Willow Creek Preserve Report Card

2023

GLACIAL LAKES CONSERVANCY

Isabel Mueller and Ashley Muench

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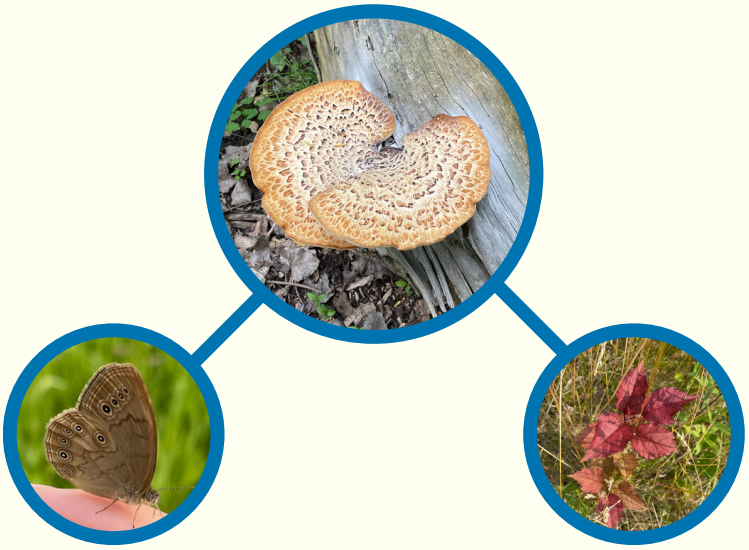
A special *thank you* to our partners...

Authors: Ashley Muench - intern at Glacial Lakes Conservancy, Isabel Mueller - Land Project Coordinator and Willow Creek Preserve Project Manager

To Our Valued Willow Creek Preserve Visitors...

Glacial Lakes Conservancy presents to you its very first Willow Creek Preserve Report Card detailing data from our 2022-2023 monitoring. In 2022-23, GLC staff, Ashley and Isabel, and volunteers completed training in accordance with Water Action Volunteers (WAV) protocols and training manuals to accurately and thoroughly collect valuable water quality data from Willow Creek Preserve in Sheboygan, WI. This was in addition to winter chloride sampling in 2022.

There are four locations along Willow Creek that were monitored. Due to decreased rainfall and record-setting Canadian wildfires that carried smoke as far south as Georgia, it was expected that Willow Creek would face some changes in the Summer of 2023. However, with this being the new normal, it was crucial for GLC staff to start obtaining baseline data. This data will in turn help to indicate success of future restoration activities. In 2023 GLC obtained our Land Management Plan, this will guide us through these restoration activities. All the while we will have water quality monitoring to tell us how things are changing on site.



From Glacial Lakes Conservancy's staff, we would like to say thank you for caring about the native wildlife and beauty that Willow Creek Preserve has to offer. We hope that you find this report card insightful and inspiring. Might it even encourage you to get out next season with us!

2022-23 Staff

Jennifer Born Rutten - *Executive Director*

Isabel Mueller - *Land Project Coordinator and Willow Creek Preserve Project Manager*

Miriam Headrick - *Land Project Coordinator*

Ashley Muench - *Land and Office Intern*

2022-2023 Key Volunteers on Water Quality Project

Peter Pittner - Board Vice President & Land Lead

Victor Pappas - Willow Creek Team Volunteer

Beth Stockdale - Volunteer

Brenna Zajkowski - Volunteer

About Glacial Lakes Conservancy

Glacial Lakes Conservancy's is a non-profit land trust based in Sheboygan, Wisconsin. Our mission is to **permanently** preserve and protect land and water resources for future generations. We strive to maintain the beauty and natural, native biodiversity of each and every piece of land that we manage and protect. For many years to come, we will strive to improve, maintain, and protect the land we rely on. We will do this all while serving surrounding counties of Fond du Lac, Manitowoc, Calumet and Kewaunee as we do our very own Sheboygan County.

GLC holds **29** conservation easements + GLC's **5** public perserves = Totaling over **2,100** acres of land!

Glacial Lakes Conservancy works within five different counties in Wisconsin: Fond du Lac, Sheboygan, Calumet, Manitowoc, and Kewaunee. This report card focuses on Willow Creek Preserve, one of GLC's public preserves located in Sheboygan County. For more details about Willow Creek and Willow Creek Preserve, see **page 4.**

For more information on Glacial Lakes Conservancy, visit https://www.glaciallakes.org

Making the Grade Scale

A Water quality data meets surface water standards 87% to 100% of the time

B Water quality data meets surface water standards 74% to 86% of the time

C Water quality data meets surface water standards 61% to 73% of the time

D Water quality data meets surface water less than 60% of the time

F Water quality data never meets surface water standards

Note: Not all parameters use this scale. See page 5.

Data is collected from WAV trained GLC staff and volunteers from around the Sheboygan, WI area. Collected data is then entered into the Wisconsin DNR's Surface Water Integrated Monitoring System (SWIMS). Because this is the first year of monitoring in Willow Creek at Willow Creek Preserve, future years data will be compared to data collected prior. In the future, the grade scale may be adjusted to accommodate for future patterns and/or changes and overall stream health trends.

Willow Creek Preserve Map

About Willow Creek Preserve

Willow Creek Preserve is a 143-acre lot, located in Sheboygan, WI. The Preserve lies in a former oxbow of the Sheboygan River, surrounded by steep, wooded slopes. The Preserve contains many ecosystems including wetlands, forest, fallow fields and more! Willow Creek itself is one of only two tributaries on the Sheboygan River, which is an Area of Concern, that can be accessed by Lake Michigan fisheries. Hence why it is such an important site to GLC! It wasn't until October 2018 that GLC acquired Willow Creek Preserve from the City of Sheboygan with funding provided by the Sheboygan River Natural Resources Damage Assessment (NRDA) settlement. The preserve's successes thus far would not be made possible without the contributions of the City and County of Sheboygan, the Wisconsin Department of Natural Resources (WDNR), and the many invested government and community stakeholders. Thanks to them, we now are working towards a healthier and more diverse Preserve.

While it is home to many native species, invasive species are a huge concern at Willow Creek Preserve. Another concern is the discharge of hazardous substances into the Sheboygan River. Willow Creek flows into the Sheboygan River, so anything in Willow Creek can have an impact on the Sheboygan River. Willow Creek Preserve has been degraded over time, and it is crucial to GLC that the site is managed for ecosystem health, biodiversity and community access to the outdoors. That being said, ongoing maintenance, stewardship, and preservation projects are vital throughout the upcoming years.

Methods and Protocols

Dissolved Oxygen (DO)

Dissolved Oxygen is measured using a Hach Kit. This kit utilizes drop count titration which can be done on site. Low DO levels are associated with poor water quality conditions. While adequate levels are necessary for species who reside in the water source.

WDNR Surface Water Standard - >5 mg/L

*scale based on % of time the stream met this standard

Streamflow

Streamflow might be the most fun to measure on site! For this test, stream measurements are taken and then a float test is performed. During the float test, you will time the length of time in seconds it takes for a float (tennis ball) to make it 20ft within the waterway.

Healthy Levels between 100-200 cubic square feet/ second

*scale based on % of time the streamflow fell in this bracket

Temperature

Temperature is a pretty straightforward measurement! We use a thermometer to gather air and water temperatures. This number helps to assess stream health in a multitude of ways from DO level to stream temperature fluctuations throughout the day.

Healthy Level is below 20 degrees celsius

*scale based on % of time the streamflow met these requirements

Aquatic Index

Aquatic Indexing entails catching some critters that call the water home. While we were shocked in our October monitoring by the salmon run, that is not the normal! Typically, we are surveying riffles, leaf packs, undercut banks or snags of trees and roots.

Rating Scale (based on presence/ absence survey)

*scale: F=0, D=1-1.5, C=1.6-2, B=2.1-2.5, A=2.6-3.5

Transparency

Water transparency is measured by using a transparency tube in which water is collected up to 120cm. At that point, the tester looks through to get visuals on the checkered disc at the bottom. If the disc is not visible water levels are lowered until it is.

Healthy levels - <25NTU

*scale based on % of time the streamflow met these requirements

Total Phosphorus

While we would like to think we are smart enough and have the tools to get this done, this is tested by the State Lab of Hygiene in Madison.

WDNR Surface Water Standard - <0.075 mg/L

*scale based on % of time the phosphorus met requirements

Chloride

This metric was tested in the 2022-23 winter season by the Environmental Research and Innovation Center (ERIC) Lab based out of UW Oshkosh

Healthy levels - <100 mg/L

*scale: F=>800, D=>395, C= 230-395, B= 100-229, A=≤100

WAV Monitoring Locations Map

Location #1

Tributary 1

Tributary 1 is located just before the railroad as you are walking towards the south loop of the Preserve. This tributary testing site is the last one prior to its confluence with Willow Creek, near the confluence to the Sheboygan River.

B-

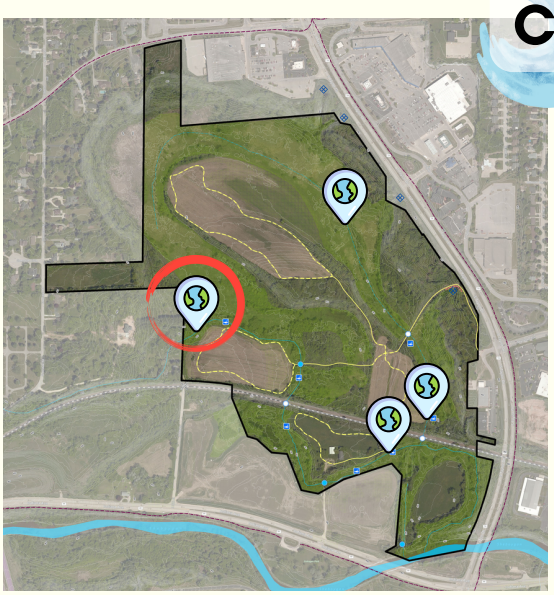
Latitude 43.74381190
Longitude -87.74624370

Location #2

Willow Creek 2

Willow Creek 2 is located where Willow Creek first flows into the Preserve. This Creek comes from the Kohler area, flows through the Preserve and discharges into the Sheboygan River.

C+



Latitude 43.74575080
Longitude -87.75303680

Map Legend:

= monitoring location

= specified monitoring location

WAV Monitoring Locations Map

Location #3

Willow Creek 1

B-

Willow Creek 1 testing location is accessible and encouraged to be accessed by trail users! This site is off of the trail headed toward the South Loop. This site also hosts our CrowdHydrology meter where trail users can input water level data for us while on a hike!

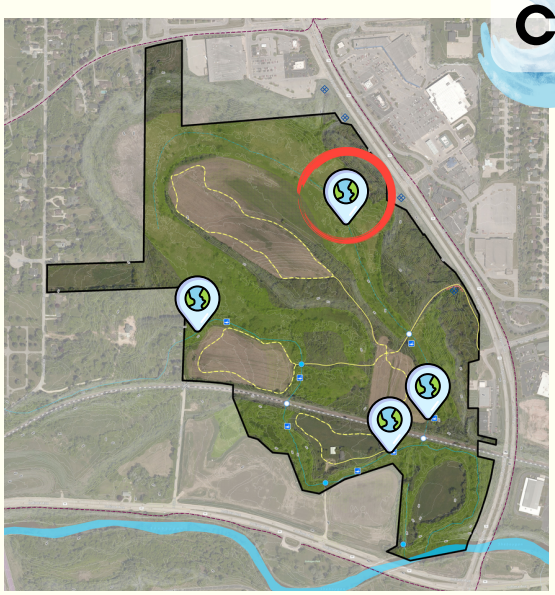
Latitude 43.74307610
Longitude -87.74728740

Location #4

Tributary 2

C+

Tributary 2 is located in the thralls of no man's land! This site is located within the old Oxbow of the Sheboygan River. This site has typically lower water levels and lower DO levels. But has potential to serve species with restoration successes.

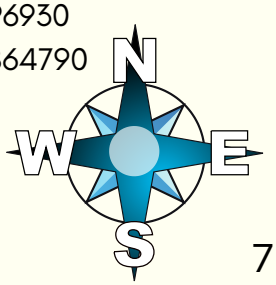


Latitude 43.74796930
Longitude -87.74864790

Map Legend:

= monitoring location

= specified monitoring location



Location #1 Results

Location #1 - Trib 1

Phosphorus — C

Dissolved Oxygen — C

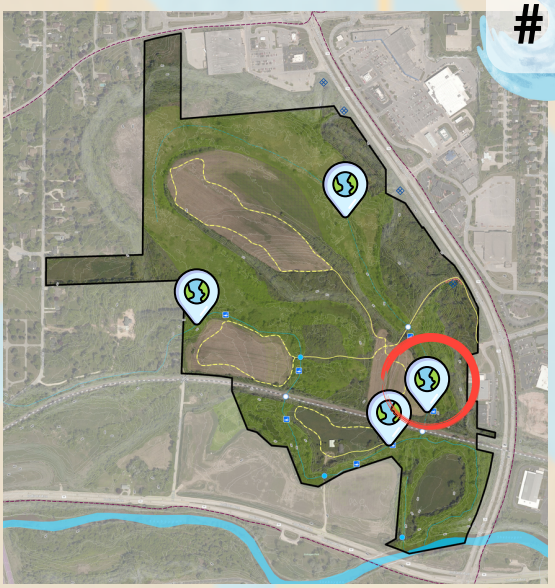
Streamflow — D

Temperature — A

Aquatic Index — C

Transparency — A

Chloride — B



Grade: B-

Location #2 Results

Location #2 - WC2

Phosphorus — C

Dissolved Oxygen — B

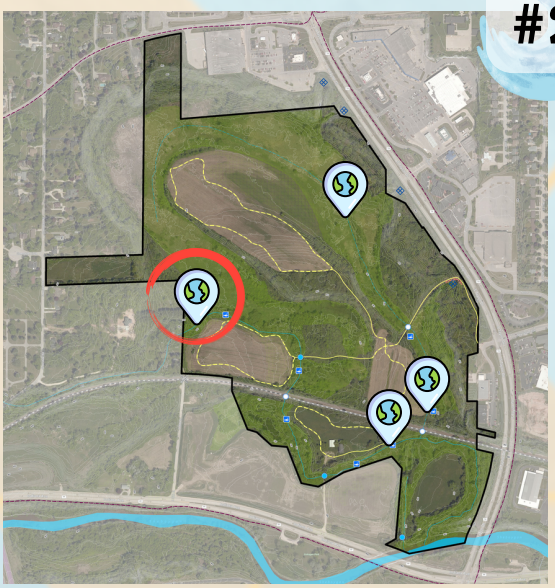
Streamflow — D

Temperature — A

Aquatic Index — C

Transparency — B

Chloride — N/A



Grade: C+

Location #3 Results

Location #3 - WC1

Phosphorus — C

Dissolved Oxygen — B

Streamflow — D

Temperature — A

Aquatic Index — C

Transparency — A

Chloride — B

Grade: B-

Location #4 Results

Location #4 - Trib 2

Phosphorus

N/A

Dissolved Oxygen

D

Streamflow

D

Temperature

A

Aquatic Index

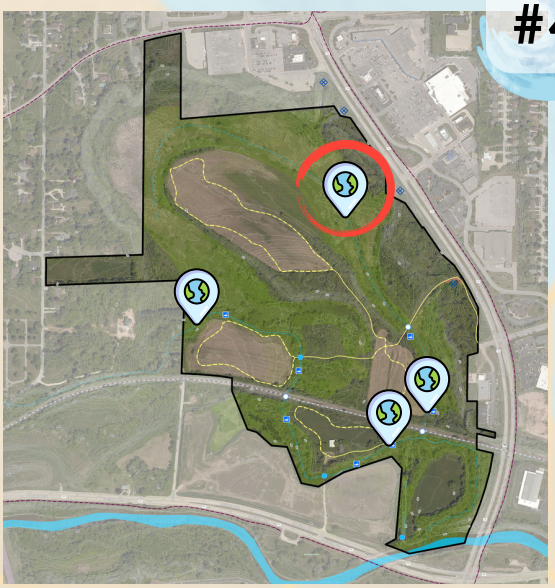
C

Transparency

A

Chloride

N/A



Grade: C+

Discussion

You may notice that these results are not perfect by any means. However, they are a great starting point. As this is our first year of baseline data collection, we had no metrics to go off of as far as stream health is concerned, besides fisheries reports. That said, these reports were lacking sufficient data.

With this year's baseline data, we were able to have eyes and tools in the stream assessing health, populations, and challenges every month. You may have noticed that some streams were tested for chloride or phosphorus while others were not. This was due to the timing of establishing monitoring sites and funding. While we do not have a fully holistic view of the preserve currently, these metrics will continue being tested and compared as the years go on. This will help to guide us as we move forward with restoration projects.

What we know from this year of monitoring can be summarized briefly. We know that fish were able to access the tributary in certain circumstances. This was previously believed to be impossible! We also know that the chloride runoff from street salting was a bit higher than ideal, but still within reason. This will hopefully in part be mitigated by the warm temps this winter and so too our Regenerative Stormwater Conveyance down the line!

We also know that while there are not many installments currently in place to filter water as it flows through Willow Creek, there is substantial natural filtration that happens between WC2 and WC1 sites.

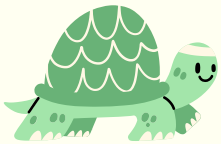
The hope is that with continued monitoring, new tools, and a more holistic approach as the years carry on, we will be able to document the benefits that GLC's restoration efforts will have on the Willow Creek Property, Willow Creek itself, and the Sheboygan River.

Protecting Willow Creek Preserve

As a Land Trust

Archaeological Study -

GLC will be performing a full site archaeological study in 2023-2024. This will allow us to know how the land was used before and to make more informed decisions as we move forward.



Turtle Nesting Site -

This project is one of our smaller projects that will help the critters on our site find a suitable nesting area that is near the water and not primed for predation.

Regenerative Stormwater Conveyance -

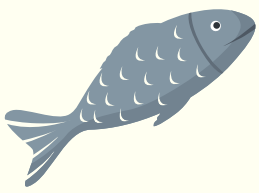
This project is of highest importance as the installation of this green stormwater infrastructure will improve water quality and safety on the Preserve! By installing a series of ponded retention ponds, stormwater will be filtered, slowed and cooled while headed downstream to the Sheboygan River.

Wetland Enhancement Project -

This wetland project will help to eradicate invasives, extend the hydrologic period of the wetland many of our critters use year round, along with increase biodiversity and water quality.

Invasive Project -

The invasive endeavor might be our biggest yet! This will be a whole site effort to reduce the amounts of invasives currently present at Willow Creek. This will in turn result in increased biodiversity and ecosystem health.



Fish Passage Project -

If you have been to Willow Creek before, you might have noticed in good times, there are lots of fish friends! Unfortunately, years of degraded water quality, stream bank degradation, and hinderances within the stream our fish friends will need a little help to get by. This project aims to research how to best fit our preserve for water quality and fish passage/ health in addition to making our stream function how a healthy stream should!

Caring for Willow Creek Preserve

and so should you!

Why Should I Care?

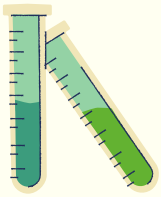
The importance of healthy freshwater ecosystems is deeply misunderstood and taken for granted throughout the world. **3%** of Earth's water is freshwater, and only **1%** is accessible to humans. Humanity relies heavily on healthy freshwater in many ways.

One of the basic laws of ecology is that everything is connected to everything else. That being said, one can see why it's important to keep freshwater ecosystems healthy. If one freshwater ecosystem goes bad, it will eventually have an impact on all of us in one way or another.

Phosphorus, an important element for the biological function of living organisms, was a part of testing. In excess, phosphorus can lead to the overgrowth of algae, degradation of water quality, and can destroy entire ecosystems. One main source of phosphorus in streams is from agricultural land use.

Because Willow Creek flows into the Sheboygan River which flows into Lake Michigan, poor water quality in Willow Creek and the tributary can lead to harmful effects in Lake Michigan.

What *you* can do to Help



Become a Citizen Scientist!

That's right, you can be a citizen scientist and contribute meaningful contributions to water quality in your area. As a Water Action Volunteer, the water quality data that YOU collect will be used by professionals to find ways to improve the health of your local waters. It's a win-win. You get to be a part of something cool and life-changing to many forms of life, while the waters benefits from your contributions.

Be careful how you utilize Willow Creek Preserve. While nice, leisurely strolls through the paths of Willow Creek Preserve are welcome, we discourage littering or dumping any kind of waste into nearby waters, as they can be harmful to the biodiversity and health of Willow Creek preserve.

Be Mindful of Your Actions

Make a Donation or Become a Member with GLC

More funding will help provide the resources necessary to get more thorough results. In future efforts to obtain water quality data, we can afford the means to collect the data we were lacking this season, such as chloride from trib 2 and WC 2, and phosphorus from trib 2.

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