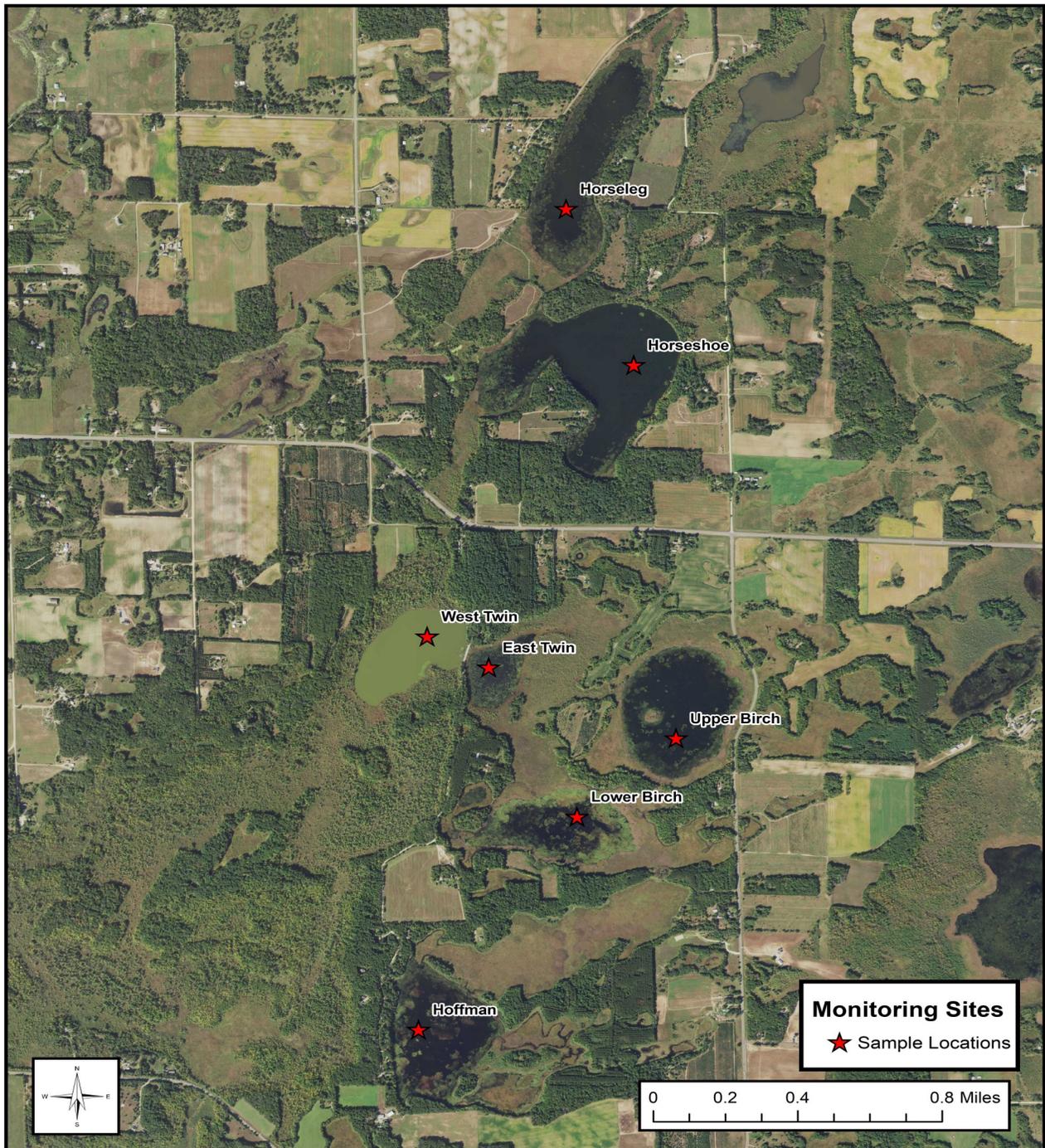


2021 Oxford Township Monitoring Report



Completed By: Thomas Zimmermann, Isanti SWCD

Completed for Oxford Township

By Isanti Soil and Water Conservation District



2021 Oxford Township Monitoring Report

Monitoring

What: Seven lakes were sampled once every month from May to September. Lake samples were tested for total phosphorus (TP) and Chlorophyll-a (Chl-a). Field measurements were recorded for transparency, dissolved oxygen and temperature. 2021 was the fifth year of monitoring on these lakes

Why: The information helps land and water resource management entities such as Isanti County Zoning, Oxford Township, and the Isanti SWCD make informed decisions to keep the lakes healthy. It would be important for lakes with outstanding water quality to focus on management activities that keep the water healthy (it's cheaper than waiting for water to become degraded and then trying to fix it). Actions to keep water healthy include updated shoreline zoning ordinances, low impact development, wetland restorations, soil health practices, and protection of existing healthy lands via land easements (wetlands, forested areas, and intact prairie).

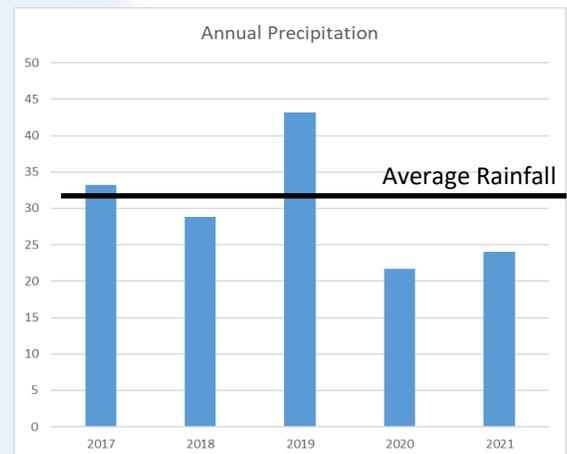
Shallow Lakes

All of the lakes monitored as part of this program are classified as “shallow lakes”; most of the lake is less than 15 feet in depth. Healthy shallow lakes typically support abundant plant life and clear water. Unhealthy shallow lakes typically have limited plant life and turbid water. Healthy shallow lakes have many benefits to the community: they reduce flooding, lower nitrogen and phosphorus in water before it moves downstream, recharge aquifers for drinking water, and provide habitat for wildlife. For all of the reasons named, shallow lakes impact the community economically (think hunting, fishing, property values, and clean drinking water).

2021 Rainfall and Temperatures

Rainfall and temperature affect water health.

Warm, dry conditions which began in mid-2020 continued through much of 2021 resulting in the worst drought in 10-30 years for most of the state. The total precipitation in 2021 was approximately 24 inches; the normal is 32 inches.



General Definitions

Total Phosphorus (TP): An essential plant nutrient in which an excess can cause severe algal blooms.

Chlorophyll-a (Chl-a): A pigment found in green plants, used to estimate quantity of algae in a lake.

Secchi Transparency: A measure of light penetration in water, an indication to the amount of algae in the water.

2021 Lake Monitoring Results

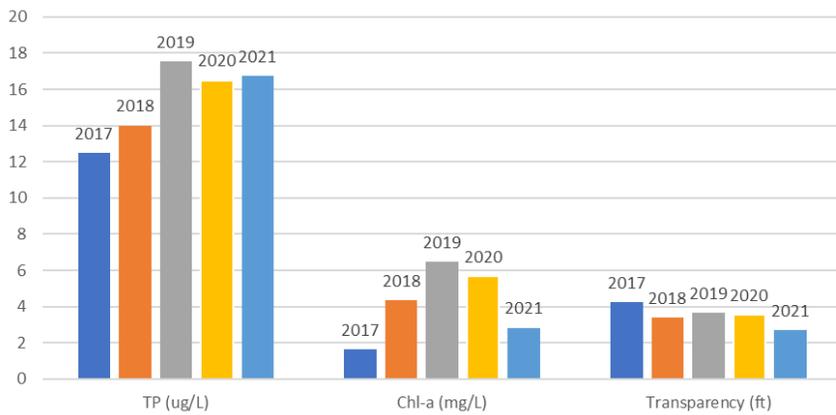
Chlorophyll-A, Total Phosphorus, and Transparency

Horseleg Lake

MN Clean Water Goals for Shallow Lakes

Total Phosphorus (TP): $\leq 60 \mu\text{g/L}$ Chlorophyll-a: $\leq 20 \mu\text{g/L}$ Transparency: ≥ 3.28

Horseleg Lake- Growing Season Averages
(June-Sept)



Year	Grade
2017	A
2018	A
2019	A
2020	A
2021	A

Horseleg Lake is 75 acres and has a maximum depth of 6 feet.

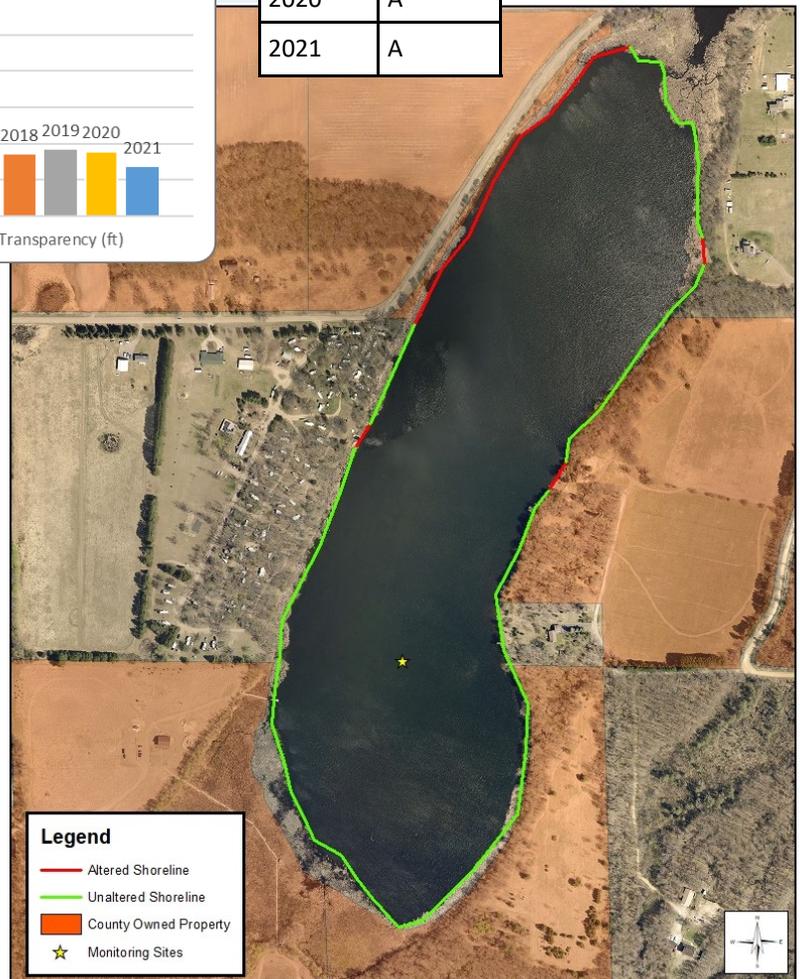
This lake drains north to the North Branch of the Sunrise River.

This is a healthy shallow water lake, data suggests the lake has excellent water quality!

Grades are based on Met Council grading system which creates an easy to understand way to communicate lake health.

A shoreline survey was completed in 2017: 75% of the shoreline was classified as "unaltered" and 25% was altered.

An aquatic plant survey was completed in 2017: the lake supports a healthy and diverse plant community.



Help keep Horseleg Lake Healthy: Because this lake is currently healthy it is important to focus on preservation of current natural lands. How? Ordinances that preserve vegetative cover adjacent to the lake and wetlands, forest management, wetland restorations, land purchases and conservation easements. Isanti County currently owns a majority of land around the lake!

2021 Lake Monitoring Results

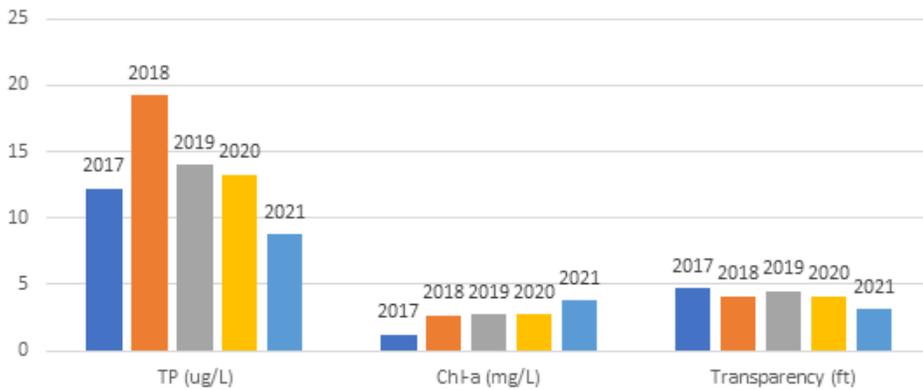
Chlorophyll-A , Total Phosphorus, and Transparency

Horseshoe Lake

MN Clean Water Goals for Shallow Lakes

Total Phosphorus (TP): $\leq 60 \mu\text{g/L}$ Chlorophyll-a: $\leq 20 \mu\text{g/L}$ Transparency: $\geq 3.28 \text{ ft}$

Horseshoe Lake- Growing Season Averages
(June-Sept)



Year	Grade
2017	A
2018	A
2019	A
2020	A
2021	A

Horseshoe Lake is 100 acres and has a maximum depth of 5 feet.

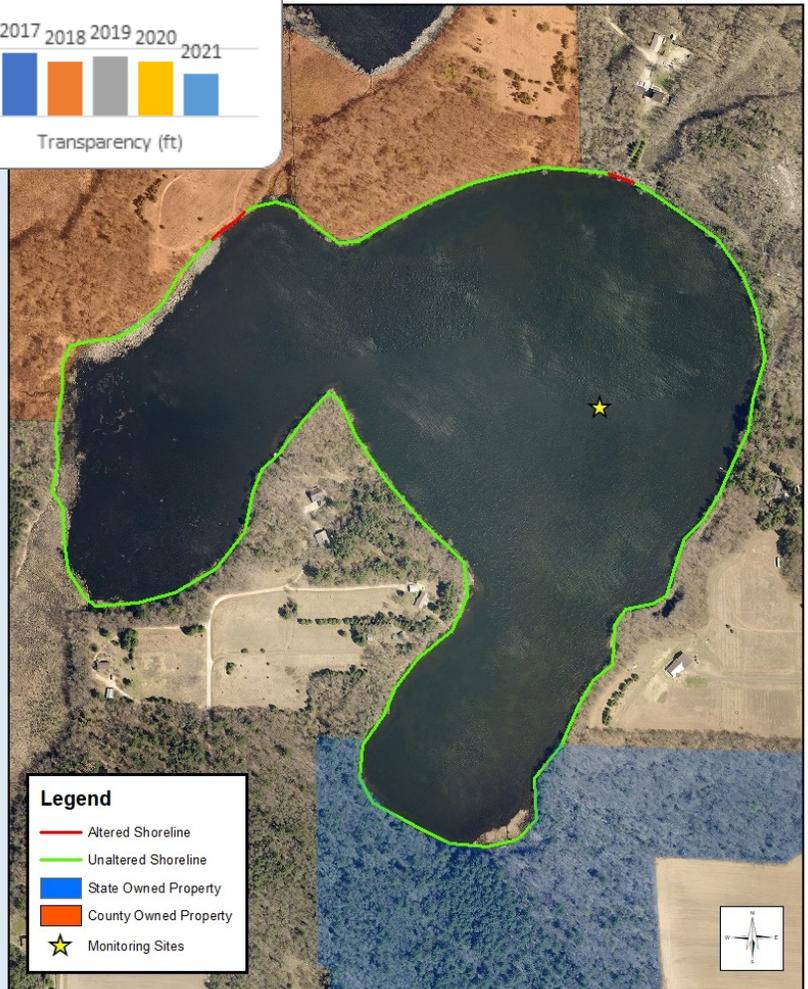
This lake drains north to the North Branch of the Sunrise River.

This is a healthy shallow water lake, data suggests the lake has excellent water quality!

Grades are based on Met Council grading system which creates an easy to understand way to communicate lake health.

A shoreline survey was completed in 2017: 97% of the shoreline was classified as "unaltered" and 3% was altered.

An aquatic plant survey was completed in 2017: the lake supports a healthy and diverse plant community. The MN biological survey indicates the lake has a Rare Plant community type (Lake beach-inland sand subtype).



Help keep Horseshoe Lake Healthy: Because this lake is currently healthy it is important to focus on preservation of current natural lands. How? Ordinances that preserve vegetative cover adjacent to the lake and wetlands, forest management, wetland restorations, land purchases and conservation easements. Isanti County and the State owns a significant portion of land around the lake!

2021 Lake Monitoring Results

Chlorophyll-A, Total Phosphorus, and Transparency

West Twin Lake

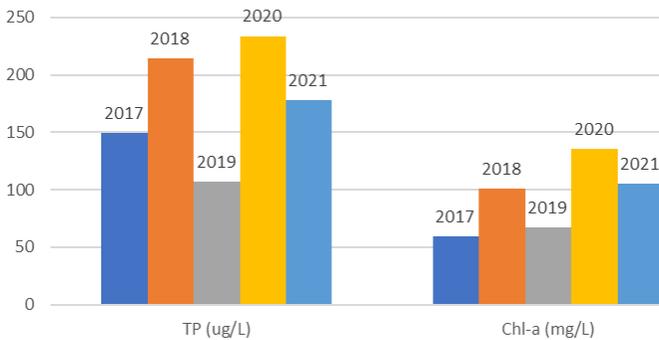
MN Clean Water Goals for Shallow Lakes

Total Phosphorus (TP): $\leq 60 \mu\text{g/L}$

Chlorophyll-a: $\leq 20 \mu\text{g/L}$

Transparency: $\geq 3.28 \text{ ft}$

West Twin Lake- Growing Season Averages (June-Sept)



Year	Grade
2017	D
2018	F
2019	D
2020	F
2021	F

West Twin Lake is 52 acres, has a maximum depth of 6 feet.

This lake drains south to the West Branch of the Sunrise River.

This lake represents a shallow water lake in the “turbid” state, the lake has poor health.

West Twin Lake was listed on the 2022 Impaired Waters list.

Grades are based on Met Council grading system which creates an easy to understand way to communicate lake health.

A shoreline survey was completed in 2017: 93% of the shoreline was classified as “unaltered” and 7% was altered (township road).

An aquatic plant survey was completed in 2017: Even though the lake is not clear it still supports a diverse plant community. A plant species of special concern was found (swamp loosestrife). Also, Otters were spotted on the lake!

If you are aware of historic disturbances or other occurrences that could have affected the health of this lake (such as ditching or farming) please contact the SWCD.



Legend

- Altered Shoreline
- Unaltered Shoreline
- County Owned Property
- ★ Monitoring Sites

Help keep West Twin Lake Healthy: While West Twin Lake does not meet water health standards, the area surrounding the lake including the plant species found within it are healthy. As such, we suggest focusing on preservation of current natural lands around the lake. How? Ordinances that preserve vegetative cover adjacent to the lake and wetlands, forest management, wetland restorations, land purchases and conservation easements.

2021 Lake Monitoring Results

Chlorophyll-A , Total Phosphorus, and Transparency

East Twin Lake

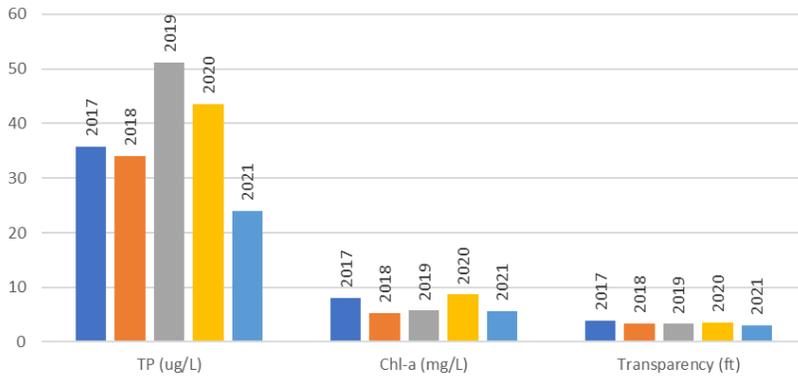
MN Clean Water Goals for Shallow Lakes

Total Phosphorus (TP): $\leq 60 \mu\text{g/L}$

Chlorophyll-a: $\leq 20 \mu\text{g/L}$

Transparency: ≥ 3.28

East Twin Lake- Growing Season Averages
(June-Sept)



Year	Grade
2017	B
2018	B
2019	B
2020	B
2021	A

East Twin Lake is 17.5 acres and has a maximum depth of 5 feet.

This lake drains to West Twin and then south to the West Branch of the Sunrise River.

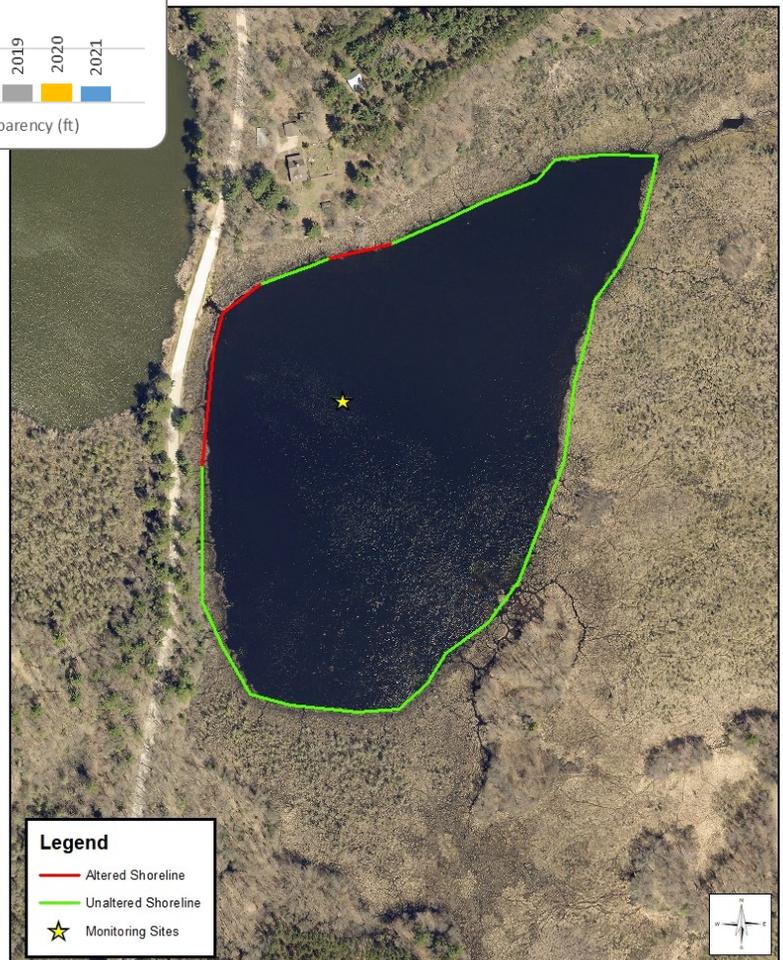
This is a healthy shallow water lake, data suggests the lake has good water quality!

Grades are based on Met Council grading system which creates an easy to understand way to communicate lake health.

During high water years West Twin lake could backflow into the lake and impact it.

A shoreline survey was completed in 2017: 84% of the shoreline was classified as "unaltered" and 16% was altered.

An aquatic plant survey was completed in 2017: the lake supports a healthy and diverse plant community. A plant species of special concern was found (swamp loosestrife).



Help keep East Twin Lake Healthy: Because this lake is currently healthy it is important to focus on preservation of current natural lands. How? Ordinances that preserve vegetative cover adjacent to the lake and wetlands, forest management, wetland restorations, land purchases and conservation easements.

2021 Lake Monitoring Results

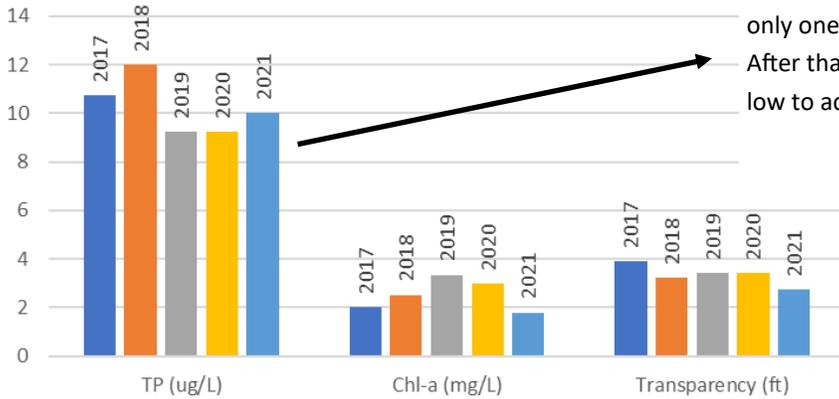
Chlorophyll-A , Total Phosphorus, and Transparency

Upper Birch Lake

MN Clean Water Goals for Shallow Lakes

Total Phosphorus (TP): $\leq 60 \mu\text{g/L}$ Chlorophyll-a: $\leq 20 \mu\text{g/L}$ Transparency: $\geq 3.28 \text{ ft}$

Upper Birch Lake- Growing Season Averages
(June-Sept)



2021 average is based on only one sample in June. After that, the lake was too low to access for sampling.

Year	Grade
2017	A
2018	A
2019	A
2020	A
2021	IF

Upper Birch Lake is 62 acres and has a maximum depth of 6 feet.

This lake drains south to the West Branch of the Sunrise River.

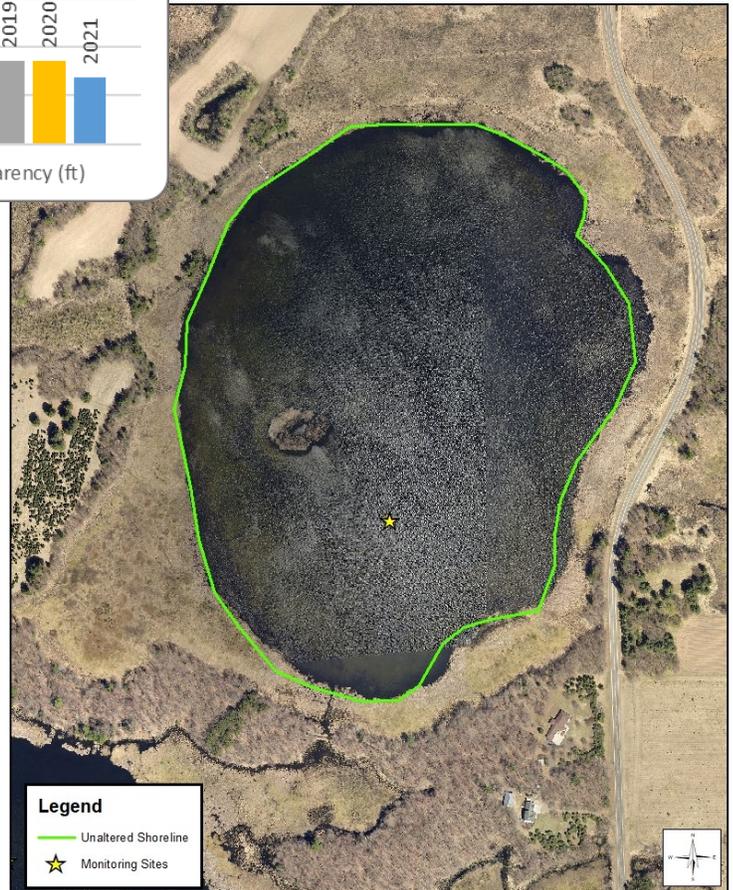
This is a healthy shallow water lake, data suggests the lake has excellent water quality! This lake has the lowest nutrients of all seven monitored lakes.

Grades are based on Met Council grading system which creates an easy to understand way to communicate lake health.

A shoreline survey was completed in 2017: 100% of the shoreline was classified as "unaltered".

An aquatic plant survey was completed in 2017: the lake supports a healthy and diverse plant community.

A new development on the north side of the lake was approved in 2021. If near shore vegetation clearing, ditching and/or wetland filling occurs it could have a negative impact on the lake.



Help keep Upper Birch Lake Healthy: Because this lake is currently healthy it is important to focus on preservation of current natural lands. How? Ordinances that preserve vegetative cover adjacent to the lake and wetlands, forest management, wetland restorations, land purchases and conservation easements.

2021 Lake Monitoring Results

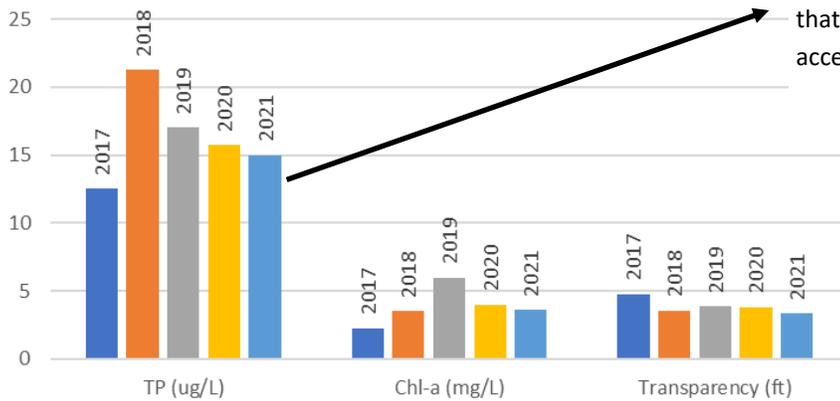
Chlorophyll-A, Total Phosphorus, and Transparency

Lower Birch Lake

MN Clean Water Goals for Shallow Lakes (MCWG)

Total Phosphorus (TP): $\leq 60 \mu\text{g/L}$ Chlorophyll-a: $\leq 20 \mu\text{g/L}$ Transparency: $\geq 3.28 \text{ ft}$

Lower Birch Lake- Growing Season Averages (June-Sept)



2021 average is based on only one sample in June. After that, the lake was too low to access for sampling.

Year	Grade
2017	A
2018	A
2019	A
2020	A
2021	IF

Lower Birch Lake is 62 acres and has a maximum depth of 6 feet.

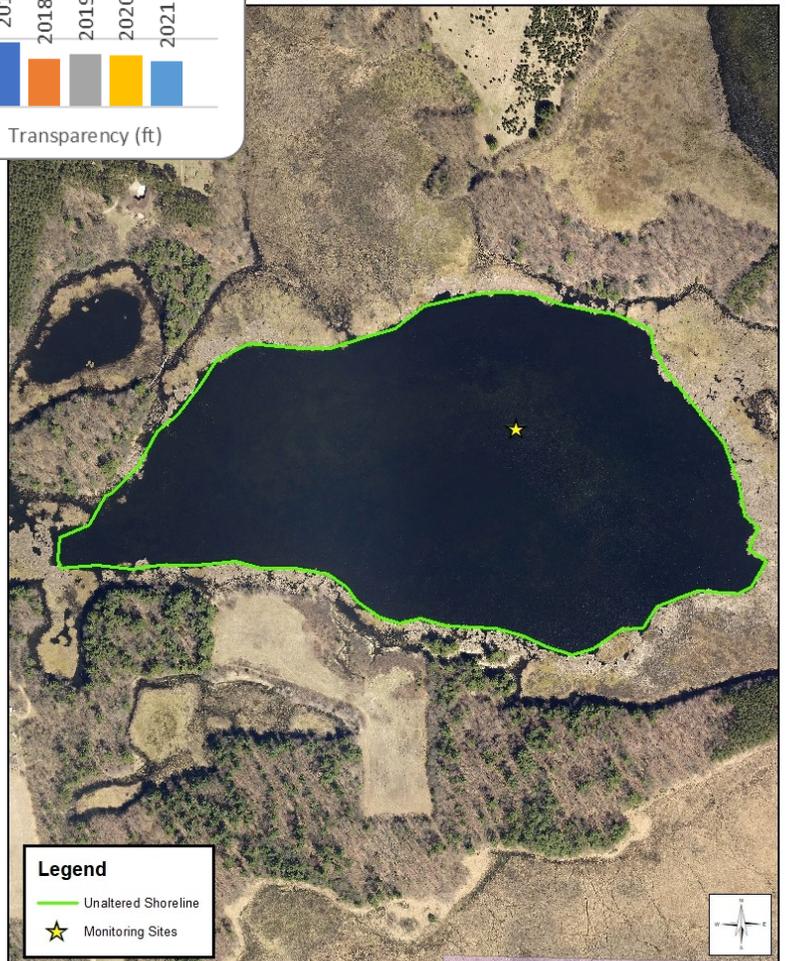
This lake drains south to the West Branch of the Sunrise River.

This is a healthy shallow water lake, data suggests the lake has excellent water quality!

Grades are based on Met Council grading system which creates an easy to understand way to communicate lake health.

A shoreline survey was completed in 2017: 100% of the shoreline was classified as "unaltered".

An aquatic plant survey was completed in 2017: the lake supports a healthy and diverse plant community. The MN Biological Survey indicated a rare habitat type on this lake: Low shrub poor fen.



Help keep Lower Birch Lake Healthy: Because this lake is currently healthy it is important to focus on preservation of current natural lands. How? Ordinances that preserve vegetative cover adjacent to the lake and wetlands, forest management, wetland restorations, land purchases and conservation easements.

2021 Lake Monitoring Results

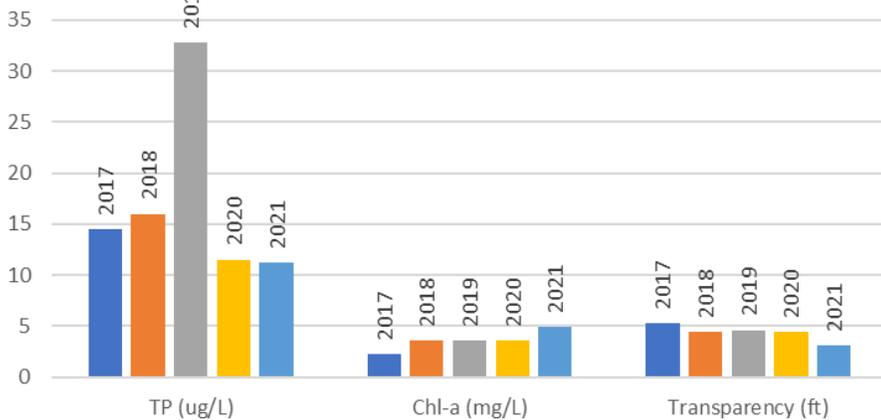
Chlorophyll-A , Total Phosphorus, and Transparency

Hoffman Lake

MN Clean Water Goals for Shallow Lakes

Total Phosphorus (TP): $\leq 60 \mu\text{g/L}$ Chlorophyll-a: $\leq 20 \mu\text{g/L}$ Transparency: $\geq 3.28 \text{ ft}$

Hoffman Lake- Growing Season Averages
(June-Sept)



Year	Grade
2017	A
2018	A
2019	A
2020	A
2021	A

Hoffman Lake is 52 acres and has a maximum depth of 6 feet.

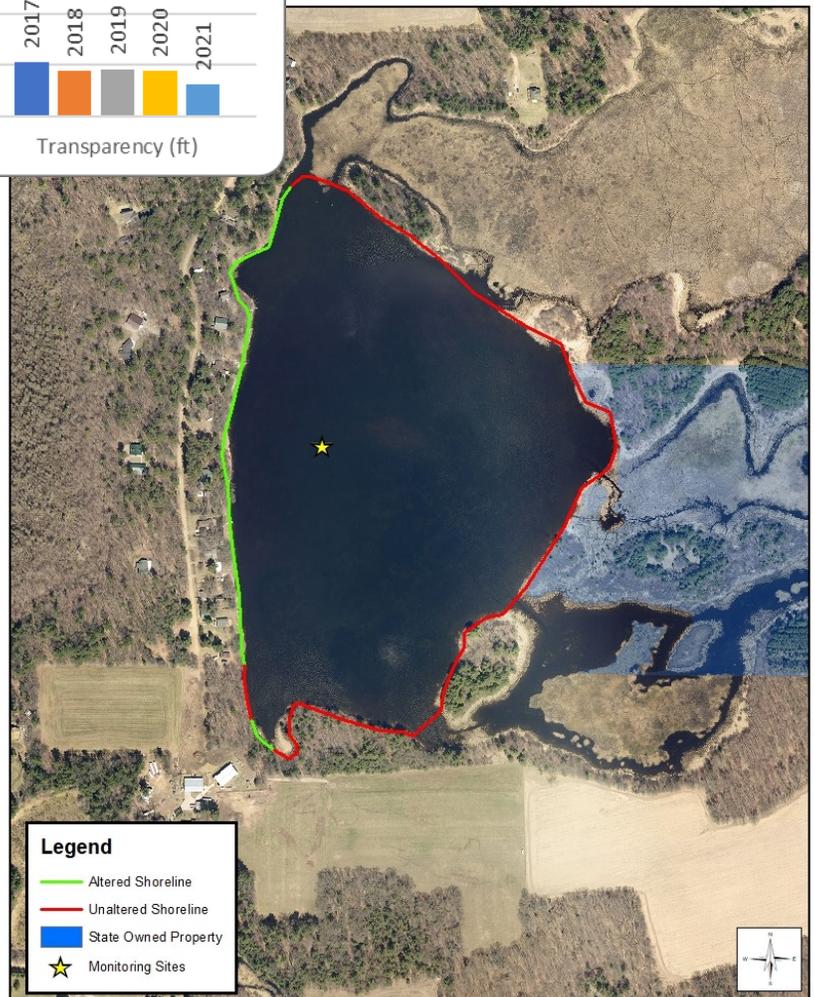
This lake drains south to the West Branch of the Sunrise River.

This is a healthy shallow water lake, data suggests the lake has excellent water quality!

Grades are based on Met Council grading system which creates an easy to understand way to communicate lake health.

A shoreline survey was completed in 2017: 66% of the shoreline was classified as “unaltered” and 34% was altered.

An aquatic plant survey was completed in 2017: the lake supports a healthy and diverse plant community. Invasive upland species were documented: reed canary grass and glossy buckthorn.



Help keep Hoffman Lake Healthy: Because this lake is currently healthy, it is important to focus on preservation of current natural lands. How? Ordinances that preserve vegetative cover adjacent to the lake and wetlands, forest management, wetland restorations, land purchases and conservation easements.

2021 Results and Recommendations

Summary:

The first five years of data (2017-2021) indicate that all lakes, excluding West Twin Lake, have exceptional health. It is important to note that, even though West Twin Lake has somewhat degraded water health, it does support a special plant community and wildlife. Minimal shoreline development and land alterations around the lakes surely plays a large role in maintaining water health, healthy native plant communities and wildlife habitat. Furthermore, with the exception of purple loosestrife on Horseleg lake, none of the lakes monitored have aquatic invasive species! This is RARE!

Recommendations for 2022

- Continue with the monitoring schedule as planned. **2022 costs:** not to exceed 5,262 (total cost est. \$7,440, we will utilize leftover funds from 2021 to cover difference).
- Investigate interest in adding Tamarack and/or Long Lake to monitoring routine in 2023.

Interested in helping protect the health of one of these lakes?

If you own farmland we can complete a conservation plan for your land (to address your resource concerns) and seek funding to help you implement it.

If you own Cropland we have a Cover Crop program for you! Cover Crops improve soil health, reduce erosion, and increased the soils water holding capacity. Call us today to learn more!

If you have a drained or altered wetland that you would like to restore we may be able to help design and restore the basin (potentially even pay money for it).

If you own lakeshore property

1. The SWCD can provide a technical assessment to determine if there is anything you could/should be doing to protect the health of the lakes and we may have funding available to cover a portion of the cost of the project.

2. If you plan to do any work near the shoreline or near a wetland: contact Isanti County Zoning to find out what rules you are required to follow: 763-689-5165.

3. Check out the Lower St. Croix Partnership YouTube channel for "What are Natural Environment Lakes in MN?". This video features Oxford Twp. Natural Environment Lakes, describes why they are special, and how to protect them!

For more information contact: Isanti SWCD 763-689-3271

Tiffany Determan, District Mgr TDeterman@isantiswcd.org