

Town of  
Barnes

June 1  
2016

The Town of Barnes owns and operates its own diver-assisted suction harvesting boat and equipment. In 2016, the Town will use the BAISS (Barnes Area AIS Sucker) to manage its lakes containing curlyleaf pondweed and Eurasian watermilfoil. The following plan describes the Town's overall BAISS strategy, as well as individual plans for each of the lakes to be managed.

# Aquatic Plant Management Plan

## Barnes AIS Sucker (BAISS): Aquatic Plant Management Plan

The Town of Barnes is building a diver assisted suction harvester, and is requesting a permit for use of this mechanical harvester. Hand pulling and chemical treatment of Eurasian water milfoil and curly-leaf pondweed have proven unsuccessful.

109.04 (2)

E. **Impairments:** boating, fishing, swimming, competition with native aquatic plants, less plant biological diversity, impaired water quality and clarity, reduced oxygen levels, higher nutrient input, increased threat to non-infested lakes.

F. **Aquatic plants to be controlled or removed:** Upper and Middle Eau Claire Lakes: curly-leaf pondweed (*Potamogeton crispus*); Tomahawk and Sandbar: Eurasian water milfoil (*Myriophyllum spicatum*); and on all four lakes, any new aquatic invasive plants found

G. **Type of equipment and methods to be used:** diver assisted suction harvester (DASH), more specifically, manually uprooting the plants and sucking them up-more efficient and selective than hand pulling, and less potential damage to native plants than chemical treatment.

Middle and Upper Eau Claire will be managed first (i.e. early season) since CLP has earlier growth. Tomahawk and Sand Bar will be managed mid- to late- season.

**Decontamination:** visually inspect and remove any plants and animals, drain all water, high pressure wash boat and equipment, flushing lines and pumps with clean water, and using bleach solution per DNR disinfection protocols

H. **Description of other control methods considered and justification for the method selected:** considered and did hand pulling, SCUBA, snorkeling, raking, shoreline monitoring and fragment collecting; see G. above;

I. **Description of any other methods used or intended for use by applicant:** Tomahawk lake: 1 whole lake chemical treatment, 2 spot chemical treatments; Sandbar Lake: 2 whole lake chemical treatments; on Tomahawk and Sandbar Lakes: raking, hand pulling, beach cleanup, SCUBA diving, snorkeling, intense shoreline monitoring; Upper Eau Claire Lake: hand pulling, snorkeling, SCUBA diving, intense shoreline monitoring; Middle Eau Claire Lake: hand pulling, SCUBA diving, snorkeling, intense shoreline monitoring; Overall: annual survey by professional consultant on each lake (SCUBA diving; point-intercept surveys by private consultant, DNR and U.S. Army Corps of Engineers; and littoral zone survey) and consultation with the WI DNR

J. **The area used for removal, reuse, or disposal of aquatic plants:** Town of Barnes transfer site or brush dump, or other site designated by Town of Barnes

K. **Name of any person or commercial provider (responsible party?) of control or removal services:** Town of Barnes AIS Committee

109.09 (2)

F. **Recommendations for an integrated aquatic plant management strategy utilizing some or all of the methods evaluated in par. E. :** using a mechanical harvesting system because we believe it is more selective than hand pulling or chemical treatments;

**Goals:** 1. Contain plants to one acre or less in all four lakes; and

2. Monitor George Lake and be prepared to respond if new aquatic invasive plants are found

G. **Education and information strategy:** Clean Boats Clean Waters (CBCW), Lake Ecology Education Program, articles in the Barnes Blog, articles in Friends of the Eau Claire Lakes Area Property Owners Association newsletter and website, involvement with Bayfield County AIS Coordinator, signs on the BAISS boat, 4'x8' signs for information and regulation at boat landings, shoreline monitoring, training at Volunteer Appreciation Luncheon, formal training sessions for CBCW, and a highly involved Town of Barnes AIS Committee and Bayfield County AIS Committee

-Since 2008, 5,164 shoreline monitoring hours, 35 CBCW volunteers, monitor water quality on 14 lakes, shoreline monitoring on 30 lakes, 67 shoreline monitors

-Since 2007, CBCW program in Barnes has inspected, on average, 3500 boats/year

-Since 2007, contacted an average of 8300 people per year through CBCW

-Spent an average of 1900 hours each year on CBCW

H. **Strategy for evaluating efficacy and environmental impacts of the aquatic plant management activities:** randomly sample plants being harvested and attempt to minimize non-target plant mortality; train all diver harvesters in plant ID and proper harvesting techniques of invasive plants; documented log of man hours and pounds of invasive plants harvested

I. **Involvement of local units of government and lake organizations:** Town of Barnes AIS Committee-Town of Barnes owns the boat, will provide insurance and hire divers, manages grants and funds, provides supplies for the boat and partial funding for divers, and will provide

access to high-pressure power washer for decontamination; Friends of the Eau Claire Lakes Area Property Owners Association-provides volunteers, education/outreach strategy and implementation, and partial funding for boat operations

# **TOMAHAWK LAKE AQUATIC PLANT MANAGEMENT (APM) SUMMARY**

## **Goals and Objectives**

- a. Goal: reduce the Eurasian Watermilfoil population and prevent the spread within and beyond the lake.
- b. Objective: Eurasian Watermilfoil will not exceed 1 acre total area or 1% relative frequency.

## **Waterbody Description**

Tomahawk Lake is a 131 acre lake located in Bayfield County. It has a maximum depth of 42 feet. Visitors have access to the lake from a public boat landing. Fish include Panfish, Largemouth Bass and Walleye. The lake's water is moderately clear.

## **Water Use Intensity**

Recreational use is low to moderate for a northern Wisconsin lake, although intensity is limited because of its distance from urban areas. The nearest urban areas are Hayward, 30 miles south, and Duluth/Superior 45 miles northwest. There are no public drinking water systems or discharges to the lake.

## **Management Locations**

Eurasian Watermilfoil is contained along the north shore by the Town of Barnes Park swimming area. There are a few isolated plants east of the boat landing and just west of the property line (Reference pages 2 - 6). The total estimated cumulative surface area is approximately one acre.

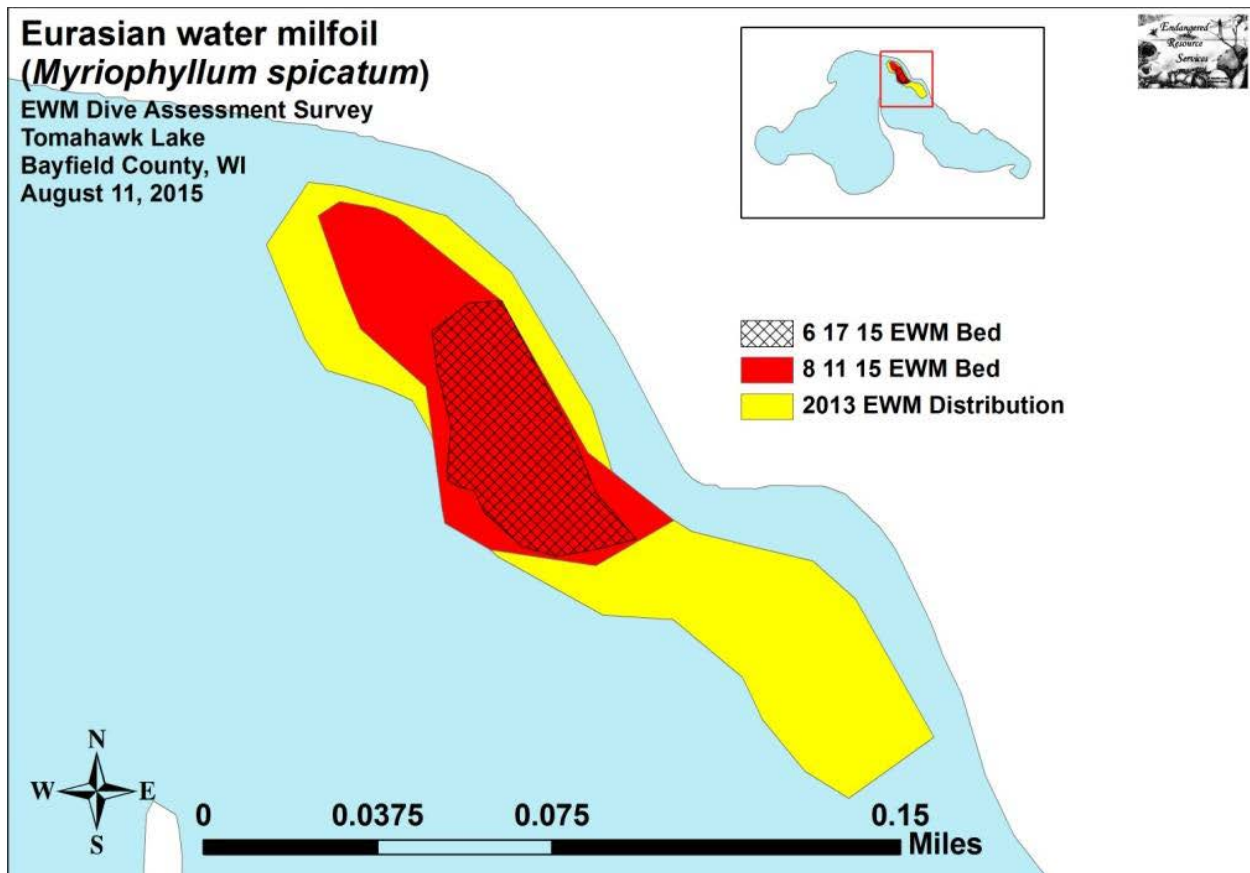
## **Evaluation of Alternative Methods**

A whole lake chemical treatment and two spot treatments have helped us contain the invaded area. We feel that further chemical treatment will not yield any improvement. Manual/mechanical removal is the best management strategy. Weevils were discussed as a biological control option but, because of low water levels the shoreline habitat would not maintain a healthy population.

## **Integrated APM Strategy**

Continuous volunteer monitoring and annual professional monitoring will measure the success of the BAISS strategy. Manual removal will be encouraged. If monitoring indicates our objectives are not being met, alternative methods, including chemical control will be revisited.

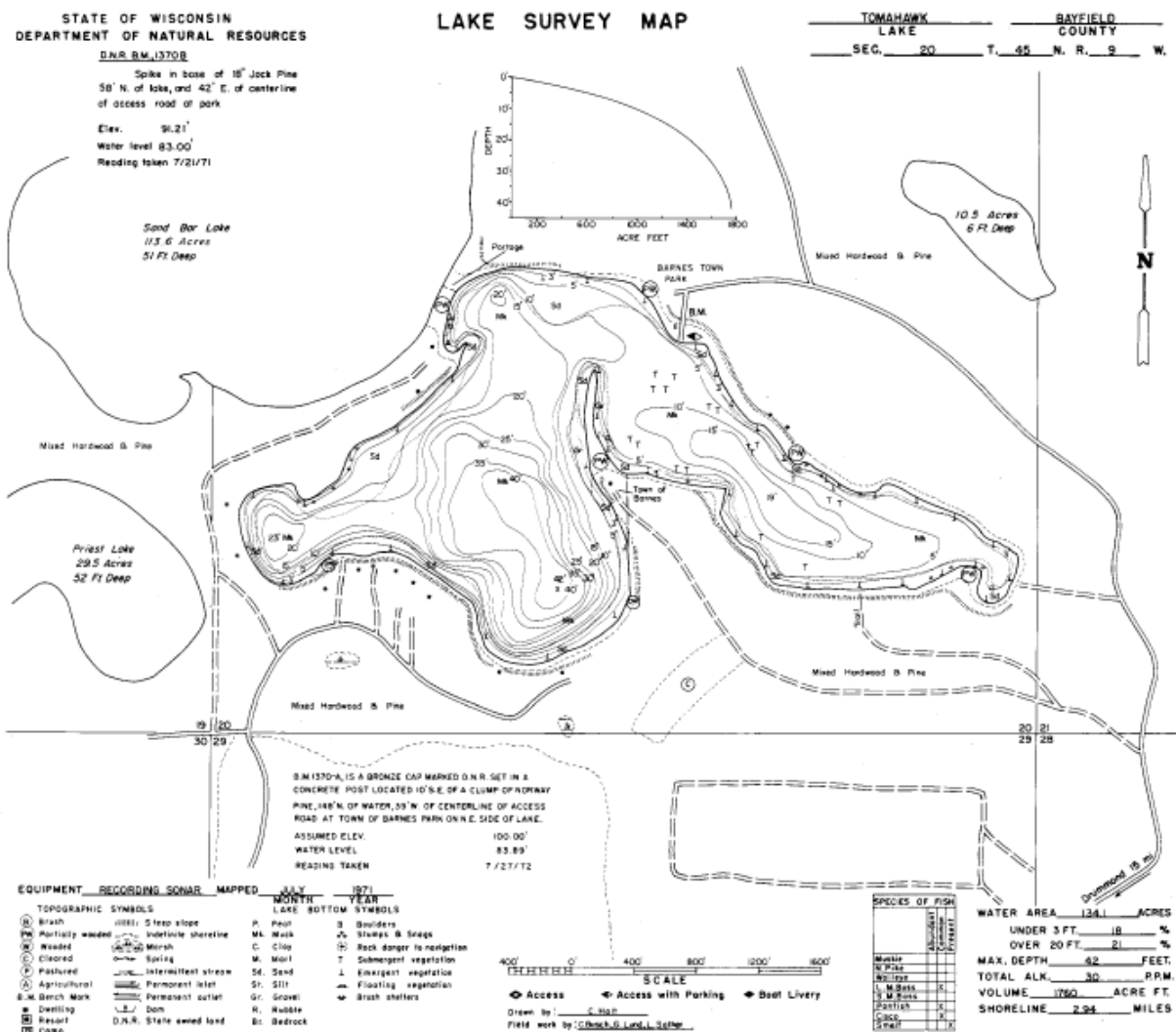
**EWM SCUBA Dive Monitoring Surveys**  
**Eurasian water milfoil (*Myriophyllum spicatum*)**  
**Tomahawk Lake – WBIC: 2501700**  
**Bayfield County, Wisconsin**



Survey Conducted by and Report Prepared by:  
Endangered Resource Services, LLC  
Matthew S. Berg, Research Biologist  
St. Croix Falls, Wisconsin  
June 17<sup>th</sup> and August 11<sup>th</sup>, 2015

# INTRODUCTION:

Tomahawk Lake (WBIC 2501700) is a 131 acre seepage lake on the west-central edge of Bayfield County, Wisconsin in the Town of Barnes (T45N R9W S20). It reaches a maximum depth of 42ft on the east side and has an average depth of approximately 13ft (WDNR 2015). The lake is mesotrophic bordering on oligotrophic in nature with Secchi readings from 2000 to 2014 averaging 13.1ft (WDNR 2015). This good water clarity produced a littoral zone that extended to at least 15ft in the summer of 2015. The bottom substrate is predominately sand along the shoreline, but this gradually transitions to sandy muck at most depths over 6ft (Figure 1) (Holt et al. 1971).



## **Figure 1: Tomahawk Lake Bathymetric Map**

Eurasian water milfoil (*Myriophyllum spicatum*) (EWM) is an exotic invasive plant species that is a growing problem in the lakes and rivers of northwestern Wisconsin. First identified in Sand Bar and Tomahawk Lakes in 2004, the Town of Barnes – Aquatic Invasive Species Committee (TOB) and the Wisconsin Department of Natural Resources (WDNR) have used herbicide applications with both bed and whole lake treatments to control the infestation. The most recent herbicide application – a small bed treatment covering approximately 3.5 acres just south of the park - occurred on late June 2013. Unfortunately, a late summer 2013 dive survey found surviving EWM fragments and two dive surveys in 2014 found EWM was rapidly recolonizing the treatment area. In an effort to quantify the expansion of EWM, we were asked by the TOB to conduct two more follow-up dives in 2015. This report is the summary of those two surveys.

### **METHODS:**

Gerald “Gus” Gustafson, Tomahawk Lake resident, and assisted with logging GPS coordinates for each survey. Entering the water at the boat landing dock, we dove meandering zigzag transects along the south side of the bed and across the 5-15ft bathymetric rings so as to scan the entire littoral zone. Upon finding EWM plants, we logged GPS waypoints so as to encircle the entire bed.

### **Results:**

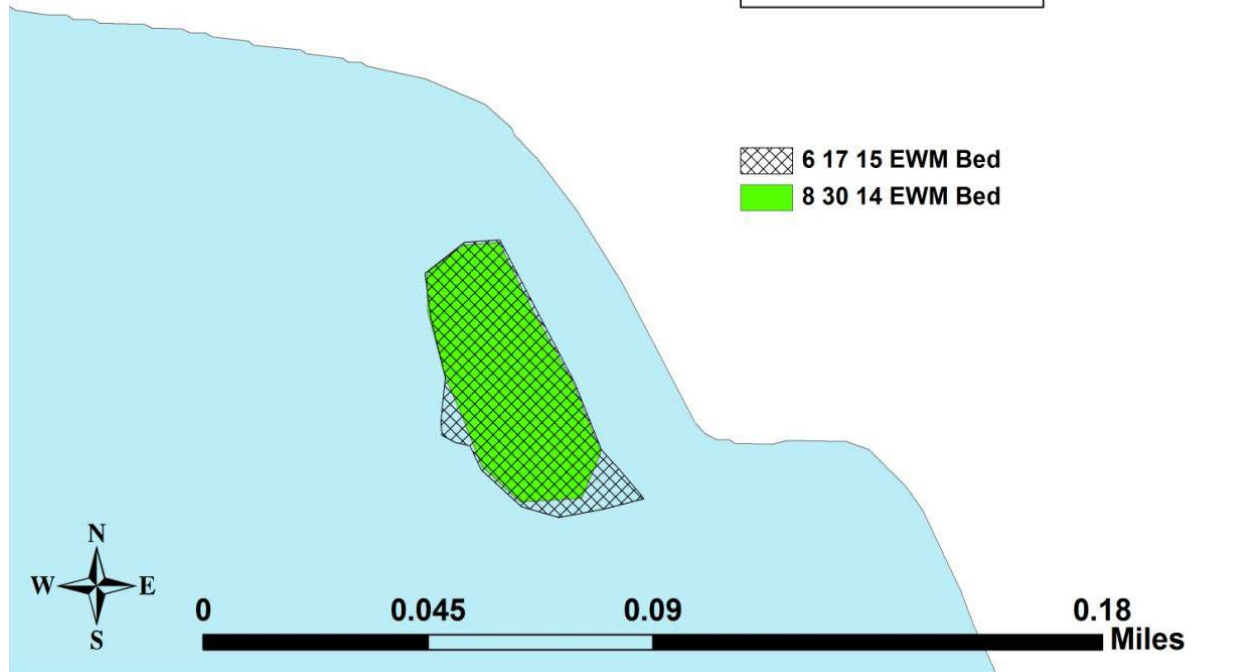
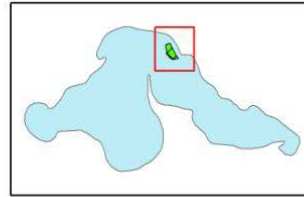
#### **June**

During the June 17<sup>th</sup> survey, we found the EWM was actively growing and expanding within the 0.69 acre bed mapped the previous fall. However, it had not spread much beyond the boundaries identified in 2014 as we found the area had only increased to cover 0.81 acres (Figure 2).



**Eurasian water milfoil  
(*Myriophyllum spicatum*)**

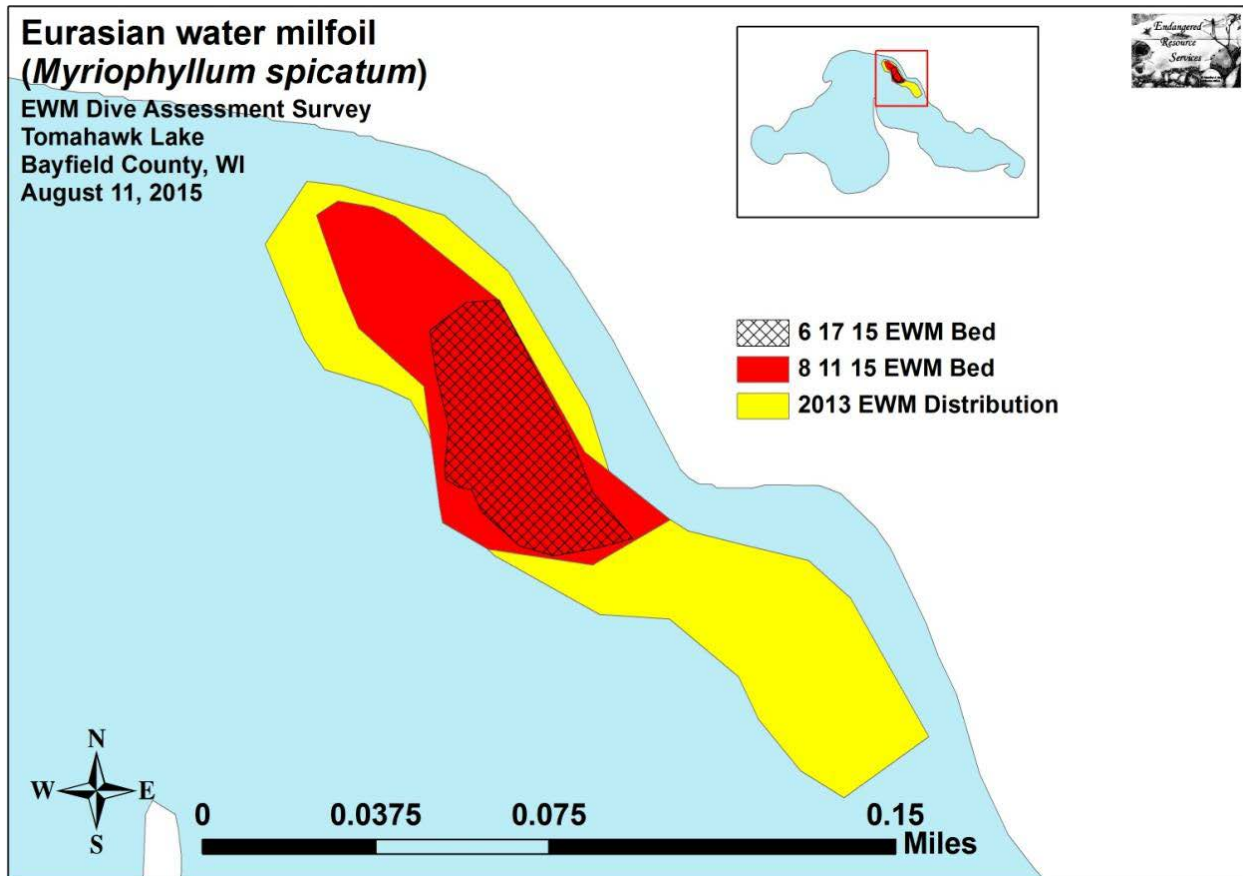
EWM Dive Assessment Survey  
Tomahawk Lake  
Bayfield County, WI  
June 17, 2015



**Figure 2: EWM Locations on Tomahawk Lake – 6/17/15**

**August**

By August, the core bed mapped in June was thickening and many patches were nearing canopy. The bed had also expanded significantly, and, although still not as big as the 2013 treatment area, it now covered 1.53 acres (Figure 3). Plants were actively fragmenting, and we found many floating fragments as far to the southeast as the boat landing.



**Figure 3: EWM Locations on Tomahawk Lake – 8/11/15**

**Discussion and Considerations for Management:**

Without active management, it is clear that the Eurasian water-milfoil in Tomahawk Lake will continue to spread and recolonize all areas it was previously found in. The TOB is in the process of developing a Diver Assisted Suction Harvest (DASH) system that should be operational in the summer of 2016. Ideally, harvesting will begin as soon as plants are up and growing, and before they can spread further.

**LITERATURE CITED**

Holt, C., C. Busch, G. Lund, and L. Sather. 1971. Tomahawk Lake Bathymetric Map. <http://dnr.wi.gov/lakes/maps/DNR/2501700a.pdf> (November, 2015)  
 WDNR. [online]. 2015. Citizen Monitoring Lake Water Quality Database – Tomahawk Lake, Bayfield Co. Available from <http://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2501700> (November, 2015)

## **SANDBAR LAKE AQUATIC PLANT MANAGEMENT (APM) SUMMARY**

### **Goals and Objectives**

- a. Goal: reduce the Eurasian Watermilfoil population and prevent the spread within and beyond the lake.
- b. Objective: Eurasian Watermilfoil will not exceed 1 acre total area or 1% relative frequency.

### **Waterbody Description**

Sand Bar Lake is a 127 acre lake located in Bayfield County. It has a maximum depth of 49 feet. Fish include Pan fish, Largemouth Bass and Northern Pike. The lake's water clarity is very clear.

### **Water Use Intensity**

Recreational use is low to moderate for a northern Wisconsin lake, although intensity is limited because of its distance from urban areas. The nearest urban areas are Hayward, 30 miles south, and Duluth/Superior 45 miles northwest. There are no public drinking water systems or discharges to the lake.

### **Management Locations**

The major infestation is on the east central shore in approximately 6 – 7 feet of water. Additional plants have been found in other areas of the lake (Reference pages 2 - 6).

### **Evaluation of Alternative Methods**

A whole lake chemical treatment and two spot treatments have helped us contain the infested area. We feel that further chemical treatment will not yield any improvement. Manual/mechanical removal is the best management strategy. Weevils were discussed as a biological control option but, because of low water levels the shoreline habitat would not maintain a healthy population.

### **Integrated APM Strategy**

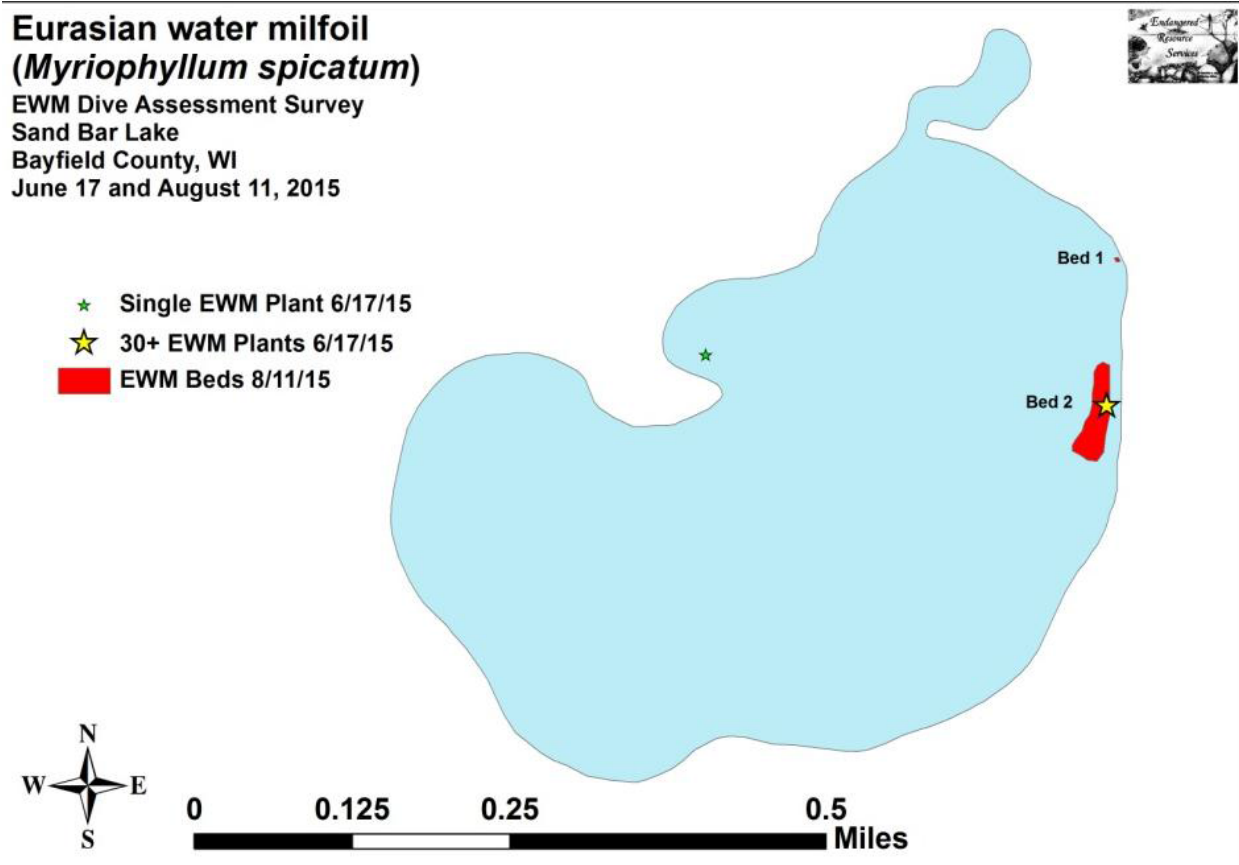
Continuous volunteer monitoring and annual professional monitoring will measure the success of the BAISS strategy. Manual removal will be encouraged. If monitoring indicates our objectives are not being met, alternative methods, including chemical control will be revisited.

# EWM SCUBA Dive Monitoring Surveys

## Eurasian water milfoil (*Myriophyllum spicatum*)

### Sand Bar Lake – WBIC: 2494900

### Bayfield County, Wisconsin

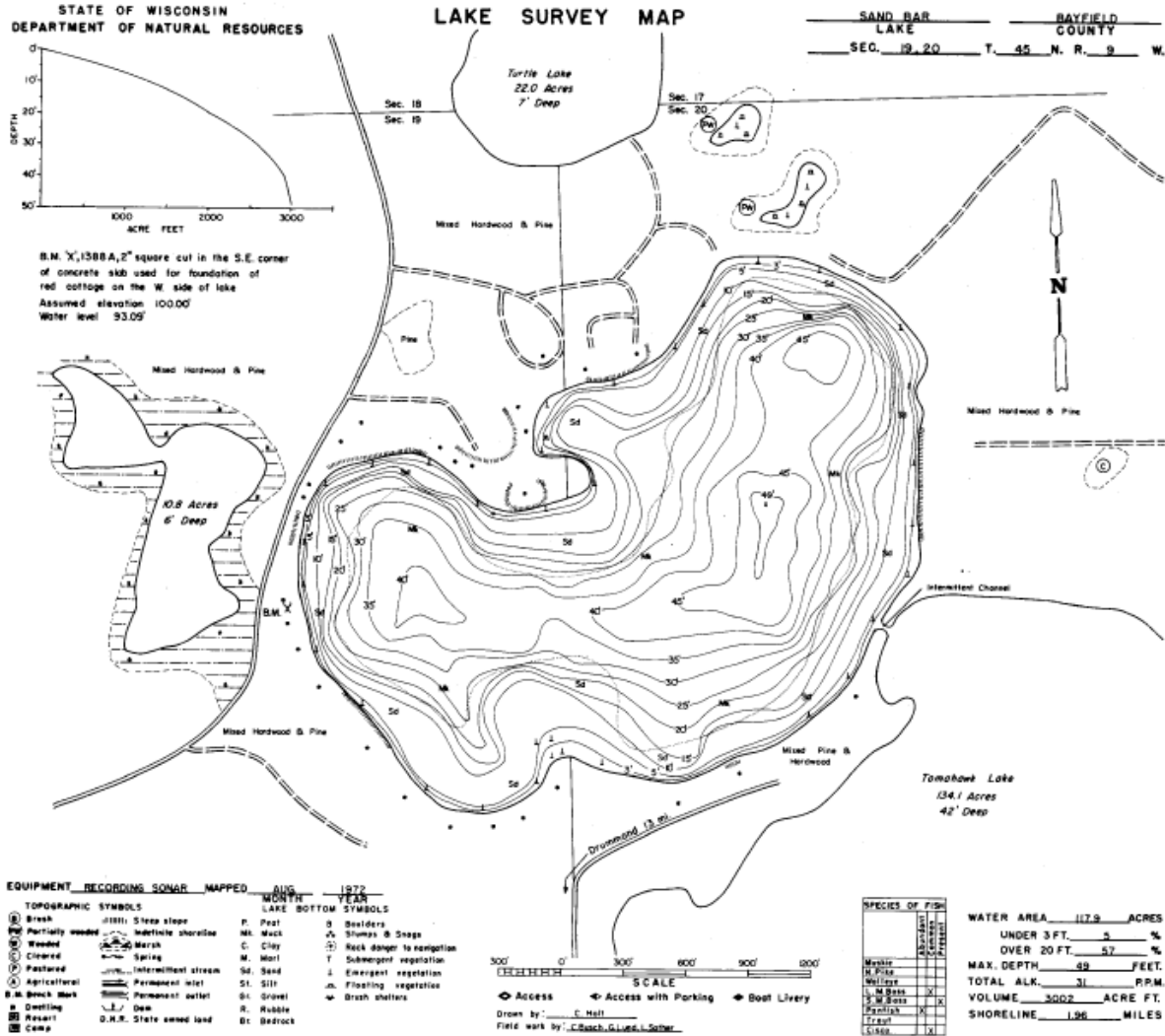


Survey Conducted by and Report Prepared by:  
Endangered Resource Services, LLC  
Matthew S. Berg, Research Biologist  
St. Croix Falls, Wisconsin  
June 17<sup>th</sup> and August 11<sup>th</sup>, 2015

#### INTRODUCTION:

Sand Bar Lake (WBIC 2494900) is a 127 acre seepage lake on the west-central edge of Bayfield County, Wisconsin in the Town of Barnes (T45N R9W S19/20). It reaches a maximum depth of 49ft on the east side and has an average depth of approximately 25ft (WDNR 2015). The lake is

oligotrophic in nature with Secchi readings from 2000 to 2013 averaging 17.7ft (WDNR 2015). This good to very good water clarity produced a littoral zone that extended to at least 20ft in the summer of 2015. The bottom substrate is predominately sand along the shoreline, but this gradually transitions to sandy muck at most depths over 6ft (Figure 1) (Holt et al. 1972).



**Figure 1: Sand Bar Lake Bathymetric Map**

Eurasian water milfoil (*Myriophyllum spicatum*) (EWM) is an exotic invasive plant species that is a growing problem in the lakes and rivers of northwestern Wisconsin. First identified in Tomahawk and Sand Bar Lakes in 2004, the Town of Barnes – Aquatic Invasive Species Committee (TOB) and the Wisconsin Department of Natural Resources (WDNR) have used herbicide applications in both bed and whole lake treatments to control the infestation. The most recent herbicide application – a whole lake treatment - occurred on June 21, 2013. In her posttreatment survey, Michelle Nault, WDNR, found a few near dead EWM on the north side of the lake. However, a late summer dive survey in 2013, and two summer dive surveys in 2014 failed to locate any surviving EWM. In an effort to determine if EWM was still surviving in the

lake, we were asked by the TOB to conduct two more follow up dives in 2015. This report is the summary of those two surveys.

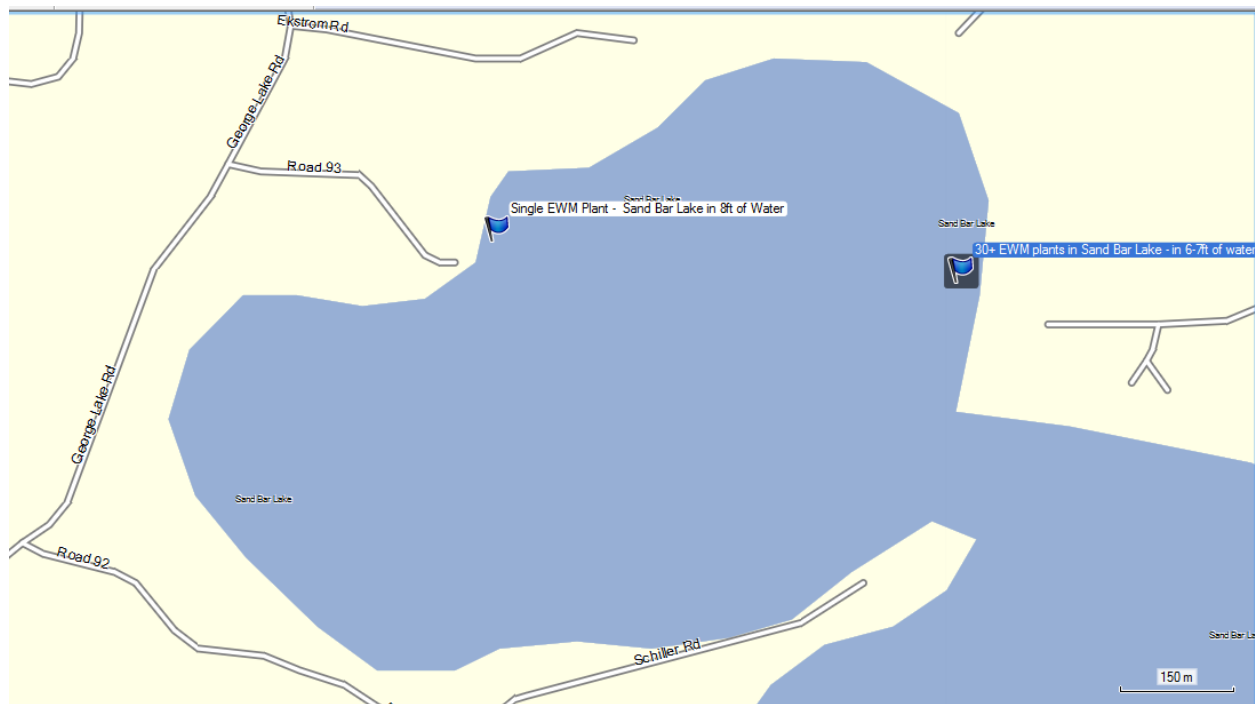
## **METHODS:**

Ingemar Ekstrom, Sand Bar Lake resident, chaperoned us around the lake during each survey. Although we toured the shoreline of the entire lake, we focused our time underwater in areas that had previously supported high numbers of canopied EWM plants prior to treatment; especially along the north and eastern shorelines. At each stopping point, we dove meandering transects that zigzagged through the bathymetric rings from 5-20ft so as to scan the entire littoral zone. In between previous high density areas, we motored at idle speed while hanging over the side and used goggles to scan for EWM.

## **Results:**

### **June**

During the June 17<sup>th</sup> survey, we found a single EWM plant in 8ft of water in the midlake bay along the north shoreline. Unfortunately, it was only a few feet tall, mixed in with other plants, and we were unable to locate it and remove it after we initially drifted over it. On the eastern shoreline, we also found approximately 30 plants that were scattered in 6-7ft of water. Although we also search along the rest of the lake's shoreline, the track back on our GPS was turned off so our survey graph doesn't reflect this (Figure 2).

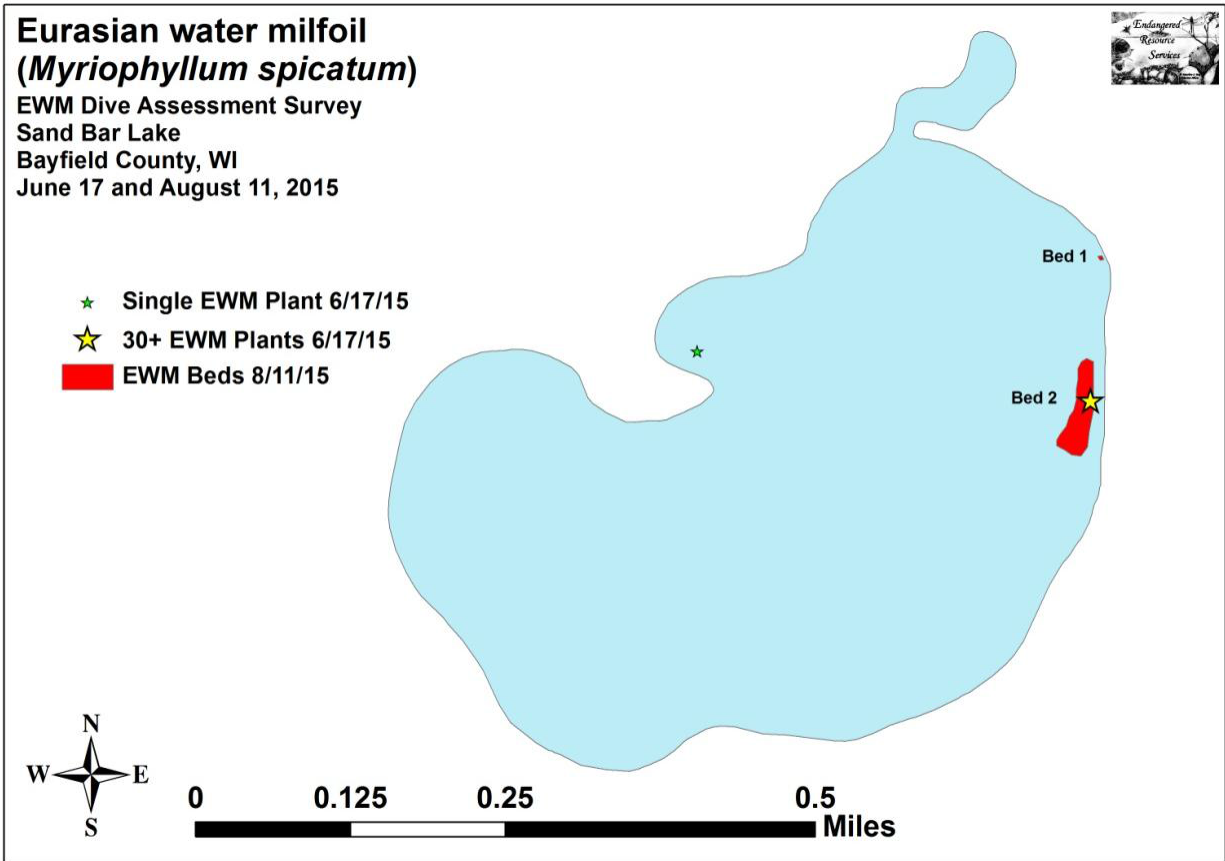


**Figure 2: EWM Locations on Sand Bar Lake – 6/17/15**

### **August**

Despite the somewhat disappointing, but not unexpected discovery in June that EWM was back and spreading, we were still surprised at just how fast this expansion had occurred. What had been just a few 10's of plants in June was now many 100's of plants scatter across two beds

totaling 0.81 acres (Figure 3). Similar to what we found in June, Bed 1 was a small pioneer area with just a few 10's of plants and covering only 0.01 acre. Bed 2, however, had exploded and the area was now covered by more or less continuous patches of plants that were merging and expanding rapidly in all directions both from the roots and via fragmentation.



**Figure 3: EWM Locations on Sand Bar Lake – 8/11/15**

### **Discussion and Considerations for Management:**

Without active management, it is clear that the Eurasian water-milfoil in Sand Bar Lake will continue to spread and recolonize all areas it was previously found in. The TOB is in the process of developing a Diver Assisted Suction Harvest (DASH) system that should be operational in the summer of 2016. Ideally, harvesting will begin as soon as plants are up and growing, and before they can spread further.

### **LITERATURE CITED**

- Holt, C., C. Busch, G. Lund, and L. Sather. 1972. Sand Bar Lake Bathymetric Map. <http://dnr.wi.gov/lakes/maps/DNR/2494900a.pdf> (November, 2015)
- WDNR. [online]. 2015. Citizen Monitoring Lake Water Quality Database – Sand Bar Lake, Bayfield Co. Available from <http://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2494900> (November, 2015)

## **UPPER EAU CLAIRE LAKE AQUATIC PLANT MANAGEMENT (APM) SUMMARY**

**\*Upper Eau Claire Lake is currently in rapid response mode and thus a detailed APM Plan is not required.**

### **Goals and Objectives**

- a. Goal: reduce the Curlyleaf pondweed population and prevent the spread within and beyond the lake.
- b. Objective: Curlyleaf pondweed will not exceed 1 acre total area or 1% relative frequency.

### **Waterbody Description**

Upper Eau Claire Lake is a 1024 acre oligotrophic lake located in Bayfield County. It has a maximum depth of 92 feet with a mean depth of 29 feet, with a total shoreline of 9.93 miles. Visitors have access to the lake from a public boat landing. Fish include Musky, Panfish, Largemouth Bass, Smallmouth Bass, Northern Pike and Walleye. The Lakes water clarity is clear and has a total alkalinity of 78PPM. The bottom is 50% sand, 30% gravel, 0% rock, and 20% muck.

### **Water Use Intensity**

Recreational use is moderate to high for a northern Wisconsin lake, especially on weekends, although intensity is limited because of its distance from urban areas. The nearest urban areas are Hayward, 20 miles south, and Duluth/Superior 45 miles northwest. There are no public drinking water systems or discharges to the lake.

### **Management Locations**

Curly-leaf pondweed is found in numerous shallow patches in Pease Bay and deep water patch in Pease Bay, as well as numerous patches on the east shore between the island and the main land.

### **Evaluation of Alternative Methods**

Since the locations are small beds nested within a thriving native plant community, manual/mechanical removal is the best management strategy. Chemical control is unlikely to be effective because spot treatments tend to have minimal concentration exposure times resulting in limited control; plus native pondweeds could be harmed. There is no biological control option for curlyleaf pondweed, and physical control is not feasible or likely to be permitted.

### **Integrated APM Strategy**

Continuous volunteer monitoring and annual professional monitoring will measure the success of the BAISS strategy. Manual removal will be encouraged. If monitoring indicates our objectives are not being met, alternative methods, including chemical control will be revisited.



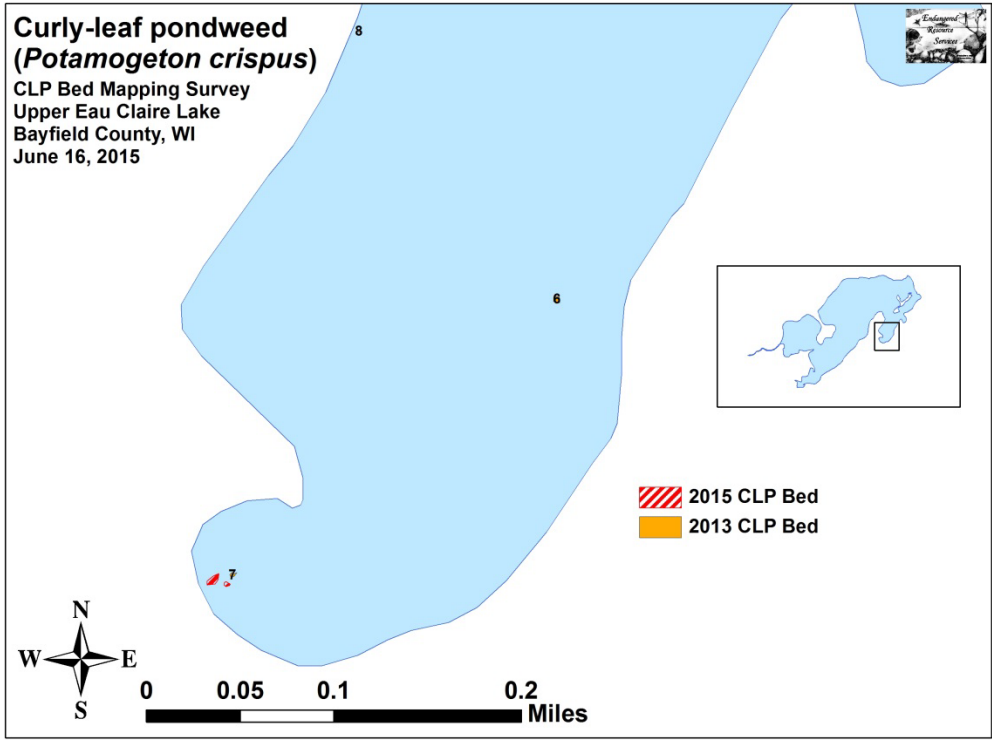
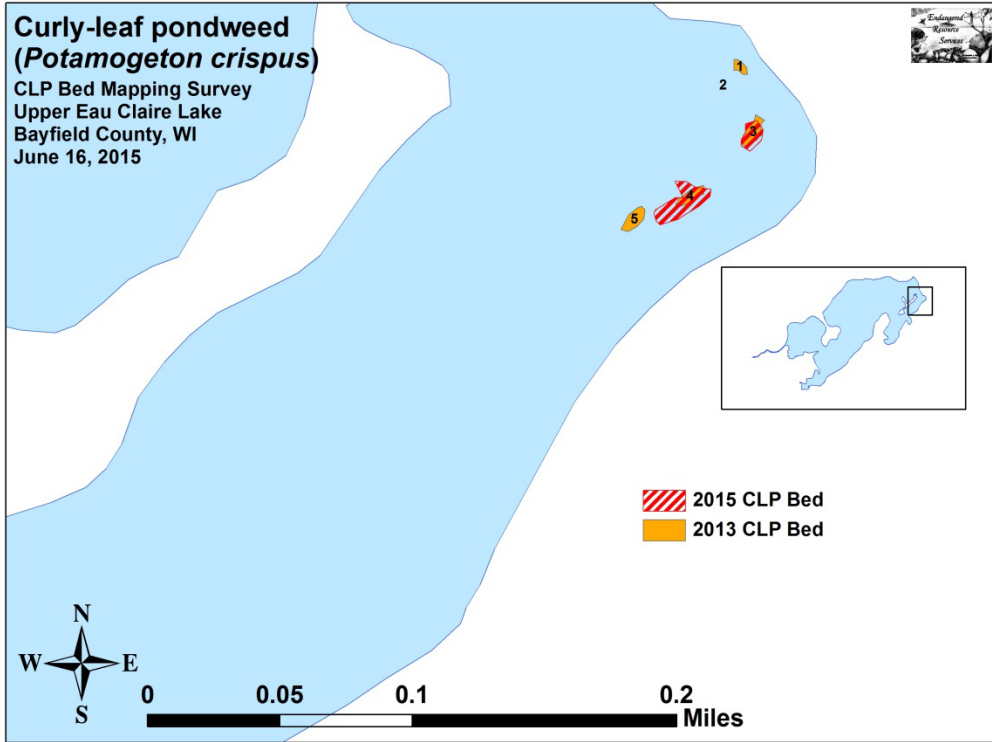


Figure 1: 2015 Curly-leaf pondweed locations in Upper Eau Claire Lake, Bayfield County.

## **MIDDLE EAU CLAIRE LAKE AQUATIC PLANT MANAGEMENT (APM) SUMMARY**

**\*Middle Eau Claire Lake is currently in rapid response mode and thus a detailed APM Plan is not required.**

### **Goals and Objectives**

- a. Goal: reduce the Curlyleaf pondweed population and prevent the spread within and beyond the lake.
- b. Objective: Curlyleaf pondweed will not exceed 1 acre total area or 1% relative frequency.

### **Waterbody Description**

Middle Eau Claire Lake is a 880 acre mesotrophic lake located in Bayfield County. It has a maximum depth of 66 feet, with a mean depth of 17 feet and a total shoreline of 11 miles. The bottom is 80% sand, 5% gravel, 0% rock, and 15% muck. The water is moderately clear and has a total alkalinity of 34PPM. Visitors have access to the lake from a public boat landing. Fish include Musky, Panfish, Largemouth Bass, Smallmouth Bass, Northern Pike and Walleye.

### **Water Use Intensity**

Recreational use is moderate to high for a northern Wisconsin lake, although intensity is limited because of its distance from urban areas. The nearest urban areas are Hayward, 20 miles south, and Duluth/Superior 45 miles northwest. There are no public drinking water systems or discharges to the lake.

### **Management Locations**

Curly-leaf pondweed is widespread in the southern half of the lake with a small isolated patch along the northeastern shore (Figure 1). The total estimated cumulative surface area is less than one acre.

### **Evaluation of Alternative Methods**

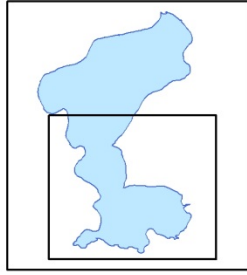
Since the locations are small beds nested within a thriving native plant community, manual/mechanical removal is the best management strategy. Chemical control is unlikely to be effective because spot treatments tend to have minimal concentration exposure times resulting in limited control; plus native pondweeds could be harmed. There is no biological control option for curlyleaf pondweed, and physical control is not feasible or likely to be permitted.


### **Integrated APM Strategy**

Continuous volunteer monitoring and annual professional monitoring will measure the success of the BAISS strategy. Manual removal will be encouraged. If monitoring indicates our objectives are not being met, alternative methods, including chemical control will be revisited.

**Curly-leaf pondweed  
(*Potamogeton crispus*)**

**CLP Bed Mapping Survey  
Middle Eau Claire Lake  
Bayfield County, WI  
June 16, 18, 2015**



 **2015 CLP Bed**

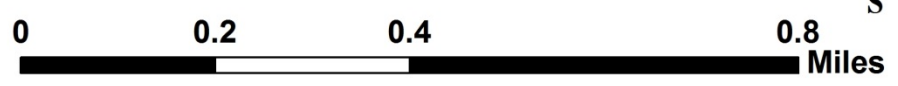
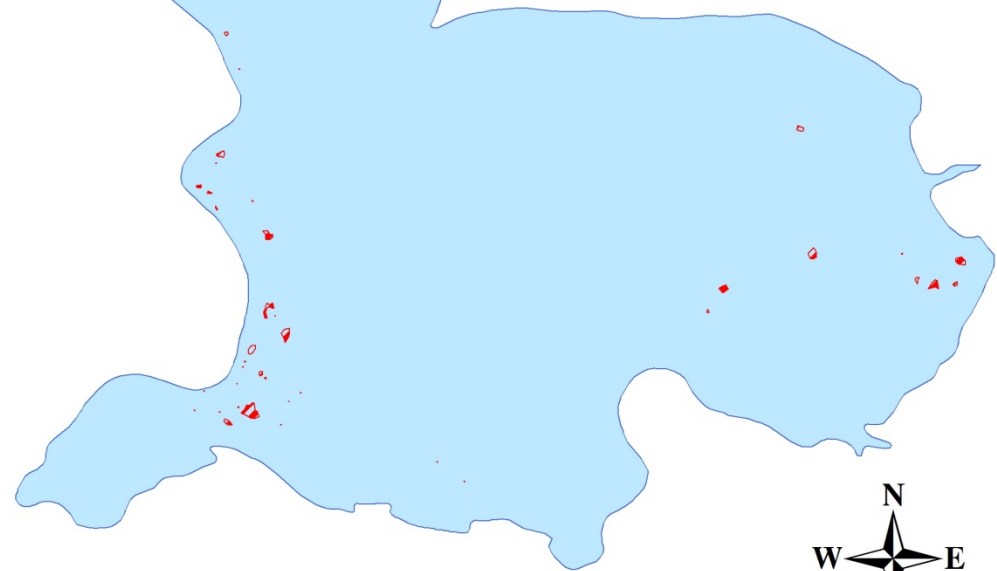


Figure 1: 2015 Curly-leaf pondweed locations in Middle Eau Claire Lake, Bayfield County.