



Shoreline Assessment Fish Lake

Survey Completed October 2022

Report Created June 2023



Background

The Cannon River Watershed Joint Powers Organization (CRWJPO) conducted a baseline lakeshore survey of Fish Lake as part of the Comprehensive Watershed Management Plan 2020-2030. The activity in the Plan is to “establish a baseline of existing natural shoreline conditions and achieve no-net loss (from the baseline) of existing natural shoreline on 10 Natural Environment Lakes” (see page 155 of the Plan). One of the lakes chosen for a baseline shoreline assessment was Fish Lake.

Fish lake is 77 acres of surface water with approximately 9,700 feet of shoreline and is located near Elysian, MN in Le Sueur County. The average depth of Fish Lake is 18 feet and has a maximum depth of 55 feet. There is a MNDNR access on the southeast side of the lake. Other than the access, all land is in private ownership. The land surrounding the lake is primarily wooded, except for two farm fields that are approximately 100 feet from the lake shore. Some of the wooded and grassed areas are grazed as pastureland, as fencing is visible from the drone flight.

The general geology of the area is dominated by three major bedrock aquifer systems: St. Peter-Prairie Du Chien-Jordan, Franconia-Ironton-Galesville, and the Mt. Simon-Hinckley. Glacial deposits almost completely conceal the bedrock surface. The St. Peter-Prairie Du Chien-Jordan Aquifer system underlines most of Le Sueur County and may vary greatly in distance due to major erosional unconformity. These three bedrock units function as a single aquifer system because all three are sources of groundwater and no regional confining bed separating them. The major bedrock aquifers in this system are the St. Peter and Jordan sandstones, which yield water from between individual grains, and the Prairie Du Chien dolomites, which yield water through fractures and crevices. The bedrock units of the St. Peter-Prairie Du Chien-Jordan aquifer system represent the shallow bedrock aquifers. The Franconia-Ironton-Galesville aquifer system is overlain by the St. Lawrence confining bed. The upper bedrock aquifer unit is Franconia glauconitic sandstone which yields moderate supplies of groundwater. The lower bedrock aquifer unit is the Ironton-Galesville sandstones which are generally a more productive aquifer. The Eau Claire formation separates the Franconia-Ironton-Galesville and Mt. Simon-Hinckley aquifer system. The Mt. Simon-Hinckley aquifer system is the deepest of the three bedrock aquifers within Le Sueur County. Little information is available of the geology and hydrology of this aquifer system due to a lack in deep well data.

Geology data from: Water Resources Center Mankato State University. 1991. Geologic Atlas Le Sueur County, Minnesota.

Fish is considered a groundwater dominant lake, as the contributing watershed is relatively small. The shoreline survey was conducted during a drought and levels appeared low. There are not enough historical water level readings to determine the typical amount of fluctuation. Water levels can fluctuate both seasonally and annually on seepage lakes due to their strong connection with the water table. This would explain why the water level readings collected during the survey were low. Furthermore, since Fish Lake is not considered a flow through lake; therefore, it is extremely susceptible to increased nutrient and sediment loading. Fish lake does not have any inlets.; however, it outlets through surface flow towards Lake Tetonka.

Hydrology data from: MPCA. 2014. Cannon River Watershed Monitoring and Assessment Report. & MN DNR. 2023. Lakefinder.

Lake Assessment Methodology

The MNDNR has developed a lakeshore assessment tool called “Score Your Shore” designed to be used by lakeshore property owners to evaluate their shoreland habitat. The tool provides a standardized method to evaluate the type, quantity, and quality of lakeshore habitats including upland, shoreline, and aquatic zone areas. The upland zone is defined as the area from the house (if present) to the top of the lakeshore bank, the shoreline zone is defined as the area from the top of the lakeshore bank to the edge of water, and the aquatic zone is defined as the area from the edge of water to the deep end of the macrophyte bed. Scores are assigned for each of the three main habitat types assessed, with a combined maximum point value of 100 for upland and shoreline zone areas and a maximum point value of 100 for the aquatic zone (for a maximum total of 200 points). The overall combined score provides an indication of lakeshore quality over a point range from 0-200, with 0 points indicating a severely degraded shoreline that does not provide any functional habitat, to 200 points indicating a very healthy and functional shoreline with intact habitat in all three habitat zones. To support the Score Your Shore assessment, photographs were taken in conjunction with drone videography to document existing lakeshore conditions.

Results

The following is a summary of the shoreline assessment and includes individual lakeshore scores derived from the Score Your Shore evaluation. A total of 7 parcels were assessed around Fish Lake. The average score for the lake is 196. The shoreline around the lake scored high. Most lots are not developed and those that are, have buildings that are not even visible from the lake. There are slight openings in vegetation for lake access in two locations. However, overall aquatic vegetation both emergent and submerged scored high. One factor that slightly reduced the upland score was the pastureland.

There was minimal need for installation of best management practices. No shoreline erosion was observed. Many upland areas are fairly covered in vegetation. Baseline conditions appear to be good, so the goal would be to maintain baseline conditions.

Below is the table for Score Your Shore for the 7 parcels on Fish Lake, listed counterclockwise starting at the DNR access. The flight path and time stamp of the video is also noted on the map in Appendix A. The drone video is posted on the CRWJPO YouTube page: <https://www.youtube.com/@crwjpo>

Parcel ID	Linear Feet	Upland Total	Shoreline Total	Aquatic Total	Total Score
04.024.7900	80	65	35	100	300
04.999.0070	2,150	65	35	95	295
04.024.0100	2,100	65	35	100	300
04.023.3000	1,900	48	35	100	266
04.023.2500	2,050	65	35	100	300
04.024.7600	1,050	65	35	95	295
04.024.7500	280	65	35	100	300

Shoreline Ordinance Review

Shoreland Ordinances are in place to guide and manage land use activities within in shoreland areas and are critical for protecting and improving water resources. From review of the Le Sueur County Zoning Ordinance, it provides a balanced approach to protection and development on Fish Lake which is listed as a Natural Environment (NE) Lake. Natural Environment Lakes are generally small, shallow, and have limited capacity to assimilate the impacts of development. Furthermore, Fish Lake’s shoreland land use district is solely described as Special Protection (SP). The intent of a Special Protection District is to guide the wise development and utilization of shorelands of public waters for the preservation of water quality, natural characteristics, economic values, and general health and safety and welfare of all public waters in the unincorporated areas of the County. Furthermore, the purpose of the district is to manage areas unsuitable for development due to wet soils, steep slopes, or large areas of exposed bedrock; and to manage areas of unique natural and biological characteristics. Fish Lake does not appear to be facing development pressure. The existing aquatic and upland vegetation are of high quality. The current Le Sueur County Zoning Ordinance-Shoreland District was updated and approved by the MN DNR in 2022 and reflects the MN DNR Shoreland and County standards at that time. The MN DNR model ordinance was recently updated in Spring of 2022 and additional language, standards, or visuals could be reviewed and integrated into the current ordinance, plans, or other supporting documents and resources for Le Sueur County. In discussions with Le Sueur County and MN DNR staff, the ordinance, and the county/agency interaction is working well. The County has taken an adaptive management approach within the Shoreland District in order to better reflect existing and future land use changes and activities within the County as well as staff knowledge, expertise, and technical capacity.

Appendix A – Map of Flight Path