Aquatic Invasive Species (AIS) Survey/Analysis

Silver Lake

Barron County, WI
WBIC: 1881100
June/August, 2019

Survey and analysis conducted by Ecological Integrity Service, LLC
Amery, WI

AIS Survey-2019
Silver Lake, Barron County WI

An aquatic invasive species (AIS) survey was conducted on Silver Lake, Barron County WI in June and August, 2019 to evaluate the presence of aquatic invasive species present in Silver Lake. The survey included a meander survey in June and August, as well has installing sampling plates for zebra mussel (*Dreissena polymorpha*) monitoring. Silver Lake is a 331 acre seepage lake with a maximum depth of 91 feet. The lake is classified with a trophic status of mesotrophic.

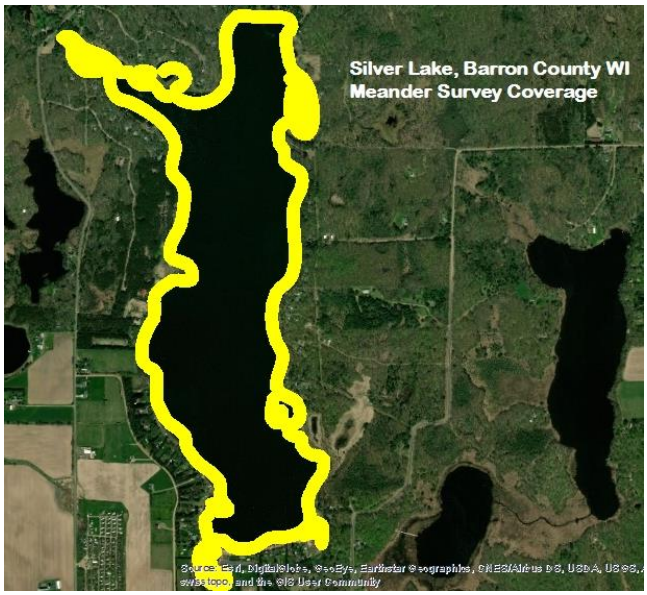
Methods

A June survey was conducted to focus on presence/absence of *Potamogeton crispus*-curly leaf pondweed, which grows in early spring and typically senesces by July. The survey was done in June so as to catch potential curly pondweed around peak growth. Other AIS species were surveyed as well.

The early season survey entailed meandering around the littoral zone of Silver Lake and sampling any suspect plants with a rake to verify. In addition, a surface viewing scope as well as a HD underwater camera was utilized to help check areas of concern. Special attention was paid to bays with high nutrient sediments, piers with boats, and boat landings. In addition, 4 substrate plates were installed around the lake for zebra mussel monitoring.

In August, a late season meander survey was conducted. This is to target any AIS species as plant species should be robust and easier to detect. Extra effort was added around the boat landing as any new introduction would like start at or near this location. The zebra mussel plates were retrieved in Sept.

The Map below shows the areas monitored in the meander survey:



In August, a water sample was collected to test for calcium and total hardness to assess the susceptibility Silver Lake is to a zebra mussel infestation.

Results

The chart below summarizes various water chemistry criteria that have been utilized to determine the potential for adult mussel survival in lakes from various studies. The Silver Lake values are highlighted in yellow.

Parameter	Little potential for adult survival	Little potential for larval development	Moderate but likely won't flourish	High and favorable for optimal growth	Silver Lake (2019 values)
Calcium (mg/L)[1]	< 8	8-15	15-30	>30[1]	**2.21**
Calcium (mg/L)[2]	<12	12-20	20-28	>28	
Hardness (mg/L)[1]	<30	30-35	55-100	100-280	**9.38**
Hardness (mg/L)[2]	<25	25-45	45-90	>90	
Total Phos. (ug/L)	<5 or >50	5-10 or 35-50	10-25	25-35	**9.96-21.9**
Chlorophyll a (ug/L)[1]	<2.5 or >25 <4	2-2.5 or 20-25 --	8-20 4-8	2.5-8 >10	**0.5-5.25**
Chlorophyll a (ug/L)[2]					
Secchi disk (m)	<1 or >8	1-2 or 6-8	4-6	2-4	**3.7-4.6**

[1]Mackie, G.L. and R. Claudi. 2010. Monitoring and control of macro-fouling mollusks in fresh water systems. CRC Press, Boca Raton, FL.

[2]Sorba, E.A., and D.A. Williamson. 1997. Zebra Mussel colonization potential in Manitoba, Canada. Water Quality Management Section, Manitoba Environment Report No. 97-07

Two important parameters that fell into the “little potential for adult survival” were calcium and total hardness. The values for these two parameters are significantly lower than the criteria, indicating little potential for an adult population of zebra mussels to be sustained. The limited calcium doesn’t allow for adequate shell synthesis. As a result, no plankton tows were conducted (which were in 2018). The plate samplers were retained as already installed. They did not contain any mussels in 2019.

No other plant species that are non-native/invasive were sampled, observed or suspected. This does not mean there is no chance for AIS, but the coverage is not extensive enough that they were observed and if present growth would be very limited. Reed canary grass was documented in 2018. There did not appear to be any changes in reed canary grass coverage and there are no concerns about any areas becoming inundated with this plant.

It is recommended that the Silver Lake Board suggest pier owners inspect their posts, ladders and boats for adult zebra mussels when these are removed in the fall. Any suspected sampled could be collected and verified. It is also recommended that some education be conducted on AIS so more lake users can be observant for AIS species. Lastly, AIS surveying efforts should continue along with a robust Clean Boats/Clean Waters monitoring program in future years. The best way to mitigate AIS is to not have them introduced, and if they are introduced, respond as quickly as possible. Therefore, early detection is paramount.

The map below outlines areas of highest susceptibility for invasive plants due to presence of higher nutrient sediments and potential boat traffic, which are common vectors for AIS introductions. Plant growth is limited in Silver Lake, but most of these areas of higher susceptibility have some plants growing. Maintaining the present native plant species is important as they can help stave off invasive species establishment through competition.