

Eurasian Watermilfoil & Curlyleaf Pondweed Delineation

Crooked Lake (# 02-0084)

Anoka County, MN

Surveyed June 14, 2017



Survey, Analysis, and Reporting by:

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Purpose of Survey

This late-spring survey was designed to locate and delineate areas of Eurasian watermilfoil (EWM) and curlyleaf pondweed (CLP) throughout Crooked Lake (#02-0084) to (1) assess the effectiveness of the 2016 lake-wide granular sonar treatment in controlling EWM, (2) identify any remaining areas of EWM that may need spot treatments in 2017, and (3) identify areas of CLP that may be considered for treatment in 2018. This information will help to guide EWM and CLP management in Crooked Lake, and is required as a part of the DNR permitting process.

Survey Method

Delineation Surveys

Freshwater Scientific Services surveyed the entire nearshore area of Crooked Lake (<15 ft). During this survey, we navigated a meandering search path over the nearshore area. While navigating this search path, we used a combination of surface observations, sonar readings, and rake tosses to locate and delineate areas of EWM and CLP growth. When we encountered either of these invasive plants, we marked the location, recorded the water depth, and rated the density of the growth using visual and rake density scores as described in the table below.

Score	Visual	Rake
1	Light / Solitary plants	1-2 stems
2	Moderate / Scattered dense patches	3 to 9 stems
3	Dense / Uniform dense growth	10+ stems

For rake samples, we dragged a sampling rake over approximately 10 square feet of lake bottom and recorded the EWM and CLP density based upon the number of plants (stem count) retrieved on the rake. The recorded water depths and density scores were linked to the appropriate GPS locations and then mapped using desktop GIS software.

2017 Late-Spring Delineation of Eurasian Watermilfoil Crooked Lake (# 02-0084)



Eurasian Watermilfoil

-- 2016 EWM Plots (treated)

● EWM Found in 2017
(solitary plants)

Surveyed: June 14, 2017
Methods: Visual, Sonar, Rake
Surveyor: JA Johnson



Summary of EWM Survey Results

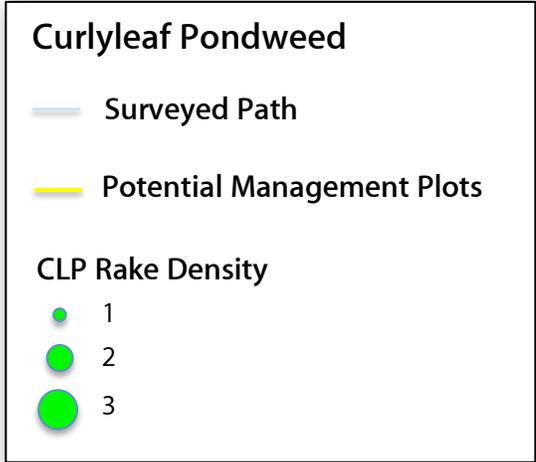
We found no EWM during the survey conducted on June 14, 2017. However, MDNR staff found one small EWM fragment in a rake sample collected along the northwest shore in June, and we discovered 2 additional solitary EWM plants growing at the edge of lilies in the far southern tip of the lake while conducting the native plant transplantings at the end of June. Other than these two locations, we observed no additional EWM plants in Crooked Lake. These results are remarkable and strongly suggests that the experimental granular sonar treatment conducted in 2016 effectively controlled EWM lake-wide.

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2017 Late-Spring Delineation of Curlyleaf Pondweed Crooked Lake (# 02-0084)



Surveyed: June 14, 2017
Methods: Visual, Sonar, Rake
Surveyor: JA Johnson



Summary of CLP Survey Results

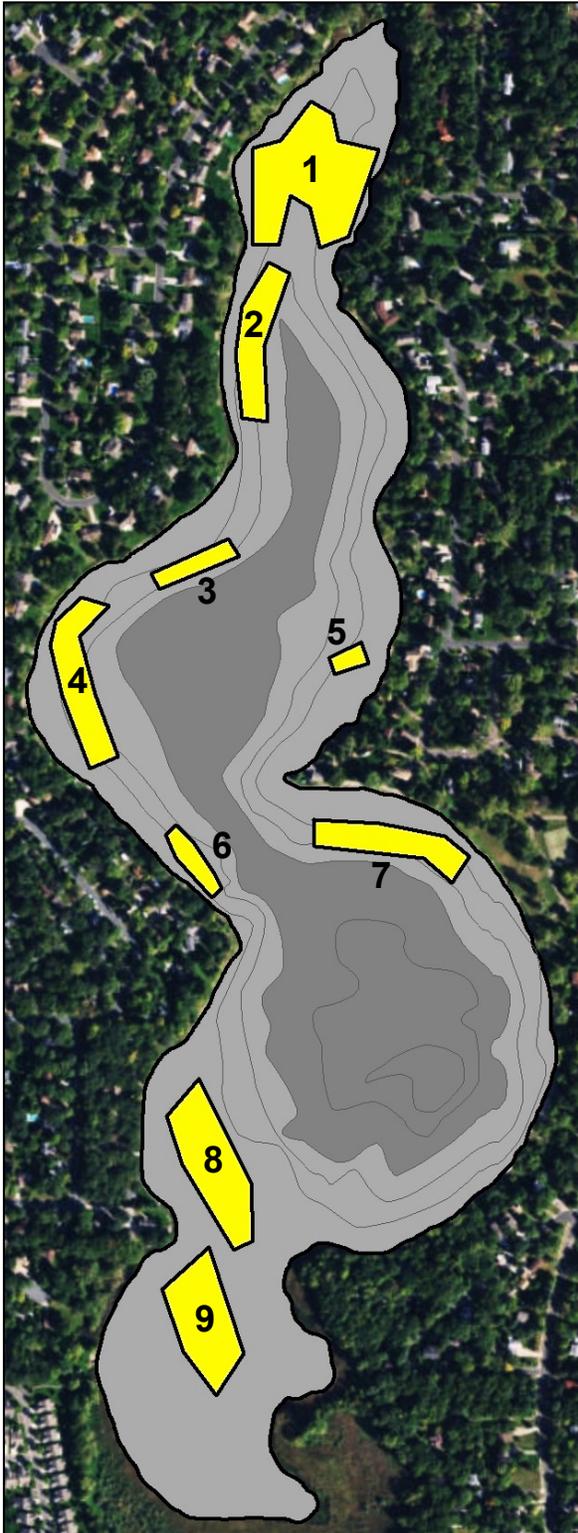
In past years, EWM dominated a substantial portion of the littoral area (≤ 15 ft). The reduction of EWM in the lake likely allowed for more light penetration. Consequently, the amount of CLP that reached the surface of the lake was greater in 2017 than in past years. Although CLP was fairly widespread in 2017, most CLP growth was very sparse and patchy; only a few locations supported stands of nuisance-level growth. Plots 1 and 2 (see page 5) were treated in 2017 prior to conducting this survey, but it is reasonable to expect that these areas will still produce dense CLP in future years. In addition, plots 4, 8, and 9 supported moderate to high-density CLP growth that will likely impair recreation in 2018 if not treated.

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 Potential CLP Management Plots

Surveyed: June 14, 2017
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Plot	Area (acres)	Mean Depth (ft)	Mean EWM Density (1-3)
1	3.6	3.9	2.1
2	1.4	5.7	1.6
3	0.5	5.9	2.0
4	1.7	4.5	2.2
5	0.2	4.1	2.5
6	0.5	4.1	2.0
7	1.4	3.9	1.8
8	2.3	3.0	2.2
9	2.0	2.5	2.0

Total 13.6

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Online Resources & Contacts

Minnesota Administrative Rules for Aquatic Plant Management
<https://www.revisor.mn.gov/rules/?id=6280>

Minnesota DNR – Aquatic Plant Management Regulations & Permit Application Forms
<http://www.dnr.state.mn.us/apm/index.html>

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