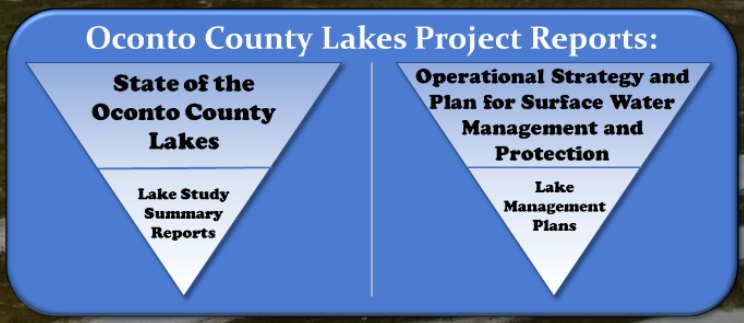
Oconto County Lakes Project

WHITE POTATO LAKE STUDY

SUMMARY REPORT

2021



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

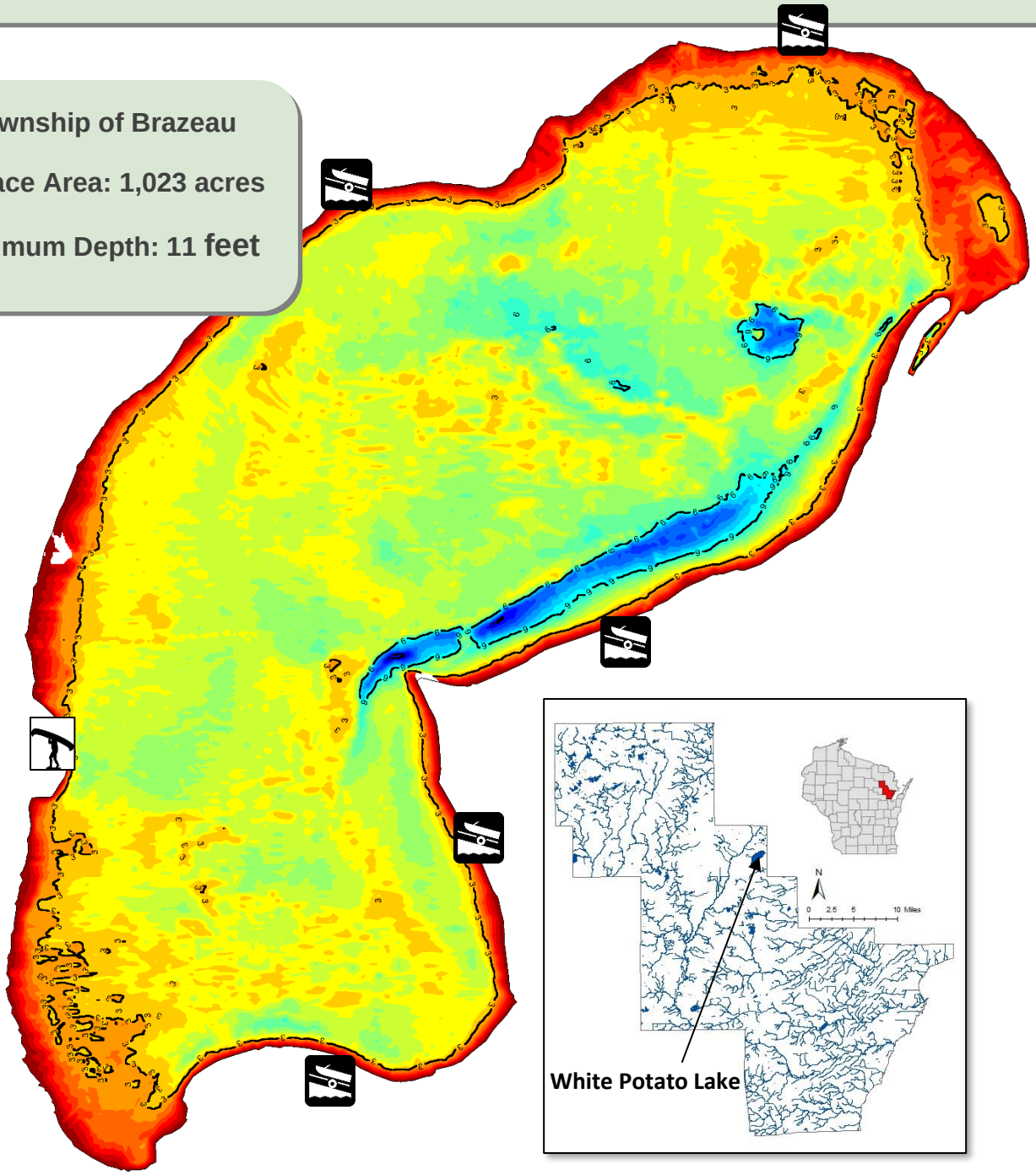
Background

- White Potato Lake is a 1,023-acre seepage lake in central Oconto County with a maximum depth of 11 feet.
- Most water enters White Potato Lake via groundwater. Surface water runoff and direct precipitation also contribute water.
- Visitors have access to the lake from 6 public boat launches located around the lake.
- This report summarizes data collected during the 2019-2020 lake study.

Township of Brazeau

Surface Area: 1,023 acres

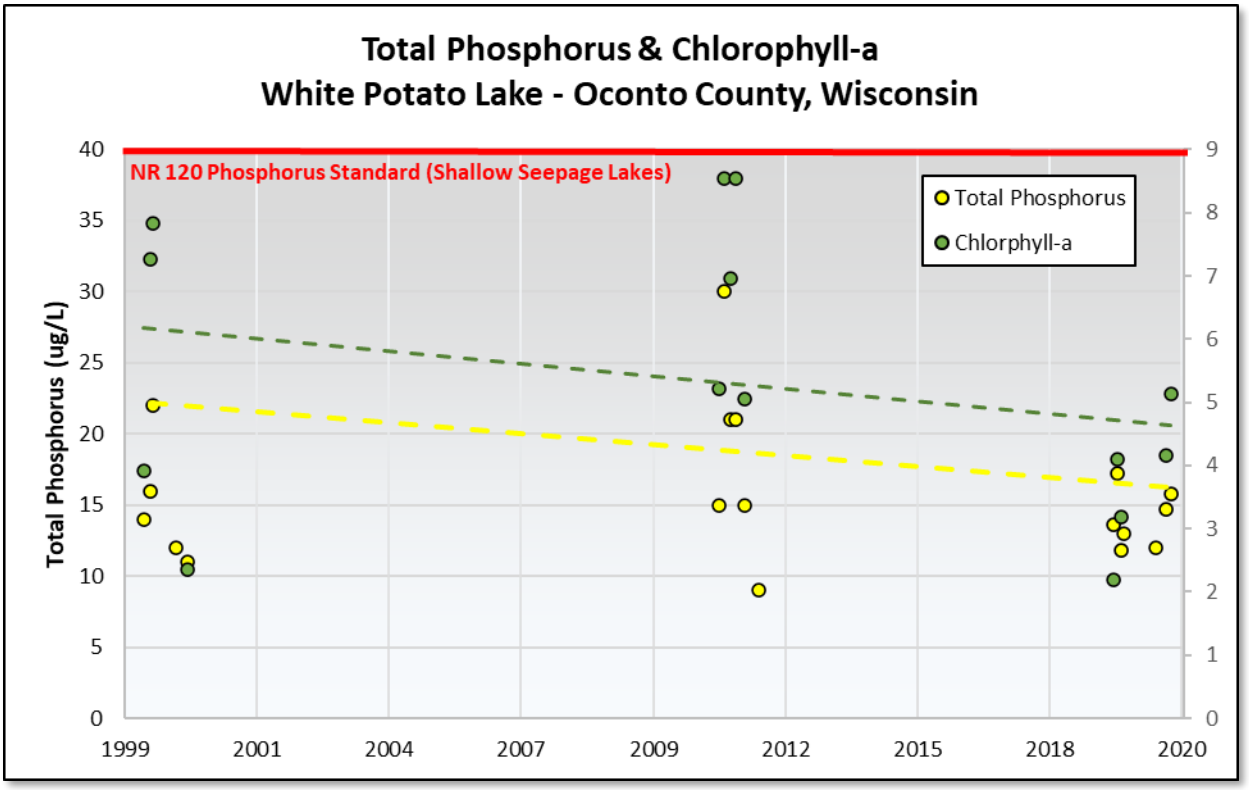
Maximum Depth: 11 feet



Water Quality

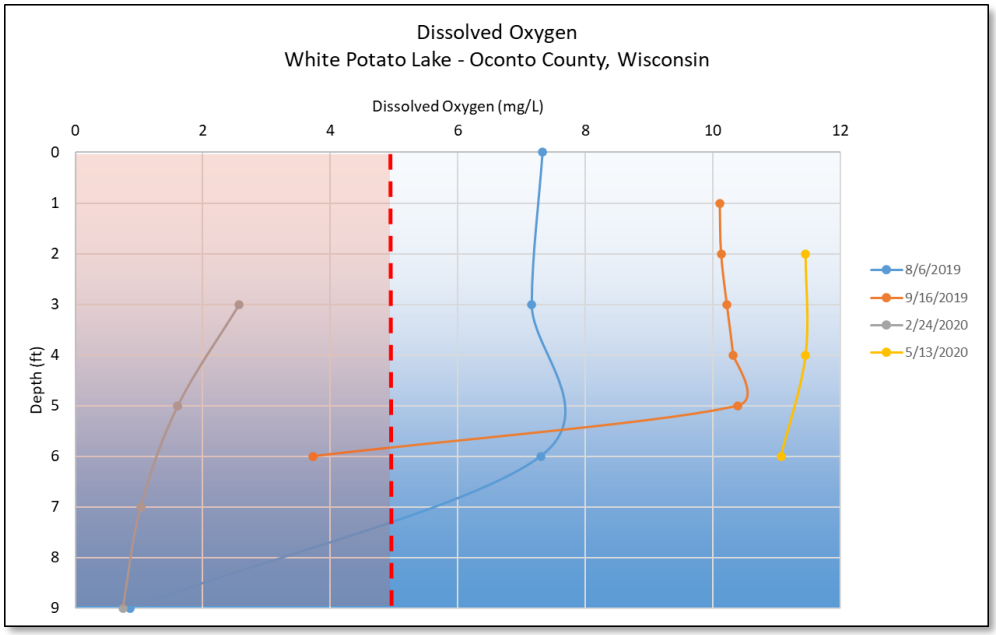
Nutrients such as phosphorus and nitrogen are what feed aquatic plants and algae in a lake. Excessive amounts of nutrients delivered to a lake will result in abundant plant and algae growth. Disturbance within a watershed combined with the landscape's inability to infiltrate and filter runoff is what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

- Total Phosphorus was consistently below the Wisconsin state standard of 40 ug/L for shallow drainage lakes during the two-year study. The long-term trend (based on summer samples) suggests a slightly decreasing average concentration.
- Inorganic nitrogen remained below the threshold of 0.3 mg/L when algal blooms increase.
- Chlorophyll-a, an indirect measure of algae, remained below the threshold of 6 ug/L. Data suggests a decreasing trend.



Water Quality

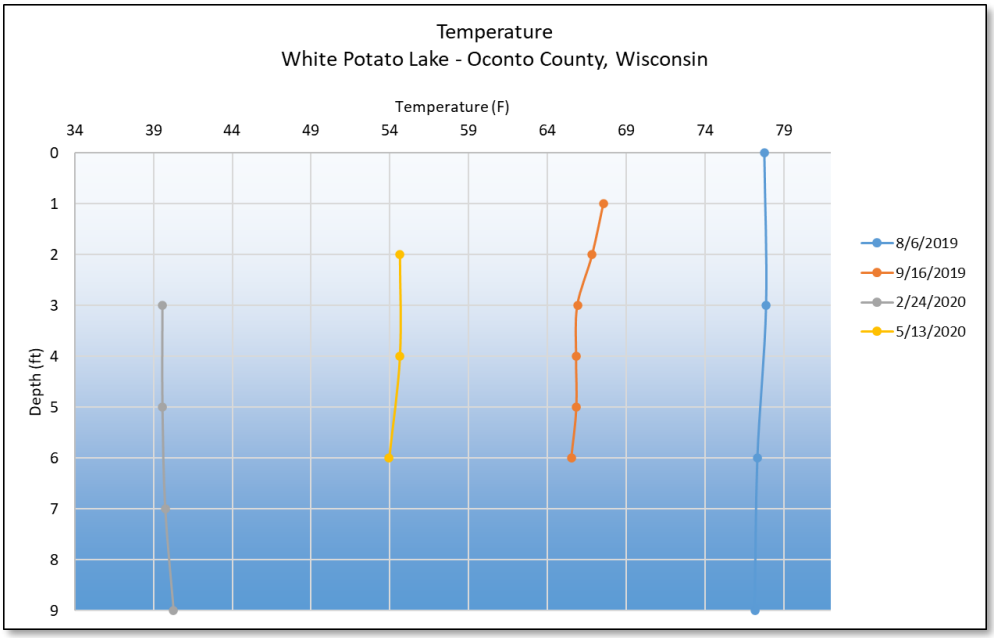
Sufficient **dissolved oxygen** in lake water is essential to the survival of aquatic organisms. The amount of dissolved oxygen present within a lake varies by season and depth. It is determined by the biological activity that consumes or produces oxygen, by water mixing through wind, changes in temperature,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



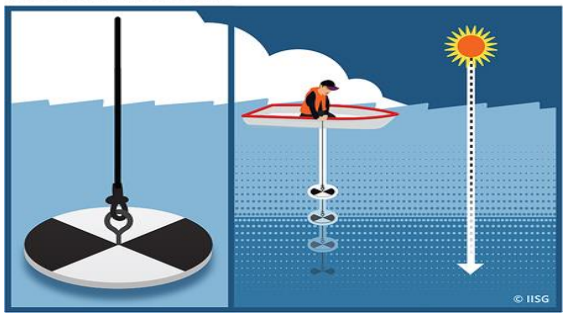
- Sufficient oxygen is available in the water column of White Potato Lake most of the year, however, by late winter, concentrations can be very low, indicating this lake may be susceptible to fish kills.
- Small algae blooms at depth (~5 ft) in late summer are suggested by the profiles.

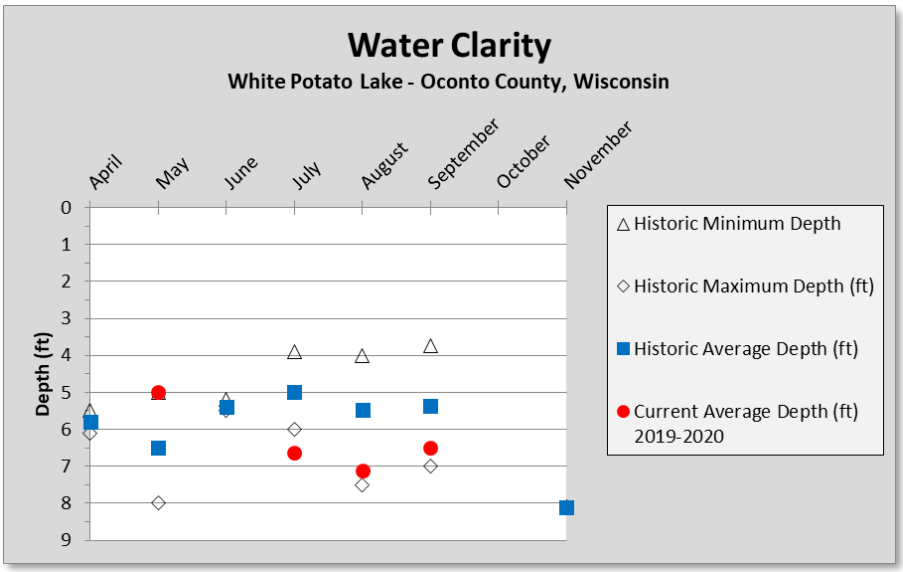
Lake water **temperature** has a significant impact on water chemistry, spatial distribution of fish, microbial growth and oxygen content.

- The temperature gradient in White Potato Lake is relatively straight most of the year, typical of a shallow, mixed lake.



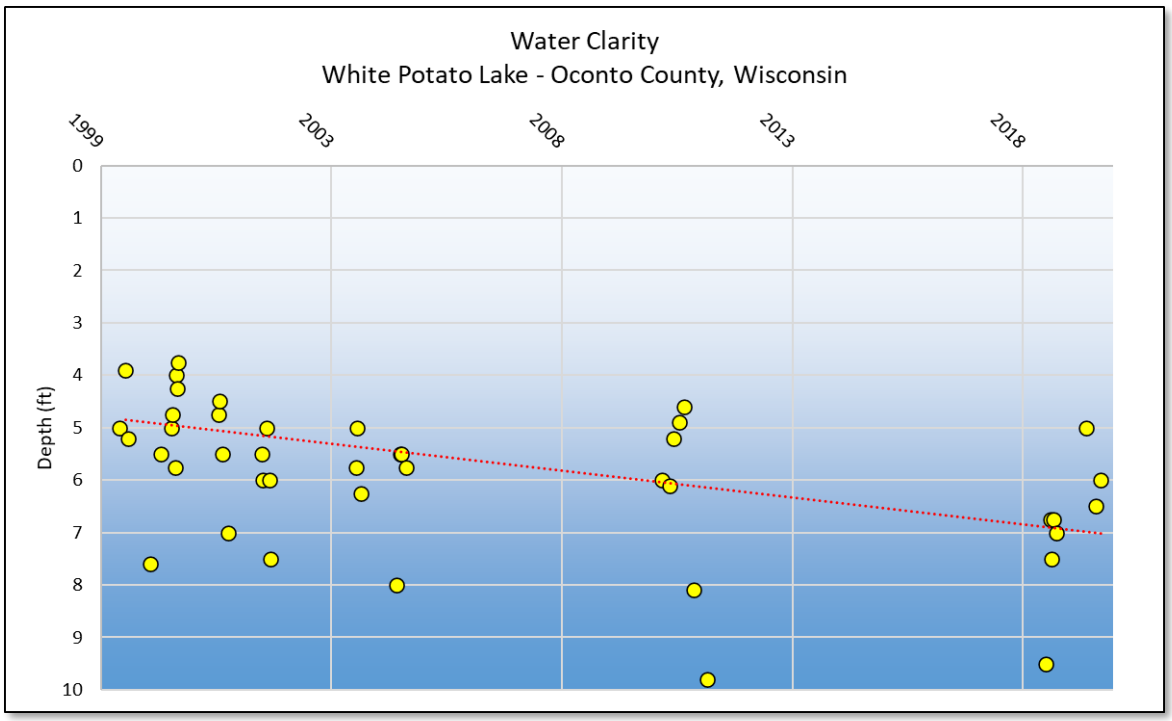
Water Quality





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 graph below shows water clarity measurements taken between April and November.
- During 2019-20, the average water clarity measurements were consistent with previous observations and demonstrates an increasing trend over the long term.



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.

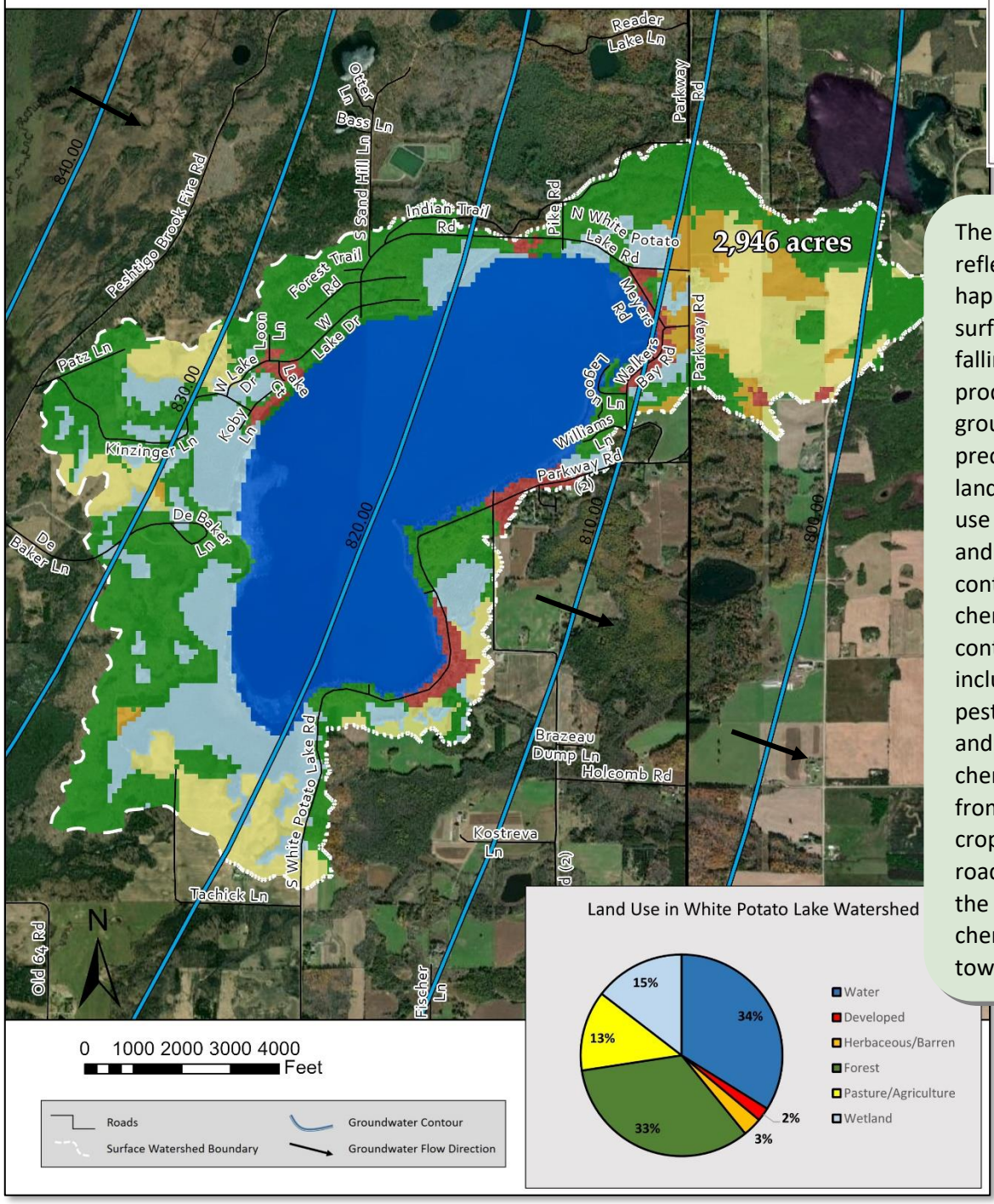
- Concentrations of potassium (1.07 mg/L), chloride (5.7 mg/L) and sodium (3.3 mg/L) were all low. This suggests minimal impact from septic systems, road salt, animal waste and fertilizers.
- DACT, a screening tool to determine if your lake is being impacted by pesticides, was not detected.
- Water in White Potato Lake is moderately hard (69 mg/L CaCO3), having a slightly elevated level of dissolved minerals. These minerals tend to bind with phosphorus making it less available to algae blooms.

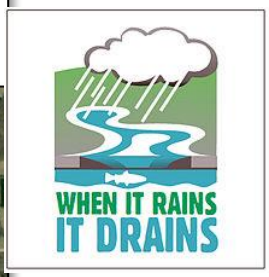
For more information on how to interpret your lake's water quality data, please refer to the "State of the Oconto County Lakes Report" that is on file with Oconto County.

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.

White Potato 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.

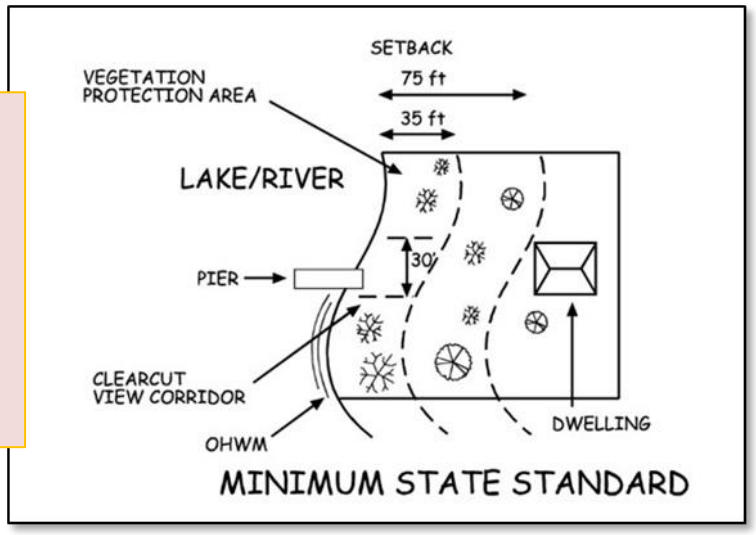
- Shorelands around White Potato Lake were surveyed in May 2019. Some of White Potato Lake's shoreland is healthy, but many stretches are in need of restoration.

Total lakefront footage	No. Riparian lots	Measured shoreland disturbance (feet)	Measured shoreland disturbance (%)
33,815	260	20,310	60%

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:

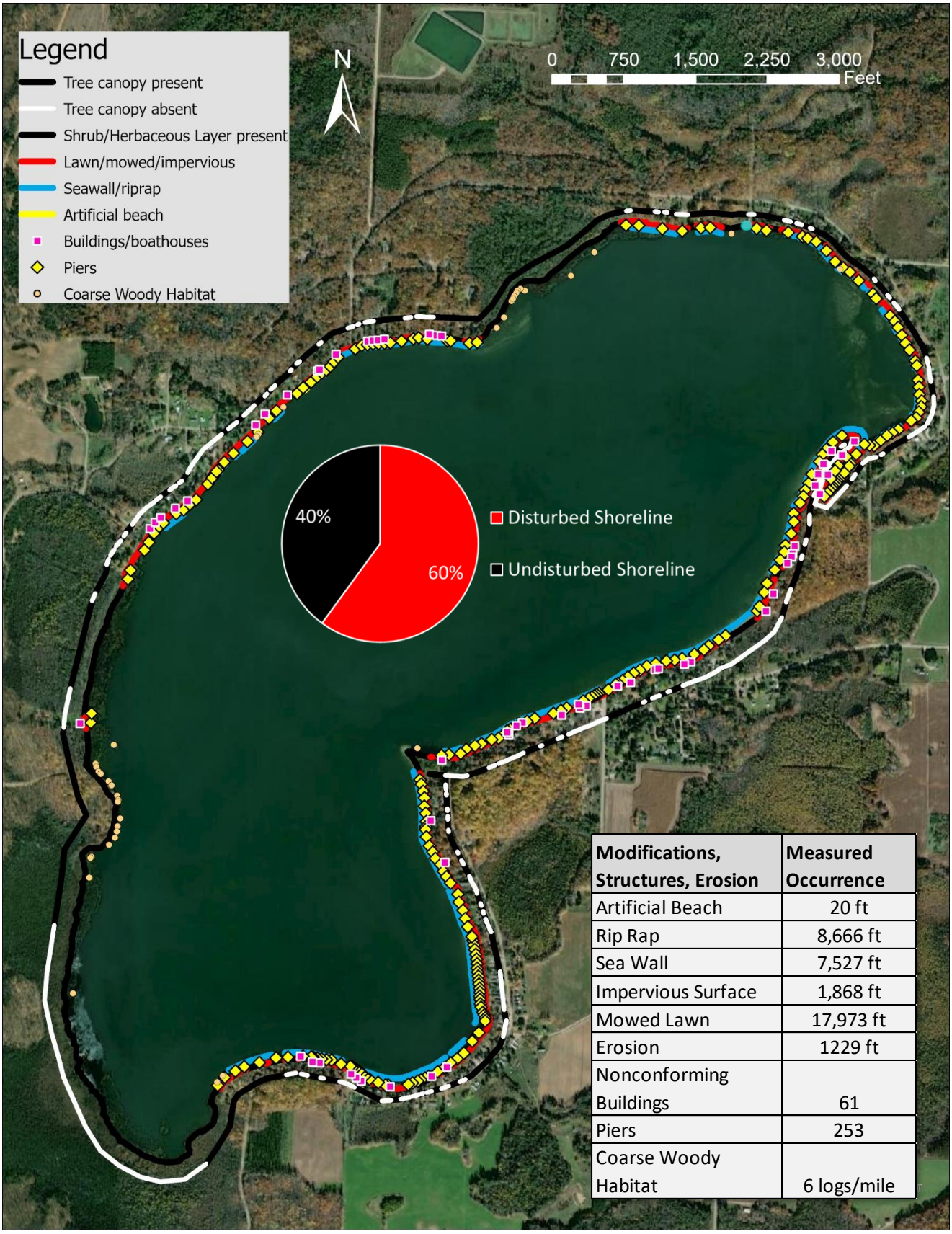
- Up to 30% of shoreline may be removed of shrubs and trees for a view corridor
- A mowed or constructed pedestrian path up to 5 feet wide to access lake



What Can You Do To Help White Potato 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

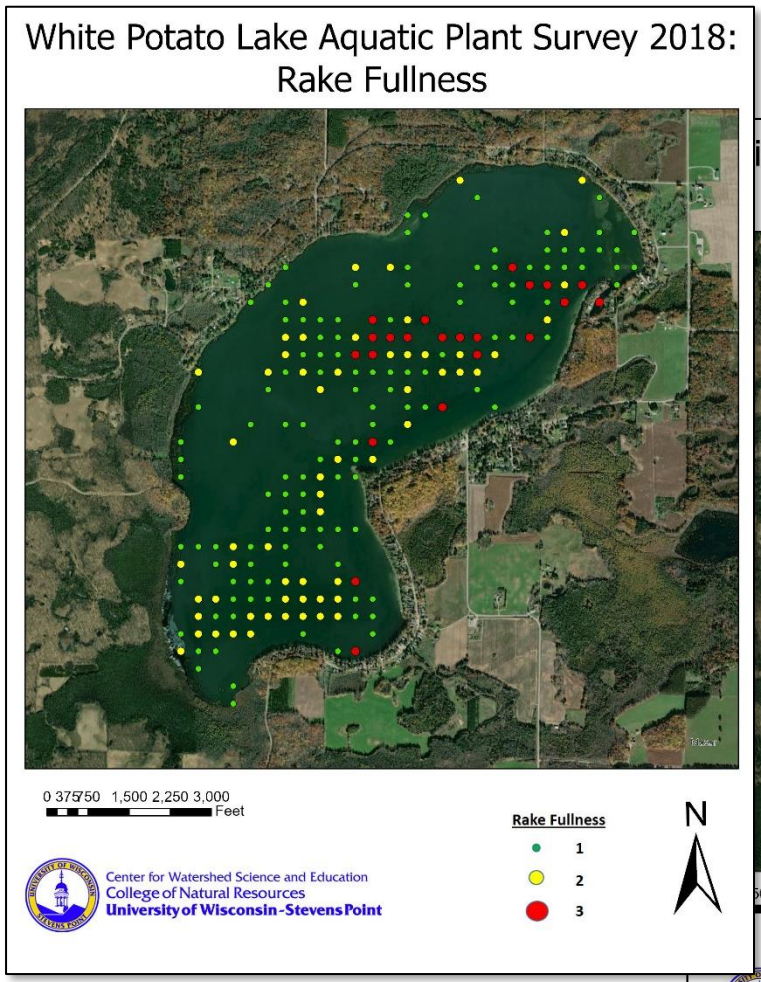


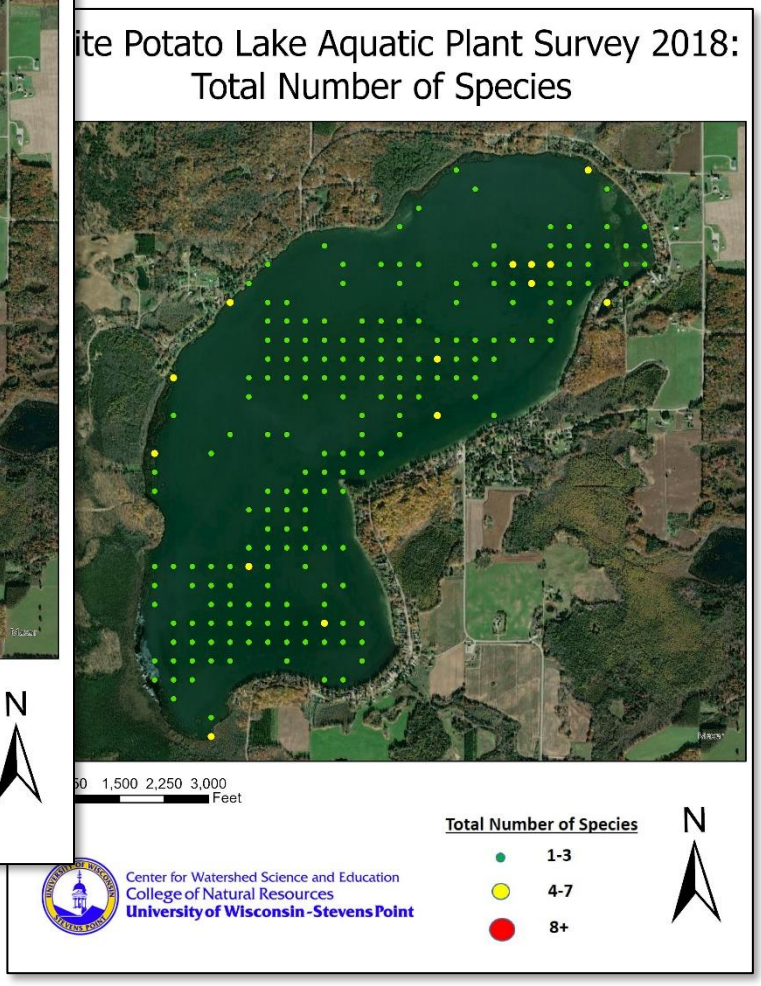
Modifications, Structures, Erosion	Measured Occurrence
Artificial Beach	20 ft
Rip Rap	8,666 ft
Sea Wall	7,527 ft
Impervious Surface	1,868 ft
Mowed Lawn	17,973 ft
Erosion	1229 ft
Nonconforming Buildings	61
Piers	253
Coarse Woody Habitat	6 logs/mile

Aquatic Plants

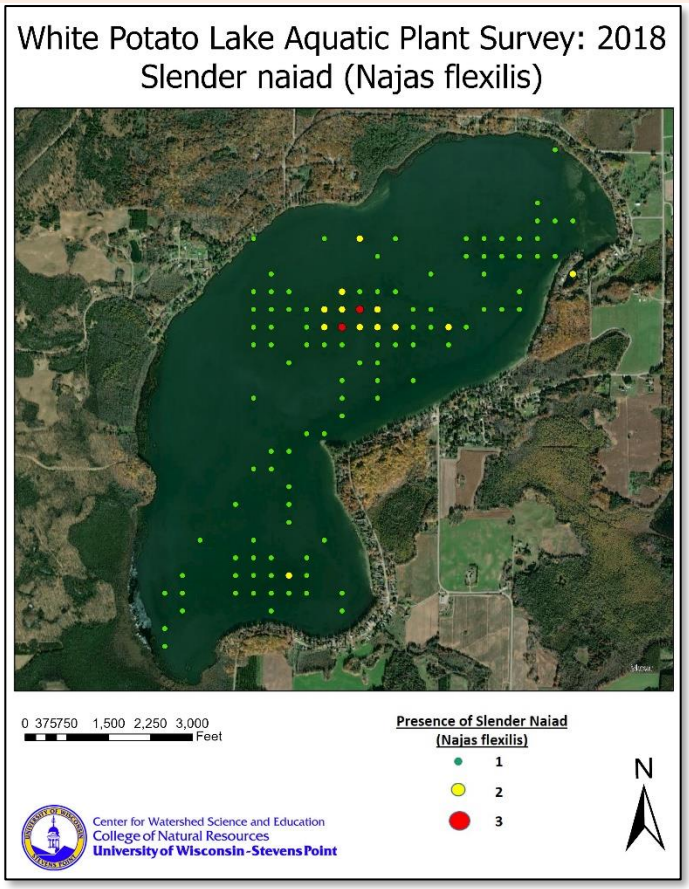
Aquatic plants are the forest landscape within a lake. They provide food and habitat for terrestrial and aquatic creatures such as fish, ducks, turtles, invertebrates and other animals. They increase oxygen levels in the water and utilize nutrients that would otherwise be used by algae. A healthy lake 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 White Potato Lake is characterized by a slightly above average diversity of plant species when compared to other lakes in the Oconto County Lakes Project, with a total of 26 species in the 2018 survey.
- During the 2018 aquatic plant survey of White Potato Lake, 49% of visited sites had vegetative growth. The maximum depth of vegetation was 9 feet.
- The most frequently encountered plant species were slender naiad (55%), largeleaf pondweed x white stem pondweed hybrid (37%) and white-stem pondweed (33%). All three species are native to Wisconsin.
- No invasive species were observed.

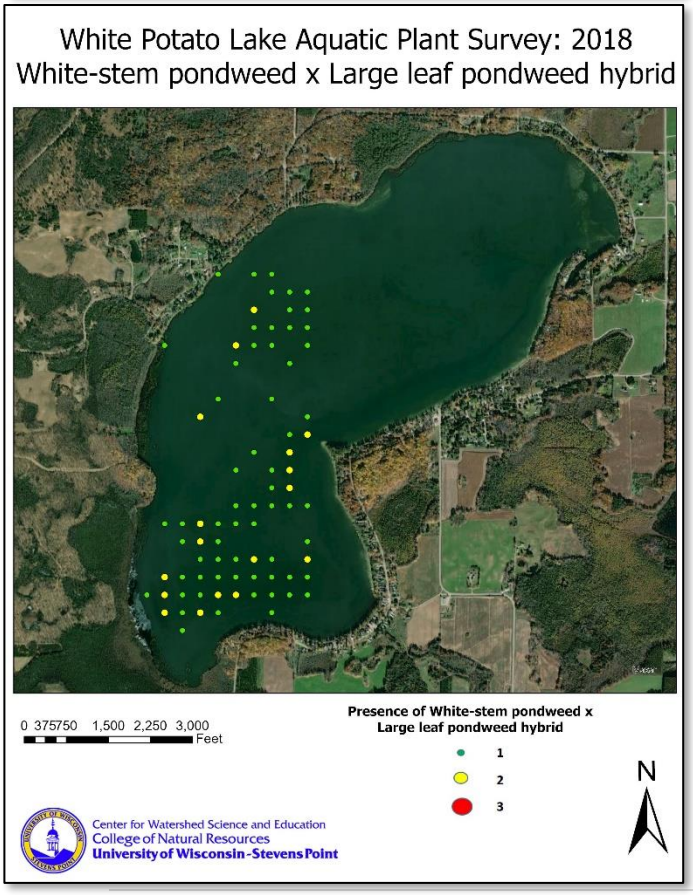




Aquatic Plants

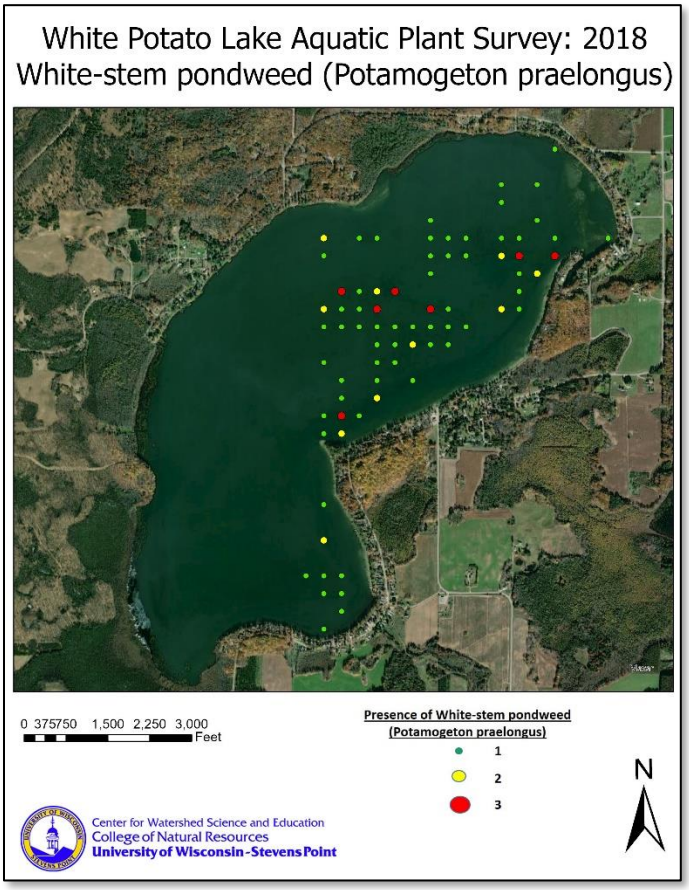


Slender naiad, also called nodding water-nymph, is a primary food source for waterfowl and provides habitat for many invertebrates.



White-stem/large leaf pondweed hybrid, is a cross between these two quality aquatic plants. Having traits of both species, this plant provides great habitat and forage for wildlife.

Aquatic Plants



White-stem pondweed is commonly found in northern lakes in soft sediment shallower than 4 meters but does not tolerate turbidity. Its late summer fruits are common forage.

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 2018 aquatic plant survey.
- Chinese mystery snail (2015), Eurasian watermilfoil (2018), purple loosestrife (2015) and rusty crayfish (2007) have been previously documented in White Potato Lake.

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.

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.

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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