Oneida COUNTY
Land & Water Conservation Department

Moen Lake

Oneida County, Wisconsin

Page 1: **July 20, 2022** Aquatic Invasive Species Monitoring and Water Quality Report

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Moen Lake AIS Monitoring and Water Clarity Report

Field Date:	July 20, 2022
WBIC:	1573800
Previous AIS Findings:	Chinese Mystery Snail, Rusty Crayfish
New AIS Findings:	No new AIS findings.
Field Crew:	Aubrey Nycz, AIS Lead Program Assistant, and Madeline Hetland, AIS Project Assistant, Oneida County Land and Water Conservation Department
Report By:	Madeline Hetland

Purpose: 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.

Each year, the Oneida County Aquatic Invasive Species (AIS) Program staff conducts AIS early detection monitoring and baseline water quality monitoring in Oneida County waterbodies. In addition, staff conducts AIS monitoring at boat landings, rivers, streams, wetlands, roadsides, culverts, and Organisms in Trade. Monitoring takes place from June through September of each year.

AIS early detection monitoring is the most effective approach to locating pioneer populations of WI Chapter NR 40 regulated AIS, species not widely established, and newly introduced species to Wisconsin. Early detection of AIS is crucial for rapid response, containment, management, preventing their spread, and reducing management costs. Implementation of rapid response activities is vital in maintaining the stability of a waterbodies ecosystem services, habitats, fisheries, recreational opportunities, property values, economy, and human health.

Water quality monitoring provides information on the physical, chemical, and biological characteristics of water. Monitoring aims at assessing the environmental state, detecting trends, and identifying potential problems in the water or watershed. The state of water quality is the result of complex natural and manmade conditions and the consequent of those interactions over time. Evaluating trends determines whether water quality is changing relative to land use and natural conditions. Water quality data provides important and useful information to lake

groups, local and regional resource managers, community stakeholders, and provides guidance with protecting and enhancing our waters, watersheds and development to new approaches to water quality management.

Our monitoring program is in collaboration with the DNR, UW Extension's Citizens Lake Monitoring Network Program, and Great Lakes Indian Fish Wildlife Commission. All AIS staff are trained in the in the DNR's AIS monitoring, identification, collection, verification, reporting, and decontamination protocols.

Data Collected: AIS identification, live specimens, photos, population densities, distribution, locations and GPS coordinates. Other observations may include species size, characteristics, and impact to native habitat. Water quality data includes Secchi disc, dissolved oxygen, temperature, water characteristics, and GPS coordinates.

Areas Observed: Perimeter of lake's littoral zone, including beaches and boat landings, inlets and outlets, and under and around docks and piers, and other areas identified as most vulnerable to the introduction of AIS.

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 and tools are utilized to achieve the survey: survey from the canoe, walking along the shoreline and shallows, using aqua view scopes, snorkeling to examine underwater solid surfaces, sifting through vegetation, and analyzing plant rake samples, veliger tows, and D-net sediment samples.

Targeted Chapter NR40 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, yellow iris, and variegated reed manna grass (Glyceria Maxima 'Variegated').

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.

Moen Lake Data: Moen Lake, located in the Town of Pine Lake, Oneida County, is a 461-acre drainage lake with a maximum depth of 11 feet (**Figure 1**.). There is one public boat landing on Moen Lake located on Lakeshore Drive (**Figure 2**). The substrate is 65% sand, 12% gravel, 3% rock, and 20% muck. Along with reporting the depth and substrate, the Wisconsin Department of Natural Resources (WDNR) reports that the lake has musky, panfish, largemouth bass, smallmouth bass, northern pike, and walleye.

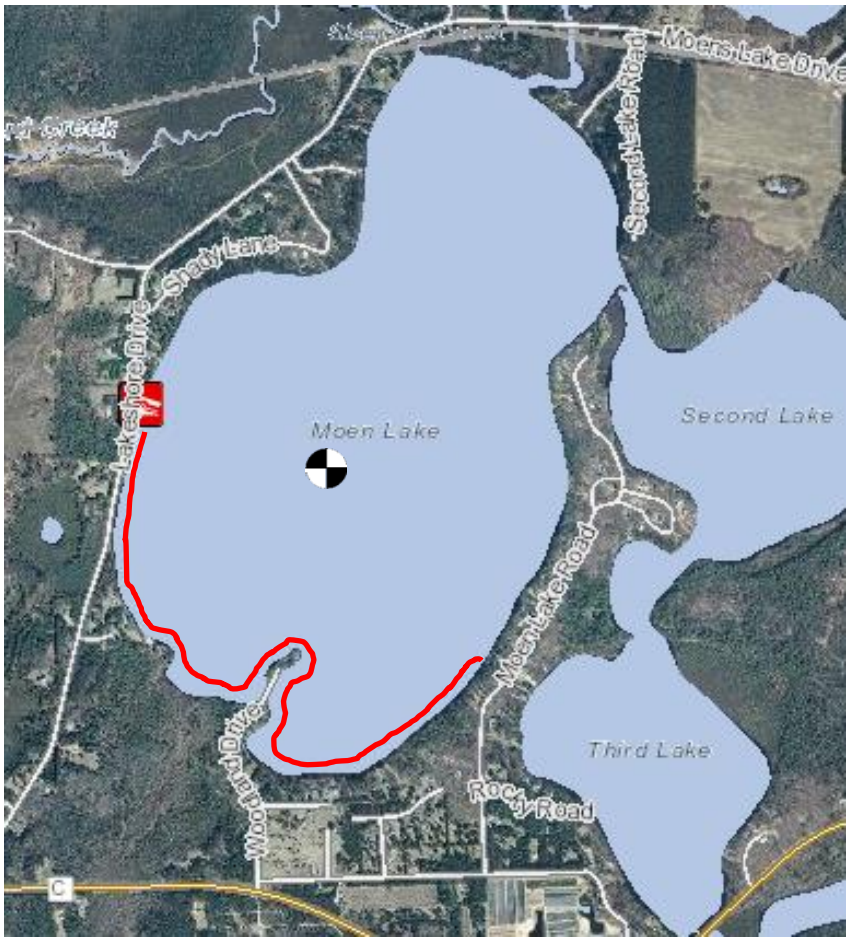
Field Notes (weather): The weather while conducting research on Moen Lake was warm but very windy. The air temperature was 74 degrees Fahrenheit. The winds were strong and sent waves crashing against our canoe, blowing at 14 miles per hour from the Northwest.

Field Notes (AIS monitoring): We completed a visual meander survey around part of the lake's 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, though the dark water made it difficult to see aquatic plants. Throughout our monitoring, we made note of the plants and animals we observed in the process (see **Table 1**). During our search, we observed Chinese Mystery Snails, which were already identified in Moen Lake along with Rusty Crayfish. Information on Chinese Mystery Snails and Rusty Crayfish can be found in the *AIS Quick Guide* in **Appendix A**.

Field Notes (water quality monitoring): To observe the water clarity and quality on Moen 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. The dissolved oxygen measurements on Moen Lake looked healthy, even with the dark water. These measurements can be found in **Table 2**. The Secchi disk reading was at 3.5 feet out of a maximum depth of 12.4 feet.

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

Figure 2. Map of Moen Lake.



Map Key

Boat Landing

Location of dissolved oxygen and Secchi disk reading
Latitude: 45.663607
Longitude: -89.314592

Part of Shoreline Monitored

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

Bullhead Pond Lily *(Nuphar variegata)* **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. **Status:** Native *Photo Credit: Jomegat's Weblog*	
Clasping-leaf pondweed *(Potamogeton richardsonii)* **Description:** A submerged aquatic plant. Leaves are wavy and smooth leaf edges and pointed tips. **Status:** Native *Photo Credit: Paul Skawinski*	
Pickerel Weed *(Pontederia cordata)* **Description:** An aquatic plant with thin, bright green leaves. Emergent leaves tend to be arrow shaped with 6 parted, blue flowers. **Status:** Native *Photo Credit: asapaquatics.com*	
Water Shield *(Brasenia schreberi)* **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. **Status:** Native *Photo Credit: Shannon Sharp*	
Variable Leaf Pondweed *Potamogeton gramineus* **Description:** Submergent leaves with 3-7 veins and floating leaves with 11-19 veins. Can be found growing at various water depths. **Status:** Native *Photo Credit: outdooralabama.com*	

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

Depth (Feet)	Temperature (°F)	Percent of Dissolved Oxygen	Dissolved Oxygen Levels (mg/L)
1	75.9	94.8%	7.38
2	75.9	94.2%	7.33
3	75.9	93.8%	7.31
4	75.9	93.4%	7.28
5	75.9	93.2%	7.26
6	75.9	93.0%	7.25
7	75.9	92.8%	7.23
8	75.8	92.5%	7.21
9	75.8	92.1%	7.18
10	75.8	90.0%	7.03
11	74.4	37.7%	2.99

Resources: https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=1573800

Appendix A. AIS Quick Guides

Aquatic Invasive Species Quick Guide

Chinese Mystery Snail (*Cipangopaludina chinensis* Reeve)

Golden Sands Resource Conservation & Development Council, Inc.

Description: Chinese mystery snails are often large, up to nearly 3 inches tall. Shells are typically dark brown, and may have some dark vertical ridges near the opening. The lowermost whorl of the shell is usually much wider than the rest of the shell. At the opening of the shell, a thick, hardened plate called an operculum is able to seal the shell against predators or harmful chemicals in the water. Chinese mystery snails are capable of grazing algae from surfaces and filter-feeding on suspended algae particles.

North American Distribution: Scattered across North America, but they are most abundant in the eastern and central United States.

The Chinese mystery snail can be nearly 3 inches tall.

Chinese mystery snails have a tough plate called an operculum covering the shell opening.

Dispersal Vectors: Native to eastern Asia, Chinese mystery snails were first imported to the U.S. in the late 1800s as a food item in oriental markets. It is believed that some people may have "seeded" these snails into local waterways for later harvest. Chinese mystery snails are also introduced to water gardens for the purpose of clarifying the water and grazing algae from hard surfaces. At any time during summer and fall, each female may contain dozens of small snails at different stages of development. She occasionally gives birth to small batches of live young, complete with shells.

Ecological Impacts: Chinese mystery snails likely compete for food and resources with native snails and other grazers or filter-feeders. Some research studies suggest that impacts to native species may be insignificant. Chinese mystery snails serve as a secondary host for a trematode parasite that has been killing large numbers of waterfowl in the Midwestern U.S. Some larger animals like turtles or muskrats may occasionally feed on Chinese mystery snails.

Control Options: Manual removal of Chinese mystery snails remains the only effective method of control. Of course, the effect on the population depends on the number removed and the total population size. These snails prefer mucky, organic sediments, so manual removal is likely to be a difficult option in many areas.

Chemical control efforts tend to be unsuccessful and have unintended consequences to native snails and/or other animals. Chinese mystery snails can seal up their shells with their operculum, protecting them from unfavorable conditions like chemical pesticides. Most North American snails do not have this ability and would be harmed.

Juvenile Chinese mystery snails, just minutes old.

Additional Information:

Dillon, R. T. Jr., M. Ashton, M. Kohl, W. Reeves, T. Smith, T. Stewart & B. Watson 2013. *The freshwater gastropods of North America*. http://www.fwgna.org.

Global Invasive Species Database. *Bellamya chinensis*. http://www.issg.org/database/species/ecology.asp?si=1812&fr=1&sts=sss&lang=EN

Photo credit: Paul Skawinski

Developed by Golden Sands Resource Conservation & Development (RC&D) Council, Inc. as part of an aquatic invasive species (AIS) education program, supported by an AIS grant from the Wisconsin Department of Natural Resources. CMS-1-14

Aquatic Invasive Species Quick Guide

Rusty Crayfish (*Orconectes rusticus* Girard)

Golden Sands Resource Conservation & Development Council, Inc.

Description: The rusty crayfish is a large crayfish of the family Cambaridae. Adults can reach six inches in length, including the claws. Most of the body is tan to light brown, but each side of the carapace has a rusty brown spot. Claws are large and typically have brightly colored tips above dark bands. Rusty crayfish are omnivores, feeding primarily on aquatic plants, snails, and other small invertebrates. They can commonly be found hiding under rocks, logs, and other debris. Rusty crayfish typically live 3-4 years.

Rusty crayfish are mostly light brown, with bright claw tips.

North American Distribution: Rusty crayfish are most abundant in the western Great Lakes states, but have been documented from Minnesota and Iowa eastward to Maine, and in northern New Mexico.

Each side of the carapace has a rusty brown spot.

Dispersal Vectors: Rusty crayfish are native to the Ohio River Basin, and were likely transported to the Midwest United States as bait by fishermen. Rusty crayfish quickly colonize lakes and streams by producing several hundred eggs per female each season. Eggs are protected under the female's tail until they hatch.

Ecological Impacts: Rusty crayfish are larger and more aggressive than most native crayfish, and are able to outcompete native species for food and habitat. Rusty crayfish consume large amounts of aquatic invertebrates, small fish, fish eggs, tadpoles, native crayfish, plants, and other aquatic life. They can hasten spread of Eurasian watermilfoil and other aggressive plants by cutting the stems, which then take root elsewhere.

Control Options: Manual trapping is effective for rusty crayfish. Always follow local trapping regulations. Modification of size limits of predator fish species can be effective. Walleye, smallmouth bass, largemouth bass, and yellow perch will consume young rusties. This strategy combined with trapping of large adults can reduce rusty crayfish populations.

Eggs and newly hatched young are held under the female's tail for protection.

An effective, safe pesticide for rusty crayfish has not been found. Although crayfish-selective pesticides exist, they are also harmful to native crayfish species.

An effective biological control agent has not been found. A parasite called *Microphallus* infects rusty crayfish (and other crayfish species), and is currently being researched. Lakes with abundant rusty crayfish are often found to have no *Microphallus* present.

Additional Information:

Hein, C.L., Roth, B.M., Ives, A.R., and M. Jake Vander Zanden. 2006. Fish predation and trapping for rusty crayfish (*Orconectes rusticus*) control: a whole-lake experiment. Can. J. Fish. Aquat. Sci. 63: 383-393.

Wisconsin Department of Natural Resources. Potential impacts to rusty crayfish (*Orconectes rusticus*) populations from a parasite, *Microphallus* sp.

Photo Credit: Paul Skawinski

This Quick Guide is part of a series on aquatic invasive species, and may be reproduced for educational purposes. Visit us at www.uwsp.edu/uwexlakes/clmn or www.goldensandsrcd.org/our-work/water to download this series of handouts.

Developed by Golden Sands Resource Conservation & Development (RC&D) Council, Inc. as part of an aquatic invasive species (AIS) education program, supported by an AIS grant from the Wisconsin Department of Natural Resources. RC-1-14