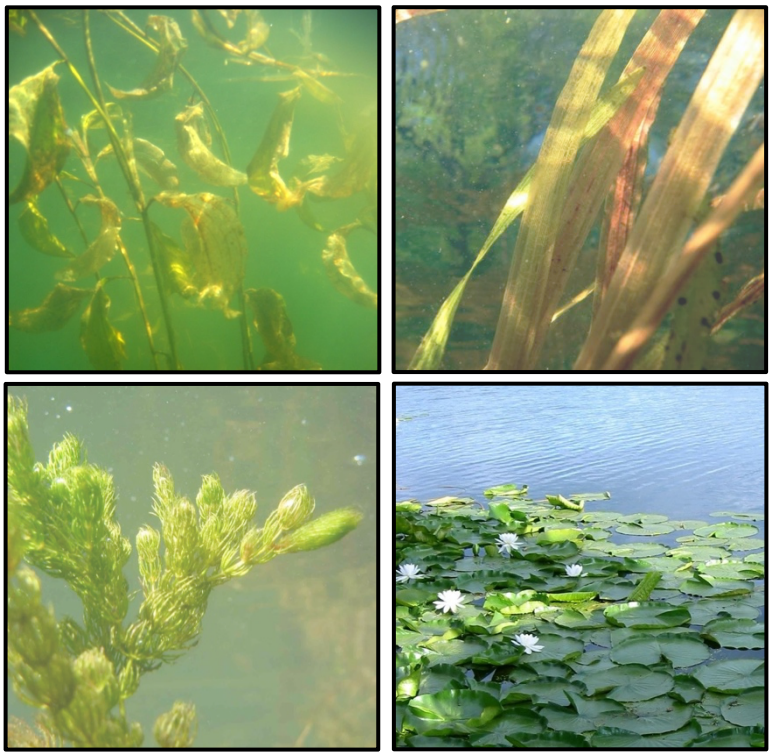
fixmylake.com
15771 Creekside Lane
Osseo, MN 55369
james@freshwatersci.com
(651) 336-8696

Aquatic Plant Community of Briggs Lake: 2020

Briggs Lake *(#71-0146)*
Sherburne County, MN

Surveyed August 11, 2020



Survey, Analysis, and Reporting by:
James A. Johnson – *Aquatic Ecologist, Freshwater Scientific Services, LLC*

Certified Lake Manager
www.NALMS.org

Funding Provided by:
Three Lake Improvement District – Clear Lake, MN

Survey & Analysis Methods

Point-Intercept Survey

Freshwater Scientific Services, LLC surveyed plants in Briggs Lake on Aug 11, 2020 using the point-intercept method described by Madsen (1999). This survey incorporated assessments at a total of 254 sample points arranged in a uniform grid (65-m spacing; Figs 1 and 2). We generated these sample points using desktop GIS software to project a grid of points over an aerial images of the lake. We then loaded the selected sample locations onto a handheld GPS unit (Garmin GPSMAP-78) for navigation to each point while in the field.

At each designated sample location, we collected plants using a double-headed, 14-tine rake on a on a rope. For each rake sample, we dragged the rake over the lake bottom for approximately 5 ft before retrieving. Retrieved plants were piled on top of the rake head and assigned density scores from 1 to 4 based upon rake head coverage (Table 3) for each individual species and for all plants collectively.

We calculated the littoral frequency (≤15 ft, % occurrence) and littoral mean density score (plant abundance) for each encountered plant species (Table 1), as well as lake-wide and littoral community metrics (Table 2). We also used desktop GIS software to map the distribution and abundance of plants in the lake (pages 5–11). Additional species that were observed floating or growing in the vicinity of a sample point but not retrieved on the rake were given a rating of zero for that location. These "zero" species were noted as being in the vicinity on the plant distribution maps (shown as an "X"), but "zero" ratings were excluded from calculations of plant community metrics and statistics (not treated as denoting presence). At each location, we also documented water depth and overall plant height.

Figure 1. Designated sample locations for the 2020 Briggs Lake plant survey.

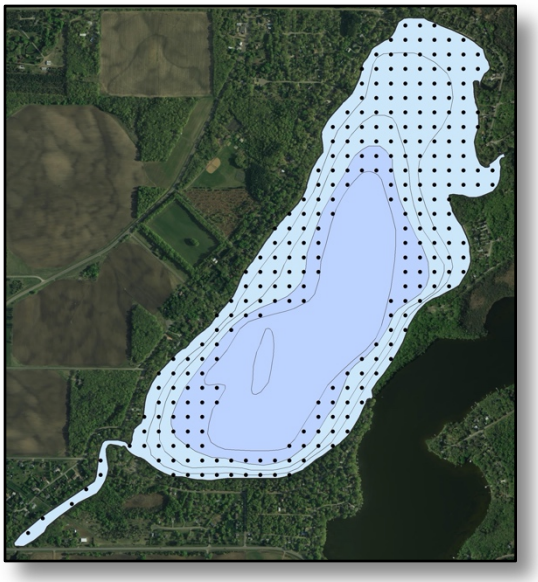
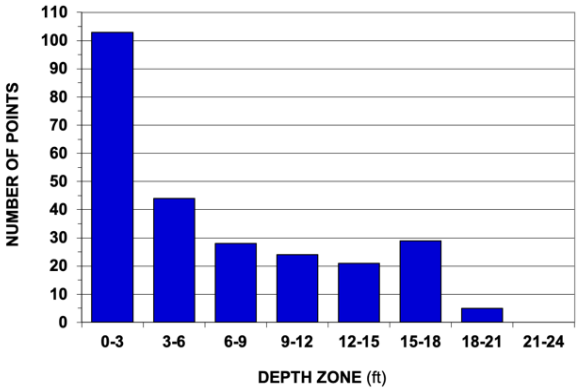


Figure 2. Sampling effort (number of locations sampled) within successive 3-ft depth zones



Results

Statistical Summary of Findings

Table 1. Littoral frequency (% occurrence) and abundance (mean density score) of plant species found in Briggs Lake (Sherburne Co., MN) during the 2020 plant survey. *% Occurrence* and *Mean Density* (1-4 scale) were calculated using all littoral points (water depth ≤15 ft).

PLANT TAXA	COMMON NAME	% OCCURRENCE	MEAN DENSITY
SUBMERSED TAXA			
Najas flexilis	Slender naiad	29	0.4
Ceratophyllum demersum	Coontail	27	0.5
Myriophyllum sibiricum	Northern watermilfoil	23	0.4
Chara sp.	Muskgrass	19	0.3
Heteranthera dubia	Water stargrass	18	0.3
Potamogeton foliosus	Leafy pondweed	18	0.2
Potamogeton richardsonii	Clasping-leaf pondweed	5	0.1
Elodea canadensis	Canadian waterweed	4	<0.1
Vallisneria americana	Wild celery	4	<0.1
Stuckenia pectinata	Sago pondweed	3	<0.1
Potamogeton crispus	Curly-leaf pondweed	2	<0.1
Potamogeton zosteriformis	Flat-stem pondweed	P	–
FLOATING TAXA			
Nymphaea odorata	White waterlily	4	<0.1
Wolffia columbiana	Common watermeal	4	<0.1
Spirodela polyrhiza	Large Duckweed	4	<0.1
Lemna minor	Small duckweed	3	<0.1
Nuphar variegata	Bull-head pond-lily	1	<0.1
EMERGENT TAXA			
Schoenoplectus acutus	Hardstem bulrush	2	<0.1
Sagittaria sp.	Arrowhead	P	<0.1

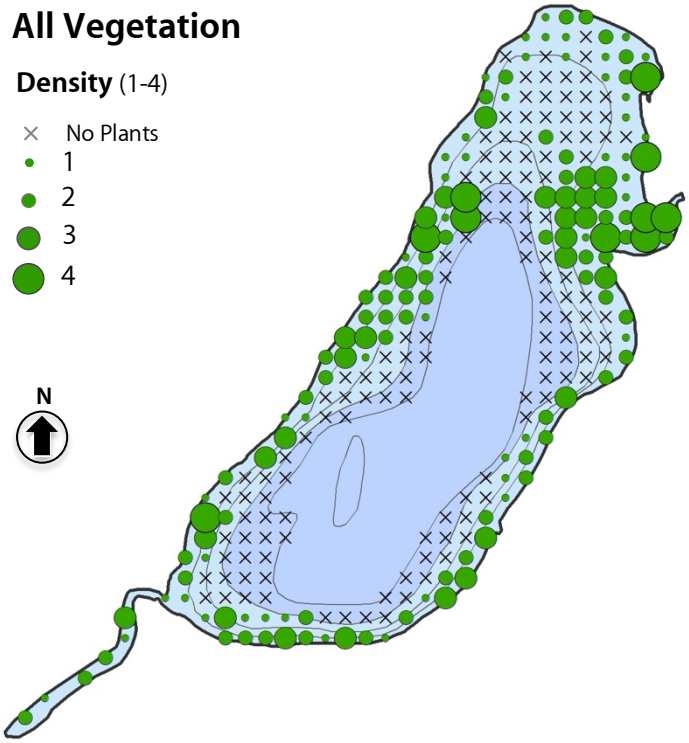
Table 2. Summary of Briggs Lake plant community metrics from 2020 survey.

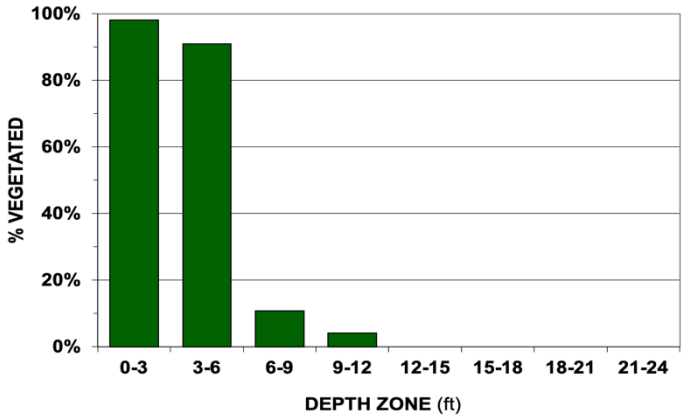
	AUG 2020
WHOLE-LAKE METRICS	
Lake Area (acres)	412
Total Points Sampled	254
% Points Vegetated	57%
% Points Veg. to Surface	10%
Max Depth of Growth (95%)	5.8 ft
Native Submersed Taxa	11
Native Floating/Emergent Taxa	8
Non-Native Submersed Taxa	1
LITTORAL METRICS *(≤15 ft)*	
Littoral Area (acres)	273
Littoral Points Sampled	227
% Littoral Points Vegetated	64%
Mean Plant Height (ft)	0.9
% of Max Littoral Biovolume	28%
Mean Native Taxa / Point	1.7
Simpson's Diversity	89
Floristic Quality (FQI)	20.3
AMCI Score (Nichols et al. 2000)	42.0

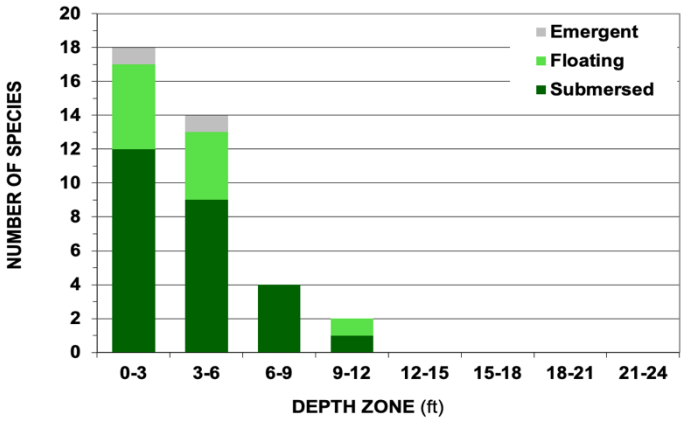
Table 3. Overview of rake density scores used to document plant abundance during point-intercept surveys.

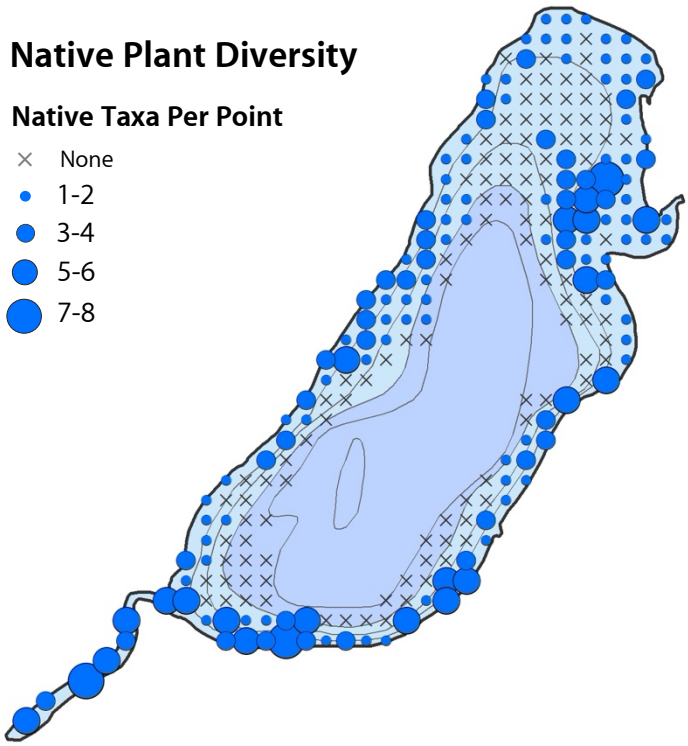
Density Score	Rake Coverage	Description
1		Only a few plants retrieved
2		Full length of rake head covered, but tines only partially covered
3		Plants completely cover the rake head and tines
4		Enough plants to cover rake head and tines multiple times

Briggs Lake – Aquatic Plant Community









Surveyed: Aug 11, 2020
Methods: Rake, Visual, Sonar
Surveyor: JA Johnson

Certified Lake Manager
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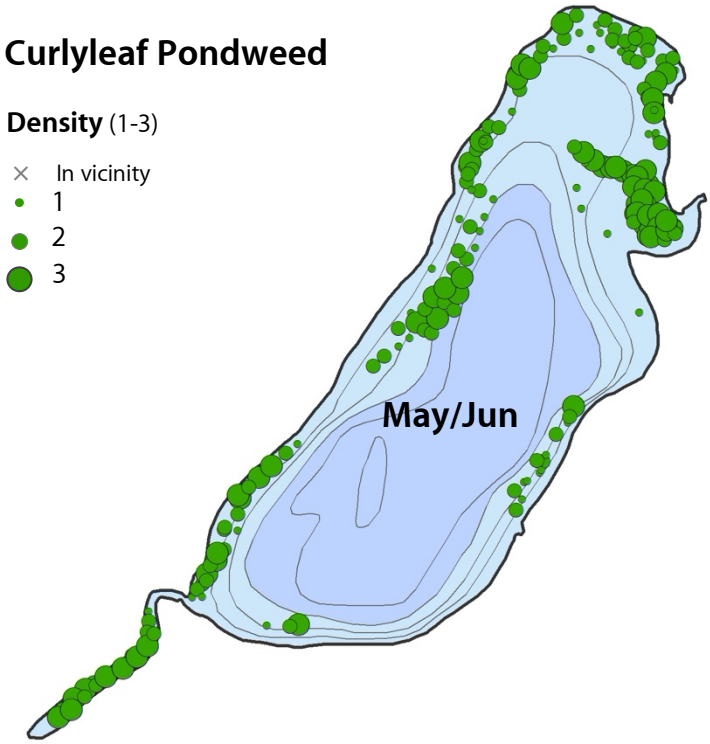
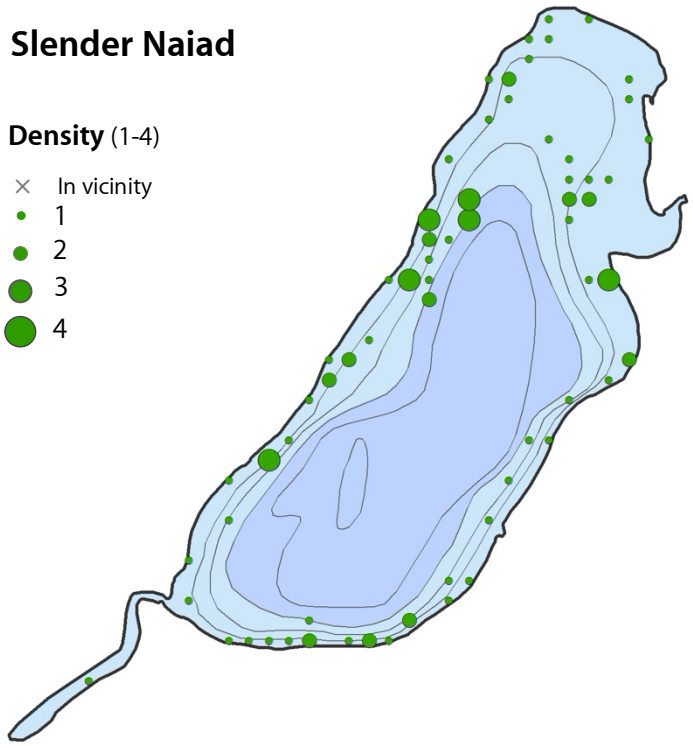
Briggs Lake – Invasive Aquatic Plants

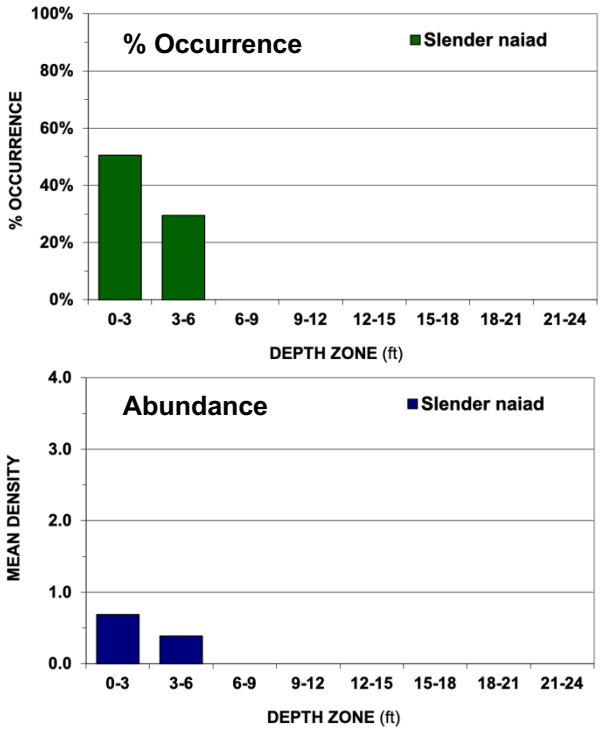


Curlyleaf pondweed naturally dies off in the late spring. Although we found a few locations with curlyleaf during this late-summer survey, the map to the left (from May and June surveys) is a more accurate assessment of curlyleaf in Briggs Lake. For more detail, see the 2020 curlyleaf pondweed delineation survey report for the Briggs Chain.

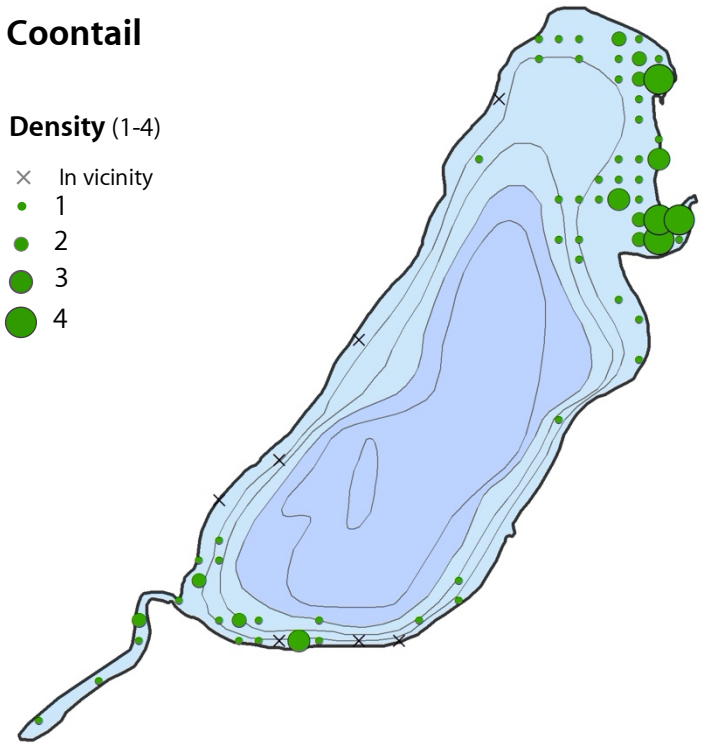
Briggs Lake – Native Aquatic Plants *(Submersed)*

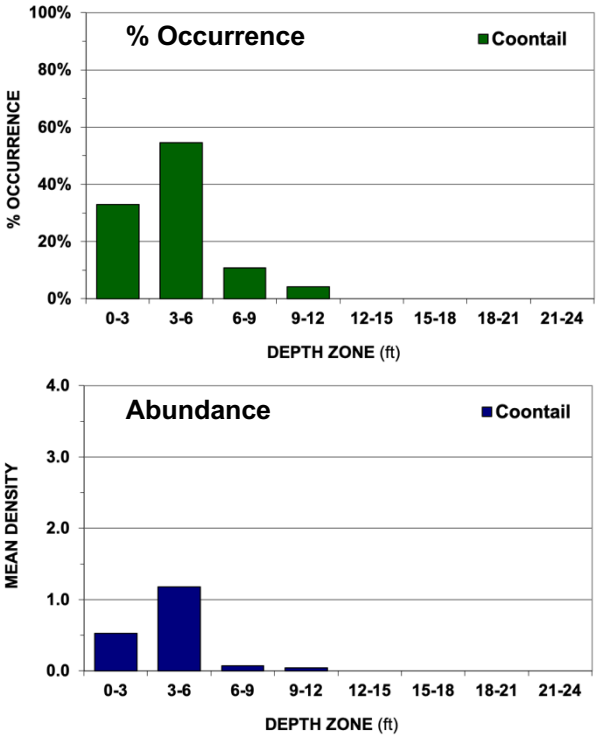
Slender Naiad





Coontail



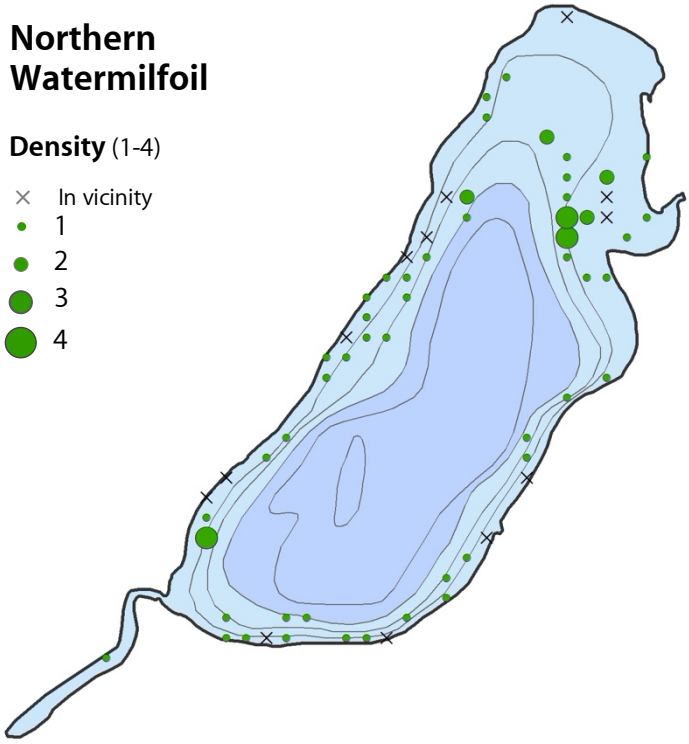


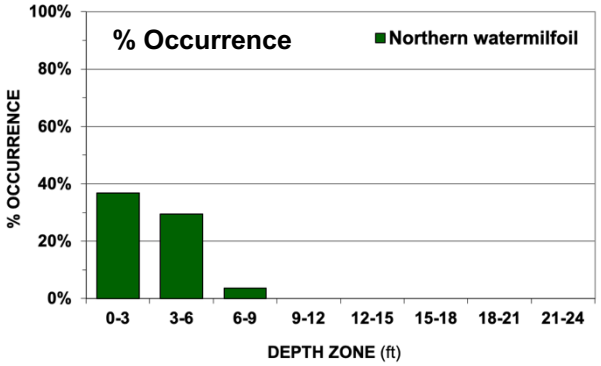
Briggs Lake – Native Aquatic Plants *(Submersed)*

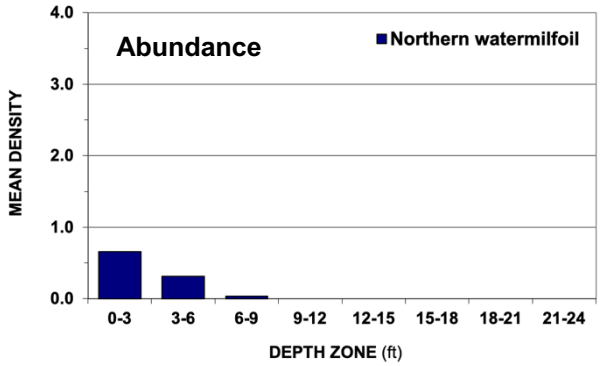
Northern Watermilfoil

Density (1-4)

× In vicinity
• 1
• 2
• 3
• 4



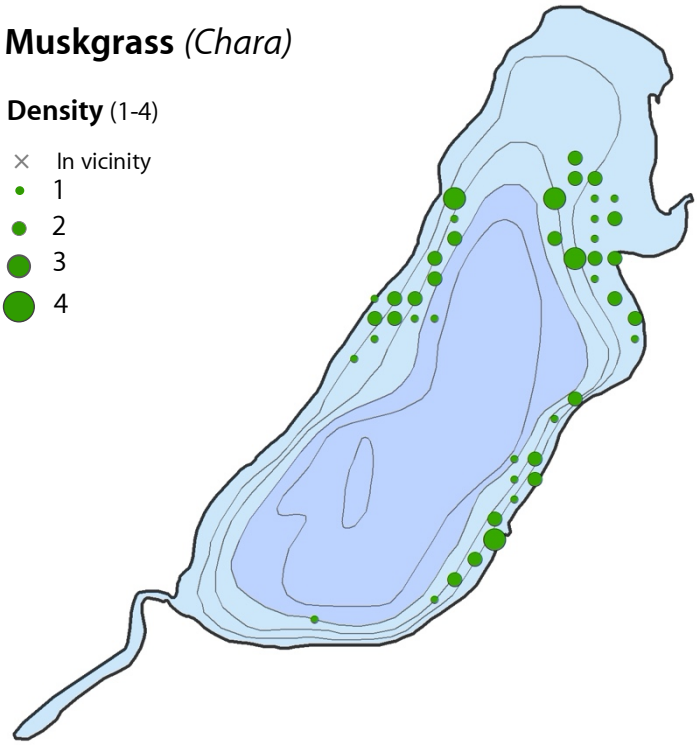


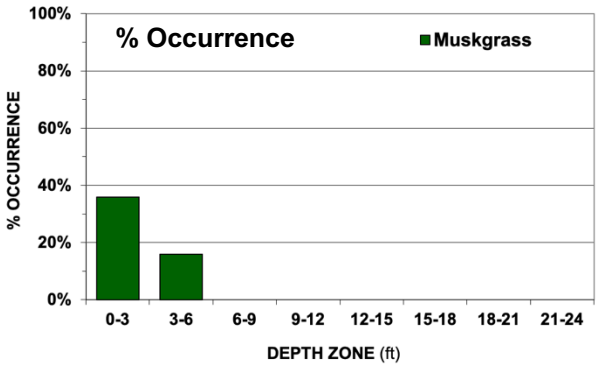


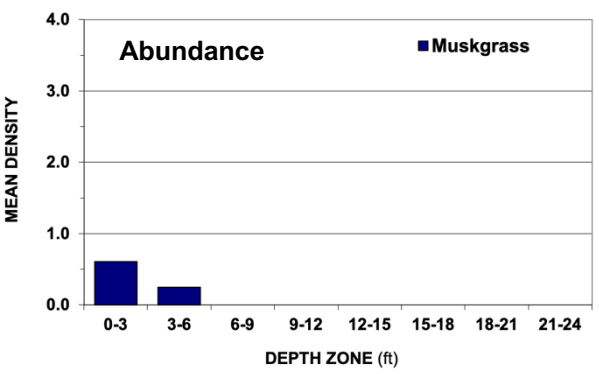
Muskgrass *(Chara)*

Density (1-4)

× In vicinity
• 1
• 2
• 3
• 4

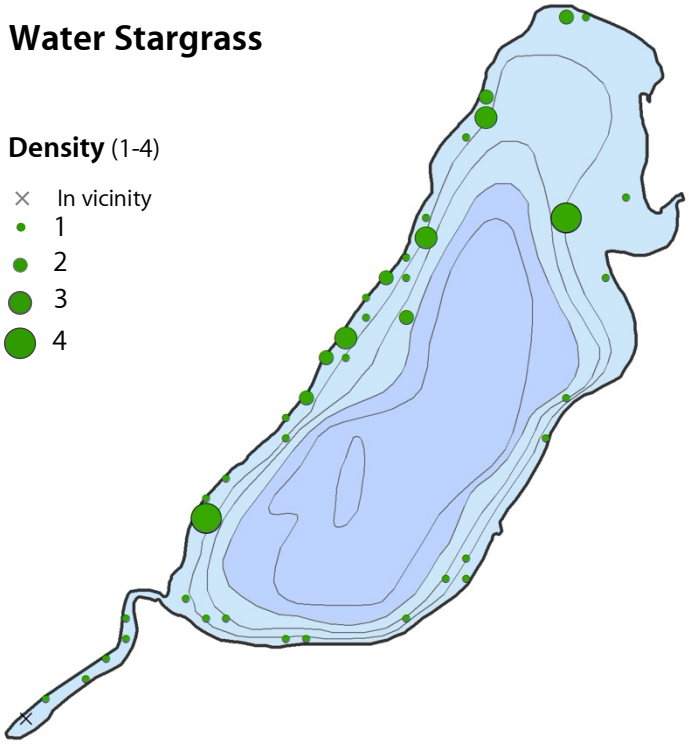


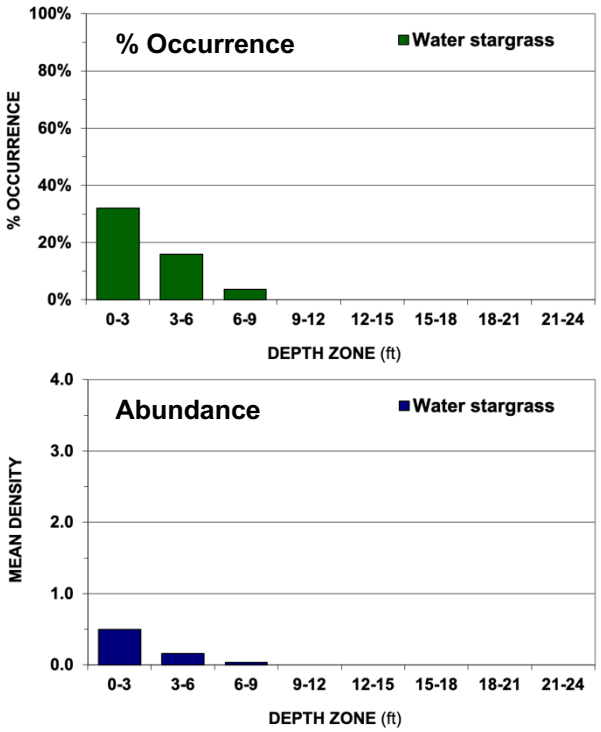




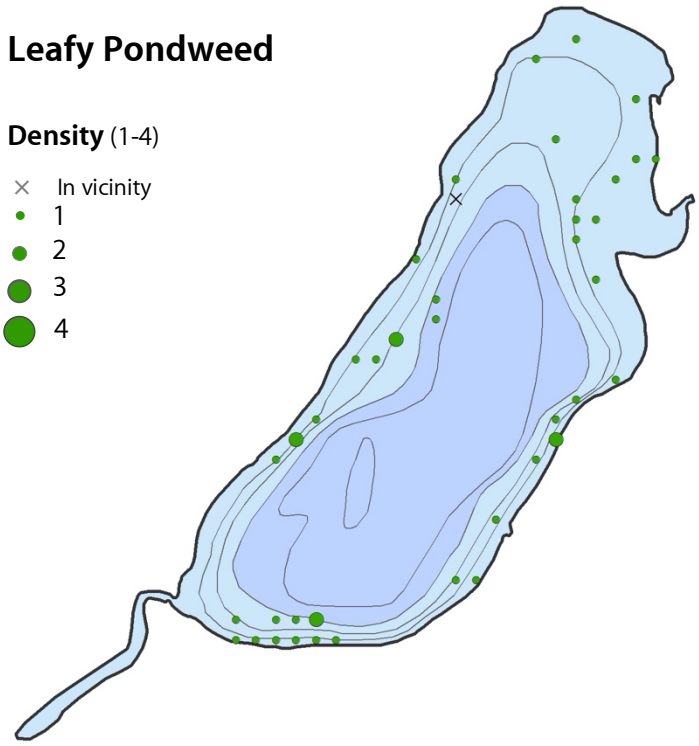
Briggs Lake – Native Aquatic Plants *(Submersed)*

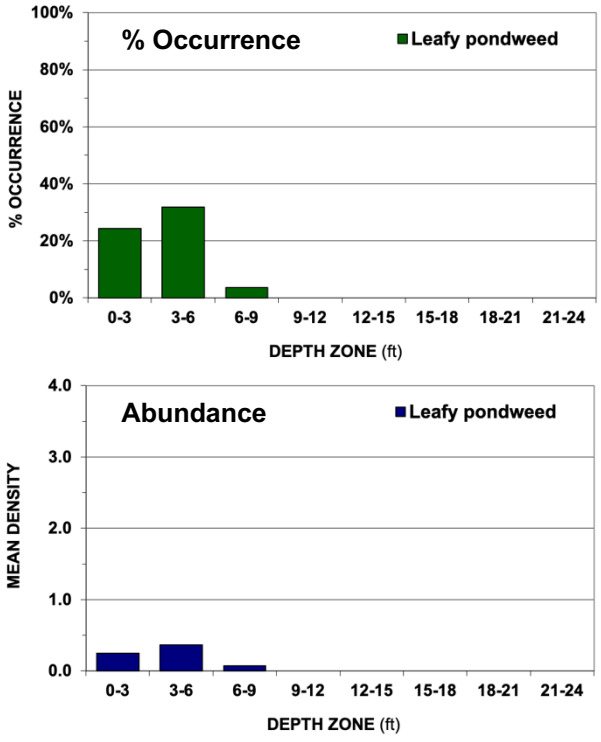
Water Stargrass



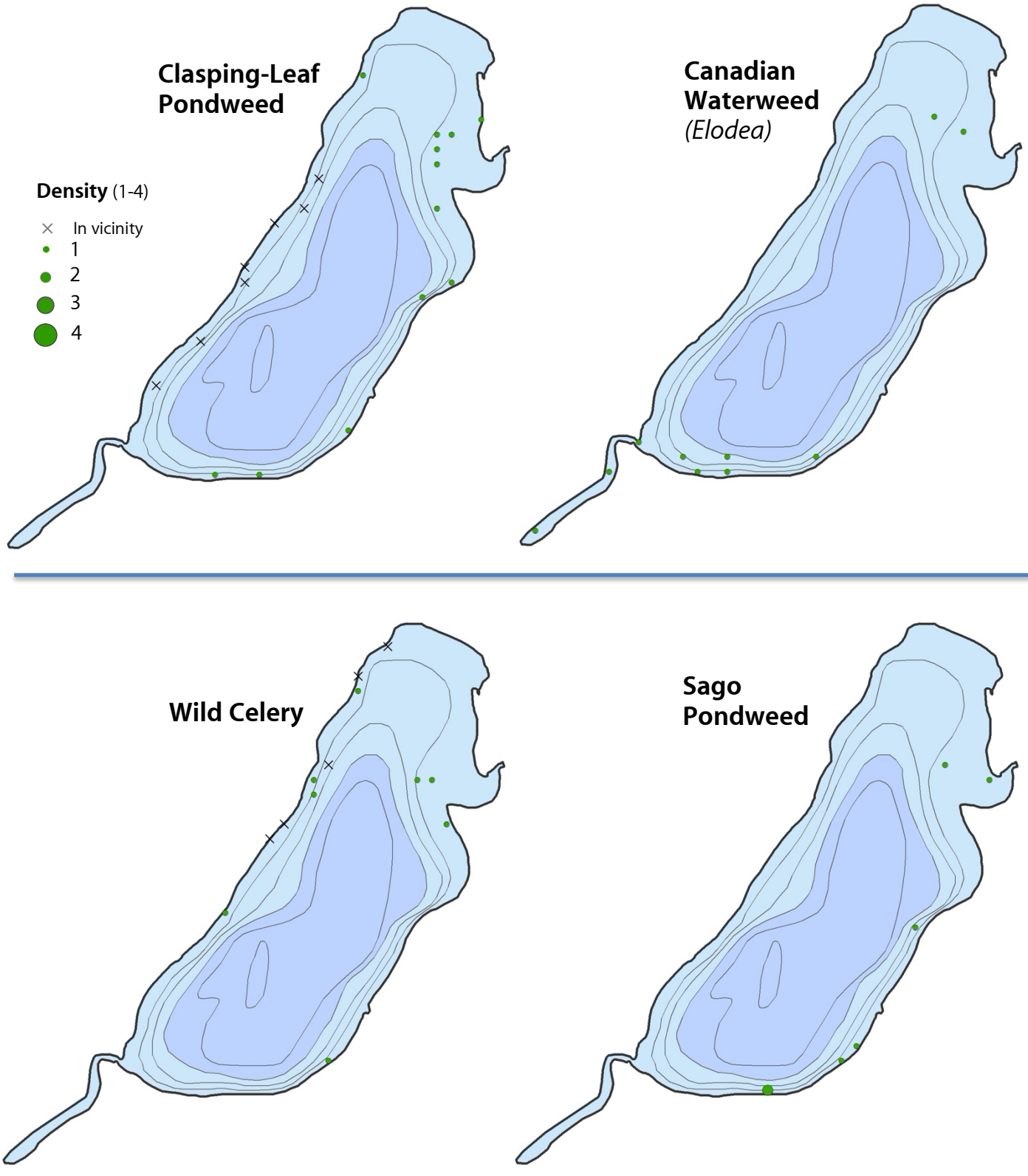


Leafy Pondweed

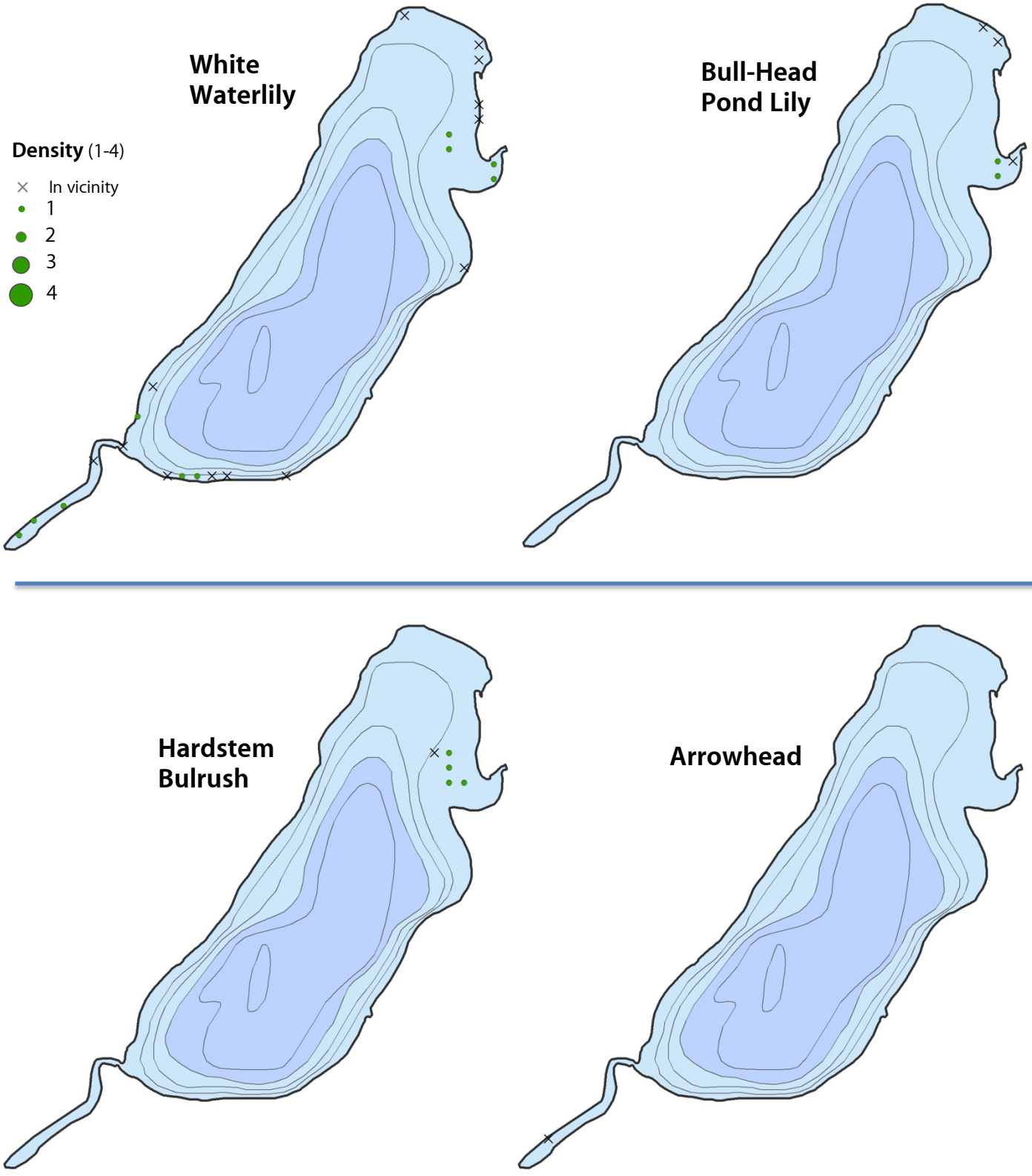




Briggs Lake – Native Aquatic Plants *(Submersed)*



Briggs Lake – Native Aquatic Plants *(Floating & Emergent)*



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