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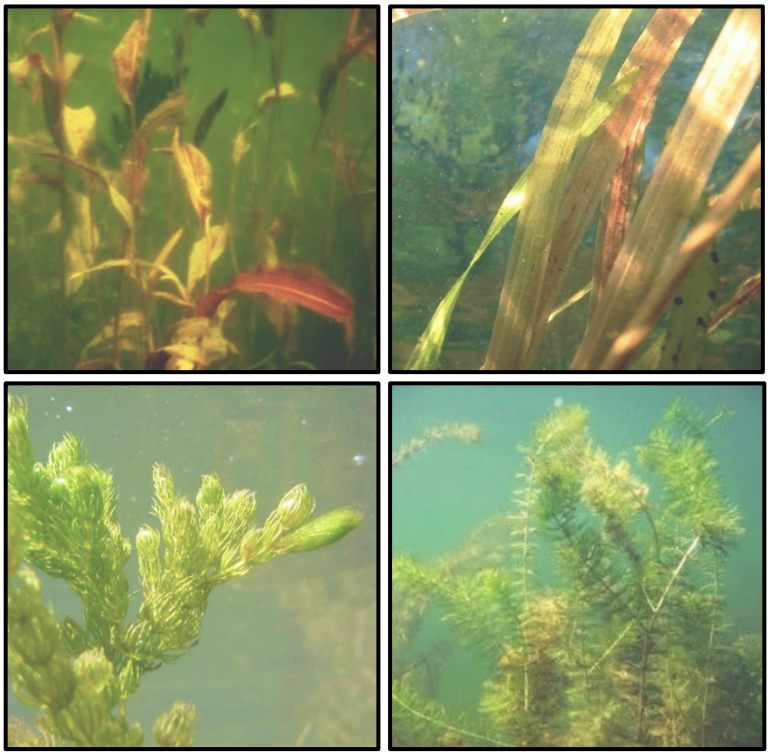
Aquatic Plant Community of Martha Lake

Wright County, MN *(#86-0009-00)*

Surveyed June 25, 2015



Surveying, Analysis, and Reporting by:

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Survey & Analysis Methods

Point-Intercept Survey

Freshwater Scientific Services, LLC surveyed the aquatic plant community of Martha Lake (#86-0009-00; Wright Co., MN) on June 25, 2015 using the point-intercept survey method described by Madsen (1999). This survey incorporated assessments at ~123 sample points arranged in a uniform grid (55-m spacing) across the entire lake (Figures 1 and 2).

At each designated sample location, we collected plants using a double-headed, 14-tine rake 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 (Figure 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, as well as lake-wide and littoral community metrics (Tables 1 and 2). Plant species that were observed growing in the immediate 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 present in the lake's species list, 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. Designated sample locations for Martha Lake in June 2015.

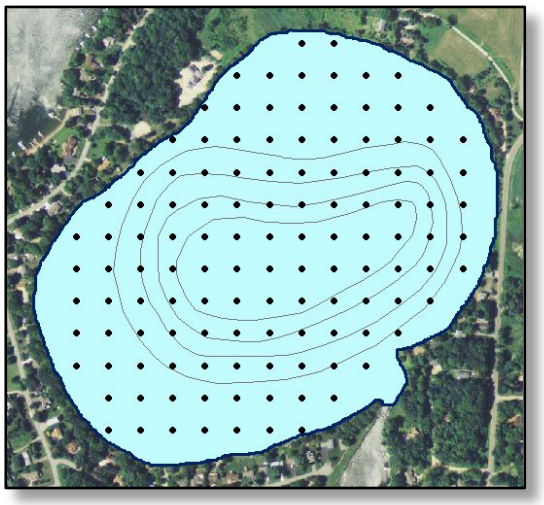
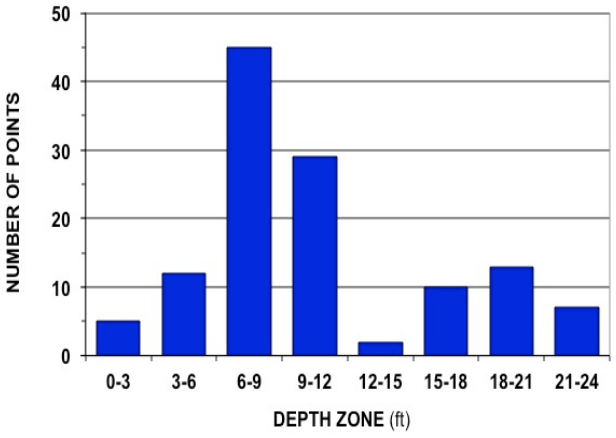


Figure 2. Sampling effort (number of locations sampled) within successive 3-ft depth zones for the June 2015 survey of Martha Lake.



Results

Statistical Summary of Findings

Table 1. Littoral frequency (% occurrence) and abundance (mean density score) of plant species found during the June 2015 survey of Martha 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 in the lake but not retreived in any rake samples.

PLANT TAXA	COMMON NAME	% Occurrence	Littoral Density
ALL TAXA (combined)		**99**	**2.0**
SUBMERSED TAXA			
Potamogeton crispus	Curly-leaf pondweed	86	1.5
Ceratophyllum demersum	Coontail	37	0.5
Chara sp.	Muskgrass	18	0.3
Zosterella dubia	Water stargrass	15	0.2
Potamogeton foliosus	Leafy pondweed	9	0.1
Stuckenia pectinata	Sago pondweed	7	0.1
Elodea canadensis	Canadian waterweed	1	<0.1
Najas flexilis	Slender naiad	1	<0.1
FLOATING / EMERGENT TAXA			
Lemna trisulca	Star duckweed	44	0.5
Spirodela polyrhiza	Large Duckweed	1	<0.1
Schoenoplectus acutus	Hardstem bulrush	P	–

Table 2. Summary of plant community metrics for the June 2015 survey conducted on Martha Lake.

2015 SURVEY RESULTS	June
WHOLE-LAKE METRICS	
Lake Area (acres)	101
Total Points Sampled	123
% Lake Vegetated	81%
% Lake with Plants to Surface	29%
Max Depth of Growth (95%)	15 ft
# Native Taxa	10
# Non-Native Taxa	1
LITTORAL METRICS (≤15 ft) *	
Littoral Area (acres)	79
Littoral Points Sampled	94
% Littoral Points Vegetated	99%
Mean Littoral Plant Height (ft)	3.4 ft
% of Max Littoral Biovolume	45%
Mean Native Taxa / Point	1.3
Simpson's Diversity	0.76
Floristic Quality (FQI)	14.2
AMCI Score	40

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

References

Madsen JD. 1999. Point intercept and line intercept methods for aquatic plant management. APCRT Technical Notes Collection. U.S. Army Engineer Research and Development Center, Vicksburg, MS.