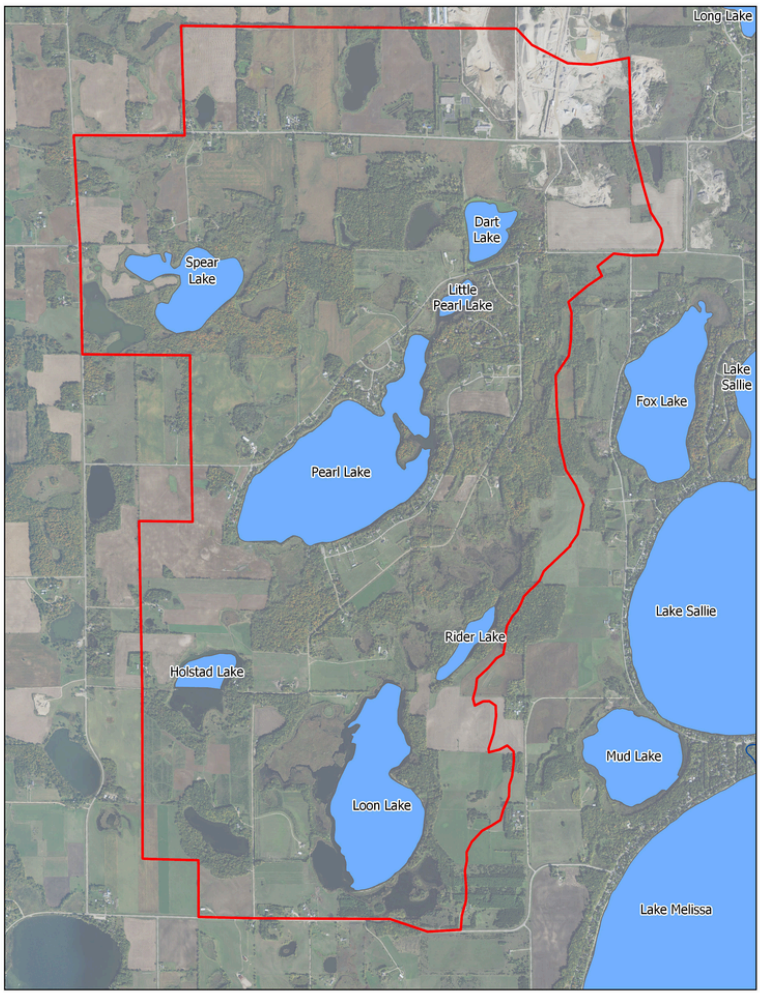
Pelican River watershed district

# PEARL/LOON WATER MANAGEMENT AREA

1
2023

## >>> GENERAL INFORMATION




### MAJOR LAKES

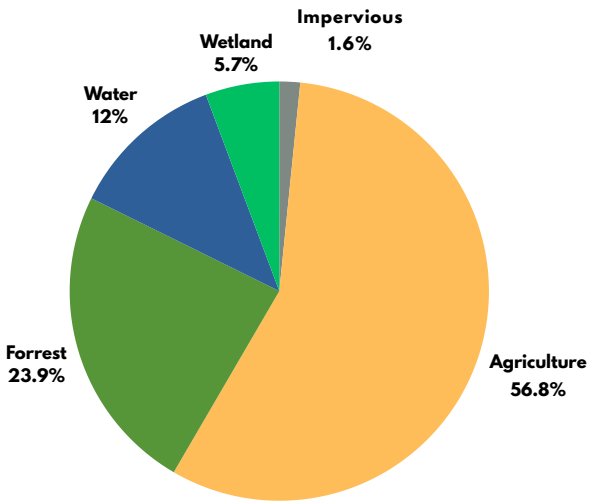
- Pearl

### SHALLOW LAKES

- Spear
- Loon
- Holstad
- Dart
- Rider

## LAND USE:

5,400 acres




| Water Body | Status | Summary |
|---|---|---|
| Pearl | Protect | Maintain good condition and protect against future risks |

## >>> PRWD GOALS FOR THE WATER MANANGMENT AREA

- Reduce nutrient loading from nearshore sources.
- 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.

# PEARL/LOON WATER MANAGMENT AREA



## BEST MANAGMENT 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 NIUMBERS

- **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.

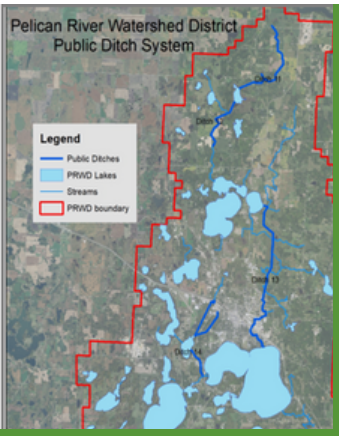
One of the most effective ways we have found is to make sure our local schools have the resources to get kids out into nature. Each year we fund transportation costs for field trips to Hamden Slough, Ike Fisher Farm, and Sucker Creek Preserve.

PRWD also administers 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.



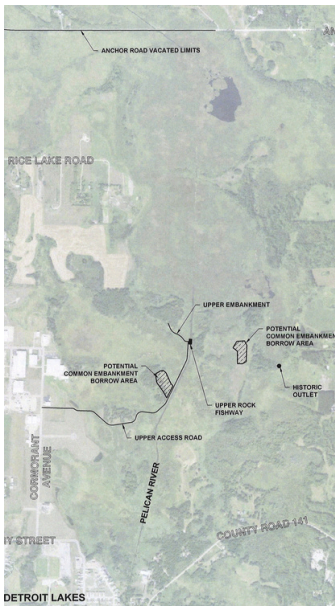
# DISTRICT-WIDE PROJECTS

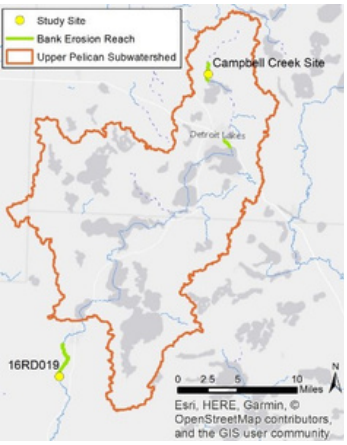


## >>> RICE LAKE RESTORATION

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.

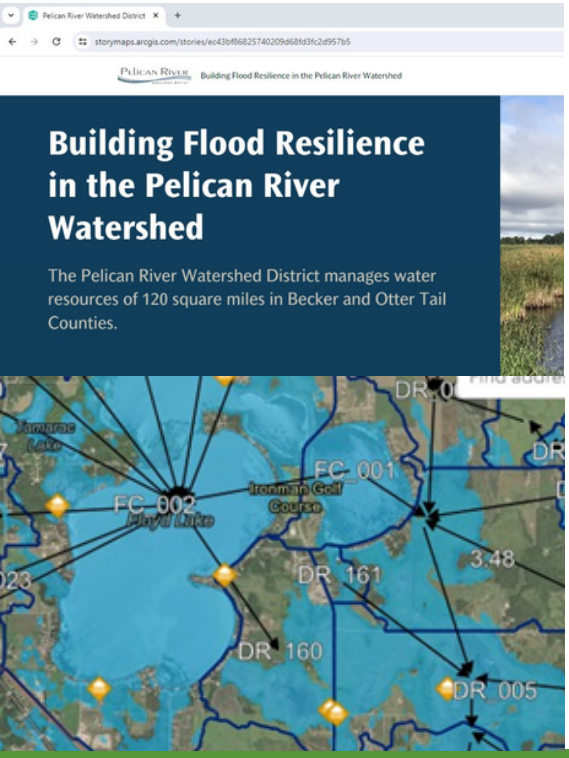



## CAMPBELL CREEK 319 PROJECT <<<

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/



# PEARL/LOON WATER MANAGEMENT AREA

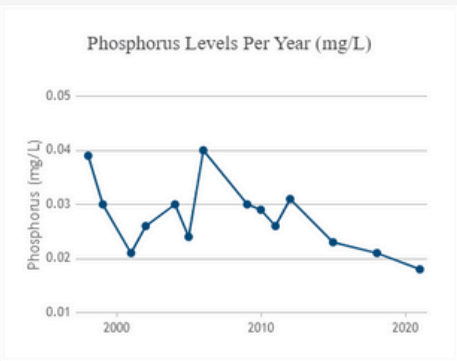


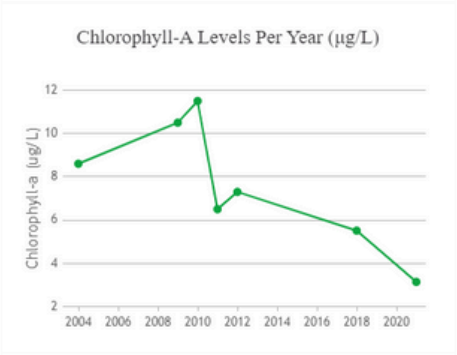
The Pearl/Loon WMA is about 5,400 acres on the Western edge of the District. All lakes are relatively small and shallow waterbodies in the western edge of the District, and all depend primarily upon groundwater. Most land in this WMA is used for agricultural purposes. Pearl exhibits relatively clear conditions, but Phosphorus and Chlorophyll-a levels are much higher than would be expected, given the lake's clarity. An MPCA Clean Water Partnership diagnostic study was completed on Pearl Lake in 2012 which noted large annual fluctuations in water quality and water level, concluding the primary sources of nutrients is lake sediments, agricultural runoff, and shoreline alteration. Curly-leaf pondweed has also spread throughout Pearl Lake since 2010 when it was discovered. Loon Lake was sampled 2006 to 2008 and demonstrated good water quality for a shallow lake. No data has been collected on any of the other smaller lakes.

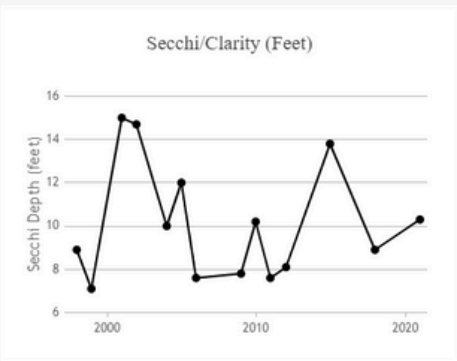
Water quality testing for Pearl and Loon lakes is performed according to our 2020-2030 Monitoring plan. Neither lake was tested in 2023 according to the plan. Pearl Lake was tested last in 2021 and is scheduled for monitoring in 2026. Loon Lake was tested last in 2020 and is scheduled for monitoring in 2025. 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 ALL YEARS

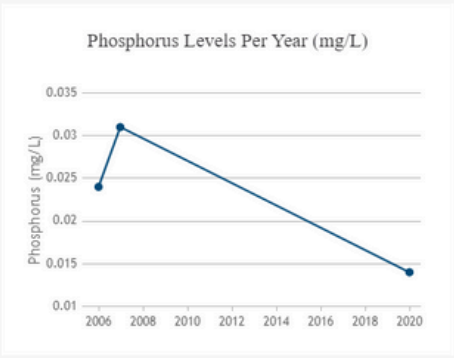
### PEARL

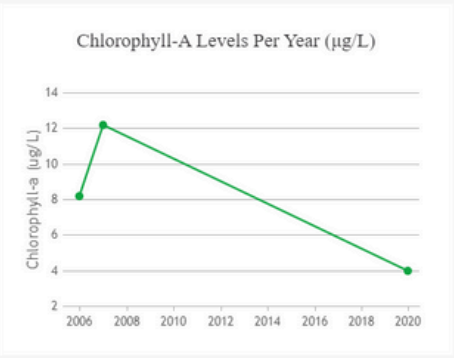


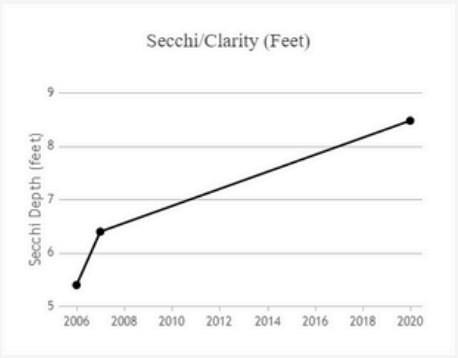




### LOON




## BACKGOUND 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 grown.

**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.

# PEARL/LOON WATER MANAGEMENT AREA

## >>> AQUATIC VEGETATION SURVEY 2023

### >>> PEARL

The first vegetation point-intercept survey of Pearl Lake was conducted by the PRWD staff on July 18, 2023. Of the 172 points sampled, 80% of the points had submersed native vegetation with a mean of 2.4 submersed native taxa per point. No non-native taxa were located at any point.



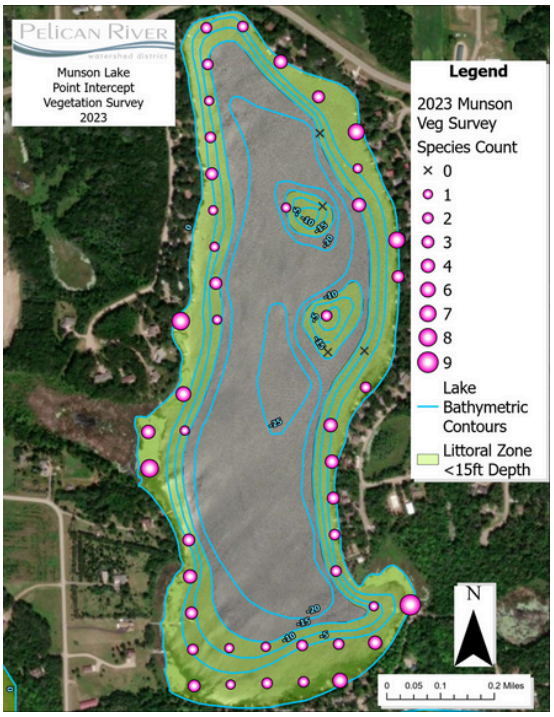
*Ceratophyllum demersum*
**Coontail**
68% frequency



*Potamogeton zosteriformis*
**Flat-stem Pondweed**
63% frequency



*Nuphar lutea*
**Yellow Pond Lily**
37% frequency






*Najas gracillima*
**Slender Waternymph**
27% frequency



*myriophyllum verticillatum*
**Whorled Watermilfoil**
26% frequency



*Potamogeton praelongus*
**White-Stem Pondweed**
17% frequency



*Stuckenia pectinata.*
**Sago Pondweed**
15% frequency



*Elodea canadensis*
**Canada Waterweed**
15% frequency



*Potamogeton natans*
**Floating Leaf Pondweed**
13% frequency



*Potamogeton amplifolius*
**Large Leaf Pondweed**
12% frequency



*Typha latifolia & angustifolia*
**Cattail**
8% frequency



*Potamogeton perfoliatus*
**Clasping Leaf Pondweed**
7% frequency



*Schoenoplectus spp.*
**Bulrush**
6% frequency

**Also noted in less than 5% Frequency:**

*Chara spp./Nitella spp.* - **Chara**
*Sparganium americanum* - **American Burr Reed**
*Spirodela polyrrhiza* - **Greater Duckweed**
Myriophyllum sibiricum - **Northern Water-milfoil**
*Lemna minor* **- Small Duck Weeds**
*Lemna trisulca* **- Star Duckweed**

# PEARL/LOON WATER MANAGEMENT AREA



## 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 PEARL/LOON WMA

**Total Permits by Lake**

- **0** on Pearl
- **0** on Loon

**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.

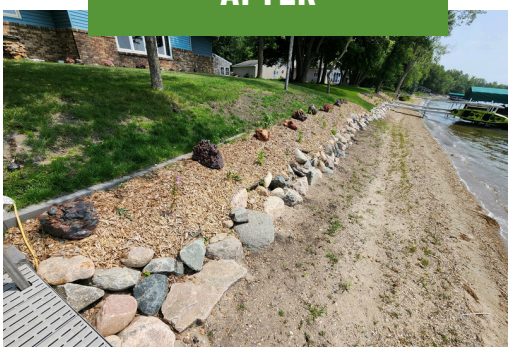


BEFORE



AFTER





# CLIMATE



## 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

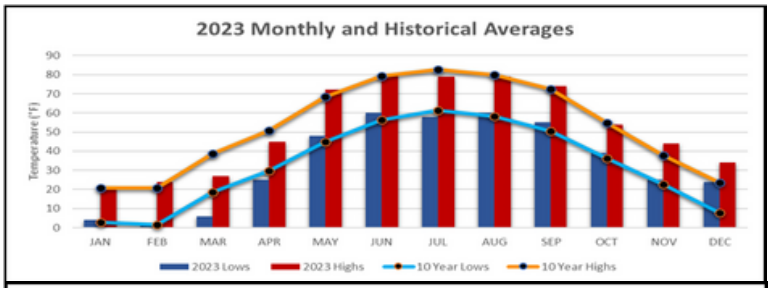
High Temp: **91** degrees F (6/20/2023)
Low Temp: **3** degrees F (4/7/2023)
Precipitation: **5.66** inches, Snowfall: **5.00** inches
Days of precipitation greater than 0.5": **4**
Days of precipitation greater than 0.5" 5-yr average: **6.4** (2018-2022)
Drought status: Abnormally Dry (D0) to Moderate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

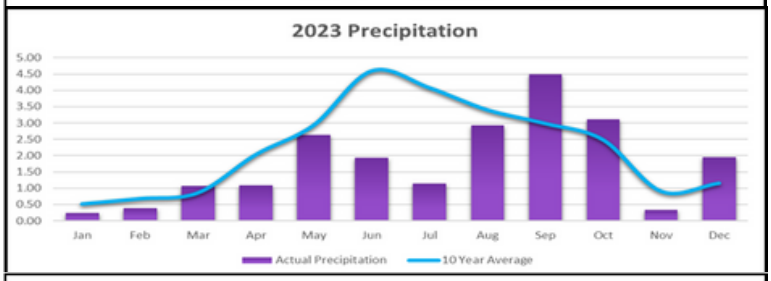
## SUMMER - JUL TO SEPT

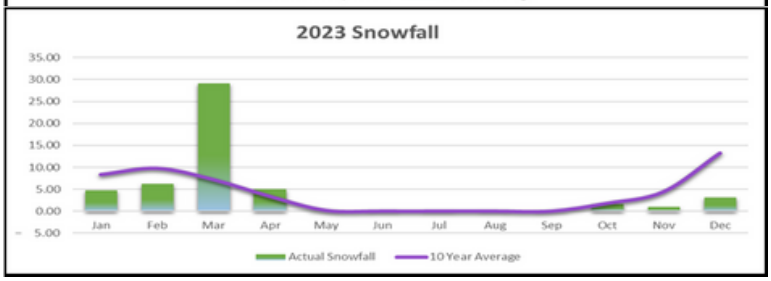
High Temp: **95** degrees F (9/2/2023)
Low Temp: **43** degrees F (9/17/2023)
Precipitation: **8.56** inches, Snowfall: **0.00** inches.
Days of precipitation greater than 0.5": **7**
Days of precipitation greater than 0.5" 5-yr average: **7.8** (2018-2022)
Drought status: Moderate Drought (D1) to Severe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







## 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.



Pelican River watershed district

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