Oconto County Lakes Project

WESCOTT LAKE STUDY

SUMMARY REPORT

2020

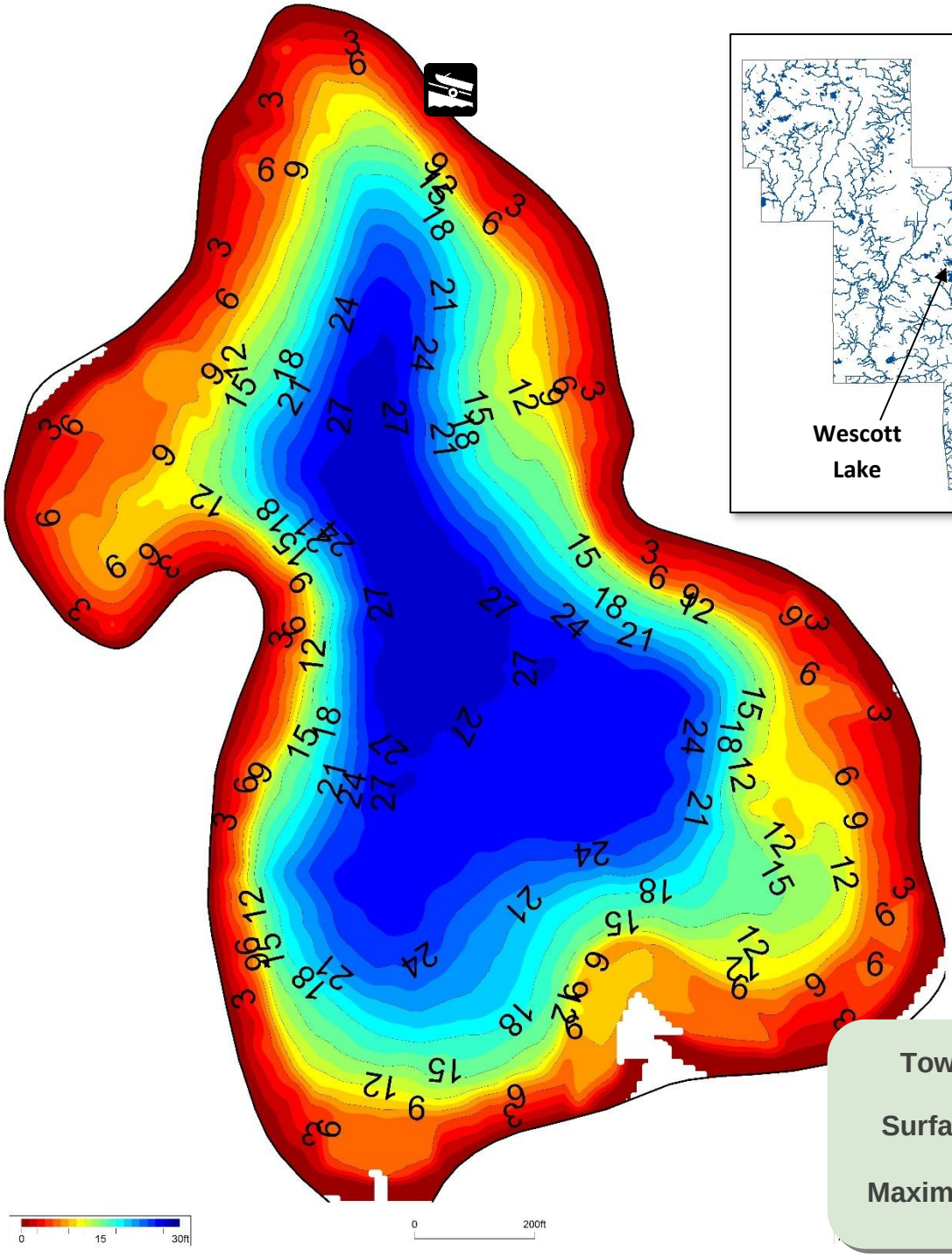
University of Wisconsin-Stevens Point and

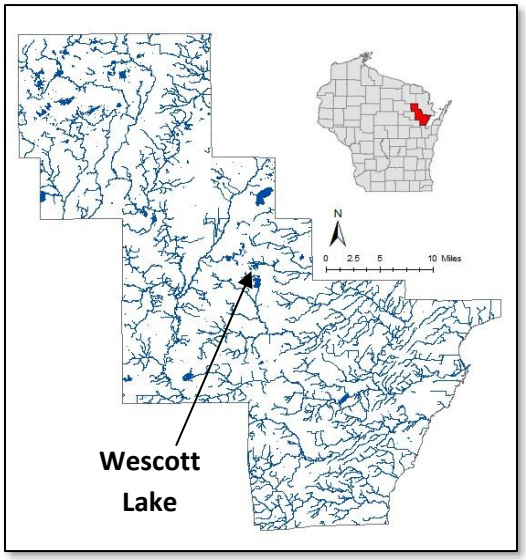
Oconto County Staff and Citizens

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

Background

- Wescott Lake is a 40-acre seepage lake in northern Oconto County with a maximum depth of 27 feet.
- Most water enters and leaves Wescott Lake via groundwater. Surface water runoff and direct precipitation also contribute water.
- Visitors have access to the lake from one public boat landing located on the lake's north side.
- This report summarizes data collected during the 2018-2019 lake study.





Township of Bagley

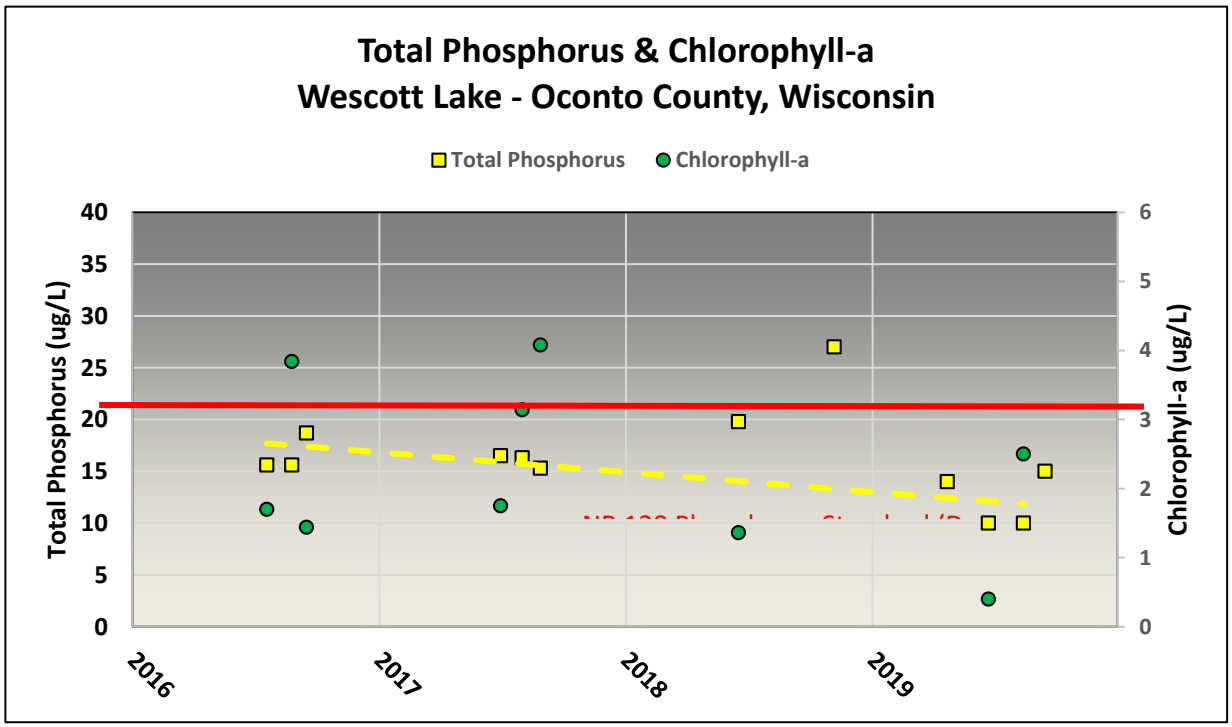
Surface Area: 40 acres

Maximum Depth: 27 feet

Water Quality

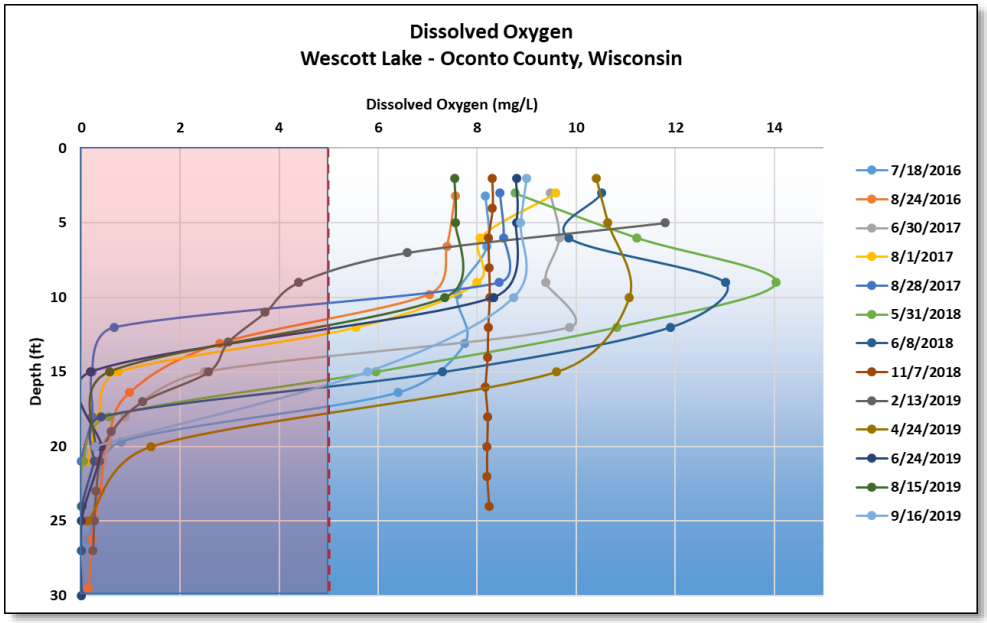
Nutrients such as phosphorus and nitrogen are what feed aquatic plants and algae in a lake. Excessive amounts of nutrients delivered to a lake will result in abundant plant and algae growth. Disturbance within a watershed combined with the landscape's inability to infiltrate and filter runoff is what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

- Total Phosphorus periodically **exceeded** the Wisconsin state standard of 20 ug/L for deep seepage 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, was consistently below the threshold of 6 ug/L and when nuisance algae blooms become more frequent.



Water Quality

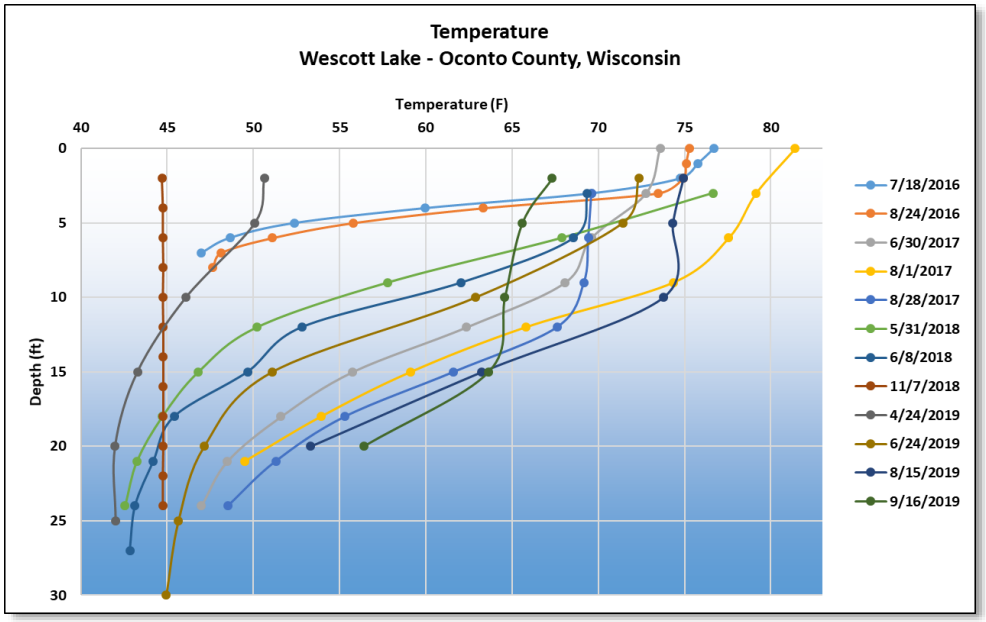
Sufficient **dissolved oxygen** in lake water is essential to the survival of aquatic organisms. The amount of dissolved oxygen present within a lake varies by season and depth. It is determined by the biological activity that consumes or produces oxygen, by water mixing through wind, changes in temperature,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



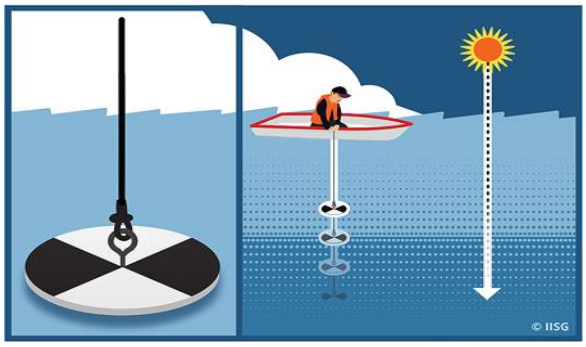
- Sufficient oxygen is available in the water column of Wescott Lake throughout the year. The lowest concentrations were observed in late winter when only the top 8 feet has enough oxygen to support most fish species.
- Bumps in dissolved oxygen at depth (~10 feet) are indicative of algae blooms.

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

- The temperature gradient in Wescott Lake exhibits a clear thermocline between 5 and 15 feet during the growing season that separates warmer oxygen-rich water at the top from colder oxygen-poor water below.

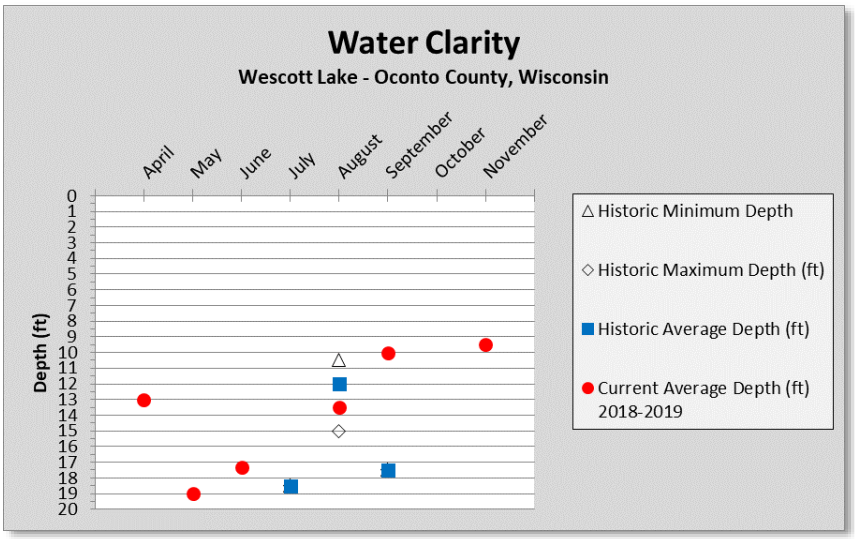


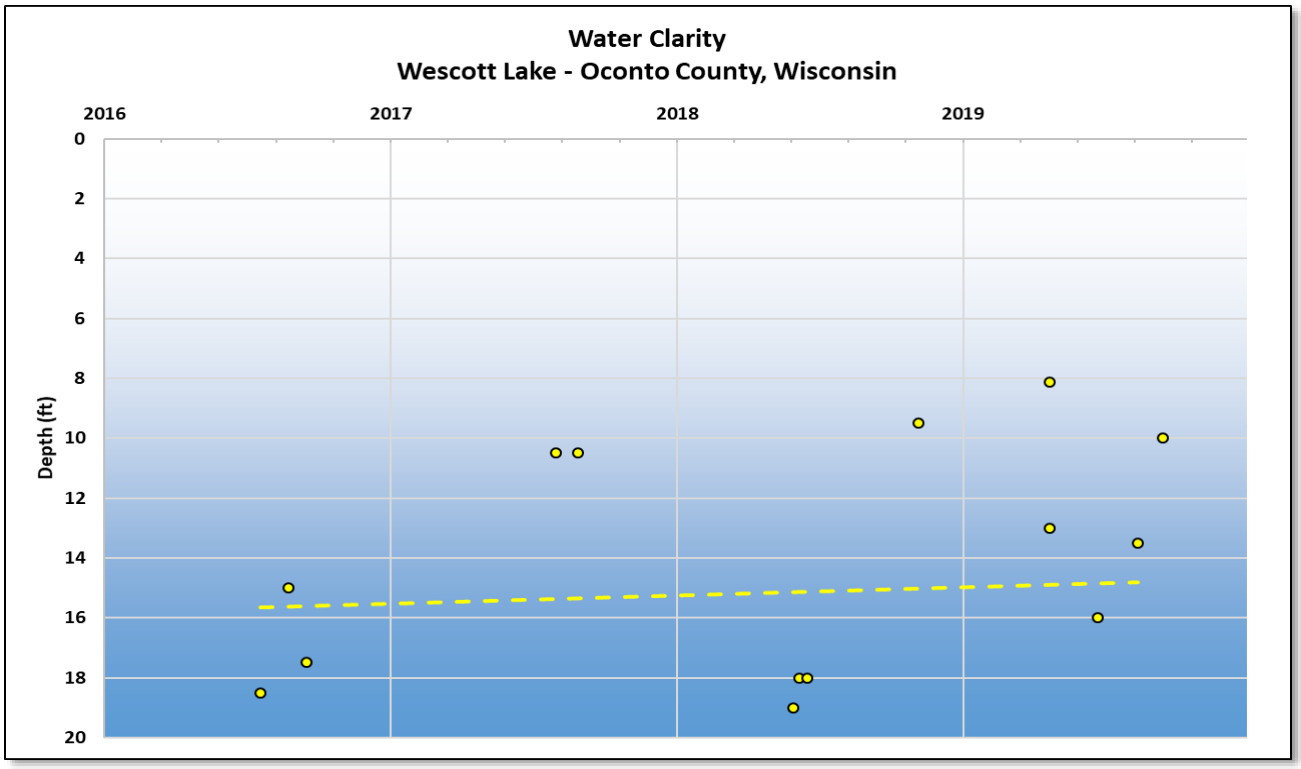
Water Quality



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 2018-19, on average, the poorest water clarity in Wescott Lake was in fall and the best was in May. This demonstrates a slightly decreasing trend over the long term.





Water Quality

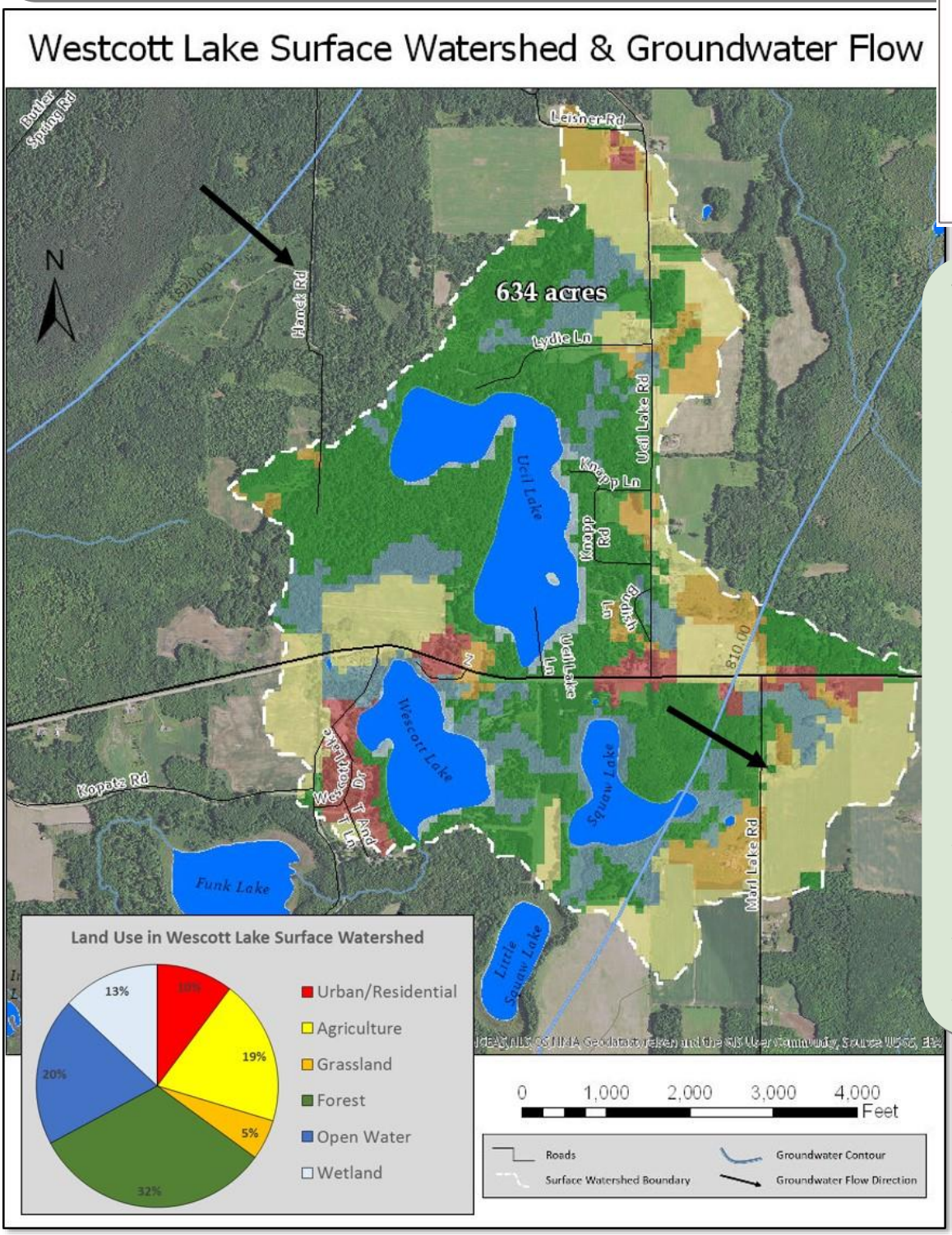
Other chemistry data was collected from lake water samples, such as basic cations, pollutants and acid rain input, and physical parameters. Results of such analyses can provide insights into a variety of other potential impacts to the lake. While concentrations of these compounds in lake water is usually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

- Concentrations of potassium (1.31 mg/L) were low, but chloride (15.8 mg/L) and sodium (8.12 mg/L) had elevated concentrations. This suggests some impact from septic systems, road salt, animal waste and/or fertilizers.
- DACT, a screening tool to determine if your lake is being impacted by pesticides, was not detected.
- Water in Wescott Lake is hard (161 mg/L CaCO3), having an elevated level of dissolved minerals. These

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.



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 Wescott Lake were surveyed in May 2018. Much of Wescott Lake's shoreland is healthy, but some stretches are in need of restoration.

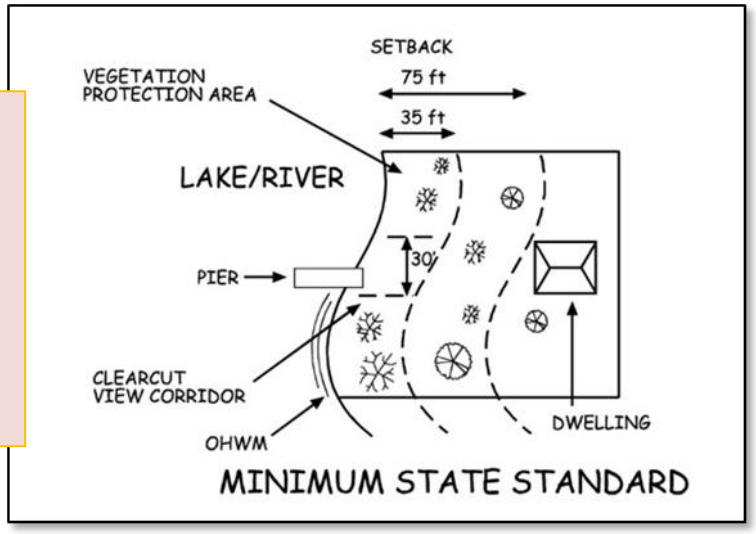
Total lakefront footage	No. Riparian lots	Measured shoreland disturbance (feet)	Measured shoreland disturbance (%)
6,394	29	1,242	19%

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:

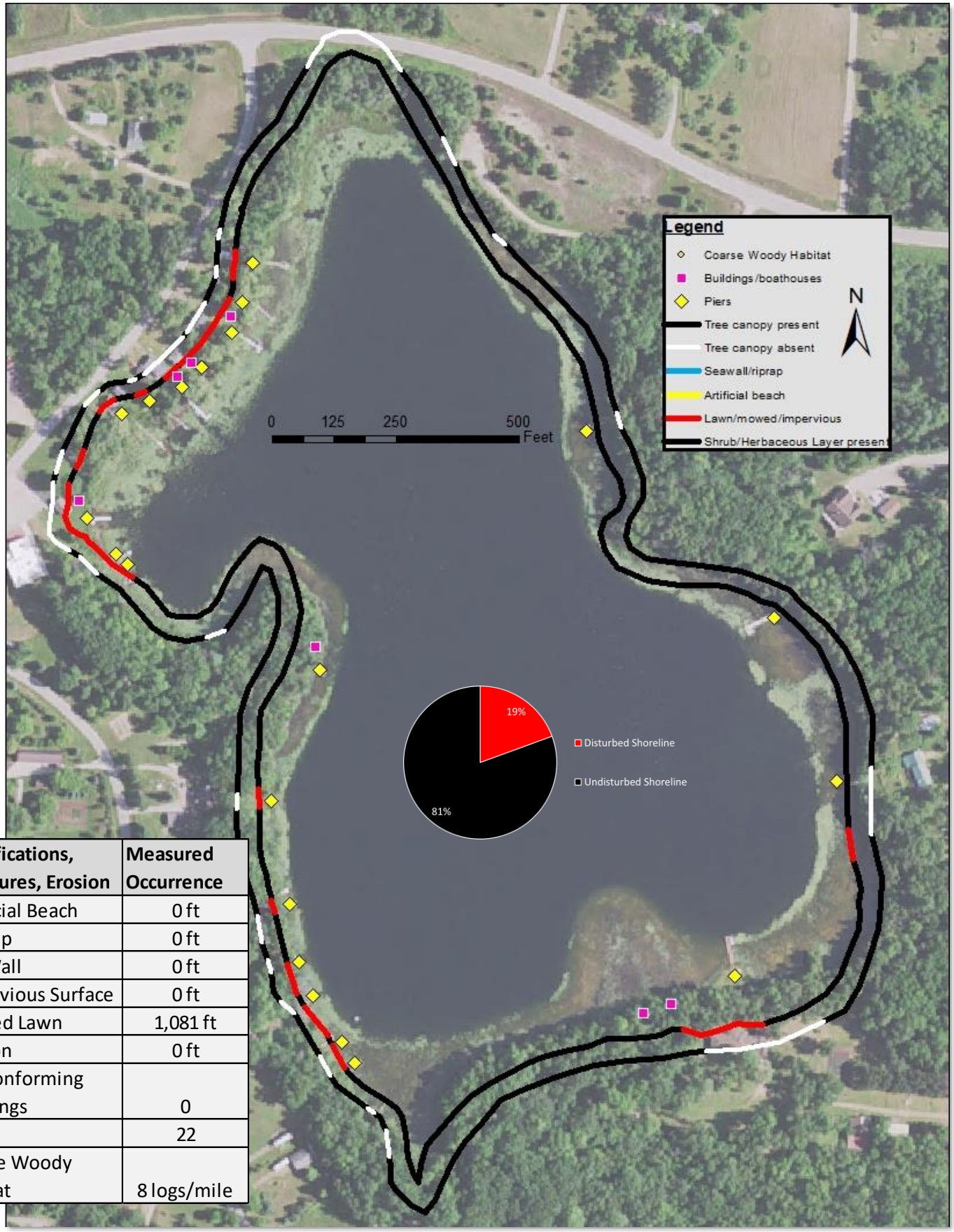
- Up to 30% of shoreline may be removed of shrubs and trees for a view corridor
- A mowed or constructed pedestrian path up to 5 feet wide to access lake



What Can You Do To Help Wescott 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

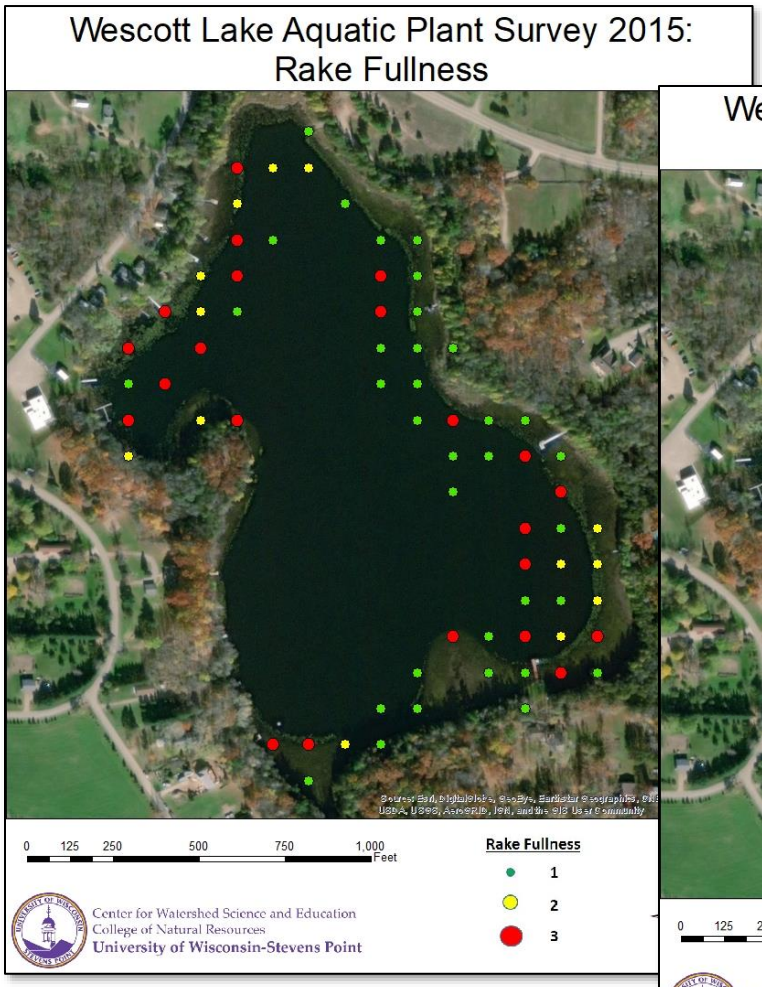


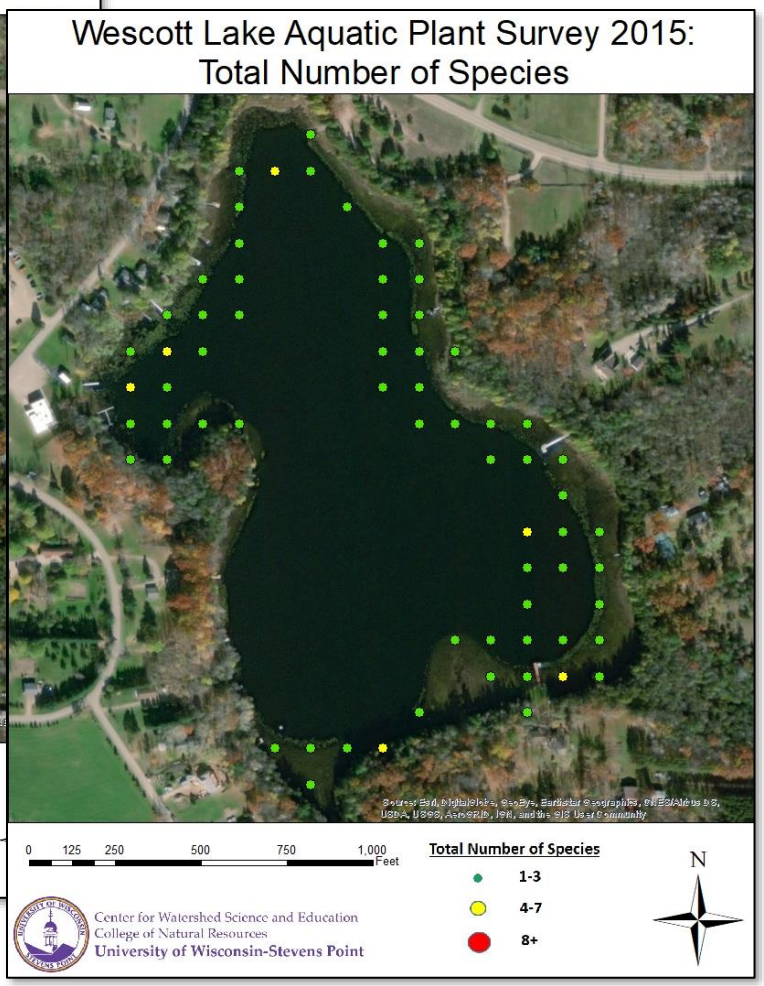
Modifications, Structures, Erosion	Measured Occurrence
Artificial Beach	0 ft
Rip Rap	0 ft
Sea Wall	0 ft
Impervious Surface	0 ft
Mowed Lawn	1,081 ft
Erosion	0 ft
Nonconforming Buildings	0
Piers	22
Coarse Woody Habitat	8 logs/mile

Aquatic Plants

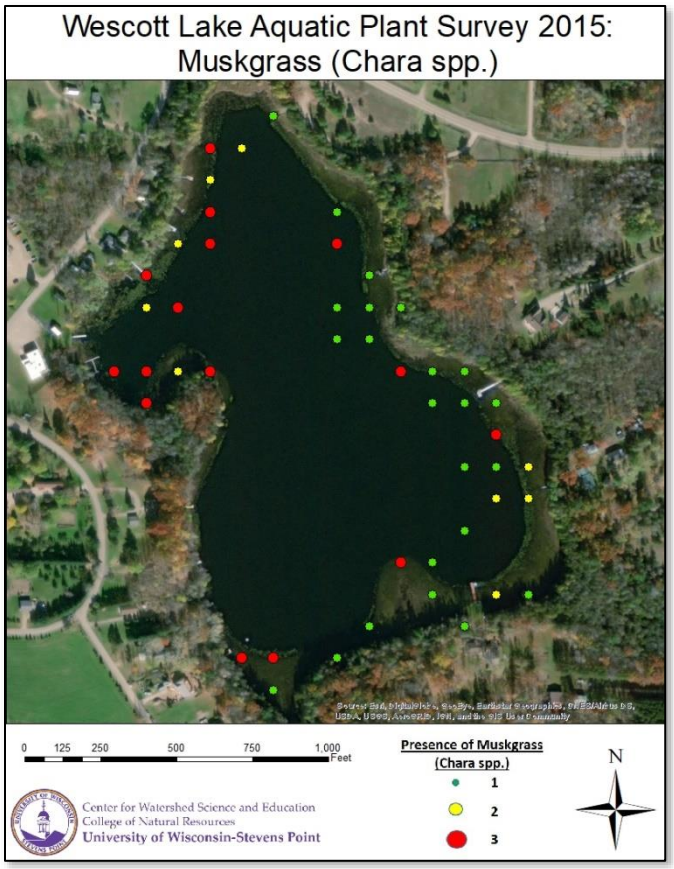
Aquatic plants are the forest landscape within a lake. They provide food and habitat for terrestrial and aquatic creatures such as fish, ducks, turtles, invertebrates and other animals. They increase oxygen levels in the water and utilize nutrients that would otherwise be used by algae. A healthy lake 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 Wescott Lake is characterized by 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 2015 survey.
- During the 2015 aquatic plant survey of Wescott Lake, 48% of visited sites had vegetative growth. The maximum depth of vegetation was 17 feet.
- The most frequently encountered plant species were chara (71%), northern watermilfoil (20%) and white water lily (17%). All three species are native to Wisconsin.
- Filamentous algae was observed at 15% of sites and the invasive species Curly-leaf pondweed was observed at one location.

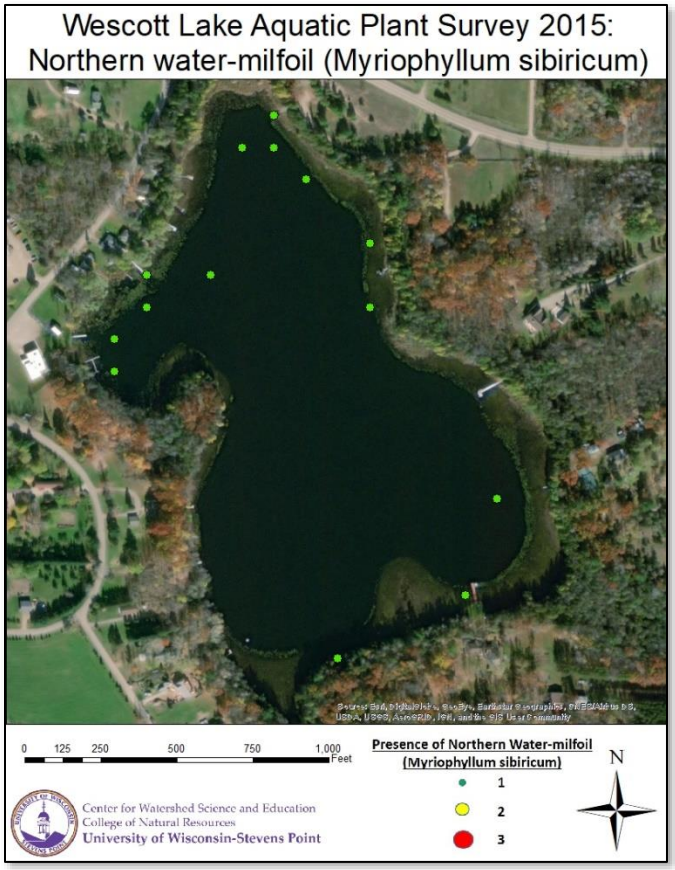




Aquatic Plants

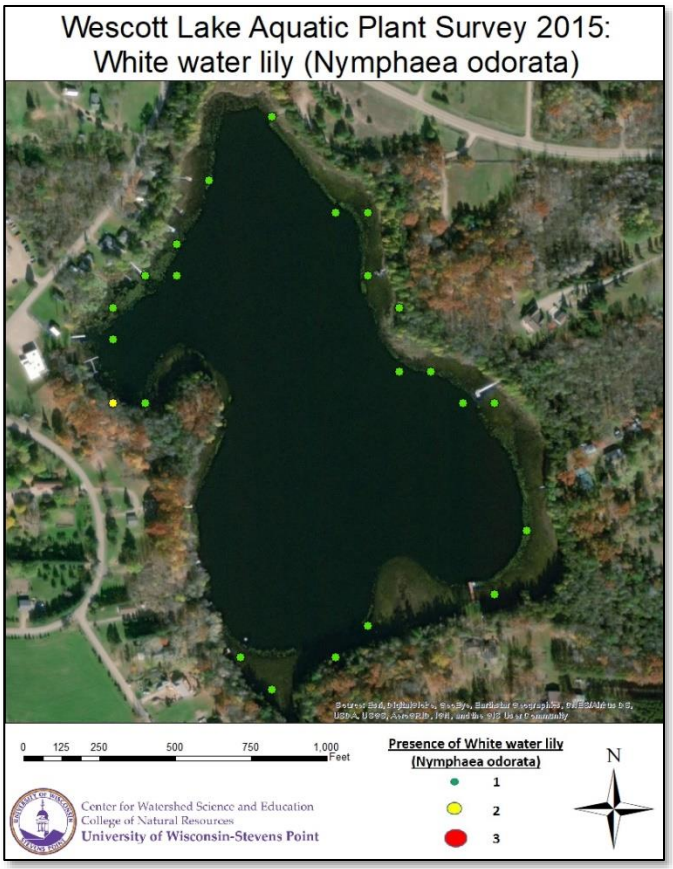


Chara is a type of macro algae that grows attached to muddy lake bottoms and has a musky odor. Muskgrass, as it is known, filters the lake water and is helpful in preventing the establishment of invasive species.

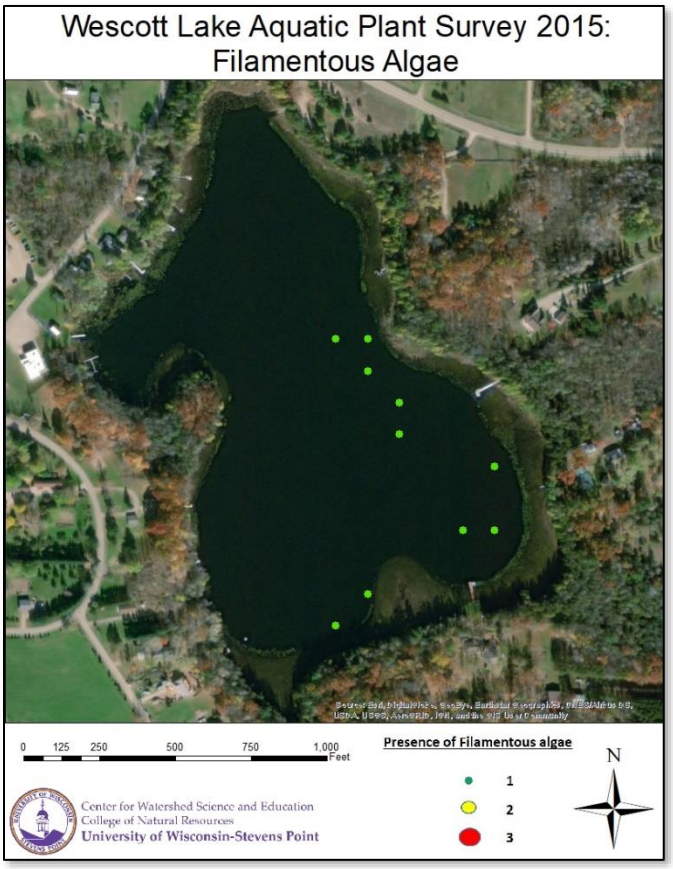


Northern watermilfoil is important forage and cover for aquatic animals and an important food source for waterfowl.

Aquatic Plants



White water lily has round stalks that grow up from a rhizome in the sediment connecting to large round floating leaves. By mid-summer, white flowers also float at the surface. Lilies are important cover for fish, are food by many species, and help prevent erosion by slowing wave action.

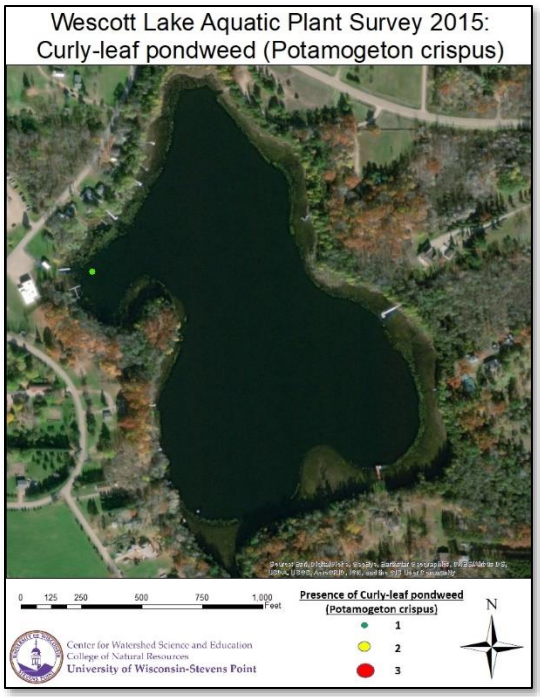


Filamentous algae is a bloom that grows in hair like strands or colonies at the water surface and is usually an indication of an overabundance of nutrients. An important food source for protozoans, insects and fish, it can reach nuisance levels causing recreational conflicts or depleting oxygen levels in the lake when it dies.

Invasive Species

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.

- ✓ Curly-leaf pondweed was observed at one location during the 2015 survey.
- ✓ Chinese mystery snail (2010), curly-leaf pondweed (2010), banded mystery snail (2013) and yellow iris (2018) have been documented in Wescott Lake.



Curly-leaf pondweed invades freshwater lakes and can become dominant due to its tolerance of a variety of habitats. CLP grows primarily during the winter and dies off by June, just was water is warming up which can drastically increase nutrient concentrations.

Yellow iris can form dense rhizomatic mats displacing native species and disrupting water flow. The sap can cause skin irritation.


Yellow iris *WDNR*

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.


Chinese mystery snail,

Banded mystery snails compete with native snails for food and habitat, can serve as a host for parasites and may invade largemouth bass nests.


Banded mystery snail, *WDNR*

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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