



Land & Water Conservation Department

Thunder Lake

Oneida County, Wisconsin

Page 1: July 29, 2020 Aquatic Invasive Species Monitoring and Water Quality Report





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Thunder Lake AIS Monitoring and Water Clarity Report

WBIC: 1580400
Previous AIS Findings: None
New AIS Findings: None
Field Date: July 29, 2020
Field Crew: Aubrey Nycz, AIS Lead Program Assistant, and Rachel Cook, AIS Project Assistant, Oneida County Land and Water Conservation Department
Report By: Rachel Cook

Purpose of lake monitoring: Water is Wisconsin’s most precious resource. It provides an essential lifeline between wildlife, recreation, public trust resources, agriculture, industry, health and safety, and environmental, urban and rural interests throughout the state. With a growing population and a treasured supply of fresh water, the protection of water for designated and beneficial uses is of paramount importance.

The Oneida County AIS program monitors Oneida County waterbodies for the presence of aquatic invasive plants, animals, and organisms and obtains baseline water quality data. Early detection of AIS is crucial for rapid response, containment, and management. Obtaining baseline water quality data provides an indicator of each lake’s current health and documents changes in water quality over time. Lake monitoring is in collaboration with the Department of Natural Resources, UW Extension’s Citizens Lake Monitoring Network Program, and Great Lakes Indian Fish Wildlife Commission. The AIS Team follows the DNR’s monitoring protocols and collected data is entered into the DNR’s statewide database.

Data Collected: Suspected invasive species samples, AIS high-risk areas, Secchi disk readings, dissolved oxygen, water temperature, water column appearance, water color, and perception of water quality, shoreline and woody habitat notes, and GPS coordinates.

Areas observed: Perimeter of whole lake’s littoral zone, including beaches and boat landings, inlets and outlets, and under and around docks and piers.

Methodology: Searching for AIS in the water and along the shoreline is achieved by slowly canoeing around the entire lake's littoral zone, meandering between shallow and maximum rooting depth or 100' from shore (whichever comes first).

Additionally, targeted sites considered high risk of invasive species introductions, such as boat landings, access points, parks, beaches, and inlets receive comprehensive AIS monitoring. Several methods are used to achieve the survey: survey from the canoe, walking along the shoreline and shallows, using aqua view scopes, sifting through vegetation, examining underwater solid surfaces, and analyzing rake tows and D-net samples.

Target invasive species include: Asian clams, banded mystery snails, Chinese mystery snails, Faucet Snails, New Zealand mudsnail, quagga mussels, zebra mussels, rusty crayfish, spiny waterfleas, Eurasian watermilfoil, curly leaf pondweed, flowering rush, non-native phragmites, purple loosestrife, and yellow iris.

Other priority species include: red swamp crayfish, Japanese knotweed, Japanese hops, European frog-bit, yellow floating heart, water chestnut, Brazilian waterweed, Hydrilla, fanwort, parrot feather, water hyacinth, water lettuce, and rock snot.

Facts and figures about Thunder Lake: Thunder Lake, located in the Town of Pine Lake, Oneida County, is a 182-acre drainage flowage with a maximum depth of 12 feet (Figure 1). There are two public boat landings on Thunder Lake, one located on the southern-most tip of the lake off of Eagle St. (seen in Figure 2), and one located on the western side of the lake behind the Jailhouse Saloon. The substrate is 50% sand, 30% gravel, 0% rock, and 20% muck. Along with reporting the depth and substrate, the Wisconsin Department of Natural Resources (DNR) reports that the lake has largemouth bass, smallmouth bass, northern pike, walleye, panfish, and musky.

Notes from the field (weather): The weather while conducting research on Thunder Lake was ideal. The outside temperature was 80 degrees Fahrenheit, and it was sunny and little wind. This made it easier to maneuver the canoe and to visualize the plants on shore and submerged under the surface.

Notes from the field (aquatic invasive species monitoring): We completed a visual meander survey around the entire lake perimeter, searching both sides of the canoe, and moving in and out between various water depths. Polarized sunglasses were used to aide in looking at the bottom substrate. We looked both in the water and along the shoreline and made note of the plants and animals we observed in the process (see table 1).

Notes from the field (water quality monitoring): To observe the water clarity and quality on Thunder Lake, we used a depth finder and maps indicating where data had been collected in the past to locate the deep hole. After locating the deep hole, we used a Secchi disk to measure water clarity and a dissolved oxygen meter to measure water quality. 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 are under stress. These measurements can be found in table 2. The Secchi disk reading was at 2.5 feet out of a maximum depth of 12 feet. The water on Thunder Lake looked murky and brown, and we received reports from fishermen and residents that the water clarity was worse than in previous years. This could be due to the recent rain events and overall high water levels.

Figure 1. Map of Oneida County, WI with Thunder Lake circled in red.

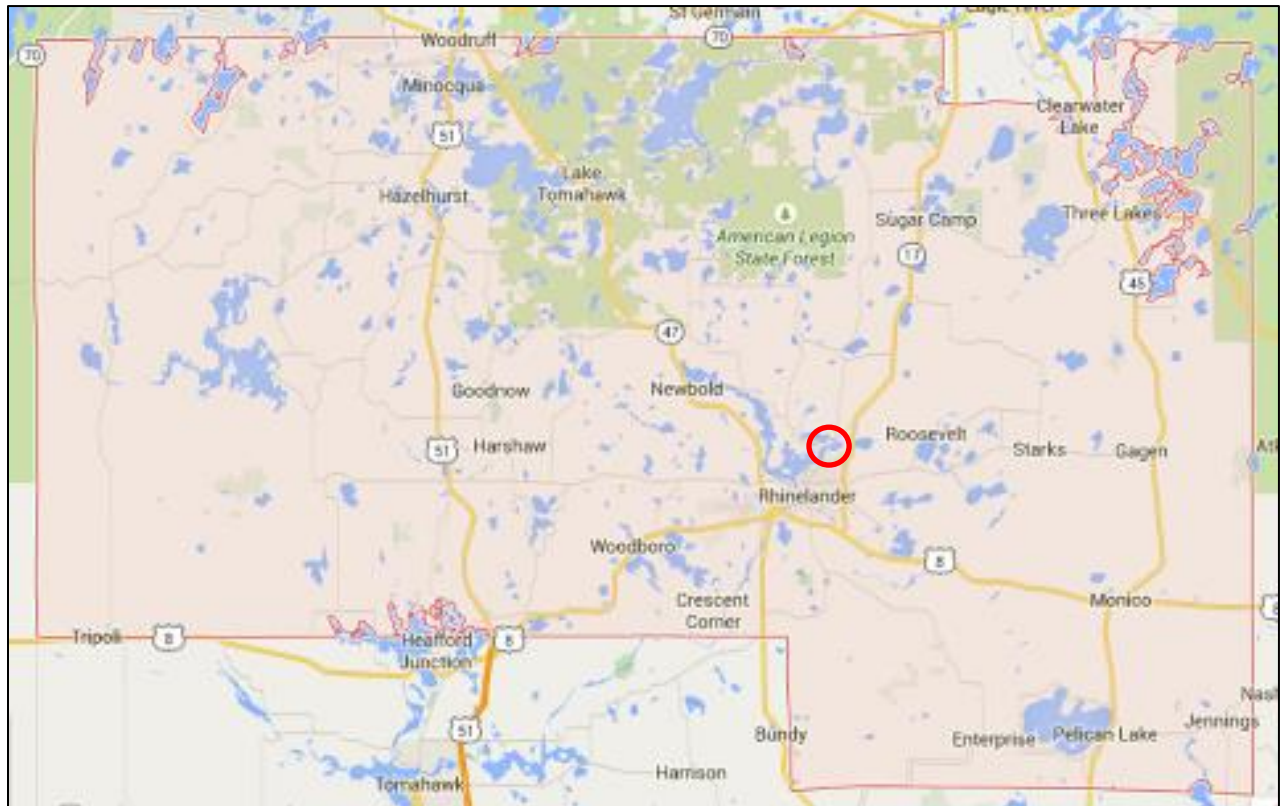


Figure 2. Map of Thunder Lake with boat landing, deep hole, and monitored areas labeled.

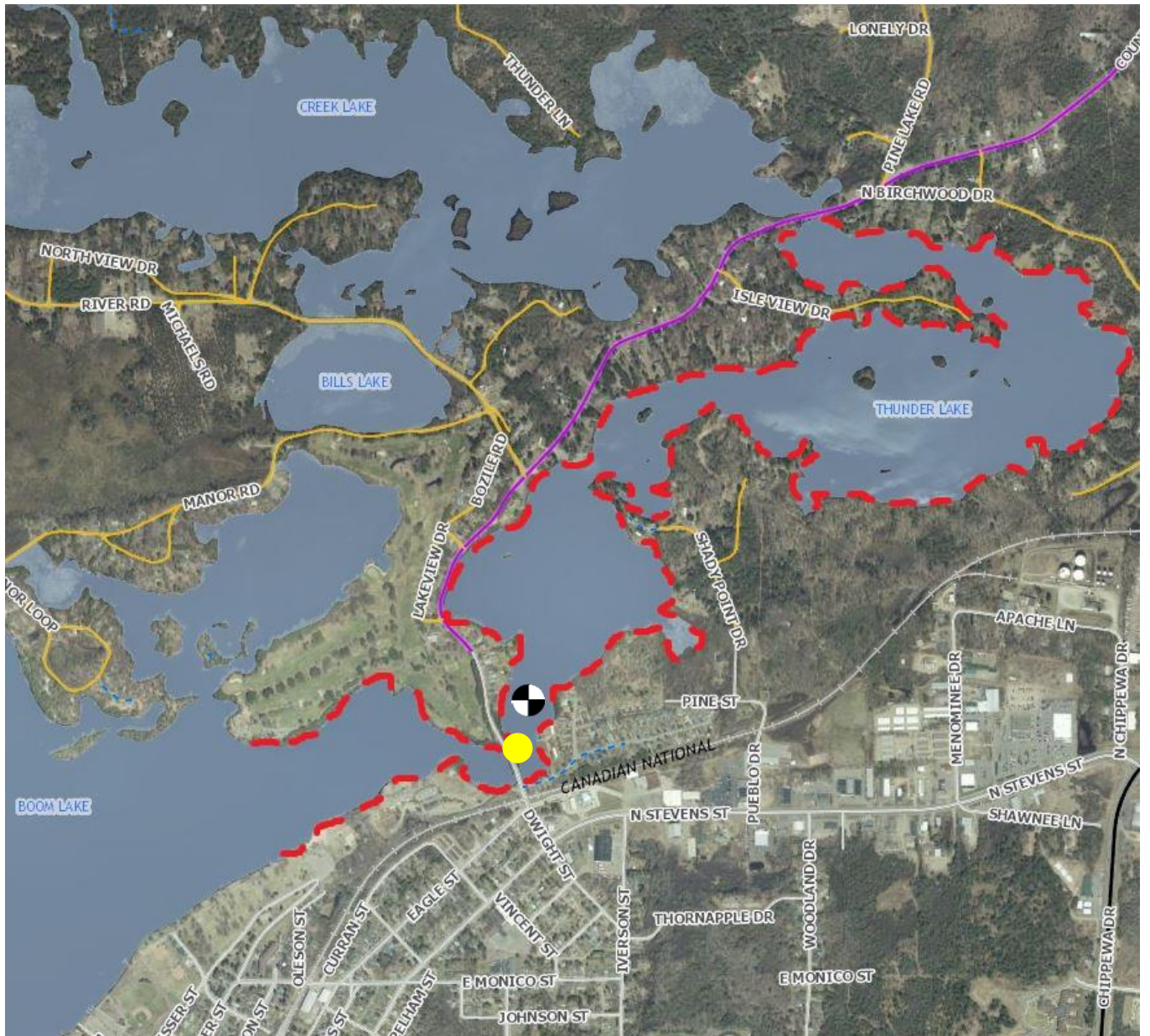
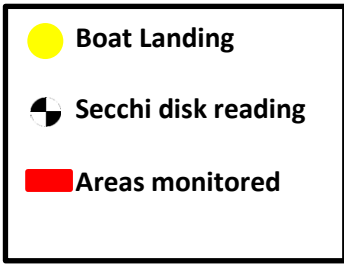


Table 1. Common plants found in Thunder Lake while monitoring.




| | |
|---|---|
| <p>Common Bladderwort (<i>Utricularia macrorhiza</i>)</p> <p>Description: 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.</p> <p>Status: Native</p> <p><i>Photo Credit: frenchhill.org</i></p> |  |
| <p>Pickereel Weed (<i>Pontederia cordata</i>)</p> <p>Description: An aquatic plant with thin, bright green leaves. Emergent leaves tend to be arrow shaped with 6 parted, blue flowers.</p> <p>Status: Native</p> <p><i>Photo Credit: asapaquatics.com</i></p> |  |
| <p>Bullhead Pond Lily (<i>Nuphar variegate</i>)</p> <p>Description: An aquatic plant with heart-shaped leaves that can grow to be 15 inches long. This plant also has a yellow, cup-shaped flower.</p> <p>Status: Native</p> <p><i>Photo Credit: Jomegat's Weblog</i></p> |  |
| <p>Water Shield (<i>Brasenia schreberi</i>)</p> <p>Description: 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.</p> <p>Status: Native</p> <p><i>Photo Credit: Shannon Sharp</i></p> |  |
| <p>White Water Lily (<i>Nymphaea odorata</i>)</p> <p>Description: 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.</p> <p>Status: Native</p> <p><i>Photo Credit: Stephanie Boismenu</i></p> |  |

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

| Depth (Feet) | Dissolved Oxygen Levels (mg/L) | Percent of Dissolved Oxygen | Temperature (°F) |
|---------------------|---------------------------------------|------------------------------------|-------------------------|
| 2 | 5.85 | 77.4 | 80.1 |
| 4 | 5.76 | 75.0 | 78.4 |
| 6 | 5.47 | 69.2 | 75.9 |
| 8 | 1.94 | 24.1 | 73.7 |
| 10 | 0.12 | 1.5 | 70.2 |
| 12 | 0.07 | 0.8 | 68.0 |

Resources: <https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=1580400>