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2017 Aquatic Plant Survey: Silver Lake

(WBIC# 27-0136-00)

Surveyed August 4, 2017

Surveying, Analysis, and Reporting by:

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NALMS Certified Lake Manager
www.NALMS.org

Prepared for Riley Purgatory Bluff Creek Watershed District – September 2017

Survey & Analysis Methods

Point-Intercept Survey

Freshwater Scientific Services, LLC surveyed the aquatic plant community of Silver Lake (Hennepin Co., MN) on August 4, 2017 using the point-intercept survey method described by Madsen (1999). This survey incorporated assessments at 113 sample points arranged in a uniform grid (50-m spacing) across the entire lake (Figures 1 and 2).

At each designated sample location, we collected plants using a 14-tine rake on an extendable pole. 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 (Figure 3) for each individual species and for all plants collectively.

We calculated the littoral frequency (≤15 ft, % occurrence) and littoral mean plant abundance (density score) for each encountered plant species, as well as bay-wide and littoral community metrics (Tables 1 and 2). Plant species that were observed growing within 10 ft 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 present, but these "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. Sampled points for Silver Lake in 2017

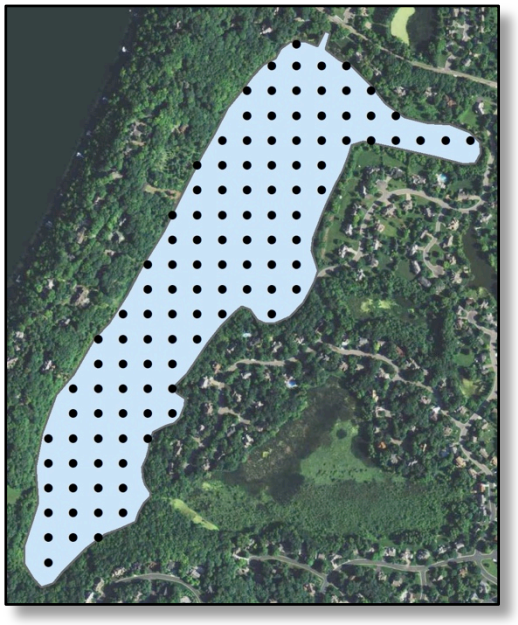
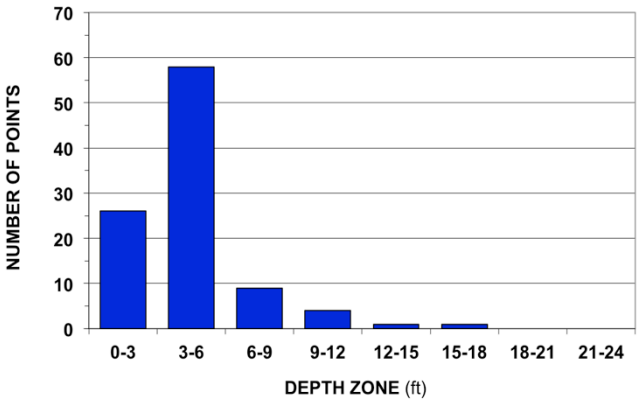


Figure 2. Sampling effort (number of locations sampled) within successive 3-ft depth zones. (Silver Lake, 2017)



Results

Statistical Summary of Aquatic Plant Community in Silver Lake

Table 1. Littoral frequency (% occurrence) and abundance (mean density score) of plant species found during the 2017 survey of Silver Lake. % Occurrence and mean density (0-4 scale) were calculated using all littoral points (water depth ≤15 ft). "P" denotes taxa that were observed growing but not retreived in any rake samples.

PLANT TAXA	COMMON NAME	% Occurrence	Littoral Density
ALL TAXA (combined)		**96**	**3.2**
SUBMERSED TAXA			
Ceratophyllum demersum	Coontail	93	2.4
Elodea canadensis	Canadian waterweed	60	1.2
Potamogeton zosteriformis	Flat-stem pondweed	59	0.6
Stuckenia pectinata	Sago pondweed	8	0.1
Potamogeton foliosus	Leafy pondweed	4	<0.1
Aquatic Moss	Aquatic moss	2	<0.1
Najas flexilis	Slender naiad	2	<0.1
Utricularia vulgaris	Common bladderwort	2	<0.1
*Potamogeton crispus**	Curly-leaf pondweed	1	<0.1
FLOATING/EMERGENT TAXA			
Nymphaea odorata	White waterlily	51	0.5
Lemna trisulca	Star duckweed	49	0.5
Spirodela polyrhiza	Large Duckweed	36	0.4
Lemna minor	Small duckweed	12	0.1
Zizania palustris	Northern wild rice	3	<0.1
Typha sp.	Cattail	1	<0.1
*Lythrum salicaria**	Purple loosestrife	P	–
Phragmites australis†	Common reed	P	–

* Aquatic invasive plant
† Appears to be native *Phragmites*

Table 2. Summary of plant community metrics for the 2017 survey conducted on Silver Lake

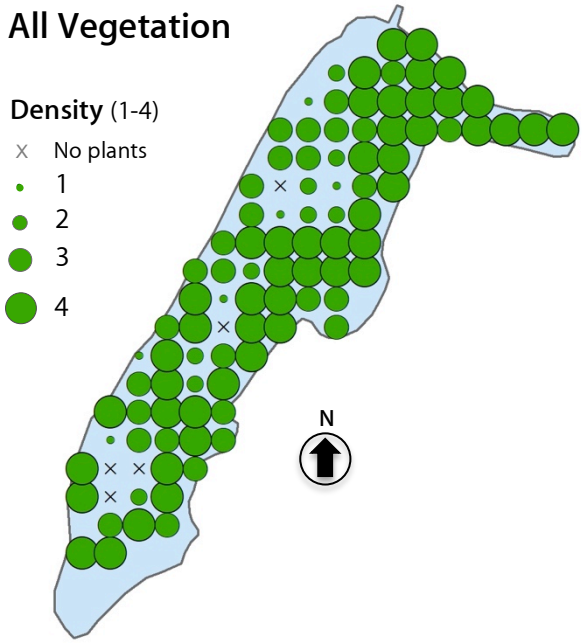
SURVEY RESULTS	2017
LAKE-WIDE METRICS	
Lake Area (acres)	62
Total Points Sampled	99
% Lake Vegetated	96%
% Lake with Veg. to Surface	58%
Max Depth of Growth (95%)	6.7 ft
# Native Taxa	15
# Non-Native Taxa	2
LITTORAL METRICS (≤15 ft)	
Littoral Area (acres)	62
Littoral Points Sampled	98
% Littoral Points Vegetated	96%
Mean Littoral Plant Height (ft)	3.3 ft
% of Max Littoral Biovolume	77%
Mean Native Taxa / Point	3.8
Simpson's Diversity	0.85
Floristic Quality (FQI)	15.8
AMCI Score	49

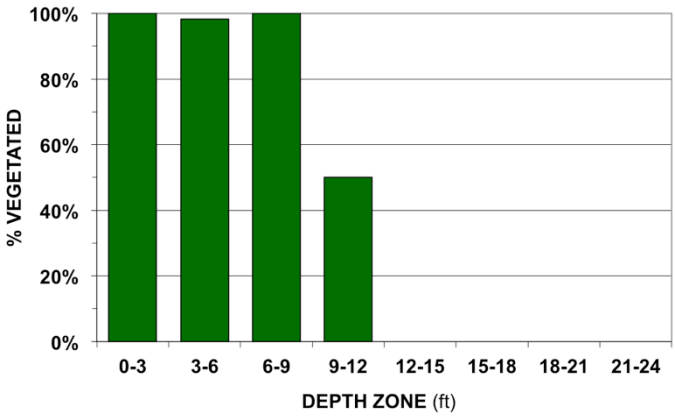
Figure 3. Rake density scores used to assess plant abundance during point-intercept surveys

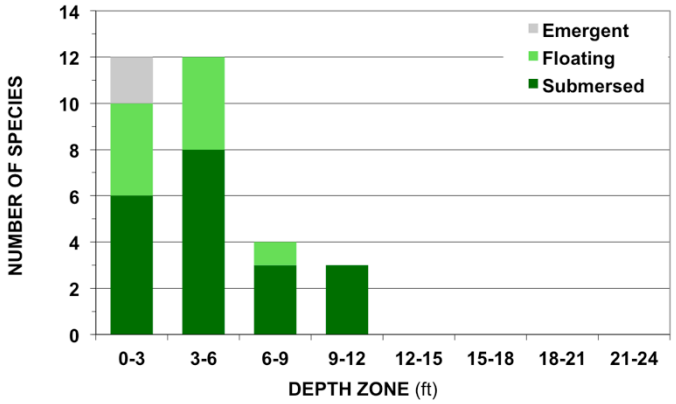
Density Score	Rake Coverage	Description
1		Only a few plants retrieved
2		Full length of rake head covered, but tines only partially covered
3		Plants completely cover the rake head and tines
4		Enough plants to cover rake head and tines multiple times

Silver Lake – Aquatic Plant Community

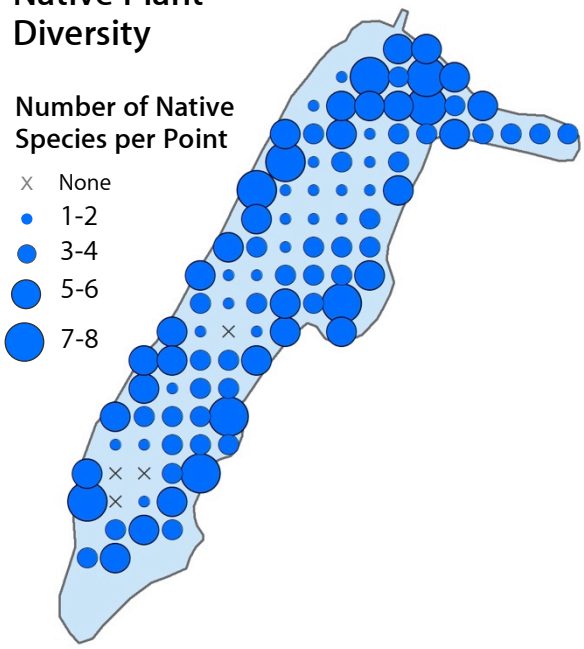
All Vegetation







Native Plant Diversity



Surveyed: August 4, 2017
Methods: Rake, Sonar, Depth Rod
Surveyor: JA Johnson

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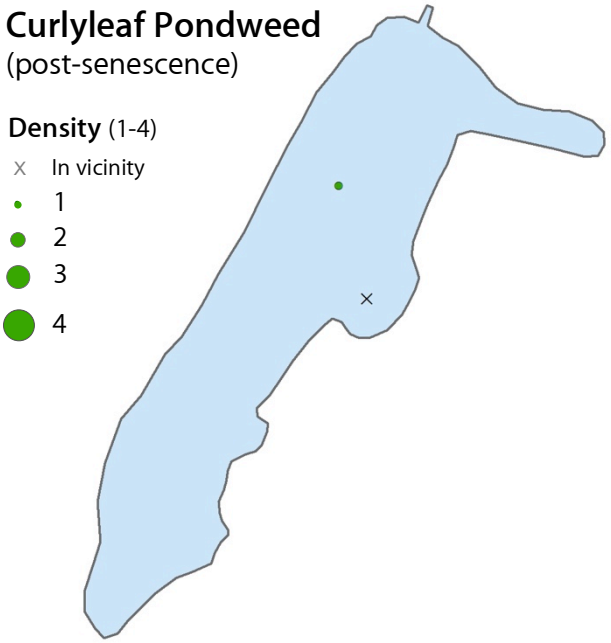
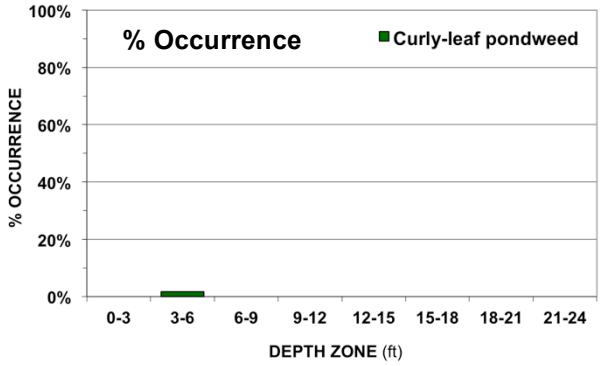
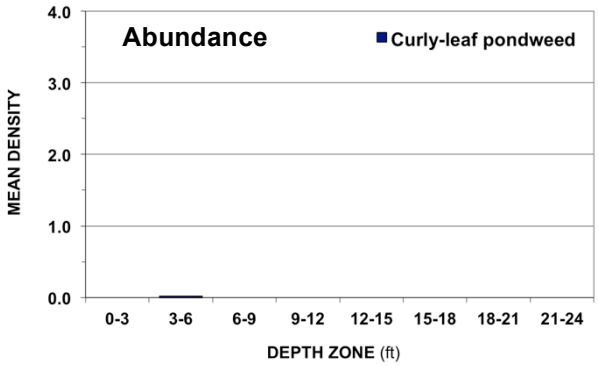
Silver Lake – Invasive Aquatic Plants

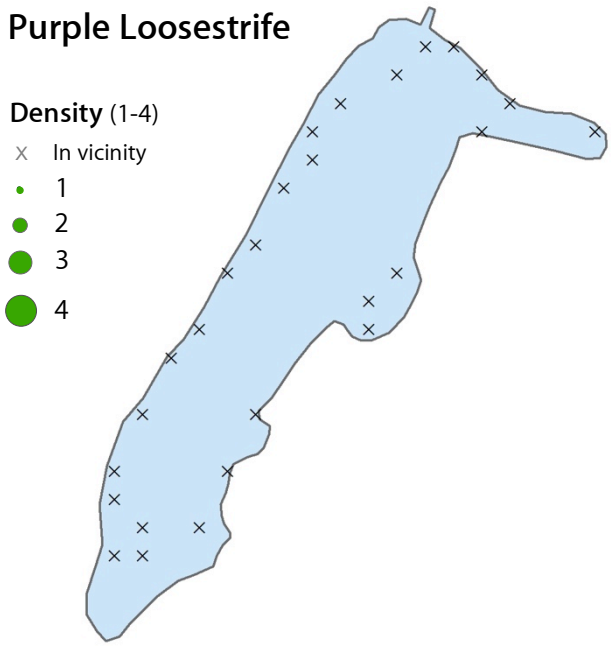
Curlyleaf Pondweed
(post-senescence)





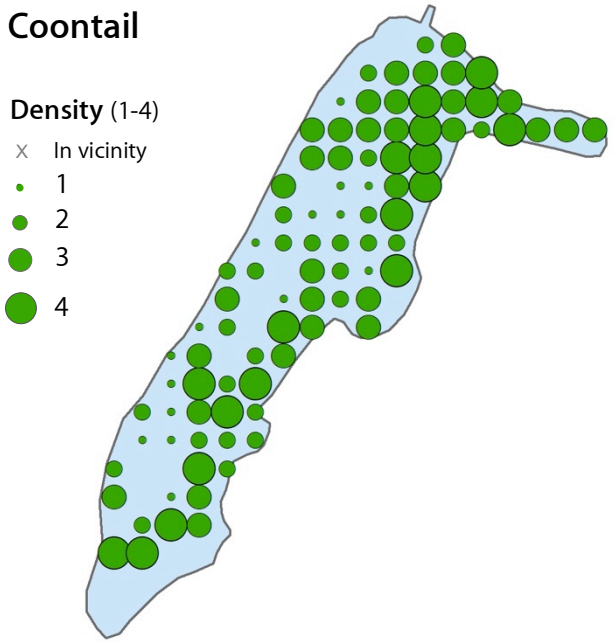


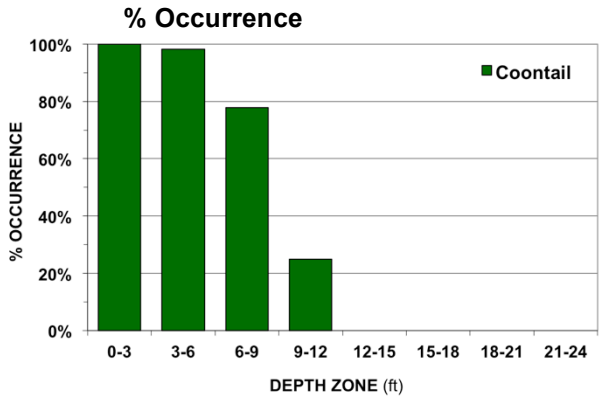
Purple Loosestrife

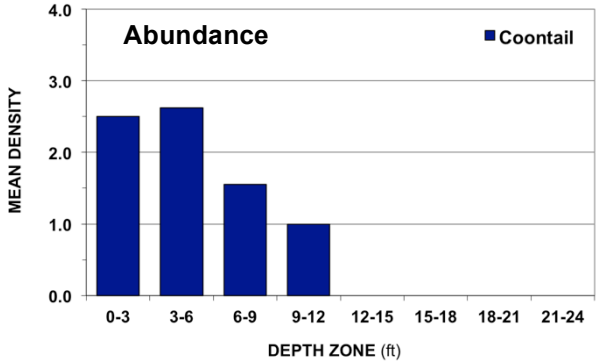


Silver Lake – Native Submersed Aquatic Plants

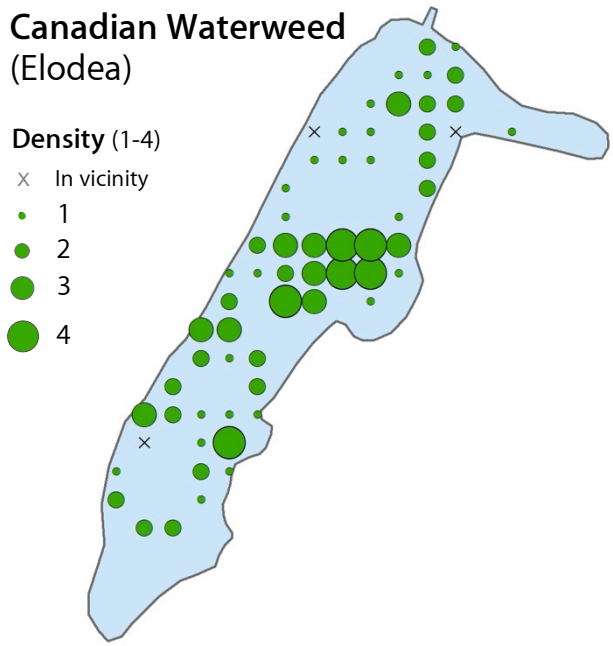
Coontail

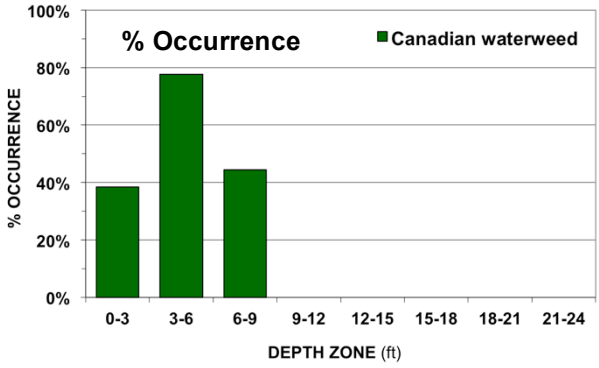


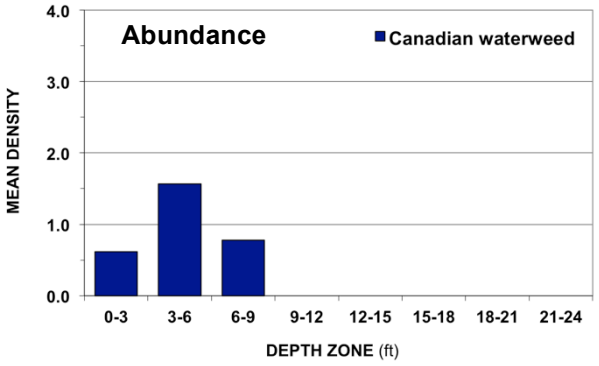




Canadian Waterweed (Elodea)

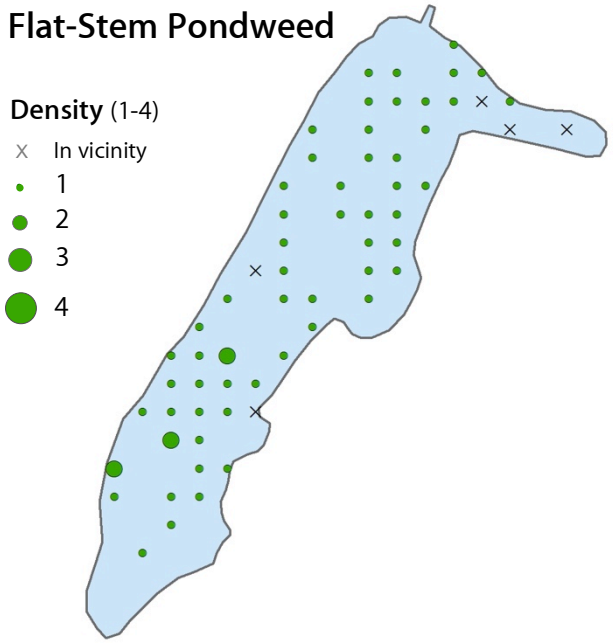


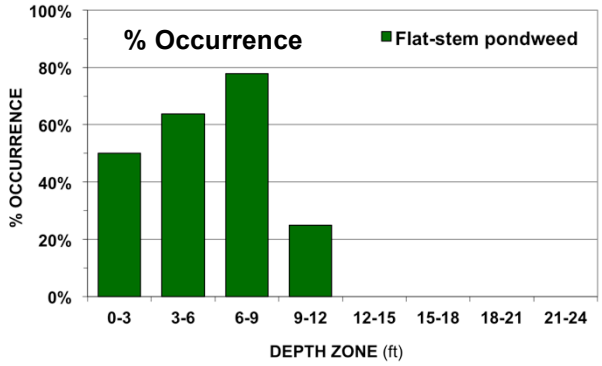


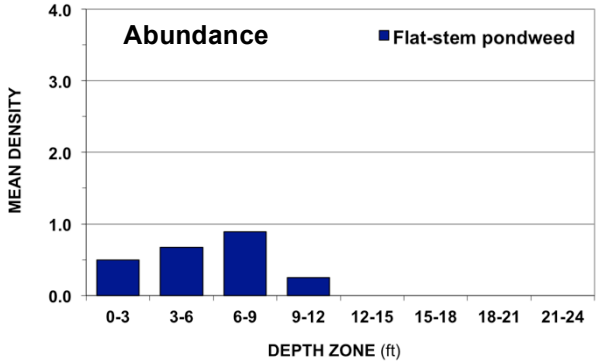


Silver Lake – Native Submersed Aquatic Plants

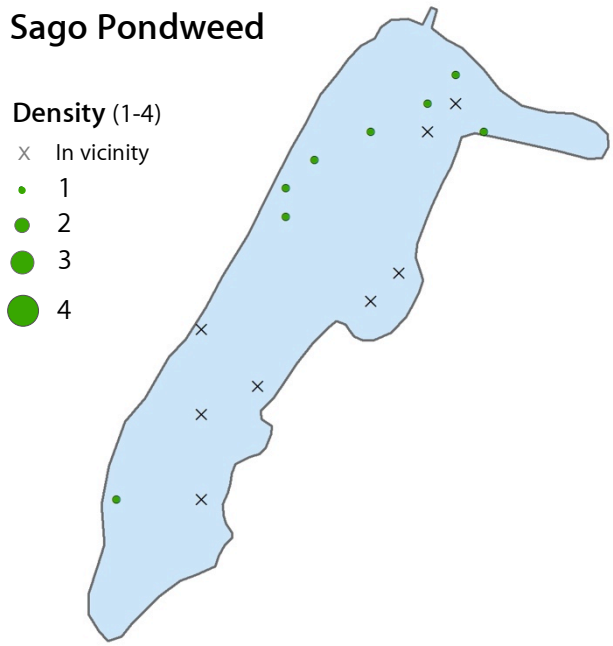
Flat-Stem Pondweed

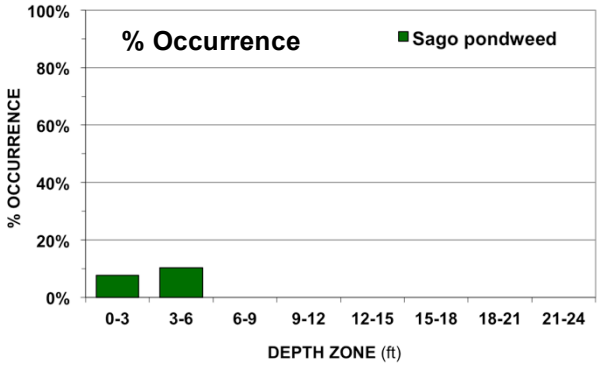


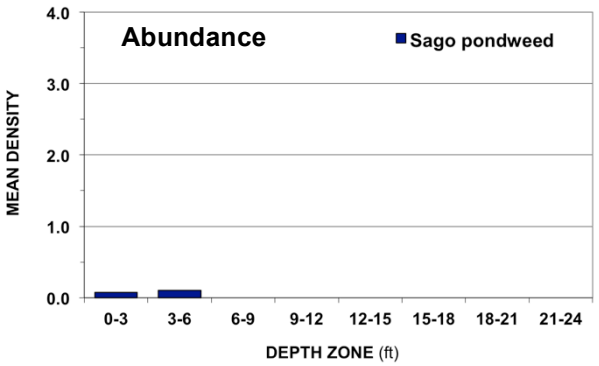




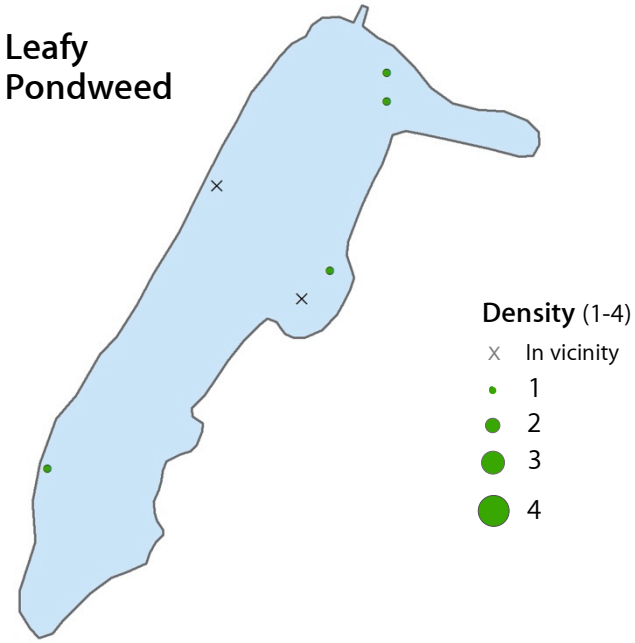
Sago Pondweed

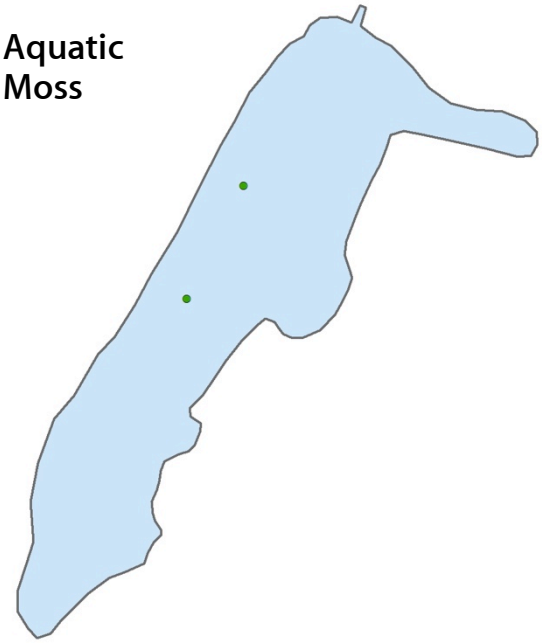


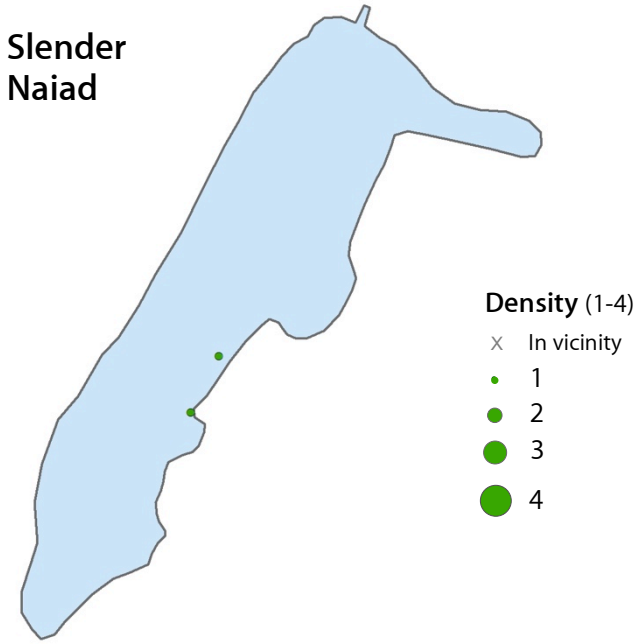


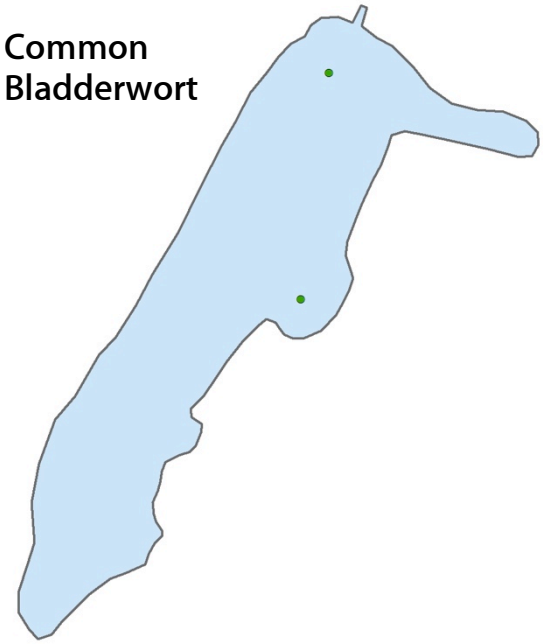


Silver Lake – Native Submersed Aquatic Plants

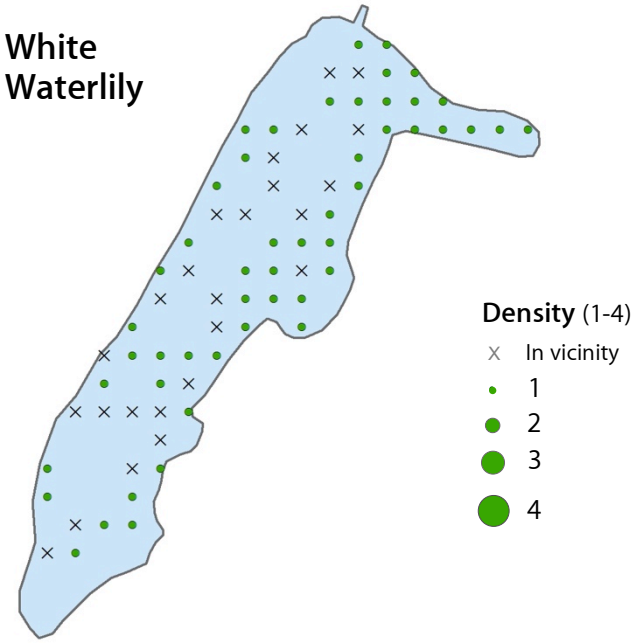


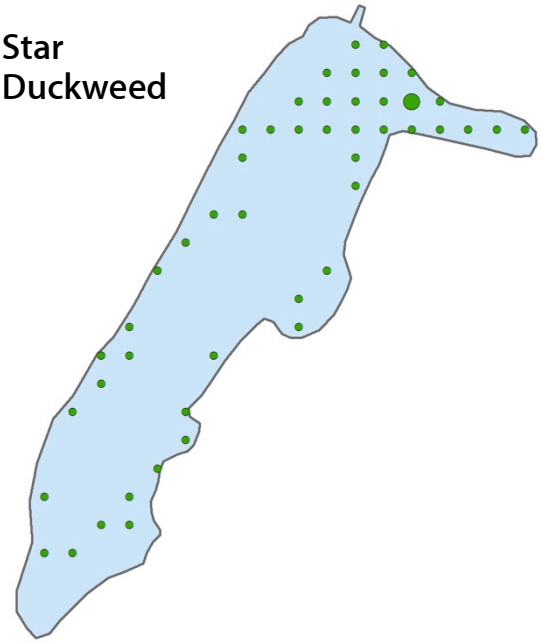


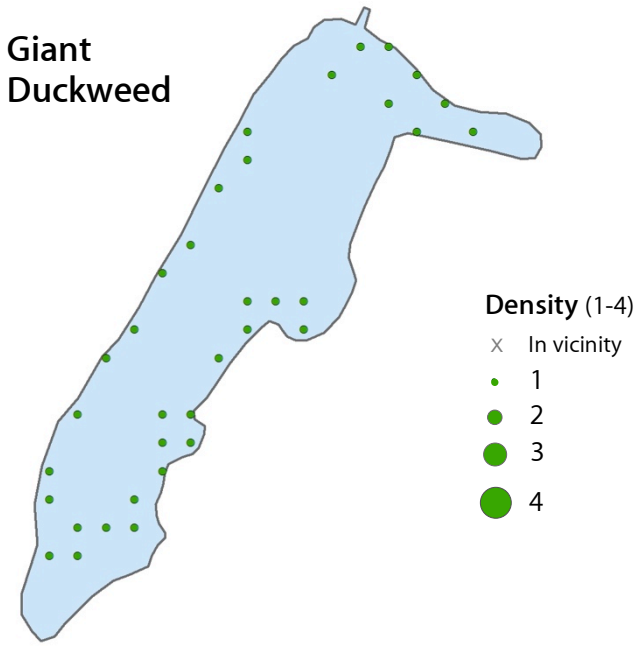


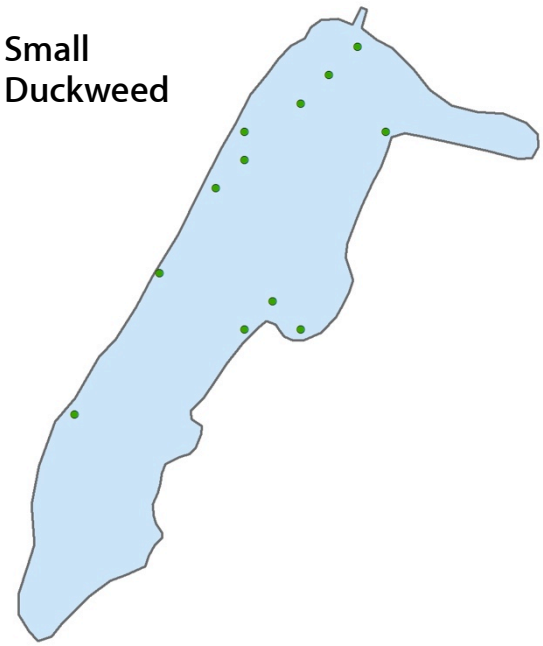


Silver Lake – Native Floating Aquatic Plants



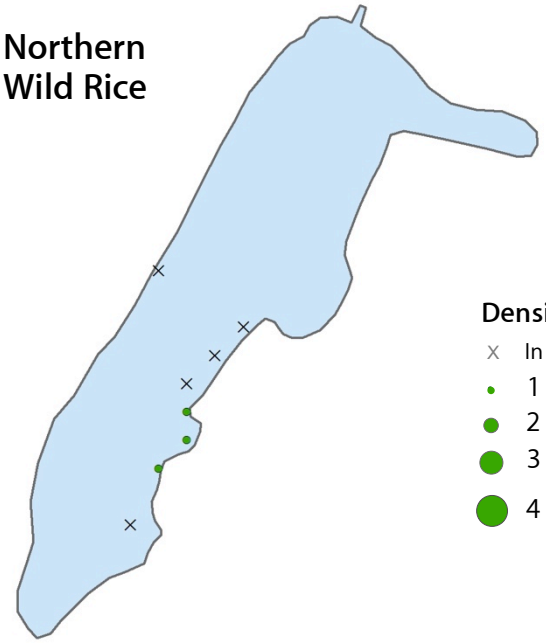




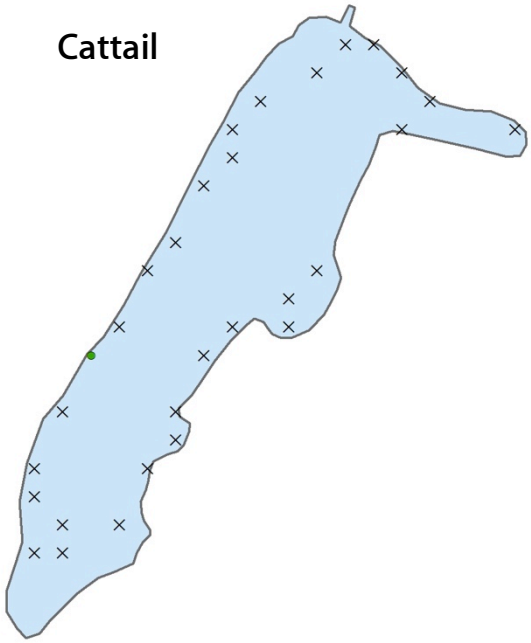


Silver Lake – Native Emergent Aquatic Plants

Northern Wild Rice

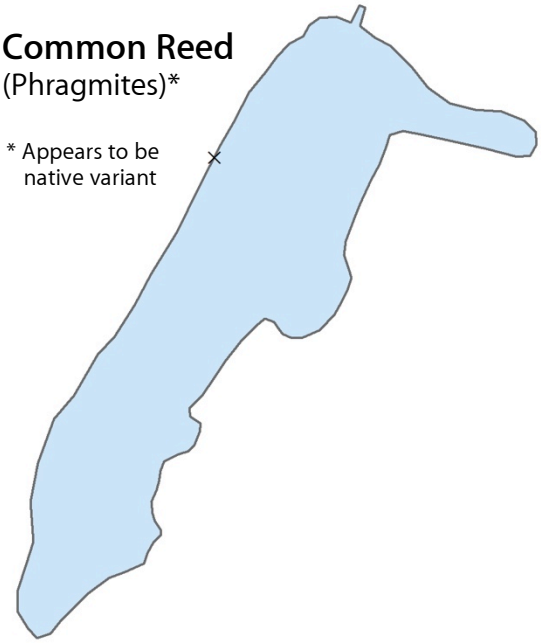


Cattail



Common Reed (Phragmites)*

* Appears to be native variant



References

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