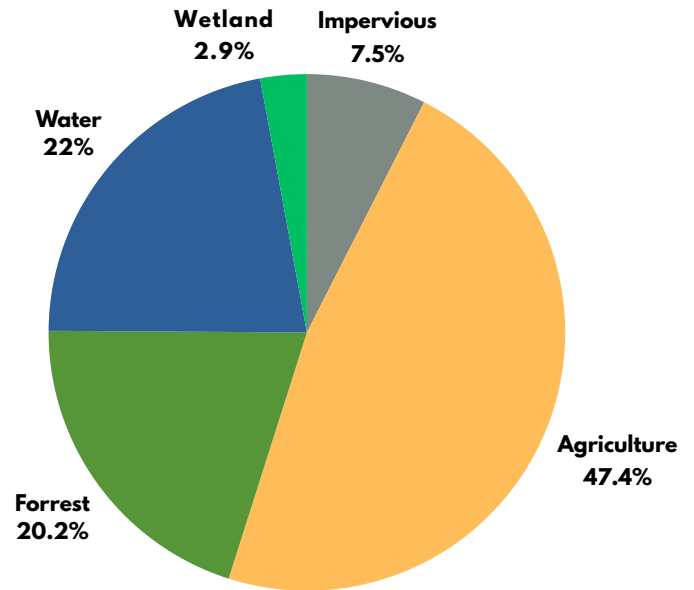


➤➤➤ GENERAL INFORMATION



LAND USE:

2,384 acres



MAOR LAKES

- Long

SHALLOW LAKE

- Strunk

Water Body	Status	Summary
Long	Protect	Maintain good condition and protect against future risks

➤➤➤ PRWD GOALS FOR THE WATER MANANGMENT AREA

- Reduce nutrient loading to Long Lake.
- Promote shorelines practices that are resilient to fluctuating water levels.
- Ensure a sustainable groundwater supply.
- Prevent establishment of new invasive species and manage existing invasive species
- Protect and improve wildlife habitat in near shore areas
- Maintain healthy fish communities.

➤➤➤ BEST MANAGEMENT PRACTICES (BMPS)

The Watershed District offers a BMP program to reimburse homeowners a portion of the cost to install landscaping practices that:

- protect or restore the quality of our lakes and rivers
- protect or restore native plant communities and wildlife habitats
- innovative approaches to stormwater treatment at the source

BMP NUMBERS

- 4 BMP projects Funded
- **\$2,440.50** paid to homeowners as reimbursement.
- 3 Shoreline projects
- 1 Pollinator project

DISTRICT HIGHLIGHTS



REGULATORY AND PERMITS NUMBERS

- **69** Shore Impact Zone Permits (sand blankets, riprap, shoreline vegetation)
- **2** Subdivisions/Planned Unit Developments
- **7** Commercial Stormwater Management
- **8** Residential Stormwater Management
- **4** Roads, Parking Lots, Bridges, Culverts, or Storm Sewer Projects
- **5** Underground Cable Projects

➤➤➤ REGULATORY AND PERMITTING PROGRAMS

Watershed Districts are mandated by the legislature to adopt rules. Regulation plays an important role in preventing and mitigating water resource issues. The regulatory program sets standards that must be met by entities that develop or otherwise disturb land within the District. The regulatory program is intended to provide for consistent application of resource protection from impacts related to land use change throughout the watershed.

PRWD works in cooperation with property owners, contractors and engineers, and local government units to maintain or increase the water quality in our district through the rules and permitting process. The largest number of permits are issued each year for Shore Impact Zone Alterations. However, our office also permits the stormwater management for Subdivisions, Planned Unit Developments, Commercial and Residential Construction, Roadways, and Underground Utilities.

➤➤➤ ENVIRONMENTAL EDUCATION

One of the great joys for our staff is sharing our knowledge and passion for our lakes and rivers with the young people in our community.

One of the most effective ways we have found is to make sure our local schools have the resources to get kids out into nature. Each year we fund transportation costs for field trips to Hamden Slough, Ike Fisher Farm, and Sucker Creek Preserve.

PRWD also administers a small grant programs to help educators purchase science supplies for their classrooms and we routinely give presentations to students in classrooms and on field trips.

EDUCATION NUMBERS

- **\$571.75** for classroom supplies and event sponsorships
- **\$3,428.45** for transportation costs for environmental field trips.
- **6 classes** of 5th, 7th, & 8th Grade received education on Aquatic Invasive Species
- **400** fourth grade students from Detroit Lakes, Frazee Vergas, and Lake Park Audubon attended Waterfest



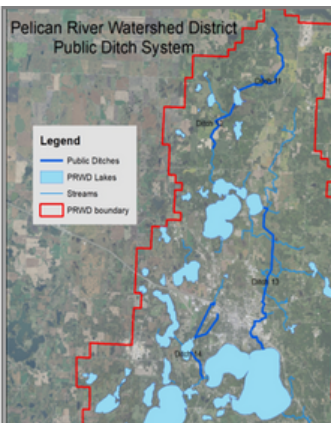
DRAINAGE NUMBERS

- **7** Beaver Dams Removed
- **31** Beaver Trapped
- **0** Buffer Enforcement Actions

➤➤➤ DRAINAGE AUTHORITY

In the late 1990's, PRWD assumed drainage authority of Becker County Ditch 11/12 (Campbell Lake/Creek area), 13 (Floyd Lake, Rice Lake, City of Detroit Lakes area), and 14 (St. Clair Lake, City of Detroit Lakes area).

Most of the District's work as the Drainage Authority centers on beaver control and removing debris blockages from the drainage channel. In addition, these systems are governed by a MN Buffer Rule and the District is responsible for enforcement of the required buffers.



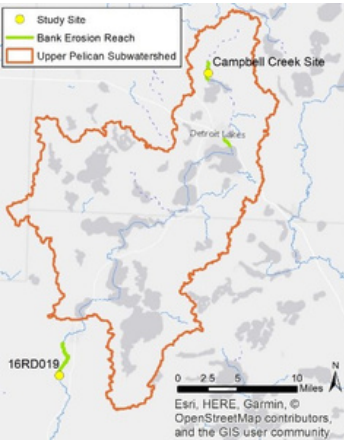
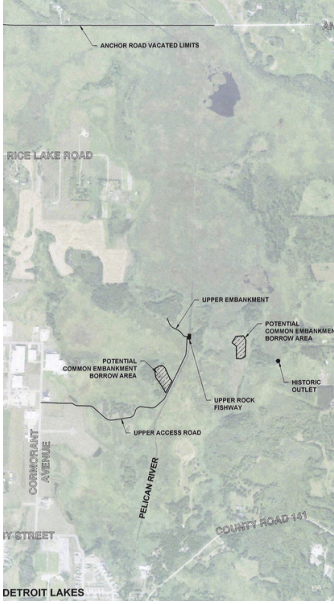
DISTRICT-WIDE PROJECTS



➤➤➤ RICE LAKE RESTORATION

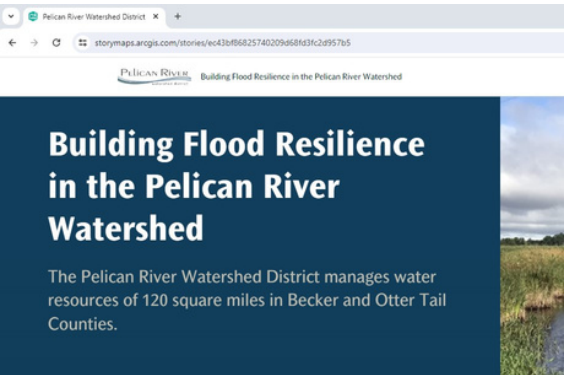
In the 1970's, the Rice Lake Wetland, was identified as the primary source and contributor of "legacy" phosphorus loading to Big Detroit. To address this issue, the wetland was restored in 2022 (see photo on the right with the construction of rock arch rapids to raise the wetland water level and to allow for fish passage). This wetland is located between Little Floyd Lake and HWY 34. 2023 monitoring results showed a decrease in phosphorus from the wetland to the Pelican River from previous years data.

Another downstream structure near Terry Street will be built in 2024 to further lower phosphorus levels to the Pelican River and downstream Detroit Lake.



◀◀◀ CAMPBELL CREEK 319 PROJECT

The District was awarded a federal 319 grant to address excessive sediment and phosphorus in the Campbell Creek sub-watershed area. In early 2024, the project area workplan was approved by the Environmental Protection Agency to construct: (1) 3,750 linear feet of streambank stabilization above and below Becker County HWY 149 using a variety of practices, (2) a multi-stage drainage and control structure near Campbell Lake, and (3) a grade stabilization project in a nearby farm field. The planning, design, and engineering work is starting this summer, with construction to occur in 2025 and 2026 for an estimated cost of \$500,000. The grant will be matched using Otter Tail 1W1P grant and District funds.



➤➤➤ FEMA FLOOD MITIGATION GRANT

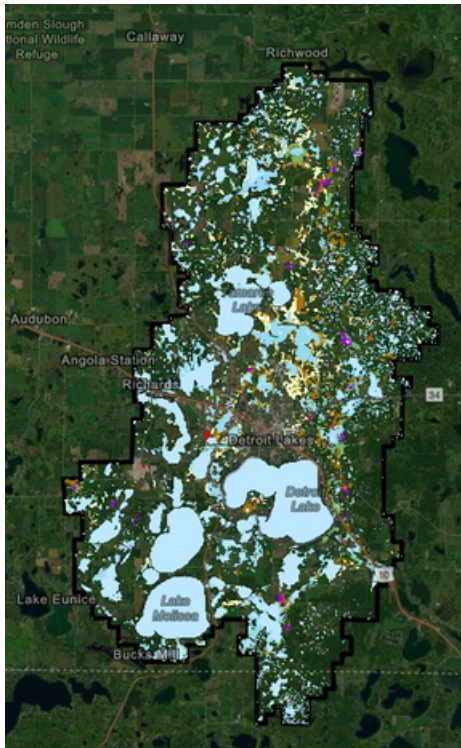
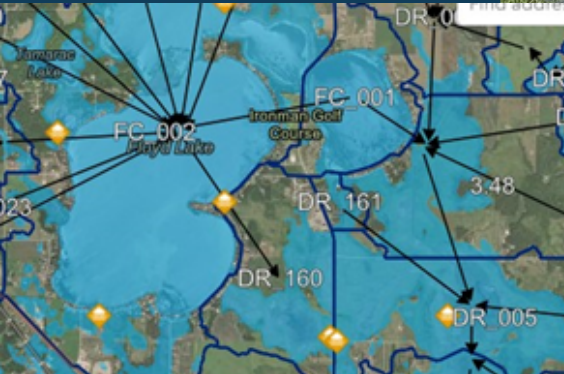
PRWD is completing the FEMA Flood Mitigation project in 2024. A Hydrologic & Hydraulic (H&H) model map was developed to identify flood prone areas. This information will assist with developing future projects to reduce flood risk.

Four flood prone areas were identified.

- Highway 21 at Rice Lake Road
- Pelican River at North Shore Drive
- Sucker Creek at Mountain Road
- East Munson Drive

You can report observed flooding at the PRWD website under the resources tab under Special Studies.

<https://prwd.org/resources/fema-flooding-study/>





The Long WMA is 2,384 acres and includes Long and Strunk Lakes. Strunk Lake, a small 24-acre basin, drains to Long Lake via a series of wetlands, but little is known about the lake itself. Long Lake is the main lake in this WMA, with 407 acres and 6 miles of shoreline. Most of Long Lake's water comes from groundwater sources, although there is some surface flow from its direct watershed and from wetlands near Strunk Lake. Long Lake eventually drains through a small outlet to St. Clair Lake.

Most of the land in the Long Lake WMA has been greatly altered. Gravel mining takes place in this WMA, and highways have impacted drainage patterns. Shoreline along Long Lake has also been greatly modified. Recreational pressure on the lake is also very high. Boat traffic and noise have sometimes emerged as issues, especially with the advent of wake surfing boats.

Water quality data for 2023 testing is included in the pages that follow. For more detailed information on historical water monitoring in this area, please see the 'Our Water' Section of our website at www.prwd.org.

LAKE WATER QUALITY NUMBERS 2023

LONG	2023 Average	20 Year Average	MNPCA Lake Standards
Total Phosphorus (TP)	0.007 ug/L	0.013 ug/L	> 0.040 ug/L
Chlorophyll-a (Chl-a)	1.82 ug/L	3.82 ug/L	> 14 ug/L
Secchi depth	24.38 feet	15 feet	< 4.6 feet

BACKGROUND ON WATER QUALITY TESTS

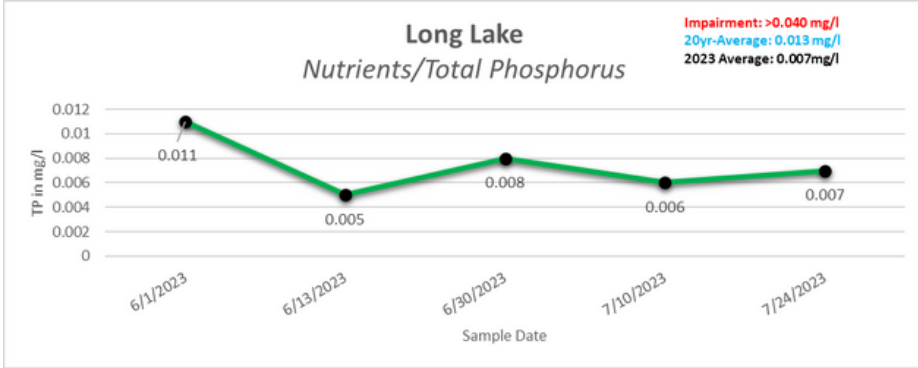
Phosphates are chemicals that enter waterways from both natural and human caused sources. Phosphates become detrimental when they over-fertilize aquatic plants and increase the rate of natural eutrophication. Eutrophication results in an increase in the carbon content and the amount of "mucky" or organic-laden sediments. This in turn leads to nuisance conditions such as algal growth.

Chlorophyll-a is a naturally occurring compound found in all algae. Measuring Chlorophyll-a concentration in lake water is a reasonable estimation of the presence or absence of algal growth in a lake system. An increase in the biomass of algae in a body of water can result in decreased levels of dissolved oxygen, which is needed by many aquatic animals to survive.

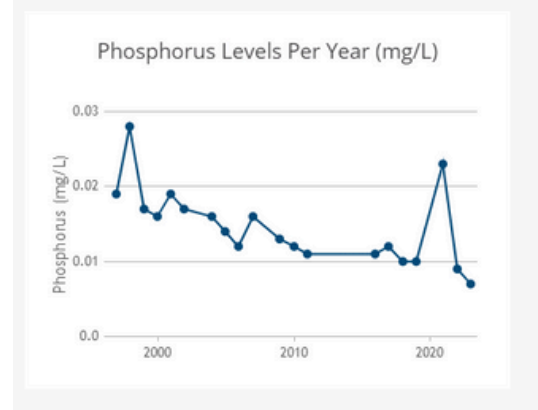
A **Secchi** depth measurement is a visual measure of water clarity through water column. Measuring clarity of the water is another test of eutrophication of a water body.

LAKE WATER QUALITY 2023 ALL TEST DATES

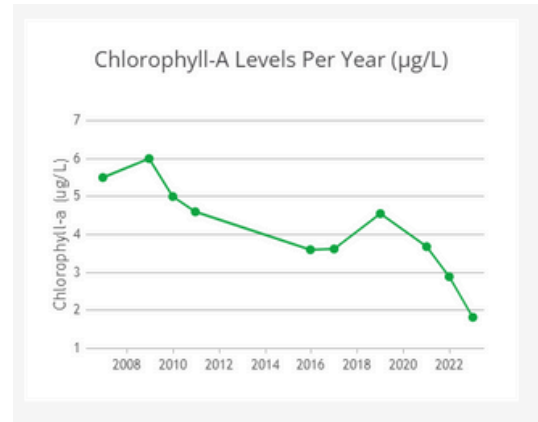
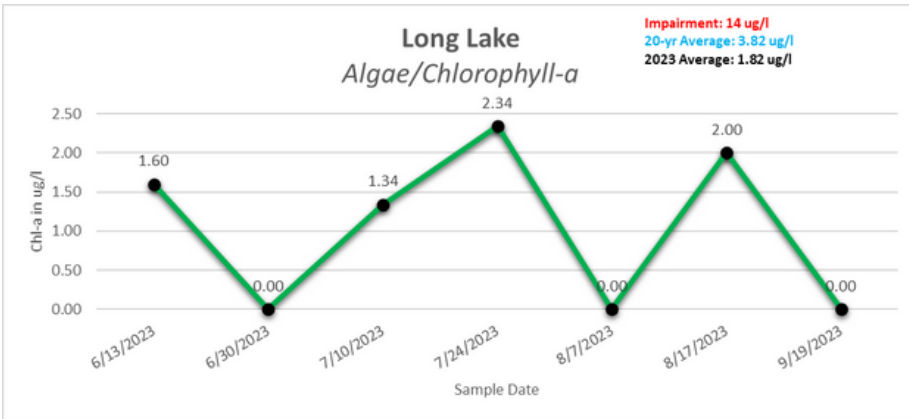
TOTAL PHOSPHORUS



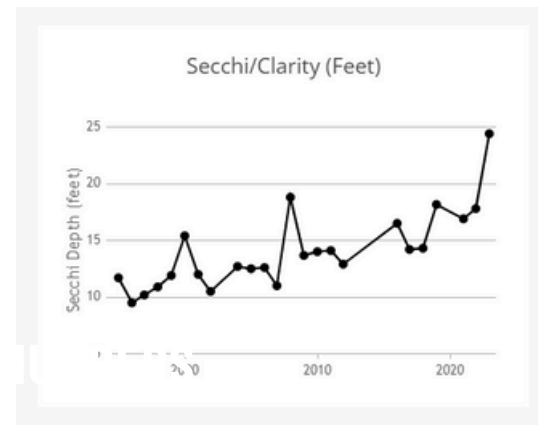
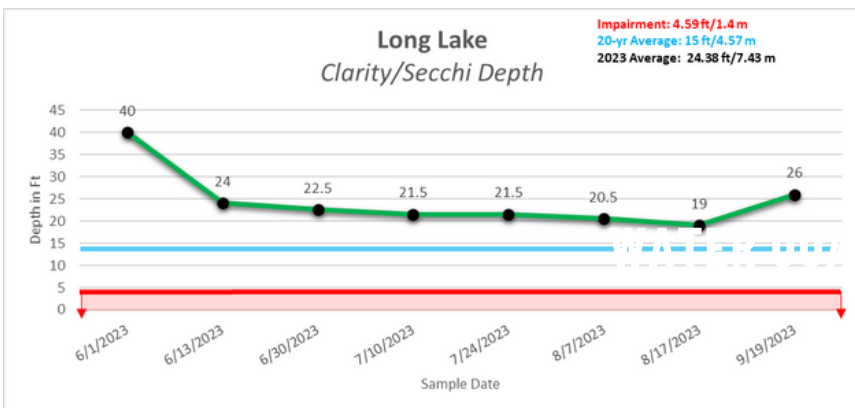
LAKE WATER QUALITY ALL YEARS



CHLOROPHYLL-A



SECCHI DEPTH

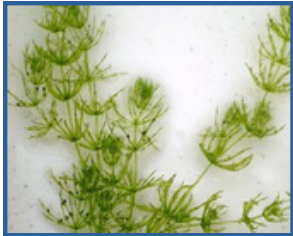


LONG LAKE WATER MANAGEMENT AREA

>>> AQUATIC VEGETATION SURVEY 2023

>>> LONG

The first vegetation point-intercept survey of Long Lake conducted by the PRWD occurred on July 20, 2023. Of the 131 points sampled, 98% of the points had submersed native vegetation with a mean of 2.9 submersed native taxa per point. No non-native taxa were located at any point. Long Lake has an average of 4.4 species per sampling site.



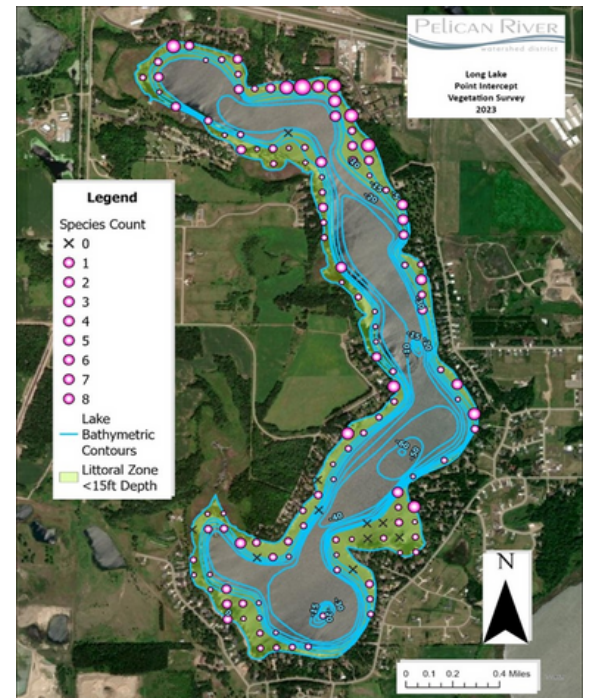
Chara spp./Nitella spp.
Chara
234 sites - 85% frequency



Utricularia spp.
Bladderwort
68 sites - 40% frequency



Schoenoplectus spp.
Bulrush
66 sites - 21% frequency



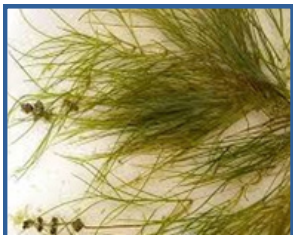
Typha latifolia & angustifolia
Cattail
41 sites - 14% frequency



Nymphaeaceae spp.
Water Lilies
35 sites - 15% frequency



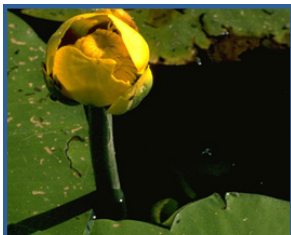
Potamogeton praelongus
White-Stem Pondweed
21 sites - 16% frequency



Stuckenia pectinata.
Sago Pondweed
18 sites - 14% frequency



Zizania palustris
Wild Rice
17 sites - 8% frequency



Nuphar lutea
Yellow Pond Lily
16 sites - 7% frequency



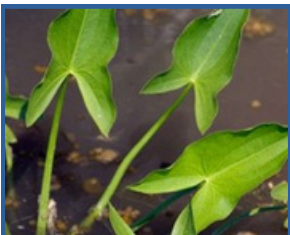
myriophyllum verticillatum
Whorled Watermilfoil
14 sites - 9% frequency



Potamogeton zosteriformis
Flat-stem Pondweed
11 sites - 5% frequency



Elodea canadensis
Canada Waterweed
8 sites - 6% frequency



Sagittaria cuneata
Arum leaved Arrowhead
8 sites - 5% frequency



Ceratophyllum demersum
Coontail
5 sites - 4% frequency



Potamogeton pusillus
Small Pondweed
5 sites - 4% frequency

Also noted in less than 5 sites:

- Sparganium americanum* - American Burr Reed
- Najas gracillima* - Slender Waternymph
- Basenia schreberi* - Watershield
- Vallisneria americana* - Water Celery

SHORELAND PROJECTS

Basic Goals for Shoreland Restorations:

- **Imitate Nature** - The native vegetation strengthens shoreline structural integrity. The deep roots of these plants bind the earth together while their foliage and branches protect the ground from rainfall and winds.
- **Keep slopes gentle** - The gradual slope of a natural shoreline absorbs the energy of waves. A steep, eroded slope or retaining wall allows waves to crash into the shore, drastically increasing erosion and causing that wave energy to cause damage on adjacent shorelines.
- **Employ “soft armoring” whenever possible** - By “soft armoring” we refer to live plants, logs, root wads, vegetative mats, and other methods that eliminate or reduce the need for “hard armoring”, such as rock rip-rap. Soft armor is alive and so can adapt to changes in its environment as well as reproduce and multiply. It also provides habitat for fish and wildlife.
- **Mix it up** - On natural shorelines, you will see a wide diversity of materials: live trees, dead branches, stumps, rocks of many shapes and sizes, silt, sand, cattails, grasses, flowering plants, etc. By imitating this variety, you can maintain or reproduce the natural value of the shoreline and have an effective, resilient, and eye-pleasing shoreline. Working with these natural and locally available materials can also dramatically cut project costs. In the end, a mix of techniques may yield the best project.

SHORELAND PERMITS ISSUED IN THE LONG LAKE WMA

Total Permits by Lake

- 6 on Long Lake

Permitted Actions (note, many permits include more than one action)

- 3 Permits for riprap - 2 install, 1 repair
- 3 Sand blankets - 2 install, 1 replenish
- 1 Retaining wall partial removal
- 0 shoreline vegetation restorations
- 1 tree removal and replacement.
- 2 lake access installs
- 1 raingarden install

Keep in mind that healthy trees are often the cornerstones of a stable shoreline.

SPOTLIGHT RESTORATION

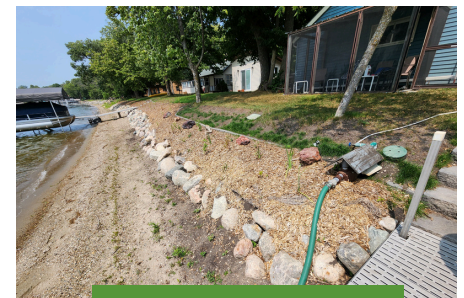
This property in 2022 utilizing Watershed Best Management Processes (BMP) funding. The homeowner removed the old railroad tie retaining wall and replaced with erosion controlling native plants and a small toe of riprap. PRWD reimbursed the homeowner \$500 for plants, mulch and erosion control materials.

Reasons to love this:

- Plants hold, especially native plants. Plants put down roots which will protect the shore against fluctuating water levels.
- The gentle slope lessens the risk for ice push damage on the shore
- Shrubs and trees provide habitat for wildlife.



BEFORE



AFTER



WINTER - JAN TO MAR

High Temp: **46** degrees F (2/8/2023)
 Low Temp: **-24** degrees F (2/2/2023 & 2/3/2023)
 Precipitation: **1.69** inches, Snowfall: **40.00** inches.
 Days of precipitation greater than 0.5": **1**
 Days of precipitation greater than 0.5" 5-yr average: **0.4** (2018-2022)
 Drought status: Moderate Drought (D1) to Abnormally Dry (D0)

SPRING - APR TO JUN

High Temp: **91** degrees F (6/20/2023)
 Low Temp: **3** degrees F (4/7/2023)
 Precipitation: **5.66** inches, Snowfall: **5.00** inches
 Days of precipitation greater than 0.5": **4**
 Days of precipitation greater than 0.5" 5-yr average: **6.4** (2018-2022)
 Drought status: Abnormally Dry (D0) to Moderate Drought (D1)

SUMMER - JUL TO SEPT

High Temp: **95** degrees F (9/2/2023)
 Low Temp: **43** degrees F (9/17/2023)
 Precipitation: **8.56** inches, Snowfall: **0.00** inches.
 Days of precipitation greater than 0.5": **7**
 Days of precipitation greater than 0.5" 5-yr average: **7.8** (2018-2022)
 Drought status: Moderate Drought (D1) to Severe Drought (D2)

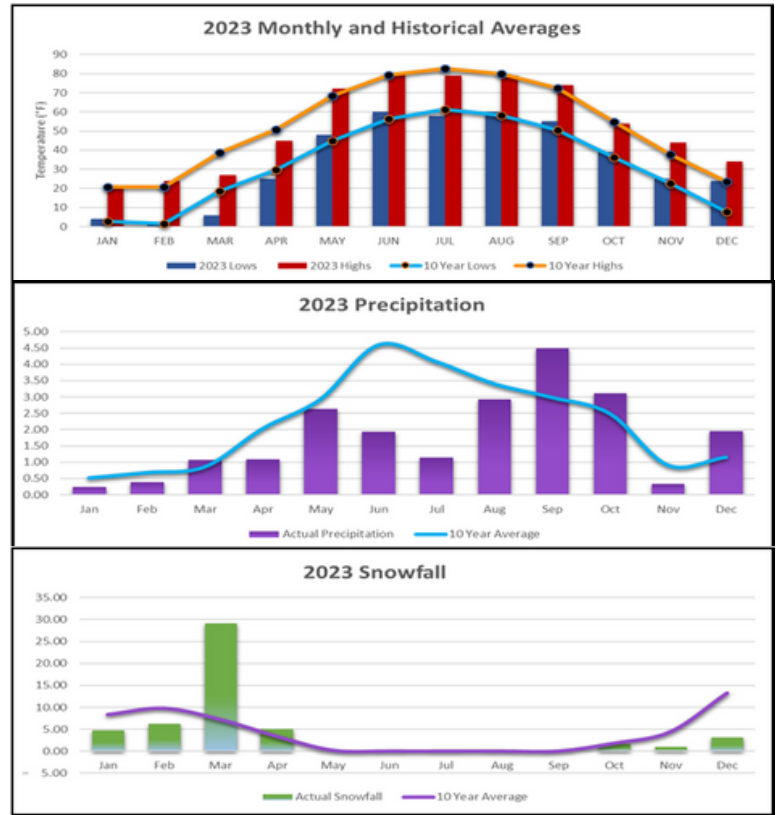
FALL - OCT TO DEC

High Temp: **88** degrees F (10/1/2023)
 Low Temp: **2** degrees F (11/27/2023)
 Precipitation: **5.41** inches, Snowfall: **5.86** inches.
 Days of precipitation greater than 0.5": **1**
 Days of precipitation greater than 0.5" 5-yr average: **3.4** (2018-2022)
 Drought status: Moderate Drought (D1) to Abnormally Dry (D0)



CLIMATE

8
2023



WHAT TO WATCH IN 2024

- **Little Floyd Lake Rock Arch Rapids** - In collaboration with the MN DNR, the current Little Floyd Lake dam will be constructed into a rock arch rapids to improve fish passage.
- **District Rules Revision** - PRWD will be updating and clarifying its Water Management Rules in 2024. Look out for stakeholder meetings in the summer of 2024 to add your input!
- **Willow Street Stormwater Management** - The feasibility study will provide measures to increase phosphorus removal of stormwater runoff to St. Clair Lake.
- **Bucks Mill Dam Modification** - in collaboration with the MN DNR, PRWD will undertake design and construction on the addition of a rock arch fishway to Buck's Mill Dam.



STAFF:

- TERA GUETTER, ADMINISTRATOR
- GINA KEMPER, WATER RESOURCES COORDINATOR
- SHANNA BACH, OFFICE COORDINATOR
- COLTON UTECHT, SHORELAND TECH

BOARD OF MANAGERS:

- RICK MICHAELSON - PRESIDENT
- LAURIE OLSON - VICE PRESIDENT
- CHRIS JASKEN - SECRETARY
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- DENNIS KRAL
- ORRIN OKESON
- CHARLES JASKEN

WWW.PRWD.ORG

PHONE: 218-846-0436

EMAIL: PRWDINFO@ARVIG.NET

211 HOLMES STREET WEST

SUITE 201

WELLS FARGO BUILDING

DETROIT LAKES, MN 56501