20	3.1	0%	0%	0%
Bolfing	2.6	39%	91%	14	2.2	5%	3%	52%
Cedar Island	3.1	41%	76%	22	2.4	8%	7%	44%
Great Northern	2.1	49%	92%	17	2.5	34%	18%	53%
Horseshoe	3.1	46%	80%	22	2.7	8%	3%	54%
Knaus	2.2	52%	93%	15	2.4	25%	14%	50%
Krays	1.9	63%	96%	10	2.5	37%	10%	72%
Long	2.5	21%	57%	17	1.2	23%	0%	4%
Schneider	4.2	49%	95%	18	2.7	7%	10%	37%
Zumwalde	<u>2.4</u>	<u>54%</u>	<u>85%</u>	<u>13</u>	<u>2.8</u>	<u>21%</u>	<u>41%</u>	<u>47%</u>
Average	2.8	42%	80%	17	2.4	13%	7%	40%

Field Descriptions

CC = Conservation coefficient is the weighted average value for each lake based on the types and densities of plants in each lake. CC ranges from 0 to 10 with lower numbers indicating lakes with potentially poorer functioning plant communities. The higher the value, the more desirable is the type of plants that exist in a given lake.

Rake Density = Provides a measurement of the average density or thickness of plants collected at each point location. The measurement is based on a maximum density of 3 and provides the average rake value divided by the max.

Plant Coverage = Proportion of points sampled with at least one plant.

Total Species = Total number of unique kinds of plants in the lake.

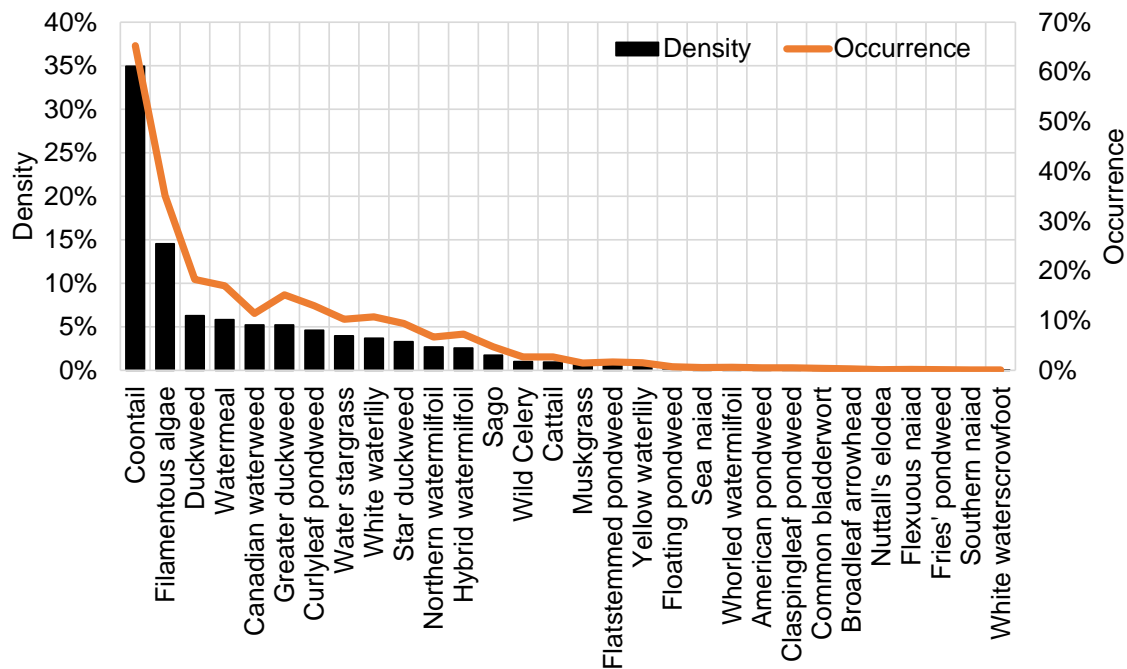
Species/Point = Average number of unique kinds of plants collected at each point.

CLP Coverage = Proportion of points sampled with at least one curlyleaf pondweed plant identified. Note that the date of this survey is very late to accurately determine coverage of CLP and as such this value likely underestimates true coverage during peak CLP growth in June.

HWM Coverage = Proportion of points sampled with at least one hybrid watermilfoil plant identified.

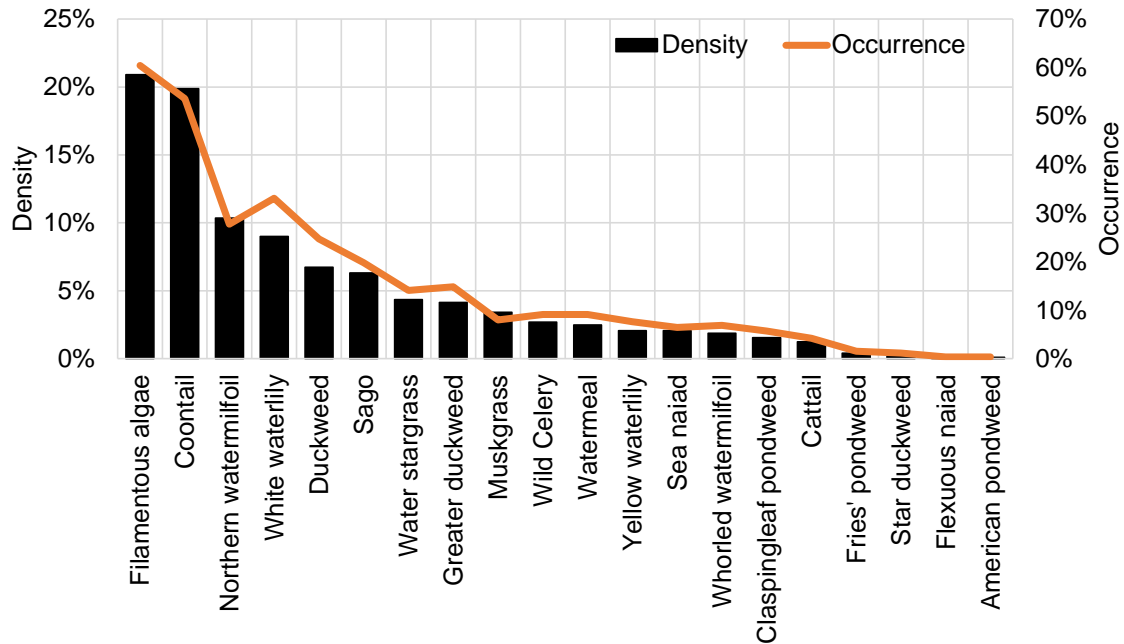
ZM Coverage = Proportion of points sampled with at least one plant having zebra mussels attached to it.

**Sauk River Chain of Lakes
All Lakes Combined
Aquatic Point Intercept Survey Summary
October 2023**



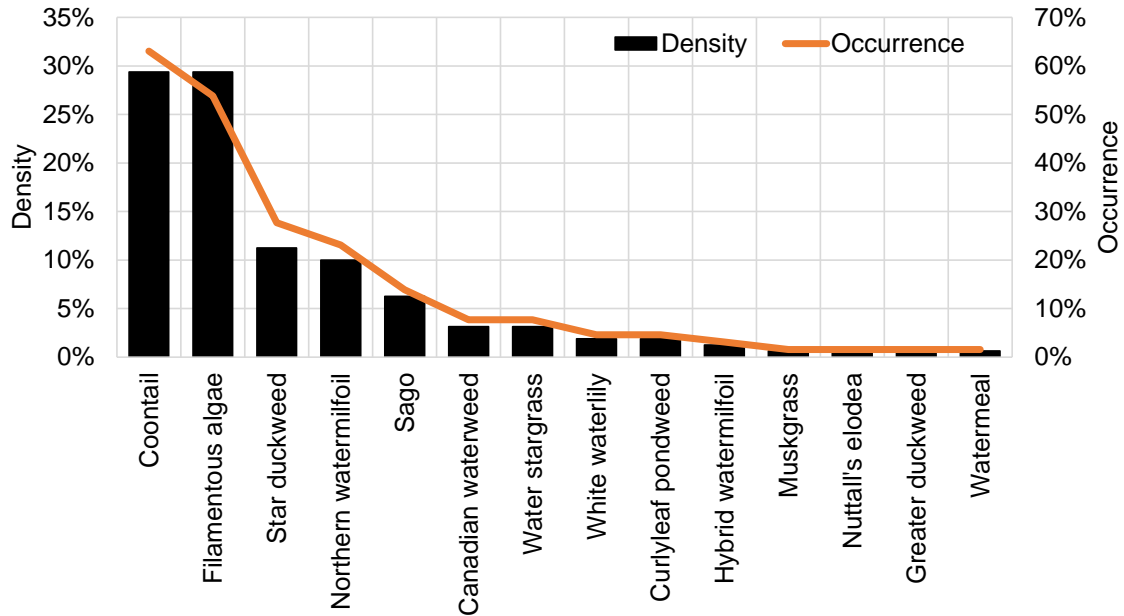
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	34.9%	65.3%
Filamentous algae	Various	14.5%	35.1%
Duckweed	<i>Lemna</i> spp.	6.3%	18.3%
Watermeal	<i>Wolffia columbiana</i>	5.8%	17.0%
Canadian waterweed	<i>Elodea canadensis</i>	5.2%	11.4%
Greater duckweed	<i>Spirodela polyrrhiza</i>	5.2%	15.2%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	4.6%	13.0%
Water stargrass	<i>Heteranthera dubia</i>	4.0%	10.3%
White waterlily	<i>Nymphaea odorata</i>	3.7%	10.7%
Star duckweed	<i>Lemna trisulca</i>	3.3%	9.4%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	2.7%	6.7%
Hybrid watermilfoil	<i>Myriophyllum spicatum x sibiricum</i>	2.6%	7.3%
Sago	<i>Stuckenia pectinata</i>	1.8%	4.7%
Wild Celery	<i>Vallisneria americana</i>	1.0%	2.7%
Cattail	<i>Typha</i> spp.	0.9%	2.7%
Muskgrass	<i>Chara</i> spp.	0.8%	1.5%
Flatstemmed pondweed	<i>Potamogeton zosteriformis</i>	0.6%	1.7%
Yellow waterlily	<i>Nuphar variegata</i>	0.5%	1.5%
Floating pondweed	<i>Potamogeton natans</i>	0.3%	0.7%
Sea naiad	<i>Najas marina</i>	0.2%	0.6%
Whorled watermilfoil	<i>Myriophyllum verticillatum</i>	0.2%	0.6%
American pondweed	<i>Potamogeton nodosus</i>	0.2%	0.5%
Claspingleaf pondweed	<i>Potamogeton richardsonii</i>	0.2%	0.5%
Common bladderwort	<i>Utricularia vulgaris</i>	0.1%	0.4%
Broadleaf arrowhead	<i>Sagittaria latifolia</i>	0.1%	0.3%
Nuttall's elodea	<i>Elodea nuttallii</i>	0.1%	0.1%
Flexuous naiad	<i>Najas flexilis</i>	0.1%	0.2%
Fries' pondweed	<i>Potamogeton friesii</i>	0.0%	0.1%
Southern naiad	<i>Najas guadalupensis</i>	0.0%	0.1%
White waterscrowfoot	<i>Ranunculus aquatilis</i>	0.0%	0.1%

Becker Lake Aquatic Point Intercept Survey Summary October 2023



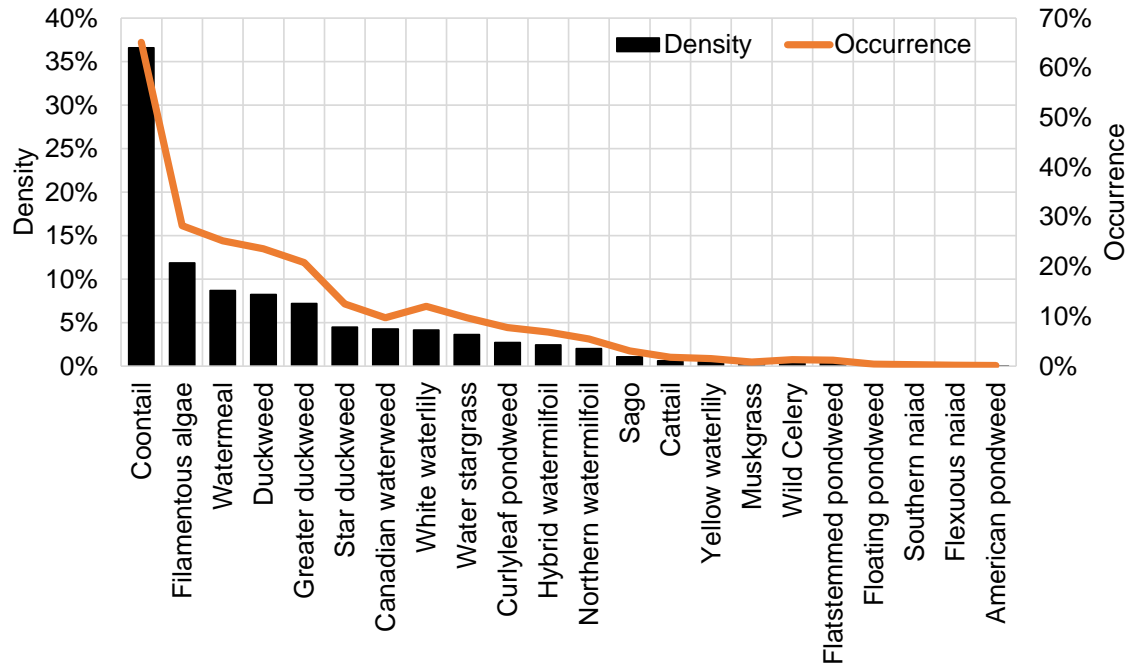
Common	Scientific	Density	Occurrence
Filamentous algae	Various	20.9%	60.5%
Coontail	<i>Ceratophyllum demersum</i>	19.9%	53.6%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	10.4%	27.8%
White waterlily	<i>Nymphaea odorata</i>	9.0%	33.1%
Duckweed	<i>Lemna</i> spp.	6.7%	24.7%
Sago	<i>Stuckenia pectinata</i>	6.3%	19.8%
Water stargrass	<i>Heteranthera dubia</i>	4.3%	14.1%
Greater duckweed	<i>Spirodela polyrrhiza</i>	4.1%	14.8%
Muskgrass	<i>Chara</i> spp.	3.4%	8.0%
Wild Celery	<i>Vallisneria americana</i>	2.7%	9.1%
Watermeal	<i>Wolffia columbiana</i>	2.5%	9.1%
Yellow waterlily	<i>Nuphar variegata</i>	2.1%	7.6%
Sea naiad	<i>Najas marina</i>	2.1%	6.5%
Whorled watermilfoil	<i>Myriophyllum verticillatum</i>	1.9%	6.8%
Claspingleaf pondweed	<i>Potamogeton richardsonii</i>	1.6%	5.7%
Cattail	<i>Typha</i> spp.	1.2%	4.2%
Fries' pondweed	<i>Potamogeton friesii</i>	0.4%	1.5%
Star duckweed	<i>Lemna trisulca</i>	0.3%	1.1%
Flexuous naiad	<i>Najas flexilis</i>	0.1%	0.4%
American pondweed	<i>Potamogeton nodosus</i>	0.1%	0.4%

Bolfin Lake Aquatic Point Intercept Survey Summary October 2023



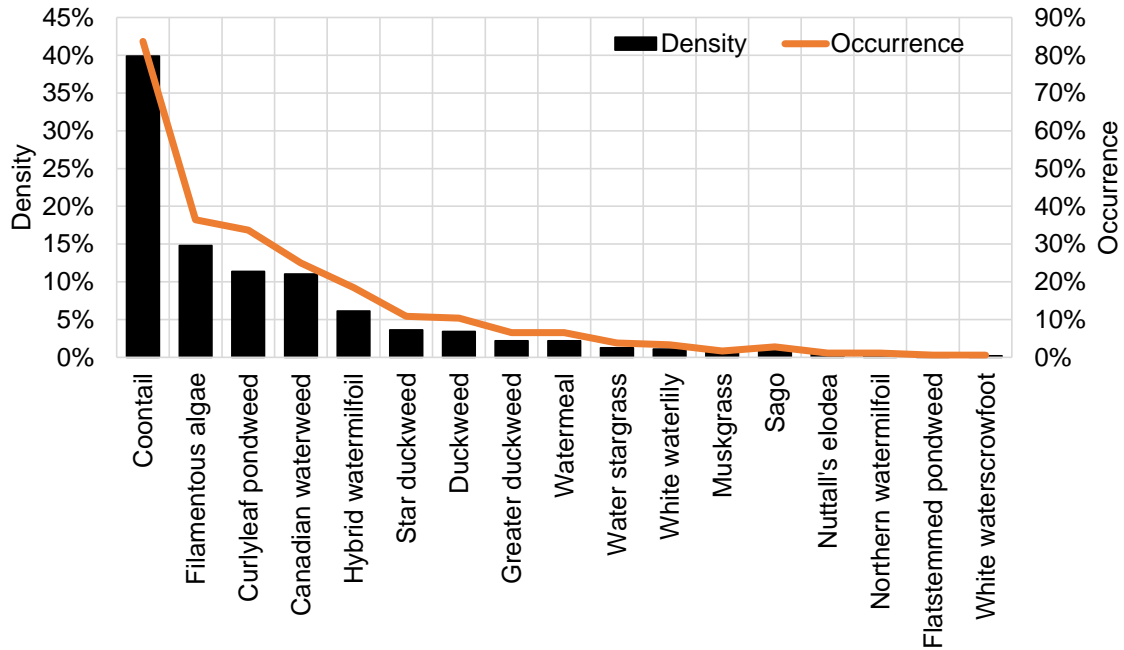
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	29.4%	63.1%
Filamentous algae	Various	29.4%	53.8%
Star duckweed	<i>Lemna trisulca</i>	11.3%	27.7%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	10.0%	23.1%
Sago	<i>Stuckenia pectinata</i>	6.3%	13.8%
Canadian waterweed	<i>Elodea canadensis</i>	3.1%	7.7%
Water stargrass	<i>Heteranthera dubia</i>	3.1%	7.7%
White waterlily	<i>Nymphaea odorata</i>	1.9%	4.6%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	1.9%	4.6%
Hybrid watermilfoil	<i>Myriophyllum spicatum x sibiricum</i>	1.3%	3.1%
Muskgrass	<i>Chara</i> spp.	0.6%	1.5%
Nuttall's elodea	<i>Elodea nuttallii</i>	0.6%	1.5%
Greater duckweed	<i>Spirodela polyrrhiza</i>	0.6%	1.5%
Watermeal	<i>Wolffia columbiana</i>	0.6%	1.5%

Cedar Island Lake Aquatic Point Intercept Survey Summary October 2023



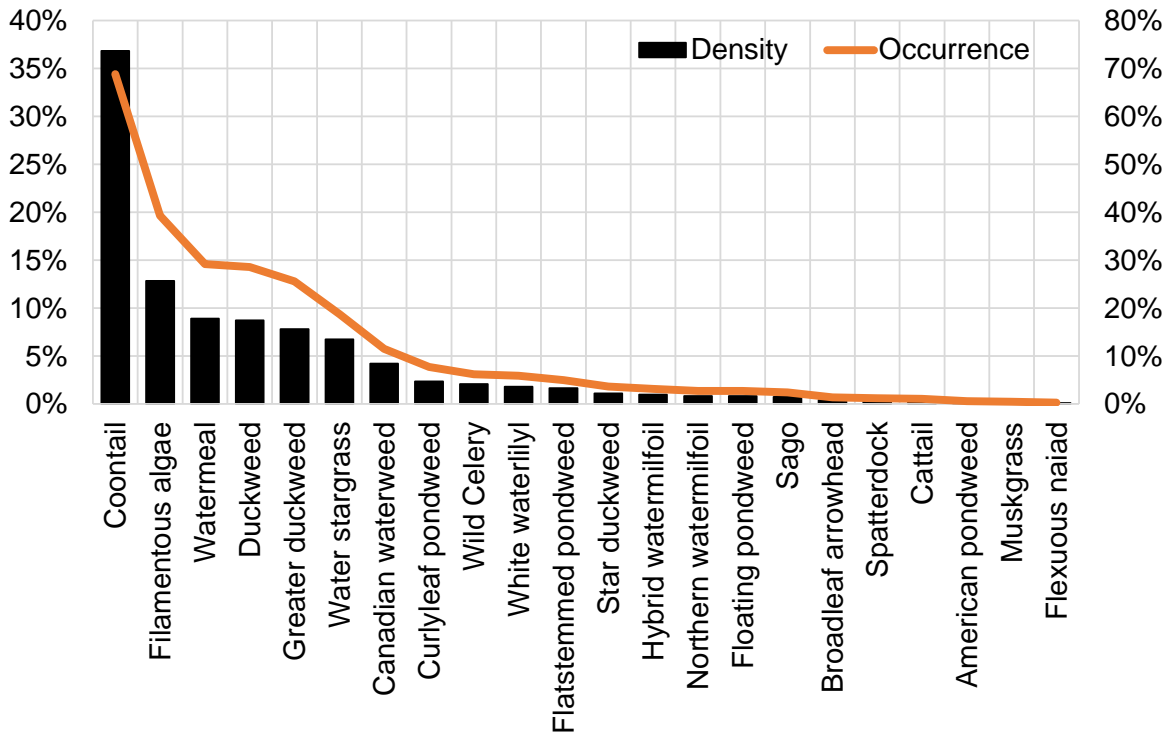
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	36.6%	65.1%
Filamentous algae	Various	11.8%	28.2%
Watermeal	<i>Wolffia columbiana</i>	8.7%	25.2%
Duckweed	<i>Lemna</i> spp.	8.2%	23.6%
Greater duckweed	<i>Spirodela polyrrhiza</i>	7.2%	20.8%
Star duckweed	<i>Lemna trisulca</i>	4.5%	12.5%
Canadian waterweed	<i>Elodea canadensis</i>	4.3%	9.7%
White waterlily	<i>Nymphaea odorata</i>	4.1%	12.0%
Water stargrass	<i>Heteranthera dubia</i>	3.6%	9.7%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	2.7%	7.7%
Hybrid watermilfoil	<i>Myriophyllum spicatum x sibiricum</i>	2.4%	6.8%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	2.0%	5.5%
Sago	<i>Stuckenia pectinata</i>	1.1%	3.1%
Cattail	<i>Typha</i> spp.	0.6%	1.8%
Yellow waterlily	<i>Nuphar variegata</i>	0.5%	1.5%
Muskgrass	<i>Chara</i> spp.	0.4%	0.8%
Wild Celery	<i>Vallisneria americana</i>	0.4%	1.3%
Flatstemmed pondweed	<i>Potamogeton zosteriformis</i>	0.4%	1.2%
Floating pondweed	<i>Potamogeton natans</i>	0.1%	0.4%
Southern naiad	<i>Najas guadalupensis</i>	0.1%	0.3%
Flexuous naiad	<i>Najas flexilis</i>	0.1%	0.2%
American pondweed	<i>Potamogeton nodosus</i>	0.0%	0.1%

Great Northern Lake Aquatic Point Intercept Survey Summary October 2023



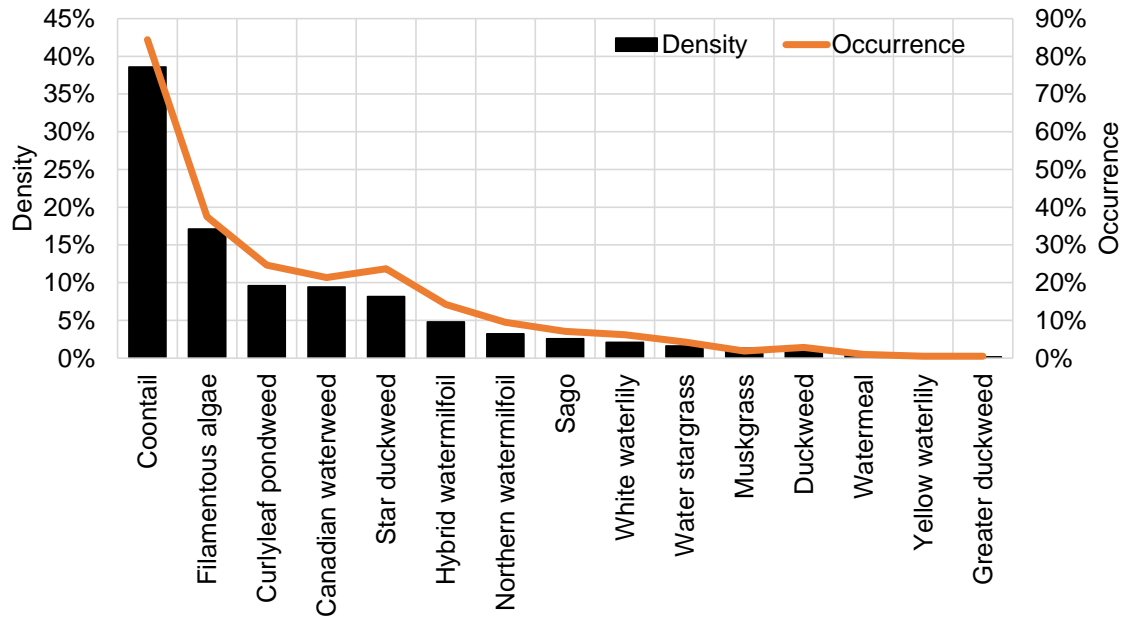
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	39.9%	83.7%
Filamentous algae	Various	14.8%	36.4%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	11.4%	33.7%
Canadian waterweed	<i>Elodea canadensis</i>	11.0%	25.0%
Hybrid watermilfoil	<i>Myriophyllum spicatum x sibiricum</i>	6.1%	18.5%
Star duckweed	<i>Lemna trisulca</i>	3.6%	10.9%
Duckweed	<i>Lemna</i> spp.	3.4%	10.3%
Greater duckweed	<i>Spirodela polyrrhiza</i>	2.2%	6.5%
Watermeal	<i>Wolffia columbiana</i>	2.2%	6.5%
Water stargrass	<i>Heteranthera dubia</i>	1.3%	3.8%
White waterlily	<i>Nymphaea odorata</i>	1.1%	3.3%
Muskgrass	<i>Chara</i> spp.	0.9%	1.6%
Sago	<i>Stuckenia pectinata</i>	0.9%	2.7%
Nuttall's elodea	<i>Elodea nuttallii</i>	0.5%	1.1%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	0.4%	1.1%
Flatstemmed pondweed	<i>Potamogeton zosteriformis</i>	0.2%	0.5%
White waterscrowfoot	<i>Ranunculus aquatilis</i>	0.2%	0.5%

Horseshoe Lake Aquatic Point Intercept Survey Summary October 2023



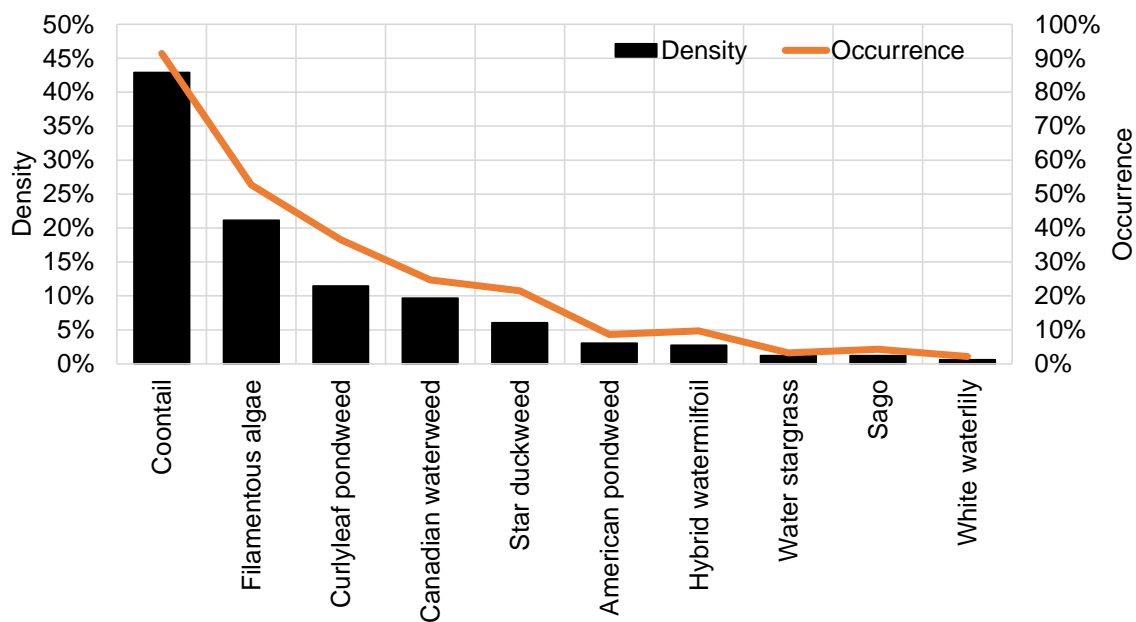
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	36.8%	68.8%
Filamentous algae	Various	12.8%	39.3%
Watermeal	<i>Wolffia columbiana</i>	8.9%	29.2%
Duckweed	<i>Lemna</i> spp.	8.7%	28.6%
Greater duckweed	<i>Spirodela polyrrhiza</i>	7.8%	25.6%
Water stargrass	<i>Heteranthera dubia</i>	6.7%	18.8%
Canadian waterweed	<i>Elodea canadensis</i>	4.2%	11.5%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	2.4%	7.7%
Wild Celery	<i>Vallisneria americana</i>	2.1%	6.2%
White waterlily	<i>Nymphaea odorata</i>	1.8%	5.9%
Flatstemmed pondweed	<i>Potamogeton zosteriformis</i>	1.7%	5.0%
Star duckweed	<i>Lemna trisulca</i>	1.1%	3.6%
Hybrid watermilfoil	<i>Myriophyllum spicatum x sibiricum</i>	1.0%	3.2%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	0.8%	2.7%
Floating pondweed	<i>Potamogeton natans</i>	0.8%	2.7%
Sago	<i>Stuckenia pectinata</i>	0.7%	2.4%
Broadleaf arrowhead	<i>Sagittaria latifolia</i>	0.4%	1.4%
Spatterdock	<i>Nuphar variegata</i>	0.4%	1.2%
Cattail	<i>Typha</i> spp.	0.3%	1.1%
American pondweed	<i>Potamogeton nodosus</i>	0.2%	0.6%
Muskgrass	<i>Chara</i> spp.	0.1%	0.5%
Flexuous naiad	<i>Najas flexilis</i>	0.1%	0.3%

Knaus Lake Aquatic Point Intercept Survey Summary October 2023



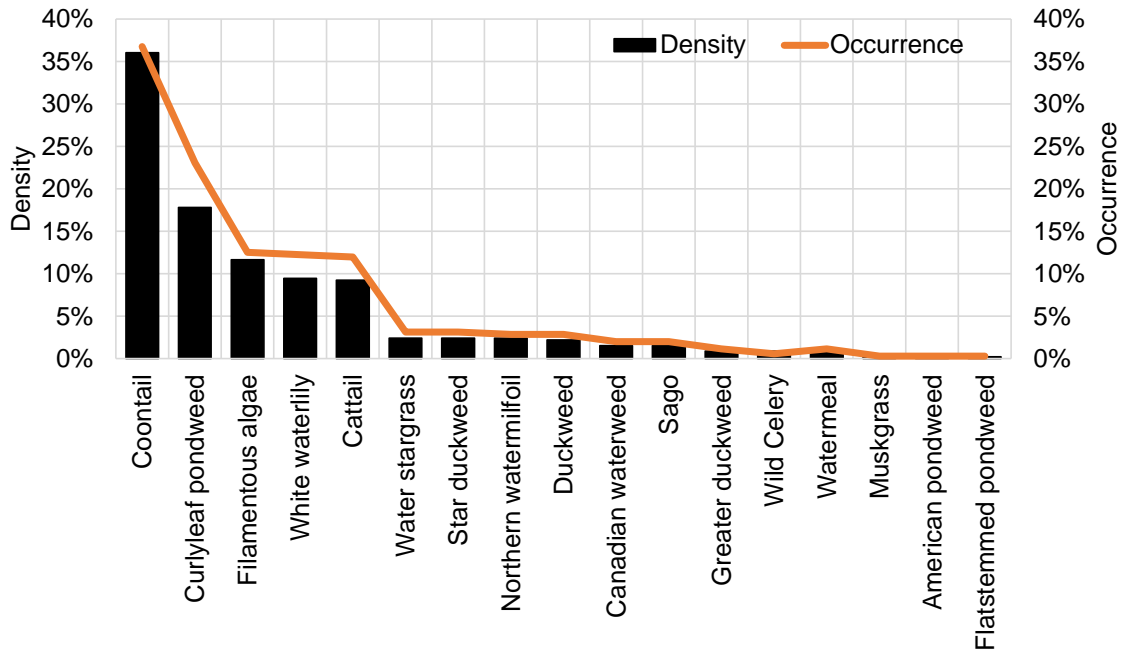
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	38.6%	84.4%
Filamentous algae	Various	17.1%	37.4%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	9.6%	24.6%
Canadian waterweed	<i>Elodea canadensis</i>	9.4%	21.3%
Star duckweed	<i>Lemna trisulca</i>	8.2%	23.7%
Hybrid watermilfoil	<i>Myriophyllum spicatum x sibiricum</i>	4.8%	14.2%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	3.2%	9.5%
Sago	<i>Stuckenia pectinata</i>	2.6%	7.1%
White waterlily	<i>Nymphaea odorata</i>	2.1%	6.2%
Water stargrass	<i>Heteranthera dubia</i>	1.6%	4.3%
Muskgrass	<i>Chara</i> spp.	1.3%	1.9%
Duckweed	<i>Lemna</i> spp.	1.0%	2.8%
Watermeal	<i>Wolffia columbiana</i>	0.3%	0.9%
Yellow waterlily	<i>Nuphar variegata</i>	0.2%	0.5%
Greater duckweed	<i>Spirodela polyrrhiza</i>	0.2%	0.5%

Krays Lake Aquatic Point Intercept Survey Summary October 2023



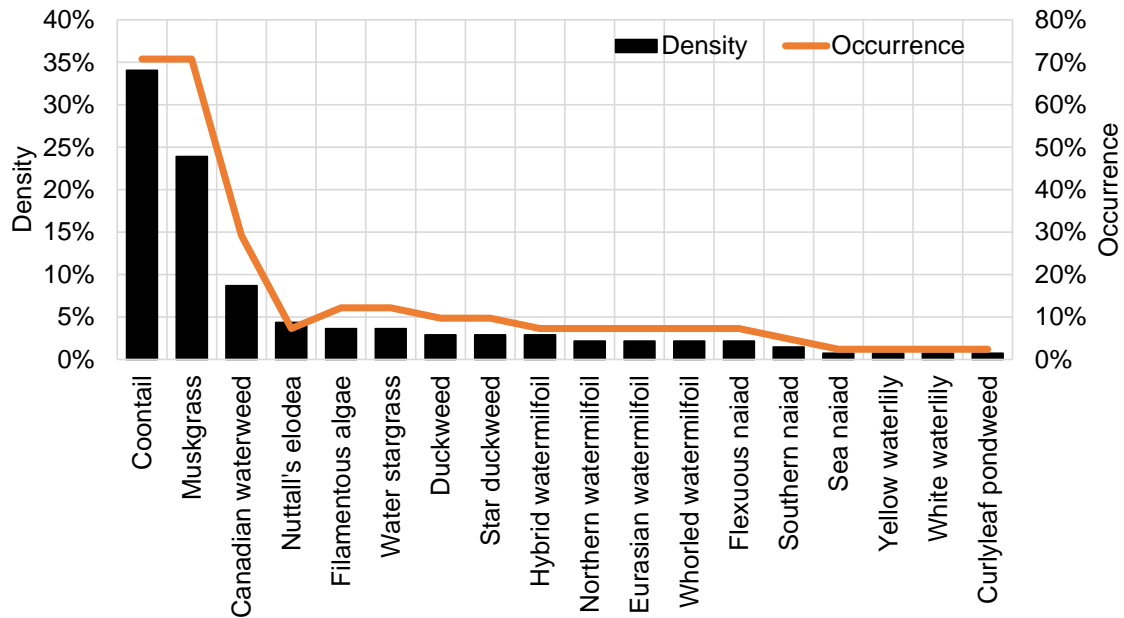
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	42.9%	91.4%
Filamentous algae	Various	21.1%	52.7%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	11.5%	36.6%
Canadian waterweed	<i>Elodea canadensis</i>	9.7%	24.7%
Star duckweed	<i>Lemna trisulca</i>	6.0%	21.5%
American pondweed	<i>Potamogeton nodosus</i>	3.0%	8.6%
Hybrid watermilfoil	<i>Myriophyllum spicatum × sibiricum</i>	2.7%	9.7%
Water stargrass	<i>Heteranthera dubia</i>	1.2%	3.2%
Sago	<i>Stuckenia pectinata</i>	1.2%	4.3%
White waterlily	<i>Nymphaea odorata</i>	0.6%	2.2%

Long Lake Aquatic Point Intercept Survey Summary October 2023



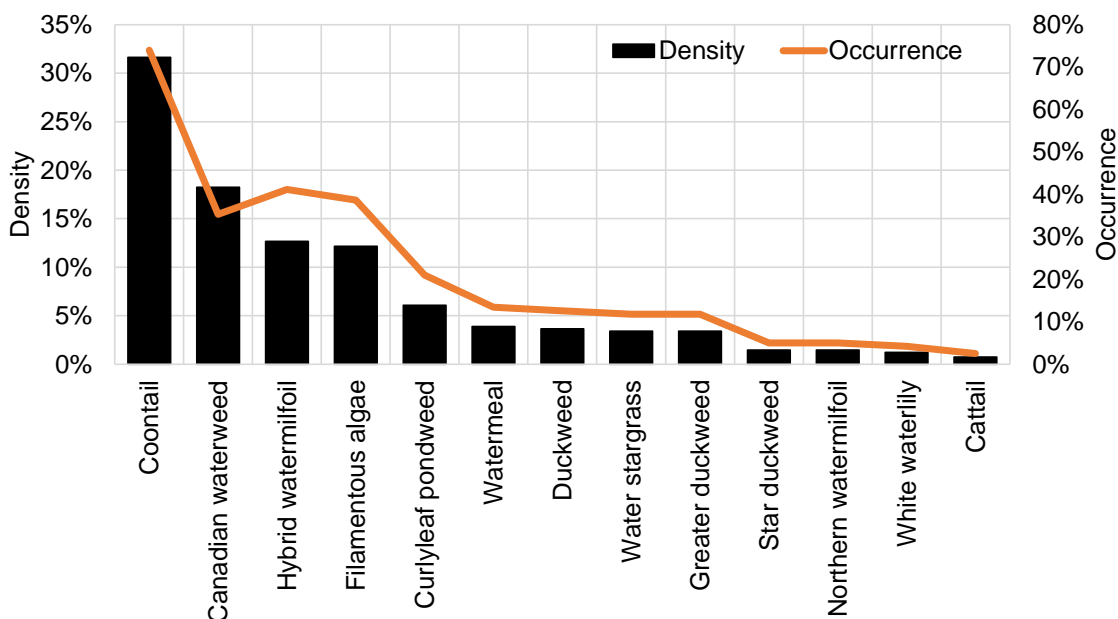
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	36.0%	36.8%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	17.8%	23.1%
Filamentous algae	Various	11.6%	12.5%
White waterlily	<i>Nymphaea odorata</i>	9.5%	12.3%
Cattail	<i>Typha</i> spp.	9.2%	12.0%
Water stargrass	<i>Heteranthera dubia</i>	2.4%	3.1%
Star duckweed	<i>Lemna trisulca</i>	2.4%	3.1%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	2.4%	2.8%
Duckweed	<i>Lemna</i> spp.	2.2%	2.8%
Canadian waterweed	<i>Elodea canadensis</i>	1.5%	2.0%
Sago	<i>Stuckenia pectinata</i>	1.5%	2.0%
Greater duckweed	<i>Spirodela polyrrhiza</i>	0.9%	1.1%
Wild Celery	<i>Vallisneria americana</i>	0.9%	0.6%
Watermeal	<i>Wolffia columbiana</i>	0.9%	1.1%
Muskgrass	<i>Chara</i> spp.	0.2%	0.3%
American pondweed	<i>Potamogeton nodosus</i>	0.2%	0.3%
Flatstemmed pondweed	<i>Potamogeton zosteriformis</i>	0.2%	0.3%

Schneider Lake Aquatic Point Intercept Survey Summary October 2023

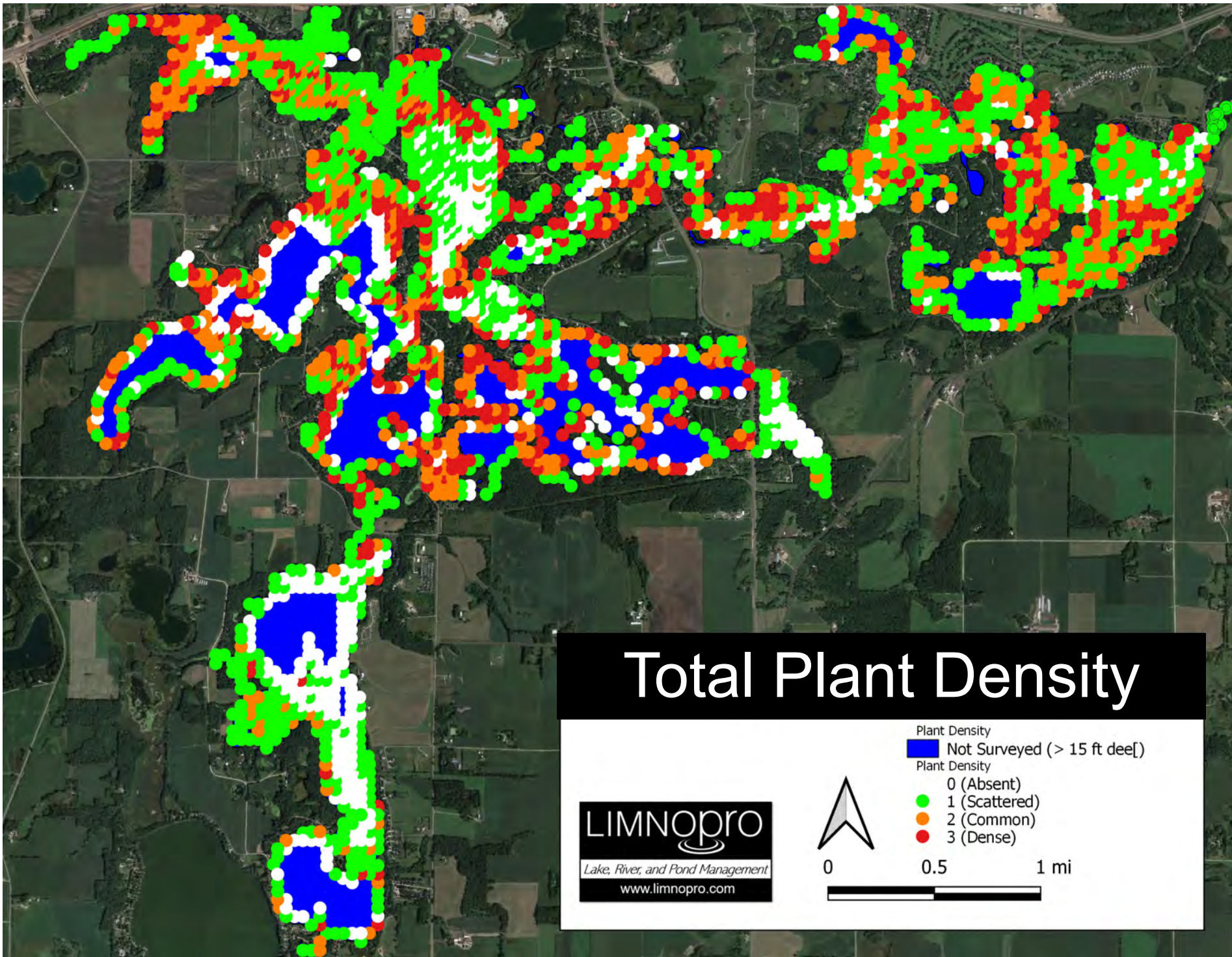


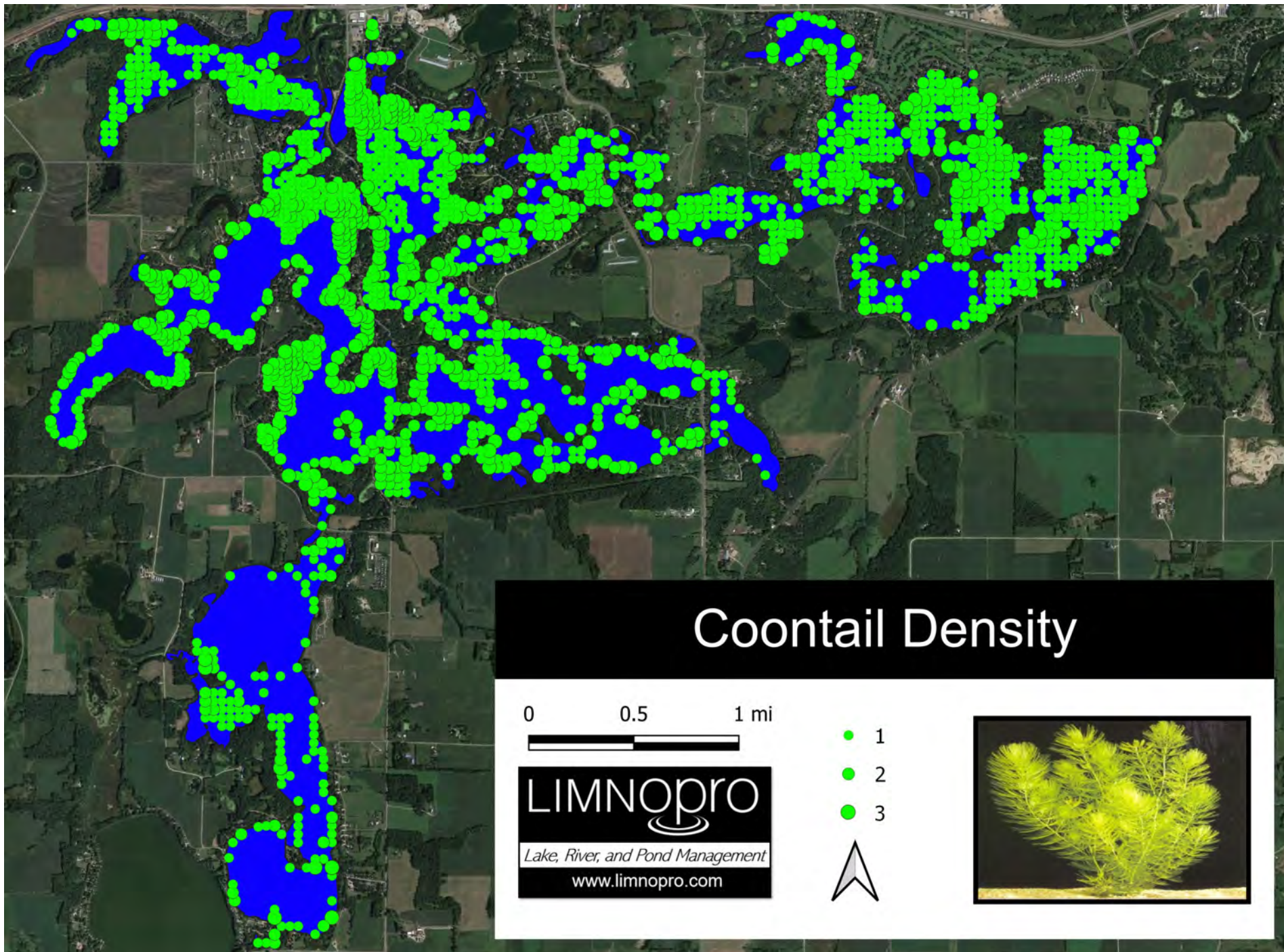
Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	34.1%	70.7%
Muskgrass	<i>Chara</i> spp.	23.9%	70.7%
Canadian waterweed	<i>Elodea canadensis</i>	8.7%	29.3%
Nuttall's elodea	<i>Elodea nuttallii</i>	4.3%	7.3%
Filamentous algae	Various	3.6%	12.2%
Water stargrass	<i>Heteranthera dubia</i>	3.6%	12.2%
Duckweed	<i>Lemna</i> spp.	2.9%	9.8%
Star duckweed	<i>Lemna trisulca</i>	2.9%	9.8%
Hybrid watermilfoil	<i>Myriophyllum spicatum</i> x <i>sibiricum</i>	2.9%	7.3%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	2.2%	7.3%
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	2.2%	7.3%
Whorled watermilfoil	<i>Myriophyllum verticillatum</i>	2.2%	7.3%
Flexuous naiad	<i>Najas flexilis</i>	2.2%	7.3%
Southern naiad	<i>Najas guadalupensis</i>	1.4%	4.9%
Sea naiad	<i>Najas marina</i>	0.7%	2.4%
Yellow waterlily	<i>Nuphar variegata</i>	0.7%	2.4%
White waterlily	<i>Nymphaea odorata</i>	0.7%	2.4%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	0.7%	2.4%

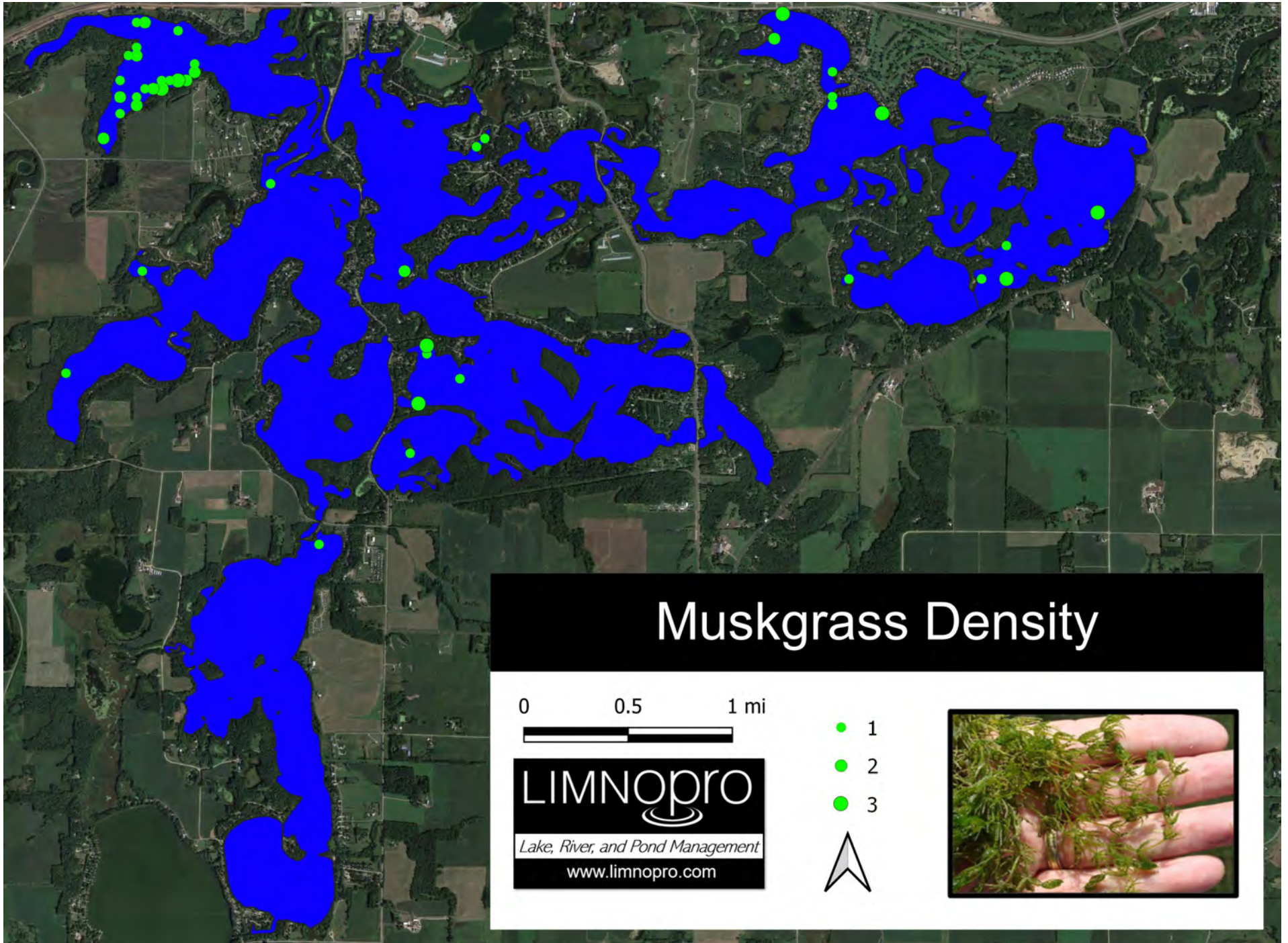
Zumwalde Lake Aquatic Point Intercept Survey Summary October 2023

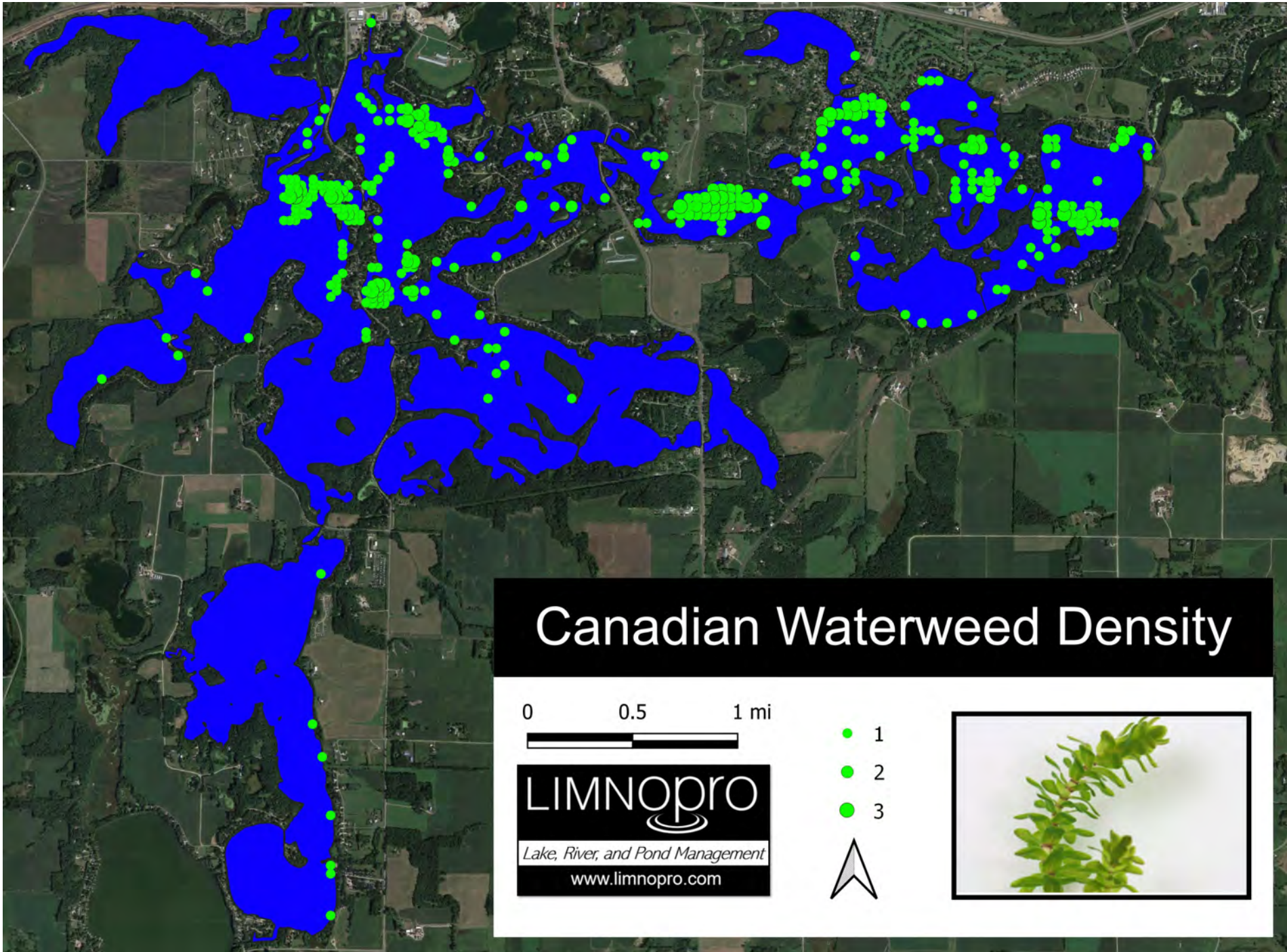


Common	Scientific	Density	Occurrence
Coontail	<i>Ceratophyllum demersum</i>	31.6%	74.0%
Canadian waterweed	<i>Elodea canadensis</i>	18.2%	35.3%
Hybrid watermilfoil	<i>Myriophyllum spicatum x sibiricum</i>	12.7%	41.2%
Filamentous algae	Various	12.2%	38.7%
Curlyleaf pondweed	<i>Potamogeton crispus</i>	6.1%	21.0%
Watermeal	<i>Wolffia columbiana</i>	3.9%	13.4%
Duckweed	<i>Lemna</i> spp.	3.7%	12.6%
Water stargrass	<i>Heteranthera dubia</i>	3.4%	11.8%
Greater duckweed	<i>Spirodela polyrrhiza</i>	3.4%	11.8%
Star duckweed	<i>Lemna trisulca</i>	1.5%	5.0%
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	1.5%	5.0%
White waterlily	<i>Nymphaea odorata</i>	1.2%	4.2%
Cattail	<i>Typha</i> spp.	0.7%	2.5%









Canadian Waterweed Density

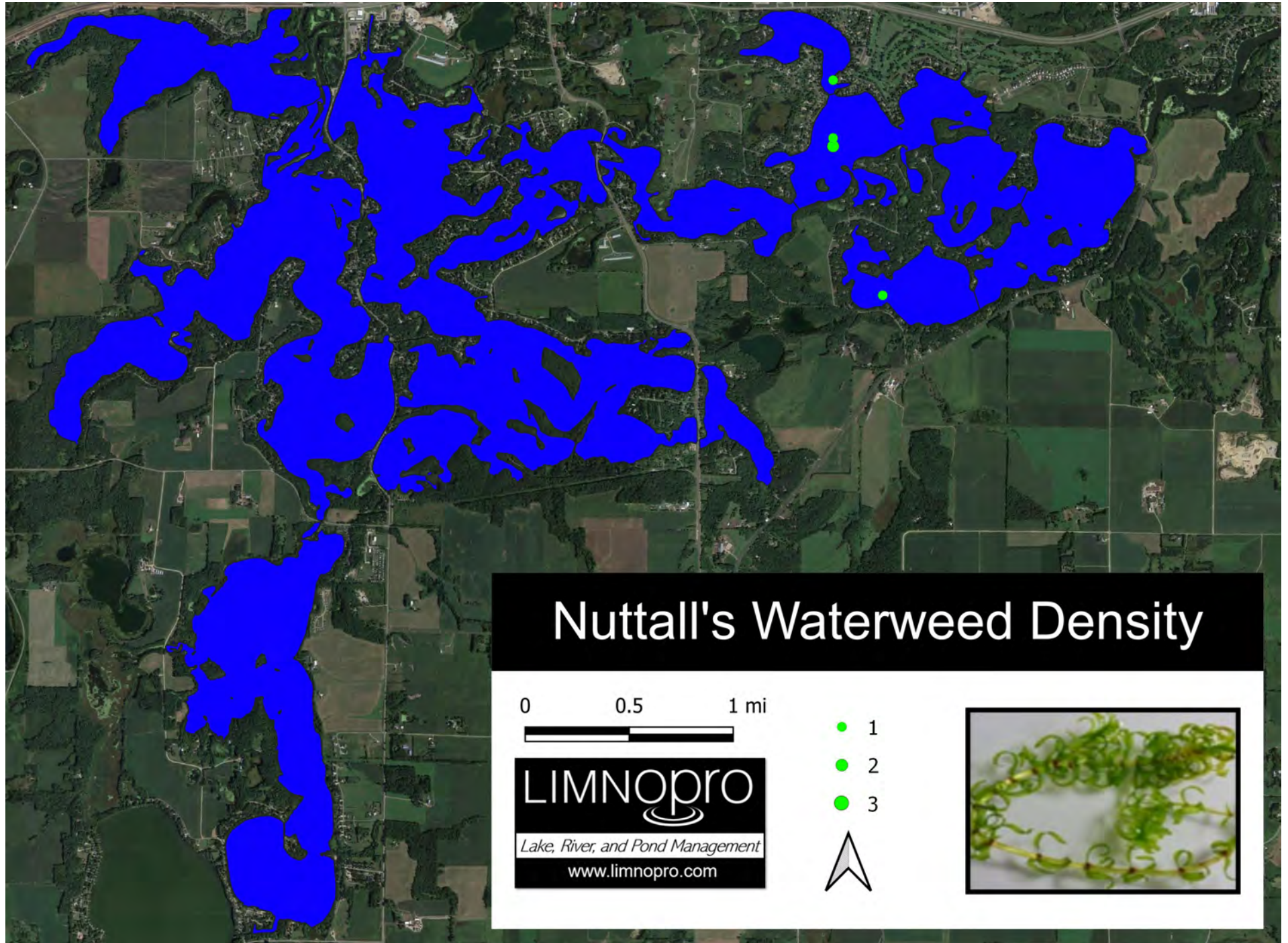
0 0.5 1 mi

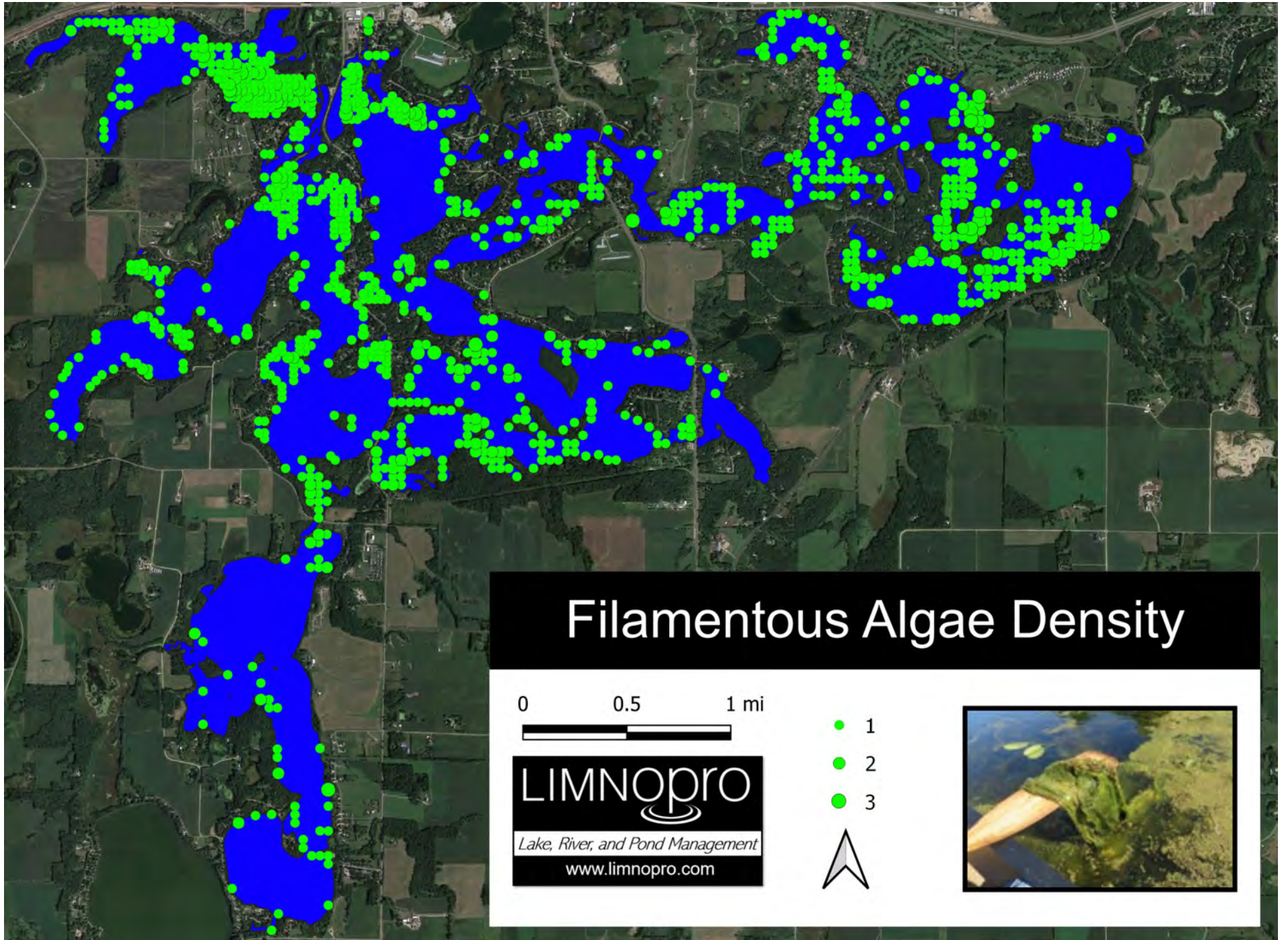
LIMNopro

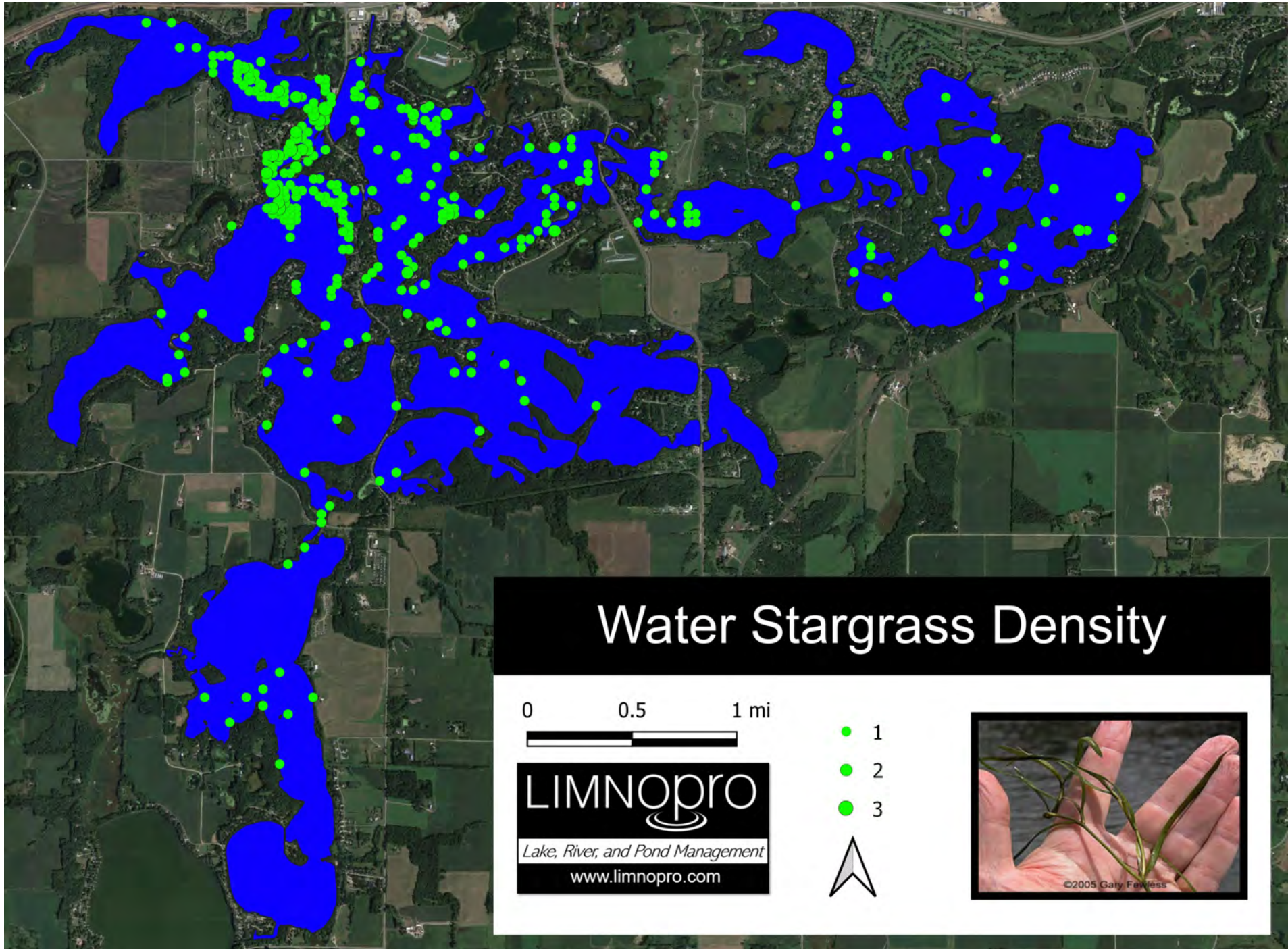
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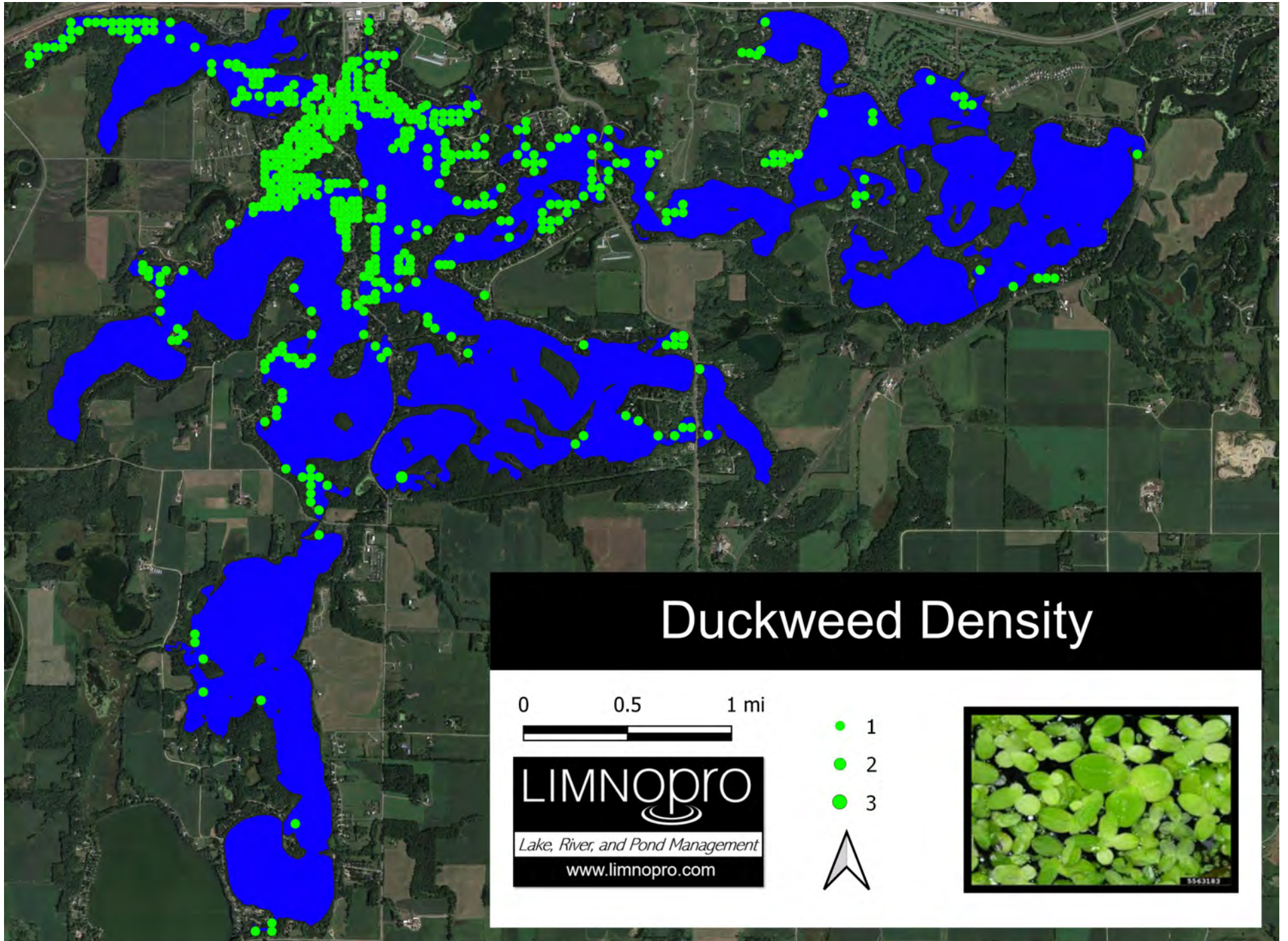
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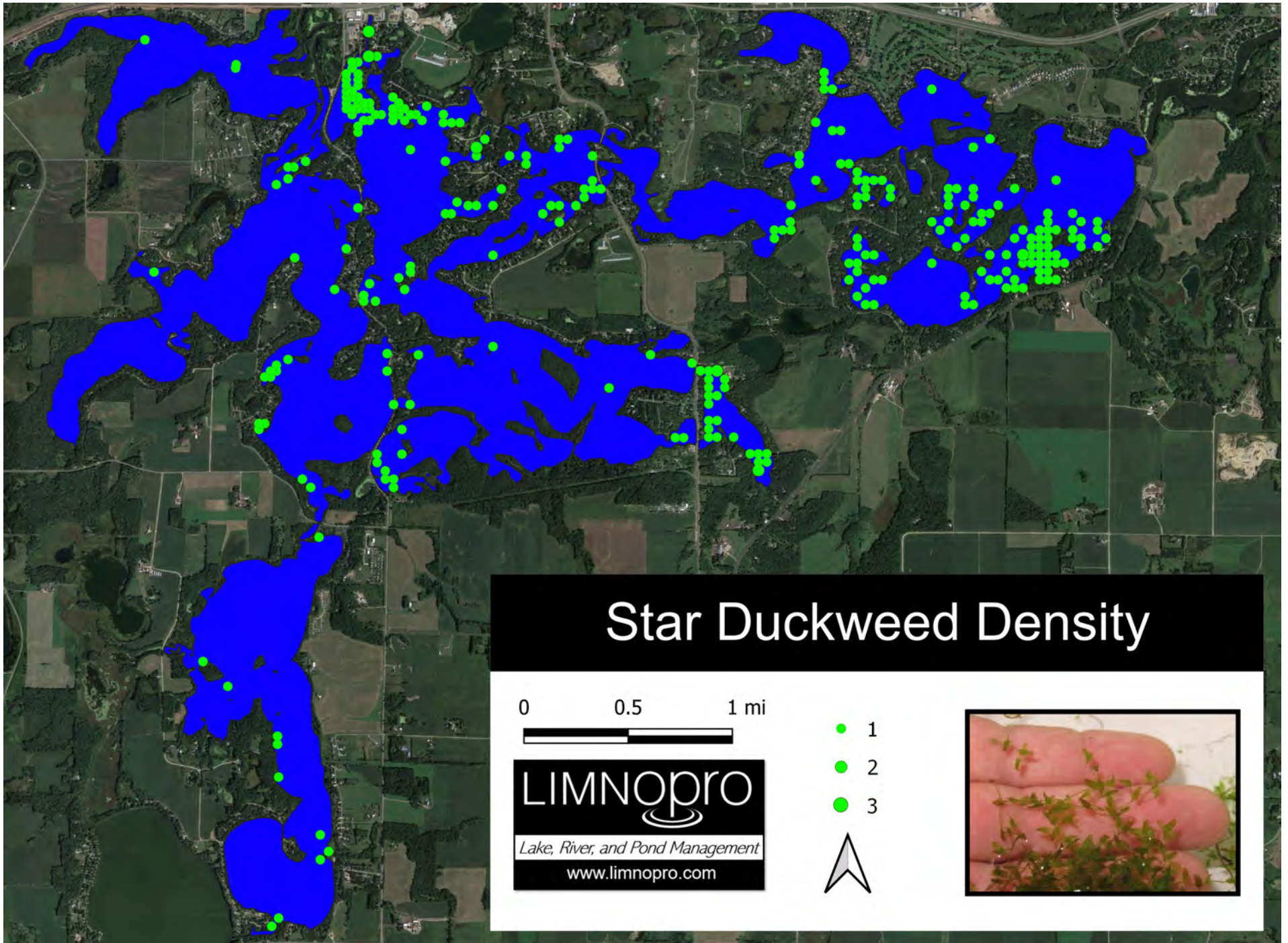


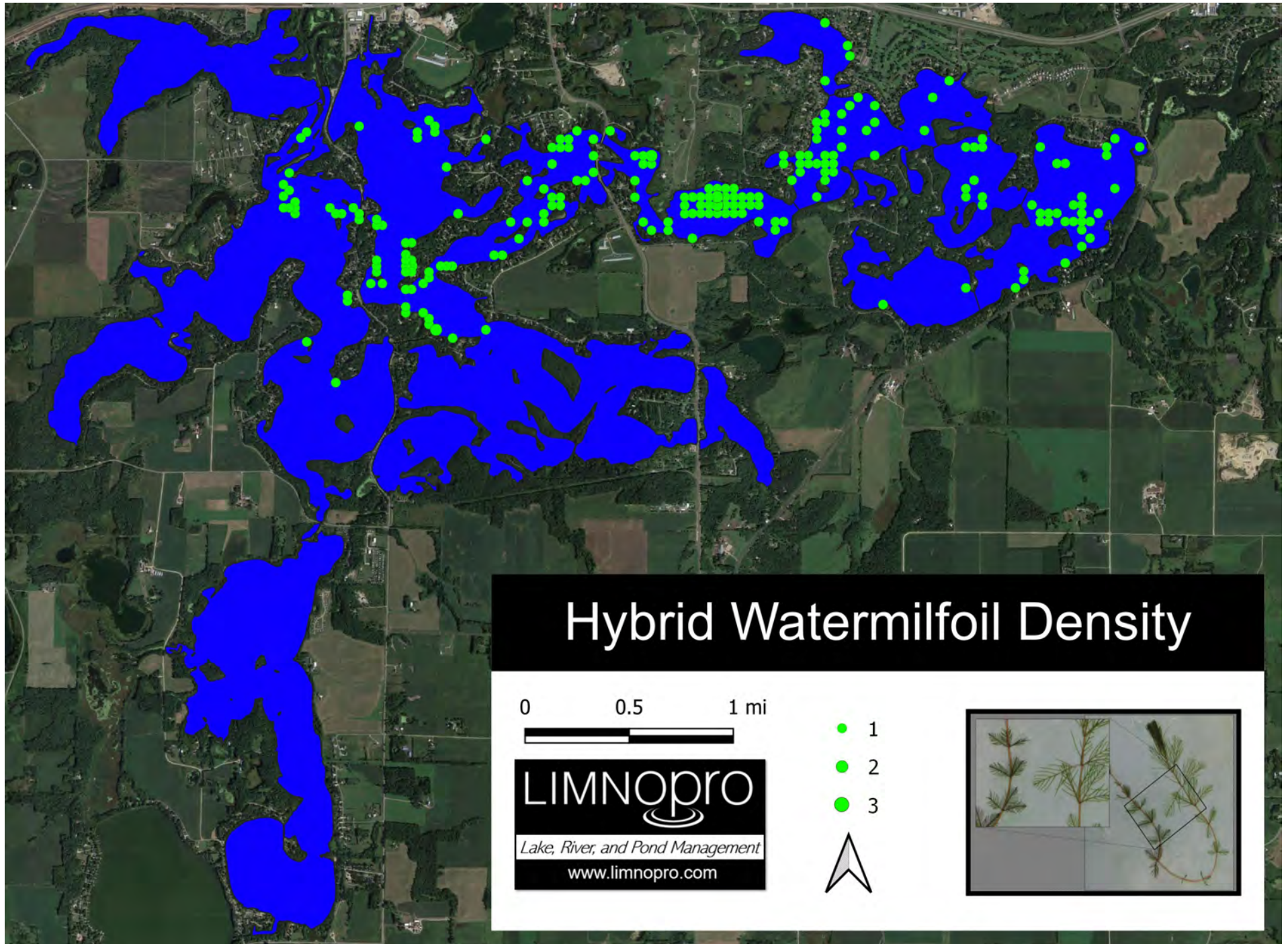


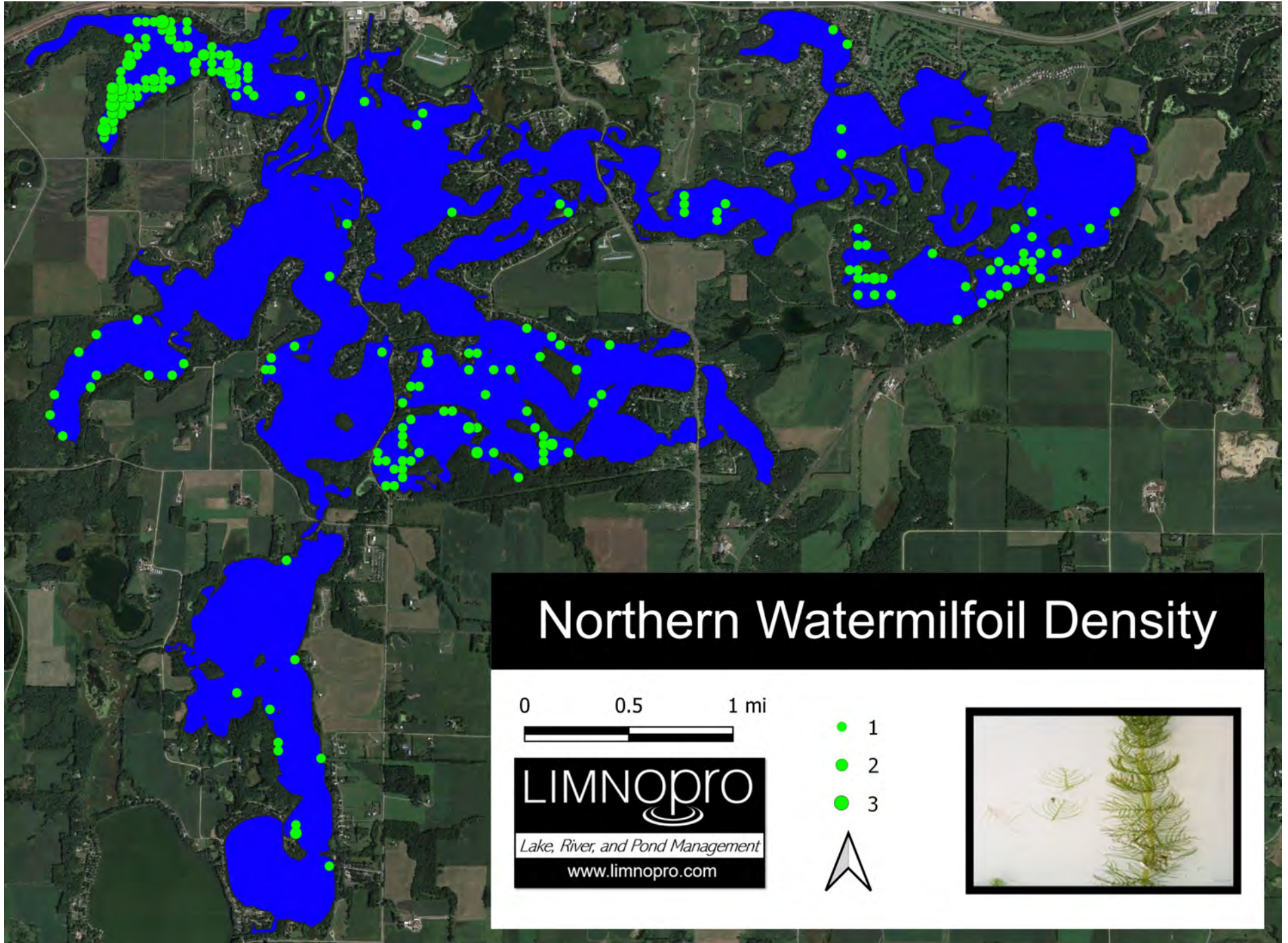


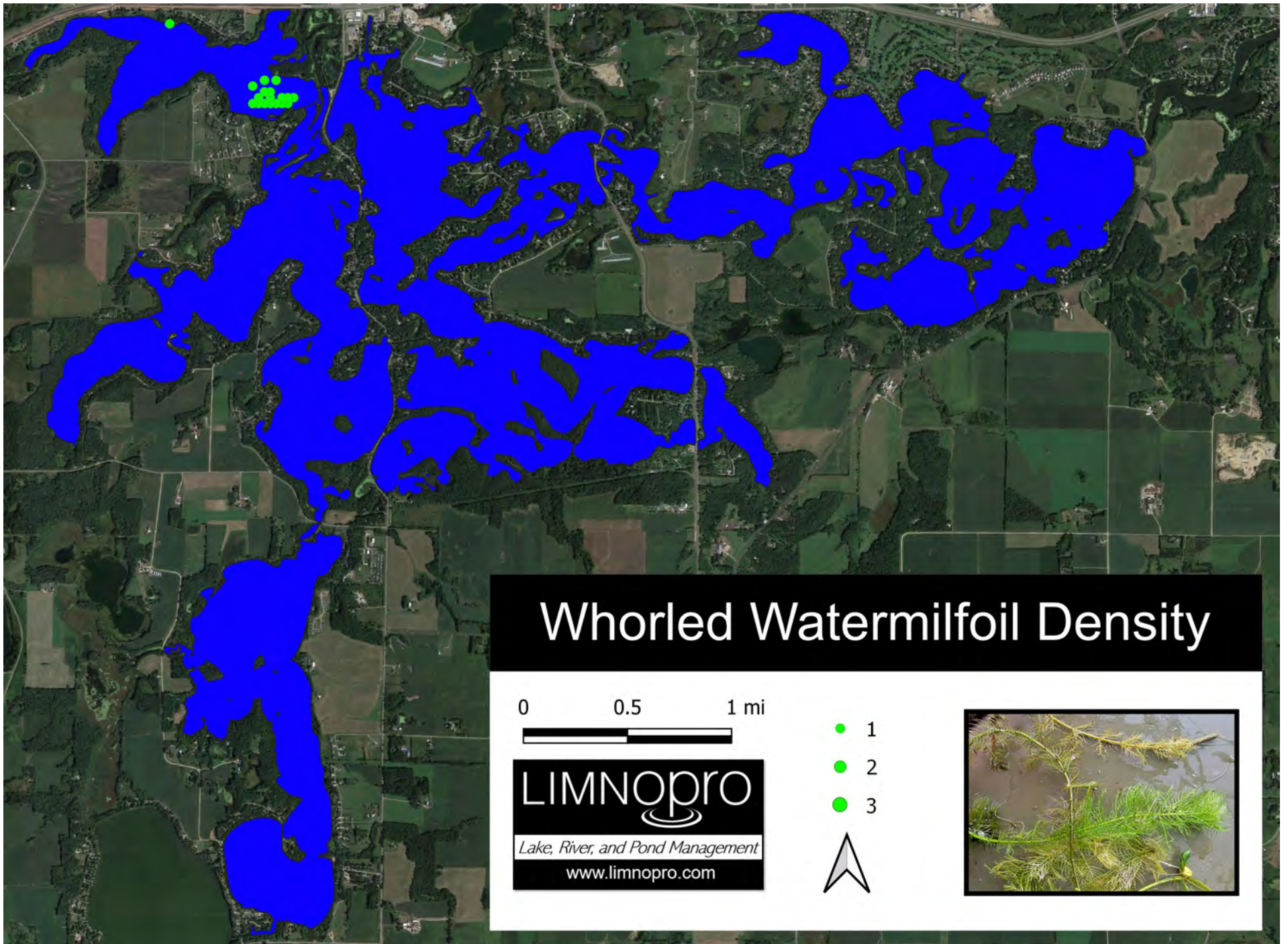


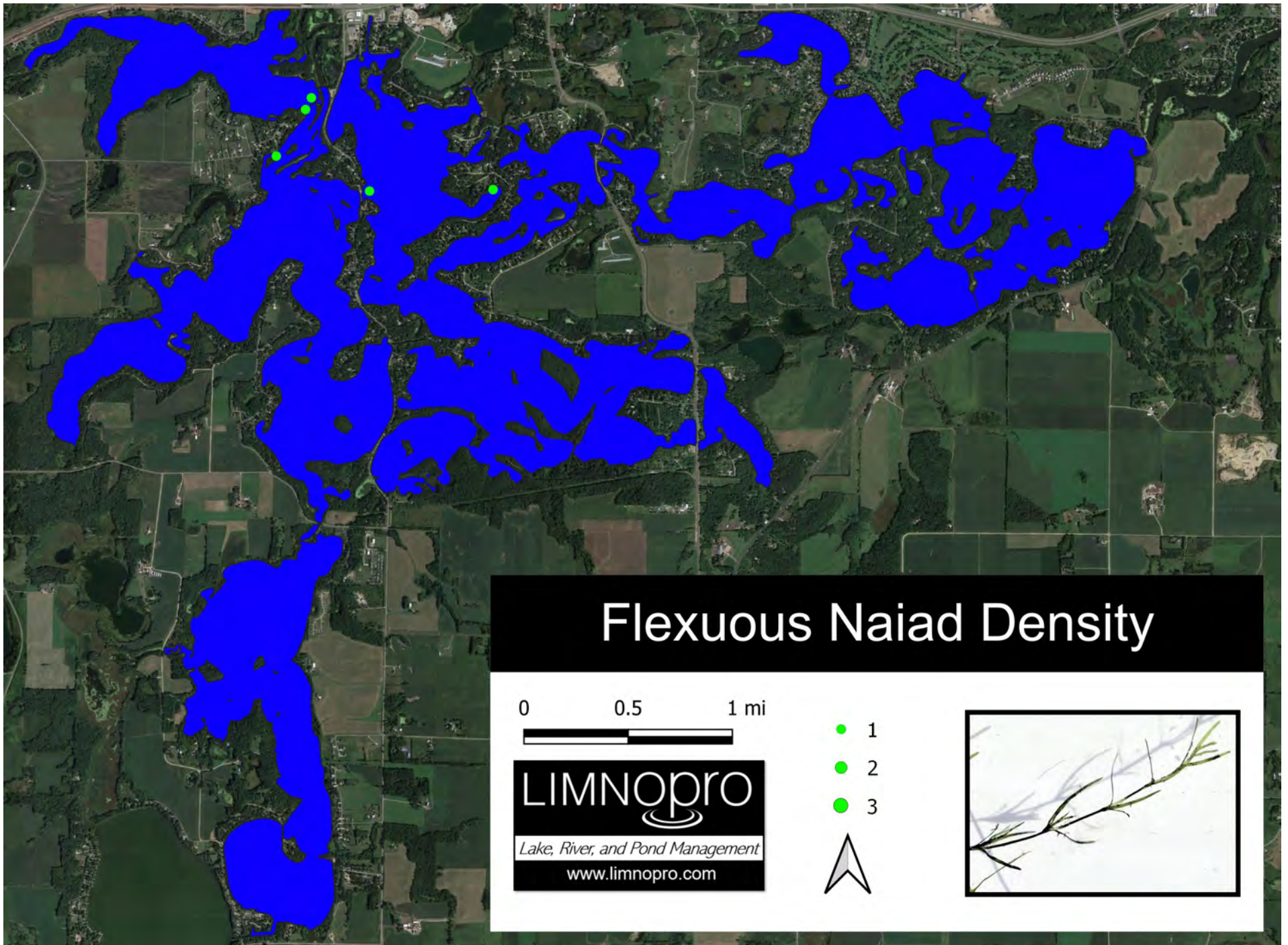


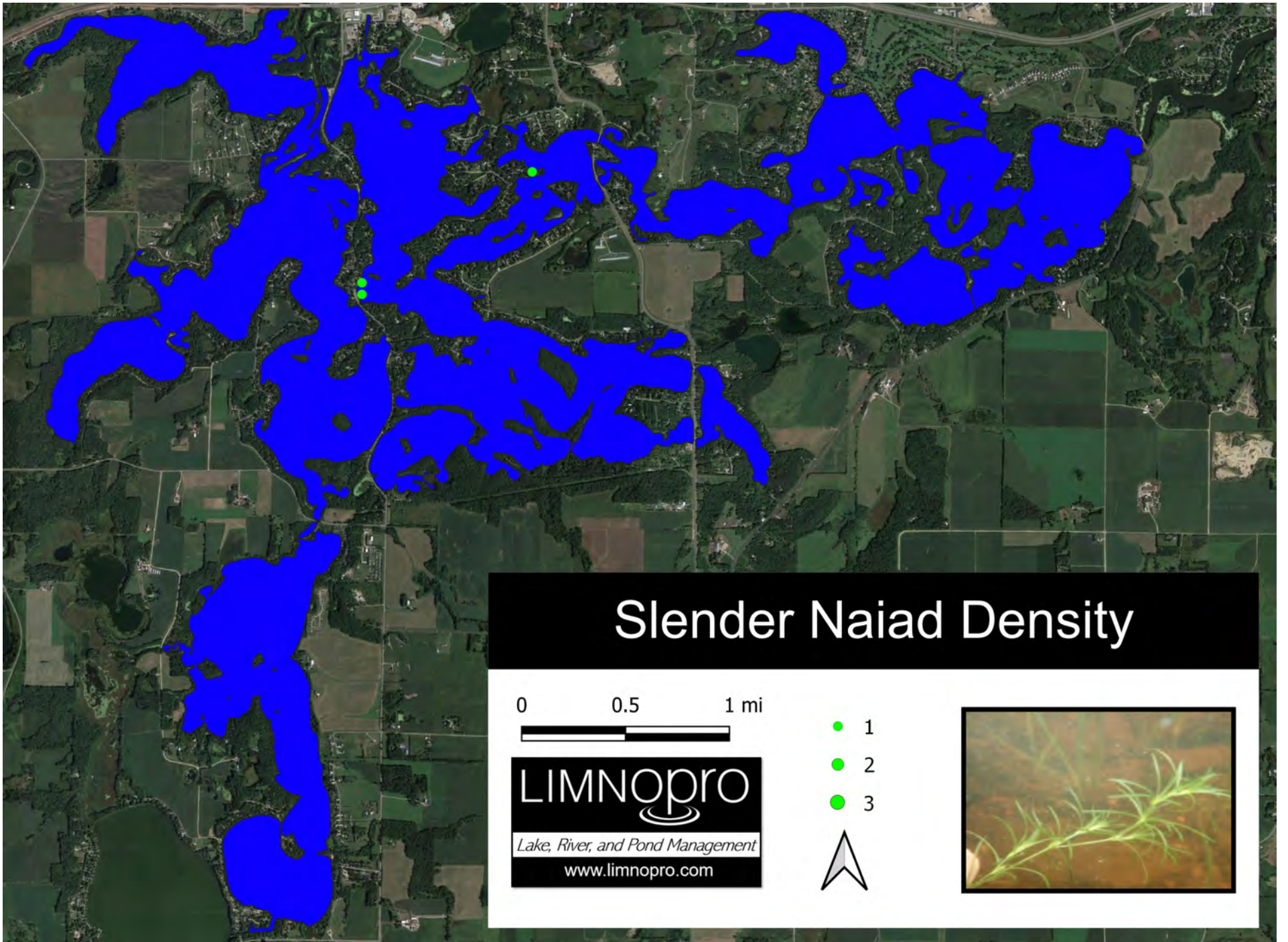


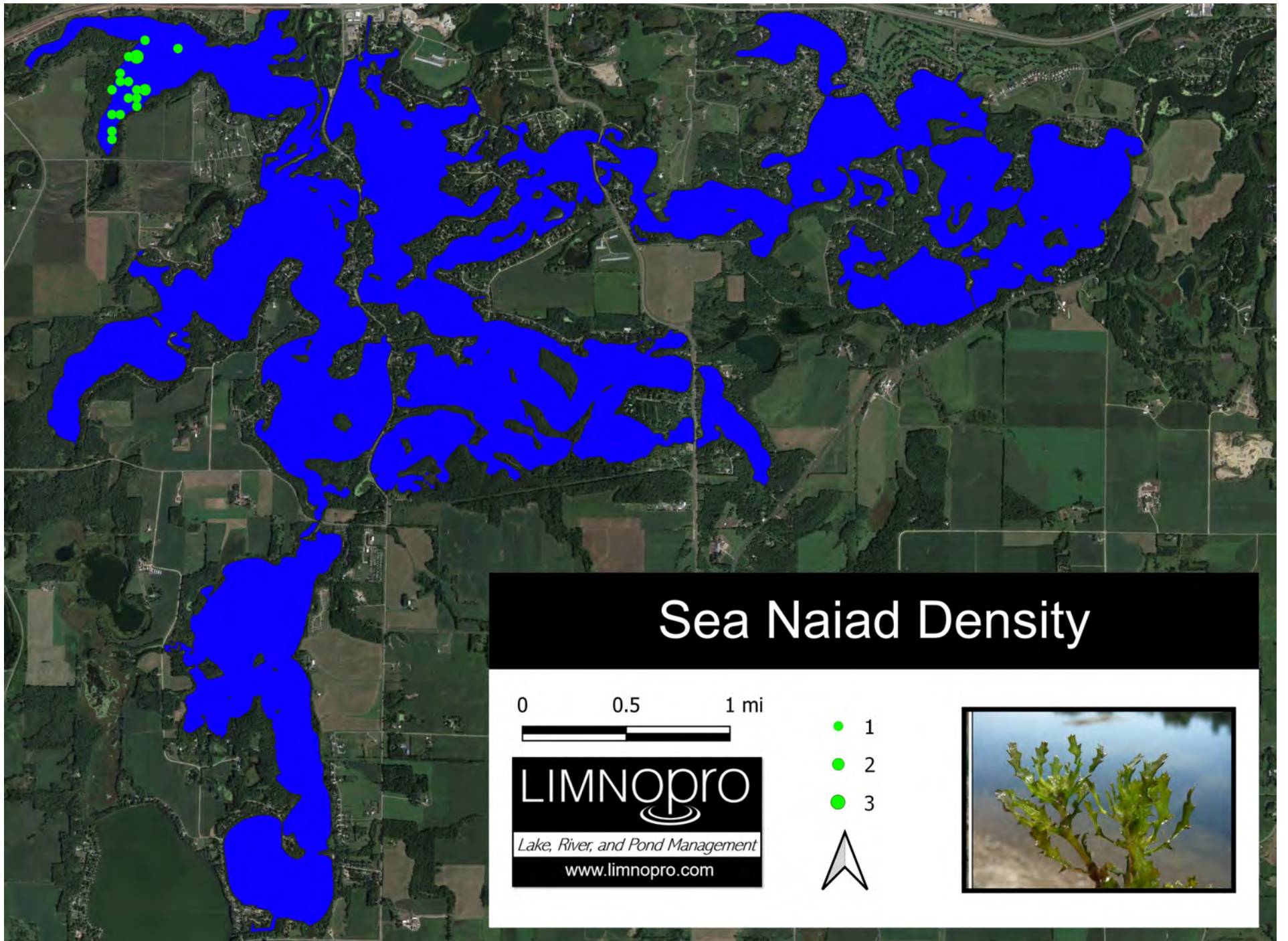


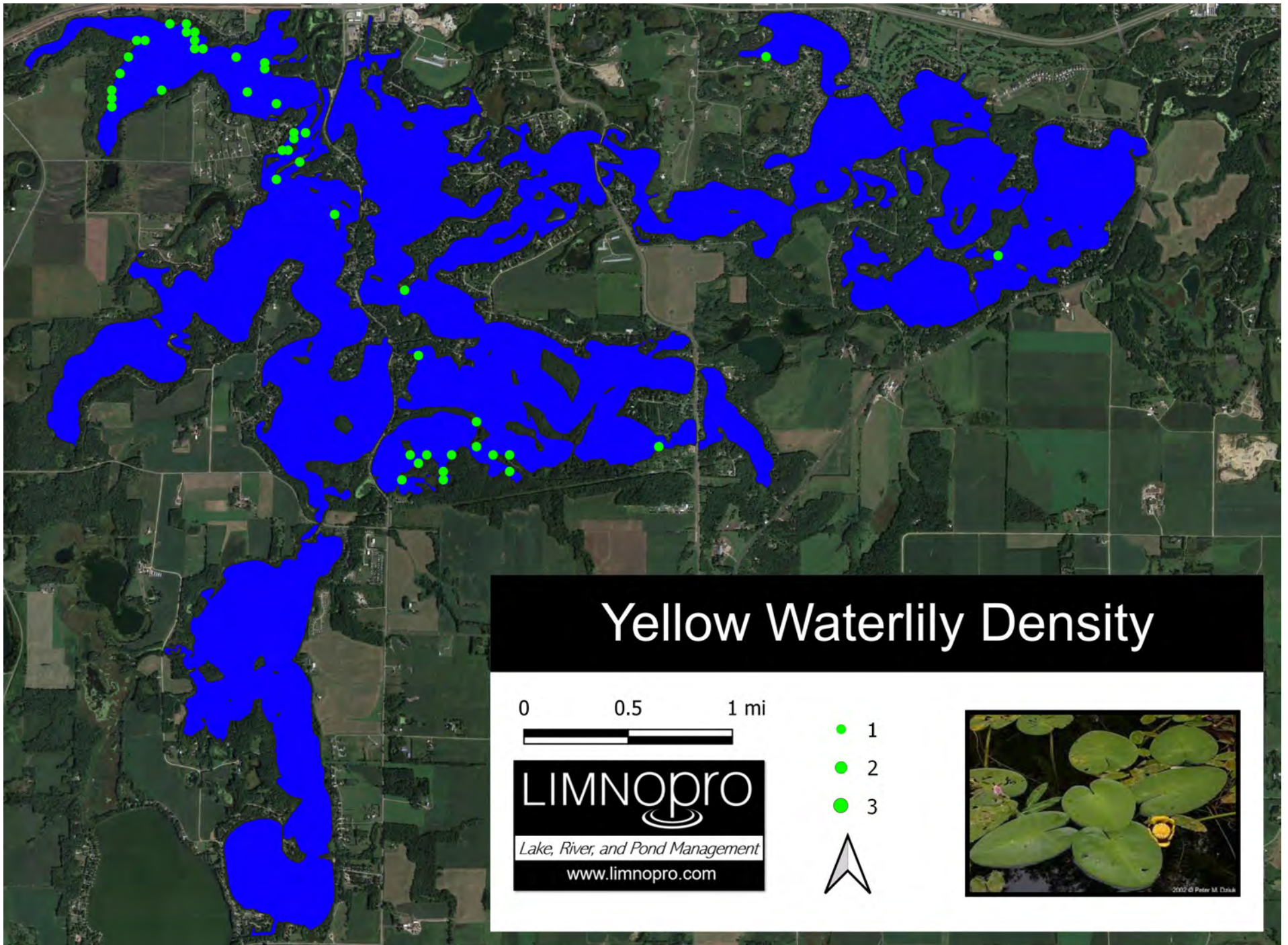


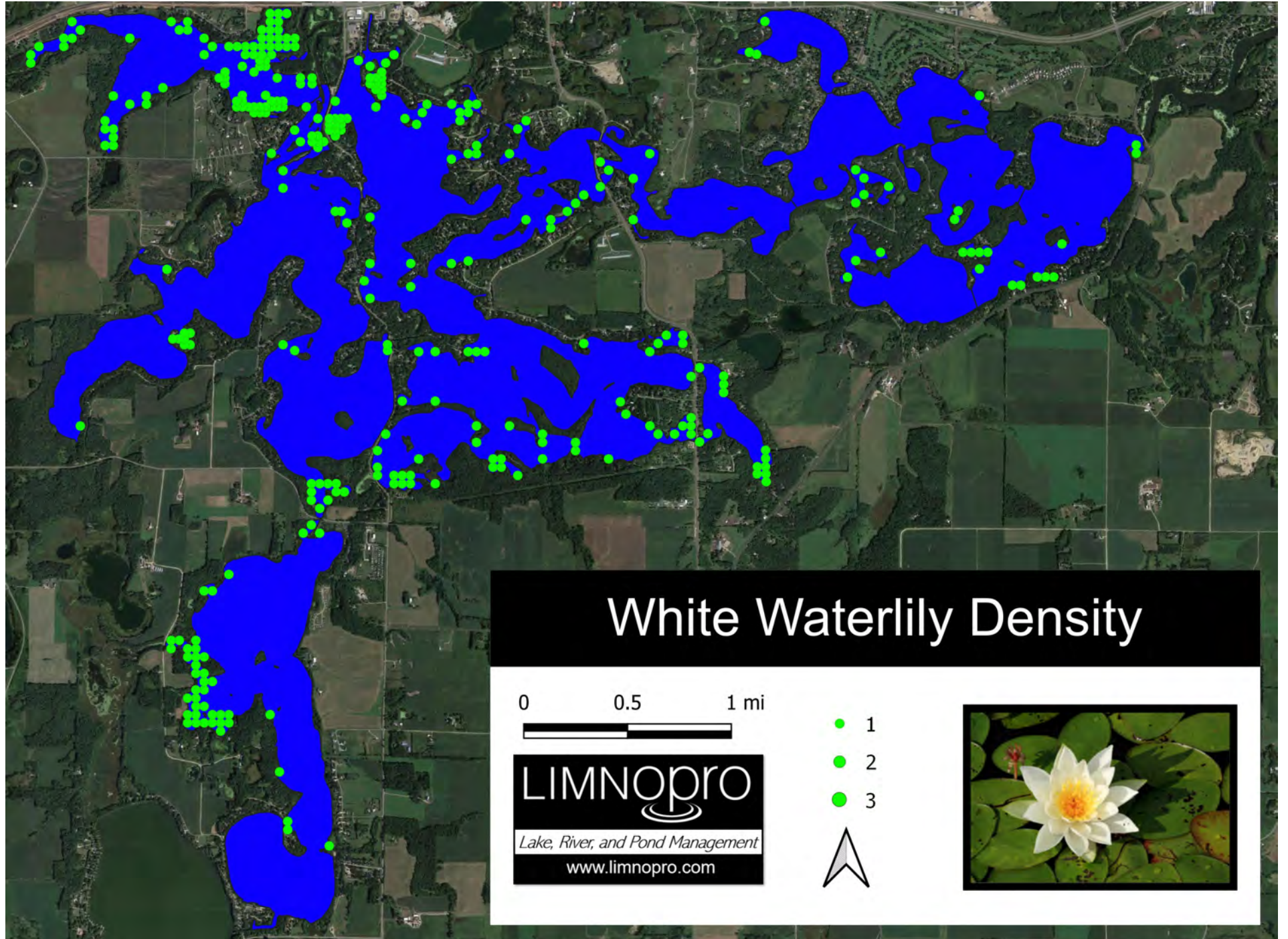


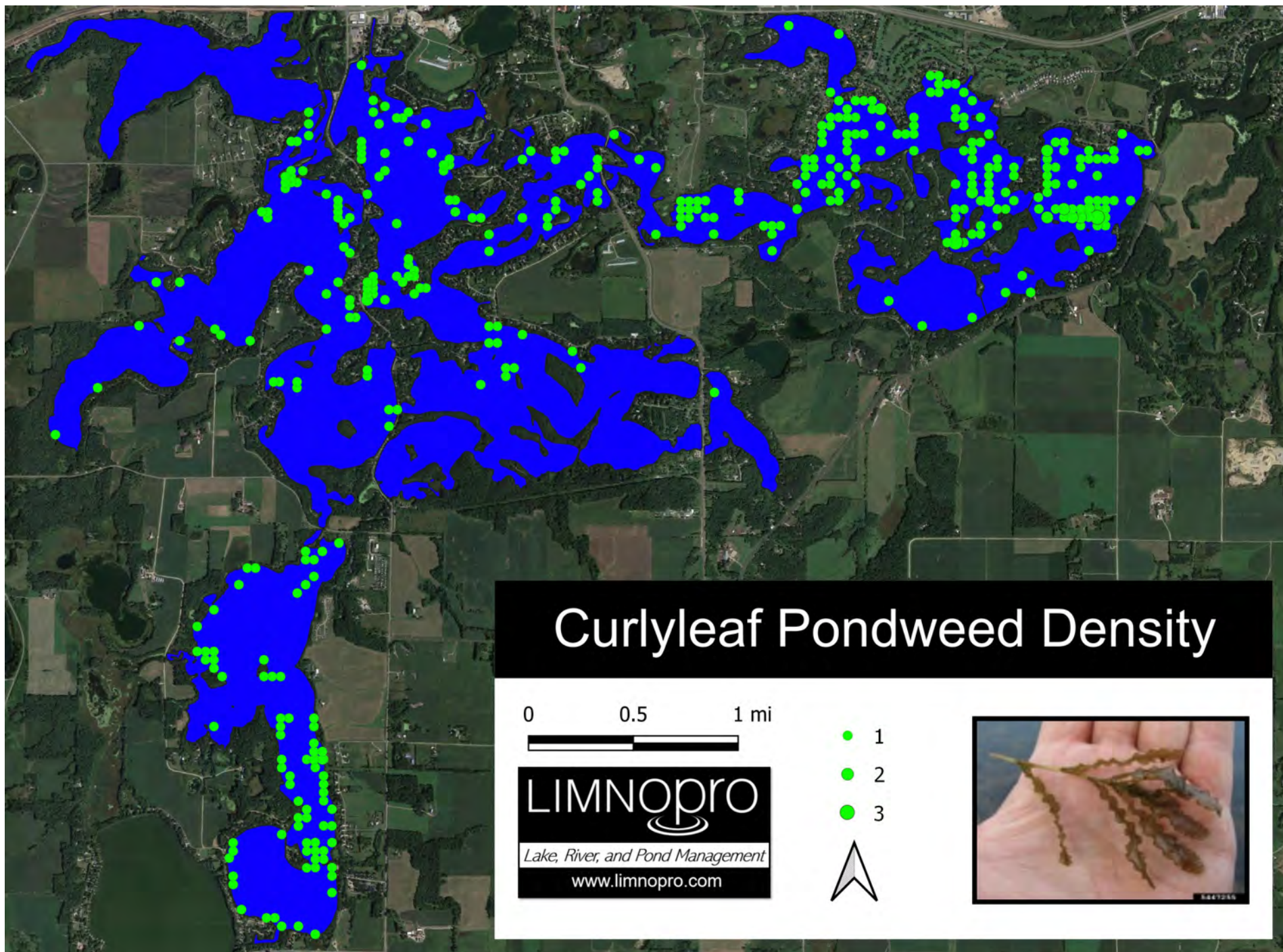


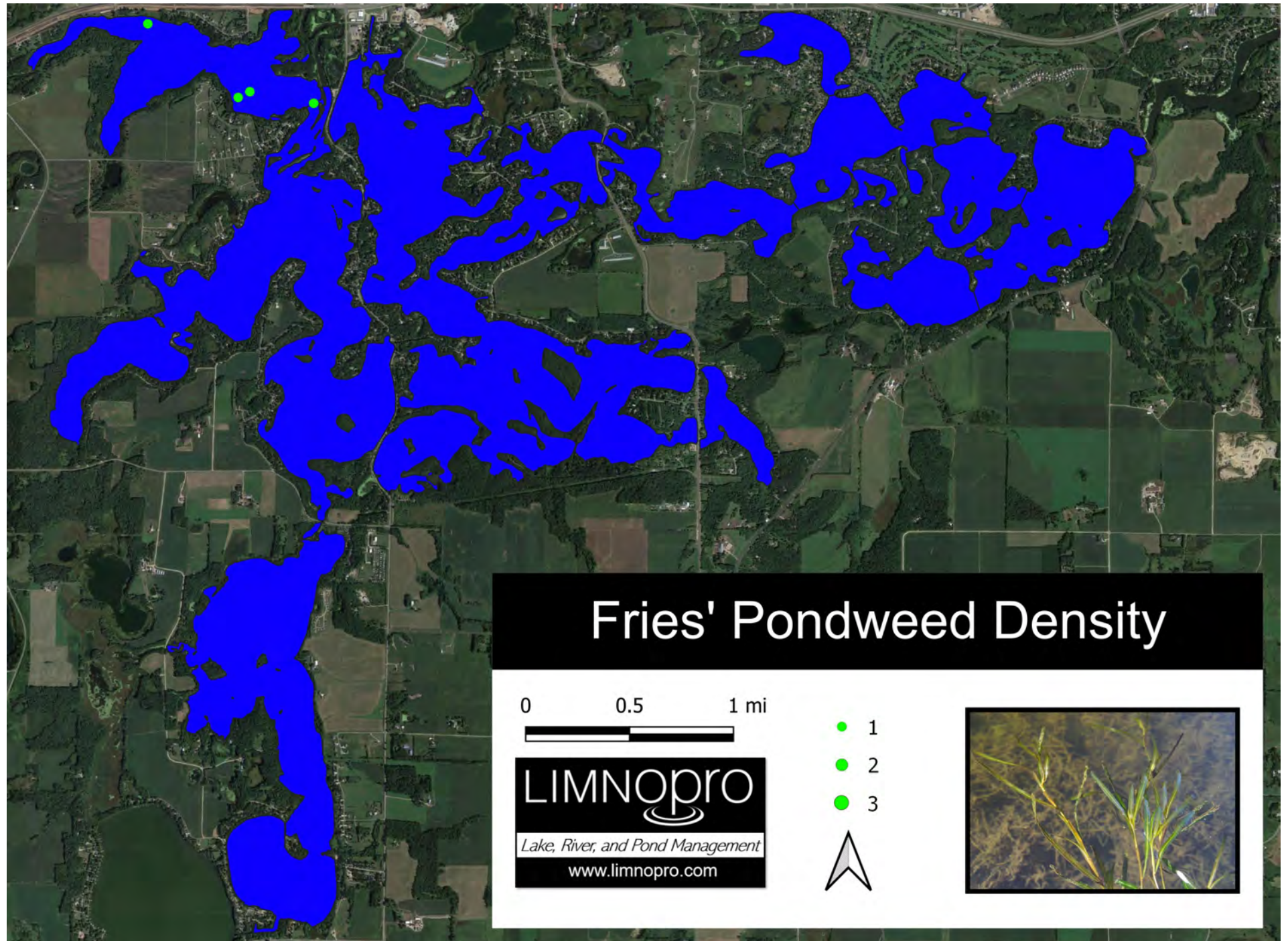


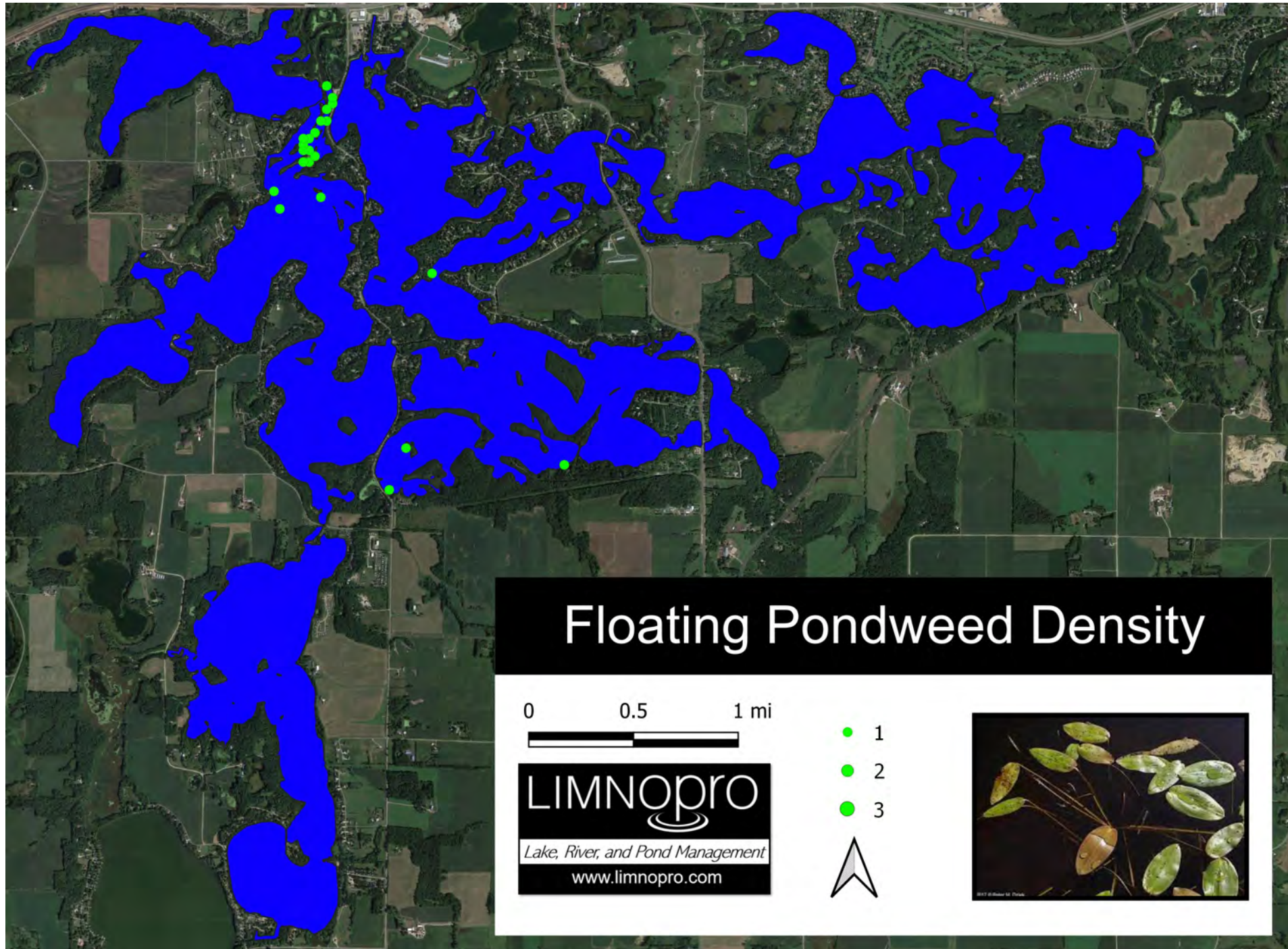


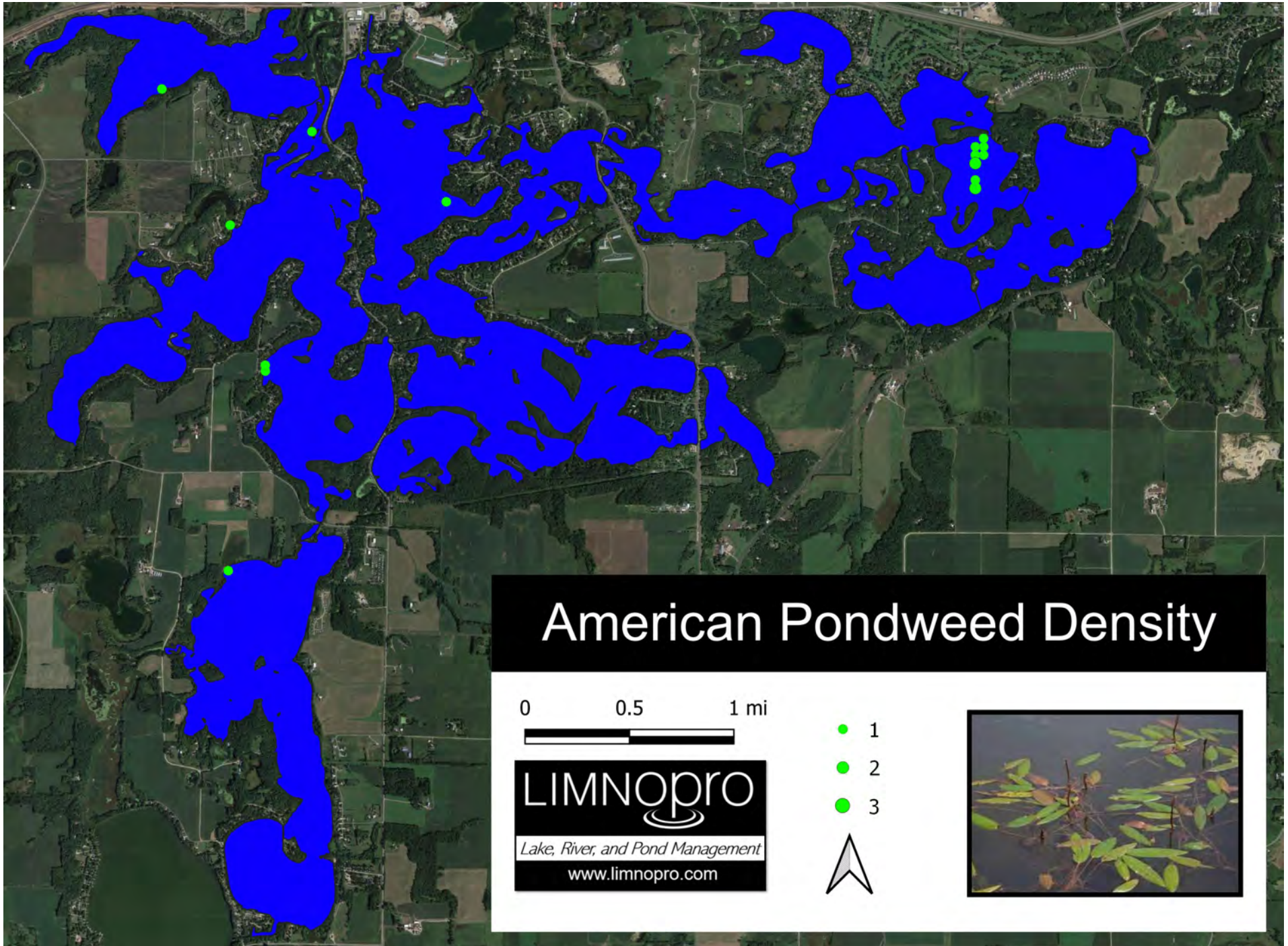












American Pondweed Density

0 0.5 1 mi

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