ONEIDA COUNTY LAND AND WATER CONSERVATION DEPARTMENT

McNaughton Lake

Land & Water Conservation Department

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McNaughton Lake AIS Monitoring and Water Clarity Report

Field Date:	August 16th, 2018
WBIC:	1587600
Previous AIS Findings:	Purple Loosestrife
New AIS Findings:	None
Field Crew:	Aubrey Nycz, AIS Project Leader, Tom Boisvert, AIS Project Assistant, and Jody Partin, AIS Project Assistant, Oneida County Land and Water Conservation Department
Report By:	Jody Partin

On August 16th, 2018, Aubrey, Tom, and I went to McNaughton Lake to remove Purple Loosestrife, as it has expanded from the area in which it was previously documented. It is now present along the entire perimeter of the lake. While we were there, we implemented AIS monitoring along with water clarity and quality assessments. McNaughton Lake is a 121 acre mesotrophic lake located in Oneida County with one public boat landing. The shoreline along McNaughton Lake is composed of American Legion State Forest. Because of this, none of the lake shoreline is built up with housing, and the shoreline looks natural in most areas. The lake has a maximum depth of 9 feet, and the substrate is reported to be 35% sand, 0% gravel, 0% rock, and 65% muck. Along with reporting the depth and substrate, the Wisconsin Department of Natural Resources also reports that the lake has northern pike and panfish present.

The weather while conducting research on McNaughton Lake was pleasant. The outside temperature was in the low 80s degrees Fahrenheit, the sky was cloudy, the wind was fairly calm, and the water clarity was good. There was no adverse weather to impede our measurements in any way.

When conducting our AIS lake survey, the AIS team did a complete shoreline scan while meandering in and out between different depths. 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 McNaughton Lake, I went to the deep hole and 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 also for plants to respire at night. The measurements from the dissolved oxygen meter can tell us if the organisms in the lake would be under stress. Thankfully, both of these measurements were relatively average in nature, and there should be no concern for the health of McNaughton Lake. The Secchi disk reading was 8.5 feet, and the dissolved oxygen readings can be found in table 2.

The AIS team was disheartened to discover how widely the purple loosestrife had spread. It took 6-7 hours for the team to remove it all by pulling or prevent its spread by clipping the flowers. Despite this, the remainder of the lake seems to be healthy, and native plants were present and thriving. Common plants found in McNaughton Lake can be seen below in table 1.

Findings: Taken 9:00 a.m. – 4:00 p.m. on August 16th, 2018

Aquatic Invasive Species: We found Purple Loosestrife at McNaughton Lake.

Secchi: The Secchi reading on this lake was 8.5 feet out of a 9 foot maximum depth. The water color was a greenish color, and appeared clear when glancing across the lake.

Dissolved Oxygen: These measurements can be seen in Table 2.

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

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

Public boat landing

Deep hole & location of Secchi disk reading

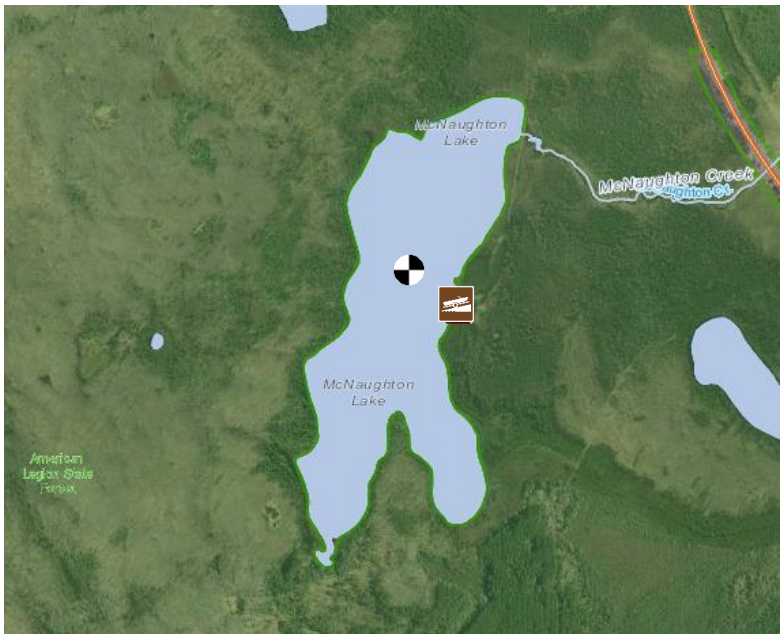

Table 1. Common plants found in McNaughton Lake when monitoring.

Common Plant Name Scientific Plant Name	Description	Image
Fern-leaf Pondweed *Potamogeton robbinsii*	A stiff, robust plant that produces only underwater leaves. It is usually dark-green with flat closely spaced leaves pointing away from the stem on two sides. Fern pondweed is also able to stabilize bottom sediments. Fern pondweed is known to provide habitat for small aquatic animals used as food by predator fishes, especially northern pike. This plant is native.	 *Photo Credit: UWSP*
Purple Loosestrife *Lythrum salicaria*	A flowering plant with a square or 6-sided stem and smooth leaves. Flowers tend to be a pinkish purple with 6 petals. This plant is invasive!	 *Photo Credit: Dave Britton*
Water Smartweed *Persicaria amphibia*	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 National Forest/CCSA*

Table 2. Dissolved oxygen levels and temperatures at the deep hole.

Depth (Feet)	Dissolved Oxygen Levels (mg/L)	Temperature (F)	Percent Dissolved Oxygen
1	9.67	82.5	131.0%
2	9.71	82.8	131.8%
3	11.17	81.1	149.2%
4	11.18	80.6	148.7%
5	10.71	80.5	142.2%
6	8.04	80.2	106.5%
7	4.43	80.0	58.6%
8	3.08	79.8	40.7%

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Paradise Lake AIS Monitoring and Water Clarity Report

Field Date:	July 13th, 2017
WBIC:	1587600
Previous AIS Findings:	Purple Loosestrife
New AIS Findings:	None
Field Crew:	Aubrey Nycz, AIS Project Leader, and Derek Thorn, AIS Project Assistant, Oneida County Land and Water Conservation Department
Report By:	Aubrey Nycz & Derek Thorn

On July 13th, 2017, Derek and I went to McNaughton Lake to implement AIS monitoring along with water clarity and quality assessments. McNaughton Lake is a 121 acre mesotrophic lake located in Oneida County, and has one public access boat launch. The lake has a maximum depth of 14 feet, and the substrate is reported to be 35% sand, 0% gravel, 0% rock, and 65% muck. Along with reporting the depth and substrate, the Wisconsin Department of Natural Resources reports that the lake has northern pike and panfish present.

The weather while conducting research on McNaughton Lake was not ideal. The outside temperature was 67 degrees Fahrenheit, the sky was cloudy, and there were large wind gusts that made canoeing challenging. Throughout the course of our monitoring, we were canoeing against the wind, which made it difficult keeping our canoe straight.

When conducting our AIS lake survey, Derek and I did a complete shoreline scan while meandering in and out between different depths. We looked on the shoreline itself and also in the water, noting the plants and animals we had observed in the process. When possible, we got in the water and used the aquascopes to have a closer look at the bottom composition. While completing our shoreline scan, we noted that the water color was fairly clear, as that we could see the lake's bottom while in approximately 8 feet of water.

To observe the water clarity and quality of McNaughton Lake, Derek and I went to the deep hole to obtain data information. After locating the deep hole with our sonar unit, we used a Secchi disk to measure clarity and a dissolved oxygen meter to measure water health. Oxygen is needed for a healthy fish population, and also for plants to respire at night as well. The measurements from the dissolved oxygen meter can tell us if the organisms in the lake would be under stress. Thankfully, both of these measurements were relatively average in nature, and there should be no concern for the health of McNaughton Lake. The Secchi disk reading was 8 feet, and the dissolved oxygen readings can be found in table 2.

Derek and I did not find any new invasive species while on McNaughton Lake. The lake seems to be healthy, and many native plants were present and thriving. The three most common native plants that we observed were Bullhead Pond Lily, Watershield, and White Water Lily. These plants can be seen below in table 1.

Findings: Taken between 9 a.m. – 11:30 a.m. on July 13th, 2017

Aquatic Invasive Species: We did not find any new invasive species along the perimeter of McNaughton Lake.

Secchi: The Secchi reading on this lake was 8 feet out of a 14 foot maximum depth. The water color was a brownish color, and was relatively clear when glancing across the lake.

Dissolved Oxygen: These measurements can be seen in Table 2.

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

Figure 2. Map of McNaughton Lake with the location of Secchi disk reading labeled.

Public boat landing

Deep hole & location of Secchi disk reading

Secchi Disk Readings:
McNaughton - Deep Hole
Coordinates - Not Available

Table 1. Plants found in McNaughton Lake when monitoring.

Common Name	Scientific Plant Name	Description	Image
Bullhead Pond Lily (Spatterdock)	*Nuphar variegata*	An aquatic plant with heart-shaped leaves that can grow to be 15inches long. This plant also has a yellow, cup-shaped flower. This plant is native.	 *Photo Credit: Jomegat's Weblog*
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*
White Water Lily	*Nymphaea odorata*	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: Joseph A. Marcus*

Table 2. Dissolved oxygen levels and temperatures taken at the deep hole.

Depth (Feet)	Dissolved Oxygen Levels (mg/L)	Temperature (F)	Percent Dissolved Oxygen
2	9.22	75.10	115.5
4	9.16	75.5	115.1
6	3.33	74.0	41.2
8	0.17	68.2	1.9

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McNaughton Lake AIS Monitoring and Water Clarity Report

WBIC:	1587600
Previous AIS Findings:	None
New AIS Findings:	Purple Loosestrife
Field Date:	August 14, 2014
Field Crew:	Stephanie Boismenue and Sara Mills, AIS Project Assistants, Oneida County Land and Water Conservation Department
Report by:	Stephanie Boismenue

Sara and I monitored McNaughton Lake on August 14, 2014. This is a beautiful crystal clear, 121 acre lake, located in the Town of Lake Tomahawk. It's a spring-fed, groundwater drainage lake with a means depth of 4 feet and a maximum depth of 8 feet. There is one public boat landing and the lakes undeveloped shoreline is protected by the Northern Highland American Legion State Forest. The WNDR lists McNaughton Lake's trophic state index as Mesotrophic. Mesotrophic lakes are commonly clear water waterbodies with a variety of submerged aquatic plants and support a wide variety of fish. They have intermediate level of nutrients and productivity, more than the oligotrophic lakes, but not nearly as much as eutrophic lakes.

The morning's blue sky and slight breeze made perfect conditions for monitoring the lake via the canoe. Using the depth finder and bathymetric map ***(Figure 1)***, I navigated the canoe to our monitoring location, which is located at the deep hole on the north end of the lake ***(Figure 2).*** There is an interesting "dead head" located directly at the deep hole. To prevent the canoe from moving while obtaining monitoring data, I pointed the bow of the canoe downwind, had Sara drop the anchor. I was in the stern and was able to keep the stern unwind by holding on to the dead head while Sara obtained a GPS point of our location and then collect Secchi, dissolved oxygen, and temperature readings ***(Table 1).***

After data collection, we paddled to three locations on the lake to perform an AIS presence/absence check). The protocol for this process is to complete a visual inspection of the littoral zone along 100' of shoreline in each area. We choose to monitor the boat landing, and then two areas south of the boat landing *(Figure 2)*. We visually inspected from the canoe, meandering the shoreline and via walking

along the shoreline - as far out as comfortable, using an aqua scope, looking through vegetation, and checking around and under solid surfaces.

FINDINGS:

Secchi:

McNaughton Lake is so incredibly clear that we could see the Secchi disk as it hit the bottom of the deep hole, which was at 8 feet.

Dissolved Oxygen:

In discussing the dissolved oxygen levels and temperature results with Michele, we determined that they were appropriate for this spring-fed, groundwater drainage lake. See table 1 for dissolved oxygen and temperature readings.

Aquatic Invasive Species:

Unfortunately, we discovered Purple Loosestrife growing at the boat landing and several small clumps of plants scattered along the southeast shore ***(Figure 3)***. We did obtain GPS coordinates of each of these locations.

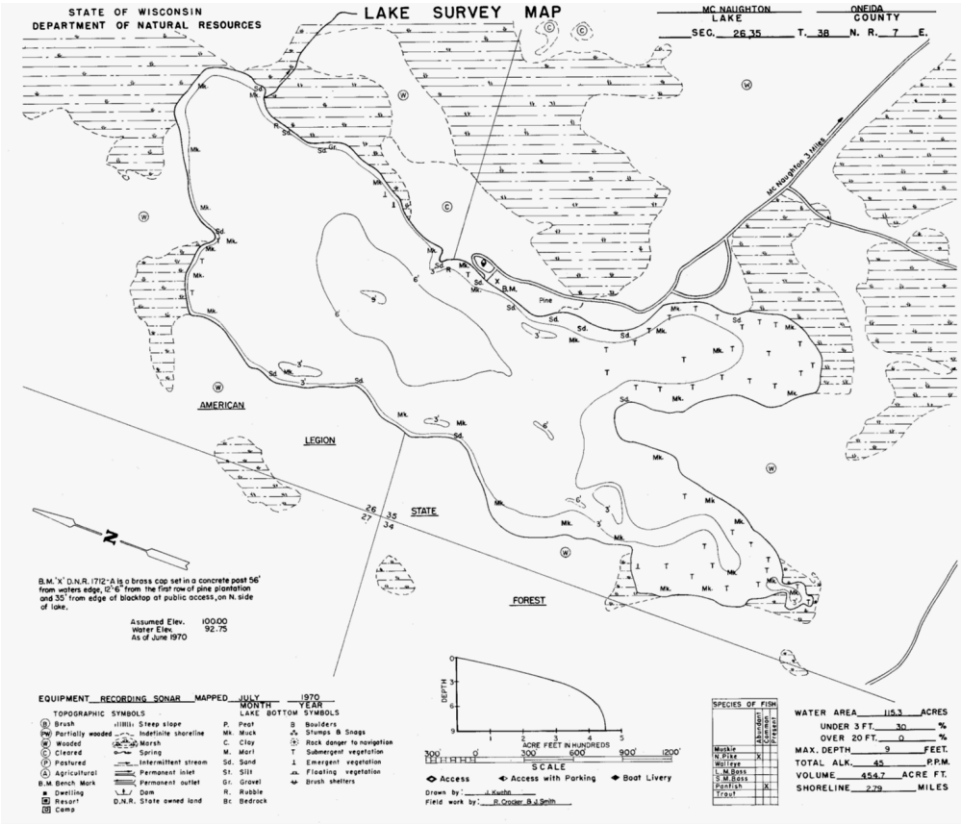

Figure 1. Bathymetric map of McNaughton Lake.

Map Source: Wisconsin Department of Natural Resources 608-266-2621, McNaughton Lake – Oneida County, Wisconsin - DNR Lake Map , Date – Jul 1970 - Historical Lake Map

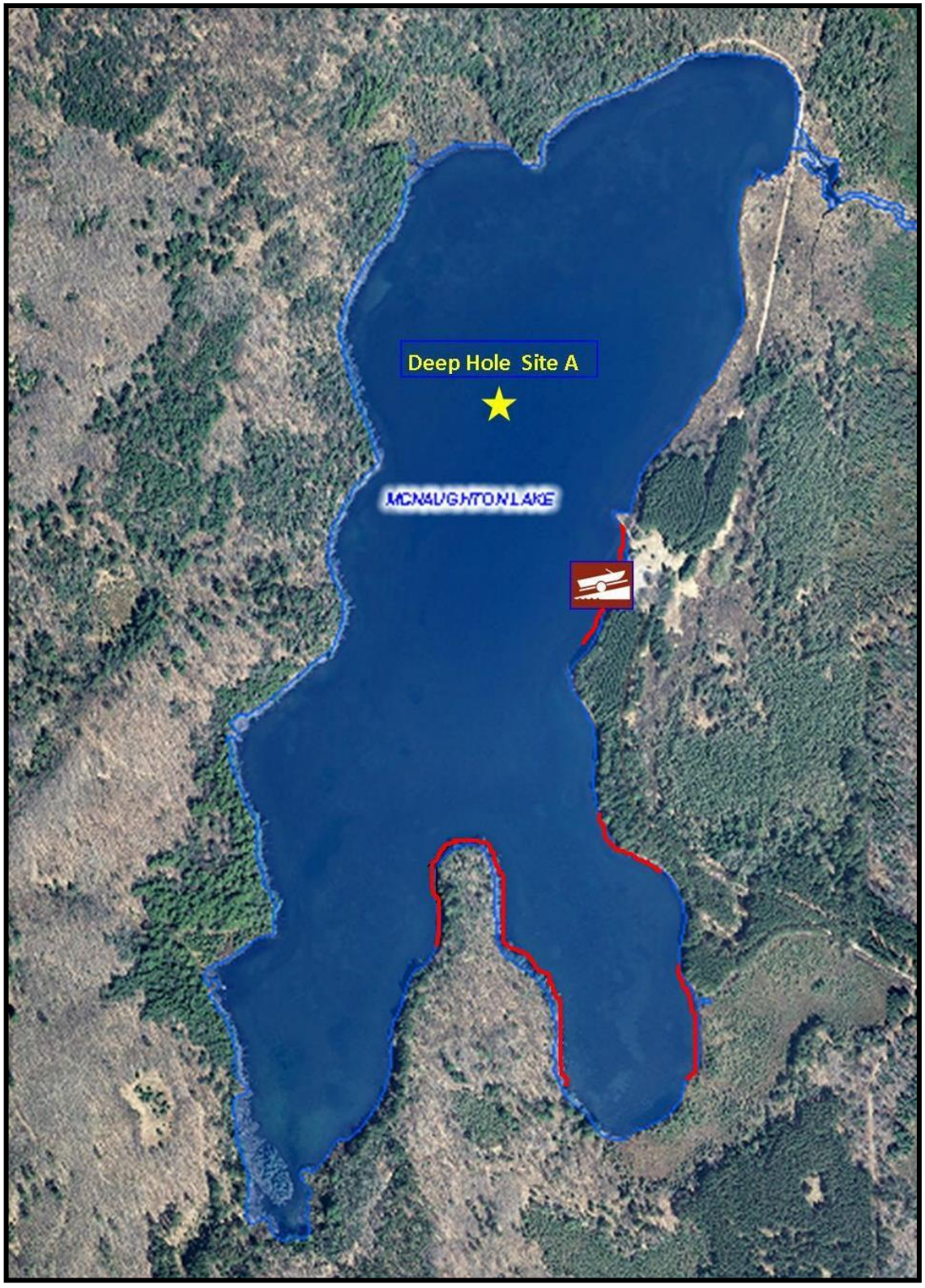

Figure 2. Map of McNaughton Lake's Deep Hole Site A and the locations monitored for AIS Presence/Absence**.**

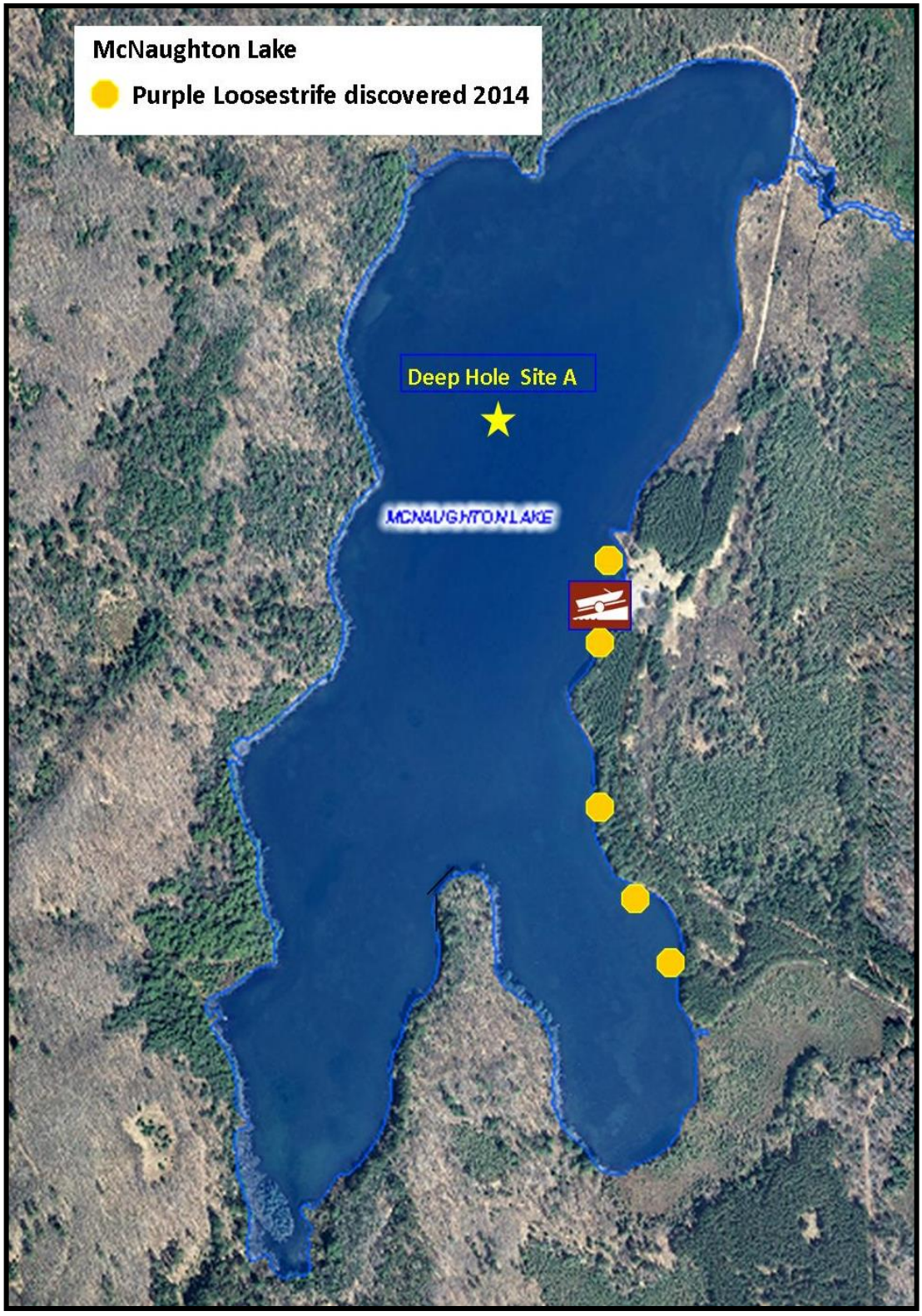

Figure 3. Map of purple loosestrife locations in McNaughton Lake.

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

Depth	Dissolved Oxygen Level	Temperature
1’	9.51 mg/L	69.0°F
2’	9.62 mg/L	69.3°F
3’	9.75 mg/L	69.4°F
4’	9.91 mg/L	69.4°F
5’	9.83 mg/L	69.5°F
6’	9.84 mg/L	69.5°F
7’	9.94 mg/L	69.6°F
8’	-	-

Resources:

http://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=1587600