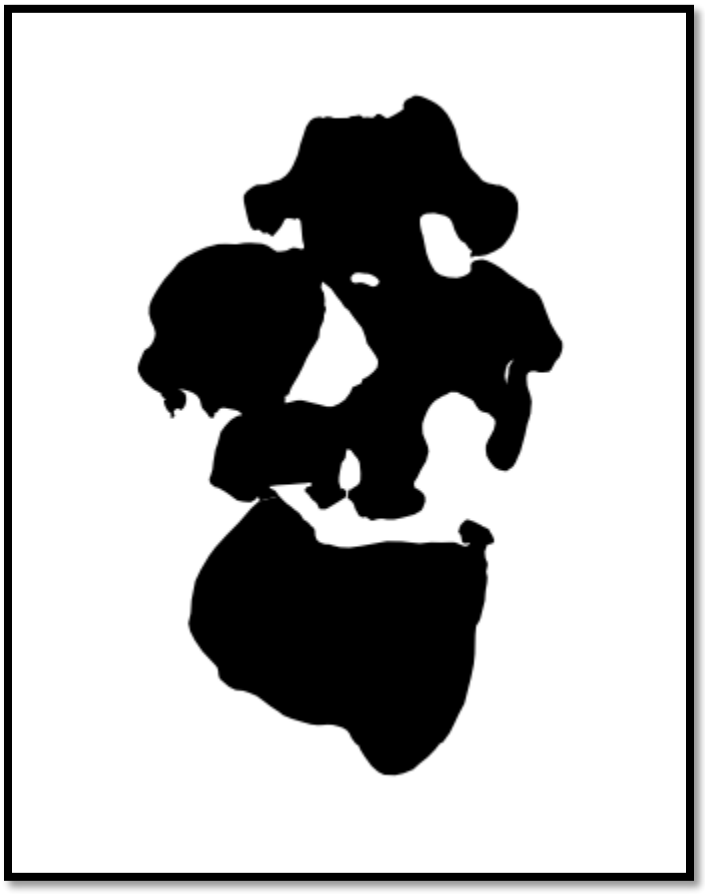
MINK/SOMERS LAKES



CURLYLEAF PONDWEED SURVEY

JUNE 2020

Mink & Somers Lakes Curlyleaf Pondweed Survey

Prepared for Mink Somers Lake Improvement District

June 2020

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Lake, River, and Pond Management
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Mink & Somers Lakes
Curlyleaf Pondweed Survey

Introduction

A point intercept survey of aquatic vegetation in Mink and Somers Lakes of Wright County, Minnesota was conducted on June 12, 2020 to collect information about curlyleaf pondweed distribution in the lake near its seasonal peak growth. Native plant distributions were also assessed but not reported on here. Rather an additional survey will take place between July 15 – August 30, 2020 to determine distributions of native plants and other potential invaders, and results from the spring native community survey will be combined with those into a single comprehensive report on the distribution of plants within Mink & Somers Lakes.

Methods

All field work and analysis were conducted by Limnopro Aquatic Science, Inc. for the Mink Somers Lake Improvement District. Mink and Somers Lakes have a combined listed littoral area of 404 acres (MN DNR LakeFinder). Altogether, a total of 202 pre-loaded GPS coordinates were loaded to an onboard GPS/sonar unit (Fig. 1). These points were evenly distributed over the entire littoral area. After navigating the boat to each coordinate, a double-sided rake attached to a rope was thrown off the port side of the boat and dragged to obtain a sample representing approximately one square meter of the bottom. All plants brought to the surface were identified to species and ranked on a density scale from 1 to 3 (Fig. 2). While navigating through the lake over points, sonar data were collected autonomously to a Lowrance HDS Gen 3 sonar unit as an *.sl2 file. These sonar files were processed by EcoSound, a third-party software service owned by BioBase, a subsidiary of Navico. The output of this service is a map of "biovolume percent" (BV%). BV% is a measure of the percentage of the water column depth occupied by plants. It is a useful way to show overall plant density, but it is not able to distinguish CLP from other plants. Subsequently, we can overlay species identification to the BV% map to provide some indication of where CLP may be contributing to high plant densities. More information on BioBase processing and data output can be

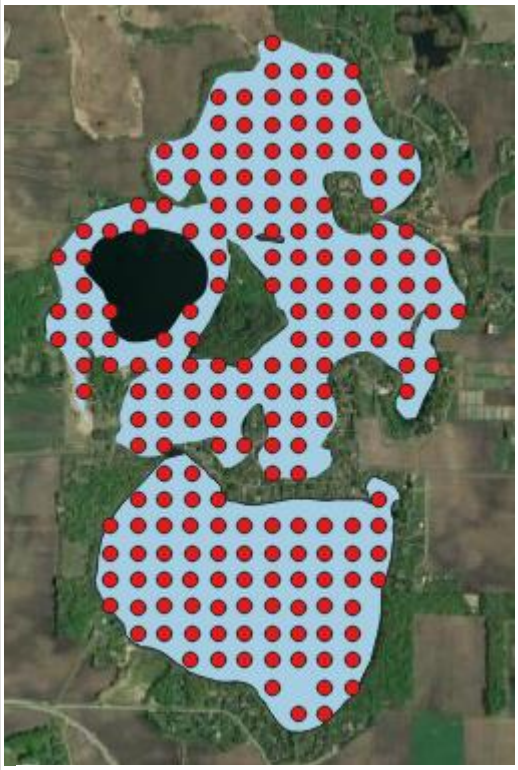


Fig. 1. Location of spring points surveyed at a resolution of one point per two acres.

collected at www.biobasemaps.com. Additional mapping and geostatistical analysis were performed using a geographic information system (QGIS 3.10). Specifically, we generated standard point density plants of CLP over the lake and did an indicator analysis using spatial model of presence/absence of CLP with the multilevel b-spline interpolation method in QGIS. An indicator analysis provides a probability map of whether CLP is likely to be found in unsampled areas based on results from sampled areas. Conditions at the time of the survey showed water temperatures of 74 ˚F and Secchi depth at 12.5 feet.

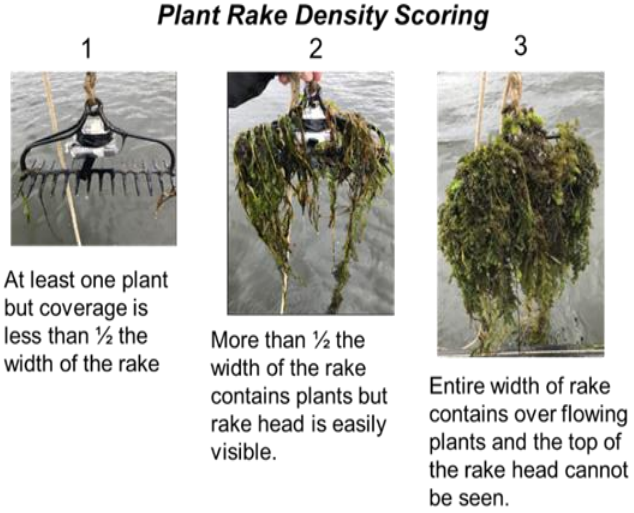


Fig. 2. Rake density scoring system.

Results

Curlyleaf pondweed was found in 106/202 (52%) of the sites surveyed and was the most ubiquitous and dense plant species found in the lake during the survey, followed by coontail, filamentous algae, and 12 other native plant species (Table 1). The indicator analysis suggests 219 of 404 acres (54%) surveyed have CLP, of which 142 acres are in Mink and 77 acres in Somers (Fig. 3). BioBase estimated approximately 42% (168/404 acres) of the surveyed area had high density of plants growing to at least half the depth of water column they inhabited (Fig. 4). Of the 106 points where CLP was identified, 65 of those occurred with the high-density areas as determined by BioBase (Fig. 5).

Discussion

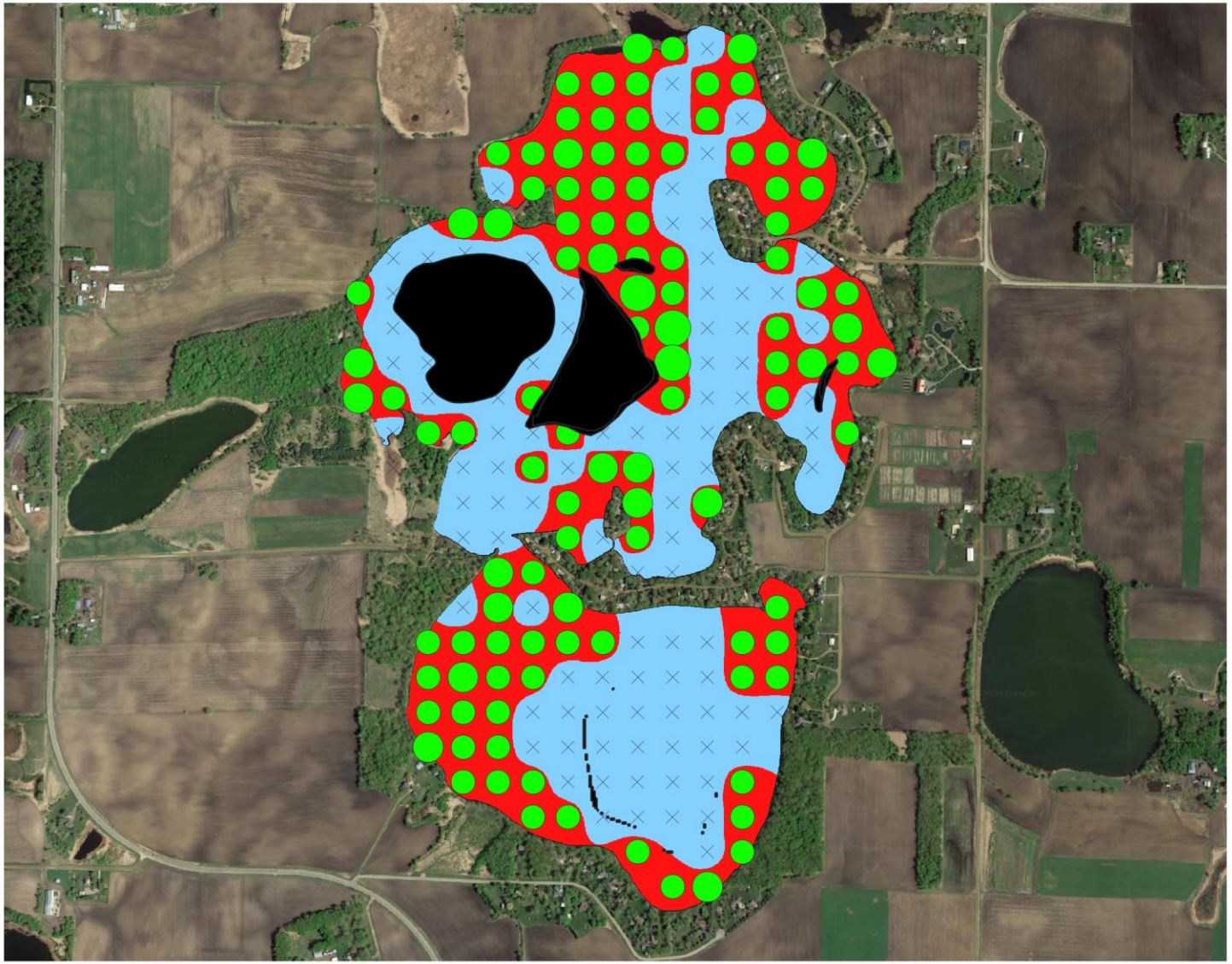
We estimated 219 acres of CLP coverage on Mink (142 acres)/Somers (77 acres) lakes. According to MN Statute 6280.0350, a total of 15% (Mink = 41.4 acres/ Somers =19.2 acres) of the littoral zone can be lawfully treated. Useful areas for treatment can be those that are adjacent to properties near shore, navigational areas, at or around boat launches, and other areas of high-density plants that get used by lake users. It is important to note that the types of chemicals authorized by the MN DNR to treat CLP are contact herbicides and not generally designed to reduce or eliminate plants as much as they are designed to reduce nuisance characteristics. In other words, areas on the lake that have CLP even at high density that are hidden or else will not likely be used often by lake users are not likely good candidate areas to treat. We have provided a delineation of some plots that may be chosen from for future treatment (Fig. 6). MN Administrative Rule 6280.1000 does allow a mechanism to

Table 1. Summary of plant species identified on June 12, 2020 during an aquatic plant survey at Mink/Somers Lakes. Occupancy is a measure of the percentage of sites that a given species occupies out of the 202 surveyed. Density is a measure of the total proportion of plant biomass collected during the survey.

Common Name	Scientific Name	Occupancy	Density
Curlyleaf Pondweed	*Potamogeton crispus*	52%	34%
Coontail	*Ceratophyllum demersum*	28%	17%
Filamentous algae	Various	24%	14%
Duckweed	*Lemna* spp.	14%	7%
White waterlily	*Nymphaea odorata*	13%	6%
Watermeal	*Wolffia* spp.	10%	5%
Nitella	*Nitella* spp.	4%	2%
Large duckweed	*Spirodela polyrhiza*	4%	2%
Forked duckweed	*Lemna triscula*	4%	2%
Canadian waterweed	*Elodea canadensis*	4%	2%
Slender waterweed	*Elodea nuttallii*	3%	2%
Sago pondweed	*Stuckenia pectinata*	3%	2%
Eurasian watermilfoil	*Myriophyllum spicatum*	2.5%	1.2%
Chara	*Chara* spp.	2.0%	1.0%
Flat-stem pondweed	*Potamogeton zosteriformis*	1.5%	1.0%
Horned pondweed	*Zannichellia palustris*	0.5%	0.2%
Northern watermilfoil	*Myriophyllum sibiricum*	0.5%	0.2%
Yellow waterlily	*Nuphar variegata*	0.5%	0.2%

petition the state for a variance to the 15% rule so that more acreage can be chemically treated under conditions specified in that rule. It calls for a document referred to as a "Lake Vegetation Management Plan (LVMP)", which must be drafted in partnership with the MN DNR.

Mink/Somers Lakes Curlyleaf Pondweed – June 2020



Survey Date: June 12, 2020
Surveyor(s): ER Hosey/JG Brezinka
Survey Method: Rake, Sonar, Visual

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Fig. 3. Curlyleaf pondweed point density map. Points show actual locations where CLP was detected, and the red polygon is the output from an indicator geostatistical model that predicts where CLP is more likely to exist than not. A total of 142 acres in Mink Lake and 77 acres in Somers Lake are more likely than not to have CLP.

Mink/Somers Lakes Plant Biovolume (BV%) – June 2020

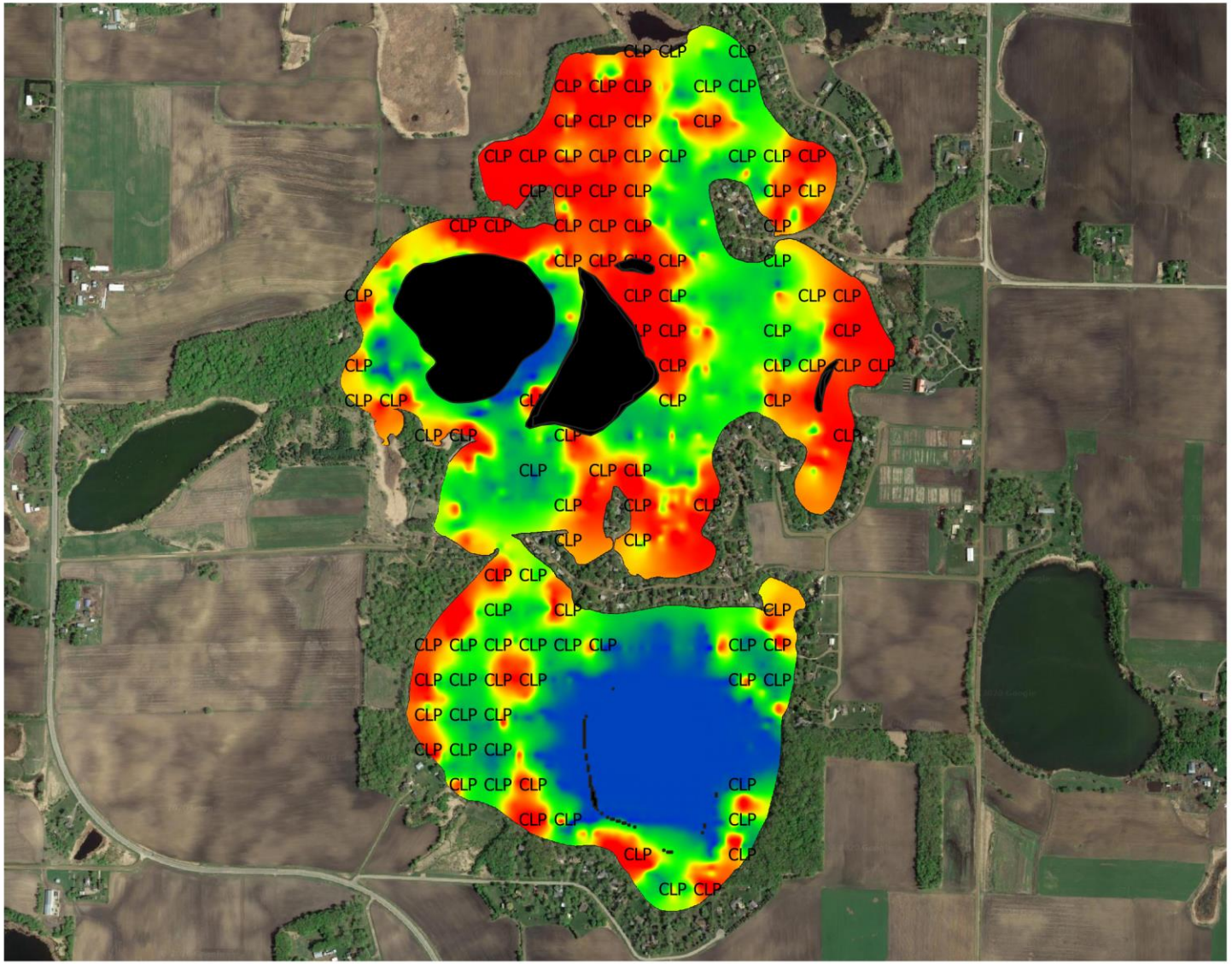

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Fig. 4. Sonar mapping of plant height as a percentage of depth (i.e., biovolume percent = BV%) overlaid with point locations where curlyleaf pondweed (CLP) was positively identified. BV% is not species specific so that dense vegetation may include other species besides CLP

Mink/Somers Lakes CLP/High Density BV% – June 2020

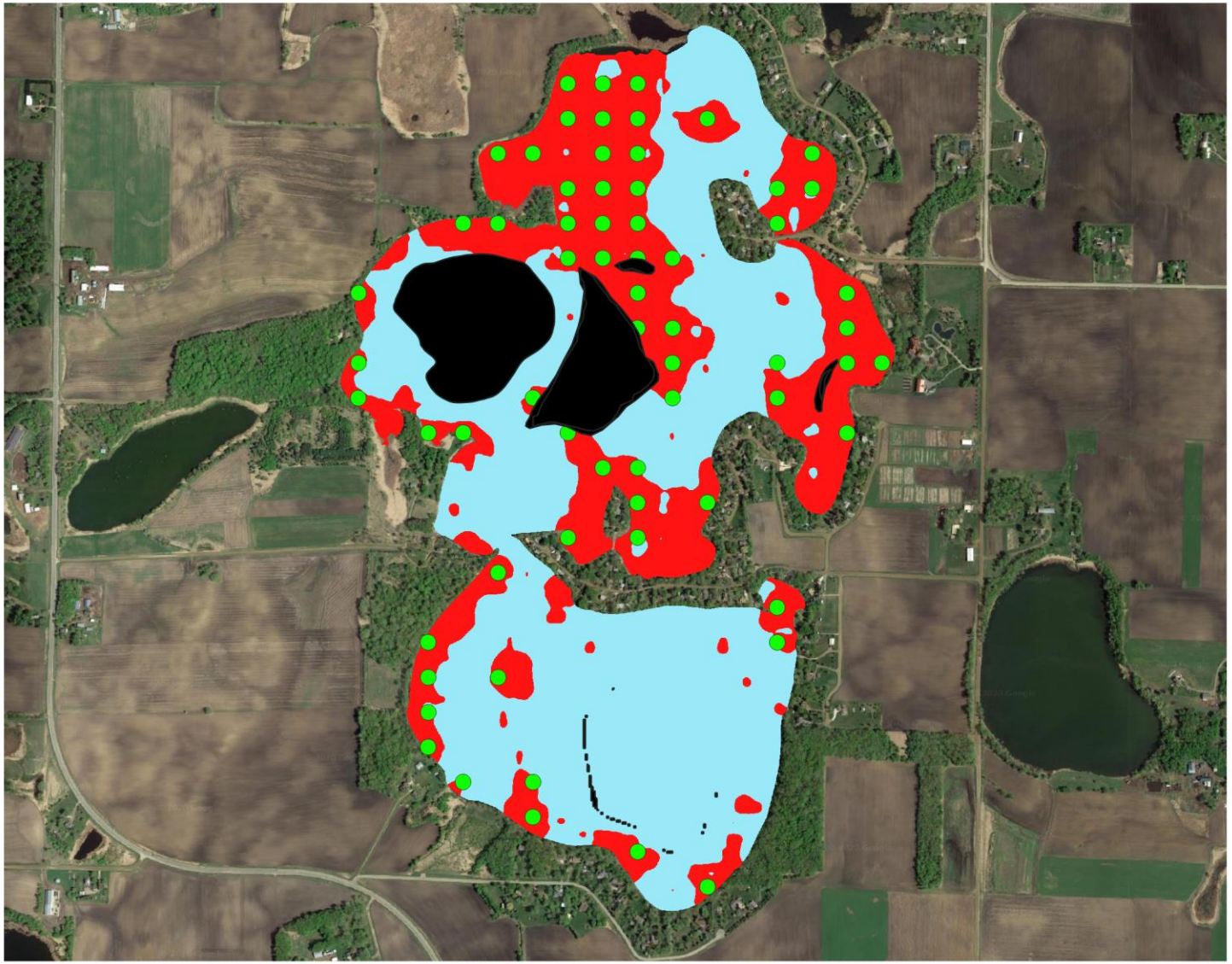

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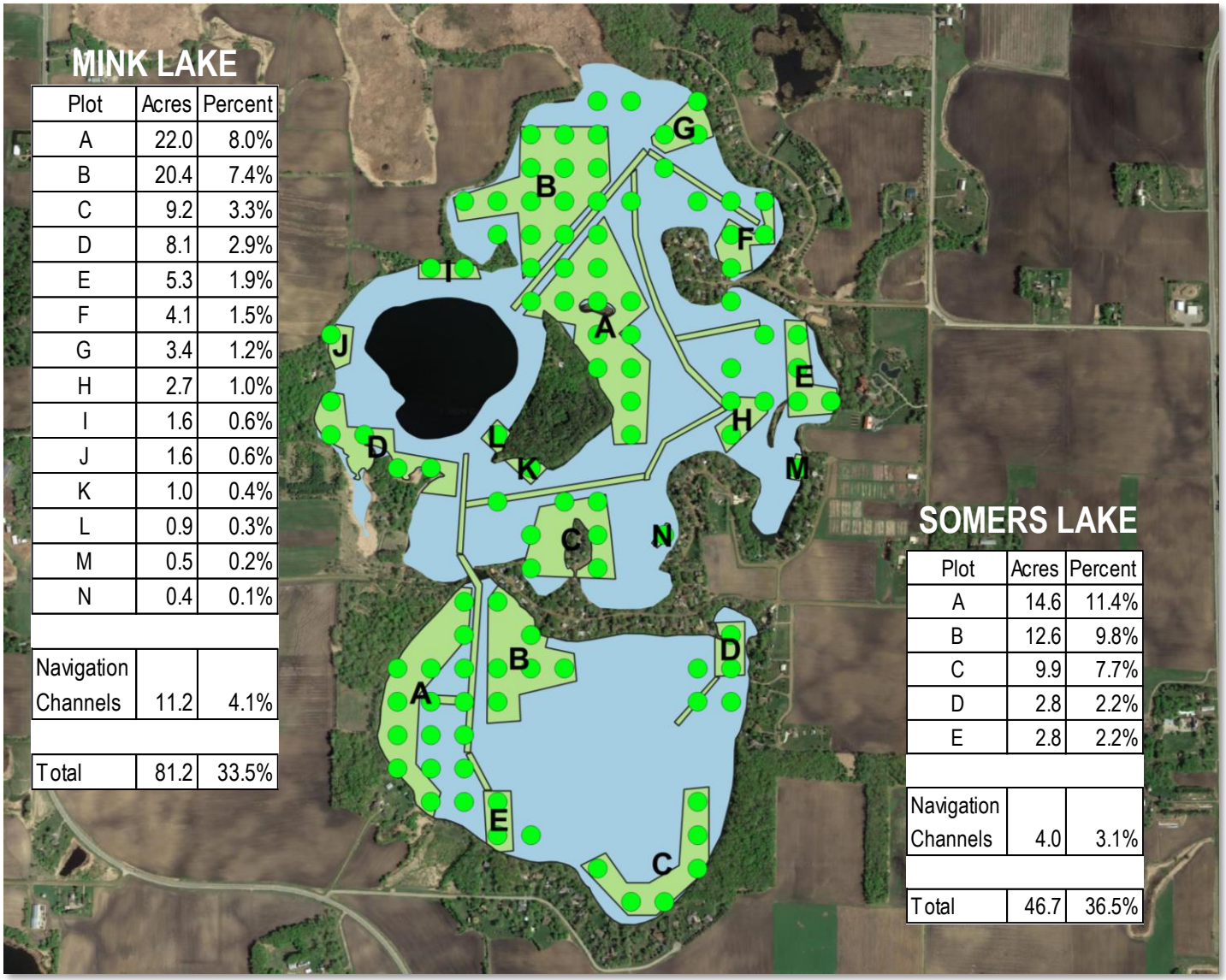
Fig. 5. Curlyleaf pondweed that was detected to be part of high-density plant areas, defined as areas where plant grew to the midpoint of water column, as determined by BioBase EcoSound algorithms. CLP that did not fall in the high-density areas is not shown.

Mink/Somers Lakes Proposed Treatment Areas – FY 2021



Plot	Acres	Percent
A	22.0	8.0%
B	20.4	7.4%
C	9.2	3.3%
D	8.1	2.9%
E	5.3	1.9%
F	4.1	1.5%
G	3.4	1.2%
H	2.7	1.0%
I	1.6	0.6%
J	1.6	0.6%
K	1.0	0.4%
L	0.9	0.3%
M	0.5	0.2%
N	0.4	0.1%
Navigation Channels	11.2	4.1%
Total	81.2	33.5%

Plot	Acres	Percent
A	14.6	11.4%
B	12.6	9.8%
C	9.9	7.7%
D	2.8	2.2%
E	2.8	2.2%
Navigation Channels	4.0	3.1%
Total	46.7	36.5%

Survey Date: June 12, 2020
Surveyor(s): ER Hosey/JG Brezinka
Survey Method: Rake, Sonar, Visual

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Fig. 6. A first proposal of areas to chemically treat for curlyleaf pondweed in 2021. By MN rules, 15% of the littoral zone may be chosen for treatment. Delineated areas are based on locations of CLP within high density BV% areas