

Oconto County Lakes Project

GRIGNON LAKE STUDY

SUMMARY REPORT

2022

Oconto County Lakes Project Reports:

**State of the
Oconto County
Lakes**

Lake Study
Summary
Reports

**Operational Strategy and
Plan for Surface Water
Management and
Protection**

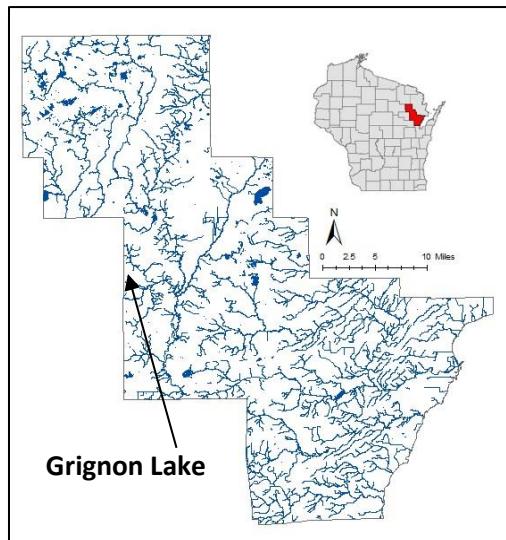
Lake
Management
Plans

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



Background

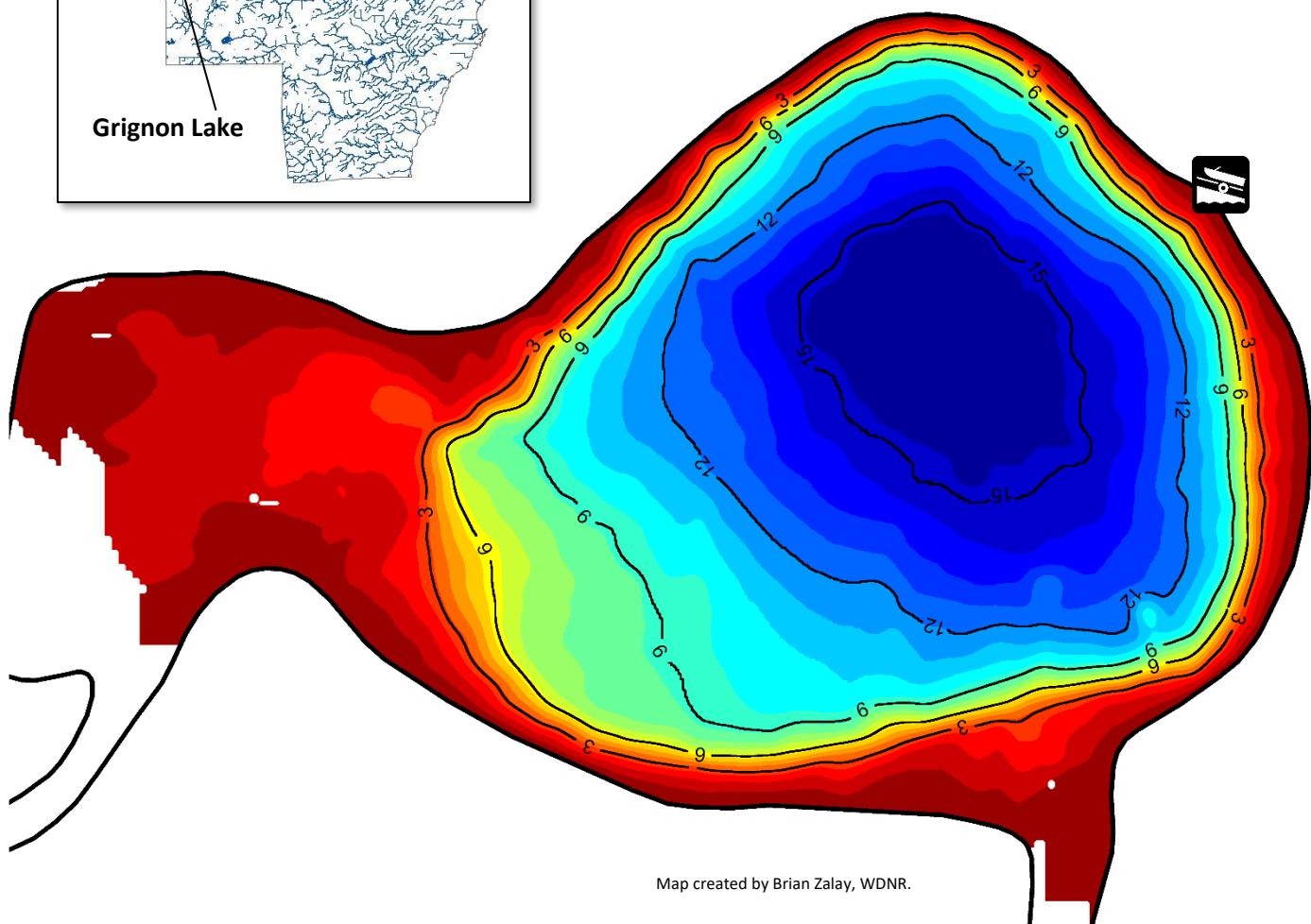
- Grignon Lake is a 33-acre drainage lake in west-central Oconto County with a maximum depth of 17 feet.
- Most water enters and leaves Grignon Lake via Pecore Creek which flows east to the Oconto River. Groundwater, surface water runoff and direct precipitation also contribute water.
- Visitors have access to the lake from one public boat launch located on the lake's east side.
- This report summarizes data collected during the 2020-2021 lake study.



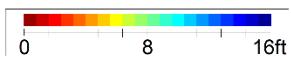
Township of How

Surface Area: 33 acres

Maximum Depth: 17 feet



Map created by Brian Zalay, WDNR.



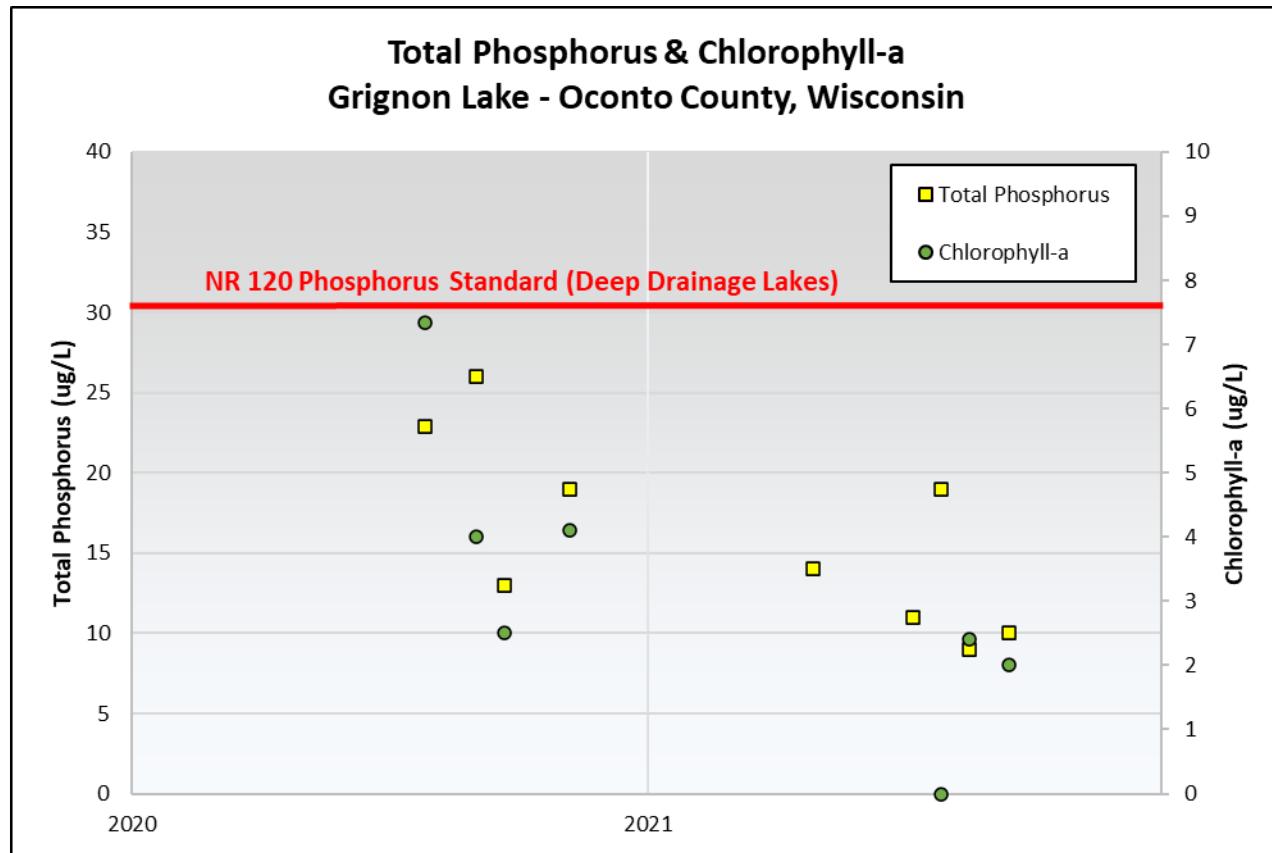
0 200ft

Grignon Lake
Mapping by AutoChart

Water Quality

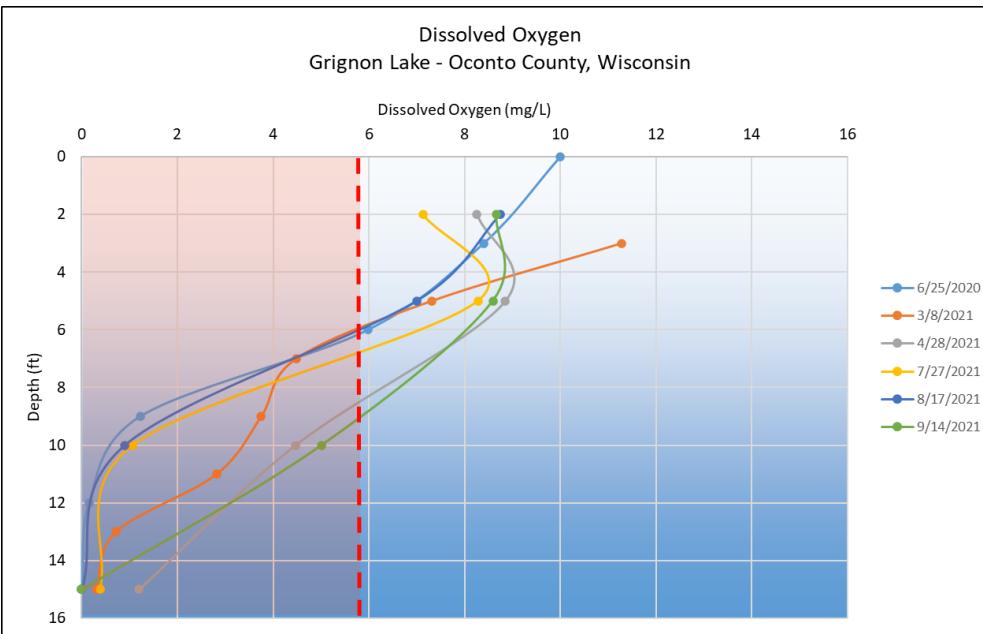
Nutrients such as phosphorus and nitrogen are what feed aquatic plants and algae in a lake. Excessive amounts of nutrients delivered to a lake will result in abundant plant and algae growth. Disturbance within a watershed combined with the landscape's inability to infiltrate and filter runoff is what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

- Total Phosphorus was consistently below the Wisconsin state standard of 30 ug/L for shallow seepage lakes during the two-year study. The limited dataset does not indicate a clear trend.
- Inorganic nitrogen remained below the threshold of 0.3 mg/L when algal blooms increase.
- Chlorophyll-a, an indirect measure of algae, was detected above the threshold of 6 ug/L in one sample.



Water Quality

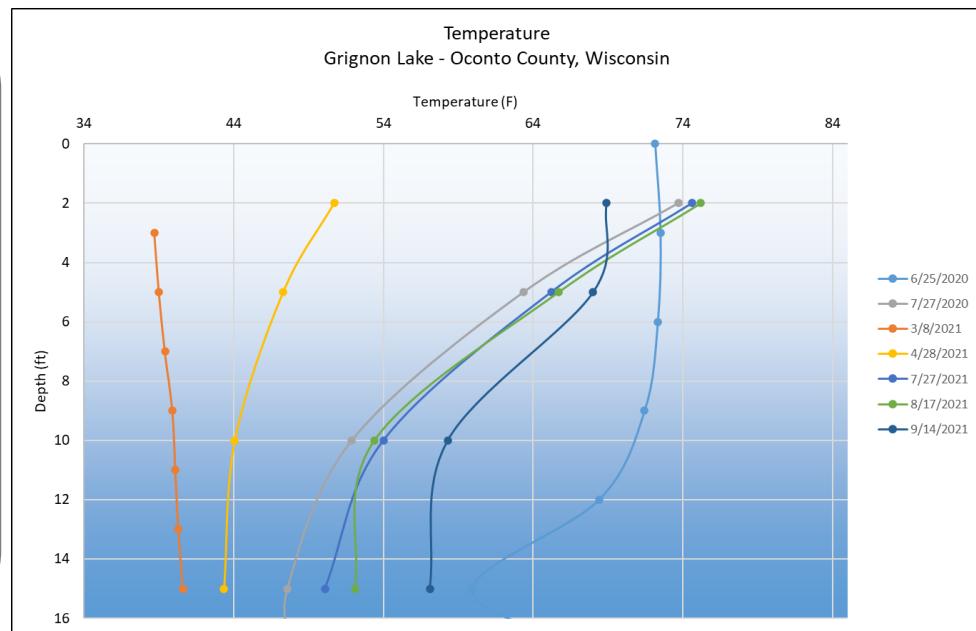
Sufficient **dissolved oxygen** in lake water is essential to the survival of aquatic organisms. The amount of dissolved oxygen present within a lake varies by season and depth. It is determined by the biological activity that consumes or produces oxygen, by water mixing through wind, changes in temperature,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



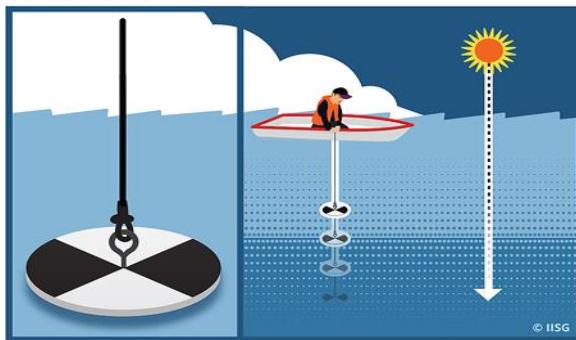
➤ Sufficient oxygen is available in the water column of Grignon Lake throughout the year. Generally, the top 6 feet maintains enough oxygen to support most fish species.

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

- Most temperature gradients in Grignon Lake show some slight stratification developing as surface temperatures heat up in summer and bottom temperatures represent cool groundwater inputs.

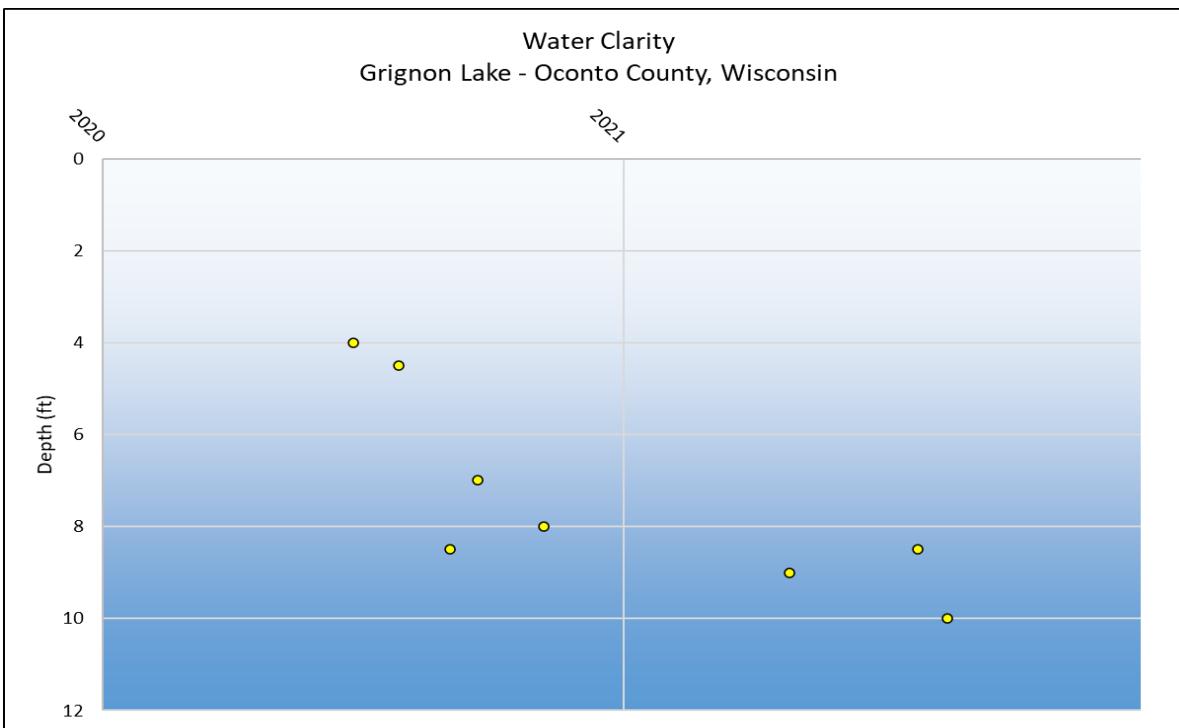
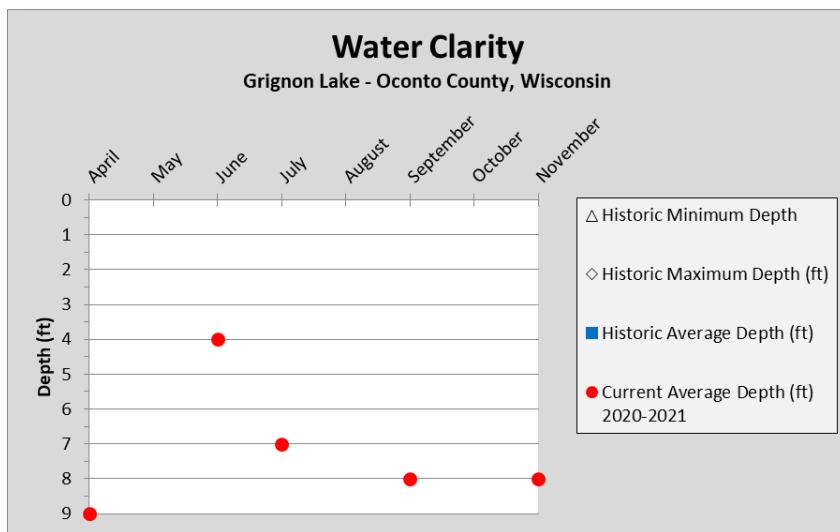


Water Quality



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 graph below shows water clarity measurements taken between May and November.
- During 2020-21, the poorest average water clarity was in June and best was in April. Not enough data is available to determine a trend.



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 (1.07 mg/L), chloride (5.7 mg/L) and sodium (3.3 mg/L) were all low. This suggests minimal impact from 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 Grignon Lake is hard (153 mg/L CaCO₃), having an elevated level of dissolved minerals. These minerals tend to bind with phosphorus making it unavailable to algae blooms.

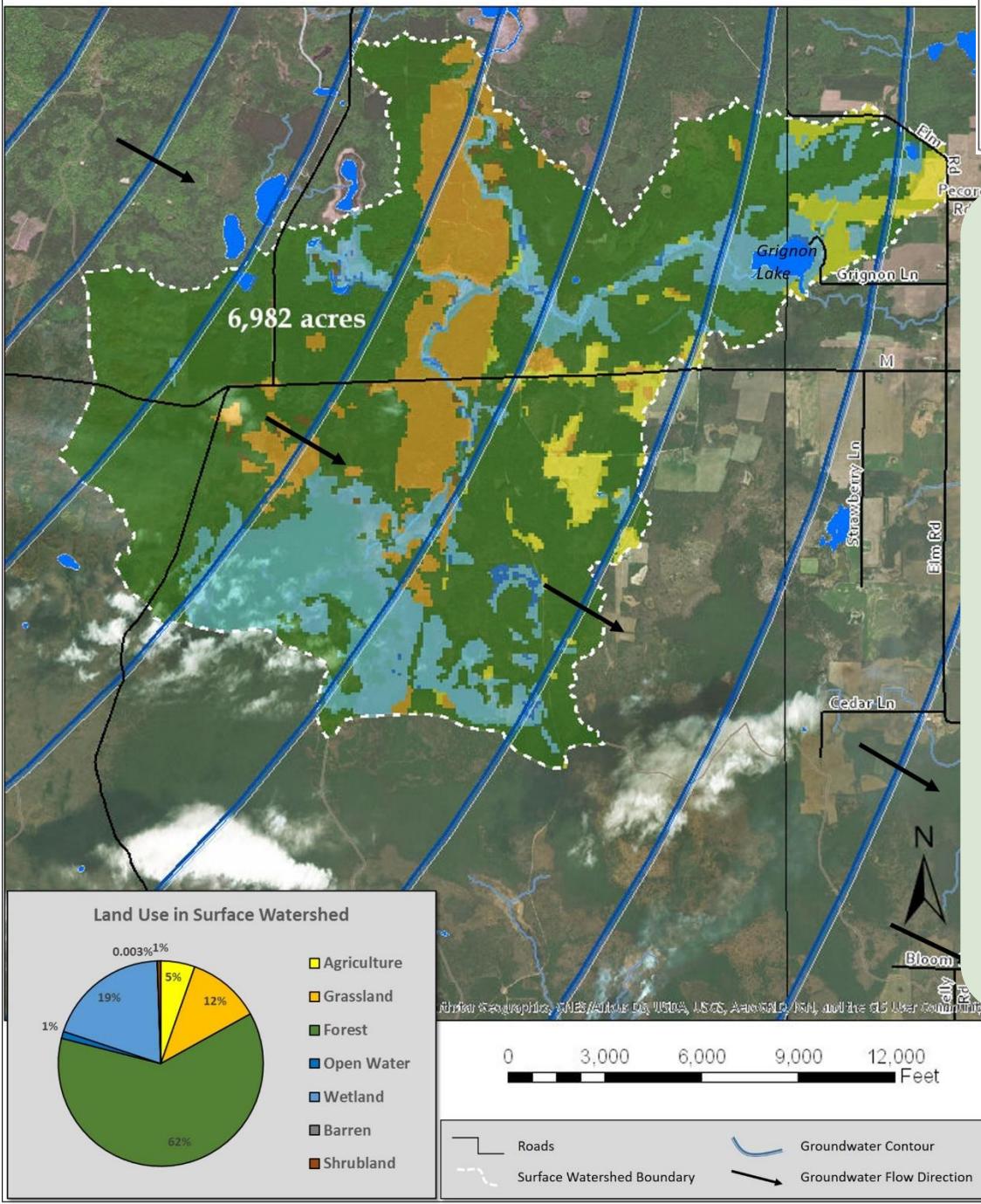


*For more information on how to interpret
your lake's water quality data, please refer to
the "State of the Oconto County Lakes
Report" that is on file with Oconto County.*

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.

Grignon Lake Surface Watershed & Groundwater Flow



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 Grignon Lake were surveyed in July 2020. Nearly all of Grignon Lake's shoreland is healthy.

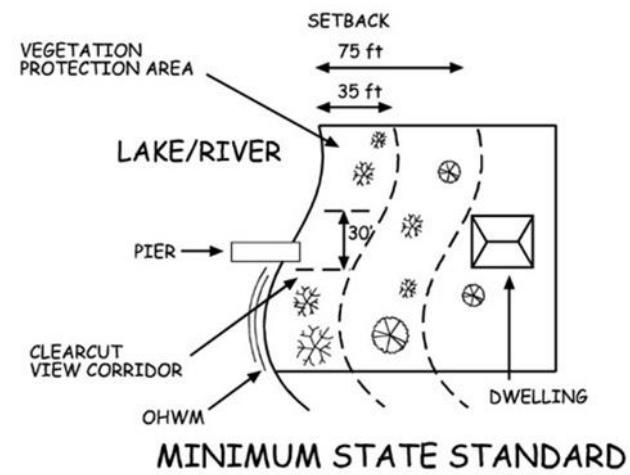
Total lakefront footage	No. Riparian lots	Measured shoreland disturbance (feet)	Measured shoreland disturbance (%)
5,843	4	120	2%



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:

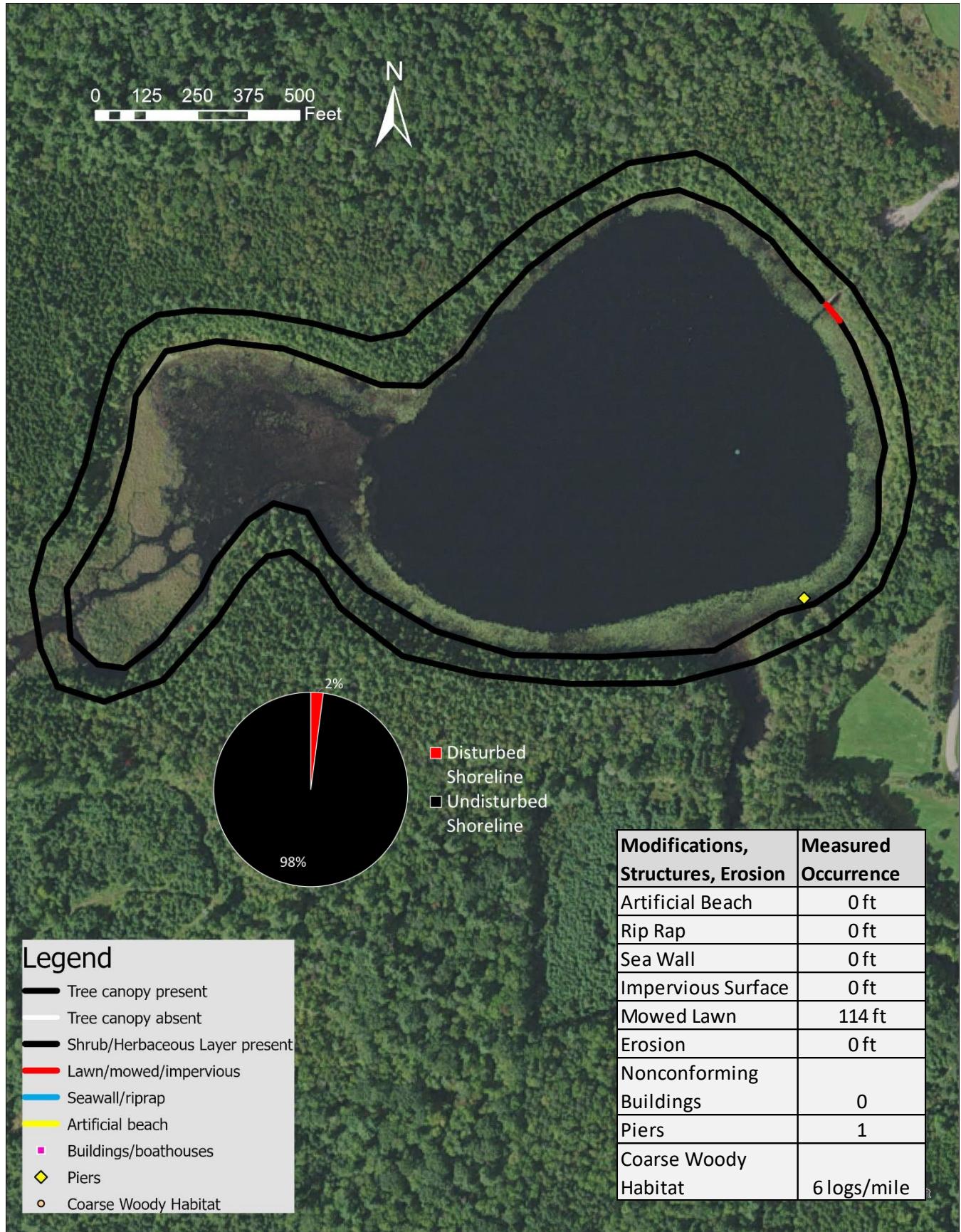
- Up to 30% of shoreline may be removed of shrubs and trees for a view corridor
- A mowed or constructed pedestrian path up to 5 feet wide to access lake



What Can You Do To Help Grignon 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

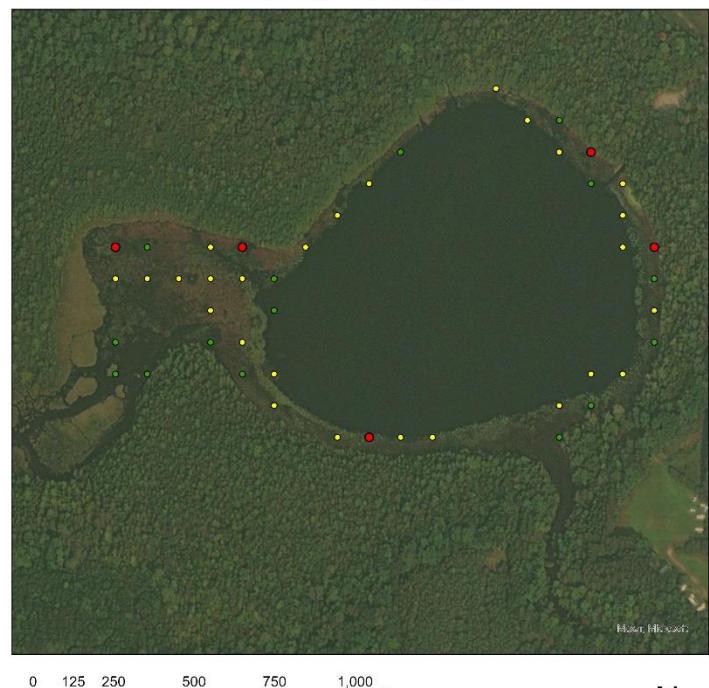


Aquatic Plants

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.

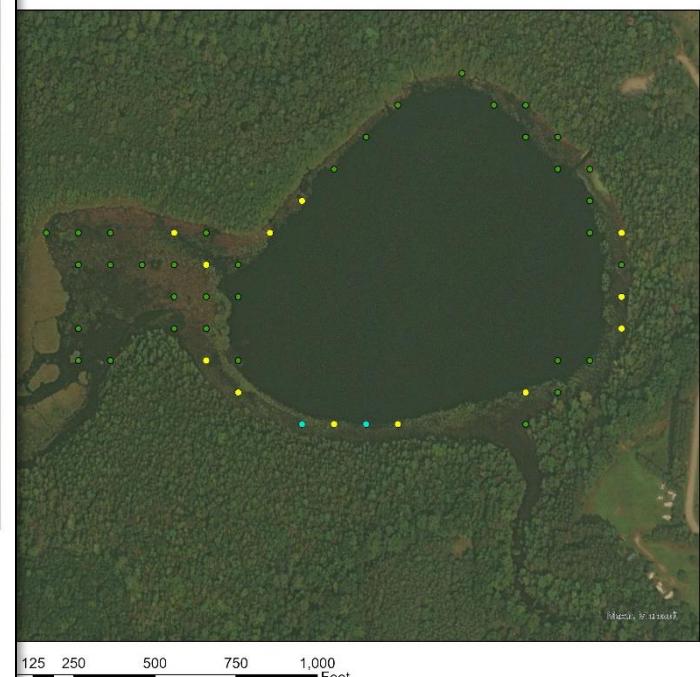
- The aquatic plant community in Grignon Lake is characterized by average diversity of plant species when compared to other lakes in the Oconto County Lakes Project, with a total of 20 species in the 2020 survey.
- During the 2020 aquatic plant survey of Grignon Lake, 38% of visited sites had vegetative growth. The maximum depth of vegetation was 7.5 feet and the Floristic Quality Assessment (FQI) was 26.
- The most frequently encountered plant species were coontail (57%), spatterdock (39%) and Northern wild rice (43%). All three species are native to Wisconsin.
- No invasive species were observed.

Grignon Lake Aquatic Plant Survey 2020:
Rake Fullness



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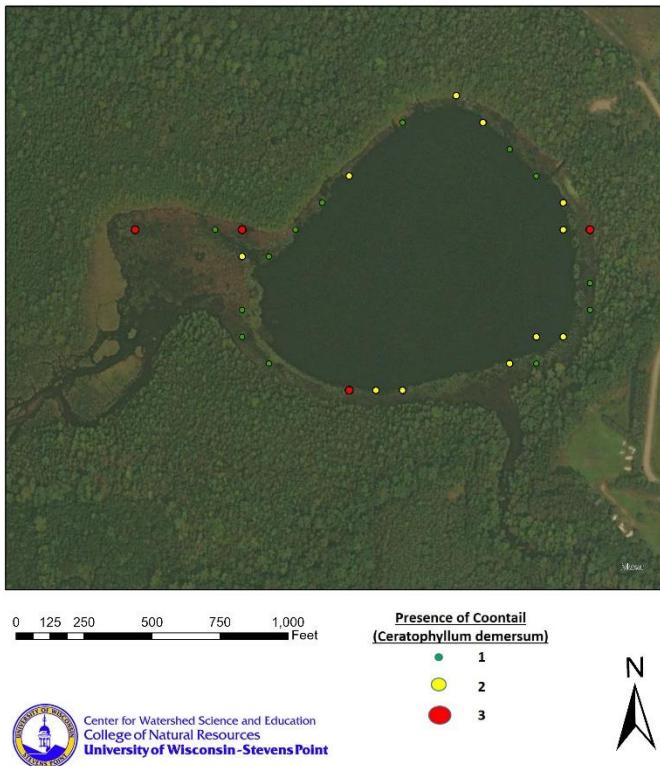
Grignon Lake Aquatic Plant Survey 2020:
Total Number of Species



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Aquatic Plants

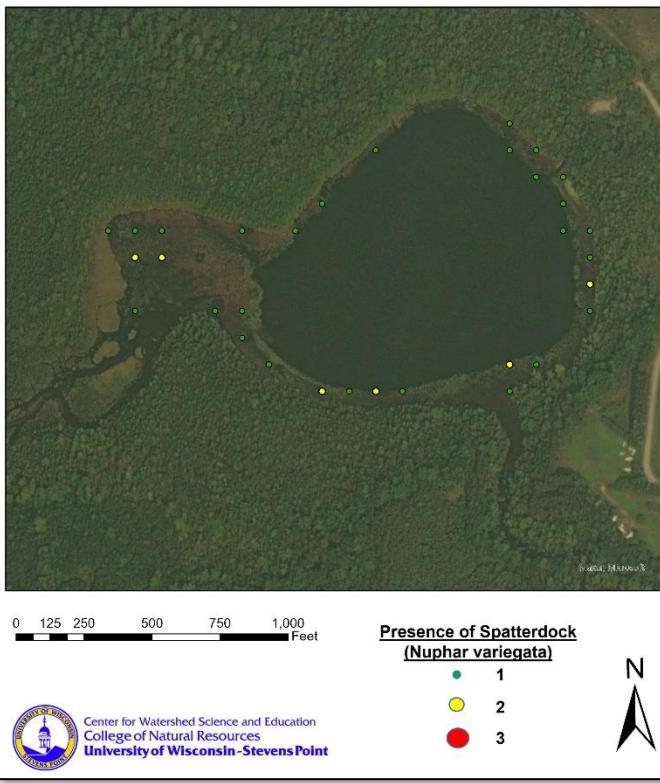
Grignon Lake Aquatic Plant Survey 2020: Coontail (*Ceratophyllum demersum*)



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.



Grignon Lake Aquatic Plant Survey 2020: Spatterdock (*Nuphar variegata*)



Spatterdock, or yellow pond lily, can be a valuable plant for fish and wildlife habitat providing food, shelter, and a place of breeding for many. Leaves provide shade, shelter, and cover from predators for many invertebrates that fish use for food. Seeds are eaten by waterfowl and other birds. Muskrat, beaver, and porcupine will eat the rhizomes and deer have been known to graze on leaves and flowers.



Aquatic Plants

Grignon Lake Aquatic Plant Survey 2020: Northern wild rice (*Zizania palustris*)

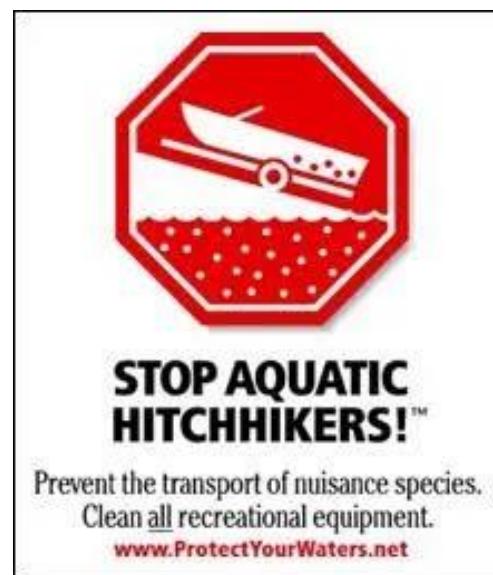


Wild rice is one of the only grains native to North America. Not directly related to Asian rice, Wild Rice is not really rice, but an aquatic grass. It sprouts under water in late April or early May, producing a single root and submerged thin ribbon-like leaves. In June, leaves that float on the surface of the water are produced. During this time, adventitious roots sprout near the first few nodes of the stem, and in early July leaves appear above the water. The heads appear by the end of July with female flowers at the top and male flowers at the bottom.



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.

- No invasive species were observed during the 2020 aquatic plant survey.



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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