ONEIDA COUNTY LAND AND WATER CONSERVATION DEPARTMENT

Alva Lake

Land & Water Conservation Department

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Alva Lake AIS Monitoring and Water Clarity Report

Field Dates:	July 23rd, 2020
WBIC:	968100
Previous AIS Findings:	Chinese Mystery Snail, Banded Mystery Snail
New AIS Findings:	None
Field Crew:	Aubrey Nycz, AIS Project Leader, and Rachel Cook, AIS Project Assistant, Oneida County Land and Water Conservation Department
Report By:	Rachel Cook

On July 23rd, 2020, Aubrey and I went to Alva Lake to conduct AIS monitoring and to assess water clarity and quality. Alva Lake is a 199-acre oligotrophic seepage lake in Oneida County. It has one public boat landing on the eastern side of the lake at the end of Alva Lake Road (seen in Figure 2). The perimeter of Alva Lake is mostly occupied by private residents, so there are many piers, boat lifts, and private landings along the shoreline. The lake has a maximum depth of 43 feet, and the substrate is reported to be 65% sand, 20% gravel, 10% rock, and 5% muck. Along with reporting the depth and substrate, the Wisconsin Department of Natural Resources also reports that the lake has musky, largemouth bass, smallmouth bass, and walleye present.

The weather while conducting research on Alva Lake was ideal. The outside temperature was 70 degrees Fahrenheit, the sky was clear and sunny, and there was just a slight breeze. This made maneuvering the canoe and visualizing things under the water's surface much easier. We began monitoring the lake at the public boat landing, moving in a clockwise direction around the lake, meandering in and out of wetland areas as well, including paddling into the unnamed lake through a channel on the northeast side of Alva Lake. We looked on the shoreline itself and also in the water, noting the plants and animals we had observed in the process.

To observe the water clarity and quality of Alva Lake, Aubrey and I went to the deep hole towards the middle of the lake. After locating the deep hole with our sonar unit, we used a Secchi disk to measure water clarity and a dissolved oxygen meter to measure water health. Oxygen is needed for a healthy fish population, and for plants to respire at night. The measurements from the dissolved oxygen meter can tell us if the organisms in the lake are under stress. The secchi disk reading was slightly less than

previous years' findings, however, there had been many rain events in the previous days which may have made the water clarity slightly lower than normal. The dissolved oxygen readings were comparable to previous results, and there should be no concern for the water health on Alva Lake. The Secchi disk reading was 13 feet, and the dissolved oxygen readings can be found in Tables 2 and 3.

Aubrey and I did observe many Chinese Mystery Snails as well as a few Banded Mystery Snails in Alva Lake, however, these invasives were already known to have been established here. Besides these two invasives being present, Alva Lake still had many native plants and animals present and thriving. The eight most common plants we observed were Water Smartweed, Watershield, Pickerel Weed, White Water Lily, Bullhead Pond Lily, Common Bladderwort, Soft-Stem Bulrush, and Broad-leafed Cattail. These plants can be seen below in Table 1.

Findings: Taken 11:00 a.m. – 1:00 p.m. on July 23rd, 2020

Aquatic Invasive Species:
Chinese Mystery Snails were seen on the shoreline as well as on the bogs in the wetland areas around the lake. Banded Mystery Snails were seen on the shoreline.

Secchi Disk:
The Secchi reading on this lake was 13 feet out of a 43 foot maximum depth. The water looked clear and a dark blue color.

Dissolved Oxygen:
These measurements can be seen in Tables 2 and 3.

Figure 1. Map of Oneida County, WI with Alva Lake circled in red (approximate location)

Figure 2. Map of Alva Lake with boat landing and location of Secchi disk reading labeled.

Table 1. Plants found in Alva Lake while monitoring.

Common Name Scientific Plant Name	Description	Image
Pickerel Weed *Pontederia cordata*	An aquatic plant with thin, bright green leaves. Emergent leaves tend to be arrow shaped with 6 parted, blue flowers. This plant is native.	 Photo Credit: ediblewildfood.com
Broad-Leaf Cattail *Typha latifolia*	An herbaceous plant with leaves greater than 12 mm wide. The pollen that this plant contains is shed in clusters of four grains. This plant is native.	 Photo Credit: www.nwplants.com
Water Shield *Brasenia schreberi*	An aquatic plant with stems up to 2 meters long. This plant has small floating leaves and reddish purple flowers that have 6-8 petals. This plant is native.	 Photo Credit: Shannon Sharp
Water Smartweed *Persicaria amphibian*	An aquatic, floating plant with swollen leaf nodes. Leaves tend to be smooth and rounded. Water smartweed has pink flowers that are raised a few inches above the water. This plant is native.	 Photo Credit: Superior Natl. Forest

Common Name Scientific Plant Name	Description	Image
Soft-stem Bulrush *Schoenoplectus tabernaemontani*	An emergent aquatic plant. Spikes have branching lusters at the top of the stem with 15 to 200 spikelets (flower clusters). 3 to 4 leaves at the base of the stem. Plants form colonies from rhizomes. This plant is native.	 Photo Credit: minnesotawildflowers.info
White Water Lily *Nymphaea adorata*	An aquatic plant that has large, round leaves that can grow to be 12 inches in diameter. White water lilies also have large, white flowers with many petals. This plant is native.	 Photo Credit: Stephanie Boismenue
Bullhead Pond Lily *Nuphar variegate*	An aquatic plant with heart-shaped leaves that can grow to be 15 inches long. This plant also has a yellow, cup-shaped flower. This plant is native.	 Photo Credit: Jomegat's Weblog
Common Bladderwort *Utricularia macrorhiza*	A submerged aquatic plant. Leaves contain small sacks that trap small invertebrates. This plant usually has unrooted stems that easily tangle with other plants, and tends to look cloudy underwater. This plant is native.	 Photo Credit: frenchhill.org

Table 2. Dissolved oxygen levels and temperatures at the deep hole in the center of Alva Lake.

Depth (Feet)	Dissolved Oxygen Levels (mg/L)	Temperature (F)	Percent Dissolved Oxygen
2	8.43	73.2	103.1
4	8.38	73.5	102.8
6	8.34	73.5	102.3
8	8.31	73.5	101.9
10	8.24	73.4	101.0
12	8.21	73.4	100.7
14	8.21	73.3	100.5
16	9.23	69.0	108.0
18	10.19	61.9	109.9
20	10.34	57.7	106.1
22	9.11	53.7	95.3
24	6.13	50.9	57.8
26	3.68	48.9	33.8
28	1.82	47.7	16.4
30	0.54	46.6	4.8
32	0.11	46.0	1.0
34	0.07	45.6	0.6
36	0.06	45.1	0.5

Table 3. Dissolved oxygen levels and temperatures at the deep hole in the center of Unnamed Lake on northeast side of Alva Lake.

Depth (Feet)	Dissolved Oxygen Levels (mg/L)	Temperature (F)	Percent Dissolved Oxygen
2	7.89	72.6	96.0
4	0.20	66.8	2.3
6	0.11	61.2	1.2
8	0.07	55.7	0.7

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Alva Lake AIS Monitoring and Water Clarity Report

WBIC:	968100
Previous AIS Findings:	None
New AIS Findings:	Banded Mystery Snail, Chinese Mystery Snail
Field Date:	September 9, 2015
Field Crew:	Stephanie Boismenue and Sara Mills, AIS Project Assistants, Oneida County Land and Water Conservation Department
Report by:	Sara Mills

Stephanie and I monitored Alva Lake on September 9, 2015. It is a 199 acre lake located in the towns of Cassian and Lake Tomahawk (Figure 1). It is a seepage lake with a maximum depth of 43 feet. There is one public boat landing. Most of the shoreline is developed with many private boat landings. The WDNR lists Alva Lake's trophic state as oligotrophic and substrates as 65% sand, 20% gravel, 10% rock, and 5% muck. Oligotrophic lakes are characterized by a low amount of nutrients, limiting amount of plants and algae, and often have increased dissolved oxygen levels. Alva Lake did not have a lot of plants or algae.

The conditions for lake monitoring were partly cloudy with wind at 12-13 mph. We entered the lake from a public boat landing (Figure 3). Using the bathymetric map (Figure 2) and the depth finder, Stephanie and I navigated as close as we could to the deep hole of the lake. Due to the high wind speeds, we could not find the deep hole of 43 feet. We dropped anchor to keep the canoe from drifting while taking the measurements. I collected a GPS location for our measurements, a Secchi disk reading for water clarity, and dissolved oxygen and temperatures for water quality (Table 1).

After data collection, we paddled to five locations of the lake shore to perform an AIS presence/absence check. The protocol for this process is to complete a visual inspection of the littoral zone along 100 feet of the shoreline in each area. We chose five areas around private landings, private docks with motorized watercrafts, and the public boat landing (Figure 3). For the five locations of AIS presence/absence checks, we meandered the shoreline via walking along the shoreline, looking through vegetation, and checking under and around solid surfaces. In addition to

the five presence/absence checks, we also visually inspected from the canoe for the entire shoreline of the lake.

Findings

Aquatic Invasive Species:
We discovered both Chinese mystery snails and banded mystery snails and brought them to the DNR station for identification confirmation. The new discoveries can be seen in Figure 4.

Secchi Disk Reading:
Alva Lake had very clear water with no algae present which resulted in a Secchi disk reading of 22 feet at a depth of 33 feet.

Dissolved Oxygen and Temperature:
See Table 1.

Figure 1. Map of Oneida County, WI with Alva Lake circled.

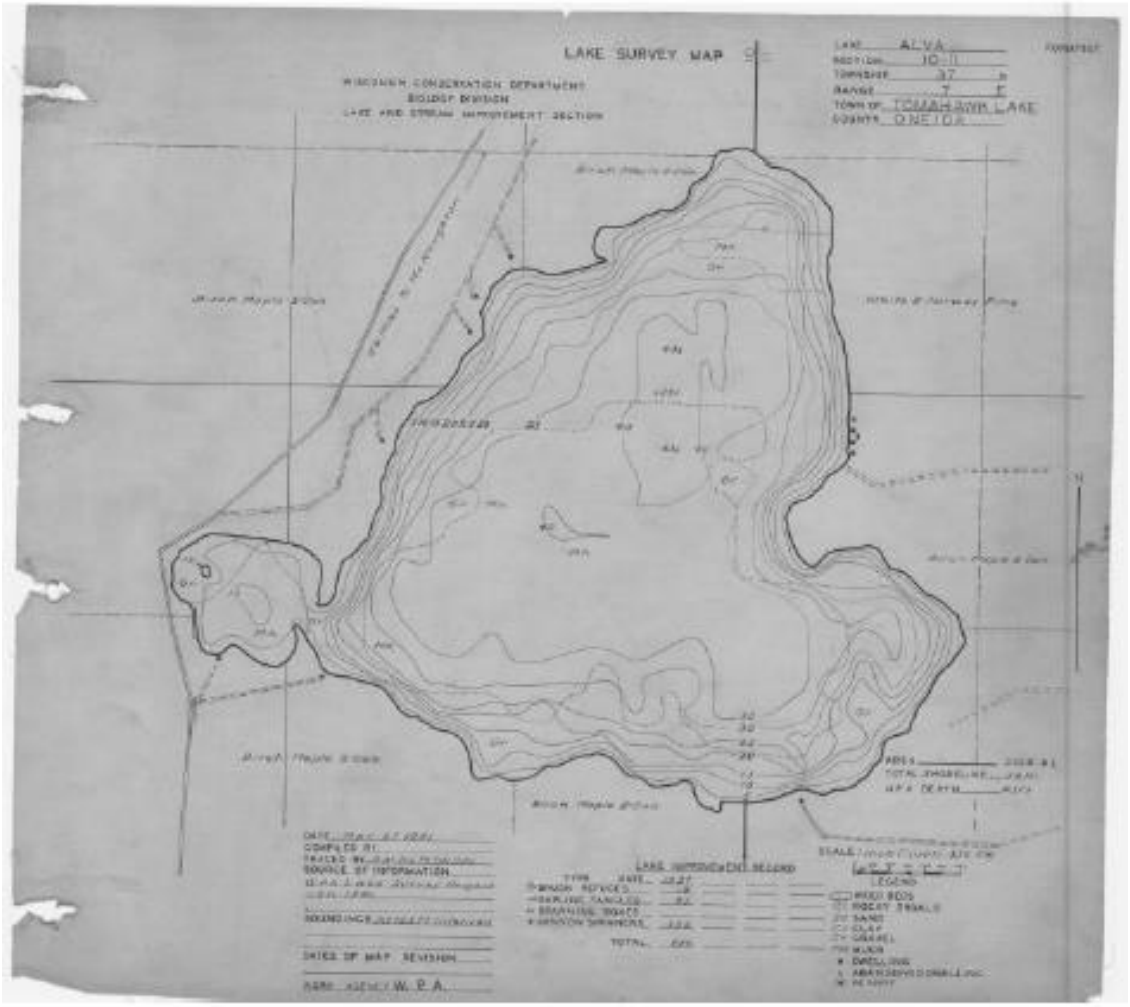

Figure 2. Bathymetric map of Alva Lake.

Map Source: Wisconsin Department of Natural Resources (608) 266-2621, Alva Lake – Oneida County, Wisconsin – DNR Lake Map, Date – March 27, 1941 – Historical Lake Map.

http://dnr.wi.gov/lakes/maps/DNR/0968100a.pdf

Figure 3. Map of Alva Lake with the deep hole, AIS checks, and public boat landing labeled.

Deep Hole GPS Coordinates: 45.71029644, -89.59135756

Figure 4. Map of Alva Lake with new AIS discoveries.

Chinese Mystery Snail GPS Coordinates: 45.70771954, -89.58718850
Banded Mystery Snail GPS Coordinates: 45.70771954, -89.58718850

Table 1. Dissolved oxygen levels and temperature readings at the deep hole site.

Depth	Temperature	Dissolved Oxygen Level
1’	70.9:F	8.70 mg/L
4’	71.5:F	8.60 mg/L
7’	71.7:F	8.56 mg/L
10’	71.7:F	8.53 mg/L
13’	71.8:F	8.49 mg/L
16’	71.8:F	8.44 mg/L
19’	69.8:F	8.68 mg/L
22’	68.8:F	8.11 mg/L
25’	67.4:F	6.73 mg/L

References: http://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=968100&page=facts