

Engineer's Report

April 14, 2021

Normandale Lake Water Quality Improvement Project:

Preparation for the 2021 monitoring season is underway, including consideration of additional monitoring for 2021 to quantify filamentous algae mass in Normandale Lake over time, measure dissolved oxygen levels across the lake, and to collect photographic documentation of lake changes during the year. Barr and District staff are also researching options to measure/quantify smells at Normandale Lake. The objectives of the potential monitoring activities are to better understand and quantify current conditions and to evaluate benefits of existing and future potential management actions. Barr and District staff are evaluating the scope and cost to conduct these additional monitoring efforts.

Planning and coordination for a 2021 spring herbicide treatment of the remaining curly-leaf pondweed continues. Based on 2020 aquatic plant surveys, we anticipate that the treatment will be a spot treatment, versus a whole lake treatment. However, the treatment approach will depend on results of a pre-treatment plant delineation survey, which is scheduled to be completed in the upcoming week. A request for quotes (RFQ) for the herbicide application was distributed and quotes were received from two herbicide application contractors. Discussion on the quotes received is planned for the April 21, 2021 regular board meeting. Upon completion of the pre-treatment plant survey and determination of the proposed treatment design, a permit application will be submitted to the Minnesota Department of Natural Resources (MNDNR).

Bush Lake Shoreline Vegetation Management:

No new activities.

Wetland Restoration and Protection Opportunity Identification:

Barr staff presented information and facilitated discussion at the District's April 1, 2021 workshop to get further guidance on the types of wetland protection and/or restoration projects the District would like to pursue and how to prioritize potential projects. The additional guidance from the board of managers will be used to inform development of a request for proposals (RFP) to further assess the feasibility, scope, and cost of potential wetland protection projects identified in the *Wetland Restoration and Protection Opportunity Identification* report (March 2021) and prioritize based on board and staff feedback. A summary of the discussion will be shared with the board at an early-May workshop for concurrence and a draft RFP will be prepared for the May regular meeting.



Protecting and restoring high-quality wetlands is one of the wetland management goals identified in the District's 10-year Water Management Plan.

Lake Level Management Plans for Arrowhead and Indianhead Lakes:

A draft report was provided to the District and Edina staff for review on February 9, 2021. We received comments on the draft report via the City of Edina on April 7 and will schedule a meeting to discuss and finalize the report in the upcoming weeks.

Edina Stream Stabilization Project:

There were no new construction or maintenance activities associated with the project.

Landbridge Ecological has prepared a proposal for vegetative management services for the spring and summer seasons as a long term contract is being created by the City of Edina. Barr staff reviewed the work plan and cost estimate from Landbridge and have recommended to the District Administrator approval of the proposal and to proceed with the preparation of the necessary contractual agreement.

Discovery Point Restoration and Building Addition Rain Garden and Landscape:

Work is underway for the final phase of ecological restoration at Discovery Point. Minnesota Native Landscapes used a forestry mower to remove woody invasive species including buckthorn and Tatarian honeysuckle from the project area. Select trees under 8" in caliper were also removed. These trees included green ash and Siberian elms. The area treated with the forestry mower has also been seeded with a native woodland seed mix and erosion control has been installed. The cover crop should germinate quickly as the soil temperatures warm through April. Management for buckthorn re-sprouts and other invasive species will begin in the coming weeks and continue until spring 2022.

Change Order #1, in the amount of \$1,600.00, was issued for the project on March 15, 2021 for additional sedimentation log to accommodate the full extent of the disturbance area along the public trail and approval of an alternate woodland seed mix due to seed availability. The change order was approved by the District administrator upon recommendation by Barr, thereby modifying the contract price from \$105,828.00 to \$107,428.00.

The first pay request was received from Minnesota Native Landscapes for work completed through April 12, 2021 in the amount of \$26,280.00. Work covered in the pay request includes mobilization, tree and woody invasive species removal, woodland seeding, and erosion control. Barr is recommending payment.

Rain garden construction and restoration of the area disturbed during construction of the building addition will occur in the coming weeks.

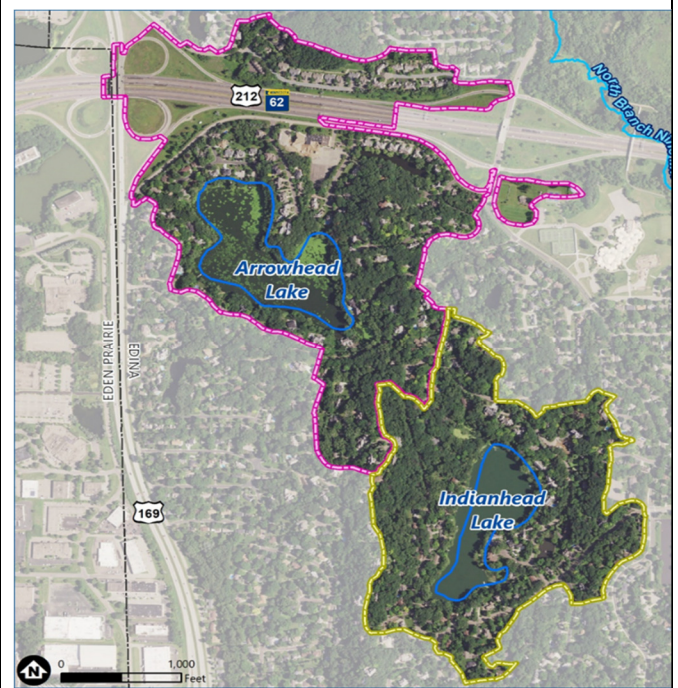


A forestry mower is used to grind down existing buckthorn on site where the "slash" (chopped material) can be left to decompose and help prevent erosion.

Arrowhead Lake and Indianhead Lake Water Quality Study:

An update of the Use Attainability Analysis (UAA) of Arrowhead Lake and Indianhead Lake in Edina is underway, with completion anticipated in 2021. A UAA was originally developed for these lakes in 2006. The goals of this study are to comprehensively evaluate the current water quality and ecological status of these lakes and identify management needs to maintain or improve lake water quality. These are landlocked lakes and hence internal lake processes (e.g. internal loading) can be expected to have a significant effect of lake water quality.

Initial meetings with the City of Edina and lake residents will be scheduled for the spring. We anticipate that the kick-off meeting with interested residents will be held in conjunction with a meeting regarding the Lake Level Management Plans for Arrowhead and Indianhead Lakes.



Watershed map of Arrowhead Lake and Indianhead Lake in southwest Edina. Both lakes are land-locked.

Lake Cornelia and Lake Edina Water Quality Improvements: Rosland Park Stormwater Filtration BMP:

Design work continues on the Rosland Park Stormwater Filtration BMP. Work in the last month included preparing 60% design level construction drawings which included plan sheets for existing conditions, removals, erosion and sediment control, a traffic control plan, filter vault layout and grading, vault structural design, piping system (inflow, outflow, and backwash piping), pump station, electrical, vegetation restoration and a planting plan. The design team continues to refine the design, with a goal of 90% design completion by late-April. Upon completion of 90% design, the construction drawings will be provided to City of Edina staff for review and formal comment. We anticipate meeting with NMCWD and City staff shortly following transmittal of the 90% design plans to discuss the design revisions and remaining design elements needing city coordination and/or input.

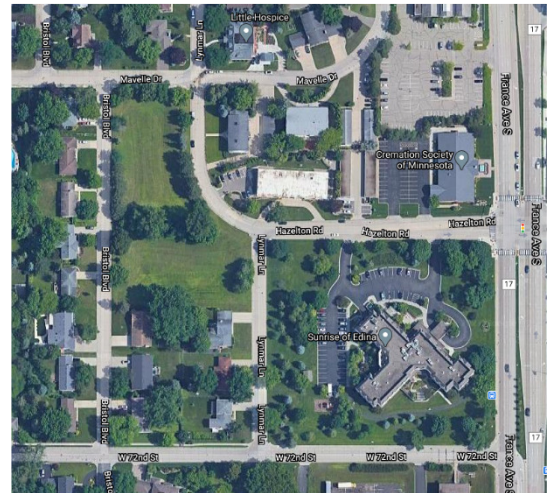
The stormwater filtration vault will include several chambers, in which multiple filtration media can be used/tested to optimize phosphorus removal. On March 31, 2021 Barr, City of Edina, and NMCWD staff met with Mike Trojan from the Minnesota Pollution Control Agency (MPCA) stormwater program and Andy Erickson, a research associate at the University of Minnesota St. Anthony Falls Laboratory (SAFL) to further brainstorm and discuss potential filtration media and monitoring the performance of the system. Barr has also begun preparing for column test experiments of several filter media options. The column testing will help to assess the performance of each media (e.g., TP removal), the filtration rates, and the performance as a function of flow rate through the media (some react quickly and some react slowly).

The design team continues to discuss the locations and types of monitoring that will be needed to assess system performance and how to incorporate access to these locations/water streams into the design for future sampling purposes.

Work on MNDNR and US Army Corp of Engineers (ACOE) permitting has also been initiated.

Lake Cornelia and Lake Edina Water Quality Improvements: Lynmar Basin Stormwater Retrofit Concept Plan:

The Lynmar Basin, located in the Lake Edina watershed, currently serves as a dry pond, providing flood detention but minimal water quality benefits. This site was identified for implementation of stormwater best management practices in the *Lake Cornelia and Lake Edina Water Quality Improvement Project, Feasibility Study/Preliminary Engineering Report (2020)* to reduce stormwater volume and pollutants to downstream Lake Edina. The proposed partnership project between the District and City of Edina will retrofit and enhance stormwater quality improvement and flood reduction best management features (BMPs) within the park. The proposed project will also seek to provide additional co-benefits, including improved ecology and wildlife habitat, enhanced active and passive recreation opportunities within the park, and educational opportunities for park users.



Lynmar Basin is a low-lying, turfed/natural area just south of Mavelle Drive, between Bristol Boulevard and Lynmar Lane.

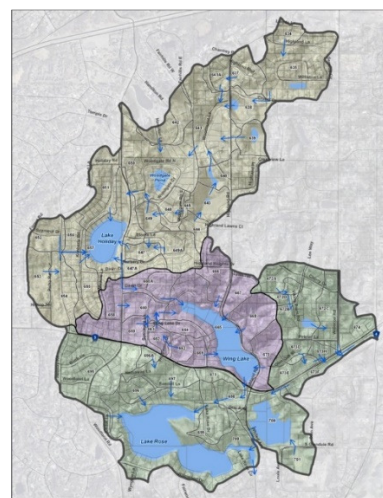
At the District's April 1, 2021 workshop, the board of managers approved a scope of work to develop a conceptual design for the stormwater retrofit project, which will include reviewing public feedback gathered by City of Edina staff on current uses of the park, developing design concepts, soliciting feedback on the concepts from the interested public, refining a design concept, and developing a cost estimate and summary of project benefits.

A public engagement plan for the project was developed by the City of Edina, with input from Barr and NMCWD staff. The City has developed a project webpage on their Better Together website (see link below), which includes a survey for interested public to provide information on how they currently use the park. A Community Open House will be held at the park on April 20, 2021 to answer questions and gather additional input from interested public. Barr staff will be attending the open house along with District and City of Edina staff.

<https://www.bettertogetheredina.org/bristol-mavelle-park?tool=map>

Holiday-Wing-Rose Lake Water Quality Study

An update of the Use Attainability Analysis (UAA) of the Holiday-Wing-Rose chain of lakes in Minnetonka is underway with completion anticipated in 2021. The original UAA was completed for these lakes in 2010. The goals of this study are to comprehensively evaluate the current water quality and ecological status of these lakes and identify management needs to maintain or improve lake water quality. These are shallow lakes and it can be expected that aquatic plants and shoreline issues will be of interest to lake residents. This suggests that city (City of Minnetonka) and public engagement will be an important component of these studies. Initial meetings with the City and lake residents will be scheduled for the spring.



Watershed map of Holiday-Wing-Rose chain of lakes in Minnetonka. Discharge from Rose Lake flows south to Birch Island Lake in Eden Prairie.

Atlas 14 Flood Risk and Resiliency, Phase II:

In the past month, Barr made significant progress on several tasks associated with Phase II of the Atlas 14 Flood Risk and Resiliency project. Barr staff completed initial volume capture of the Atlas 14 500-year event (10.5 inches), and final inundation review and associated QAQC is nearing completion. Initial level-pool inundation mapping of the 500-year event is shown in a figure below.

With volume capture nearing completion, Barr staff continued to make progress on organizing required data for calibration. Barr reviewed rainfall and monitoring data throughout 2019 and 2020 and ultimately selected three (3) candidate rainfall events for calibration:

- Validation event: May 8, 2019 (1.5-inches, 10-hour duration, 0.5 in/hr peak intensity)
- Calibration event #1: June 28-29, 2020 (2.2-inches, 12-hour duration, 2.0 in/hr peak intensity)
- Calibration event #2: November 11, 2020 (1.1-inches, 9-hour duration, 0.8 in/hr peak intensity)

Event selection was based on a number of criteria (e.g., days since last rainfall, days until next rainfall, cumulative rainfall depth, peak rainfall intensity, consistency of rainfall event throughout district, etc.). Because there were few large rainfall events which met selection criteria within the 2019-2020 dataset, Barr intends to additionally evaluate the June 18-19, 2014 rainfall event, which produced a cumulative depth of 4.9-inches over 2-days, as a second validation event.

In addition to calibration event selection, Barr has begun to evaluate and calibrate flow-depth rating curves at each of the four calibration locations. Monitored profiles at each calibration location will be compared to the

existing modeled cross-sections and model updates will be made (e.g., channel roughness and profile adjustments) until a successful hydraulic calibration is achieved at each location. Rating curve review is a critical first step to model calibration, as this step ensures modeled hydraulics are representative of real-world conditions prior to calibrating hydrologic conditions and modeled rainfall events. Barr staff also began initial work related to several other Phase II tasks, including quantifying flood damage costs, risk analysis for crossing failure, and developing a framework for evaluating flood mitigation alternatives. Barr will be presenting an overview of the Phase II project at an upcoming Technical Advisory Committee (TAC) meeting on April 27, 2021, including summarizing progress related to volume capture and calibration, and soliciting feedback and input on other Phase II tasks listed above.

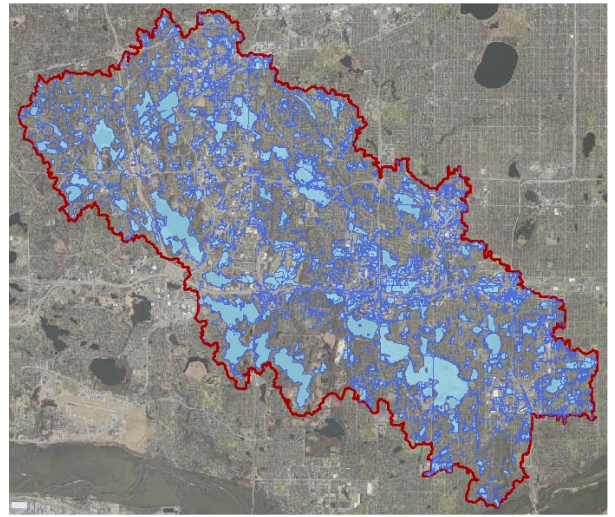


Image showing preliminary level-pool inundation mapping of the Atlas 14 500-year event (10.5 inches) throughout the watershed.

Wetland Conservation Act (WCA) and NMCWD Wetland Rule Administration:

Work administering the WCA and NMCWD wetland rule in the past month included:

- Cherokee Trail/Old Shady Oak Road Culvert Improvements (Eden Prairie) – review and discuss potential indirect wetland impacts and improvement opportunities, prepare draft WCA Notice of Decision, submit notification of 60-day extension on WCA no-loss and utility exemption decision.
- West 70th Street (Eden Prairie) – request and evaluate MNRAM data and classification
- WCA annual reporting and other miscellaneous program administration