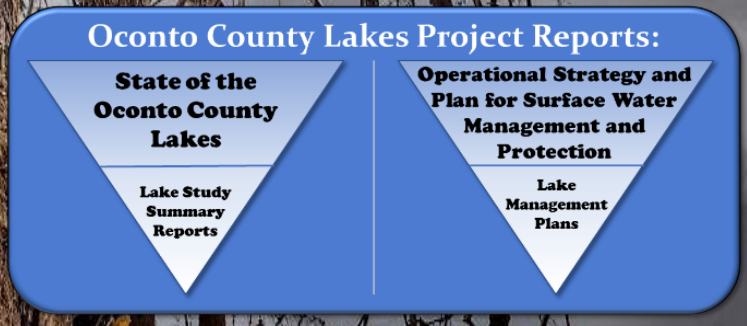
Oconto County Lakes Project

FINNEGAN LAKE STUDY

SUMMARY REPORT

2024



Center for Watershed Science and Education
College of Natural Resources
University of Wisconsin-Stevens Point

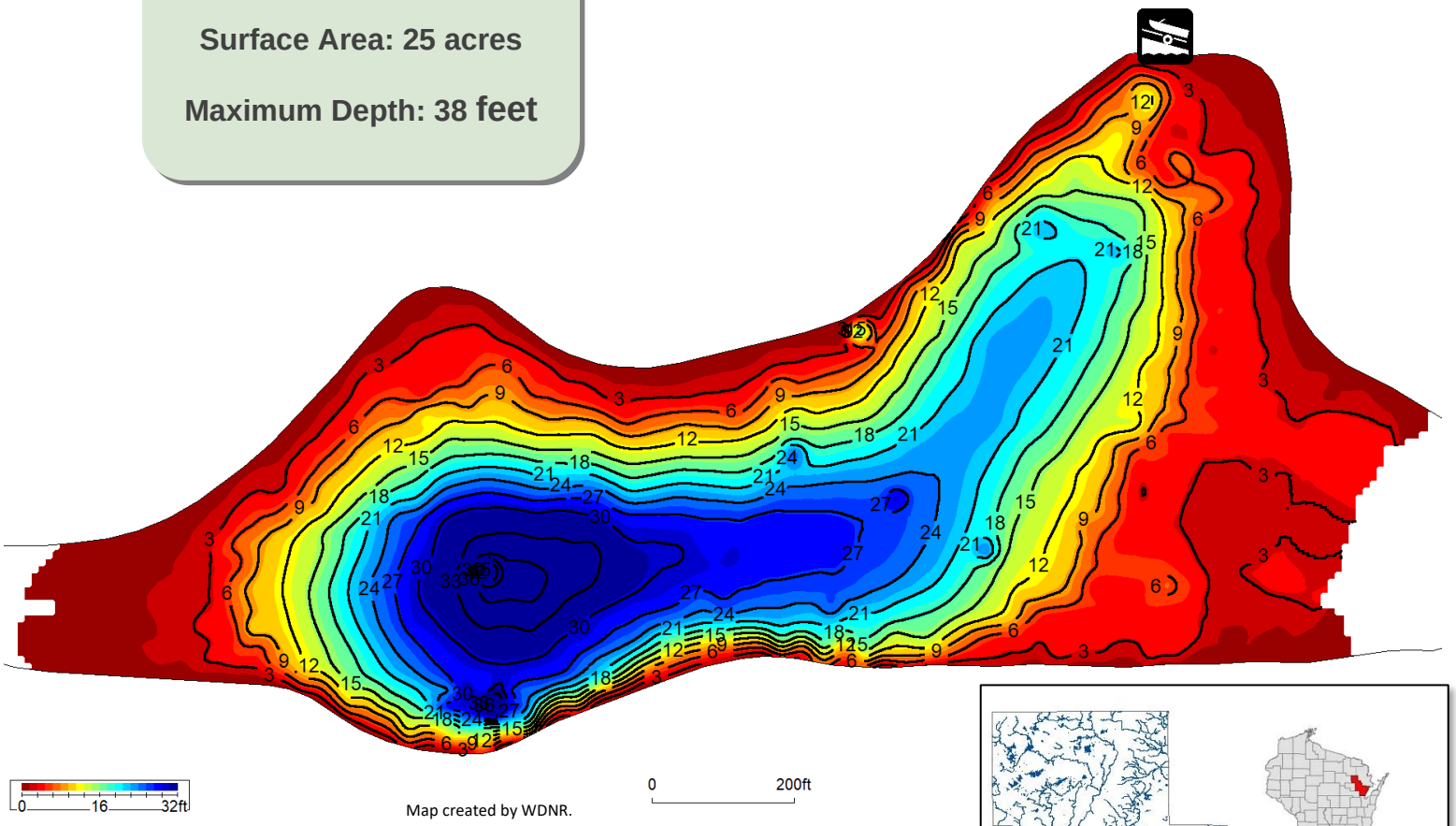
Background

- Finnegan Lake is a 25-acre seepage lake in southwest Oconto County with a maximum depth of 38 feet.
- Most water enters and leaves Finnegan Lake through groundwater. Direct precipitation and surface runoff also contribute water.
- Visitors have access to the lake from one public boat launch located on the lake's north side.
- This report summarizes data collected during the 2022-2023 lake study.

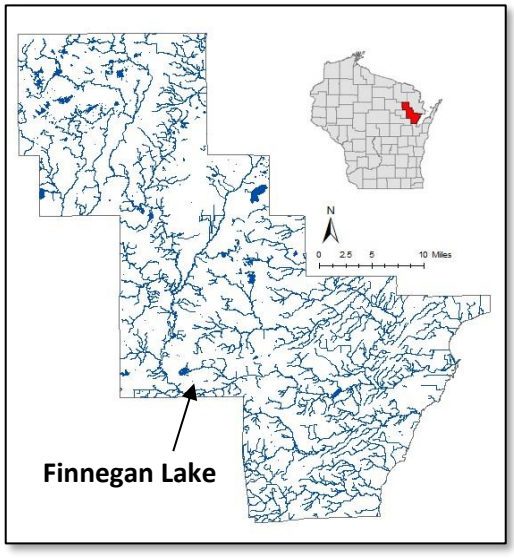
Township of Gillett

Surface Area: 25 acres

Maximum Depth: 38 feet



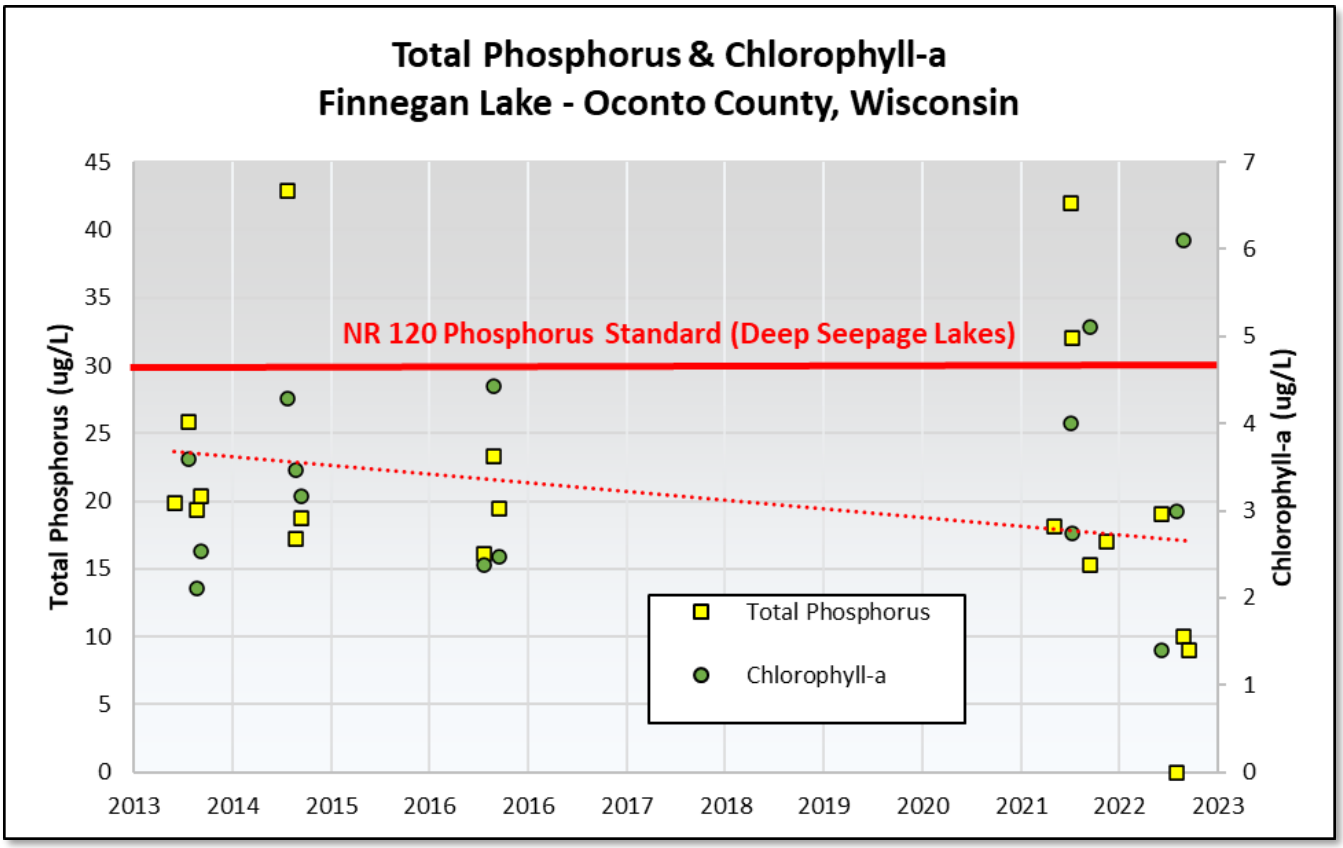
Map created by WDNR.



Water Quality

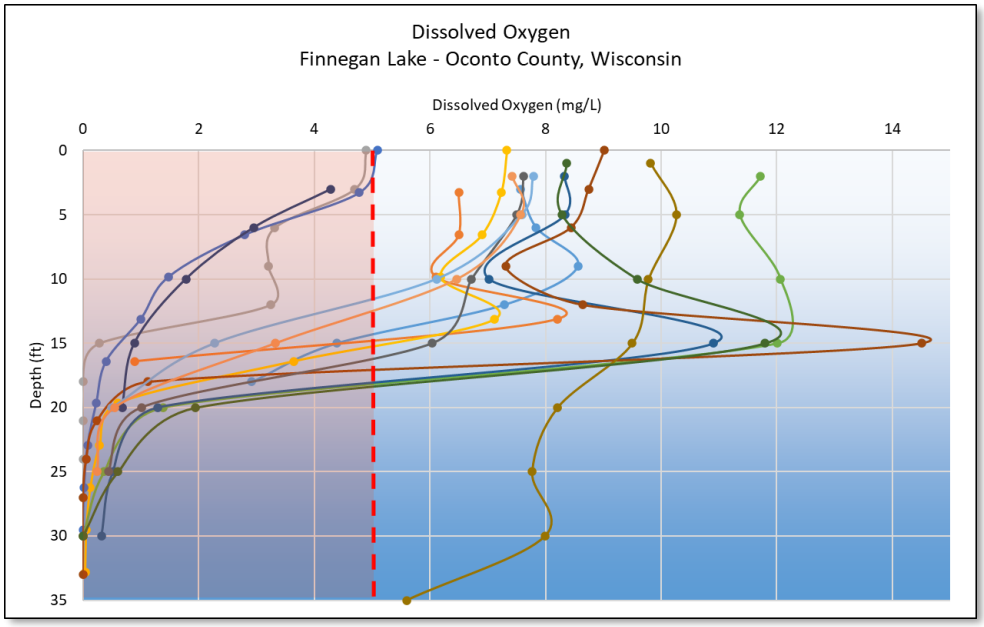
Nutrients such as phosphorus and nitrogen are what feed aquatic plants and algae in a lake. Excessive amounts of nutrients delivered to a lake will result in abundant plant and algae growth. Disturbance within a watershed combined with the landscape's inability to infiltrate and filter runoff is what primarily delivers nutrients to a lake.

- Total Phosphorus was periodically above the Wisconsin state standard of 30 ug/L for deep seepage lakes during the two-year study. Limited data suggests this average concentration is coming down.
- Inorganic nitrogen remained below the threshold of 0.3 mg/L when algal blooms increase.
- Chlorophyll-a, an indirect measure of algae, reached the threshold of 6 ug/L in one sample during the study.



Water Quality

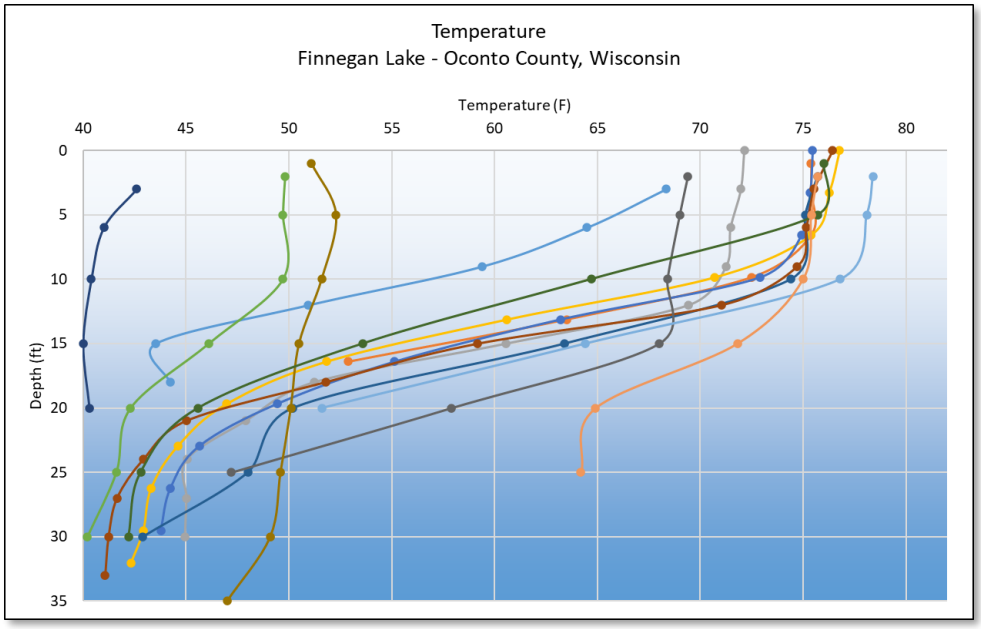
Sufficient **dissolved oxygen** in lake water is essential to the survival of aquatic organisms. The amount of dissolved oxygen present within a lake varies by season and depth. It is determined by the biological activity that consumes or produces oxygen, by water mixing through wind, changes in temperature, and inputs of surface and groundwater. Generally, at least 5 mg/L oxygen is required for fish.



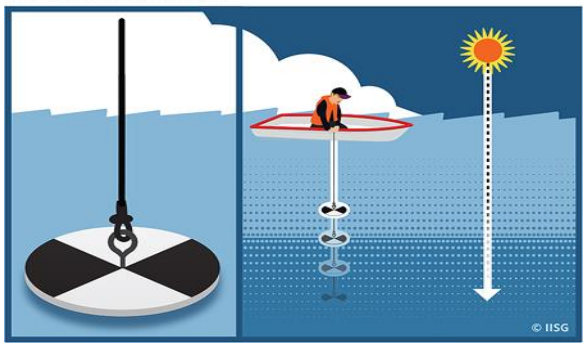
- Sufficient oxygen is available in the water column of Finnegan Lake through most of the year but may become anoxic in late winter. Generally, the top 11 feet maintains enough oxygen to support most fish species.
- Spikes in DO concentrations around 15 feet are indicative of algae blooms.

Lake water **temperature** has a significant impact on water chemistry, spatial distribution of fish, microbial growth and oxygen content.

- Temperature profiles in Finnegan Lake show stratification during the growing season with a clear thermocline between 10 and 20 feet, typical of a deep lake.

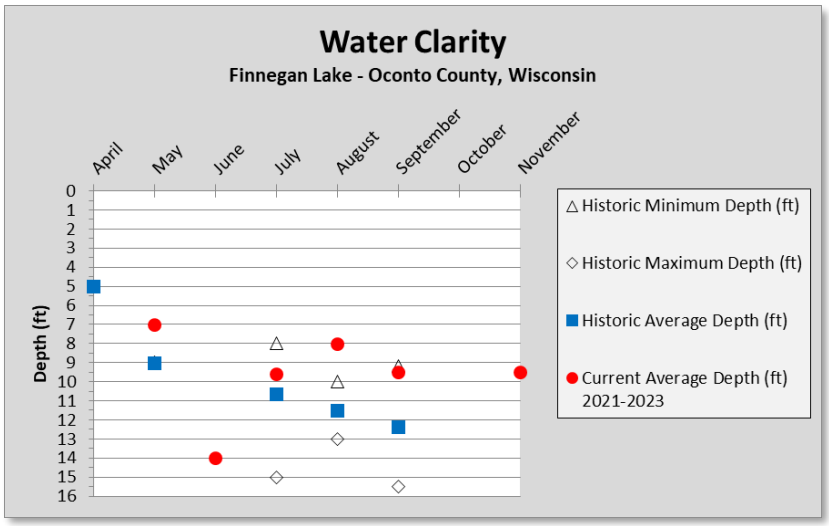


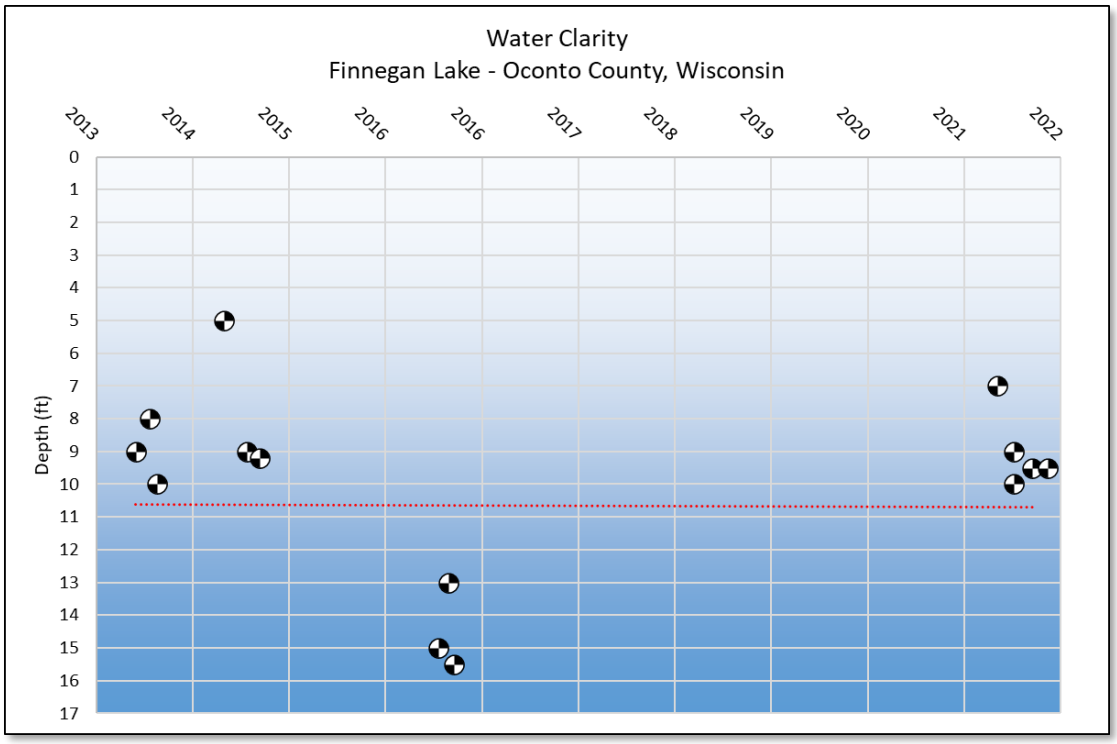
Water Quality



Water clarity is a measure of how deep light can penetrate (Secchi depth). Clarity is affected by water color, turbidity (suspended sediment), and algae. Water clarity helps determine where rooted aquatic plants can grow. It is typical for water clarity to vary throughout the year.

- The graphs below show water clarity measurements taken between May and November.
- During 2022-23, water clarity was best in June and worst in August. These averages are generally worse than historical averages.





Water Quality

Other chemistry data was collected from lake water samples, such as basic cations, pollutants and acid rain input, and physical parameters. Results of such analyses can provide insights into a variety of other potential impacts to the lake. While concentrations of these compounds in lake water is usually low, higher concentrations can be indicators of other potential issues.

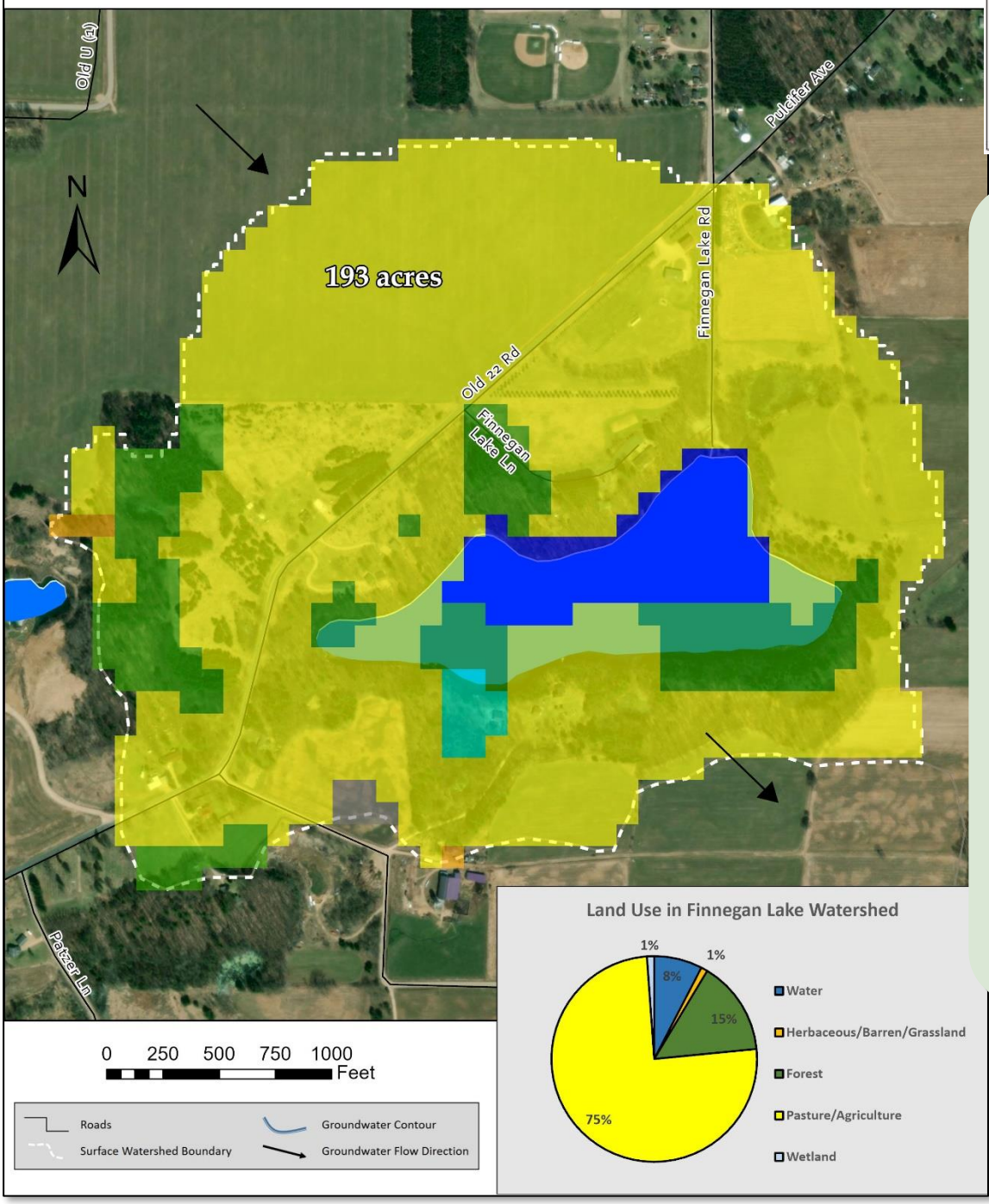
- Concentrations of potassium (2 mg/L), chloride (4 mg/L) and sodium (2.7 mg/L) were low. This suggests minimal impacts from human activity such as septic systems, road salt, animal waste and fertilizers.
- DACT, a screening tool to determine if your lake is being impacted by pesticides, was not detected.
- Water in Finnegan Lake is hard (165 mg/L CaCO3), having an elevated level of dissolved minerals. These minerals tend to bind with phosphorus making it unavailable to algae blooms.

For more information on how to interpret your lake's water quality data, please refer to the "State of the Oconto County Lakes Report" that is on file with Oconto County.

Watershed

Groundwater provides water to lakes in Oconto County throughout the entire year. Hard surfaces on the landscape prevent water from soaking into the ground and becoming groundwater. This results in less water flowing to the lake during snowmelt and rain events. Water that does not infiltrate to groundwater becomes **surface runoff** flowing across the surface of the landscape where it can move sediment and contaminants to the lake from within its watershed.

Finnegan Lake Surface Watershed & Groundwater Flow



WHEN IT RAINS IT DRAINS

The quality of lake water reflects what is happening on the land surface. Precipitation falling on forests produces clean groundwater, whereas precipitation falling on land that has chemical use can produce runoff and groundwater that contains these chemicals. Groundwater contamination may include nitrogen, pesticides, herbicides and other soluble chemicals originating from septic systems, crops, barnyards, and road de-icing. Once in the groundwater, these chemicals move slowly towards a lake or river.

Shorelands

Shoreland vegetation is critical to a healthy lake's ecosystem. It provides habitat for many aquatic and terrestrial animals including birds, frogs, turtles, and many small and large mammals. It also helps to improve the quality and quantity of the runoff that flows across the landscape towards the lake. Healthy shoreland vegetation includes a mix of tall, native grasses/flowers, shrubs and trees.

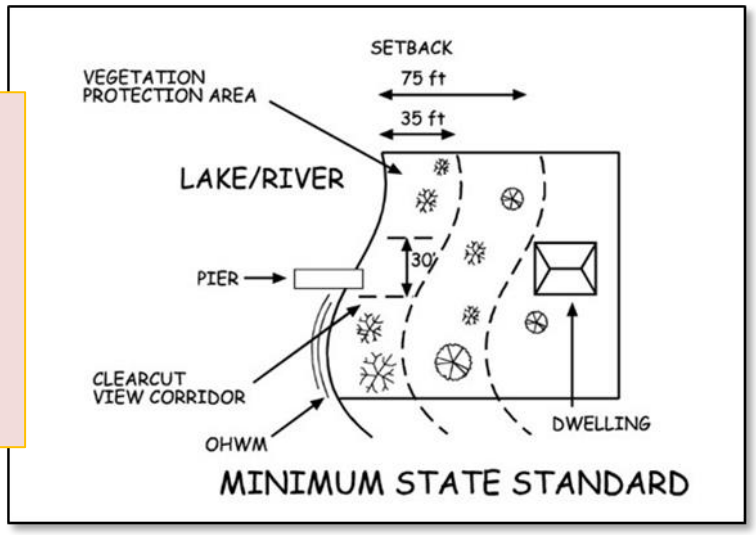
- Shorelands around Finnegan Lake were surveyed in July 2022. Most of Finnegan Lake's shoreland is healthy, but some sections are in need of restoration.

Total lakefront footage	No. Riparian lots	Measured shoreland disturbance (feet)	Measured shoreland disturbance (%)
1,750	7	62	4%

State Shoreland Zoning Ordinance
NR 115 Wisc. Adm. Code for Unincorporated Municipalities

No vegetation within 35 feet of the lake's edge shall be removed except for:

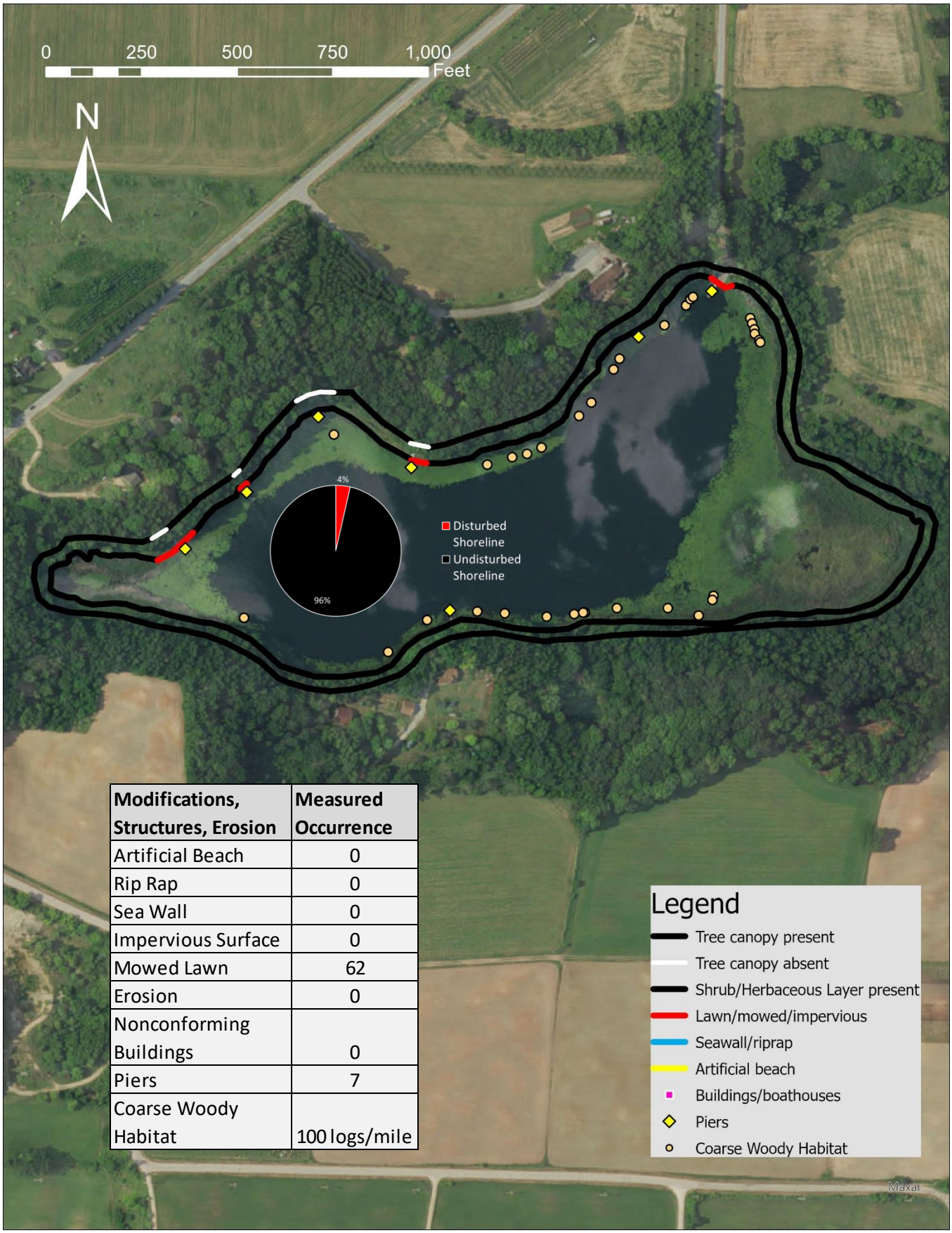
- Up to 30% of shoreline may be removed of shrubs and trees for a view corridor
- A mowed or constructed pedestrian path up to 5 feet wide to access lake



What Can You Do To Help Finnegan Lake?

- ✓ Leave natural shoreland vegetation in place or restore if it has been removed.
- ✓ Learn to identify and look for invasive plants and animals and know who to contact if found.
- ✓ Do not purchase prohibited and restricted species. Purchase native plants when possible.
- ✓ Never transplant water garden or aquarium plants into lakes, streams or wetlands. Properly dispose of them.
- ✓ Remove invasive exotic plants from your landscape and replace them with native plants or non-invasive exotics. Scout regularly for new invasive plants.
- ✓ Avoid using garden plants from other regions whose invasive potential is poorly understood.

Shorelands

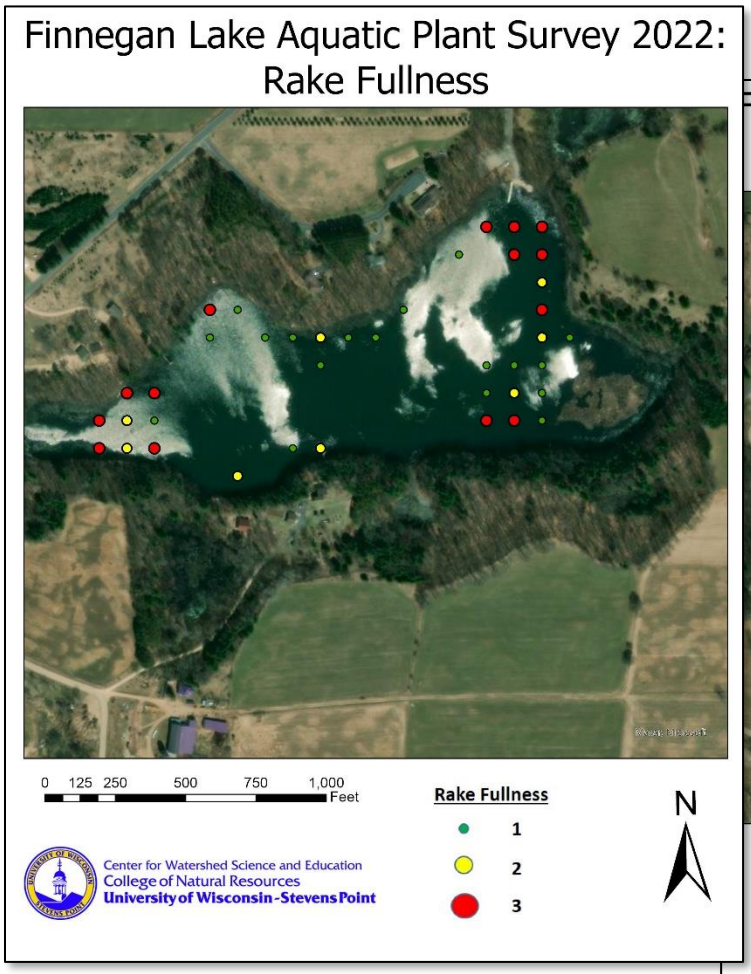


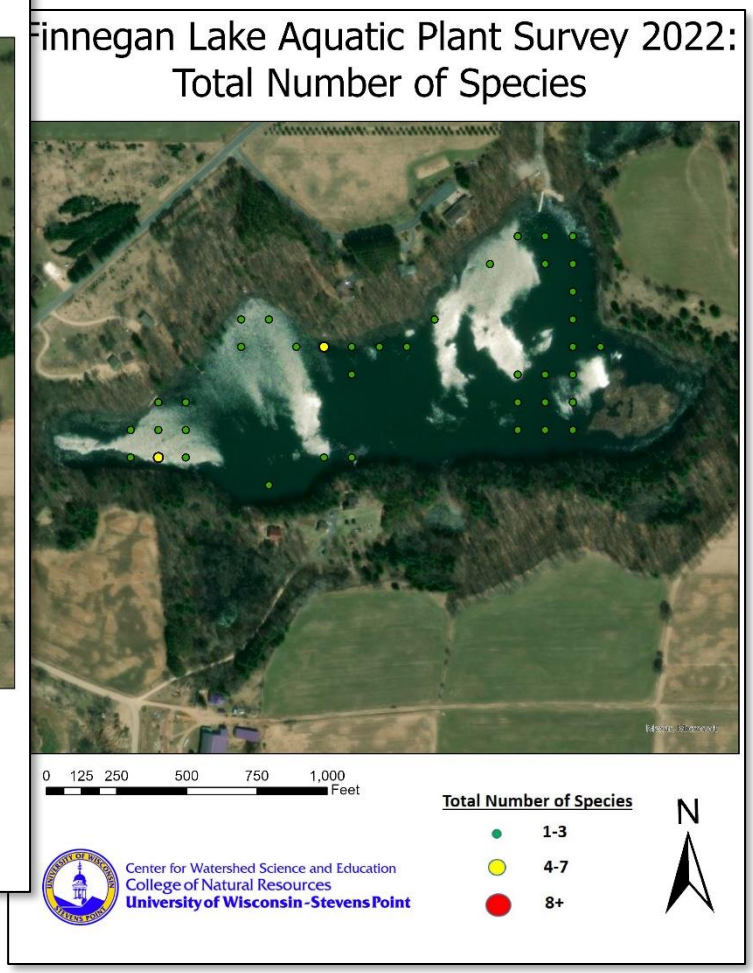
Modifications, Structures, Erosion	Measured Occurrence
Artificial Beach	0
Rip Rap	0
Sea Wall	0
Impervious Surface	0
Mowed Lawn	62
Erosion	0
Nonconforming Buildings	0
Piers	7
Coarse Woody Habitat	100 logs/mile

Aquatic Plants

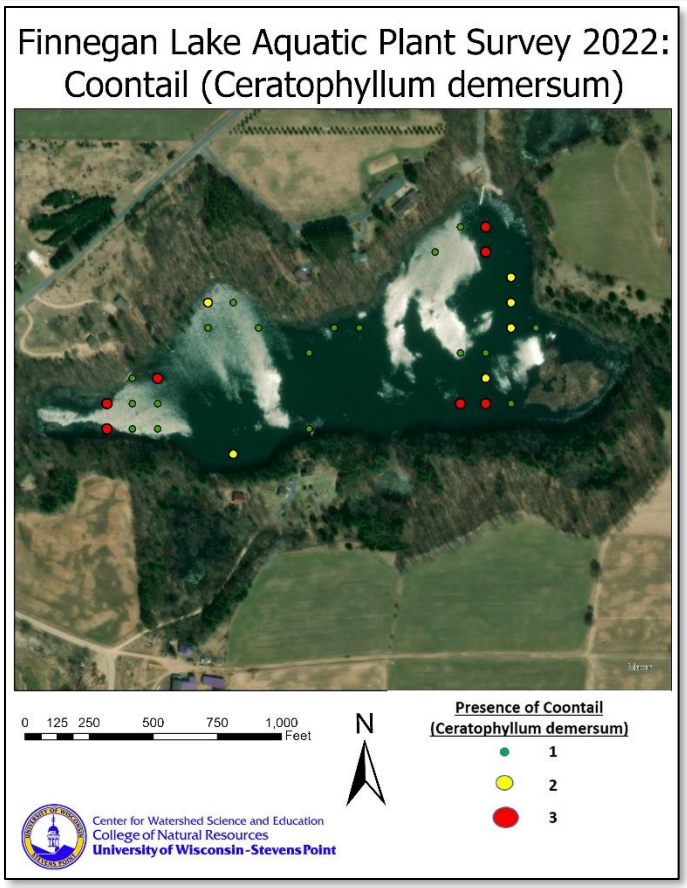
Aquatic plants are the forest landscape within a lake. They provide food and habitat for terrestrial and aquatic creatures such as fish, ducks, turtles, invertebrates and other animals. They increase oxygen levels in the water and utilize nutrients that would otherwise be used by algae. A healthy lake typically has a variety of aquatic plant species creating diversity that can help to prevent the establishment of aquatic invasive species.

- The aquatic plant community in Finnegan Lake is characterized by slightly below average diversity of plant species when compared to other lakes in the Oconto County Lakes Project, with a total of 15 species in the 2022 survey.
- During the 2022 aquatic plant survey of Finnegan Lake, 45% of visited sites had vegetative growth. The maximum depth of vegetation was 13 feet and the Floristic Quality Assessment (FQI) was 19.6.
- The most frequently encountered plant species were coontail (77%), common waterweed (30%), and chara (17%).
- Eurasian water-milfoil was observed in 3 locations.

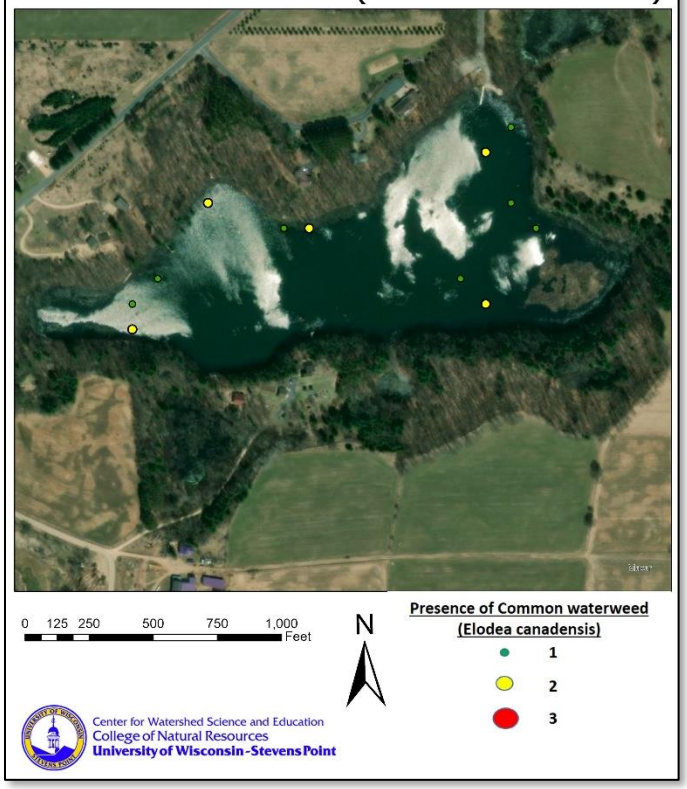




Aquatic Plants

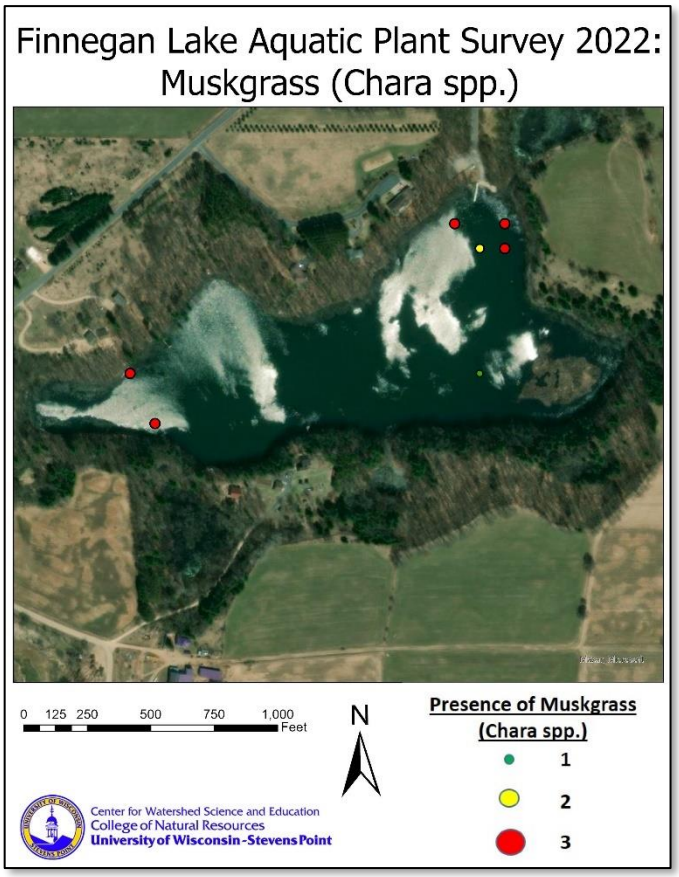


Coontail lacks roots and can form dense mats just below the surface. It is usually in calm, nutrient-rich water and provides habitat for young fish and other aquatic animals. Waterfowl will eat the seeds and foliage.

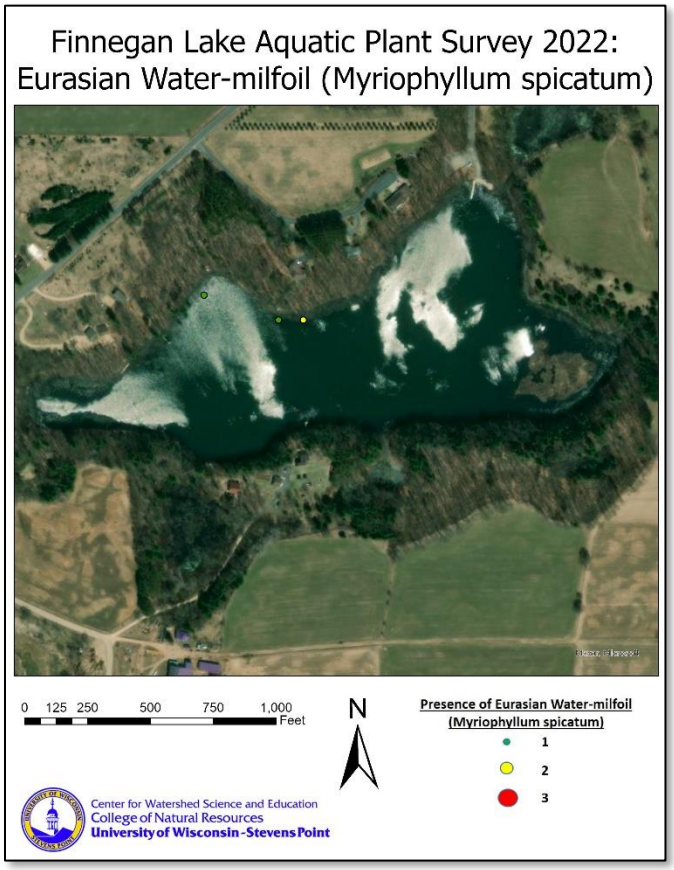


Common waterweed is a common and widespread plant in Wisconsin lakes. It is important forage and cover for aquatic animals and an important food source for waterfowl.

Aquatic Plants



Chara is a type of macro algae that grows attached to muddy lake bottoms and has a musky odor. Muskgrass, as it is known, filters the lake water and is helpful in preventing the establishment of invasive species.



Eurasian watermilfoil is one of the most common invasive aquatic plants in Wisconsin. It can from dense mats that choke out native plants and inhibit navigation. New plants can grow from stem fragments that root on contact with the substrate.

Aquatic Plants

Aquatic **invasive species** are non-native aquatic plants and animals that are most often unintentionally introduced into lakes by lake users. In some lakes, aquatic invasive plant species can exist as a part of the plant community, while in other lakes populations explode, creating dense beds that can damage boat motors, make areas non-navigable, inhibit activities like swimming and fishing, and disrupt the lakes' ecosystems.

- Eurasian water-milfoil, first documented in 2003, was observed in three locations during the 2022 survey.
- Chinese mystery snails (2015), Banded mystery snails (2015) and phragmites (2015) have previously been documented in Finnegan Lake.

Banded mystery snails are born as fully formed snails that seem to appear from nowhere. Native to southeast US, they have the potential to serve as hosts for parasites and outcompete native snails for food and habitat.

Chinese mystery snails have the potential to be a vector for the transmission of parasites and disease and have also been known to clog the screens of water intake pipes.

Phragmites, or common reed grass, creates tall, dense stands that crowd out native plants, degrades wildlife habitat and reduces access. It spreads through underground growth and takes aggressive treatment to control.

Acknowledgments

This report was prepared as an appendix to the **Oconto County State of the Lakes Report**, which is on file with the Oconto County Land Conservation Department.
Written and prepared by the Center for Watershed Science and Education at the University of Wisconsin-Stevens Point.

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Acknowledgments

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