



Shoreline Assessment

Tustin Lake

Survey Completed October 2022

Report Created June 2023



Background

The Cannon River Watershed Joint Powers Organization (CRWJPO) conducted a baseline lakeshore survey of Dora 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 Tustin Lake.

Tustin Lake is 160 acres of surface water with approximately 17,700 feet of shoreline and is within the City of Elysian, MN in Le Sueur County. Tustin Lake’s average lake depth is 3.3 feet with a maximum depth of 5 feet. There is lake access on the south side of the lake from City of Elysian Park property. Property ownership includes an almost equal division of private ownership, homeowners’ associations, City of Elysian and MNDNR. There is some farmland, MNDNR land remains natural area, and City of Elysian property contains the wastewater treatment plant on the north side of the lake.

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.

Tustin is considered a shallow flow-through lake, as the contributing watershed is large. The lake is described as a shallow flow through lake due to the Cannon River. Due to the high watershed to lake area ratio Sabre Lake receives very high water and nutrient loading and often have very short water residence times. Their shallowness, combined with large surface areas (large fetch) make them susceptible to wind mixing. This mixing serves to keep fine sediments in suspension and may allow for recycling of nutrients from the sediments. This internal nutrient loading typically increases the severity of algal blooms which, in turn, decreases water clarity as the summer progresses. The shoreline survey was conducted during a drought and levels are considered average. According to Lakefinder data from the Minnesota Department of Natural Resources (MNDNR), Tustin Lake has had a water level fluctuation of approximately 5.76 feet from 1961 to 2022. A recent water level reading was taken on May 26, 2022 (~1022.05 feet). The water level elevation in 2022 is considered average water level for the lake system (Highest Recorded 1024.07 feet, Lowest Recorded 1018.31 feet). Furthermore, since Tustin Lake is considered a shallow flow-through lake it is extremely susceptible to internal nutrient and sediment loading. Tustin is hydrologically connected with Lake Francis and Rays Lake.

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 20 parcels were assessed around Tustin Lake. The average score for the lake is 170. Shoreline and aquatic scores are high. Areas where these scores are lower is due to turf grass being mowed up to the water’s edge. There were very few docks and openings seen during the fall drone flight, which helped increase aquatic scores. Upland scores are lower on developed parcels due to lack of tree and shrub cover. Upland scores on undeveloped parcels is high.

There was minimal need for installation of best management practices. No shoreline erosion was observed. Baseline conditions appear to be good, so the goal would be to maintain quality shoreline and make improvements in upland areas and shoreline on a few parcels.

Below is the table for Score Your Shore for the 20 parcels on Tustin Lake. 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>

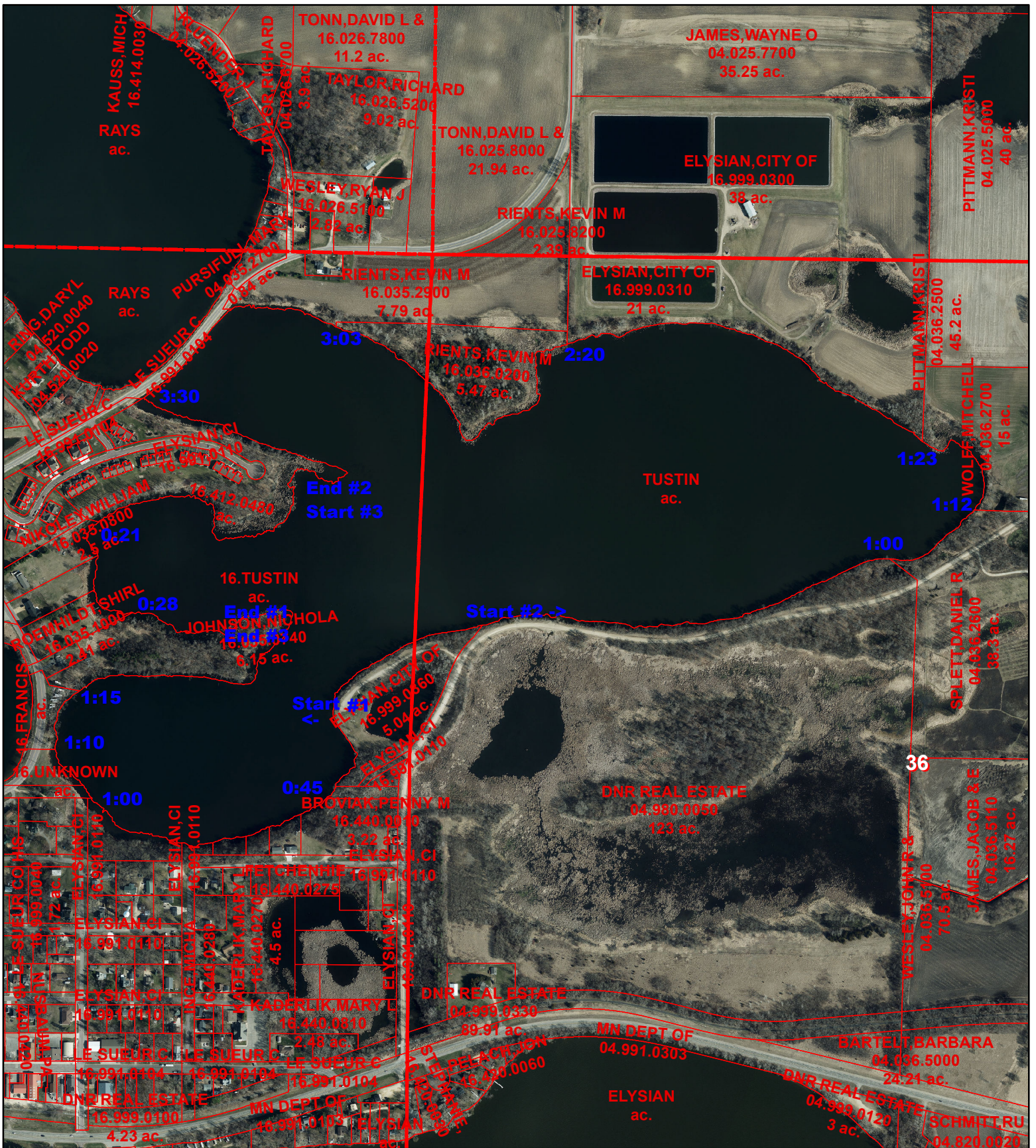
Parcel ID	Linear Feet	Upland Total	Shoreline Total	Aquatic Total	Total Score
16.999.0360	1,400	43	30	100	173
16.440.0010	200	65	35	100	200
16.440.0040	175	53	35	100	188
16.440.0050	130	53	35	100	188
16.440.0051	170	58	35	100	193
16.440.0041	100	58	35	100	193
16.440.0058	600	65	35	100	200
	400	43	25	80	148
16.035.0750	375	29	35	100	164
16.035.0740	2,300	65	35	100	200
04.980.0050	2,300	65	35	80	180
04.036.2600	550	65	35	80	180
04.036.2700	750	29	30	100	159
16.999.0310	2,000	19	30	100	149
16.036.0200	1,700	65	35	100	200
16.035.2900	550	29	35	100	164
16.412.0480	2,300	33	30	100	163
16.035.0800	300	19	17	80	116
16.035.1100	185	19	17	80	116
16.035.1000	200	33	20	80	133

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. Lake Tustin is unique and is located within two local government unit jurisdictions: Le Sueur County and the City of Elysian. From review of the Le Sueur County Zoning Ordinance, it provides a balanced approach to protection and development on Sabre 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, Tustin Lake’s shoreland land use district within County limits is 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,

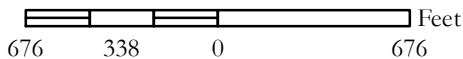
steep slopes, or large areas of exposed bedrock; and to manage areas of unique natural and biological characteristics. From review of the City of Elysian Zoning Ordinance, it provides a balanced approach to protection and development on Tustin Lake which is listed as a Natural Environment Lake. Natural Environment Lakes are generally small, shallow, and have limited capacity to assimilate the impacts of development. Furthermore, Tustin Lake's shoreland land use district within City Limits is described as Industrial, R1-General Residential, and R-2 Multi-Family Residential. The intent of the R1 General Residential district is to be comprised basically of present and future low-density housing, augmented with compatible medium density housing and appropriate miscellaneous uses. These additional uses are conditional and are to be further regulated by applying conditional use standards. The intent of the R2 Multi-Family Residential District is to preserve some land that can develop to serve the city's multi-family needs without creating incompatible situations. To protect this goal, permitted uses are few and conditional uses should be weighted in view of their impact with future multi-family development. Lastly, the intent of the Industrial District is to allow for areas in the city where industrial uses may occur. Tustin Lake does face some development pressure due to it being adjacent to the City of Elysian. However, only the upland vegetation was inadequate in some areas and could easily be addressed within establishment of vegetation. 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. The City of Elysian Zoning Ordinance was updated in 2015 and approved by the MN DNR and reflects the MN DNR Shoreland and City standards at that time. The Le Sueur County Zoning Ordinance and the MN DNR model ordinance was recently updated in 2022 and additional language, standards, or visuals could be reviewed and integrated into the current ordinance, plans, or other supporting documents and resources for the City of Elysian. 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. Le Sueur County and the City of Elysian should work together to help strengthen their Zoning Ordinance, especially within the Shoreland District.

Appendix A – Map of Flight Path



| Parcels (Certified)
 | Section
 LeSueur_Co_2021.sid
 RGB
 | Red: Band_1
 | Green: Band_2
 | Blue: Band_3

1:8,115 1 inch = 676 feet



Maps are for graphical purposes only. They do not represent a legal survey.



Le Sueur County SWCD
 (507)357-4879 Ext. 3

