

**Eurasian water-milfoil (*Myriophyllum spicatum*)
Late Summer Bed Mapping Survey
Callahan Lake (WBIC: 2434700)
Sawyer County, Wisconsin**



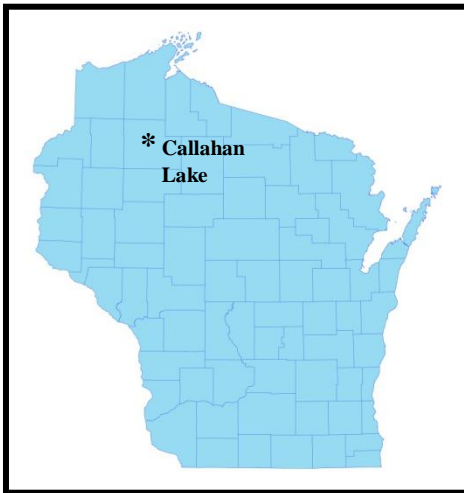
EWM beds on Callahan Lake 9/5-6/20



Eurasian water-milfoil (Berg 2007)

Project Initiated by:

The Callahan and Mud Lakes Protective Association,
Lake Education and Planning Services, LLC, and the
Wisconsin Department of Natural Resources (Grant AEPP-610-20)



Canopied Eurasian Water-milfoil - Callahan Lake 9/5/20

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September 5-6, 2020

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INTRODUCTION:

Callahan Lake (WBIC 2434700) is a 138 acre lake created by an 8ft dam on the north fork of the Chief River in north-central Sawyer County, Wisconsin in the Town of Round Lake (T41N R7W S33/34). It has a maximum depth of 18ft and an average depth of 11ft. The lake is mesotrophic in nature, and water clarity is good with summer Secchi readings averaging 10.9ft in 2020 (WDNR 2020). The lake's bottom substrate is primarily sand along the shoreline before transitioning to a sandy muck at most depths over 7ft (Bush et al. 1968) (Figure 1).

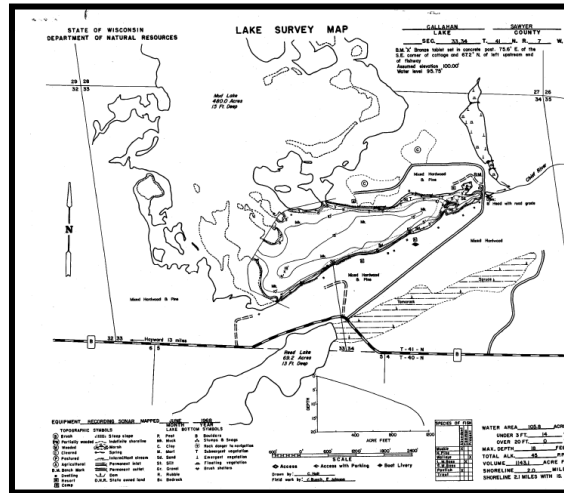


Figure 1: Callahan Lake Bathymetric Map

STUDY BACKGROUND AND RATIONALE:

Eurasian water-milfoil (*Myriophyllum spicatum*) (EWM) is an exotic invasive plant species that was first identified in Callahan Lake in the fall of 2005. Following an initial whole lake point-intercept survey in 2008 (J. Williamson), the Callahan and Mud Lakes Protective Association (CMLPA) and the Sawyer County Land and Water Conservation Department (SCLWC - K. Maki) used a 2009 Wisconsin Department of Natural Resources (WDNR) rapid response grant (AIRR-060-09) to hire Ayres Associates to write the lakes' original Aquatic Plant Management Plan (APMP) that outlined herbicide applications to control the infestation (Kleczewski 2009). Since the APMP's approval by the WDNR, these small-scale treatments have occurred periodically based on low intensity delineation surveys by the applicator and/or the SCLWC.

Per WDNR expectations (Pamela Toshner/Alex Smith, WDNR – pers. comm.), whole lake plant surveys on actively managed lakes are normally repeated every five to seven years to remain current. In anticipation of updating their plan in 2021, the CMLPA – under the direction of Dave Blumer (Lake Education and Planning Services, LLC - LEAPS) – applied for and receive a WDNR planning grant (AEPP-61020) to help cover the cost of surveys and to update the APMP. In order to determine the current level of infestation, in addition to the point-intercept survey, the CMLPA, LEAPS, and the WDNR requested we complete a late-summer EWM bed mapping survey of the lake's visible littoral zone. These data will be used to determine the acreage and density of EWM to help guide any future management. This report is the summary analysis of that field survey conducted on September 5-6, 2020.

METHODS:

Late-Summer Eurasian Water-milfoil Bed Mapping Survey:

During the survey, we searched the visible littoral zone of the lake. By definition, a “bed” was determined to be any area where we visually estimated that EWM made up >50% of the area’s plants, was generally continuous with clearly defined borders, and was canopied or close enough to being canopied that it would likely interfere with boat traffic. After we located a bed, we motored around the perimeter taking GPS coordinates at regular intervals. We also estimated the rake density range and mean rake fullness of the bed (Figure 2), the range and mean depth of the bed, whether it was canopied, and the impact it was likely to have on navigation (**none** – easily avoidable with a natural channel around or narrow enough to motor through/**minor** – one prop clear to get through or access open water/**moderate** – several prop clears needed to navigate through/**severe** – multiple prop clears and difficult to impossible to row through). These data were then mapped using ArcMap 9.3.1, and we used the WDNR’s Forestry Tools Extension to determine the acreage of each bed to the nearest hundredth of an acre. We also GPS marked additional individual EWM plants that occurred outside of the beds as they were generally few in number.




<u>Rating</u>	<u>Coverage</u>	<u>Description</u>
1		A few plants on rake head
2		Rake head is about 1/2 full Can easily see top of rake head
3		Overflowing Cannot see top of rake head

Figure 2: Rake Fullness Ratings (UWEX 2010)

RESULTS:

Late Summer Eurasian Water-milfoil Bed Mapping Survey:

On September 5-6, 2020, we searched 12.1km (7.5miles) of transects (black) throughout the lake's visible littoral zone. This, coupled with the 17.7km (11.0 miles) of transects (blue) searched during the point-intercept survey, resulted in a total search of 29.8km (18.5 miles) (Figure 3). Collectively, we mapped 18 beds that covered 3.26 acres (2.36% of the lake's surface area) (Table 1). Outside of these areas, we marked 40 additional isolated plants (Figure 4) (Appendix I).

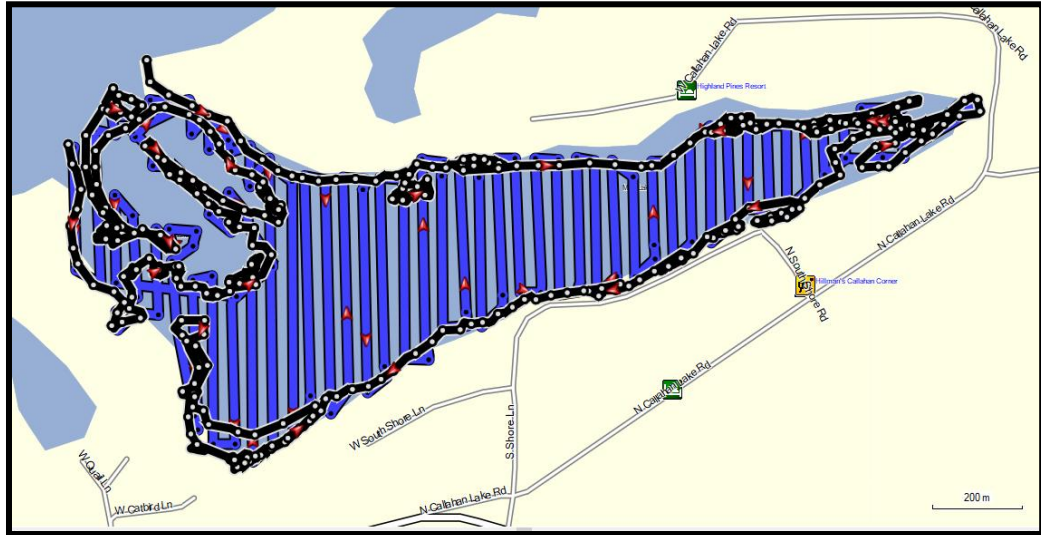


Figure 3: September 5-6, 2020 EWM Littoral Zone Survey – GPS Tracks

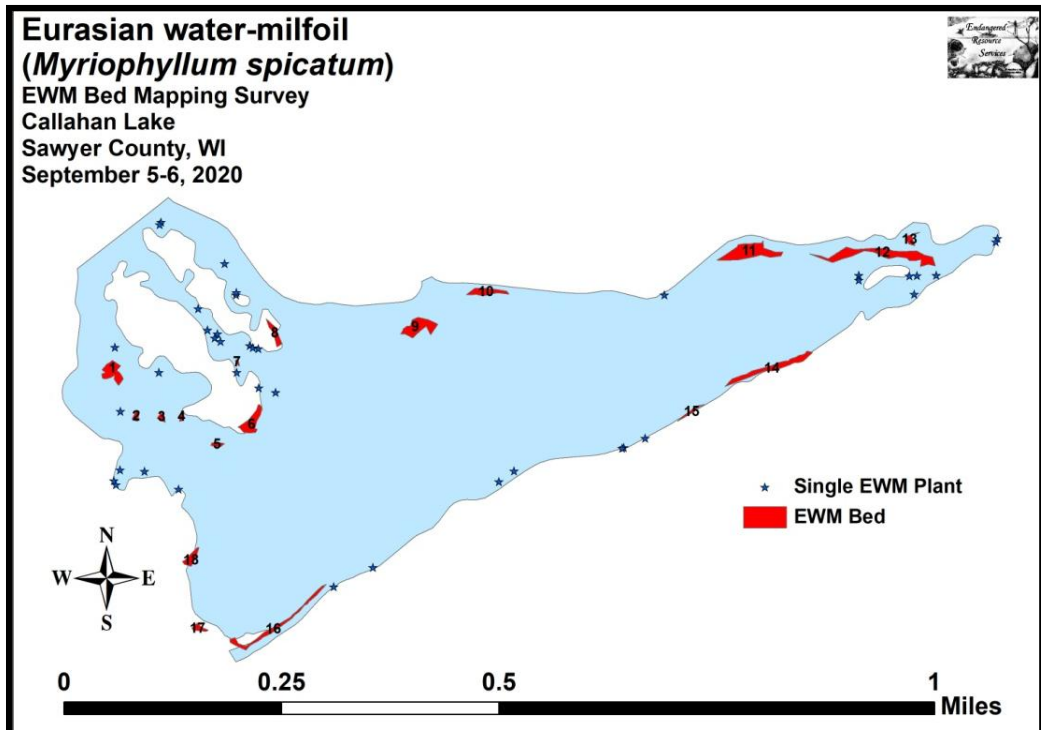


Figure 4: September 5-6, 2020 Eurasian Water-milfoil Map

**Table 1: Late Summer Eurasian Water-milfoil Bed Mapping Summary
Callahan Lake, Sawyer County
September 5-6, 2020**

Bed Number	2020 Acreage	Rake Range and Mean Rake Fullness	Depth Range and Mean Depth	Canopied	Navigation Impairment	2020 Field Notes
1	0.24	<1-3; 2	4-6; 5	Yes	Moderate	Main nav. channel between islands – many prop-clipped
2	0.04	<1-1; 1	4-5; 5	Near	Minor	Open bed next to the nav. Channel – some prop-clipping
3	0.03	<1-1; 1	4-5; 5	Near	Minor	Open bed next to the nav. Channel – some prop-clipping
4	0.03	1-3; 2	4-5; 5	Near	Minor	Open bed next to the nav. Channel – some prop-clipping
5	0.04	<1-1; 1	4-6; 5	Near	Minor	Open bed next to the nav. Channel – some prop-clipping
6	0.22	1-3; 3	3-5; 4	Yes	Moderate	One of worst areas, but next to island/not in main nav. Area
7	0.01	1-2; 1	2-4; 3	Yes	Minor	Most next to floating mud bog island
8	0.10	<1-2; 1	5-6; 6	Yes	Minor	Open patchwork of towers near mud bog island
9	0.32	<1-2; 1	6-8; 7	No	None	Deep water bed along the main nav. channel
10	0.17	<1-2; 1	6-9; 7	No	None	Hard to see narrow deep bed – nearly continuous
11	0.52	<<1-2; 1	6-9; 7	No	None	Difficult to see – narrow band ringing the 7ft bathy contour
12	0.66	<<1-2; 1	6-9; 8	Near	Minor	Many plants prop-clipped – plants didn't seem healthy
13	0.05	<1-2; 1	3-6; 5	Yes	Minor	Low density bed on point/most people could navigate around
14	0.36	1-2; 2	3-8; 6	Yes	Minor	Very narrow strip along resort shoreline
15	0.04	<<1-1; 1	4-8; 6	Yes	None	Very thin ribbon along resort in all available habitat
16	0.27	<<<1-3; 1	4-8; 6	Near	Minor	Patchy area with nearly continuous plants
17	0.05	1-3; 1	5-7; 6	Near	Minor	Open bed along floating bog
18	0.10	<1-3; 1	5-7; 6	Near	Minor	Open bed along floating bog
Total Acres	3.26					

Descriptions of Eurasian Water-milfoil Beds:

Beds 1-5 – For management purposes, these beds could be considered a single bed although there were significant gaps between them where we didn't see any plants. Eurasian water-milfoil inside these areas was mostly low density, but many plants showed evidence of prop-clipping.

Beds 6-8 – These areas were located next to and among the floating mud bog islands that occur between the main navigation channels. Although Bed 7 was a canopied mat and one of the worst areas on the lake, its close proximity to the island likely meant it had minimal impact on navigation. However, because it is in an upstream area on the lake, fragments from the bed may be a significant source of downstream “seeding”.

Beds 9-11 – Located along the north shore, these deep water beds were all difficult to see and none appeared to be causing any navigation issues. Similar to Bed 7, the bigger issue with them is their potential to seed downstream areas.

Beds 12 and 13 – These beds were established in the outlet channel and adjacent point north of the wooded sand island. Although many of the plants in Bed 12 were prop-clipped, it seemed likely most of these fragments would get pulled over the dam which probably makes this area a low treatment priority – at least at its current density. Bed 13 had some potential to impair navigation, but the local shoreline residents appeared to just avoid it as they accessed open water.

Beds 14-16 – These beds occurred along the lake's southern shoreline where the sharp drop-off into over 10ft of water produced a narrow range of suitable EWM habitat. Because the beds in this area were all narrow, they were unlikely to be more than a minor navigation impairment; however, as they occurred in front of the resort and heavily developed areas, they all had plants that were prop-clipped.

Beds 17 and 18 – Similar to Beds 6-8, these two small beds occurred along floating bogs in out of the way places that were unlikely to affect boat traffic.

DISCUSSION AND CONSIDERATIONS FOR MANAGEMENT:

Eurasian water-milfoil currently occupies a small percentage of Callahan Lake's surface area, but it is well established making eradication an unrealistic expectation. Although the species grows well in the Mud/Callahan system, active management has dramatically reduced the levels of EWM from an estimated 55 acres covering 39.86% of the lake's surface area in 2008 (Kleczewski 2009) to 3.26 acres (2.32% coverage) in 2020 – a decline of **-94.07%**. This control has come at a high economic cost, and, as herbicides are non-selective, has also likely had significant impacts on the aquatic plant community. In the future, maintaining EWM at its current low levels using targeted management will likely continue to produce satisfactory control while simultaneously minimizing financial and ecological costs.

LITERATURE CITED

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Appendix I: 2020 Eurasian Water-milfoil Bed Map

Eurasian water-milfoil (*Myriophyllum spicatum*)

EWM Bed Mapping Survey

Callahan Lake

Sawyer County, WI

September 5-6, 2020

