

Lake Sarah (Hennepin County)
Eurasian Watermilfoil Survey &
Curlyleaf Pondweed Post-Treatment Inspection
May 23, 2017



(320) 492-8582 protectyourlake@gmail.com

www.facebook.com/AISConsultingServices

Prepared for the Lake Sarah Improvement Association

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Introduction

AIS Consulting Services completed an Eurasian Watermilfoil (EWM) delineation and Curlyleaf Pondweed (CLP) post-treatment inspection on Lake Sarah on May 23, 2017. The purpose of the survey was to map the distribution of Eurasian Watermilfoil to inform treatment options of nuisance patches that may impede navigation. Additionally, the effectiveness of the Curlyleaf Pondweed treatment was assessed by checking the status of Curlyleaf Pondweed in several areas of the lake.

Methods

Protocol for the survey followed the DNR Guidance for Delineating Invasive Aquatic Plants for Management. We maneuvered our boat in a meandering pattern across the littoral area of the lake (≤ 15 ft. depth), looking for EWM and CLP with a combination of visual assessment and rake tosses aided by our sonar unit. Rake samples were examined for Eurasian Watermilfoil, Curlyleaf Pondweed and other native plants. The survey focused on historical areas of EWM, with attention being paid to areas adjacent to homes. Areas along undeveloped shoreline were not directly assessed, as they are typically areas that would not impede navigation.

If EWM was found, the location was marked with a gps waypoint, depth was recorded, and EWM was given an estimated density rating. Any native plants found on the rake sample were also recorded and assigned a density rating. Density ratings are based on the percent of rake head occupied by the plant sample. When CLP was found, the sample was examined to see if signs of decay are occurring, such as the plant turning brown, laying over on the bottom of the lake, and brittleness of leaves and stems.

Rake Density Ratings - *estimated coverage of rake head by plant sample*

- 1 = Only a few target plants retrieved**
- 2 = Full length of rake head covered, but tines only partially covered**
- 3 = Plants cover the rake head and tines**
- 4 = Enough plants to cover rake head and tines multiple times**



Rake Density of 1

Rake Density of 2

Rake Density of 3

Rake Density of 4

Methods

As EWM was found, additional locations around that point were searched, and additional waypoints marked the boundaries of the EWM bed. Each bed was then assigned a density rating based on the following criteria.

EWM Bed Density Ratings - *estimated coverage of area with EWM*

1 = Target plant is sparse, covering less than 25% of an area

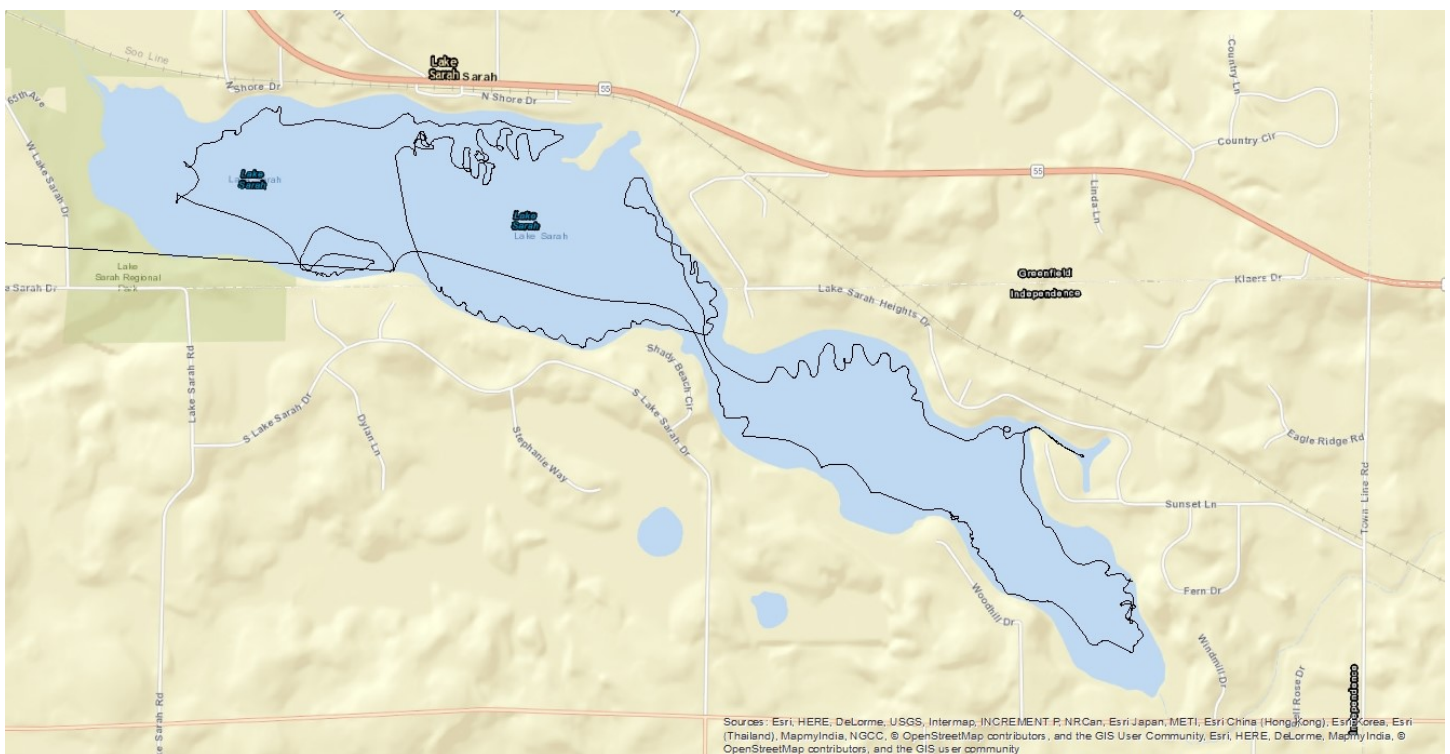
2 = Target plant is scattered and covers 25—50% of an area

3 = Target plant is common and covers 50—75% of an area

4 = Target plant is abundant/surface matted and covers 75—100% of an area

Results

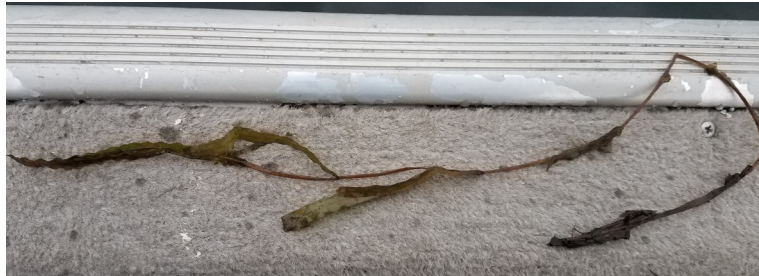
Figure 1. Tracks from EWM Survey & CLP Post-Treatment Inspection



Results

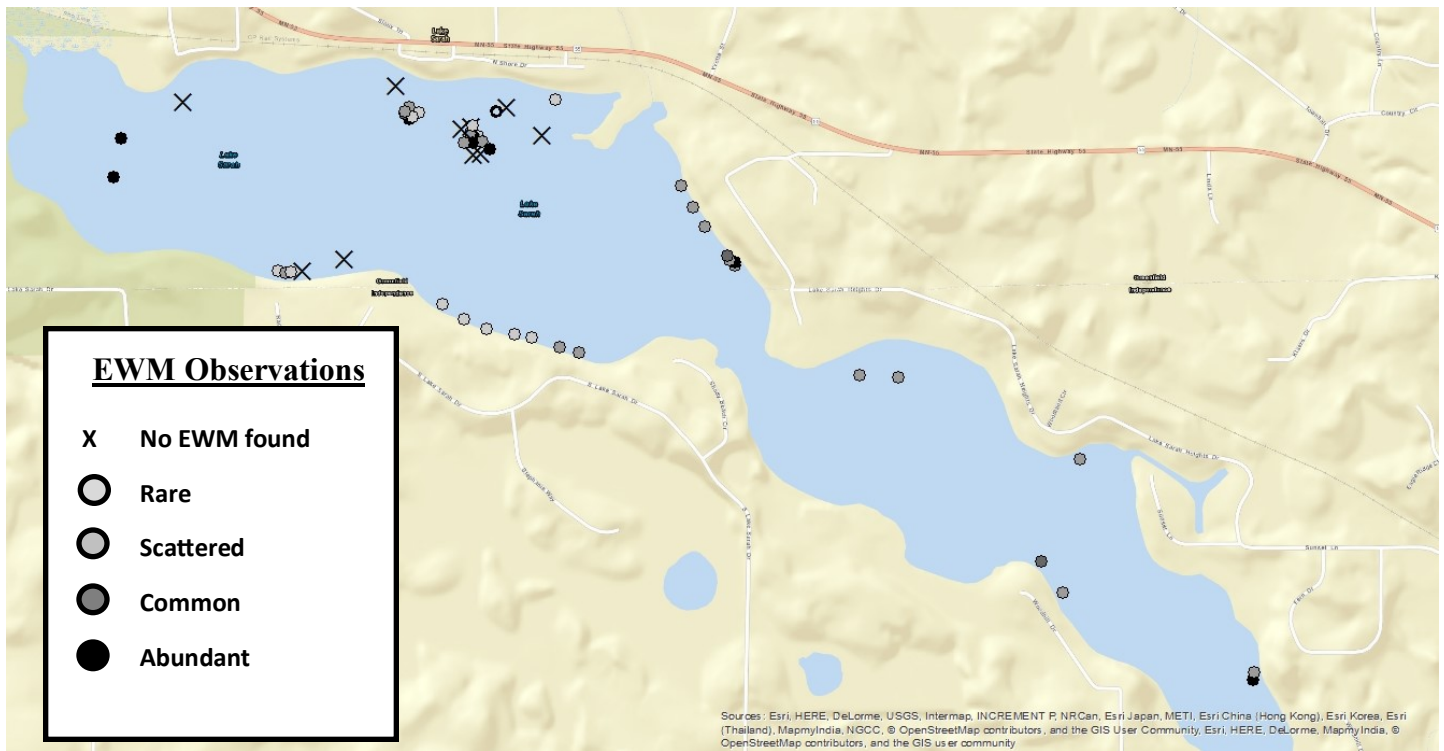
CLP Post-Treatment Inspection Results

A whole-lake Curlyleaf Pondweed treatment occurred on May 4, 2017. This survey, conducted 3.5 weeks after the treatment, serves as the post-treatment inspection. In all areas of the lake examined during this survey, any CLP found had characteristics of decaying, dead plants. Plants appeared to be laying over on the bottom of the lake, leaves and stems appeared brown and were very brittle and breaking apart. The 2017 treatment appears to be successful. Pictures of CLP from the survey are below.



Results

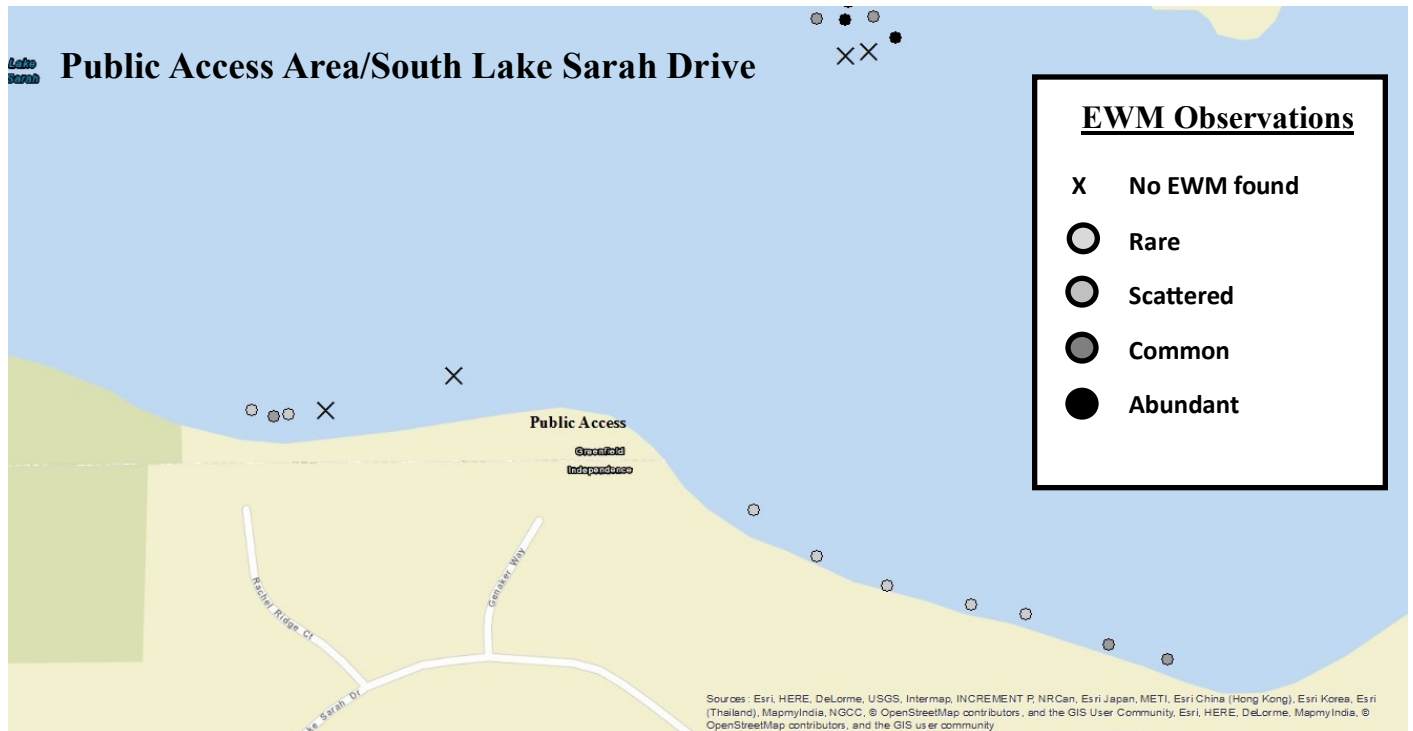
Figure 2. EWM Locations and Estimated Abundance



Based on observations from this survey and past surveys, Eurasian Watermilfoil appears to be less abundant in 2017 than previous years. Elodea and Coontail appeared to be more abundant and growing in historical areas usually occupied with more EWM. EWM plants were mostly scattered, with some dense patches found in several areas of the lake. Each area of the lake will be discussed in the following sections of this report, with some management recommendations for each area.

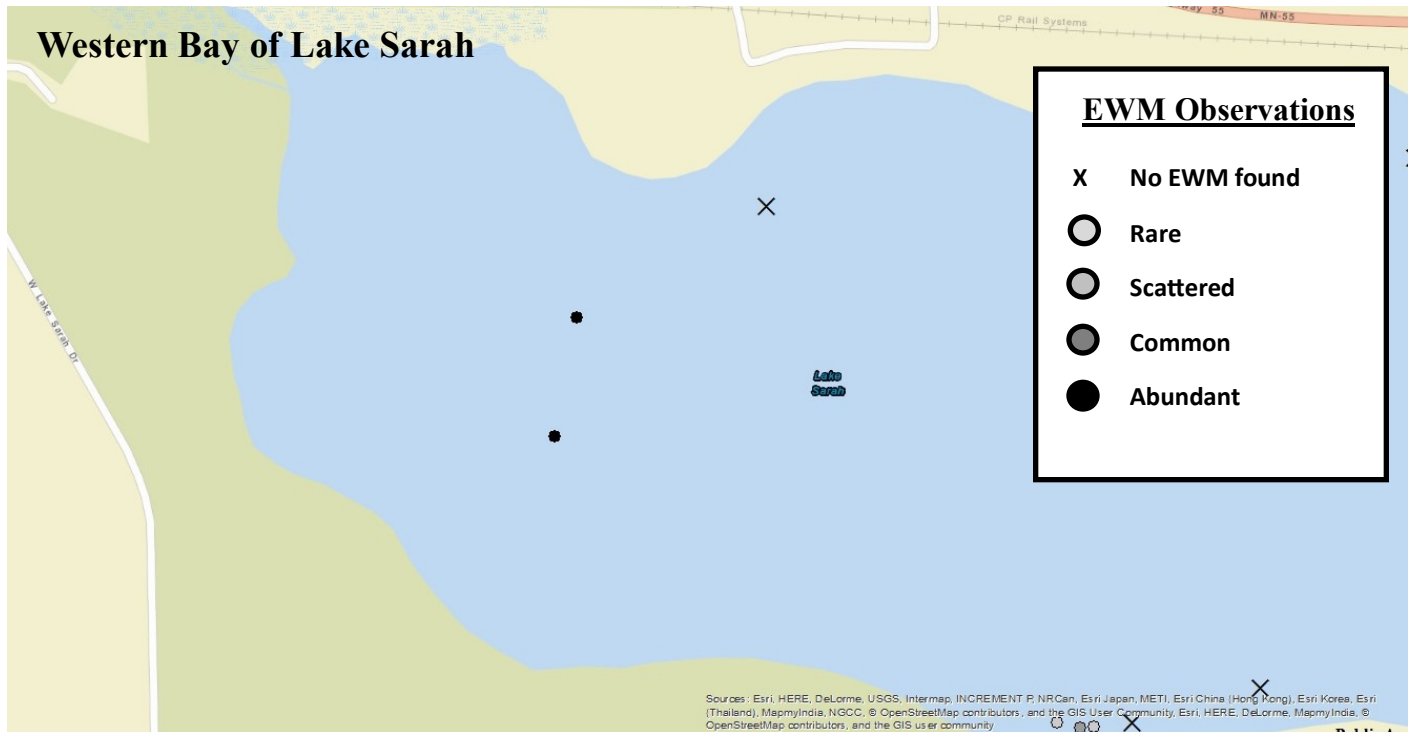


Elodea sampled on the rake during survey



The shoreline west of the public access had a small patch of EWM in 4 to 5 feet of water. Light growth of Elodea and Coontail were mixed in. No treatment is recommended here, EWM is common in the small patch, but the whole area is very small, not impeding navigation, and the small size would make for an ineffective treatment.

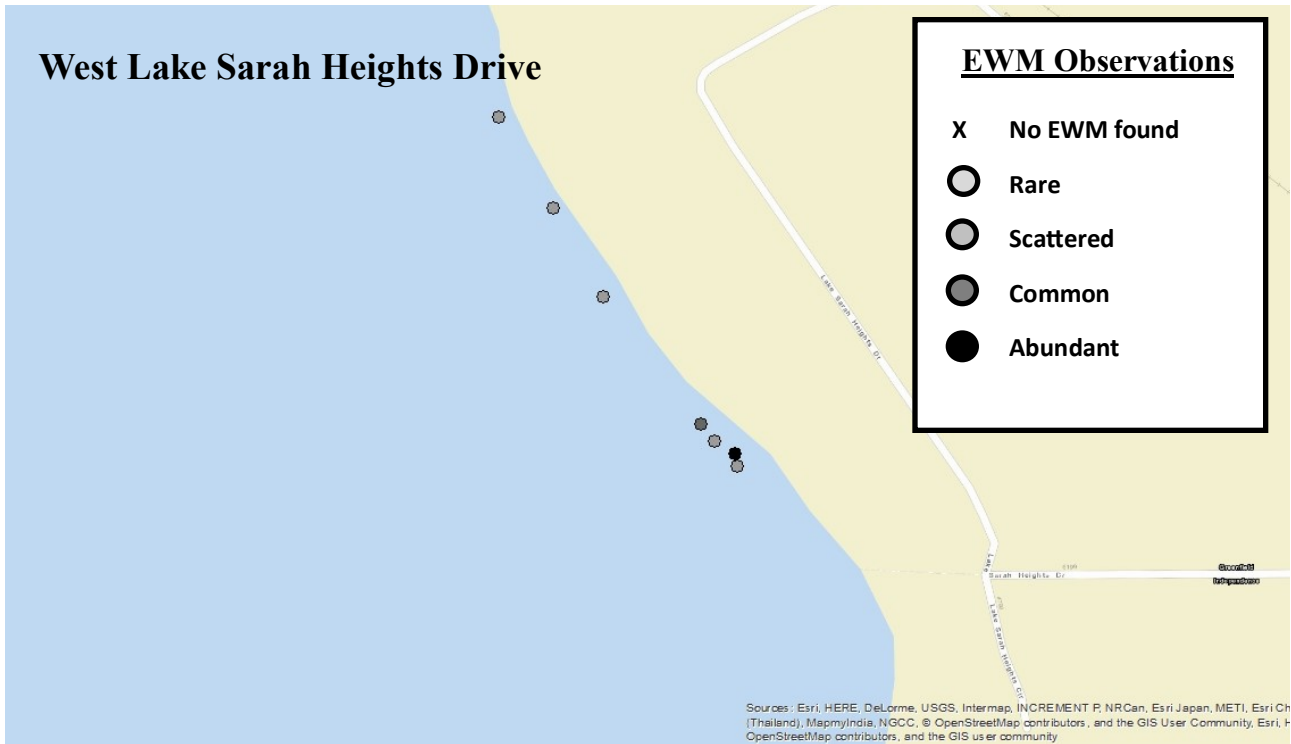
The area to the east of the public access, along South Lake Sarah Drive, has scattered EWM plants along the shoreline in 2 to 4 feet of water. Elodea is very common throughout this whole area, and is much more abundant than EWM. Elodea would also appear to be more of a nuisance along this shoreline than EWM currently is. Treatment is not recommended in this area. While EWM is scattered along the shoreline, it is not the dominant plant in this area, and is not impeding navigation. The narrow size of this treatment area, coupled with deeper depths along the outside boundary, would make for an ineffective treatment.



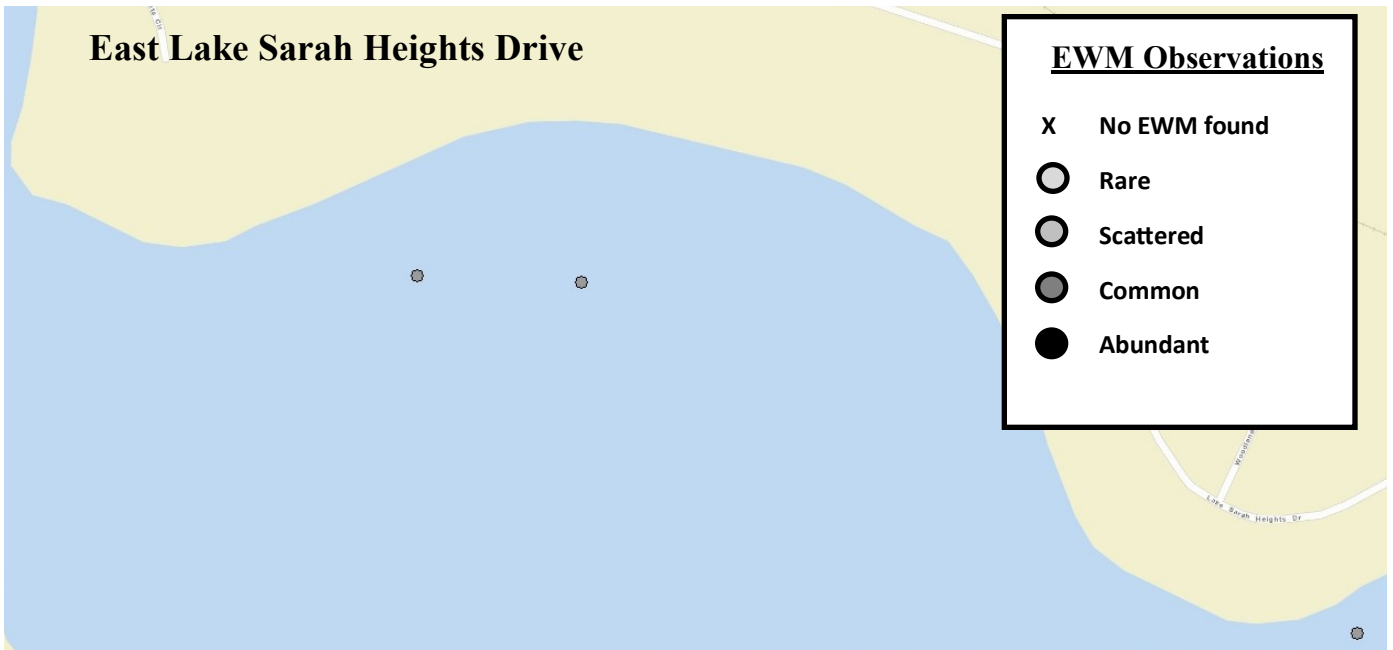
This area was not surveyed extensively as it's along undeveloped shoreline, and is not a navigational path for most watercraft. However, as you can see from two sample points taken in the bay, dense EWM is present throughout much of the bay. No treatment is recommended due to limited navigational use in this area of the lake.



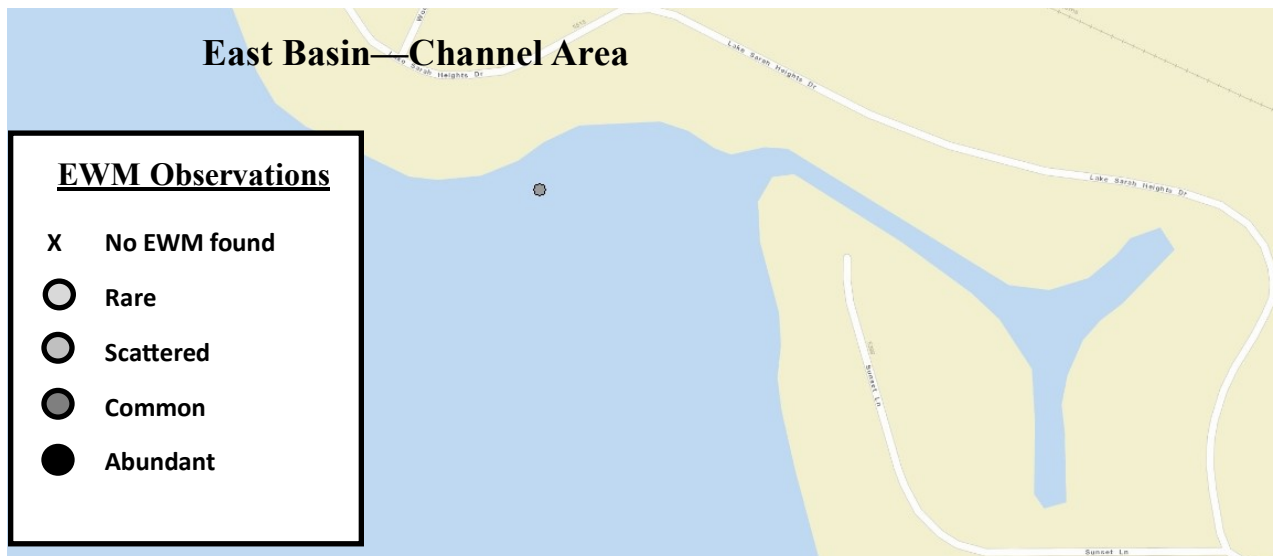
Along North Shore Drive, EWM was found in two dense patches further out from shore. Closer to shore, Elodea is the most dominant plant and could be considered to be at nuisance levels in many locations. Both of the EWM beds have abundant EWM, and would be an impediment for navigation if watercraft use these areas. Both of these areas are dominated by EWM, with some Elodea mixed in. Treatment could be warranted in these locations. The size of the treatment areas are still rather small for an effective treatment with more selective herbicides, such as 2,4-D. If treated in calm conditions for 24 hours at a high rate, treatment could be effective. Alternatively, another treatment option could be the use of diquat. Diquat is non-selective contact herbicide and would have some impact on surrounding native plants. However, treatment with diquat would require much less contact time (~3 hours), thus have a higher likelihood of treatment success. In both treatment options, some regrowth of EWM should be expected.



Along West Lake Sarah Heights Drive, EWM of varying densities was found along the shoreline. For the most part, plants were scattered in 2 to 3 feet of water, with one patch having more abundant EWM. EWM in this area should not provide much impediment to navigation, however, the small dense patch shown on the map above could provide some localized navigational issues. The small size of this site would limit the effectiveness of any treatment, however, diquat could provide some localized control for the patch. Overall, no treatment is warranted in this area, unless the one small patch was viewed as a navigational concern for residents in the area, in which case, the use of diquat could be explored.

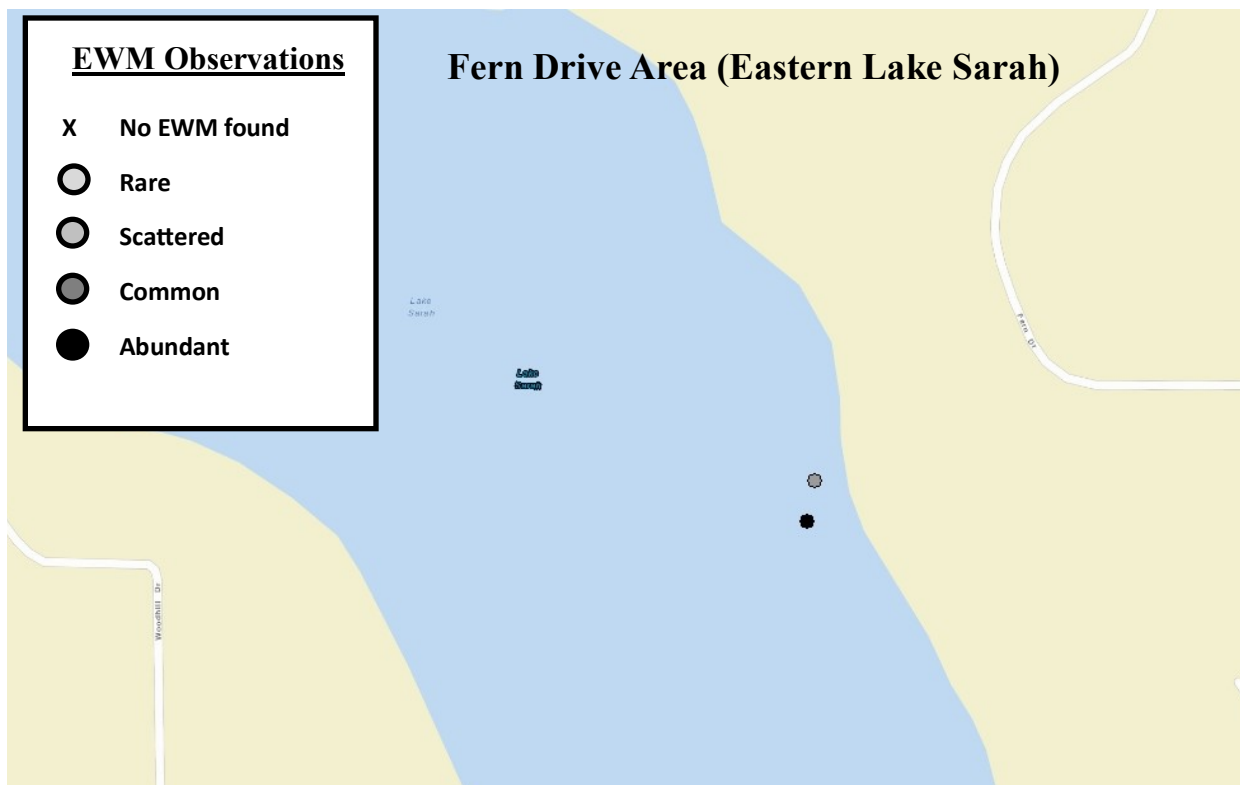


EWM was rare in this area of the lake, with the exception of some scattered patches as noted on the map. It's possible a few other scattered patches are present, but were not observed during the survey. Elodea and Coontail appeared to be much more abundant throughout this area of the lake. At this time, no treatment is warranted due to scattered patches not providing much impediment to navigation.



No Eurasian Watermilfoil was found in the channel area, but some scattered plants were found along the shoreline outside of the channel, as shown on the map. EWM growth was light, and no treatment is needed. The channel itself was dominated by Elodea and Coontail, with filamentous algae growing on top. Pictures are below.





One patch of EWM was found near the Fern Drive Area in 5 to 6 feet of water, the patch was small, but did contain abundant EWM. Given the small size of the patch, it should not impede navigation. If localized control is desired, the use of diquat herbicide should be explored due to the small size of the area.



A couple patches of EWM were found along Woodhill Drive in 3 feet of water. The patches are isolated enough where they shouldn't interfere with navigation, so no treatment is warranted.

Conclusion

The whole-lake Curlyleaf Pondweed (CLP) treatment that occurred on May 4, 2017 appeared to be successful, all CLP found during the May 23, 2017 survey was laying over on the bottom of the lake, and leaves and stems were brown and very brittle, all signs of plants dying and decaying. Eurasian watermilfoil was scattered during this survey, and appeared less abundant than past years. Some dense patches remain, although they tend to be small areas. Navigation could be impeded in a few areas, and treatment may be warranted. If treated over a couple calm days, selective herbicides like 2,4-D could be effective, although diquat herbicide may be another alternative to treat small areas. Diquat requires less contact time (~3 hrs), compared to 2,4-D (~24 hrs), however, diquat can have non-target impacts of desirable native aquatic plants.



A new native plant species not previously found in Lake Sarah was discovered during this survey. It appears to be a Stonewort species, of which there are many native varieties. It is not the invasive Starry Stonewort, and future plant surveys should determine how widespread the plant is. It's feasible the plant sprouted from a seed that has always existed in the lake, and with recent reductions in CLP and improvement in water clarity, conditions may have been right to sprout the plant. Samples will be collected and sent to an expert for final identification, since there are many look-alikes for these species. Temporary identification of the plant is Bird's Nest Stonewort, *Tolypella intricata*. More about this new species will be discussed in future survey reports once more information is gathered.