

Summary Report for Larks Lake 2009 Aquatic Plant Survey and Fishery Enhancement Committee Findings

During the summer of 2009, Tip of the Mitt Watershed Council staff carried out a comprehensive aquatic plant survey on Larks Lake. The goal of the survey was to collect baseline aquatic vegetation data for future trend analyses and to assist in fisheries enhancement planning. Funding for the survey was provided by the Petoskey Harbor Springs Area Community Foundation.

The survey was carried out over the course of four field days in July of 2009. Aquatic plant specimens were collected at 83 sites distributed throughout the lake, identified to the lowest taxonomic level possible (most to species), noted on datasheets, and photographed. Plant densities, relative to other plant taxa, for each taxa as well as overall plant density at the site were noted. Substrate consistency was also checked and recorded at each sample site. Sample site locations were recorded with a mapping grade GPS unit (Trimble GeoExplorer3) with reported accuracy of 1-3 meters.

Field notes and GPS data were used to develop maps displaying the plant communities and densities of Larks Lake as well as a map displaying substrate consistency*. All information from field datasheets was inputted into an Excel® work book. GPS data were uploaded onto a computer, post-processed to improve accuracy, and exported into a GIS (Geographical Information System) format. Field and GPS data were linked in a GIS and map layers were developed representing aquatic plant communities, plant densities, and substrate consistency.

A total of 23 aquatic plant taxa were documented during the survey; 9 submergents and 14 emergents. Approximately 34% of the lake contained aquatic vegetation, the majority of which was found to be of light or very light density (56%). Plant communities dominated by slender naiad were the most common, accounting for 70% of vegetated areas. Over 60% of the lake was determined to have very soft (mucky) substrate.

Results from the aquatic plant survey showed that a larger portion of the lake than previously believed contained aquatic plant life. In addition, aquatic plant diversity was greater than expected. Furthermore, it was thought that soft, mucky substrate would present a significant impediment to aquatic plant growth, but it was found that plants inhabited extensive areas with very soft substrate consistency.

Shortly after completing the survey, the Watershed Council began the second phase of the project, which consisted of establishing a fisheries enhancement committee to gather all available data, discuss options for enhancing the fisheries, and develop a plan for fisheries enhancement. A committee was

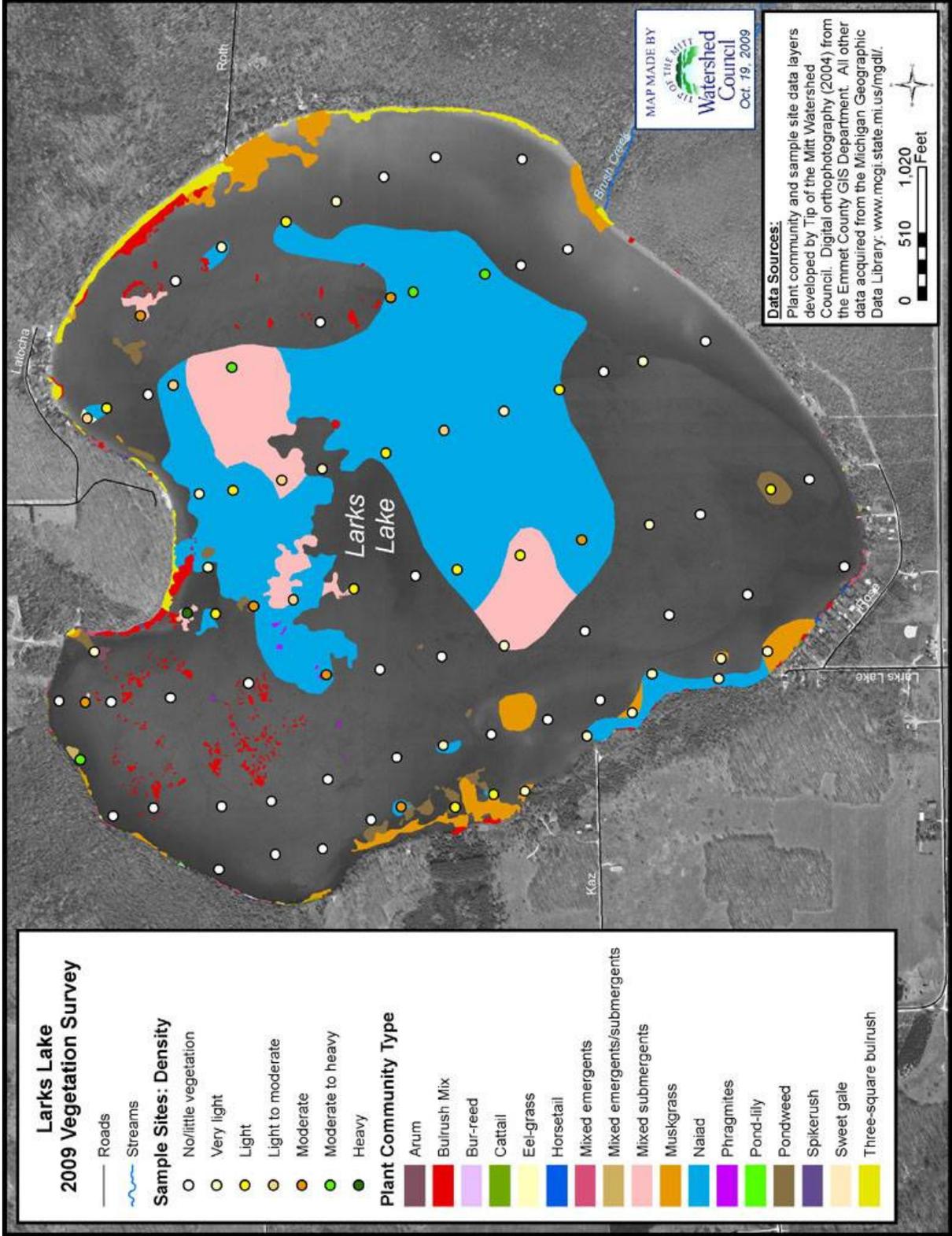
formed with representatives from the Tip of the Mitt Watershed Council, Department of Natural Resources and Environment, the Little Traverse Bay Bands of Odawa Indians and the Larks Lake Association. Data and maps developed from the aquatic plant survey were provided to committee members. An insightful and productive discussion ensued regarding the plant communities of Larks Lake.

Suggestions to augment the lake's aquatic plant community by transplanting from nurseries or other lakes met resistance due to concern for potential to introduce invasive species into an otherwise pristine, invasive-free lake. It was also suggested that Larks Lake may already be at capacity regarding the amount of aquatic plant life in the lake and that efforts to augment the aquatic plant communities of the lake may not produce results, in part because of the lack of nutrients. Committee members did feel there was merit in augmenting fish habitat using large woody debris or fish cribs, which would in turn create localized conditions conducive to plant growth and result in a more extensive and robust aquatic plant community.

Due to concerns about winter fish kills, Watershed Council staff measured the dissolved oxygen levels in Larks Lake in March of 2010 (while still covered with ice). Data showed high concentrations of dissolved oxygen, even in late winter. The Little Traverse Bay Bands of Odawa Indians' Environmental Services staff have also monitored Larks Lake in the winter and found no problems with dissolved oxygen. Although data are limited, results suggest that winter fish kill caused by late winter dissolved oxygen deficits may not be as big a factor in the lake's lackluster fishery as was suspected.

Next steps include sharing findings and implementing the Fishery Enhancement Committee recommendations. Results from the aquatic plant survey and Fishery Enhancement Committee discussions will be shared with the broader Larks Lake Association membership and with the public in general. The Watershed Council will be working with the Fishery Enhancement Committee and Lake Association to develop an action plan and procure funding for any fishery enhancement projects.

*maps included on following pages.



**Larks Lake
2009 Vegetation Survey**

- Roads
- Streams

Sample Sites: Density

- No/little vegetation
- Very light
- Light
- Light to moderate
- Moderate
- Moderate to heavy
- Heavy

Plant Community Type

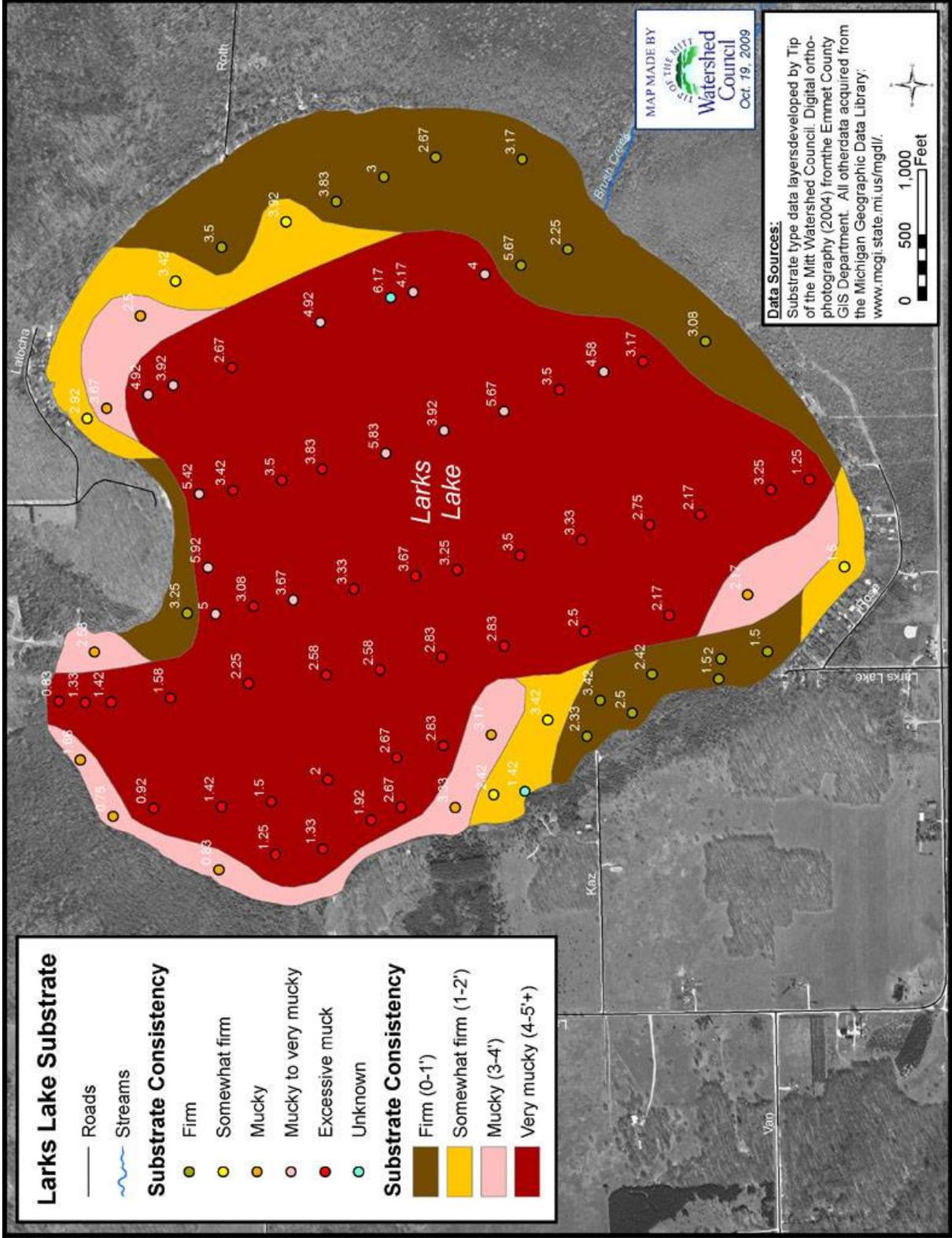
- Arum
- Buirush Mix
- Bur-reed
- Cattail
- Eel-grass
- Horsetail
- Mixed emergents
- Mixed emergents/submergents
- Mixed submergents
- Muskgrass
- Naiad
- Phragmites
- Pond-lily
- Pondweed
- Spikerush
- Sweet gale
- Three-square buirush

MAP MADE BY

 Watershed Council
 Oct. 19, 2009

Data Sources:
 Plant community and sample site data layers developed by Tip of the Mitt Watershed Council. Digital orthophotography (2004) from the Emmet County GIS Department. All other data acquired from the Michigan Geographic Data Library: www.mcgl.state.mi.us/mgdl/.





Larks Lake Substrate

— Roads

~ Streams

Substrate Consistency

● Firm

● Somewhat firm

● Mucky

● Mucky to very mucky

● Excessive muck

● Unknown

Substrate Consistency

■ Firm (0-1')

■ Somewhat firm (1-2')

■ Mucky (3-4')

■ Very mucky (4-5'+)

Van

Kox

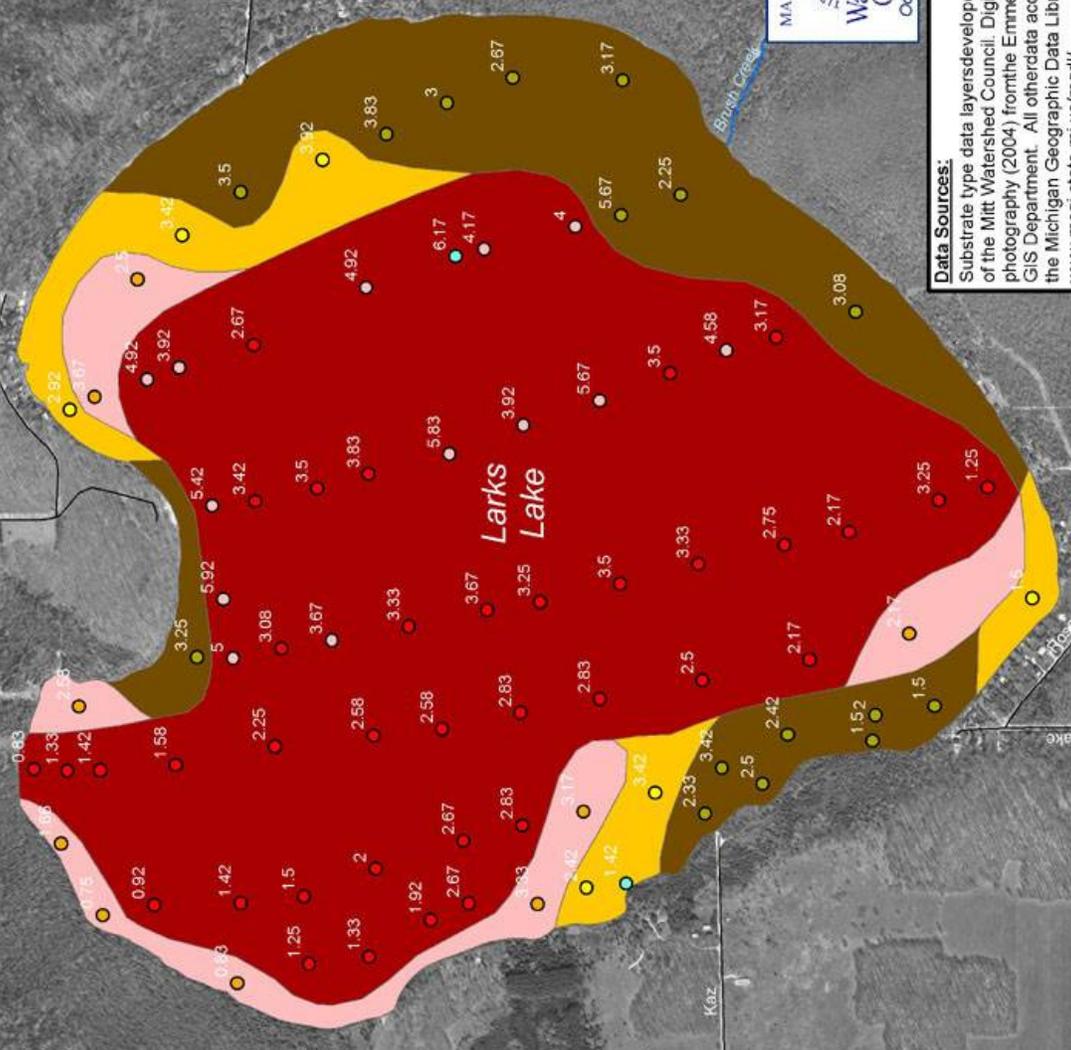
Larks Lake

Lalochia

Roth

Bluish Creek

Larks Lake



MAP MADE BY
 TIP OF THE MITT Watershed Council
 Oct. 19, 2009

Data Sources:
 Substrate type data layers developed by Tip of the Mitt Watershed Council. Digital orthophotography (2004) from the Emmet County GIS Department. All other data acquired from the Michigan Geographic Data Library: www.mcgi.state.mi.us/mgdl/.



0 500 1,000 Feet