

March 8, 2022



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## *Water Quality of the Shell Rock River Watershed*

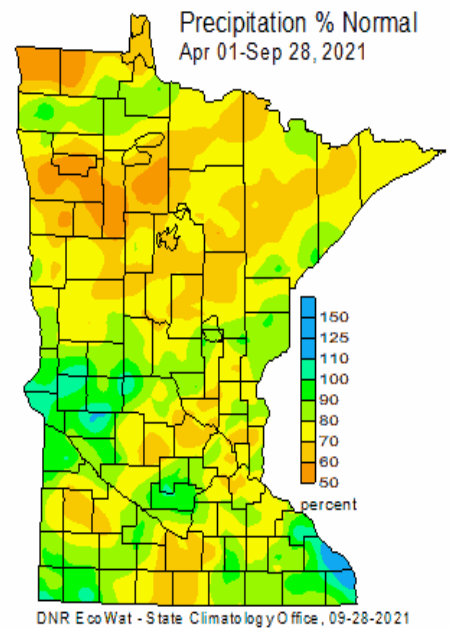
According to the Minnesota Department of Natural Resources, between April 1 and September 28, 2021 Freeborn County had about 80% precipitation of the annual average. Precipitation amounts and timing generally determine water quality for our watershed.

The first rainfall event in the 2021 growing season showed excellent water quality after the harsh winter of 2020. Clarity readings on Fountain Lake topped 6.5 feet, the highest recorded since monitoring began in 2005. Local streams showed an excellent resurgence of submergent and emergent vegetative growth. This trend was noticed in area lakes with healthy submergent plant growth early in the growing season.

Lower precipitation reduces flow from tributaries into lakes Fountain, Albert Lea and Pickerel. Reduced flow leads to lower flushing rates and longer water residency time, meaning the water stays in the lakes much longer in drought years as opposed to non drought years.

One benefit to this longer residency time is the District's monitoring programs ability to capture and extrapolate nutrient loading internally (within the lake basin) versus externally (inputs from outside the lake basin).

In this newsletter data collected, observations made and the District's Water Monitoring Program will be discussed.



**Special points of interest:**

- Drought continues into 2021
- Lower than average precipitation
- Decreased water quality compared to non drought years
- Opportunity to pinpoint nutrient loading concentrations

*Pictured right is District Monitoring site SSR03 near Gordonsville, MN. This site is also part of the Cooperative Stream Gaging System, a collaborative effort between State and Federal Agencies funded in part by the Clean Water Land and Legacy Amendment.*

*Data provided by:*

*Minnesota Department of Natural Resources*

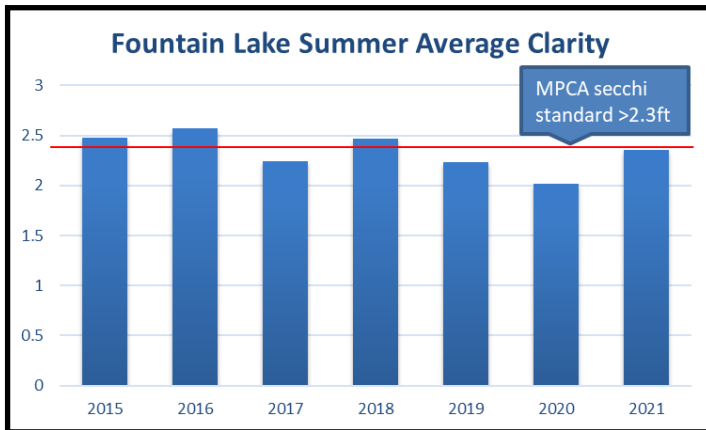
*Minnesota Pollution Control Agency*

*National Weather Service*

*U.S. Geological Survey*

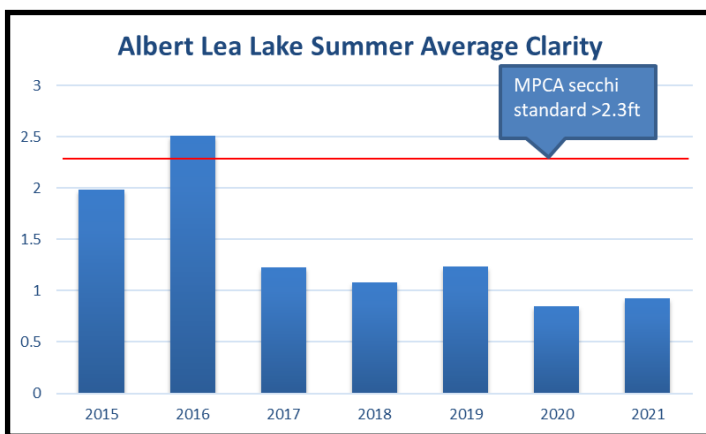


## Lake Water Clarity 2021



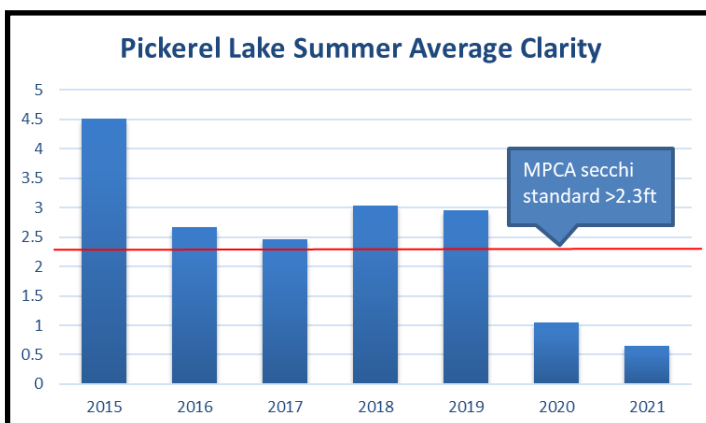
The Shell Rock River Watershed District (SRRWD) has monitored the clarity of Fountain Lake since 2004. Clarity is measured by lowering a black-and-white disk (Secchi disk) into the water and identifying the depth at which the disk is no longer visible. In 2021, Fountain Lake’s summer-average clarity was 2.3 feet, meeting the Minnesota Pollution Control Agency’s (MPCA) standard of >2.3 feet. The District recorded the highest clarity reading to date in Edgewater Bay, with a record 6.5 feet visibility in an area of 11 feet water depth.

With dredging complete in Edgewater Bay, Dane Bay and a portion of Main Bay, stratification in the water column is expected. In the coming years the District plans to enhance the dredging efforts with a comprehensive in-lake habitat project. This project will target enhancement of lake bottom contours, flow regime as well as shoreline habitat.



Albert Lea Lake summer-average depth was 0.9 feet, which is below the state standard and the 2015–2018 summer-average depth of 1.8 feet. June clarity measurements showed “disk on bottom” or clarity to the bottom of the lake with a record 4.5 feet reading. Between 2006 and 2021, summer average clarity readings on Albert Lea Lake have been 1.6 feet.

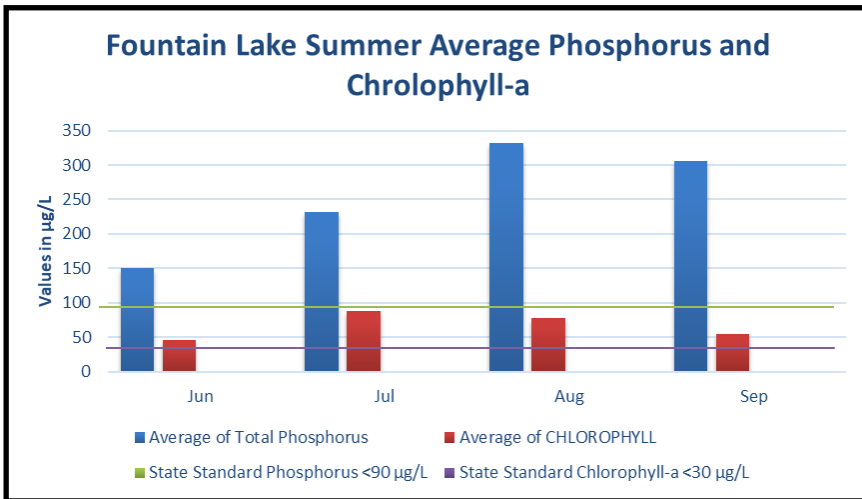
Observations made early in the growing period included an abundance of native submersed aquatic plant species such as coontail and narrow-leaf pondweed. These are major beneficial plant species for foraging wildlife such as waterfowl and muskrat.



Pickerel Lake failed to meet the state clarity standard in 2021. Summer depth average was 0.7 feet. 2021 spring netting surveys of native species like northern pike and yellow perch displayed a hardiness to the harsh winter conditions of 2020.

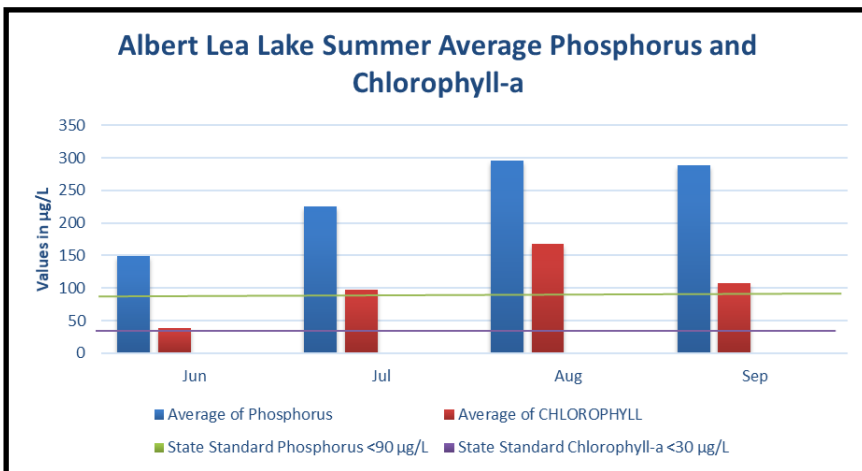
2021 observations of submersed vegetation yielded no sightings of the invasive curly-leaf pondweed, indicating the harsh winter destroyed the turions needed to produce new plants. Submersed native vegetation observed included coontail and narrow-leaf pondweed which are beneficial for fish habitat and food for wildlife.

## Lake Phosphorus and Chlorophyll-a 2021



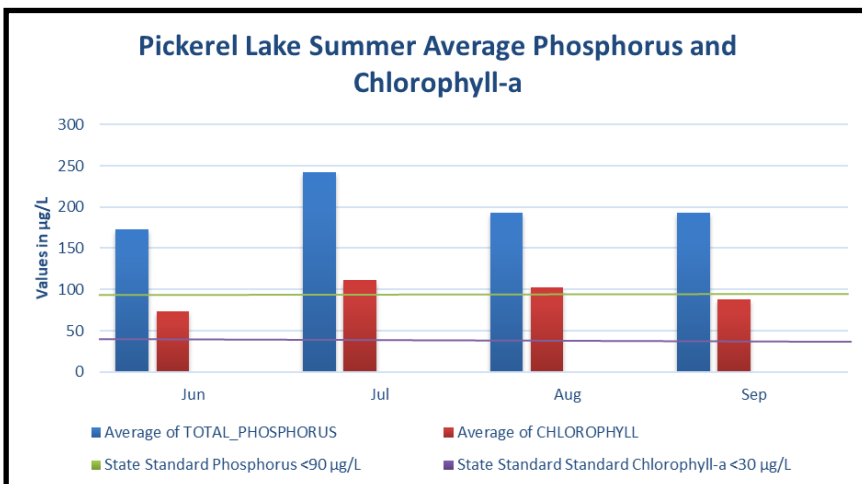
Phosphorus (P) is an essential element for plant life; however, too much can be harmful to water quality. The 2021 summer average phosphorus level for Fountain Lake was 220 µg/L. The lake is showing a reversal of the upward trend as 2005-2015 summer phosphorus levels were 249 µg/L; 2015-2021 summer phosphorus levels were 167 µg/L, a 33% reduction of summer average P levels.

To assess the abundance of algae in the lake, SRRWD monitors chlorophyll-a, the main photosynthetic pigment found in algae. In 2021, the summer average chlorophyll-a concentration in Fountain Lake was 73 µg/L.



The 2021 summer-average phosphorus concentration in Albert Lea Lake was 229 µg/L. This was above the state standard of 90 µg/L. Between 2005 and 2015 summer average P level was 237 µg/L. Summer average P level from 2015-2021 was 181 µg/L, showing a 31% reduction.

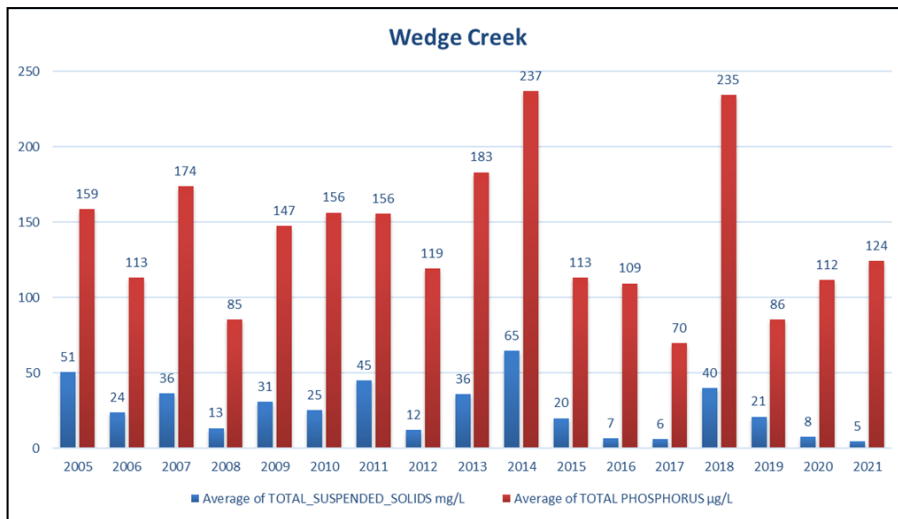
In 2021 the summer average chlorophyll-a concentration in Albert Lea Lake was 166 µg/L—higher than the MPCA standard of 30 µg/L. From 2005-2015 chlorophyll-a averaged 90.8 µg/L while 2015-2021 averaged 81.5 µg/L, an 11% reduction.



2021 summer average phosphorus levels (232 µg/L) were still above the state standard in Pickerel lake. P levels averaged between 203 µg/L and 129 from 2005-2015 and 2015-2021 respectively.

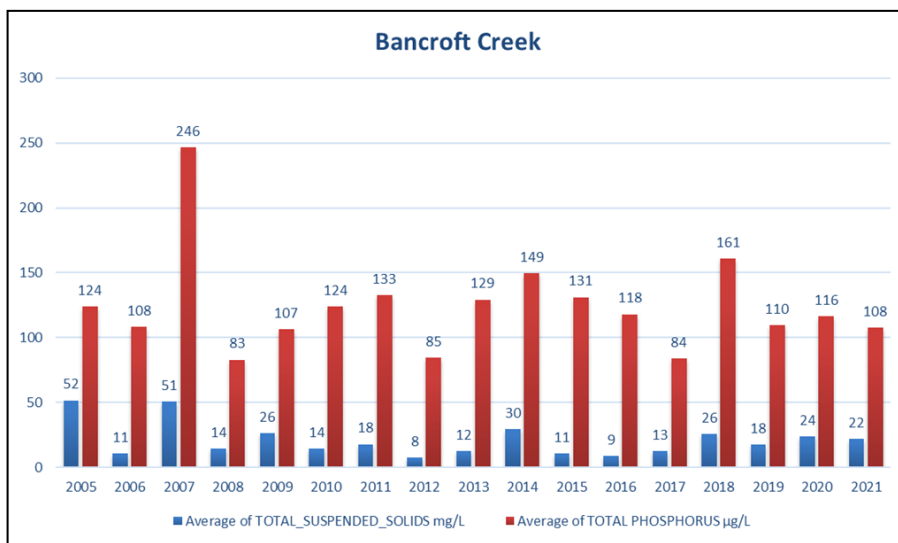
Pickerel Lake met the MPCA chlorophyll-a standard of 30 µg/L in 2017. In 2021 summer average of Chlorophyll-a was 155 µg/L. 2005-2015 and 2015-2021 chlorophyll levels averaged 88 and 59 µg/L respectively.

## *Stream Water Quality 2005-2021*



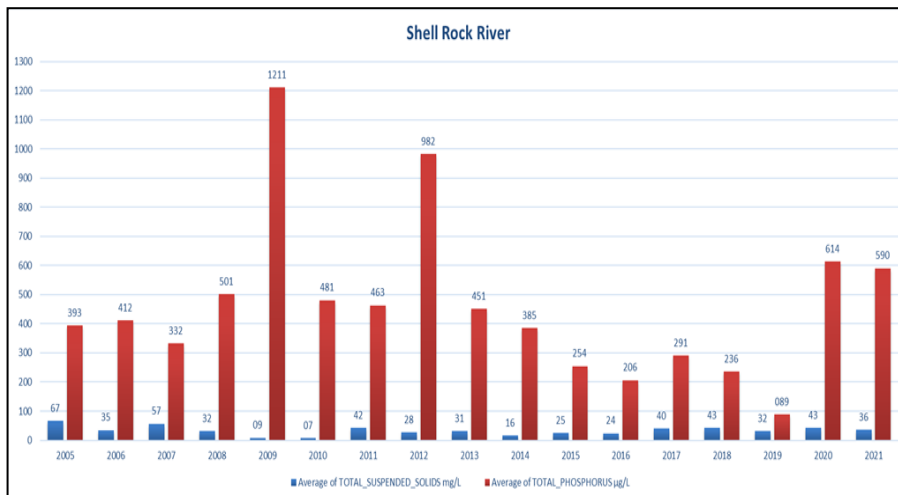
Since monitoring began in 2005, Wedge Creek has shown a downtrend in total suspended solids (TSS). TSS is measured in mg/L equivalent to parts per million (PPM) and used as a surrogate standard to turbidity. Many projects including habitat restoration, reclamation and stream improvement have taken place since 2005. Wedge creek is a major contributor of sediment to Fountain Lake.

A gentle downtrend has been forming in Wedge Creek total phosphorus concentrations since 2005. As the largest tributary to Fountain Lake, improvements in this drainage area effect water quality of Fountain lake.



Bancroft Creek is the second largest tributary to Fountain Lake. Since 2005 summer average TSS has been 21 mg/L. Upcoming SRRWD projects within the Bancroft drainage area include Bancroft Stream Restoration spanning nearly 2 miles of riparian corridor. A 112 acre acquisition along the stream itself was completed in 2021. Restoring in-stream habitat and protecting areas susceptible to erosion positively effect TSS loads in downstream Fountain Lake.

Summer average total phosphorus concentration is 125 µg/L. The District has been monitoring phosphorus levels in Bancroft creek since 2005.



The Shell Rock River the bottom of the funnel to our area lakes and streams. Summer average TSS since 2005 is 33 mg/L. Recent habitat acquisition and restoration should prove to reduce TSS loading in the Shell Rock River further yet.

Summer average total phosphorus for all Shell Rock River monitoring sites since 2005 is 424 µg/L. A linear trendline analysis indicates a summer average total phosphorus reduction by 200 µg/L since 2005. Further improvements to upstream habitat in area lakes and stream will aide in lowering total phosphorus averages.

## Shell Rock River Watershed District

Shell Rock River Watershed District  
214 West Main Street  
Albert Lea, MN 56007  
Phone: 507.377.5785

We're on the Web!  
[www.shellrock.org](http://www.shellrock.org)



## About Us

The Shell Rock River Watershed District (SRRWD) was established in June 2003 at the request of local citizen's petition for the purpose of improving water quality. The District encompasses 246-square miles located entirely within Freeborn County. The SRRWD is home to Albert Lea, Hayward, Glenville, Twin Lakes, Manchester and the southern portion of Clarks Grove.

The watershed includes 11 shallow lakes, but its tourism and identity are focused on Fountain and Albert Lea Lake. This watershed drains to the Shell Rock River at the outlet of Albert Lea Lake, and is the headwaters for the Cedar, Upper Iowa, and ultimately the Mississippi River. Being a headwaters watershed, water quality is reflected by local practices. The SRRWD is collaborating with multiple agencies to improve water quality conditions within the watershed, as well as influencing downstream conditions.

## Mission

The Shell Rock River Watershed District mission is to implement reasonable and necessary improvements to the water-related and other natural resources of the District.

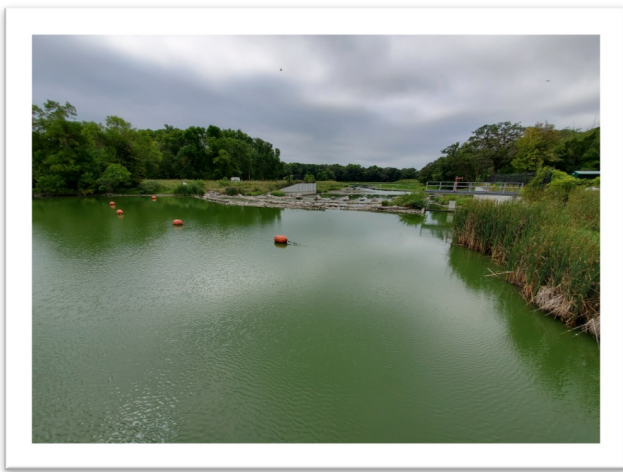


## What does the SRRWD do?

The SRRWD is guided by its Water Management Plan to conserve and restore water resources for the beneficial use of current and future generations. The District accomplishes these goals with the following activities:

- Monitor water quality of lakes and streams
- Apply for grants
- Promote Best Management Practices (BMPs) to improve water quality
- Provide cost sharing opportunities to install BMPs
- Provide flood mitigation
- Restore streambanks and wetlands
- Establish, record and maintain hydrological data
- Regulate, conserve and control the use of water in the watershed

Implement projects related to meeting the purposes of the District.



## Where does the Money Come From?

Like most watershed districts in Minnesota, the SRRWD levies \$250,000 a year in property taxes to fund administrative costs.

In 2005, the Minnesota Legislature approved a half percent sales tax for the District. This special tax is acquired when consumers make purchases at businesses within Albert Lea.

The local options sales tax has been used to implement water quality projects as contained in the Shell Rock River Watershed Management Plan. The Plan is required under State Statute 103D and is reviewed and approved by the Board of Water and Soil Resources. The second, updated 10-year plan was approved in 2015 by BWSR.

So far, the sales tax has been leveraged to bring in \$37 million dollars in funds to the watershed from multiple state, federal, and local resources.

*Pictured Left: Outlet of Albert Lea Lake and District stream monitoring site SSR01*