

# Eurasian Watermilfoil & Curlyleaf Pondweed Delineation

## Lake Pulaski (WBIC# 86-0053)

Wright County, MN

Late-Spring Delineation Survey – June 10, 2014



### Survey, Analysis, and Reporting by:

James A. Johnson – *Aquatic Ecologist, Freshwater Scientific Services, LLC*



### Funding Provided by:

*Pulaski Lake Improvement District*

Prepared for the Pulaski Lake Improvement District – June 2014

## Summary

### Purpose of Survey

This survey was conducted to locate and delineate areas of Eurasian watermilfoil (*Myriophyllum spicatum*, "EWM") and curlyleaf pondweed (*Potamogeton crispus*, "CLP") in Lake Pulaski (#86-0053) in the late-spring of 2014. This survey was conducted several weeks after herbicide treatment of previously mapped CLP beds, but prior to any treatment for EWM in 2014. The results of this survey will help to guide vegetation management planning by (1) identifying areas of nuisance EWM growth that may be targeted in 2014, (2) evaluating the effectiveness of CLP control in treated areas, and (3) identifying additional areas of nuisance CLP that were not controlled in 2014 (mapped when CLP near peak abundance).

### Summary of Findings

- 1) EWM was found growing throughout the littoral area ( $\leq 15$  ft) of Lake Pulaski, but was only found growing at the northern end of the channel in Little Pulaski. Although widespread in the large lake basin, most areas along the western and southern shores supported only patchy or very light EWM growth. We observed denser EWM growth along much of the northeastern shoreline. We also found an isolated area of very dense EWM growth around the water outlet pumps that appeared to pose a risk of pump fouling/clogging.
- 2) CLP growth in the areas treated with endothall in May 2014 was generally very light or absent, suggesting effective control. However, some CLP remained in deeper areas of the treated plot just south of the channel between Pulaski and Little Pulaski. CLP plants in this area may not have been controlled due to (1) dilution of herbicide by water movement and diffusion, or (2) cool water temperatures that delayed active growth of CLP those plants (not actively growing at time of treatment).
- 3) The previously completed early-spring CLP delineation survey (May 2014) focused on the areas around plots that were treated in previous years. This June follow-up survey looked for CLP growth throughout the lake basins to help identify any areas of nuisance CLP that were not treated. During this June survey, we found areas of dense surface-matted CLP in the eastern and western portions of Little Pulaski Lake. We also found a substantial area of dense CLP along the southeastern shore, roughly between the 8 and 15-ft contours. This area of CLP was quite dense, but was generally isolated to a narrow band that may not impair recreation due to the patch width and water depth. Although this area extended along a substantial portion of the shoreline, we did not observe any surface-matted CLP growth in this area.
- 4) Due to the steep drop-off from shore in most areas of Lake Pulaski, dense EWM and CLP were often found growing in long, narrow patches. Such narrow patches are difficult to treat effectively due to the high potential for rapid diffusion and drift of any applied herbicide. Furthermore, narrow bands of dense growth may not impair recreation sufficiently to warrant control with herbicides. Although we have identified such narrow bands of dense growth in this delineation report, the PLID should carefully consider whether herbicide treatment is warranted in these areas. You should discuss any plans to treat these areas with both your DNR AIS Specialist and herbicide applicator.

## ***Survey & Analysis Methods***

### **Late-Spring Delineation Survey**

Freshwater Scientific Services, LLC completed a lake-wide survey for EWM and CLP in Lake Pulaski on June 10, 2014. During this survey, we navigated a meandering transect over the littoral portion of the lake (<15 ft). While navigating this transect, we used a combination of surface observations (using polarized sunglasses), rake tosses, sonar readings, and an underwater video camera to locate and delineate areas of EWM and CLP growth. Sonar and visual assessments were conducted continuously, with subsequent rake tosses to assess plant abundance at ~200 locations. At each of these rake locations, we dragged a sampling rake over approximately 10 square feet of lake bottom and then inspected plants retrieved on the rake. We used a hand-held Garmin GPS unit (GPS-MAP78) to record each of the sampled locations, and documented water depth, plant height, and plant abundance (rake density rating; 1 to 4 scale as described below).

#### Rake Density Scores

1 = 1 to 25% rake coverage

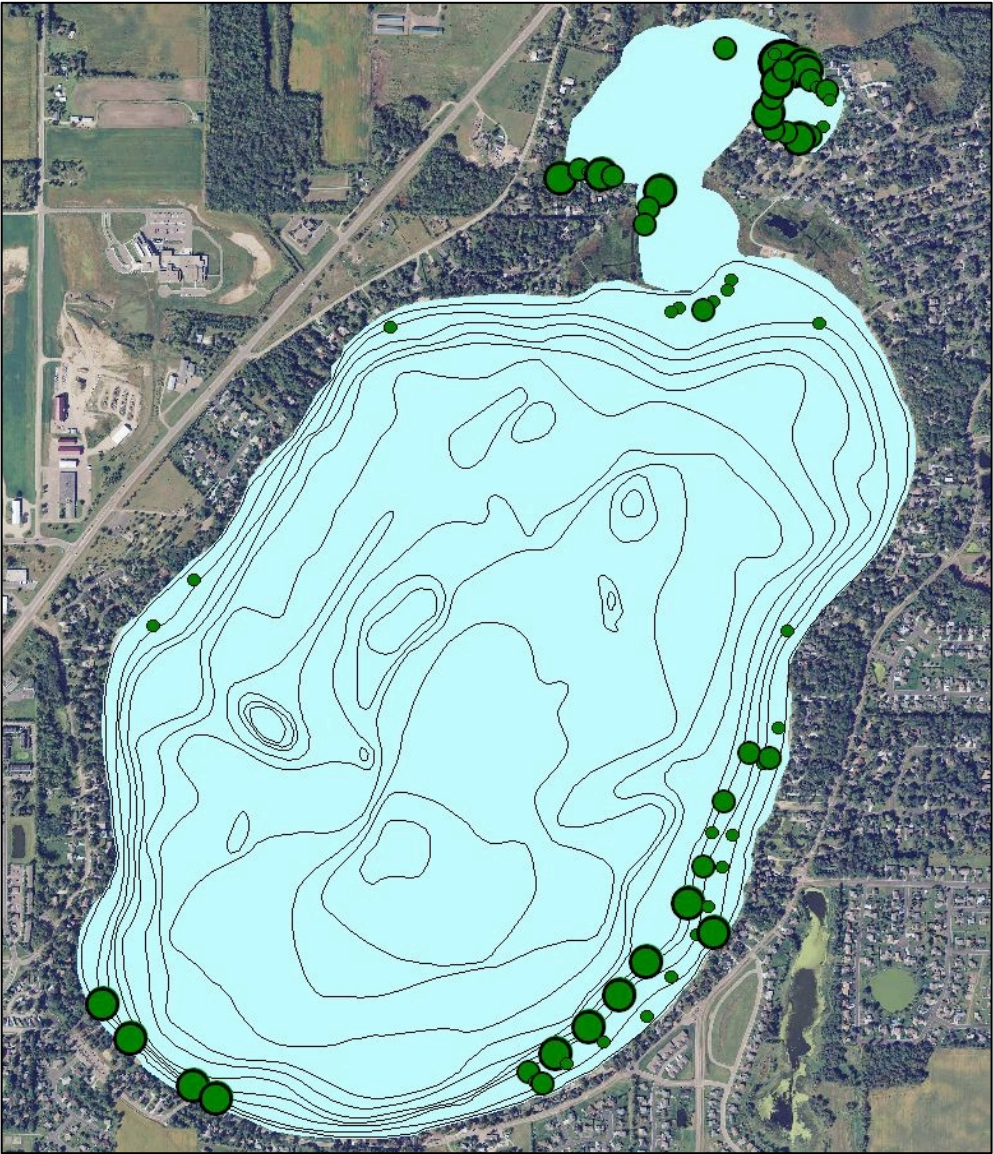
2 = 25 to 50%

3 = 50 to 75%

4 = 75 to 100%

We loaded the recorded locations, water depths, plant heights, and rake density scores into desktop GIS software and projected results over aerial imagery of the lake. We then delineated beds of EWM and CLP growth in the surveyed areas, and calculated the area and mean density within each of the delineated beds (using point data).

**Lake Pulaski (#86-0053)**  
**Spring Delineation of Curlyleaf Pondweed: June 10, 2014**



**Curlyleaf Pondweed**

Rake Density Rating (1-4)

- 1
- 2
- 3
- 4



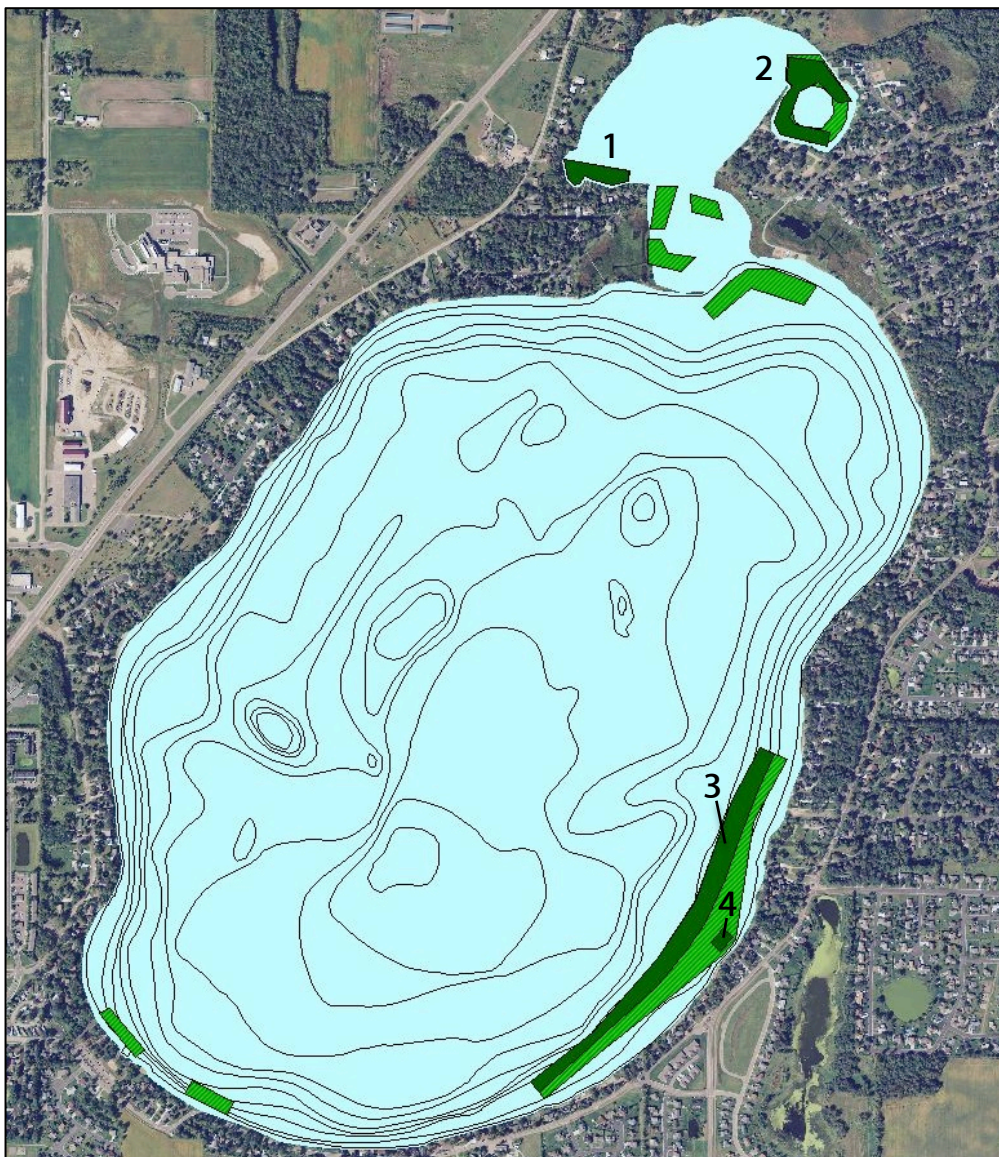
**Surveyed:** June 10, 2014  
**Surveyor:** J.A. Johnson  
**Affiliation:** Freshwater Sci. Serv.  
**Methods:** Rake, Sonar, Camera  
**Analyses by:** J.A. Johnson

Map produced for the Pulaski Lake Improvement District by:



**FRESHWATER** ●  
*Scientific Services, LLC*

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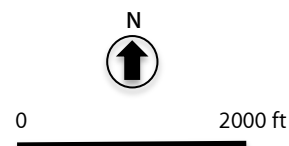
**Lake Pulaski (#86-0053)**  
**Spring Delineation of Curlyleaf Pondweed: June 10, 2014**



**Curlyleaf Pondweed**

-  Light or Patchy CLP Growth
-  Nuisance CLP Growth

Plot ID	Area (acres)	Mean CLP Density (rake, 0-4)
1	1.2	1.9
2	3.8	2.0
3	9.8	2.4
4	0.3	3.0
<b>Total</b>	<b>15.1</b>	

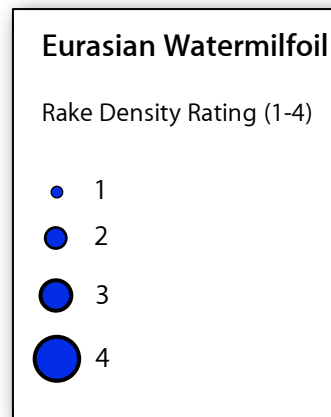
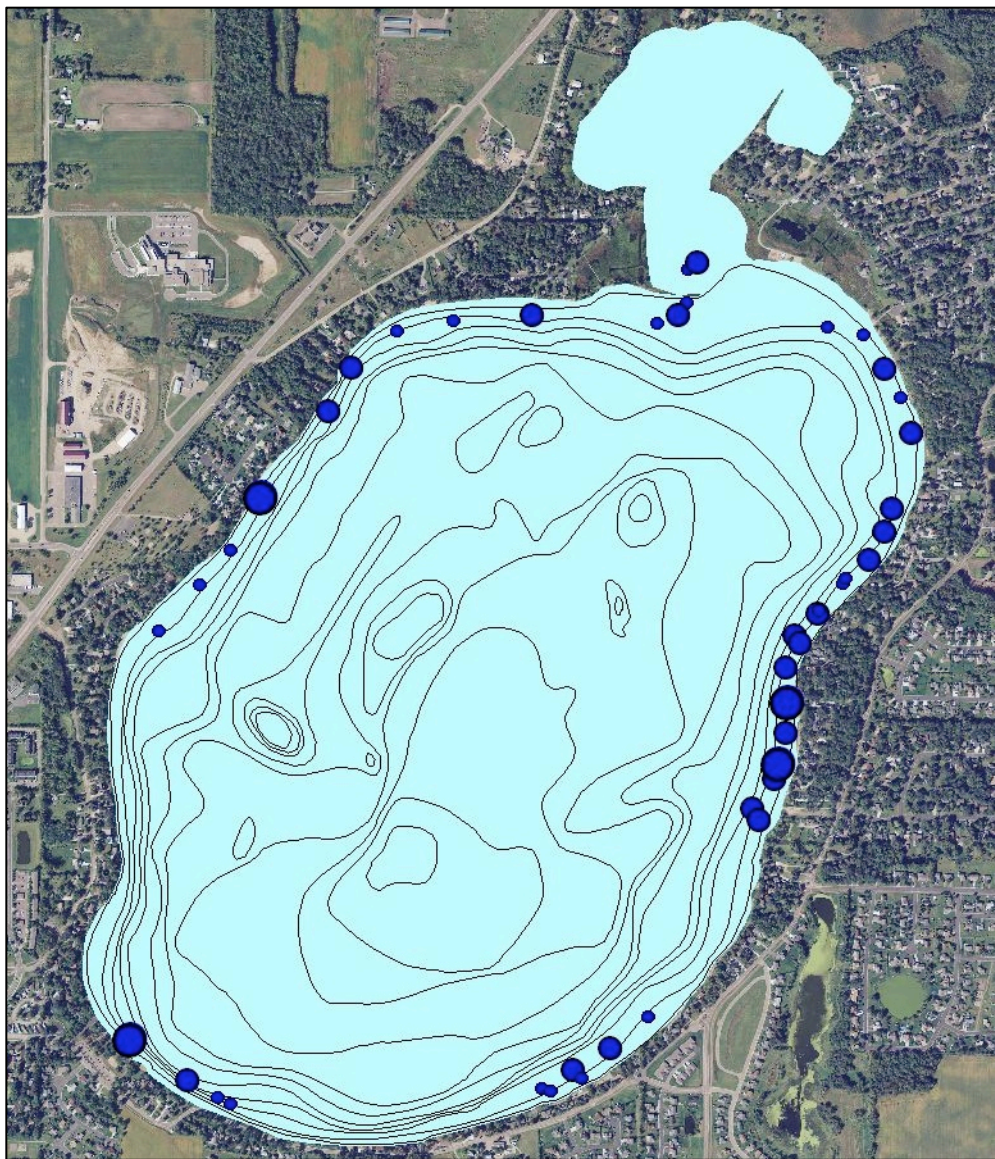


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## Lake Pulaski (#86-0053) Spring Delineation of Eurasian Watermilfoil: June 10, 2014

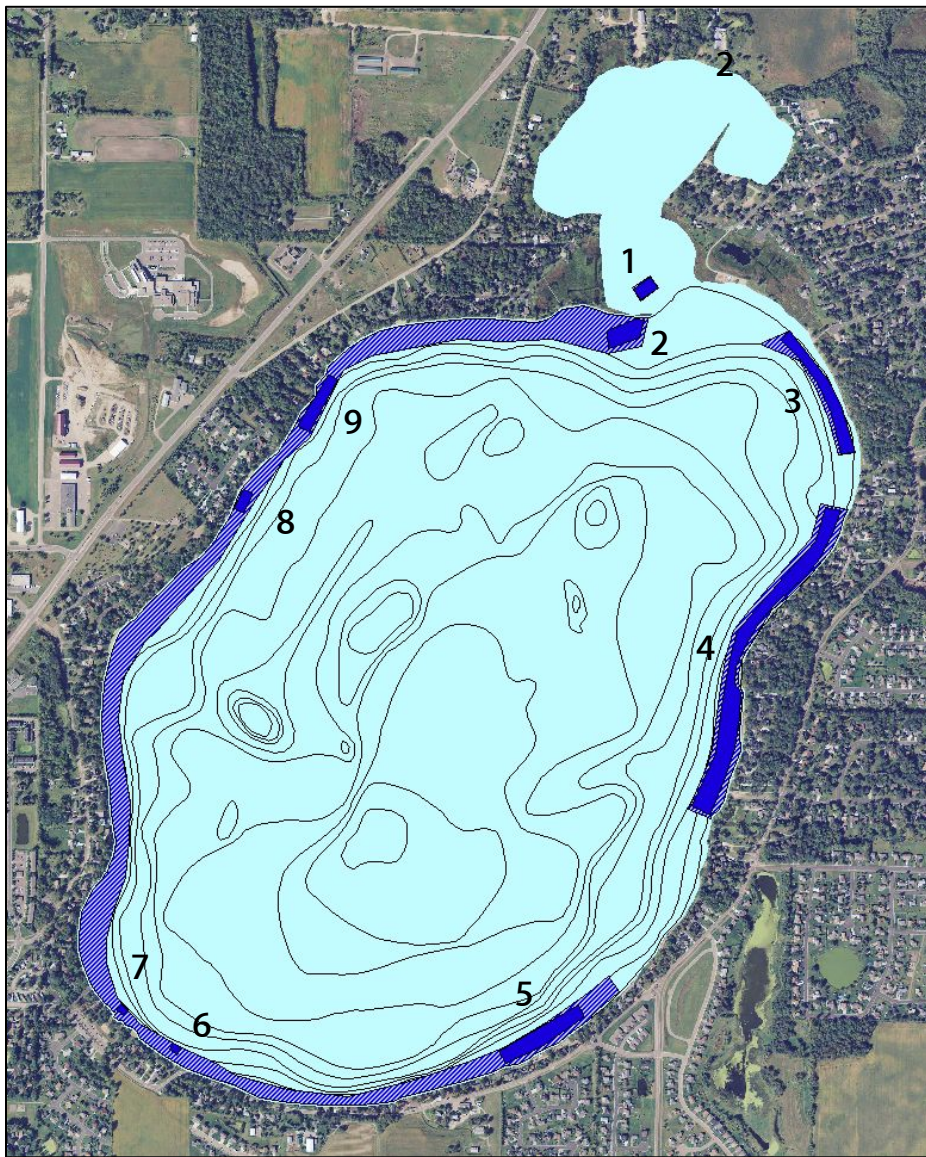


Surveyed: June 10, 2014  
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Affiliation: Freshwater Sci. Serv.  
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**Lake Pulaski (#86-0053)**  
**Spring Delineation of Eurasian Watermilfoil: June 10, 2014**



**Eurasian Watermilfoil**

-  Light or Patchy EWM Growth
-  Nuisance EWM Growth

Plot ID	Area (acres)	Mean EWM Density (rake, 0-4)
1	0.5	1.5
2	1.1	1.3
3	2.6	1.5
4	8.5	1.9
5	2.4	1.4
6	0.1	1.5
7 (pumps)	0.1	3.0
8	0.4	3.0
9	1.2	2.0

**Total                      16.9**



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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/shorelandmgmt/apg/regulations.html>

Estimated Cost of Herbicides (MDNR)

<http://files.dnr.state.mn.us/assistance/backyard/shorelandmgmt/apg/pests.pdf>

List of Herbicide Retailers and Applicators in MN

[http://files.dnr.state.mn.us/assistance/backyard/shorelandmgmt/apg/companies\\_selling\\_approved\\_aquatic\\_herbicides.pdf](http://files.dnr.state.mn.us/assistance/backyard/shorelandmgmt/apg/companies_selling_approved_aquatic_herbicides.pdf)

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