



Nine Mile Creek Discovery Point
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MEMO

TO: Nine Mile Creek Watershed District Board of Managers

FROM: Randy Anhorn

DATE: April 7, 2020

RE: Summary of 2019 Water Quality Monitoring Program Report

Background/Information

Lakes

Attached is the Summary of the District's 2019 Water Quality Monitoring Report that will be included as an attachment to the 2019 Annual Report.

The primary goal of the Nine Mile Creek Watershed District (District) is to protect and enhance the surface water quality of the lakes and streams of the District. To help accomplish this goal, the District operates an extensive lake and stream management program. Generally, the program includes:

- Data collection (monitoring)
- Assessment (e.g., studies)
- Implementation of projects and programs

The District monitors the water quality of its lakes on a rotating basis and in 2019 monitored six lakes: Arrowhead, Indianhead, Mirror, Normandale, Edina, Smetana, and Southeast Anderson. Each lake was monitored on six occasions for selected parameters including: total phosphorus, soluble reactive phosphorus (ortho phosphorus), total nitrogen, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen, pH, chlorophyll *a*, chloride, dissolved oxygen, temperature, specific conductance, turbidity, oxidation reduction potential (ORP), phytoplankton, and zooplankton. Aquatic plant (macrophyte) surveys were performed during June and August.

The District is planning on monitoring the following lakes in 2020: Arrowhead, Cornelia, Edina, Holiday, Indianhead, Normandale, Rose and Wing. In addition, the city of Eden Prairie plans on monitoring Birch Island and Smetana lakes for the District.

Stream

Because the primary use of Nine Mile Creek is ecological – a place for fish and aquatic life to live – the focus of the Nine Mile Creek stream monitoring program is evaluation of the stream's fish and aquatic life community as well as the ecosystem components essential for the survival of fish and aquatic life. In 2019 the District continued to monitor eight at set ecological monitoring stations along the North Branch, South Branch and Main Stem of Nine Mile Creek. Monitoring included:

- Annual monitoring of the fish community during summer.
- Annual monitoring of the macroinvertebrate community during October.
- Annual habitat monitoring during summer (i.e., stream substrate type, depth of fine sediment, percent

- embeddedness, and length of eroded streambank).
- March through October monthly measurements of specific conductance, dissolved oxygen, pH, temperature, turbidity, and flow.

The collected data are then evaluated to determine whether:

- Specific conductance, dissolved oxygen, pH, and temperature, levels meet MPCA standards for Class 2B waters published in Minnesota Rules 7050.
- Flow and water quality data were consistent with historical values.
- The fish and aquatic life communities were consistent with the stream's ecological use determined from past assessments.

In addition, three of the sites, N1, N2 and N3, are included in the Metropolitan Council's Watershed Outlet Monitoring Program (WOMP) where water quality and flow (base and continuous) data are also collected, summarized and reported through their program.

New to the report this year are sections on Lake level monitoring (section 11) and groundwater well monitoring (section 12)

Some highlighted findings include:

- All monitored lakes met the Minnesota chloride standard
- Nine Mile Creek met the specific conductance standard more frequently in 2019 than 2018 and observed lower values in 2019 than recent years. The measurements indicated chloride levels in the creek were lower during 2019 than recent years.
- Lake monitoring results indicate Arrowhead Lake, Indianhead Lake, and Mirror Lake failed to meet Minnesota lake eutrophication standards for shallow lakes in 2019 due to excess phosphorus and poor water clarity.
 - Monitoring results support updating the Indianhead Lake and Arrowhead Lake UAAs in 2021 and Mirror Lake UAA in 2022 as identified in the District's Water Management Plan (2017)
- Lake monitoring results indicate Normandale Lake water clarity and chlorophyll *a* met Minnesota lake eutrophication criteria for shallow lakes in 2019 while total phosphorus did not, but was close to meeting the criteria (i.e., within 5%)
 - Monitoring results support completing the curly-leaf pondweed management program to further reduce phosphorus concentrations in Normandale Lake
- The Lake Smetana plant community has consistently met the MDNR proposed Plant Index of Biological Integrity following the Bryant Lake alum treatment. In 2019, three aquatic invasive plant species were present in Lake Smetana, but were not causing problems.
 - The growth of Eurasian watermilfoil and curly-leaf pondweed and the effects of curly-leaf pondweed on Lake Smetana water quality should continue to be tracked
 - Introduction of additional purple loosestrife eating beetles could be considered to increase biological control of purple loosestrife
- The 2019 Lake Edina plant community had few species, was of poor quality, and failed to meet the MDNR proposed plant IBI impairment thresholds due to poor water quality. In addition, Eurasian watermilfoil has spread quickly since it was first observed in 2017 and was found throughout the lake in 2019.
 - Because the water quality of Lake Edina is highly influenced by the water quality of Lake Cornelia, the recommended management strategy to improve water quality in Lake Edina is to implement the UAA recommendations for upstream Lake Cornelia and consider opportunities to reduce phosphorus from the direct watershed to Lake Edina.

- Treatment of invasive (EWM) in Lake Edina could be considered to prevent it from further threatening the lake's aquatic plant community and minimize the likelihood of plant fragments being conveyed to Nine Mile Creek and downstream Normandale Lake.
- The 2019 Southeast Anderson Lake plant community met the MDNR proposed Plant IBI impairment thresholds, but the appearance and expansion of curly-leaf pondweed (CLP) in the lake during the past five years and the appearance and expansion of Eurasian watermilfoil during the past 2 years is unfavorable for the Southeast Anderson Lake native plant community. The addition of phosphorus from decaying CLP is unfavorable for the lake's water quality.
 - Management of CLP and EWM to protect, and if possible improve, the health of the native plant community and the lake's water quality could be considered.
- The fish IBI used by the MPCA to assess streams within the Minnesota River watershed from the mid-1990s through 2018 was used to assess the fish community in Nine Mile Creek from 2003-2019. 2019 data were consistent with historical values.
 - MPCA has changed water quality standards including changing the Fish IBI and adding a macroinvertebrate IBI to the standards. In the future, the District could consider using the MPCA-recommended IBIs to assess the fish and macroinvertebrate communities of Nine Mile Creek to determine whether or not the stream is biologically impaired for fish and/or macroinvertebrates.

Request

No action required. The presented is for informational purposes to promote discussion.