

LOWER PRIOR LAKE: Water Quality Report Card



Quick Facts

Surface Area: 940 acres

Watershed Area: 18,904 acres

Average Depth: 13 feet

Maximum Depth: 56 feet

Ordinary High Water Level and No Wake Zone: 903.9 feet above sea level

Connectivity to other waterbodies: Water flows into the lake from Upper Prior Lake. The lake level is controlled by an outlet structure which feeds into the Prior Lake Outlet Channel.

Impairment Status: None.



Grading System

The District monitors several lake water quality indicators, including four that are shown in the table below. To assess the lake quality on Lower Prior, a letter grade was assigned for each water quality indicator based on how well the parameter met a water quality standard over a three-year period. Trends and graphs show how water quality changed over a ten-year period to help determine how well we're improving our lake quality. More information on how these grades and trends were developed can be found on our website: www.plslwd.org.

Water Quality Indicator	Risk to Water Quality	Grade (2014-2016)	10-Year Trends & Goals (2007-2016)		Summary
			Trends	Graph	
PHOSPHORUS	Phosphorus is needed by plants and animals to survive, but can cause algae blooms if too much is available. In some cases, algae can contain a toxin which could cause illness or death in animals if ingested. Some sources of high phosphorus are fertilizer, human and animal waste, and soil erosion.	A	 <i>No Trend</i>		Very few samples over last 10 years surpass the standard.
CHLOROPHYLL-A	Chlorophyll-a is a measurement of the amount of algae in a lake. Some algae can produce dangerous toxins and the decomposition of algae consumes oxygen that would otherwise be used by fish and beneficial organisms. High algal concentrations threaten aquatic life and can impede recreation and enjoyment of the lake.	A	 <i>Improving</i>		A 74% decrease in Chlorophyll-a concentration in last 10 years means water quality is improving.
CLARITY	Clarity is affected by the amount of algae and sediment in the water. The amount of algae and sediment present is dependent on many factors including nutrients, temperature, wind, rain, and boat traffic. Low clarity means water is more "cloudy" and less sunlight is available for aquatic plants to grow. Low clarity can also negatively impact a lake user's enjoyment and harm aquatic life.	A	 <i>Improving</i>		Clarity improved by 115% over the last 10 years, improving conditions for recreation and aquatic life.
CHLORIDE	Chlorides can enter lakes through de-icing road salts, water softeners, and human and animal waste. Unnaturally high levels of chloride are toxic to plants and aquatic life. Once in the water, there is no easy or inexpensive way to remove chloride.	A	Insufficient data to determine trend.		Samples well below threshold. Additional years of data needed to determine any trend over time.

Grading Scale: Determined by data from 2014-2016

Excellent	Good	Average	Marginal	Poor
A	B	C	D	F
All or most samples meet the desired threshold.	Many samples meet or are near the desired threshold.	Some samples meet or are near desired threshold.	Many samples do not meet the desired threshold.	Most samples do not meet the desired threshold.

Trend Explanation: Water quality trends over ten years (2007-2016)

Improvement in water quality from indicator over 10-year period.
No significant increase or decrease in data over 10-year period.
Decline in water quality from indicator over 10-year period.

Example graph of average annual departure from threshold (2007-2016)



LOWER PRIOR LAKE: What is PLSLWD doing to sustain good water quality?

BACKGROUND

Lower Prior Lake is an important local and regional lake with a public boat landing, sandy swimming beach, good water quality, and a healthy fish population. Although Lower Prior Lake currently meets state water quality standards, over time, the lake has the potential to degrade as more untreated stormwater and water from polluted lakes flow into the lake.

In 2013, the Prior Lake-Spring Lake Watershed District (PLSLWD) completed a diagnostic study that concluded that while the water quality of the southwest portion of Lower Prior Lake is strongly influenced by the water quality of Upper Prior Lake, the water quality of the rest of lake is influenced by runoff flowing directly into the lake from streets and lawns. Based upon the information provided in this study, a balanced mix of regional public projects and watershed-wide private projects were selected with a strong emphasis on education.

REDUCING NUTRIENTS FROM UPSTREAM LAKES

Lower Prior Lake is the last of three in a chain of lakes: Spring Lake flows into Upper Prior, which then flows into Lower Prior. Since Lower Prior is influenced by these two upstream lakes, reducing the amount of nutrients from these lakes can improve the water quality on Lower Prior.

SPRING LAKE

Spring Lake has historically had high phosphorus levels which lead to algal blooms. Aluminum sulfate (alum) treatments reduce phosphorus and therefore algal blooms. The first of three alum doses on Spring Lake was completed in 2013 and a second dose is planned for 2018.

UPPER PRIOR LAKE

An analysis completed in 2017 identified three potential action items for improving the water quality in Upper Prior Lake: effectively manage carp populations, encourage native plant growth, and lastly, complete an alum treatment if needed. In January 2018, the District removed approximately 3,000 carp from Upper Prior Lake, which should, in turn, also help with plant growth. However, this catch only represents about 20% of the carp population, so efforts will continue to remove as many as possible.



Carp Seine on Upper Prior Lake

REGIONAL PUBLIC PROJECTS

Regional public projects include large-scale projects, such as infiltration basins or pond expansions, on public property. A couple examples of these projects are listed below.

FISH POINT PARK

At Fish Point Park, stormwater from 89 acres of land is funneled through the park's wetland and picks up excess nutrients, such as phosphorus, on its way to Prior Lake. The project includes a wetland enhancement, prairie restoration, and an iron-sand filter that captures phosphorus. This project reduces the amount of phosphorus entering Prior Lake from this area by approximately 66%.



Fish Point Park Prairie Planting

SAND POINT BEACH PARK

The District is partnering with the City of Prior Lake on a project at Sand Point Beach Park. An existing stormwater basin will be enhanced and expanded to include an outlet control structure which will connect to an iron-enhanced sand filter. These features will allow sediments to settle out of the stormwater, provide time for water to infiltrate, and filter out excess phosphorus. This project will be completed in 2018.

WATERSHED-WIDE PRIVATE PROJECTS

The 2013 diagnostic study identified a number of smaller projects on privately owned property that, together, can have a significant positive impact on water quality. These include projects such as shoreline buffers, raingardens, and rain barrels. Several raingarden and shoreline projects have been completed over the last 10 years, and the District continues to work with the Scott Soil & Water Conservation District (SWCD) on outreach and technical support to help identify and implement future projects.

EDUCATION AND OUTREACH PROGRAM

The Education Program consists of many activities, such as: hosting workshops, creating educational materials, giving presentations, writing articles, updating the website, coordinating events, and posting on social media. Each year, PLSLWD holds two Clean Water-Clean Up events, hosts tours, assists with a carp tournament, and presents at local lake association meetings. The District also contributes articles to the Prior Lake American, Scott County Scene, and local lake association newsletters. In partnership with Scott SWCD, PLSLWD hosts raingarden, native prairie, and shoreline restoration workshops and PLSLWD's Citizen Advisory Committee initiated a Water Quality Improvement Award to promote projects that improve water quality.