

Eurasian water milfoil (*Myriophyllum spicatum*)
Fall Bed Mapping Survey
Long Trade Lake - Polk County, Wisconsin
WBIC: 2640500



Eurasian water milfoil (Berg 2007)



Fall 2012 EWM Beds on Long Trade Lake

Project Sponsored by:
Round-Trade Lake Improvement Association, Inc., Short, Elliot,
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INTRODUCTION:

Long Trade Lake (WBIC 2640500) is a 150 acre drainage lake in northwest/north-central Polk County, Wisconsin in the Town of Laketown (T36N R18W S4 SE NE). It reaches a maximum depth of 13ft in two spots in the south basin and has an average depth of approximately 8ft. Long Trade Lake is eutrophic bordering on hypereutrophic in nature with very poor water clarity. From 1986 to 2009, summer Secchi readings have ranged from 1.2-3.0ft with an average of 2.1ft (WDNR 2012). The bottom substrate is primarily sand and gravel in the main basin with organic muck in sheltered bays (Miller et al. 1965).



Figure 1: Long Trade Lake Aerial Photo

In 1995, the Wisconsin Department of Natural Resources (WDNR) identified the presence of Hybrid water milfoil – a cross between Northern and Eurasian water milfoils (*Myriophyllum sibiricum* X *Myriophyllum spicatum*) in Long Trade Lake. However, a 2006 WDNR point intercept survey turned up no milfoil of any kind in the lake. Recently, milfoil that morphologically looks like and grows like Eurasian water milfoil (EWM) has taken over most of the lake's littoral areas. In 2011, the Round-Trade Lake Improvement Association, Inc. (RTLIA) decided to explore active management of the infestation and took the first steps to develop an Aquatic Plant Management Plan (APMP) to guide any future management. In anticipation of developing that plan, the WDNR and Short, Elliot, Hendrickson, Inc. (SEH) commissioned 2011 and 2012 fall EWM bed mapping surveys. The goals of these surveys were to determine the extent and estimate the density of the lake's EWM infestation, delineate the total acreage covered by EWM, and use these data to develop an Aquatic Plant Management Plan for the lake. This report is the summary analysis of the EWM fall bed mapping survey conducted on September 29, 2012.

METHODS:

Fall EWM Bed Mapping Survey:

By definition, a “bed” was determined to be any area where we visually estimated that EWM made up >50% of the area’s plants and was generally continuous with clearly defined borders. During the survey, we searched the lake’s entire visible littoral zone. Initial transects were run parallel to shore and additional transects were added away from shore at intervals of 10-20m depending on search condition visibility until we could no longer see plants (Appendix I). At the edge of the visible littoral zone, we randomly used a 15ft telescopic rake to assess whether EWM extended beyond the area we could visually detect it.

After we located a bed, we motored around the perimeter of the area, took GPS coordinates at regular intervals, and estimated the average rake fullness rating of EWM within the bed (Figure 2). These data were then mapped using ArcMap 9.3.1. We used the WDNR’s Forestry Tools Extension to determine the acreage of each bed to the nearest hundredth of an acre and the perimeter to the nearest meter. The resulting data will be used to determine if, where, and how to treat EWM in 2013.

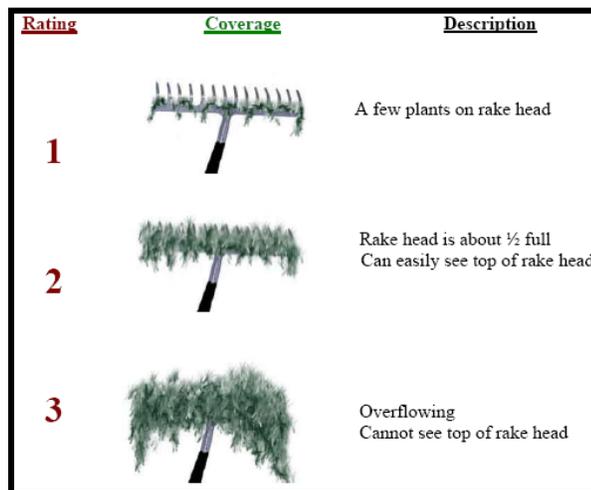


Figure 2: Rake Fullness Ratings (UWEX, 2010)

RESULTS:

Fall EWM Bed Mapping Survey:

On September 29th, we surveyed Long Trade Lake for Eurasian water milfoil beds. Conditions were ideal with calm winds and bright sunshine. Despite improved water clarity, large amounts of colonial green algae that were suspended in the water column and lesser amounts of floating blue-green algae prevented us from seeing down much more than approximately three feet. However, as we never found EWM growing in water deeper than 4ft despite raking along the outer margins of beds, we were able to see at least the tops of EWM plants throughout the entire fall littoral zone. Most EWM was within one foot of the surface, but almost no plants were canopied. As most of the lake dropped off rapidly from shore, for the majority of the survey, we were able to motor around the outside edge of the beds in a single transect (Figure 3) (Appendix I).

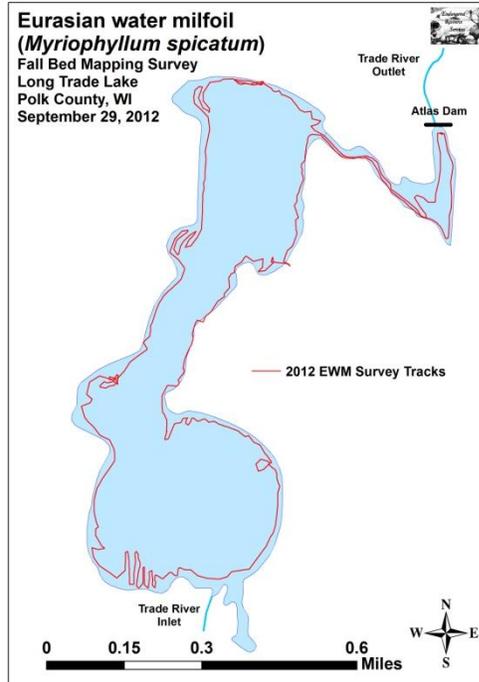


Figure 3: Long Trade Lake Fall 2012 EWM Survey Tracks

Unlike 2011 when the majority of the lake’s fall littoral zone was dominated by canopied EWM, we were surprised to find that the EWM population had essentially crashed. The 12 beds we mapped in 2011 totaling 12.97 acres were down to only six beds totaling 1.60 acres – a reduction of nearly 90% (Figure 4) (Table 1). Additionally, the plants we did see all seemed to be recent “sprouts” that were regrowing from small fragments and showed vibrant new green growth. Rake samples taken in the former beds found only small bits of EWM stem and leaflet detritus. Also of note, the lake’s Coontail (*Ceratophyllum demersum*) population, which had dominated muck bottom bays in 2011, had also crashed. We estimated that over 90% of the remaining plants in the lake were White water lily (*Nymphaea odorata*) and Curly-leaf pondweed (*Potamogeton crispus*). Although we can only speculate on this dramatic change in the lake’s vegetation, it may be the spring’s dense CLP growth, poor water clarity over the summer, changes in water chemistry due to the drought and extreme temperatures, or some combination of these factors created a negative growing environment for the majority of the lake’s plants. Regardless of the cause of the reduction, EWM appears to be recolonizing the lake as we observed EWM plants were actively fragmenting in the few places we found them.

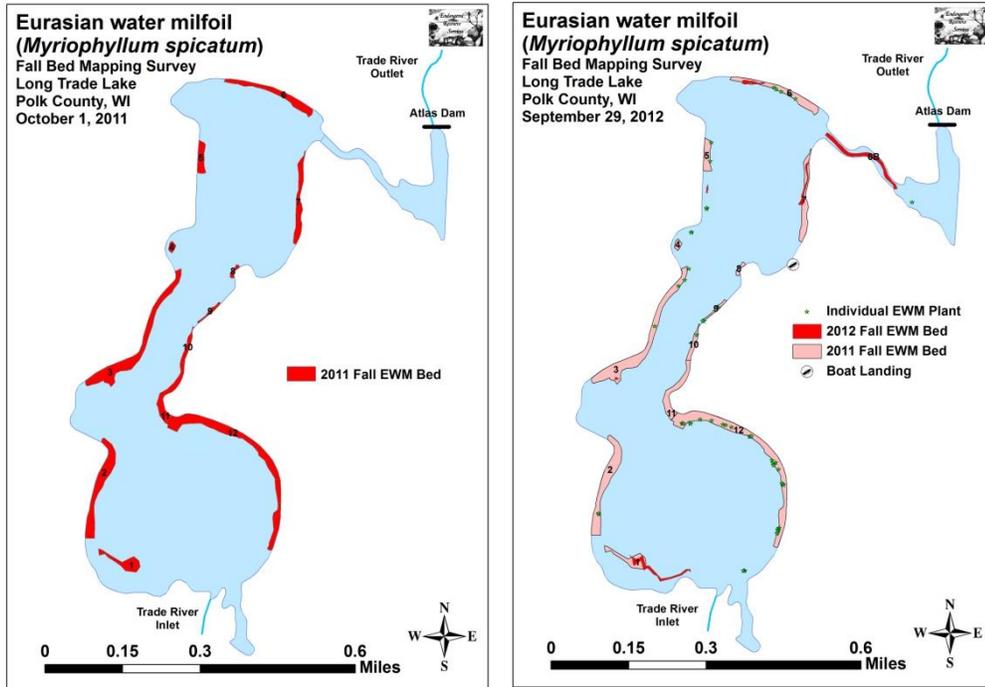


Figure 4: Long Trade Lake Fall 2011 and 2012 EWM Beds

**Table 1: Fall EWM Bed Summary
Long Trade Lake, Polk Co. September 29, 2012**

Bed Number	2012 Fall Bed Acreage	2011 Fall Bed Acreage	Change in Acreage	Mean Rake Fullness
1	0.45	0.70	-0.25	<1-1
2	0	1.89	-1.89	0
3	0.02	2.69	-2.67	<1-1
4	0	0.13	-0.13	0
4B	0.03	0	0.03	<1-1
5	0	0.51	-0.51	0
6	0.13	1.23	-1.1	<1-2
6B	0.76	0	0.76	1-3
7	0.21	1.03	-0.82	<1-1
8	0	0.11	-0.11	0
9	0	0.16	-0.16	0
10	0	0.29	-0.29	0
11	0	0.88	-0.88	0
12	0	3.35	-3.35	<1-1
Total Acres	1.60	12.97	-11.37	

Descriptions of Current and Former EWM Beds:

Bed 1 –Curly-leaf pondweed was abundant in the area and was interspersed among the EWM plants in the bed. Between the two of them, these exotic species made up almost 100% of the plants. Although probably better described as a high density EWM area, plants were near canopy and continuous throughout this narrow ribbon of habitat.

Bed 2 – Other than the two marked plants, EWM appeared to have been completely eliminated from this area.

Bed 3 – The small marked bed showed significant regrowth and plants were almost canopied. Away from this area, we only found four EWM plants, and the littoral zone was essentially barren except for scattered CLP.

Bed 4 – This area was dominated by White water lily, and there were scattered patches of Coontail. Other than a few floating fragments and the marked plants northeast of the former bed, EWM appears to have been eliminated from this area.

Bed 4B – This tiny bed was found growing in an area that was dominated by White water lily with a few scattered patches of Coontail.

Bed 5 – Two plants were the only remaining EWM we found in this former bed. The area continues to be dominated by White water lilies.

Bed 6 – In the remnants of Bed 6, EWM was consistently a rake fullness of 2, and the bed's outer edge was generally very well formed. Despite this, we noted there were 10's not 100's of plants, no plants found along the immediate shoreline, and only a handful of additional plants were found outside the 2012 Bed boundaries.

Channel to dam – The outlet channel had only a handful of plants in 2011. However, in 2012, EWM dominated the channel where there was flowing water, but disappeared close to shore where White water lily and Common bur-reeds (*Sparganium eurycarpum*) were growing. Apparently whatever conditions hurt EWM elsewhere in the lake during the summer didn't apply to this area.

Bed 7 – The densest bed on the lake in 2011 with most areas rated 2-3, we had a hard time finding any areas that rated a 2 although plants were generally canopied and continuous inside the bed. Similar to Bed 1, this area could have been downgraded to a "High Density Area" as the borders of the bed were often fragmented and poorly defined.

Beds 8-11 – Other than a handful of individual plants, EWM was entirely absent from these former beds.

Bed 12 – Although clearly not a bed in 2012, this area seemed to be filling back in as we noted 10's of plants scattered throughout it and they were actively fragmenting. This was especially true on the northeast shoreline of the bay.

LITERATURE CITED

Miller, G., M. Perkins, L. Sather, and E. Eaton. [online]. 1965. Long Trade Lake Map. Available from <http://dnr.wi.gov/lakes/maps/DNR/2640500a.pdf> (2011, November).

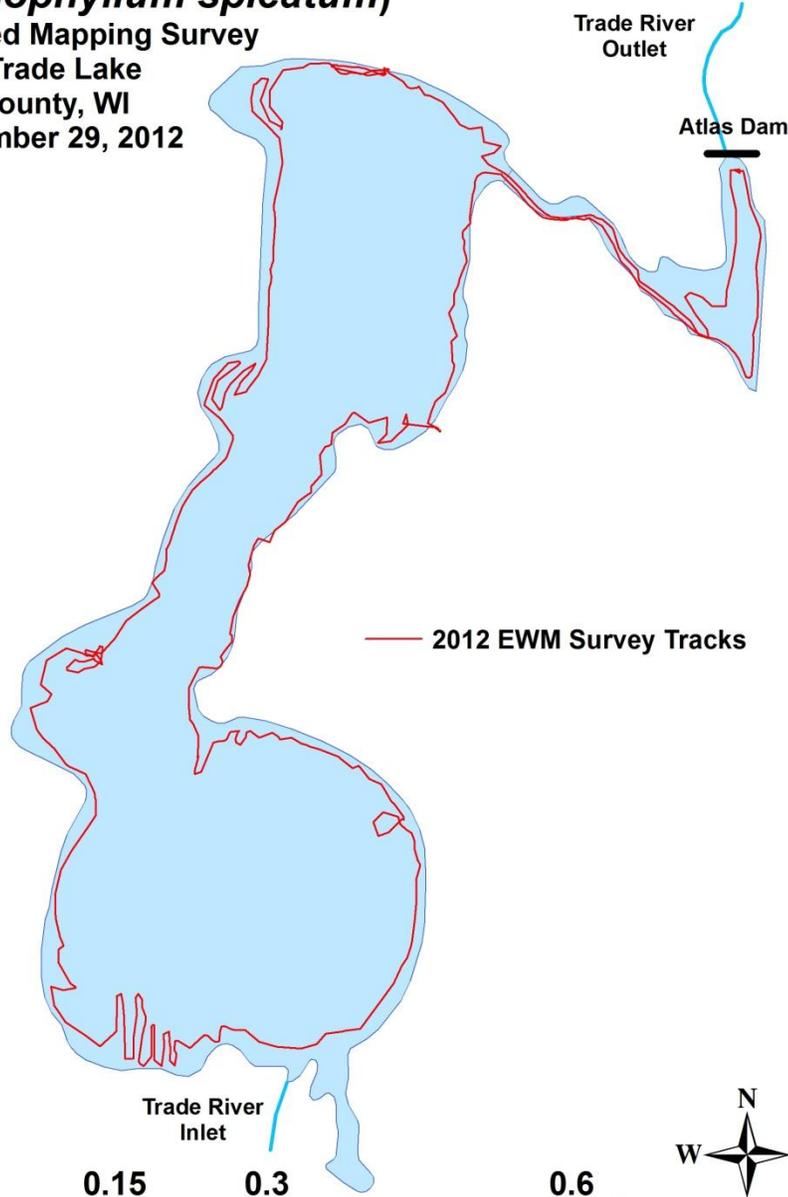
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Appendix I: Fall 2012 Eurasian Water Milfoil Survey Maps

Eurasian water milfoil (*Myriophyllum spicatum*)

Fall Bed Mapping Survey
Long Trade Lake
Polk County, WI
September 29, 2012



— 2012 EWM Survey Tracks

0 0.15 0.3 0.6 Miles



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