



Briggs Lake Management Plan Update & Recommendations 2018-2019



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Introduction

Purpose of the Update

This management plan updates and documents management activities during 2018, examines current conditions in the lake, and provides management recommendations for 2019.

Characteristics of the Lake

Briggs Lake is a 74-acre lake located in Green Oaks Township, Livingston County, Michigan. It is a private natural lake with a private beach/boat launch. Most of the shoreline has been developed. Observations made while working on the lake indicate that the lake is used for fishing, boating (non-power), and swimming.

Management Goals for Briggs Lake

- The primary goal of aquatic plant management in Briggs Lake is to control exotic aquatic plants so as to allow recreational use of the lake, protect native vegetation and promote a healthy fishery. The exotic plant species, Eurasian watermilfoil and Curly leaf pondweed and Sarry stonewort should be controlled throughout Briggs Lake to the maximum extent possible.
- Species diversity and sufficient cover of native plants to provide fish habitat shall be maintained in the lake. Native plants should be managed to encourage the growth of plants that support the Briggs Lake fishery (by creating structure and habitat) provided that they do not excessively interfere with recreational uses of the lake (e.g., swimming, water skiing, boating, and sailing) in high-use areas. Where they must be managed, management techniques that reduce the stature of plants without killing them (e.g., harvesting, contact herbicides) should be used whenever possible. Specific areas should be set aside where native plants will not be managed, to ensure adequate habitat for fish and other aquatic organisms. Muskgrass (*Chara*) should be allowed to grow throughout the lake, except where it grows so tall as to interfere with boating and swimming.
- The invasive terrestrial plants, Purple loosestrife and Phragmites should be controlled along the shoreline and adjacent wetlands where present. Both species are exotic and have the ability to displace beneficial native vegetation. Purple loosestrife grows 2 -4 feet tall and is a vibrant magenta color. It is very aggressive and can quickly become the dominant wetland vegetation. Phragmites (common reed) is a wetland grass that ranges in height from 6 to 15 feet tall. “Phrag” quickly becomes the dominant feature in aquatic ecosystems, aggressively invading shorelines, wetlands, and ditches. This plant creates dense “strands” - walls of weeds crowding out beneficial native wetland vegetation and indigenous waterfowl habitats. Spreading by fragmentation and an extensive root system, Phragmites ultimately out-competes native plant life for sun, water and nutrients.
- Conditions in Briggs Lake should not be allowed to deteriorate below present levels and lake and land management efforts should continue in an effort to improve the overall health of the lake. Also, an annual record of vegetation, water quality and management should be maintained.

Lake Management Activities Conducted in 2018

Planning/Evaluation

Spring water quality parameters were collected and an aquatic vegetation survey of the lake was conducted on April 23th, 2018 to determine areas for curlyleaf pondweed control.

Aquatic Plant/Weed Control

The initial treatment was performed for curlyleaf pondweed on May 30th. Periodic surveys were conducted throughout the rest of the summer to determine if additional native plant treatments were

required. During the August treatment eel grass was observed but in untreatable offshore areas. Mapping, Water Quality, and yearly aquatic vegetation survey were conducted on Sept. 7th. Data collect was used to determine possible Sonar A.S. treatment for the 2019 season. After evaluation the data, it is the recommendation of PLM Lake & Land Management to not Sonar Briggs Lake during the 2019 season due to the lack of bio mass of EWM.

Water Quality

Water quality in the lake was evaluated on April 23rd and Sept. 7th. Water samples were collected from the deep hole in Briggs Lake. On each occasion, Secchi disk depth, temperature and dissolved oxygen were measured and surface water quality samples were collected for LakeCheck™ analysis. A depth profile of temperature and dissolved oxygen was also measured at one-meter (approximately three foot) intervals in the deepest part of the lake. LakeCheck samples were analyzed for conductivity, total dissolved solids, pH, alkalinity, total phosphorus and nitrates.

Current Conditions in the Lake

Aquatic Vegetation

The aquatic plant community of Briggs Lake is reasonably diverse. During the August survey, native plant diversity and density was high, most likely due to the abnormally warm growing conditions this summer. I expect native plant diversity and abundance to decrease during a more typical growing season. The native plant species in Briggs Lake benefit the lake, performing such functions as stabilizing sediments and providing habitat for fish and other aquatic organisms. In general, native species cause substantially fewer problems than the exotic plant species.

Of the plants listed in Table 1, all but Curlyleaf pondweed & Eurasian Watermilfoil are native North American species. This species is non-indigenous, i.e., from other places, which cause considerably more problems than most native species.

At the time of the Sept 2018 vegetation survey, Curlyleaf pondweed and Eurasian watermilfoil were controlled throughout the lake. Eurasian watermilfoil was found in 5/23 shoreline areas but at low levels. Eurasian watermilfoil and curlyleaf pondweed are extremely invasive and can inhabit a variety of sediment types and water depths. They are known to outcompete native plant species, disrupt the ecological balance of lakes, and have negative recreational and aesthetic impacts to lakes they invade.

Table 1 Plant Species Found In Briggs Lake	
Common Name	Scientific Name
Submersed Plants	
Large leaf Pondweed	<i>Potamogeton amplifolius</i>
Muskgrass	<i>Chara spp</i>
Naiad	<i>Najas spp</i>
Curlyleaf pondweed	<i>Potamogeton crispus</i>
Thinleaf pondweed	<i>Potamogeton pusillus</i>
Illinois pondweed	<i>Potamogeton illinoensis</i>
American pondweed	<i>Potamogeton nodosus</i>
Eel grass	<i>Vallisneria Americana</i>
Coontail	<i>Ceratophyllum demersum</i>
<i>Eurasian watermilfoil</i>	<i>Myriophyllum spicatum</i>
Emergent Plants	
Water Lily	<i>Nymphaea Odorata</i>

Water Quality

Temperature and Dissolved Oxygen Profiles

Depth profiles of temperature and dissolved oxygen (attached) indicate that on April 23rd, the lake was not thermally stratified and was well oxygenated from the surface down to 6 meters. Dissolved oxygen concentrations were 11.84mg/L at the surface and 11.62 mg/L at 6 meters. The fall water quality results will be provided in the year end report typically completed in November.

Conductivity Total Dissolved Solids, pH and Alkalinity

Conductivity and Total Dissolved Solids (TDS) measure the total concentration of dissolved salts in the water. Alkalinity and pH measure the amount of dissolved bases and the balance of acids and bases in the water. Results will be provided with completed water quality report.

Secchi Disk Depths

The Secchi disk depth is a measure of water clarity, determined by measuring the depth to which a black and white disk can be seen from the surface. (Larger numbers represent greater water clarity.) In April, the Secchi disk depth was 3.2 meters.

Total Phosphorus

Total phosphorus measures the total amount of phosphorus in the water. Phosphorus is an important plant nutrient (i.e., fertilizer) and the nutrient most likely to limit algal growth. Elevated phosphorus inputs to lakes caused by human activities are a major cause of cultural eutrophication. The Phosphorus levels will be provided when the lab results are returned and the water quality reports are issued this fall.

Nitrates

Nitrates measure the total amount of in-organic nitrogen in the water. Nitrogen is an important plant nutrient (i.e., fertilizer) and the nutrient most likely to limit the growth of rooted plants. Sample results will be sent with year end water quality report.

Recommendations for 2019

Vegetation surveys and water quality monitoring should be continued. PLM will survey the lake in the spring of 2019 to determine areas requiring treatment for Curlyleaf pondweed and Eurasian watermilfoil. At this time it is PLM Lake & Land Management that there is no need for a whole lake Sonar treatment due to the lack of Milfoil present in the lake. Spring and fall water quality sampling will also be completed. In addition, a year end vegetation survey and report will be completed.

Eurasian watermilfoil

If Eurasian watermilfoil treatments are required, systemic herbicides (2,4-D or Renovate OTF) will be used in offshore/undeveloped areas to control regrowth of Eurasian watermilfoil. In residential areas, alternative methods of control can be used, including Renovate 3 or the contact herbicide, Diquat. The initial treatment should be scheduled from mid-May to early June depending upon growing conditions. Monthly follow-up surveys and spot herbicide treatments should be scheduled to control regrowth and new growth of Eurasian watermilfoil.

Curlyleaf Pondweed

Curlyleaf will most likely require treatment as with previous years. A spring survey will determine treatment areas. Curlyleaf is best controlled with Diquat (contact herbicide) once plants have begun to establish. Typically, only one treatment per year is required.

Starry stonewort

Starry stonewort should be controlled wherever it is found. Monitoring should continue and treatments performed as necessary.

Native plants & algae

Treatments with contact herbicides or copper products to target areas of nuisance plant growth and algae may be recommended. Treatment areas should be monitored and treatments scheduled as necessary. Harvesting of natives is also recommended for species not easily controlled with herbicides or where conditions warrant mechanical harvesting.

Emergent Plant

Inspections for exotic invasive plants such as Phragmites should be conducted. Monitoring should continue for this species and it should be treated wherever it is discovered.