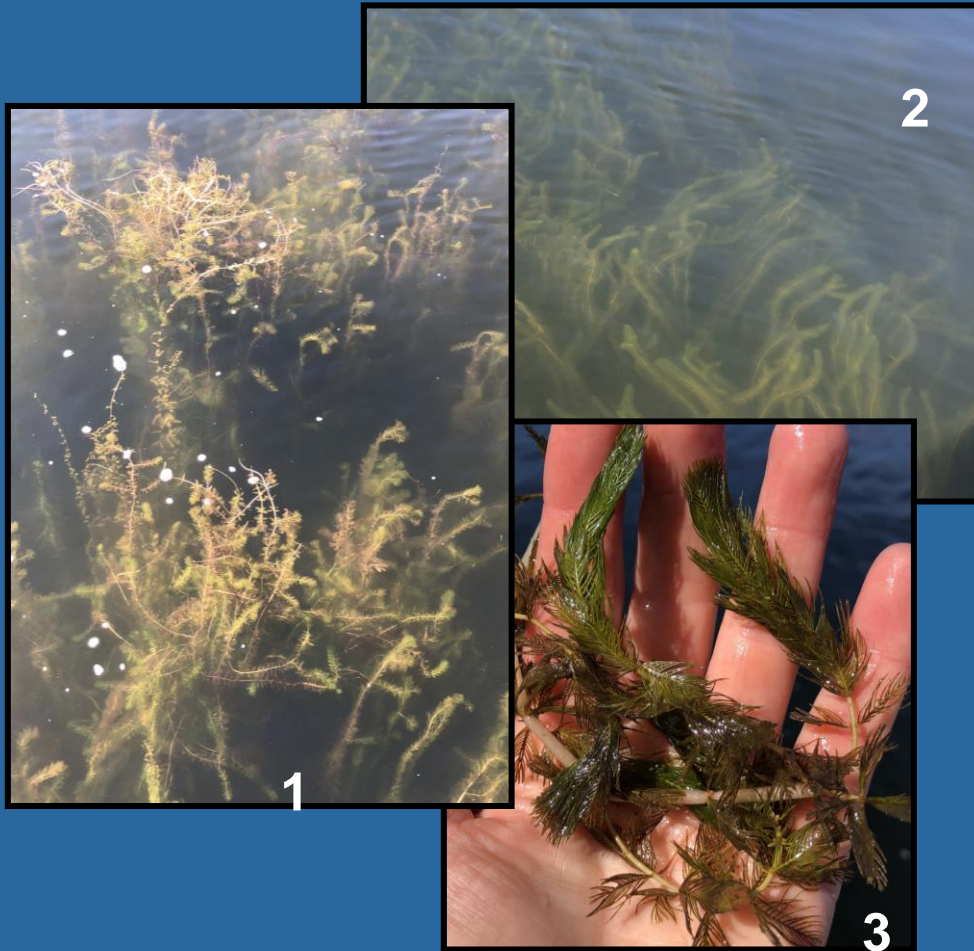


# 2020 Eurasian Watermilfoil Survey

Whitefish Lake, Sawyer County, WI

- Surveys Completed September 4-5, 2020 –
- Report Completed December 2020 -



Project initiated & funded by:  
Whitefish Lake Property Owners Association

Surveys & report completed by:  
Aquatic Plant & Habitat Services LLC  
Sara Hatleli • 715-299-4604 • sarahatleli97@gmail.com  
Survey assistance from AEM Aquatic Consulting

Photos from Cover Page:

- 1) Eurasian watermilfoil (EWM, Non-native & invasive) found in Whitefish Lake.
- 2) Northern watermilfoil (native) found in Whitefish Lake. Northern watermilfoil can be mistaken for the non-native & invasive EWM and often resembled EWM during the survey in 2020.
- 3) EWM from Whitefish Lake.

*All photos taken by Sara Hatleli, Aquatic Plant & Habitat Services LLC*

## **ABSTRACT**

Whitefish Lake in Sawyer County, Wisconsin was surveyed for Eurasian watermilfoil (*Myriophyllum spicatum*, EWM) on September 4-5<sup>th</sup>, 2020. The survey was intended to assess EWM occurrence at locations where herbicide treatment occurred in 2020 and also map EWM found elsewhere in the lake. Methods of the survey followed WDNR guidelines including delineation of EWM beds while boating around the perimeter and sub-point-intercept sampling at 20-meter grid resolution within those EWM beds. A double-sided rake on a telescopic pole was used at sample points and all species were recorded along with water depth and substrate.

***Survey results in the five locations treated with herbicide in 2020 showed very low EWM occurrence.*** EWM was found on the rake at only 1 sample point west of Pierce's Bay out of a total of 77 among all 5 treated beds. Single plants or small clumps of EWM were found in 3 of the treated areas (White's Bay #3 & #5 and Schoolhouse Bay #1), but were between sample points. Although pre-treatment data was not collected (with the exception of Schoolhouse Bay, see the Results section), these findings suggest that 2,4-D herbicide was effective in reducing EWM at treated locations during the same year that treatment occurred.

***Survey results in remaining areas revealed nine beds of EWM that ranged in size from 0.01 to 0.312 acres and totaled 1.97 acres.*** There were also many single EWM plants that were noted but not mapped as a bed of EWM because they were highly dispersed among native species. In these areas, EWM was no more abundant than the native plants and therefore not causing recreational or biological impairment. These areas should be monitored closely for increased EWM occurrence and subsequent impairment.

***Management recommendations*** are to either forego herbicide treatment in 2021 while closely monitoring EWM **or** to treat bed B20 and possibly A20 after consulting with engaged partners (e.g. WDNR, herbicide applicator, consultant, etc.) on details of herbicide selection (e.g., 2,4-D, ProcellaCOR). Hand pulling using DASH or snorkelers is appropriate in addition or in lieu of herbicide treatment in 2021 because the EWM beds are small. The highly dispersed single clumps of EWM would be best tackled by snorkelers with care to avoid fragmentation and also to pull the EWM roots. DASH or snorkeling that is contracted out should include strategies for fragment mitigation and defined expectations of success.

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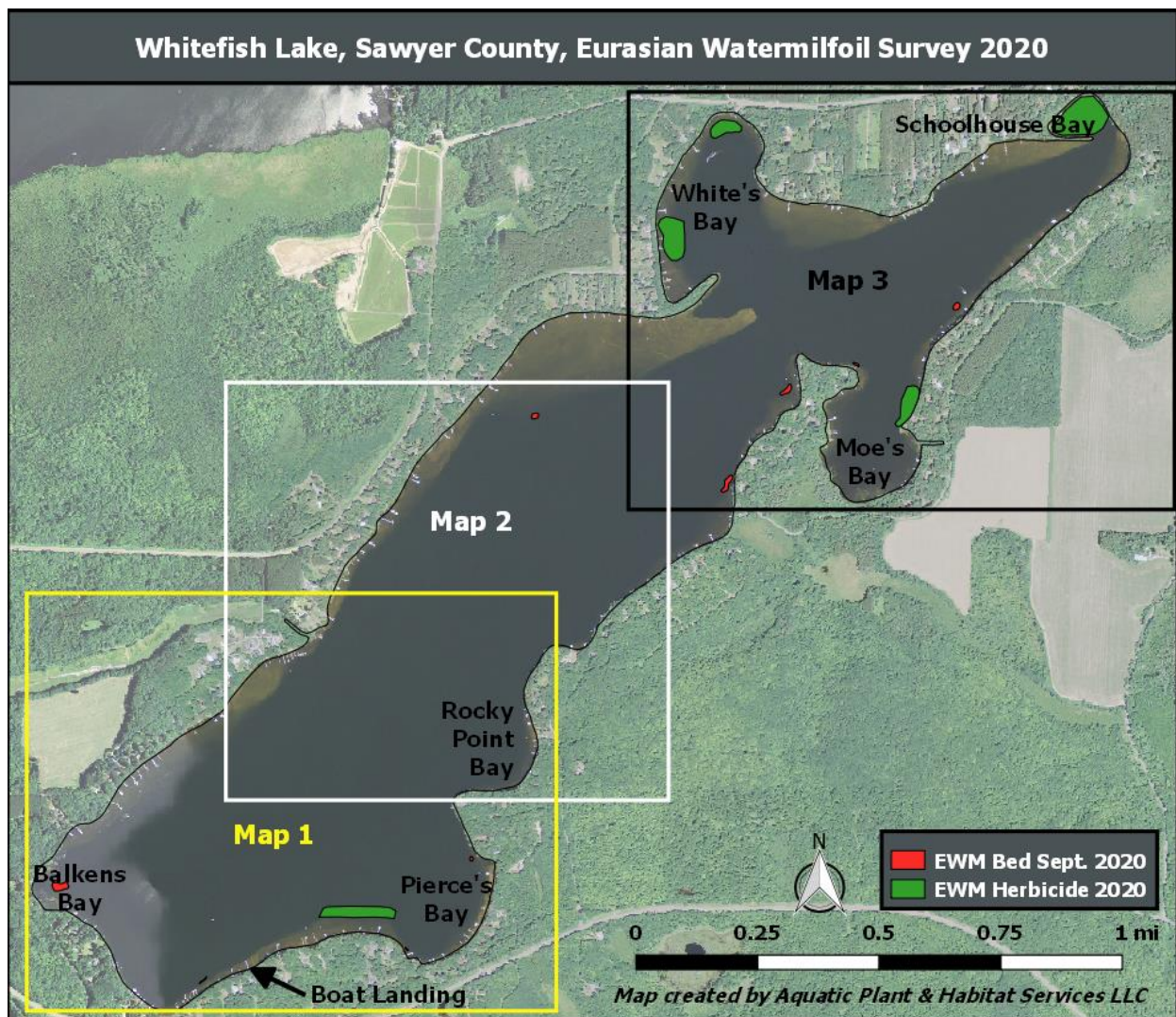
## INTRODUCTION

The Whitefish Lake Property Owners Association (WLPOA) partnered with Aquatic Plant and Habitat Services LLC to complete an assessment of areas that were treated with 2,4-D herbicide in 2020 and other areas not treated but with EWM present. This report is intended to provide results of the post-herbicide survey and overall occurrence of EWM in Whitefish Lake.

### Study Site

Whitefish Lake is a drainage lake located in Sawyer County, Wisconsin with a surface area of 800 acres (WBIC 2392000). The maximum depth is 105 feet and the mean depth is 45 feet. The lake is situated approximately 12 miles south of Hayward, Wisconsin. Whitefish Lake is considered mesotrophic with average water clarity ranging from 11 to 14 feet in the last five years.

Figure 1 – Whitefish Lake Map






## METHODS

### Field Methods

Field methods followed the Draft Aquatic Plant Treatment Evaluation Protocol document from Wisconsin Department of Natural Resources<sup>1</sup>. Five areas were surveyed September 4-5<sup>th</sup>, 2020 to gauge EWM occurrence in areas that had been treated with herbicide on June 24<sup>th</sup>, 2020. The remainder of near-shore areas were surveyed to document EWM locations and size of EWM beds. Survey locations and strategy were done in consultation with the WI DNR and WLPOA. Dense stands of EWM were targeted and boundaries were visually determined from a boat and mapped while navigating along the bed perimeter.

Each EWM bed was assigned a letter identifier followed by the year (e.g., A20). Locations of sparse EWM (i.e., no more abundant than native species and spread out) were captured but not included as beds or acreage estimates because the EWM was no more abundant than the native species growing in the same areas. Within the EWM beds a sampling grid of 20-meter-spaced points was created and then points were sampled. A double-sided rake head on a telescopic pole was used to sample each point for EWM & aquatic plant rake fullness, depth, and dominant sediment type (muck, rock, or sand). The rake fullness rating for total coverage of plants on the rake and a separate rake fullness rating for each species present were recorded (Figure 2). Aquatic plants found within 6 feet of the sample point but not found on the rake were counted as visual observations. Plant identification was verified using Skawinski (2014).

**Figure 2 – Rake Fullness Illustration**

Rating	Coverage	Description
1		Few plants
2		Plants cover length of the rake but not tines
3		Rake completely covered, tines not visible

### Map Development

Aquatic plant survey data were uploaded to an open source geographic information systems (GIS) program known as QGIS (QGIS, 2020). Maps were created to show EWM occurrence, rake fullness, bed location, and past management.

## 2020 HERBICIDE TREATMENT

**Table 1 – 2020 Details from Herbicide Treatment Records**

EWM Bed	Location	Acres Treated	2,4-D Brand	Total Sample Points	Sample Points with EWM	Applied Concentration Rate (ppm)
1	Schoolhouse Bay	3.99	Weedar 64	12	0	0.5
2	West Pierce's Bay	0.92	Navigate	25	1	4
3	White's Bay	1.03	Navigate	18	0	4
4	Moe's Bay	1.03	Navigate	13	0	4
5	White's Bay	0.52	Navigate	9	0	4
<b>TOTAL</b>		<b>7.49</b>		<b>77</b>	<b>1</b>	

<sup>1</sup> Updated October 1, 2016. <https://dnr.wi.gov/lakes/plants/research/>.

# RESULTS

## Map 1 – Southwest Whitefish Lake

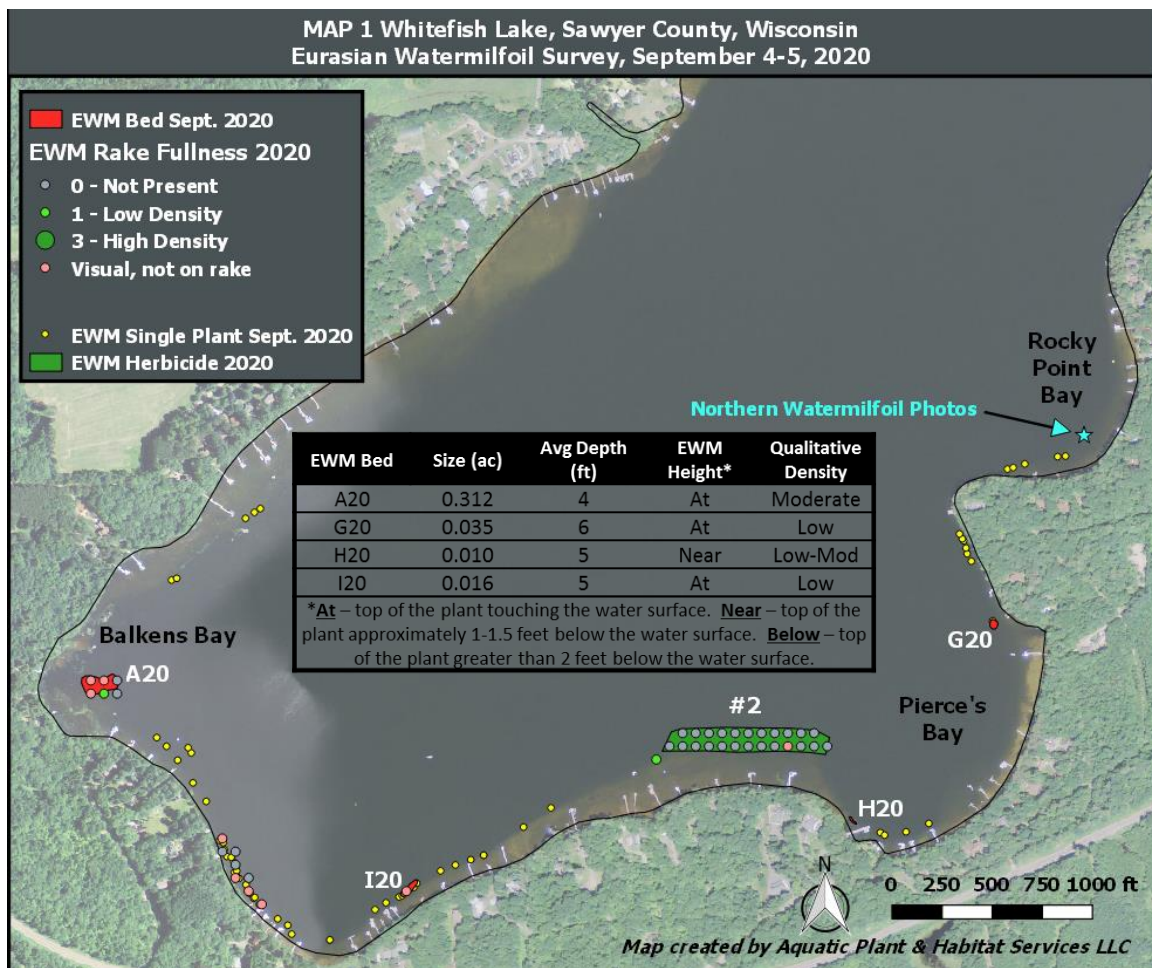
### Location #2 Treated with Herbicide in 2020

Location #2 just west of Pierces Bay was 0.92 acres treated with Navigate 2,4-D on June 24<sup>th</sup>, 2020. Of the 25 points sampled within/near #2, EWM was on the rake at one sample point and within 6 feet but not on the rake at another sample point. Although pre-treatment data was not collected in 2019, it appears the herbicide treatment was effective in reducing EWM in 2020.

### EWM Beds & Single Plants

There were 4 beds of EWM mapped in this area of the lake, the largest of which was A20 at 0.312 acres in Balkens Bay. EWM was dense in the center of A20 but scattered and of low density outside the center. Three beds of EWM were very small (G20, H20, and I20) ranging from 0.01 to 0.035 acres. Also illustrated in Figure 3, Figure 4, and Figure 5 are locations of single EWM plants or small clumps of EWM that were no more abundant or frequent than intermixed native species. Locations of the single plants appear close and abundant on the map, but this is a function of the map scale. In real space these occurrences of EWM were too spread out to warrant mapping as a bed of solid EWM.

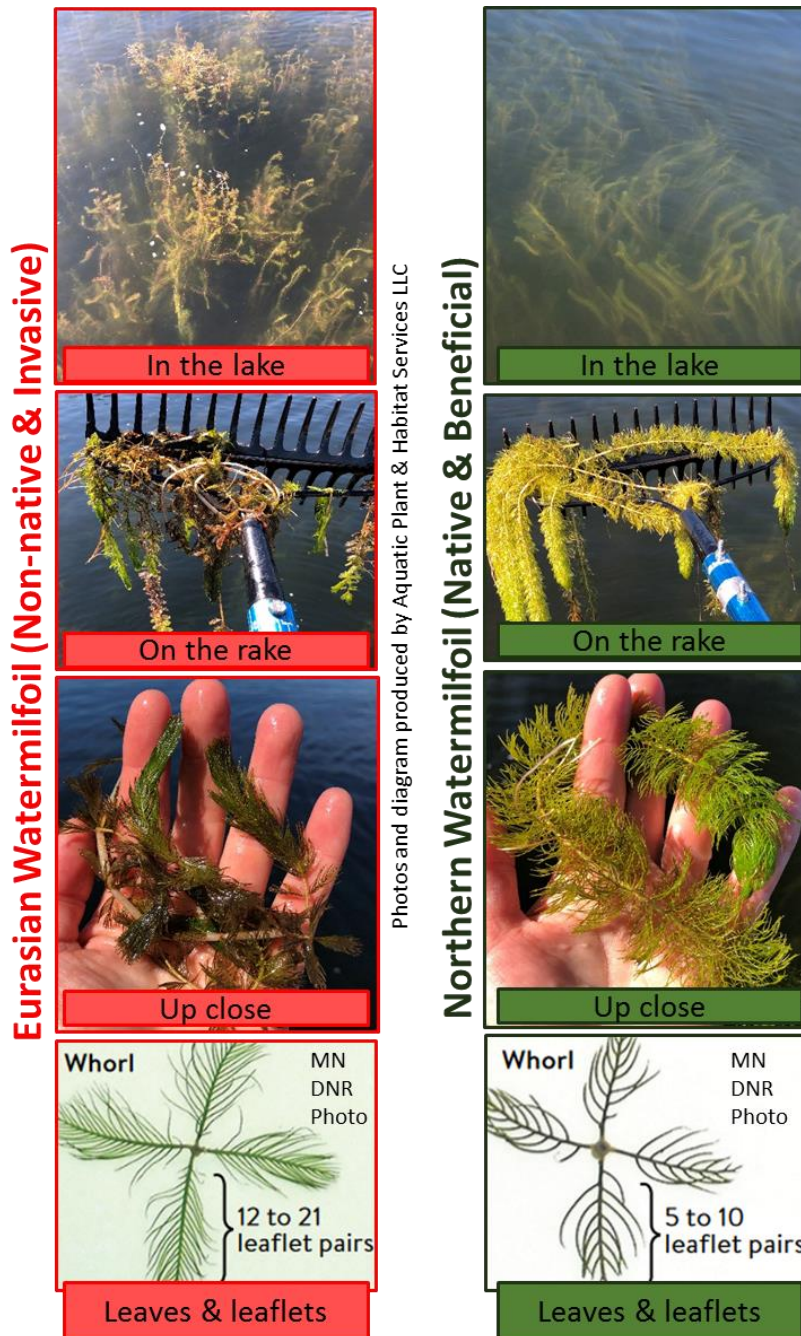
Figure 3 – Map 1, Southwest Whitefish Lake



**Northern Watermilfoil Resembling Eurasian Watermilfoil**

There were some areas in Whitefish Lake with beds of the native and beneficial northern watermilfoil (*Myriophyllum sibiricum*). From the boat, some of these beds of native northern watermilfoil (NWM) strongly resembled beds of EWM until a rake sample was taken to verify the species. One such location was documented and is represented by the blue star in Figure 3. Photos of EWM and NWM illustrate the different appearance of each species in Whitefish Lake (Figure 4).

**Figure 4 – Photos of EWM & Native Northern Watermilfoil in Whitefish Lake**

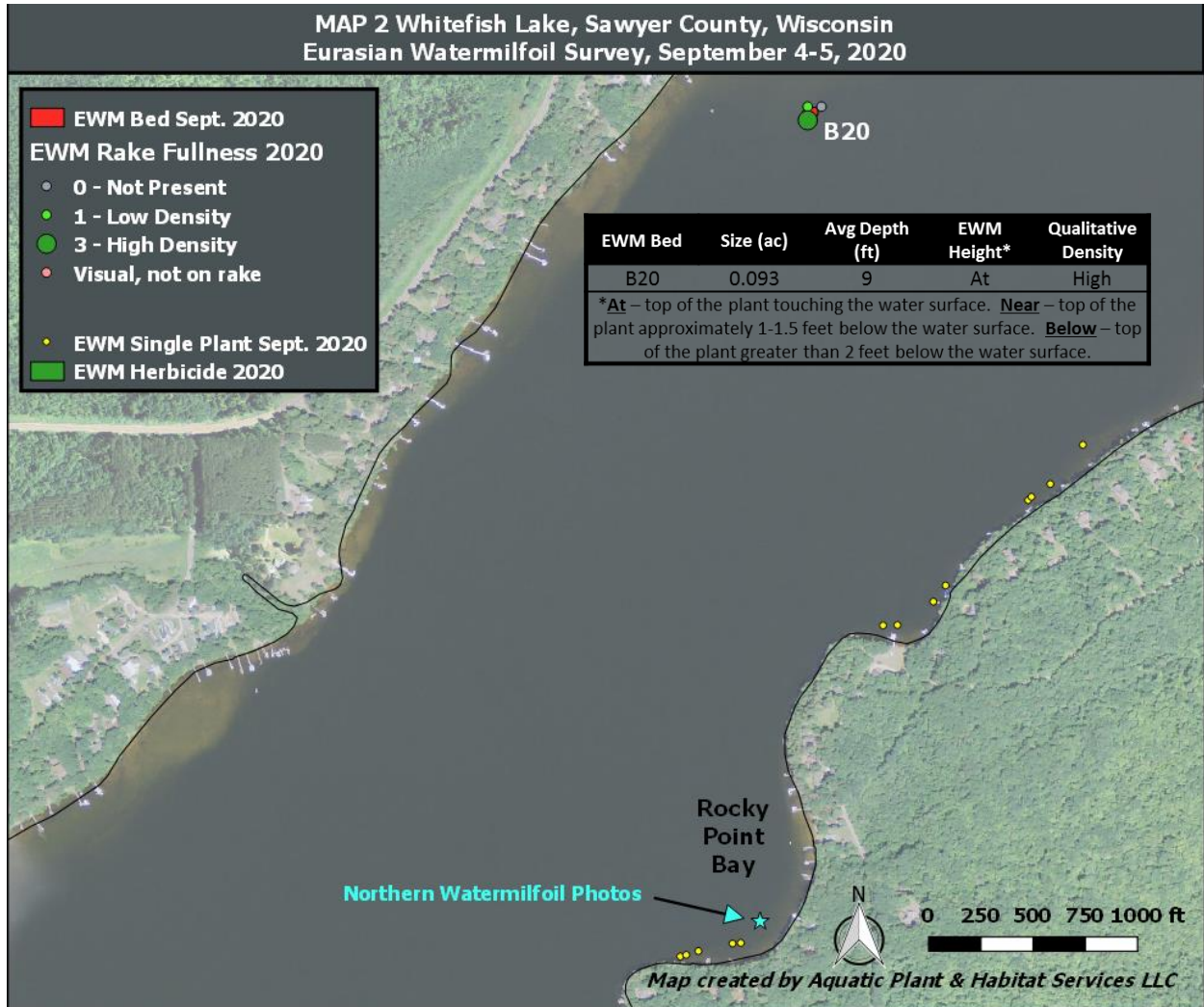


## Map 2 - Middle Whitefish Lake

### *EWM Beds & Single Plants*

There was one bed of EWM mapped in this area of the lake, which was B20 (0.093 ac) located about 600 feet (approx. 180 meters) from shore. The EWM at B20 was dense, canopied at the surface, and found in 9 feet of water.

**Figure 5 – Map 2, Middle Whitefish Lake**



### Map 3 – Northeast Whitefish Lake

#### Locations #3, #4, & #5 Treated with Herbicide in 2020

Within locations 3, 4, and 5 that were treated with 2,4-D herbicide on June 24<sup>th</sup>, 39 points were sampled with no EWM found on the rake. Only single EWM plants were found in White's Bay #3 and #5 between survey points. Although pre-treatment data was not collected in 2019, it appears the herbicide treatment was effective in reducing EWM in 2020.

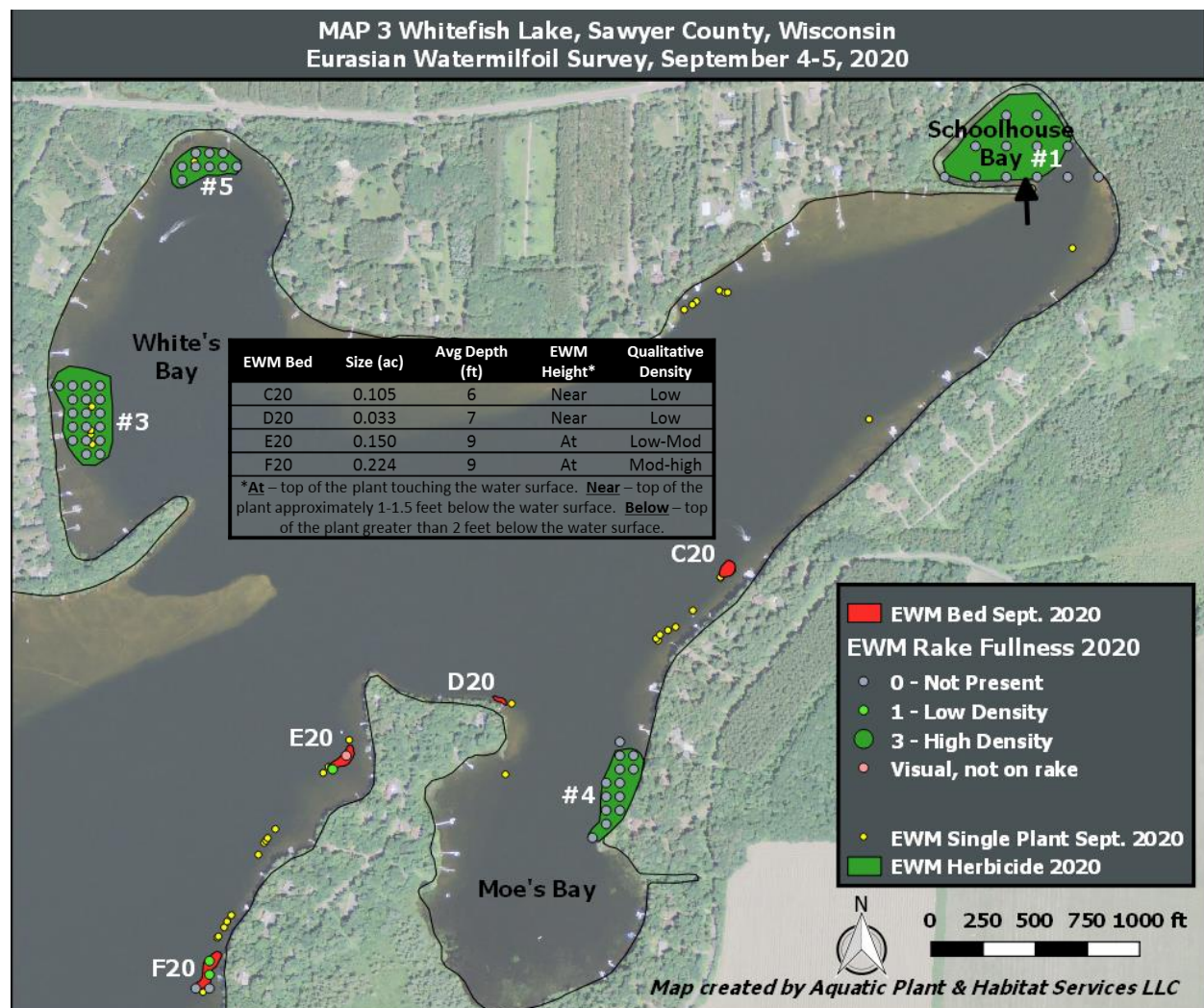
#### Location #1 Treated with Herbicide in 2020

The survey strategy for Schoolhouse Bay was different from the other treated locations. A whole-lake point-intercept survey was completed by Endangered Resource Services during which 12 points were sampled in Schoolhouse Bay with EWM at one of those points. In 2020 EWM was not raked at any of the 12 survey points but small clumps were found between sample points.

#### EWM Beds & Single Plants

There were 4 beds of EWM mapped in this area of the lake, the largest and densest of which was F20 at 0.224 acres. The remaining beds were very small ranging from 0.01 to 0.035 acres.

Figure 6 - Map 3, Northeast Whitefish Lake



## DISCUSSION

### **Aquatic Plants are Necessary for Healthy Lakes**

Aquatic plants serve important functions in lake systems. They provide structural habitat for small invertebrates that are an important food source for juvenile game fish and adult panfish. Plants also provide structural habitat for juvenile and small fish to hide from predators and vice versa as larger predators may lurk in the shadows of plants in wait of forage. Aquatic plants also provide foraging and/or hiding structure for reptiles, amphibians, and waterfowl. The shorelines of lakes are buffered from wave action when aquatic plants absorb some of the wave energy. Aquatic plants are important consumers of nutrients that would otherwise be available for nuisance algal growth. For these reasons, a healthy and diverse aquatic plant community should be protected and valued.

### **Prioritizing EWM Control**

Unfortunately, complete EWM eradication is not a realistic management goal. It is important to identify EWM locations, bed size, density, and plant height to help prioritize EWM management actions. One possible strategy is to target locations that are of greatest impact to recreation, or in other words, EWM beds that are most dense with plants near the surface or canopied. This strategy would also help address fragmentation caused by boat traffic. Prioritization means leaving locations of low EWM density and/or EWM growing well below the lake surface for close monitoring and future control when the EWM bed becomes larger or taller.

### **Management Recommendations**

Given the low occurrence of EWM on a lake-wide scale at 1.97 acres with the largest bed of EWM at 0.312 acres, it appears that the WLPOA would be able to forego herbicide treatment in 2021 if this is socially feasible for the board and membership. The EWM was not causing recreational impairment nor biological impairment in any of the beds that were mapped. However, if herbicide treatment were to occur it would be most appropriate at B20 because of high EWM density and location in open water where there would be greater susceptibility to fragmentation from boat traffic (Figure 5). Another area where herbicide might be reasonable is A20 (Figure 5) because it was the largest EWM bed. This area, however, was densest at the center but low EWM density otherwise and the shallow, and somewhat rocky nature of this area coupled with its position in the southwest area makes it less prone to fragmentation from boat traffic. The type of herbicide used in 2020 was 2,4-D, which is a common herbicide used for EWM control, and results from this survey suggest it was effective in reducing EWM occurrence during the same year as treatment<sup>2</sup>. A newer herbicide known as ProcellaCOR was first used in Wisconsin lakes in 2019 and preliminary observations suggest it is effective in significantly reducing EWM occurrence but studies continue to track the longevity of its effectiveness. Either of these herbicides are reasonable for consideration in treating EWM in 2021 but close consultation with the DNR and herbicide applicator are recommended before selecting herbicide type.

Hand pulling by divers or snorkelers is a good practice for controlling small EWM beds (>0.01 ac) of low density and for single EWM plants scattered among native species. If a company is hired to conduct diver assisted suction harvesting (DASH) or EWM removal by snorkelers, a

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<sup>2</sup> Pre-treatment data were not collected for comparison except in Schoolhouse Bay.

conversation beforehand about EWM fragment mitigation and defining success are highly recommended. If volunteers are deployed to remove EWM, they should follow guidelines in the EWM Hand Removal video produced by UW-Extension Lakes.<sup>3</sup> This method would also be appropriate where EWM is widely dispersed, such as the area along the southwest shore between the boat landing and A20 (Figure 3).

Regardless of the EWM control actions employed in 2021, a strong monitoring and surveying of known and new EWM locations is highly advised to track EWM bed growth and EWM spread to new locations. Continued monitoring of sites treated with herbicide in 2020 will also provide insight on how long herbicide control lasts.

## REFERENCES

QGIS Development Team, 2020. QGIS Geographic Information System. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>.

Skawinski, P.M. 2014. Aquatic Plants of the Upper Midwest: A photographic field guide to our underwater forests. Second Edition.

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<sup>3</sup> <https://www.youtube.com/watch?v=CfsEDyAwQP4>, accessed 26 December, 2020.