

# Little Goose Lake



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## Macrophyte & Biovolume Analysis Survey 6/06/14

This document contains two reports of information collected on Little Goose Lake. The first report details the methods and findings of a point intercept survey of macrophyte vegetation and the second report details the methods and results of an aquatic vegetation biovolume data survey.

Data collected and prepared by **Ramsey Conservation District** for

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# Little Goose Lake Macrophyte Survey

June 6, 2014

## Methods:

The point intercept method incorporating a Global Positioning System (GPS) was used to assess the aquatic macrophyte community on Little Goose Lake on June 6, 2014. Samples were taken at evenly spaced (70 m) geo-referenced points. Data on depth, plant species, and abundance rank was recorded.

A double-tined metal rake attached to a rope was used to collect specimens. At each point the device was thrown out approximately 1 meter and then dragged across the substrate for approximately 1 meter. Species were identified and given a ranking based on cover of rake tines. Plant species that were floating in the water at the collection points were also counted. The table below includes the ranking system.

Percent Cover of Tines	Abundance Ranking
81-100	5
61-80	4
41-60	3
21-40	2
1-20	1

## Results:

Data was collected at 16 points. Aquatic macrophytes were found at 12 points. Curly Pond Leafweed (*potamogeton crispus*) and Canada Waterweed (*elodea canadensis*) were the most common species. Also present was Filamentous Algae (*Spirogyra spp.*). The Secchi disk reading was .6 m (1.97 ft).

Depth measurements were taken at the 12 survey points where aquatic vegetation was found. Point number, depth, plant species and abundance ranking data is reported in the map and table included in this file.

## Percent Occurrence and Average Abundance of Taxa at Little Goose Lake on 06/06/2014

Species	Common Name	Scientific Name	% Occurrence	Average Abundance
1	Curly Leaf Pondweed	<i>Potamogeton crispus</i>	83.33%	1.90
2	Canada Waterweed	<i>Elodea canadensis</i>	50.00%	3.00
3	Filamentous Algae	<i>Spirogyra</i> spp.	8.33%	1.00

**Table 1.** Summary of percent occurrence and average abundance for aquatic plant taxa encountered during a point-intercept survey conducted on Little Goose Lake.

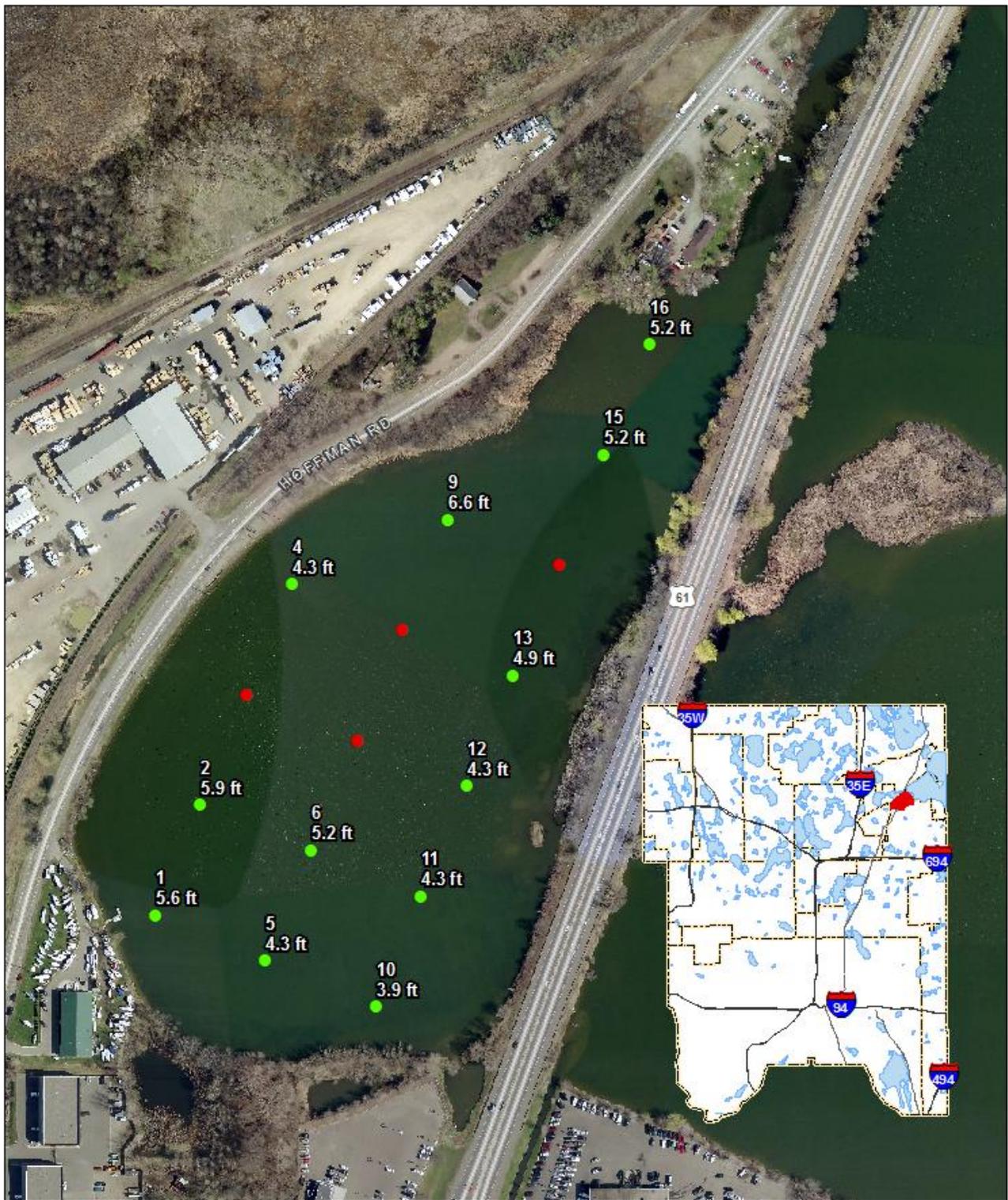
- Percent occurrence represents the number of times a plant species was observed divided by the number of total sample sites where vegetation was observed
- Average abundance is calculated as the average of the abundance ranking for an individual species present
- Weed cutting and harvesting was occurring by lake user on and around the time of survey. Affects from activity would likely have some influence on abundance and occurrence but likely not effect biodiversity of species sampled.
- The seasonal timing and water temperature on survey dates may have an influence on biodiversity as well as abundance and occurrence.

**Point Survey - Vegetation and Depth (06/06/2014)**

Point #	Depth (ft)	Curly Leaf Pondweed	Canada Waterweed	Filamentous Algae
1	5.6	2		
2	5.9	2		
4	4.3	2	1	
5	4.3	1	3	
6	5.2	4		
9	6.6	2		
10	3.9	1	5	
11	4.3		5	
12	4.3	2	2	
13	4.9		2	
15	5.2	1		1
16	5.2	2		

<b>Total Abundance</b>		<b>19</b>	<b>18</b>	<b>1</b>
<b>Count</b>	<b>12</b>	<b>10</b>	<b>6</b>	<b>1</b>
<b>Avg Abundance</b>		<b>1.90</b>	<b>3.00</b>	<b>1.00</b>
<b>% Occurrence</b>		<b>83.33%</b>	<b>50.00%</b>	<b>8.33%</b>

<b>Secchi Depth</b>	<b>1.97</b>
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**Ramsey County Aquatic Vegetation Survey**

**Little Goose Lake 6/6/2014**

- Vegetation
- No Vegetation



# Little Goose Lake Biovolume Analysis Survey

June 6, 2014

## Methods:

A Lowrance HDS-5™ Global Positioning System (GPS) enabled depth finder was used to collect submerged aquatic vegetation and lake bottom data on Little Goose Lake on June 6, 2014. Evenly spaced transects were followed at a minimum distance of 40 meters at a speed of no more than 6 miles per hour. Sonar log data was recorded to assess data on depth (bathymetric) and biovolume.

Data was reprocessed using Contour Innovations, LLC, ciBioBase system to include areas of aquatic vegetation that were topped out at the surface within Little Goose Lake.

## Results:

The results below were exported from Contour Innovations, LLC, ciBioBase system and include a map and statistics of biovolume information. More robust interactive contour and vegetation map data, including sonar log trip replays, can be viewed on the ciBioBase website: [www.cibiobase.com](http://www.cibiobase.com)

ciBIOBASE
VEGETATION ANALYSIS REPORT

Little Goose Lake, Ramsey County Minnesota
Generated: 7/1/2014 11:22:47 PM (UTC)

Waterbody Size: 11.17 ha (27.60 acres) [report link](#)

	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td><b>Data Collector</b></td><td>Ann WhiteEagle</td></tr> <tr><td><b>Data Collection Date</b></td><td>6/6/2014 12:50:28 PM (UTC)</td></tr> <tr><td><b>Average Water Temperature</b></td><td>23.9° C (75.03° F)</td></tr> <tr><td><b>Location</b></td><td>Start: 45.06848145, -93.02603149 End: 45.06887054, -93.0241394</td></tr> </table>	<b>Data Collector</b>	Ann WhiteEagle	<b>Data Collection Date</b>	6/6/2014 12:50:28 PM (UTC)	<b>Average Water Temperature</b>	23.9° C (75.03° F)	<b>Location</b>	Start: 45.06848145, -93.02603149 End: 45.06887054, -93.0241394	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td><b>Survey Size</b></td><td>Area: 10.06 ha (24.87 acres) Percent: 90.14% of waterbody Volume: 139,128.70 cu. m (112.79 acre ft)</td></tr> <tr><td><b>Est. Waterbody Volume ?</b></td><td>154,366.60 cu. m (125.15 acre ft)</td></tr> </table>	<b>Survey Size</b>	Area: 10.06 ha (24.87 acres) Percent: 90.14% of waterbody Volume: 139,128.70 cu. m (112.79 acre ft)	<b>Est. Waterbody Volume ?</b>	154,366.60 cu. m (125.15 acre ft)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td><b>Settings</b></td><td>Track Buffer: 20 m Grid Cell Size: 4 m Min. BV Detect: 5% Min. Veg Depth Detect: 0.73152 m</td></tr> <tr><td><b>Quality Control</b></td><td>Reviewer: Clifford, Patrick Status: Pass</td></tr> </table>	<b>Settings</b>	Track Buffer: 20 m Grid Cell Size: 4 m Min. BV Detect: 5% Min. Veg Depth Detect: 0.73152 m	<b>Quality Control</b>	Reviewer: Clifford, Patrick Status: Pass
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▲ Area of Interest Summary

AOI ?	Type ?	PAC ?	Avg BVp ?	SD BVp ?	Avg BVw ?	SD BVw ?	Depth Range	Avg Depth	Distance	No. Points
1	Point	91.3%	70.4%	±34.1%	64.3%	±38.1%	0.31-2.03 m	1.27 m	6.01 km	2,024
	Grid	96.8%	65.3%	±30%	63.2%	±31.6%	0.01-1.98 m	1.28 m	-	4,910

## Biovolume Analysis by Quantity

AOI ?	0-5%	5-20%	20-40%	40-60%	60-80%	>80%
1	8.7%	13.74%	9.63%	8.1%	9.73%	50.1%

## Biovolume Analysis by Depth

AOI ?	Depth	Type ?	Count	PAC ?	Avg BVp ?	SD BVp ?	Avg BVw ?	SD BVw ?
1	0-1m	Point	323	94.7%	77.6%	±31.8%	73.5%	±35.4%
	1-2m		1701	90.7%	69%	±34.4%	62.6%	±38.4%
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	692	97.7%	75.6%	±30.8%	73.9%	±32.5%
	1-2m		1582	96.6%	61.8%	±28.4%	59.7%	±30.1%
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-

## Glossary

**AOI**  
**Area of Interest:** Defines the individual transects or contiguous data samples as depicted by the color coding of each trip line. Separate areas of interest can be generated through merging of multiple trips, appending data to a single sonar log or lapses in time (greater than five minutes) within a sonar log.

**BVp**  
**Biovolume (Plant):** Refers to the percentage of the water column taken up by vegetation when vegetation exists. Areas that do not have any vegetation are not taken into consideration for this calculation.

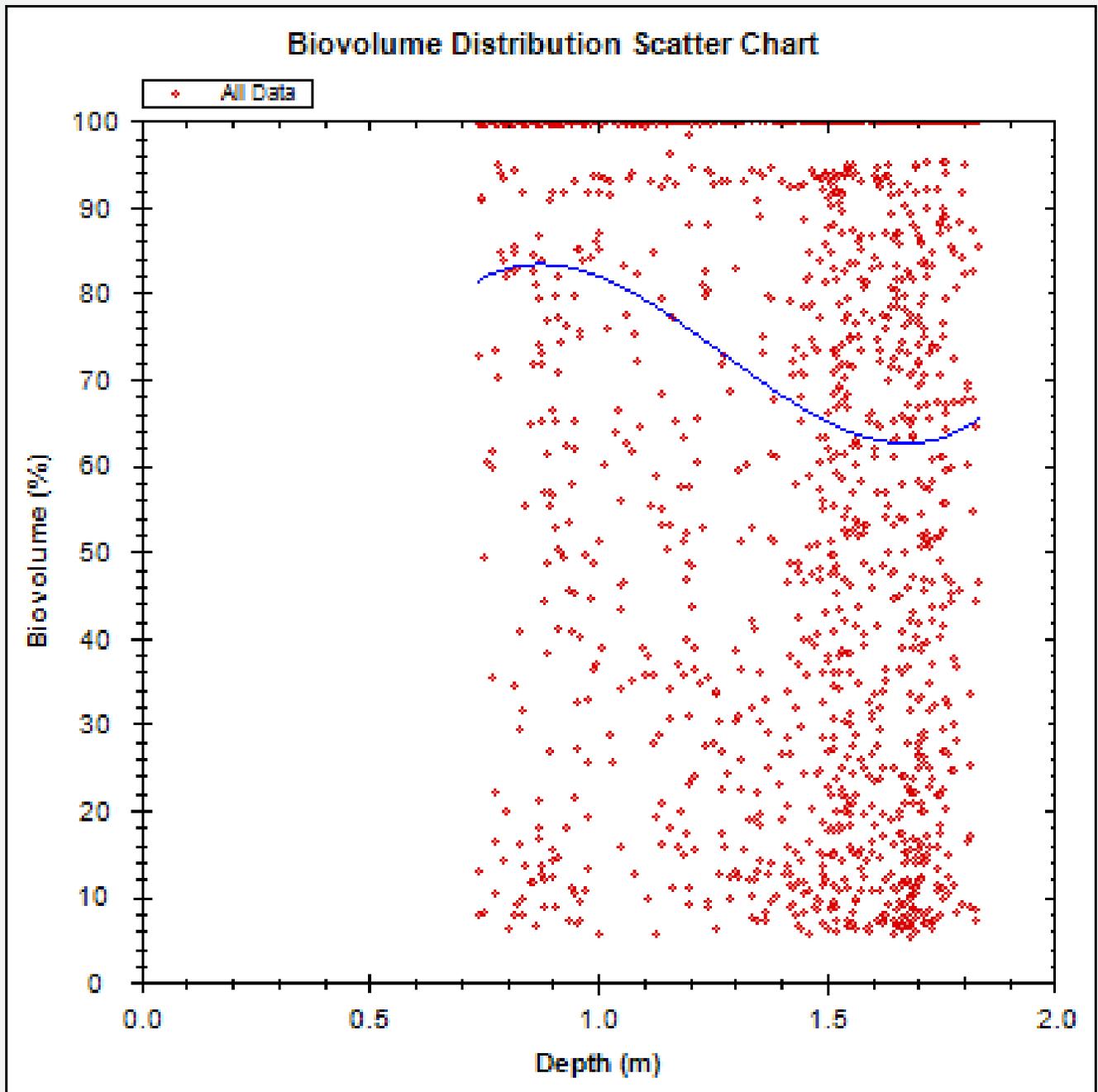
**BVw**  
**Biovolume (All water):** Refers to the average percentage of the water column taken up by vegetation regardless of whether vegetation exists. In areas where no vegetation exists, a zero value is entered into the calculation, thus reducing the overall biovolume of the entire area covered by the survey.

**PAC**  
**Percent Area Covered:** Refers to the overall surface area that has vegetation growing.

**Grid**  
**Geostatistical Interpolated Grid:** Interpolated and evenly spaced values representing kriged (smoothed) output of aggregated data points. The gridded data is most accurate summary of individual survey areas.

**Point**  
**Individual Coordinate Point:** A single point represents a summary of sonar pings and the derived bottom and canopy depths. Individual point data create an irregularly spaced dataset that may have overlaps and/or gaps in the data resulting in a increased potential for error.

## Biovolume Distribution Scatter Chart







## Macrophyte survey points overlaid on Biovolume map

