

**Gleason Lake – 2012 Aquatic Vegetation Documentation Report**

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**Project Description**

Gleason Lake, located in Plymouth, Minnesota (Figure 1) is infested with the exotic aquatic plant species, curlyleaf pondweed (*Potamogeton crispus*). Spring of 2012 began the final year of the Gleason Lake Water Quality Project-Vegetation Management Study partnership between the Minnehaha Creek Watershed District (MCWD) and the Gleason Lake Improvement Association (GLIA) for the treatment of curlyleaf pondweed in Gleason Lake. This is the third year that GLIA was responsible for funding a major portion of the project which included: 1) Minnesota Department of Natural Resources (MNDNR) application fee for permitting of the herbicide application; and 2) payment to the licensed herbicide applicator for the spot treatment of Gleason Lake.

MCWD continued to assist GLIA with the treatment process by taking responsibility for 1) coordination and cost of pre and post vegetation surveys to determine the location of treatment and effectiveness of the herbicide application on controlling curlyleaf pondweed within Gleason Lake; and 2) monitoring of water temperature to assure appropriate time/day of herbicide application. MCWD also contracted with Wenck Associates Inc. to perform a follow up invertebrate survey.

**2012 Project Activities**

1. The MCWD Board approved “Authorization to award a contract to Blue Water Science for 2012 Gleason Lake aquatic vegetation survey and report, and Wenck Associates Inc. for 2012 Gleason Lake invertebrate survey” on March 22, 2012. The survey included a pre-treatment aquatic vegetation survey during April 2012, and post treatment aquatic vegetation survey in June 2012.
2. Blue Water Science conducted the pre-aquatic vegetation survey for Gleason Lake on April 2<sup>nd</sup>, 2012. Curlyleaf pondweed was found at 3 of the 31 sample stations in the small north basin and at 52 of the 128 sample stations in the main lake. It was recommended a primary treatment zone of 41.9 acres in the main basin and an additional 3.1 acres in the north basin. Gleason Lake Improvement Association (GLIA) decided that they would treat all areas. The estimated amount of area to be treated in Gleason Lake was 45 acres (Figure 1, Table 1).
3. Water quality staff assisted GLIA in preparing the Minnesota Department of Natural Resources (MNDNR) permit application in 2012 and the DNR permit was approved and received on April 30<sup>th</sup>, 2012 to treat 45 acres.
4. On May 7<sup>th</sup>, 2012, Lake Restoration’s applicator was on site at Gleason Lake to conduct application of the aquatic herbicide Aquathol-K to control the curlyleaf pondweed in Gleason Lake.

5. Blue Water Science conducted the summer post aquatic vegetation survey for Gleason Lake on June 10<sup>th</sup>, 2012. Curlyleaf pondweed was found at 0 of the 27 sample stations in the small north basin and at 2 of the 128 sample stations in the main lake (See Gleason Vegetation Report 2012).
6. On June 27, 2012, Wenck Associates and MCWD staff collected aquatic invertebrates for analysis. As part of the conditions for the Gleason Lake project, biological monitoring of fish and aquatic invertebrates were to be surveyed prior to the herbicide application in 2007 and at the conclusion of the six year study in 2012 to examine potential changes in the biological communities (see Gleason Aquatic Invertebrate Field Report).
7. A follow up fish survey was completed in October 2011 by Blue Water Science as part of an examination of a partial fish kill in Gleason Lake. The request was from the city of Plymouth. The fish survey took place in the same monitoring locations that were established by Wenck Associates in 2007 (see Gleason Fish Survey).
8. Yvette Christianson presented at the Water Resources conference on “Managing Curlyleaf Pondweed with Herbicides: Experiences with Whole Lake and Partial Lake Treatments” on October 17, 2012.
9. A scientific paper of the study is currently in the process of being written for submittal to a peer-reviewed journal with hopes of publication early 2013.

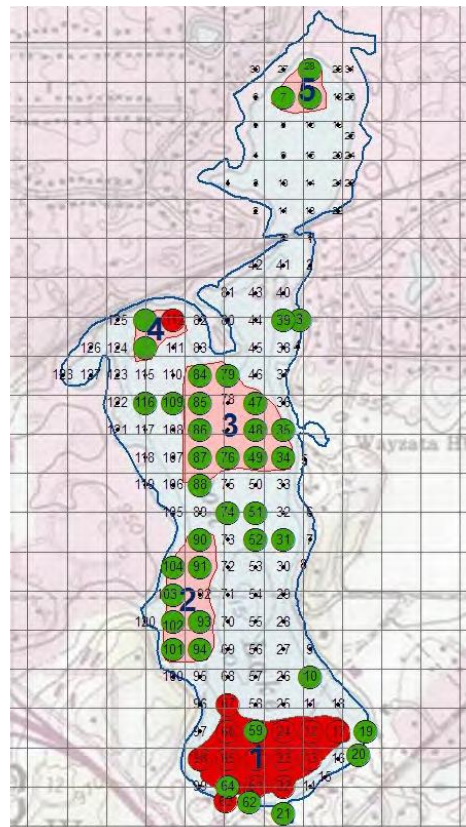


Figure 1. Herbicide treatment area for Gleason Lake (Green = light growth, Red=heavy growth)

Table 1. Areas of Curlyleaf Pondweed Growth

ID	Areas of Curlyleaf Pondweed
1	14.5
2	9
3	15.7
4	2.7
5	3.1

## Summary

This is the sixth and final year of the Gleason Lake aquatic vegetation management project. The objectives of the project were (1) determine if herbicide treatments with Aquathol K can control and manage curlyleaf pondweed, and (2) determine if herbicide treatments are a viable long-term solution for Gleason Lake.

There was a considerable difference in the amount of curlyleaf pondweed present from 2007 through 2012. Curlyleaf density and distribution throughout Gleason Lake were shown to have a steady decrease from 2007 (817 stems/m<sup>2</sup>) to 2011 (21 stems/m<sup>2</sup>) with a slight increase in 2012 (77 stems/m<sup>2</sup>). These results can lead us to believe that there is a connection to the control and management of curlyleaf pondweed through annual herbicide treatments.

With the reduction of the curlyleaf, vegetation surveys showed the enhanced growth of native vegetation. The overall water quality improved with an increase in water transparency, and reductions of total phosphorus and chlorophyll A. In 2012, the State's water quality standards for Gleason Lake were met for all three, clarity, phosphorus, and chlorophyll A for the first time during the 6 year project. These results can lead us to believe that herbicide treatments are a viable long-term solution for Gleason Lake.

Though the outcome of the study provided us with positive results, there may be other factors that did contribute to the overall condition of Gleason Lake. Aeration of the lake and the expansion of the Gleason Lake's north storm pond in 2008 which was estimated to improve its phosphorus removal 15% - 35% may have also contributed to the improvement of the water quality.

GLIA is working with the MN DNR to update their vegetation management plan for Gleason Lake for the continuation of control and management of curlyleaf pondweed and coontail. MCWD staff will continue monitoring the lake's water quality annually.