



Bassett Creek Watershed Management Commission

Regular Meeting
Thursday August 19, 2021
8:30 – 11:00 a.m.

Via Zoom – Click [HERE](#) to join the meeting.
Or join by phone +1-312-626-6799; Meeting number 828 1675 1793

AGENDA

1. CALL TO ORDER and ROLL CALL

2. PUBLIC FORUM ON NON-AGENDA ITEMS – *Members of the public may address the Commission about any item not contained on the regular agenda. A maximum of 15 minutes is allowed for the Forum. If the full 15 minutes are not needed for the Forum, the Commission will continue with the agenda. The Commission will take no official action on items discussed at the Forum, with the exception of referral to staff or a Commissions Committee for a recommendation to be brought back to the Commission for discussion/action.*

3. APPROVAL OF AGENDA

4. CONSENT AGENDA (10 minutes)

- A. Approval of Minutes – July 15, 2021 Commission Meeting
- B. Acceptance of August 2021 Financial Report
- C. Approval of Payment of Invoices
 - i. Keystone Waters, LLC – July 2021 Administrative Services
 - ii. Keystone Waters, LLC – July 2021 Printing Expenses
 - iii. Barr Engineering – July 2021 Engineering Services
 - iv. We All Need Food and Water – July 2021 Administrative and Education Services
 - v. Kennedy & Graven – June 2021 Legal Services
 - vi. Stantec – July WOMP Services
 - vii. Redpath – June Accounting Services
 - viii. Talbott Promotions – Dog Waste Bag Dispensers
- D. Approval of West Metro Water Alliance Updated Education and Outreach Plan

5. BUSINESS

- A. Receive Presentation on 2020 Lake Monitoring Results (40 min)
- B. Consider Approval of 90% Design Plans for Parkers Lake Drainage Project and Mt. Olivet Stream Restoration Project (30 min)

BREAK

- C. Consider Approval of Recommendations from Technical Advisory Committee (20 min)
- D. Consider Approval of 2022 BCWMC Operating Budget (10 min)
- E. Consider Approval of Minor Amendment to Watershed Management Plan (10 min)
- F. Discuss Potential MAWD Resolutions (10 min)

6. COMMUNICATIONS (10 minutes)

- A. Administrator's Report
 - i. Comments on PRAP

- ii. Hennepin County Board Levy Decision
- iii. Clean Water Fund Grant Application – Medley Park
- iv. Report on Salt Symposium
- v. Update on BCWMC Bicycle Tour
- B. Chair
- C. Commissioners
- D. TAC Members
- E. Committees
 - i. Report on Education Committee Meeting
- F. Education Consultant
- G. Legal Counsel
- H. Engineer
 - i. Report on Work on Hwy 55 Structure

7. INFORMATION ONLY (Information online only)

- A. BCWMC Administrative Calendar
- B. CIP Project Updates <http://www.bassettcreekwmo.org/projects>
- C. Grant Tracking Summary and Spreadsheet
- D. [Public Notices for Reissuances of MS4 Permits for Multiple BCWMC Cities](#)
- E. WCA Notice of Application, Golden Valley
- F. WCA Notices of Application and Decision, Plymouth
- G. 2021 Minnesota Stormwater Research Council Highlights
- H. [MAISRC Research & Management Showcase – Registration Open](#)

8. ADJOURNMENT

Upcoming Meetings & Events

- Bryn Mawr Meadows Park Project Public Open House: September 7th, time and location TBD
- BCWMC Regular Meeting and Public Hearing: Thursday September 16th, 8:30 a.m, Location TBD
- [MAISRC Research & Management Showcase](#): Wednesday September 22nd, online or in person, U of M St. Paul
- BCWMC Bicycling Tour and Social Gathering: Thursday September 30th, approximately 4:00 start, Utepils Brewery, Minneapolis



Bassett Creek Watershed Management Commission

AGENDA MEMO

Date: August 11, 2021

To: BCWMC Commissioners

From: Laura Jester, Administrator

RE: **Background Information for 8/19/21 BCWMC Meeting**

1. **CALL TO ORDER and ROLL CALL**
2. **PUBLIC FORUM ON NON-AGENDA ITEMS**
3. **APPROVAL OF AGENDA – ACTION ITEM with attachment**
4. **CONSENT AGENDA (10 minutes)**
 - A. Approval of Minutes – July 15, 2021 Commission Meeting- **ACTION ITEM with attachment**
 - B. Acceptance of August Financial Report - **ACTION ITEM with attachment**
 - C. Approval of Payment of Invoices - **ACTION ITEM with attachments (online)** – *I reviewed the following invoices and recommend approval of payment.*
 - i. Keystone Waters, LLC – July 2021 Administrative Services
 - ii. Keystone Waters, LLC – July 2021 Printing Expenses
 - iii. Barr Engineering – July 2021 Engineering Services
 - iv. We All Need Food and Water – July 2021 Administrative and Education Services
 - v. Kennedy & Graven – June 2021 Legal Services
 - vi. Stantec – July WOMP Services
 - vii. Redpath – June Accounting Services
 - viii. Talbott Promotions – Dog Waste Bag Dispensers
 - D. Approval of West Metro Water Alliance Updated Education and Outreach Plan – **ACTION ITEM with attachment** – *WMWA recently updated its overall education and outreach plan to better define key audiences and align with current activities of the group. I helped with these revisions and I remain an active member of WMWA including attending monthly meetings. (Plymouth and Robbinsdale staff also regularly participate in activities and attend WMWA meetings.) The BCWMC Education Committee was also given an opportunity to review the updated plan; their recommended additions on connecting the impacts of climate change on water resources were included in the plan. Staff recommends approval.*
5. **BUSINESS**
 - A. Receive Presentation on 2020 Lake Monitoring Results (40 min) - **INFORMATION ITEM with attachments (See Item 5D materials from July meeting)** – *The BCWMC performed its regular monitoring on Sweeney and Twin Lake and partnered with TRPD on monitoring Medicine Lake in 2020. See the attached reports (Item 5D from July meeting); the Commission Engineer will present the monitoring results at this meeting.*
 - B. Consider Approval of 90% Design Plans for Parkers Lake Drainage Project and Mt. Olivet Stream Restoration Project (30 min) – **ACTION ITEM with attachment** – *At the June meeting, the Commission approved the 60% designs for these two CIP projects, with comments. Commission comments were addressed with these 90% designs as described in the attached memo. Additional details were added to designs. Staff recommends approval of the 90% designs with minor comments and recommends authorizing the city to prepare bid documents and construct the projects as designed.*

BREAK

- C. Consider Approval of Recommendations from Technical Advisory Committee (20 min) – **ACTION ITEM with attachment** – *The TAC met on July 29th to discuss adoption of a new XP-SWMM model and possible implementation of CIP components by the city of Plymouth at the Four Seasons Mall site, among other minor topics. TAC recommendations are included in the attached memo.*
- D. Consider Approval of 2022 BCWMC Operating Budget (10 min) – **ACTION ITEM with attachment** – *At the June meeting, the Commission approved the proposed BCWMC Operating Budget and city assessments for 2022. The proposed budget and assessments were sent to all member cities at the end of June with requests for comments to be submitted by August 1st. I did not receive comments from any city. Staff recommends approval of the 2022 budget and city assessments as approved in June and attached here.*
- E. Consider Approval of Minor Amendment to Watershed Management Plan (10 min) – **ACTION ITEM with attachment** – *In April, the BCWMC submitted a proposed minor plan amendment to review agencies and held a public hearing in May. The purpose of the amendment is to update the Capital Improvement Program by adding five projects (Beacon Heights has since been removed) and removing one project. There were no comments from review agencies (except to commend the Commission for maintaining an updated CIP) and the Hennepin County Board approved the amendment at its August 10th meeting. At the public hearing in May, the Commission heard comments from a Plymouth resident who had questions about how CIP projects are selected and consideration of the cost benefits of projects. He requested more transparency on the CIP process. I am currently drafting a fact sheet outlining the BCWMC CIP process for use on the website and during future CIP updates and plan amendment procedures. Staff recommends approval of the plan amendment as shown in highlighted (gray) rows in the attached.*
- F. Discuss Potential MAWD Resolutions (10 min) – **DISCUSSION ITEM with attachment (See Item 5E from July meeting)** – *At the July meeting, the Commission was asked if there were any ideas for resolutions that could be considered by the MN Association of Watershed Districts (MAWD) for their annual resolutions process. No new ideas for resolution were brought forward at that time, but commissioners were given a month to consider ideas. Resolutions are due September 1st.*

6. COMMUNICATIONS (10 minutes)

- A. Administrator’s Report – **INFORMATION ITEM with attachment**
 - i. Comments on PRAP
 - ii. Hennepin County Board Levy Decision
 - iii. Clean Water Fund Grant Application – Medley Park
 - iv. Report on Salt Symposium
 - v. Update on BCWMC Bicycle Tour Chair
- B. Commissioners
- C. TAC Members
- D. Committees
 - i. Report on Education Committee Meeting
- E. Education Consultant
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Bassett Creek Watershed Management Commission

DRAFT Minutes of Regular Meeting Thursday, July 15 2021 8:30 a.m.

Via video conference due to the COVID-19 global pandemic

1. CALL TO ORDER and ROLL CALL

On Thursday, July 15, 2021 at 8:32 a.m. via video conference. Chair Cesnik brought the Bassett Creek Watershed Management Commission (BCWMC) to order.

Commissioners, city staff, and others present

City	Commissioner	Alternate Commissioner	Technical Advisory Committee Members (City Staff)
Crystal	Dave Anderson	<i>Vacant Position</i>	Mark Ray
Golden Valley	Stacy Harwell, Treasurer	Jane McDonald Black	Eric Eckman
Medicine Lake	Clint Carlson	<i>Absent</i>	<i>Absent</i>
Minneapolis	Michael Welch, Vice Chair	Jodi Polzin	Katie Kowalczyk
Minnetonka	<i>Absent</i>	<i>Vacant Position</i>	Leslie Yetka
New Hope	<i>Absent</i>	Patrick Crough	Megan Hedstrom
Plymouth	Catherine Cesnik, Chair	James Prom	Ben Scharenbroich, Chris LaBounty
Robbinsdale	Wayne Sicora	<i>Vacant Position</i>	Richard McCoy, Marta Roser
St. Louis Park	Jim de Lambert, Secretary	<i>Absent</i>	Erick Francis
Administrator	Laura Jester, Keystone Waters		
Engineers	Karen Chandler and Jim Herbert, Barr Engineering		
Recorder	Dawn Pape, We All Need Food and Water		
Legal Counsel	Dave Anderson, Kennedy & Graven		
Presenters/ Guests/Public	Brett Arne and Steve Christopher, BWSR Bob Molstad, Sathre-Bergquist, Inc. Dave Gonyea, Gonyea Custom Homes Justin Klabo, Advanced Engineering and Environmental Services, LLC Joe Retka, Enebak Construction Company		

2. PUBLIC FORUM ON NON-AGENDA ITEMS

No members of the public were present for the public forum.

3. APPROVAL OF AGENDA

MOTION: Commissioner Welch moved to approve the agenda. Alternate Commissioner Crough seconded the motion. Upon a roll call vote, the motion carried 7-0, with the cities of Minnetonka and Robbinsdale absent from the vote.

4. CONSENT AGENDA

The following items were approved as part of the consent agenda. Item 4E was pulled from the agenda for further review and discussion and added to the meeting agenda.

- A. Approval of Minutes – June 17, 2021 Commission Meeting
- B. Acceptance of July 2021 Financial Report
- C. Approval of Payment of Invoices
 - i. Keystone Waters, LLC – June 2021 Administrative Services
 - ii. Keystone Waters, LLC – June 2021 Printing Expenses
 - iii. Barr Engineering – June 2021 Engineering Services
 - iv. We All Need Food and Water – June 2021 Administrative and Education Services
 - v. Kennedy & Graven – May 2021 Legal Services
 - vi. Stantec – June WOMP Services
 - vii. Redpath – May Accounting Services
 - viii. Metro Watershed Partners – 2021 Contribution
 - ix. Metro Blooms – Lawns 2 Legumes Grant Project
- D. Set Public Hearing on 2022 CIP Projects for September 16, 2021
- E. Direct Staff to Evaluate Clean Water Fund Grant Materials and Apply for Medley Park Stormwater Treatment Facility If Warranted
- F. Approval of Special Projects Funding Request from West Metro Water Alliance (WMWA)

The general and construction account balances reported in the July 2021 Financial Report are as follows:

Current Assets	Capital Improvement Projects	General Fund	TOTAL
Checking	369,587.51	228,616.31	630,475.82
4MP Fund Investment	3,501,105.22	175.68	3,501,280.90
4M Fund Investment	1,483,511.82	25.08	1,483,536.90
Total Checking/Savings July 2021	5,354,204.55	228,817.07	5,615,293.62

MOTION: Commissioner de Lambert moved to approve the consent agenda as amended. Commissioner Carlson seconded the motion. Upon a roll call vote, the motion carried 7-0, with the cities of Minnetonka and Robbinsdale absent from the vote.

5. BUSINESS

A. Review Administrative Services Committee Recommendations

The committee met on July 7th to discuss a variety of topics. Committee Chair Harwell summarized the conversation and gave some reminders and recommendations regarding meeting conduct and procedures, including the need for early communication between cities and the Commission on large, controversial, or complicated projects; and limiting the use of the “chat” feature during virtual meetings to logistical meeting items.

[Commissioner Sicora joined the meeting.]

B. Receive Presentation on Level II Performance Review of BCWMC

The Board of Water and Soil Resources (BSWR) recently completed a Level II PRAP (Performance Review and Assistance Program) performance review of the BCWMC, including a survey of internal and external partners, review of progress toward watershed management plan goals and implementation of policies, a review of performance standards, and a review of wetland work, where applicable. BWSR staff Brett Arne presented the draft report with the findings and recommendations.

Mr. Arne reported that the BCWMC should be commended for their work in implementing core programs, rules, the Wetlands Conservation Act, planning efforts, and building partnerships. The board and staff have positive relationships with their partners. The BCWMC has also made significant progress toward implementing its watershed management plan, including meeting all basic standards and 8 of the 11 higher performance standards. He noted that meeting over 50% of the high-performance standards is considered “really good.”

The BCWMC was commended for meeting all of the basic performance standards including having data practices policies, updated capital improvement program, and completing required annual reports. In addition, it was noted that there is effective administration of the Wetlands Conservation Act. Mr. Arne noted that this report is a testament to the quality of work by the BCWMC and recognition among their partners. Programs and projects are successful due to grant writing, competent staff, and partnerships.

There were a few recommendations made by BWSR based on the data collected through internal and external surveys, including prioritizing development of an education and outreach strategy for BCWMC constituents, conducting a review of the BCWMC capital improvement program (CIP), developing clear and measurable goals for future plan implementation, prioritizing all training opportunities for staff implementing WCA, and considering a WCA appeals fee and clarifying the appeals process.

Mr. Arne stated that BCWMC is “knocking it out of the park” and that there are no immediate action items required because of the great job that is being done. He noted that comments on the draft report are welcome for the next 45-60 days until the report is finalized.

Steve Christopher from BWSR also recognized the outstanding work and very engaged board members.

Alternate Commissioner McDonald Black congratulated the Commission and noted that the BCMWC spends considerably less money doing their work than other similar agencies and that the BCWMC budget is decreasing compared to other watersheds. She suggested comparing budgets with neighboring watersheds. Mr. Christopher said he can send comparison data.

C. Consider Approval of Hollydale Development in Plymouth

At the June meeting, the Commission discussed this large project that includes site demolition and construction of a 229 single-family home development including streets, house pads, utilities, and stormwater management resulting in 112 acres of land disturbance and creating 34.7 acres of new and fully reconstructed impervious surfaces. After a lengthy discussion, the Commission moved to extend the review period by 60 days to allow for additional analyses.

Chair Cesnik opened the discussion by reviewing the BCWMC’s review process and the decision before the Board at this meeting. Attorney Anderson commented that when BCWMC gets a project review application, they have 60 days to approve or deny it. It can be approved conditionally or the review period can be extended. The board must apply its standards.

Plymouth TAC member Ben Scharenbroich summarized items related to the Wetland Conservation Act (WCA), the wetland buffers that will be incorporated into the project (which meet or exceed BCWMC requirements), and briefly covered items discussed during a meeting with the developer, city staff, BCWMC Administrator and Commission Engineer including Smart Salting techniques. He also noted the city is drafting an operation and maintenance plan for the stormwater BMPs.

Commissioner Welch noted that the Commission should be advised on which requirements are triggered and met or not met, including wetland buffers. Commission Engineer Chandler reminded commissioners that they do not review projects for wetland buffers as that is a city function based on city ordinances (which are required to meet BCWMC standards).

In analyzing volume reduction and water quality treatment, Engineer Chandler explained that stormwater reuse alone cannot meet the Commission's water quality requirements. She walked the Commission through the reuse calculator and the new analysis pointing out the change from an original calculator to an updated calculator.

There was a discussion about the calculators and modeling tools. Commissioner Welch expressed concern about a potential lack of confidence in the calculator. Engineer Chandler clarified that multiple calculators were used to cross reference the results.

Commissioner Harwell asked how climate change is factored into the calculator. Engineer Chandler clarified that the calculator does not factor in future projected rainfall amounts, it only uses past data.

Commissioner Welch called on Commissioner Sicora for opinion. Commissioner Sicora said there is an art to the analyses and that it's an imperfect process because it's a model. He noted it's our best attempt at what we think will happen. He reported he thinks this is the best tool we have and that if the Commission Engineer and city engineers are satisfied, he is satisfied with the model results.

Justin Klabo, the developer's consultant, added a further explanation of the different calculators and how this particular calculator was chosen.

Commissioner Harwell inquired about the site constraints besides the tight soils. Mr. Scharenbroich replied that high groundwater is another site constraint.

Commissioner Harwell stated she was glad to see chloride reduction in the plans but that she is still concerned that salty water may be used to irrigate lawns and vegetation. She would like to incorporate salt education in relation to irrigation to homeowners.

Commission Engineer Chandler explained the "Flexible Treatment Option" process noting that if stormwater best management practices cannot be sized to meet requirements due to site constraints, the applicant must follow the flow chart to consider the Flexible Treatment Options (FTO). When it was determined that the stormwater reuse system would not meet the BCWMC volume reduction requirements, the applicant followed the design sequence flow chart to the first option, FTO #1, which requires that the project achieve volume reduction of at least 0.55 inches from the new and fully reconstructed impervious surfaces and provide 75% removal of total phosphorus.

The applicant provided a report, including soil borings, showing shallow groundwater and soils that are not very conducive to infiltration. They also provided water quality modeling using P8 to determine the total phosphorus loading and removals from the stormwater ponds. Although P8 does not have the capacity to model phosphorus loading and removals from stormwater reuse, Barr Engineering used the model to estimate the water quality treatment provided by reuse by adding a small rate of "artificial" infiltration to the dead storage of Pond 5S. The assumed pond infiltration rate is equivalent to the irrigation application rate of one inch per week over 18.3 acres, converted to a constant flow rate, which is appropriate assumption to account for irrigation in the P8 modeling.

Chair Cesnik summarized that with all the rules that have been triggered, applicant is meeting requirements. Mr. Klabo added more explanation about the reuse calculator.

Developer Dave Goyea said he's open to practices to reduce chlorides as well as increasing the wetland buffer area to exceed requirements. He is open to incorporating native vegetation and would invite help with the planting plan.

The discussion went back to reuse calculators with some commissioners wanting more confidence in them. Engineer Chandler noted that the memo language should be stronger because she is comfortable and confident with the results. Mr. Klabo further explained how the P8 model was used to evaluate removal of total phosphorus. Commissioner Harwell felt reassured by this explanation.

MOTION: Commissioner de Lambert moved to approve the Hollydale Development in Plymouth per BCWMC's engineer's recommendations and approve the project's erosion and sediment control plan. Commissioner Welch seconded the motion.

MOTION: Commissioner Welch moved to amend the prior motion to add a requirement that the city send the wetland buffer plan to the BCWMC Administrator. Commissioner de Lambert seconded the motion. Upon a roll call vote, the motion carried 7-0, with the cities of Minnetonka and Medicine Lake absent from the vote.

VOTE ON ORIGINAL MOTION: Upon a roll call vote, the motion carried 7-0, with the cities of Minnetonka and Medicine Lake absent from the vote.

D. Receive Presentation on 2020 Lake Monitoring Results

The BCWMC performed its regular monitoring on Sweeney and Twin Lake and partnered with TRPD on monitoring Medicine Lake in 2020. It was decided to table this presentation until the next meeting.

5-MINUTE BREAK

E. Discuss Potential MAWD Resolutions

Administrator Jester explained that the Commission could consider drafting and submitting policy recommendations to the MN Association of Watershed Districts for consideration in MAWD's resolutions process. Resolutions would be evaluated by the MAWD membership and voted on at the annual meeting in December. Approved resolutions would become part of MAWD's 2022 legislative platform. Staff does not have any recommended resolutions at this time. If anyone else has suggestions, send them to Administrator Jester.

Commissioner Welch add that there is already a list regarding soil health and agricultural runoff. He noted that the Commission could write a letter of support for existing resolutions and also voice support at the MAWD annual meeting.

F. Discuss Potential for Fall Watershed Tour

Administrator Jester explained that the BCWMC typically holds a watershed tour for commissioners, elected officials, and partners about every other year. The last tour was held in 2019 in conjunction with the 50th anniversary celebration. Administrator Jester was seeking direction on whether or not to plan for a fall 2021 bus or bicycling tour of projects and resources.

Commissioner Welch suggested a social gathering and or a bike/drive tour in September starting at Wirth Chalet to vie several past and future project locations along the Main Stem in Wirth Park and Minneapolis and end at Utepils Brewery on the creek.

G. Appoint TAC Meeting Liaison (5 min)

The next TAC meeting is scheduled for Thursday July 29th, 10:30 – 12:00 at Brookview. Discussion topics will include the benefits and timing for recommending adoption of an updated XP-SWMM model, and 2) options and timing for implementing the Four Seasons CIP Project under city ownership.

Commissioner Harwell volunteered to serve as that meeting liaison.

6. COMMUNICATIONS

A. Administrator’s Report

- i. Met Council Water Resources Policy Advisory Group. Administrator Jester was asked by Met Council to serve on the advisory group. Chair Cesnik thought that this was a good opportunity. There will a few meetings per year. Commissioner Welch asked Jester to report back after the first couple of meetings to see if it’s valuable.

B. Chair—nothing to report

C. Commissioners

- i. Report on Outreach Event in Harrison Neighborhood
Commissioner Welch attended the event at Redeemer Lutheran. There were about 20 people in attendance.
- ii. Commissioner Welch reminded the Commission about attending Metro MAWD meetings.

D. TAC Members – no update

E. Committees

Administrative Services Committee met last week (report in Item 5A); Education Committee meeting is upcoming.

F. Education Consultant

- i. New Video about the residential raingarden in Golden Valley as part of the “Making Connections” Series.

Ms. Pape noted that her comments on the PRAP survey included a comment that there’s room for improvement with the BCWMC education and outreach program. She liked the idea of comparing what other watersheds spend. She noted that BCWMC supports many other worthy existing programs like River Watch, Metro Blooms and others, but spends less than \$15,000 in time and materials on targeted education/outreach. Whereas most other watershed districts have a minimum of two full-time staff people engaged with communications, education and outreach. She also suggested that training on the difference between education, outreach, and achieving behavior changes might be helpful.

G. Legal Counsel—nothing to report

H. Engineer – Engineer Chandler noted that monitoring continues on Westwood and Crane Lakes. She noted high chlorides measured in Crane Lake, even in July.

7. INFORMATION ONLY (Information online only)

- A. [BCWMC Administrative Calendar](#)
- B. [CIP Project Updates](#)
- C. [Grant Tracking Summary and Spreadsheet](#)
- D. [Chair’s Declaration on Meeting Format](#)
- E. [WCA Notice of Decision, Plymouth](#)

8. ADJOURNMENT

The meeting was adjourned at 11:10 a.m.

Signature/Title Date

Signature/Title Date

BCWMC August 2021 Financial Report				
		Capital Improvement Projects	General Fund	TOTAL
ASSETS				
Current Assets				
Checking/Savings				
	101 - Wells Fargo Checking	354,473.23	134,728.62	521,473.85
	102 - 4MP Fund Investment	3,501,105.22	262.12	3,501,367.34
	103 - 4M Fund Investment	1,483,511.82	37.42	1,483,549.24
	Total Checking/Savings	5,339,090.27	135,028.16	5,506,390.43
Accounts Receivable				
	112 - Due from Other Governments	353,800.00	6,777.00	360,577.00
	113 - Delinquent Taxes Receivable	20,717.00	0.00	20,717.00
	Total Accounts Receivable	374,517.00	6,777.00	381,294.00
Other Current Assets				
	114 - Prepays	0.00	3,223.00	3,223.00
	Total Other Current Assets	0.00	3,223.00	3,223.00
	Total Current Assets	5,713,607.27	145,028.16	5,890,907.43
TOTAL ASSETS		5,713,607.27	145,028.16	5,890,907.43
LIABILITIES & EQUITY				
Liabilities				
Current Liabilities				
Other Current Liabilities				
	212 - Unearned Revenue	200,000.00	1.00	200,001.00
	251 - Unavailable Rev - property tax	20,717.00	0.00	20,717.00
	Total Other Current Liabilities	220,717.00	1.00	220,718.00
	Total Current Liabilities	220,717.00	1.00	220,718.00
	Total Liabilities	220,717.00	1.00	220,718.00
Equity				
	311 - Nonspendable prepaids	0.00	3,223.00	3,223.00
	312 - Restricted for improvements	4,562,582.00	0.00	4,562,582.00
	314 - Res for following year budget	0.00	5,000.00	5,000.00
	315 - Unassigned Funds	0.00	493,025.05	493,025.05
	32000 - Retained Earnings	0.00	-95,159.98	-95,159.98
	Net Income	354,792.29	314,455.07	701,519.36
	Total Equity	4,917,374.29	720,543.14	5,670,189.43
TOTAL LIABILITIES & EQUITY		5,138,091.29	720,544.14	5,890,907.43
UNBALANCED CLASSES		575,515.98	-575,515.98	0.00

BCWMC Augsut 2021 Financial Report - Operating Budget

		Annual Budget	Jul 16 - Aug 19, 21	Feb 1 - Aug 19, 21	Budget Balance
Income					
411 · Assessments to Cities		554,900.00	0.00	554,900.00	0.00
412 · Project Review Fees		62,000.00	3,000.00	29,000.00	33,000.00
413 · WOMP Reimbursement		5,000.00	4,500.00	4,500.00	500.00
414 · State of MN Grants		0.00	0.00	11,777.26	-11,777.26
415 · Investment earnings		0.00	98.78	299.54	-299.54
416 · Use of Fund Balance		5,000.00	0.00	0.25	4,999.75
417 · Transfers from LT & CIP		42,000.00	0.00	0.00	42,000.00
Total Income		668,900.00	7,598.78	600,477.05	68,422.95
Expense					
1000 · General Expenses					
1010 · Technical Services		134,000.00	10,377.00	59,341.50	74,658.50
1020 · Development/Project Reviews		68,000.00	15,581.50	48,786.51	19,213.49
1030 · Non-fee and Preliminary Reviews		24,000.00	752.00	11,031.50	12,968.50
1040 · Commission and TAC Meetings		12,000.00	1,490.70	5,859.70	6,140.30
1050 · Surveys and Studies		9,000.00	0.00	2,761.41	6,238.59
1060 · Water Quality / Monitoring		129,000.00	8,107.42	48,024.88	80,975.12
1070 · Water Quantity		7,000.00	493.00	3,115.50	3,884.50
1080 · Annual Flood Control Inspection		12,000.00	1,024.00	1,563.00	10,437.00
1090 · Municipal Plan Review		2,000.00	0.00	0.00	2,000.00
1100 · Watershed Monitoring Program		23,000.00	1,705.07	9,614.37	13,385.63
1110 · Annual XP-SWMM Model Updates		0.00	0.00	375.50	-375.50
1120 · TMDL Implementation Reporting		7,000.00	0.00	0.00	7,000.00
1130 · APM/AIS Work		14,000.00	0.00	8,533.35	5,466.65
1140 · Erosion Control Inspections		0.00	0.00	0.00	0.00
1000 · General Expenses - Other			0.00	0.00	0.00
Total 1000 · General Expenses		441,000.00	39,530.69	199,007.22	241,992.78
2000 · Plan Development					
2010 · Next Gen Plan Development		18,000.00	0.00	0.00	18,000.00
2000 · Plan Development - Other			0.00	0.00	0.00
Total 2000 · Plan Development		18,000.00	0.00	0.00	18,000.00
3000 · Administration					
3010 · Administrator		67,400.00	5,652.00	41,616.00	25,784.00
3020 · MAWD Dues		3,750.00	0.00	3,750.00	0.00
3030 · Legal		15,000.00	1,857.60	7,507.90	7,492.10
3040 · Financial Management		4,000.00	1,000.00	4,600.00	-600.00
3050 · Audit, Insurance & Bond		18,000.00	0.00	14,849.00	3,151.00
3060 · Meeeting Catering		1,300.00	0.00	0.00	1,300.00
3070 · Administrative Services		8,000.00	480.88	4,317.18	3,682.82
3000 · Administration - Other			0.00	0.00	0.00
Total 3000 · Administration		117,450.00	8,990.48	76,640.08	40,809.92
4000 · Implementation					
4010 · Publications / Annual Report		1,300.00	0.00	0.00	1,300.00
4020 · Website		1,800.00	0.00	406.60	1,393.40
4030 · Watershed Education Partnership		17,350.00	0.00	3,500.00	13,850.00
4040 · Education and Public Outreach		26,000.00	827.89	5,953.37	20,046.63
4050 · Public Communications		1,000.00	0.00	514.71	485.29
4000 · Implementation - Other			0.00	0.00	0.00
Total 4000 · Implementation		47,450.00	827.89	10,374.68	37,075.32
5000 · Maintenance					
5010 · Channel Maintenance Fund		20,000.00	0.00	0.00	20,000.00
5020 · Long Term-FEMA Floodplain Mode		25,000.00	0.00	0.00	25,000.00
5000 · Maintenance - Other			0.00	0.00	0.00
Total 5000 · Maintenance		45,000.00	0.00	0.00	45,000.00
Total Expense		668,900.00	49,349.06	286,021.98	382,878.02
Net Income		0.00	-41,750.28	314,455.07	-314,455.07

BCWMC August 2021 Financial Report - CIP Projects

	Annual Budget	Jul 16 - Aug 19, 21	Feb 1 - Aug 19, 21	Inception to Date Exp	Remaining Budget
Income					
BC2,3,8 · DeCola Ponds B&C Improve		0.00	34,286.00		
BC23810 · Decola Ponds/Wildwood Park	0.00	0.00	0.00		
BC5 · Bryn Mawr Meadows	0.00	0.00	0.00		
BC7 · Main Stem Dredging Project		0.00	125,000.00		
BCP2 · Bassett Creek Park & Winnetka	0.00	0.00	0.00		
ML21 · Jevne Park Stormwater Mgmt	0.00	0.00	0.00		
NL2 · Four Seasons Mall Area	0.00	0.00	0.00		
SL1,3 · Schaper Pond Enhancement	0.00	0.00	0.00		
SL8 · Sweeny Lake Water Quality	0.00	0.00	236,850.01		
TW2 · Twin Lake Alum Treatment	0.00	0.00	0.00		
WST2 · Westwood Lake Water Quality	0.00	0.00	0.00		
Total Income	0.00	0.00	396,455.07		
Expense					
2017CRM · CIP-Main Stem Cedar Lk Rd-Du	1,064,472.00	0.00	511.50	132,029.25	932,442.75
BC-238 · CIP-DeCola Ponds B&C	1,600,000.00	0.00	0.00	1,507,985.31	92,014.69
BC-2381 · CIP-DeCola Ponds/Wildwood Pk	0.00	216.50	20,036.50	53,395.89	-53,395.89
BC-5 · CIP-Bryn Mawr Meadows	912,000.00	1,037.78	1,643.28	50,926.67	861,073.33
BC-7 · CIP-Main Stem Lagoon Dredging	2,759,000.00	882.00	3,506.50	105,913.53	2,653,086.47
BCP-2 · CIP- Basset Cr Pk & Winnetka	1,123,351.00	0.00	0.00	1,066,648.32	56,702.68
ML-12 · CIP-Medley Park Stormwater	0.00	523.50	29,622.50	82,275.11	-82,275.11
ML-20 · CIP-Mount Olive Stream Restore	178,100.00	187.50	2,813.00	38,806.92	139,293.08
ML-21 · CIP-Jevne Park Stormwater Mgmt	500,000.00	0.00	0.00	56,390.75	443,609.25
ML-23 · CIP-Purch High Eff St Sweeper	81,600.00	0.00	0.00	0.00	81,600.00
NL-2 · CIP-Four Seasons Mall	990,000.00	0.00	0.00	185,236.56	804,763.44
PL-7 · CIP-Parkers Lake Stream Restore	485,000.00	214.50	2,857.50	60,404.62	424,595.38
SL-1,3 · CIP-Schaper Pond	612,000.00	0.00	5,598.50	434,201.45	177,798.55
SL-8 · CIP-Sweeney Lake WQ Improveme	568,080.00	742.50	7,345.50	336,081.09	231,998.91
TW-2 · CIP-Twin Lake Alum Treatment	163,000.00	0.00	0.00	91,037.82	71,962.18
WST-2 · CIP-Westwood Lake Water Qualit	404,500.00	0.00	0.00	223,640.96	180,859.04
Total Expense	12,680,226.00	3,804.28	73,934.78	4,812,574.25	
Net Income	-12,680,226.00	-3,804.28	322,520.29		

BCWMC August 2021 Financial Report - Other Long Term Accounts

		Total Budget	Jul 16 - Aug 19, 21	Year-to-Date	Inception to Date	Remaining Budget
Income						
	Fld1 - Flood Control Long Term Maint		0.00	14,064.50	169,420.90	
	Fld2 - Flood Control Long Term Exp	699,980.00	0.00	5,529.50	484,266.41	
Total		699,980.00	0.00	8,535.00	-314,845.51	385,134.49
	Flood1 - Emergency FCP Income		0.00		0.00	
	Flood2 - Emergency FCP Expense	500,000.00	0.00		0.00	
Total		500,000.00	0.00	0.00	0.00	500,000.00
	Gen - Next gen Plan Development Income		0.00		0.00	
	Gen1 - Next gen Plan Development Exp	30,000.00	0.00		0.00	
Total		30,000.00	0.00	0.00	0.00	30,000.00
	Qual - Channel Maintenance Fund		0.00			
	Qual1 - Channel Maintenance Expense	440,950.00	0.00		267,073.30	
Total		440,950.00	0.00	0.00	-267,073.30	173,876.70
	TMDL1 - TMDL Studies Income		0.00			
	TMDL2 - TMDL Studies Expense	135,000.00	0.00		107,850.15	
Total		135,000.00	0.00	0.00	-107,850.15	27,149.85

**West Metro Education and Outreach Plan
West Metro Water Alliance
July 2021**

The West Metro Water Alliance is a collaboration of four Watershed Management Organizations (WMOs) in Hennepin County, Minnesota jointly providing common education and outreach programming to residents, property owners, and businesses in western Hennepin County about the water resources in the watersheds and positive actions that can be taken to protect and improve them. Other WMOs, cities, and agencies and organizations in the county also participate on an ad hoc basis.

History

In 2006 the Shingle Creek and West Mississippi Watershed Management Commission's Education and Public Outreach Committee (EPOC) invited the Education Committee of the Bassett Creek Watershed Management Commission to partner in developing joint education and outreach activities. The Elm Creek Watershed Management Commission soon joined, and the Three Rivers Park District, the Freshwater Society, and Hennepin County Department of Environmental Services sat in on meetings as well.

In 2010 this partnership formalized and took the name West Metro Water Alliance (WMWA). This partnership grew from a recognition that the individual organizations have many common education and public outreach goals and messages that could be more efficiently and effectively addressed and delivered collaboratively and on a wider scale. The partnership first developed a West Metro Education and Outreach Plan (Plan) in 2010 as a way to define those common goals and set forth a plan for implementing those common activities. In 2015 the partnership revised the Plan to reflect updated education and outreach priorities and to recognize the revised education and outreach requirements of the State of Minnesota General Stormwater Permit reissued in 2013. This Plan was revised in 2021 to reflect the most recent needs and priorities of the partners and the revised requirements of the General Stormwater Permit reissued in 2020.

It is understood that each WMO and community may have additional localized goals for their education programming. For example, implementation of a Total Maximum Daily Load (TMDL) plan may require targeted messages to specific audiences. Activities targeted to the urbanized areas of the county are likely to have a different emphasis than activities targeted to developing or agricultural areas. The Plan also serves as a guide for each of the partners to refine their own individual education and outreach plans and activities.

The West Metro Education and Outreach Plan is intended to serve as a framework to accommodate activities common to most or all WMOs and communities in the county as well as unique local activities.

Purpose, Goals, Target Audiences, and Objectives

This section identifies the vision, mission, and goals set forth collectively by the WMWA. It also identifies the target audiences, and the objectives for learning for each of these target audiences.

Vision:

The West Metro Water Alliance (WMWA) is a collaborative group working to create education and outreach opportunities to protect and improve water resources.

Mission:

The mission of the WMWA is to protect and improve water resources through education and outreach by:

- Jointly identifying and implementing education and outreach strategies to promote consistency of messages.
- Pooling resources to undertake activities in the most cost-effective manner.
- Promoting interagency cooperation and collaboration.

Goal:

The actions in this West Metro Education and Outreach Plan are intended to help the WMOs and member cities to meet their education and outreach needs as set forth in their Watershed and Surface Water Management Plans, Total Maximum Daily Load (TMDL) studies, and the Minnesota Pollution Control Agency's General Stormwater Permit.

Equity Statement:

WMWA acknowledges the past intrinsic gaps in water and natural resources outreach and education to underserved and minority communities and will work to incorporate principles of environmental justice where possible into our outreach efforts.

Target Audiences:

Target audiences are individuals or groups to whom education is being directed. The Plan has identified the following target audiences and general educational goals for each. Often more than one target audience will benefit from an educational activity.

1. Single family homeowners and renters
 - a. Have general understanding of watersheds and water resources
 - b. Understand the connection between behavior and water quality
 - c. Understand the connection between climate, water quality, and water quantity
 - d. Adopt sensible practices that protect water resources
 - e. Support protection and restoration efforts
2. Commercial, industrial, institutional, and multifamily property owners and managers
 - a. Maintain their properties and best management practices (BMPs) in water-friendly ways
3. Government: elected and appointed officials, staff, board and commission members
 - a. Have general understanding of watersheds and water resources
 - b. Understanding the connection between climate, water quality, and water quantity
 - c. Establish and maintain up-to-date ordinances, rules, and practices
 - d. Understand public opinions and needs regarding water resources
4. Educators and students
 - a. Have general understanding of watersheds and water resources
 - b. Understand the connection between behavior and water quality

Joint Education and Outreach Activities

Activity 1. Facilitate Online Information Availability and Sharing

Description:

Provide a convenient, “one-stop” online location for water quality/quantity information and resources. The WMWA website will provide informational, educational, and training materials; links to individual watershed management organization websites; links to other organizations such as Blue Thumb and Watershed Partners; and the latest news and information about water resources in Hennepin County.

Target Audience:

Government employees and officials, watershed commissions/boards and staff, City Councils and staff, general public, educators, students

Education Goals:

1. Deliver a consistent message
2. Create an efficient and cost-effective means for distribution of messages and resources

Proposed Activities:

1. Develop and curate content and links to off-site content.
2. Periodically query key members of the target audiences to solicit ideas for content.
3. Periodically inform the target audience of the website and content.

Measurable Goals:

1. Record number of “hits” on the website; the number of times content is used/published. Develop strategy for measurement.
2. Increase in knowledge and adoption of practices as measured in periodic surveys

Responsible Party(ies):

1. Partners – supply content for website
2. Coordinator – develop or identify existing content as requested, solicit content from partners, periodically query target audiences for content ideas and requests
3. Contracted staff – update website as needed

Timeframe:

Ongoing activity at www.westmetrowateralliance.org

Activity 2. Provide Coordinated Communication and Information Sharing

Description:

Provide targeted messaging and outreach regarding key environmental issues. Coordinate and, where appropriate, jointly prepare communications and information pieces such as articles, brochures, newsletters, graphics, photographs, handbooks, etc. Disseminate information developed by WMWA, cities, Hennepin County, and others using the web site, social media, and other media. Work with local and regional media to undertake coordinated information campaigns on general water resources issues.

Target Audience:

All target audiences

Education Goals:

1. Prioritize water issues and develop and implement educational materials focused on those issues.
2. Increase awareness of general water quality/quantity issues.
3. Increase awareness of the connection between climate, water quality, and water quantity
4. Provide stakeholders with the information and tools necessary to make a difference.

Proposed Activities:

1. In consultation with partners, annually identify high priority issue(s) of focus.
2. Develop a communications plan for each priority issue that identifies specific implementation actions for each relevant target audience, including measurable goals and responsible parties.
3. Develop materials, signs, displays, etc., conveying desired messages and make available to targeted audiences.
4. Assign a person to serve as “coordinator” for each communication plan, responsible for tracking and reporting activities.
5. Annually evaluate the extent to which the communications plans were implemented, and the measurable goals attained.
6. Periodically work with cities and Hennepin County to evaluate current knowledge regarding topics of relevance.
7. Maintain an up-to-date general media and communications plan.

Measurable Goals:

Number of pieces distributed, number of hits on website referred from outreach materials and social media, number of requests for copies of materials

Responsible Party(ies):

Coordinator- track communications plan implementation

All partners including financial support, editorial skills, graphic design skills, printing

Timeframe:

Annual, ongoing activity

Activity 3. Watershed PREP (Protection, Restoration, Education and Preservation)

Description:

Support and promote Watershed PREP (Protection, Restoration, Education and Preservation) activities providing classroom watershed education to K-12 students and education and outreach at school and community events.

Target Audience:

Educators and students, and all other targeted audiences

Education Goals:

1. Increase student and educator understanding of watersheds, water quality, the hydrologic cycle, the impacts of climate on water, and stormwater issues in their neighborhoods.
2. Increase general public understanding of watersheds, water quality, and stormwater issues in their cities and neighborhoods.

Proposed Activities:

1. Continue to work with school districts and individual schools and teachers to provide structured fourth-grade classroom lessons on watershed-relevant topics.
2. Promote PREP to other WMOs and organizations and share lesson plans and materials to broaden its reach.
3. Expand Watershed PREP activities to other activities such as family nights and outreach activities.
4. Provide education booth staffing and other assistance to member cities, lake associations, and other groups to deliver information on priority issues.
5. Document outcomes of ongoing programs.

Measurable Goals:

1. Number of students served
2. Favorable comments from teachers
3. Community members receiving targeted information at events

Responsible Party(ies):

Contracted educators – solicit school district approval and classroom teacher interest, coordinate and deliver lessons

Staff-assist with grant writing, and matching funding identification

Timeframe:

Ongoing activity continued as funding is available

Activity 4. Pursue and Obtain Funding for Joint Education and Outreach Activities

Description:

Investigate options and pursue funding from foundations, grant agencies, and other sources to supplement WMO and city funding for education and outreach activities.

Target Audience:

WMOs and cities

Education Goals:

1. Obtain funding to undertake and expand activities
2. Raise awareness of the WMWA with funding agencies and sources

Proposed Activities:

1. Identify fiscal agent(s)
2. Identify funding options and funding goals
3. Identify matching funding sources and amounts
4. Develop packet of information for funding sources describing WMWA and its partners, the organization's goals and activities, and education and outreach strategies
5. Write and submit grant proposals
6. Document outcomes of previous programs.

Measurable Goals:

1. Number of applications successfully made
2. Grant and matching funds raised

Responsible Party(ies):

Staff-appropriate individuals, other partners for research, grant writing, and matching funding identification

Timeframe:

Ongoing activity continued as funding opportunities are available



Sweeney Lake 2020 water quality monitoring



Monitoring water quality in Sweeney Lake

The Bassett Creek Watershed Management Commission (BCWMC) has monitored water quality conditions in the watershed's 10 priority lakes since 1972. The purpose of this monitoring is to detect changes or trends in water quality and evaluate the effectiveness of efforts to preserve or improve water quality.

At a glance: 2020 monitoring results

In 2020, the BCWMC monitored Sweeney Lake for:

- Water chemistry (nutrients, chlorophyll *a*, chloride).
- Water clarity and dissolved oxygen.
- Phytoplankton and zooplankton (microscopic plants and animals).
- Macrophytes (aquatic plants).

About Sweeney Lake

BCWMC classification	Priority-1 deep lake
Watershed area	2,397 acres
Lake size	67 acres
Average depth	12 feet
Maximum depth	25 feet
MNDNR ordinary high water level	827.9 feet
Normal water level	827.2 feet
Downstream receiving waterbody	Sweeney Lake Branch, Bassett Creek
Location (city)	Golden Valley
MPCA impairments	Chloride and nutrients
Aquatic invasive species	Curly-leaf pondweed
Public access	Yes (non-motorized boat launch)



2020 monitoring results indicate decreasing total phosphorus concentrations and increasing water clarity have improved Sweeney Lake's water quality and overall ecological health. Numbers of plant species and the quality of the plant community improved, phytoplankton numbers declined, and zooplankton numbers declined because fish were better able to see and prey upon zooplankton. Because fish growth is determined by the quantity of food consumed, the increased predation of zooplankton is favorable for fish growth.

Results of 2020 monitoring show that Sweeney Lake met the applicable Minnesota Pollution Control Agency (MPCA) and BCWMC water quality standards for Secchi disc depth (a measure of clarity), total phosphorus, and chlorophyll *a*. Trend analyses show improving water quality with statistically significant (95 percent confidence level) decreases in total phosphorus concentrations and increases in water clarity (Secchi disc depth) over the last 10 years.

The lake met the MPCA maximum standard for chloride but failed to meet the MPCA chronic standard for chloride. More near-bottom chloride measurements failed to meet the MPCA chronic criterion in 2020 than in 2017, an unfavorable change for the lake.

Phytoplankton and zooplankton numbers were within the range observed since 1982. Both the number of plant species in the lake and Floristic Quality Index (FQI) values (a measure of plant species quality) were better than the MNDNR Plant Index of Biotic Integrity (IBI) thresholds.

In the spring of 2020, an herbicide (diquat) was applied within portions of Sweeney Lake to control curly-leaf pondweed (CLP), an aquatic invasive species (AIS). The successful treatment reduced CLP frequency in the lake (two locations in June 2020 compared with 13 locations in June 2017). Other AIS species observed in 2020 were yellow iris, purple loosestrife, reed canary grass, and narrow-leaved cattail. The appearance of yellow iris is concerning because it spreads rapidly and competes with native shoreland vegetation.

The results of an AIS Suitability Analysis indicate the water quality of Sweeney Lake meets the suitability requirements for rusty crayfish, faucet snail, zebra mussel, spiny waterflea, and starry stonewort and partially meets the suitability requirements for the Chinese mystery snail.

Recommendations

- Identify management measures to reduce chloride runoff from the lake's watershed

- Communicate with landowner to request removal of yellow iris
- Continue to provide education and information to residents and lake users to reduce the chance of AIS introduction.
- Continue water quality and biological monitoring at a 3-year frequency

Water chemistry monitoring: 2020

Total phosphorus levels

While phosphorus is necessary for plant and algae growth, too much phosphorus leads to excessive algae, decreased water clarity, and water impairment. Some common sources of phosphorus are fertilizers, leaves and grass clippings, atmospheric deposition, soil erosion, and plant die-off (such as curly-leaf pondweed). Phosphorus can also be released from lake sediments when oxygen concentrations are absent or very low.

- **BCWMC/MPCA standard:** 40 micrograms per liter ($\mu\text{g/L}$) or less.
- **Range:** Total phosphorus concentrations in the North Basin ranged from a low of $19 \mu\text{g/L}$ on July 27 to a high of $38 \mu\text{g/L}$ on August 17. Total phosphorus concentrations in the South Basin ranged from a low of $16 \mu\text{g/L}$ on July 4 to a high of $32 \mu\text{g/L}$ on August 17. Fifty-eight percent of North Basin and 60 percent of South Basin total phosphorus concentrations were in the "mesotrophic" category, indicating medium levels of nutrients. All other total phosphorus concentrations were in the eutrophic category, indicating high levels of nutrients.
- **Summer average of North and South Basins:** $24 \mu\text{g/L}$ (met BCWMC/MPCA standard)

Chlorophyll α levels

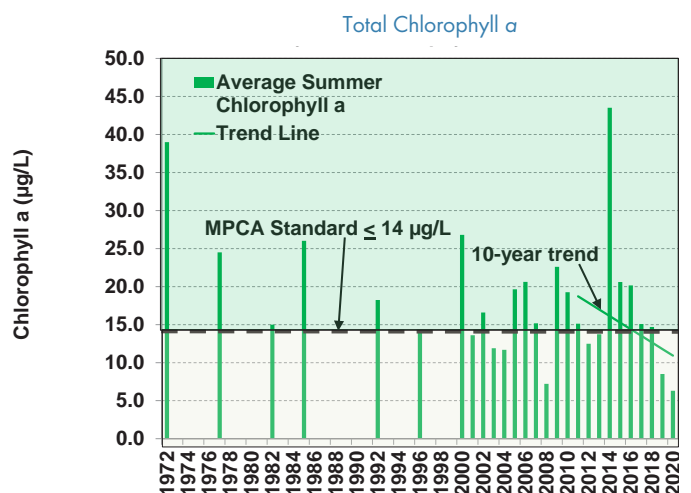
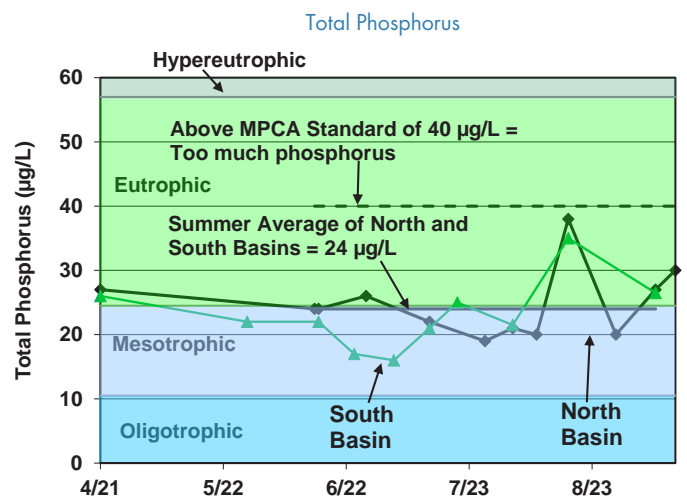
Chlorophyll α is a pigment in algae and generally reflects the amount of algae growth in a lake. Lakes which appear clear generally have chlorophyll α levels less than 15 micrograms per liter ($\mu\text{g/L}$).

- **BCWMC/MPCA standard:** $14 \mu\text{g/L}$ or less.
- **Range:** Chlorophyll α concentrations in the North Basin ranged from a low of $1.9 \mu\text{g/L}$ on June 27 to a high of $12.4 \mu\text{g/L}$ on April 21. Chlorophyll α concentrations in the South Basin ranged from a low of $2.7 \mu\text{g/L}$ on May 28 to a high of $14.3 \mu\text{g/L}$ on April 21. Sixty-seven percent of North Basin and 50 percent of South Basin chlorophyll α concentrations were in the mesotrophic category, indicating good water quality. All other chlorophyll α concentrations were in the eutrophic category, indicating poor water quality.

- **Summer average of North and South Basins:** Summer average of North and South Basins: $6.3 \mu\text{g/L}$ (met BCWMC/MPCA standard)

Definitions

- **Hypereutrophic:** Nutrient-rich lake conditions characterized by frequent and severe algal blooms and low water clarity; excessive algae can significantly reduce lake oxygen levels
- **Eutrophic:** Lake condition characterized by abundant accumulation of nutrients supporting dense growth of algae and other organisms; decay of algae can reduce lake oxygen levels
- **Mesotrophic:** Lake condition characterized by medium levels of nutrients and clear water
- **Oligotrophic:** Lake condition characterized by a low accumulation of dissolved nutrients, high oxygen content, sparse algae growth, and very clear water



Water clarity

Water clarity is often affected by sediment and the amount of algae in a lake. It is usually measured by lowering an 8-inch “Secchi” disc into the lake; the depth at which the disc’s alternating black-and-white pattern is no longer visible is considered a measure of the water’s transparency (or clarity). The higher the Secchi depth, the better the clarity.

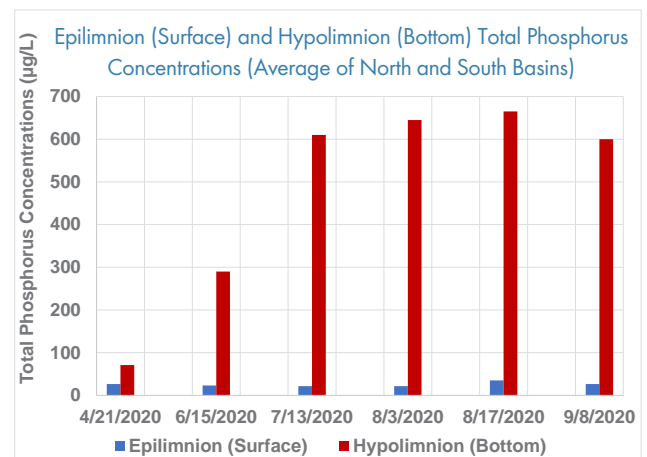
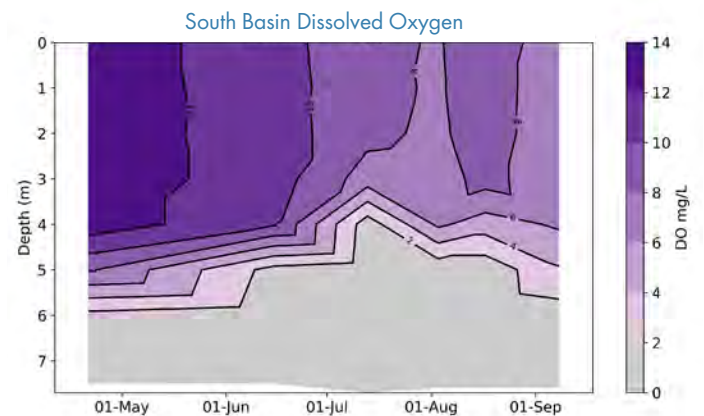
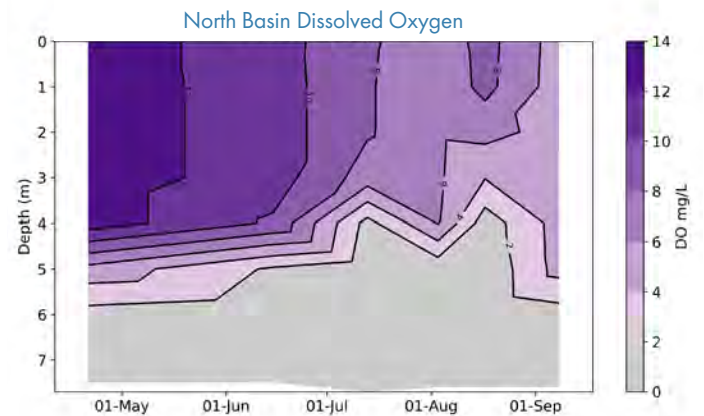
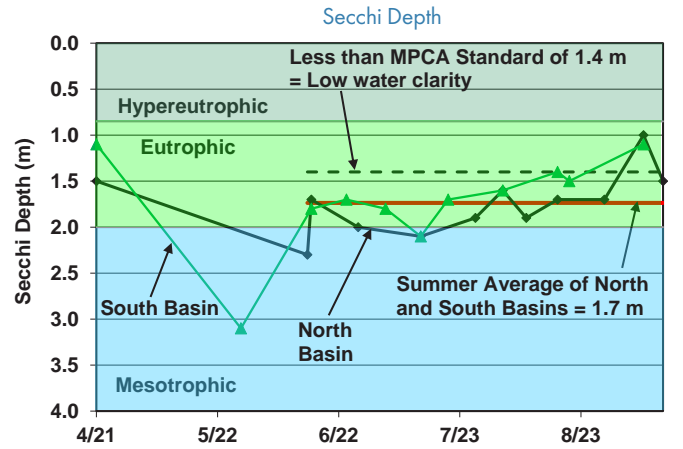
- **BCWMC/MPCA standard:** 1.4 meters or more.
- **Range:** Secchi disc depth in the North Basin ranged from a low of 1.0 meter on September 8 to a high of 2.3 meters on June 14. Secchi disc depth in the South Basin ranged from a low of 1.1 meters on April 21 and September 8 to a high of 3.1 meters on May 28. Twenty-five percent of North Basin and 18 percent of South Basin Secchi disc depths were in the mesotrophic category, indicating good water quality. All other measurements were in the eutrophic category, indicating poor water quality.
- **Summer average of North and South Basins:** 1.7 meters (met BCWMC/MPCA standard).

Phosphorus loading from sediment

The release of phosphorus stored in lake-bottom sediments when oxygen levels are low is described as internal loading from sediment. The Sweeney Lake total maximum daily load (TMDL) study found internal phosphorus loading from sediment to be a significant source of lake phosphorus—about one-third of the lake’s total annual phosphorus load. According to the study, phosphorus from Sweeney Lake’s sediment is conveyed to the surface by diffusion, wind mixing, and mixing by the aeration system in previous years. The aerators were not operated in Sweeney Lake during the 2020 sampling season.

The 2020 data indicate near-bottom oxygen levels were low (<2 mg/L) throughout the monitoring period. Internal phosphorus loading from sediment during this period caused near-bottom phosphorus concentrations to increase consistently. Because the lake remained stratified (separated into layers) throughout the monitoring period, the high phosphorus concentrations were confined to the bottom of the lake. The surface water phosphorus concentrations met the MPCA standard throughout the monitoring period.

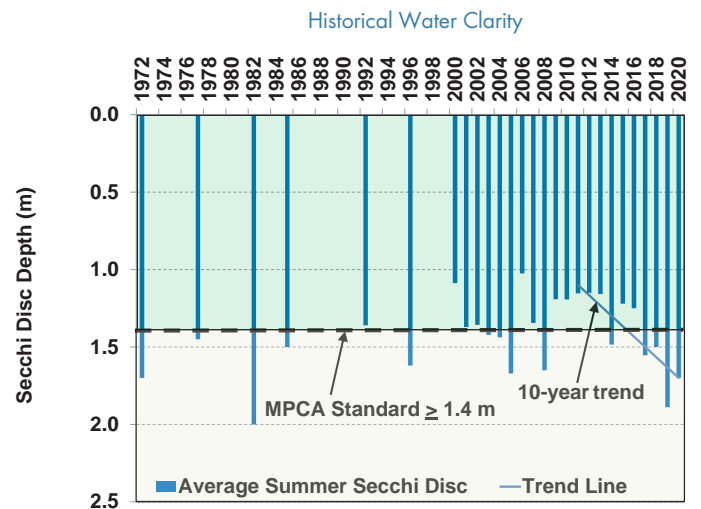
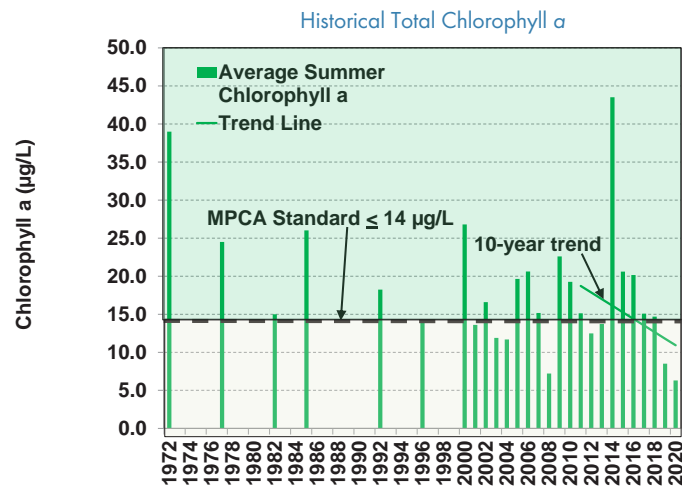
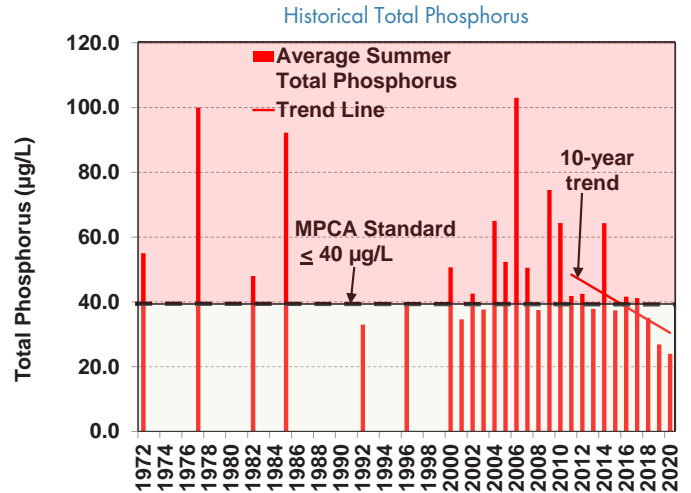
In 2020, BCWMC completed an alum treatment in the fall to reduce internal phosphorus loading from sediment. BCWMC also removed 452 carp from Sweeney Lake in 2020 to further reduce internal phosphorus loading. The bottom-feeding fish disturb the phosphorus-rich lake sediment, releasing phosphorus into the water column.



Water chemistry monitoring from 1972–2019: historical trends

Water quality in Sweeney Lake has been monitored since 1972. Summer averages (June through September) of total phosphorus, chlorophyll a, and Secchi disc depth from 1972–2020 are shown in the figures at right. During the period of record, 63 percent of total phosphorus, 70 percent of chlorophyll a, and 37 percent of Secchi disc summer averages failed to meet Minnesota State Water Quality Standards for lakes in the North Central Hardwood Forest Ecoregion, as published in Minnesota Rules 7050 (Minn. R. Ch. 7050.0222 Subp 4).

Trend analyses show improving water quality with statistically significant (95 percent confidence level) decreases in total phosphorus concentrations and increases in water clarity (Secchi disc depth) over the last 10 years. Chlorophyll a concentrations decreased during this time period, but not at statistically significant levels.



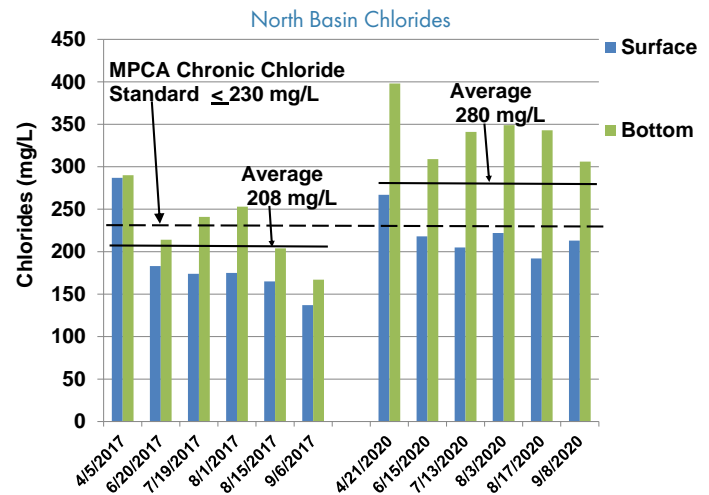
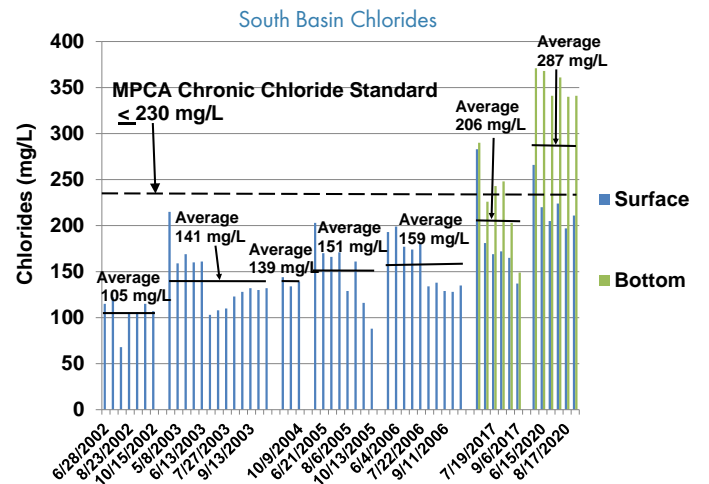
Chloride levels

Chloride concentrations in lakes and streams have increased since the early 1990s when winter maintenance practices largely switched from using sand and/or sand/salt mixtures to salt for roads and parking lots. When snow and ice melts, the salt goes with it, washing into lakes, streams, wetlands, and groundwater. It only takes 1 teaspoon of salt to permanently pollute 5 gallons of water. And, once in the water, there is no way to remove chloride.

Because high concentrations of chloride can harm fish and plant life, the MPCA established maximum and chronic chloride standards. The maximum standard is the highest concentration of chloride that aquatic organisms can be exposed to for a brief period of time with zero to slight mortality. The chronic standard is the highest chloride concentration that aquatic life can be exposed to indefinitely without causing chronic toxicity. Chronic toxicity means a condition that lingers or continues for a long period of time. A chronic effect can be mortality, reduced growth, reproduction impairment, harmful changes in behavior, and other nonlethal effects. A lake is considered impaired if two or more measurements exceed the chronic criterion (230 mg/L or less) within a 3-year period or one measurement exceeds the maximum criterion (860 mg/L). Sweeney Lake was placed on the state's 303(d) list of impaired waters in 2014 for chloride.

All measurements during the period of record were below the maximum criterion. Chloride measurements from both the surface and bottom of the North Basin and South Basin were above the chronic criterion in April of 2017 and April of 2020. Bottom samples from both basins were above the chronic criterion in July and early August of 2017 and during all 2020 sample events. The increased frequency of bottom measurements exceeding the chronic criterion in 2020 is a significant concern for the lake.

Average annual chloride concentrations have increased over the years. At the South Basin, average annual chloride concentrations increased from 105 mg/L in 2002 to 206 mg/L in 2017 to 287 mg/L in 2020. At the North Basin, average annual chloride concentrations increased from 208 mg/L in 2017 to 280 mg/L in 2020.



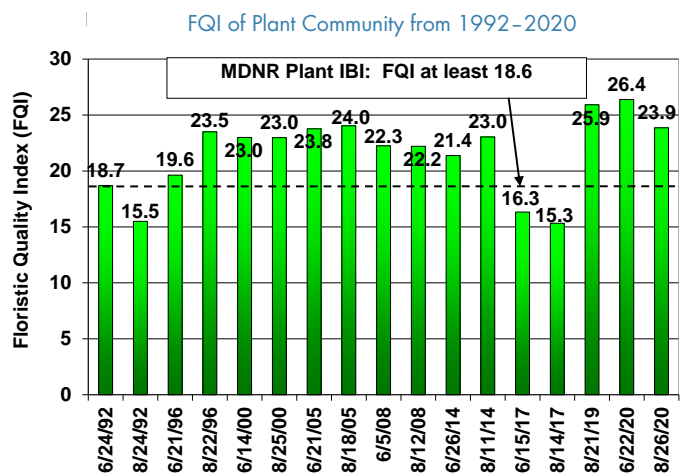
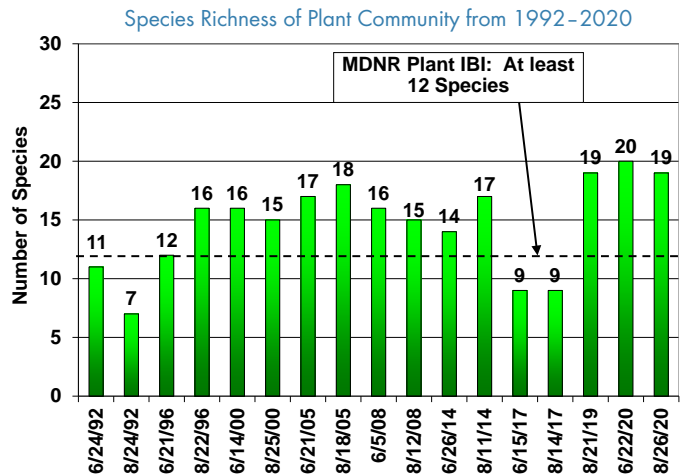
Macrophytes

Lake Plant Eutrophication Index of Biological Integrity (IBI)

Eutrophication (excessive nutrients) may have detrimental effects on a lake, including reductions in the quantity and diversity of aquatic plants. The Minnesota Department of Natural Resources (MNDNR) developed a Lake Plant Eutrophication Index of Biological Integrity (IBI) to measure the response of a lake plant community to eutrophication. The Lake Plant Eutrophication IBI includes two metrics: (1) the number of species in a lake and (2) the "quality" of the species, as measured by the floristic quality index (FQI). The MNDNR has determined a threshold for each metric. Lakes that score below the thresholds contain degraded plant communities and are likely stressed from anthropogenic (human-caused) eutrophication.

Plant survey data from 1992 to 2020 were assessed to determine plant IBI trends. The figures at right show Sweeney Lake FQI scores and the number of species for that period compared to the MNDNR Plant IBI thresholds.

- Number of species:** A deeper water lake, such as Sweeney Lake, fails to meet the MNDNR Plant IBI threshold when it has fewer than 12 species. During the period examined, the number of species in Sweeney Lake ranged from 7 to 20, meeting or exceeding the MNDNR Plant IBI threshold from 1996 through 2014 and 2019 through 2020. Nineteen to 20 species were observed in the lake in 2019 and 2020, the highest number to date.
- FQI values (quality of species):** The MNDNR Plant IBI threshold for deeper water lakes, as measured by FQI, is a minimum value of 18.6. During the period examined, FQI values in Sweeney Lake ranged from 15.3 to 26.4, exceeding the MNDNR Plant IBI threshold in June of 1992, June and August of 1996 through 2014, and 2019 through 2020. FQI scores from 25.9 to 26.4 were observed in August 2019 and June 2020, respectively, the highest scores to date.
- 2020 results:** Both the number of species in the lake and FQI values were better than the MNDNR Plant IBI thresholds. Both the number of species and FQI improved in 2019 and 2020 and, in 2020, the plant community had a greater number of species and a higher FQI score than in previous years.



Aquatic invasive species

In 2020, five invasive species were found in Sweeney Lake.

- **Yellow iris (*Iris pseudacorus*):** The first observation of yellow iris occurred in August 2019 at one location along the southwest shore of Sweeney Lake. It was observed at this same location in both June and August 2020. The appearance of yellow iris is concerning because it spreads rapidly and competes with native shoreland vegetation. Its root system forms a dense mat that compacts the soil and inhibits seed germination of other plants. The Commission Engineer recommends that BCWMC ask the landowner to remove the yellow iris. The landowner could either dig it up or spray it with glyphosate. An MNDNR permit would be required for either method of removal.
- **Curly-leaf pondweed (*Potamogeton crispus*):** Curly-leaf pondweed was first observed during the 1992 plant surveys and has consistently been in the lake throughout the monitoring period. In June of 2017, curly-leaf pondweed extent was estimated at 5.6 acres. In May of 2020, an herbicide (diquat) was used within 5.64 acres of Sweeney Lake to control curly-leaf pondweed. The treatment reduced the curly-leaf pondweed from 13 locations in June 2017 to two locations in June 2020.
- **Reed canary grass (*Phalaris arundinacea*):** Reed canary grass has been observed at different locations in the lake since June 2014, when it was first spotted at one location in the channel to Twin Lake. In August 2014, it was observed at a single location in the northwest corner of the lake. In 2020, it was observed at a location along the west shoreline in both June and August and at a second location along the northwest shoreline in June.
- **Purple loosestrife (*Lythrum salicaria*):** Purple loosestrife was first observed during the August 1992 plant survey and has been sporadically observed (1992, 2005, 2008, 2014, and 2020) in different locations during the monitoring period. It was observed at a single location along the northwest shoreline in June 2020 and at two locations along the western and northern shorelines in August 2020.
- **Narrow-leaved cattail (*Typha angustifolia*):** The first observation of narrow-leaved cattail occurred in June 2014 at two locations. It was observed at four locations in August 2014, at one location in August 2019, and at two locations in June and August 2020.



Purple loosestrife on Sweeney Lake



Yellow iris on Sweeney Lake

Phytoplankton and zooplankton

Samples of phytoplankton (microscopic aquatic plants) were collected from Sweeney Lake to evaluate water quality and the quality of food available to zooplankton (microscopic animals). 2020 results indicate increased water quality in Sweeney Lake has improved the ecological health of the lake. Phytoplankton numbers declined in 2020 due to lower phosphorus concentrations. Zooplankton numbers declined in 2020 due to increased fish predation because fish were better able to see zooplankton in the clearer water. Increased food intake is a favorable change for the fish because it increases fish growth.

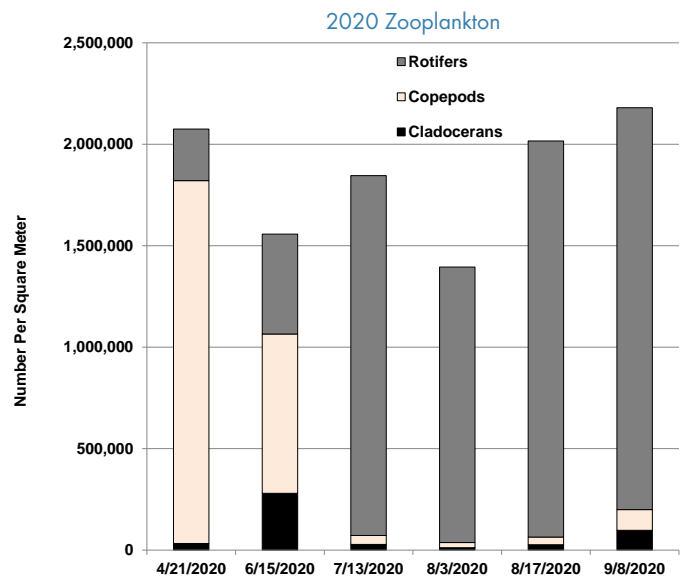
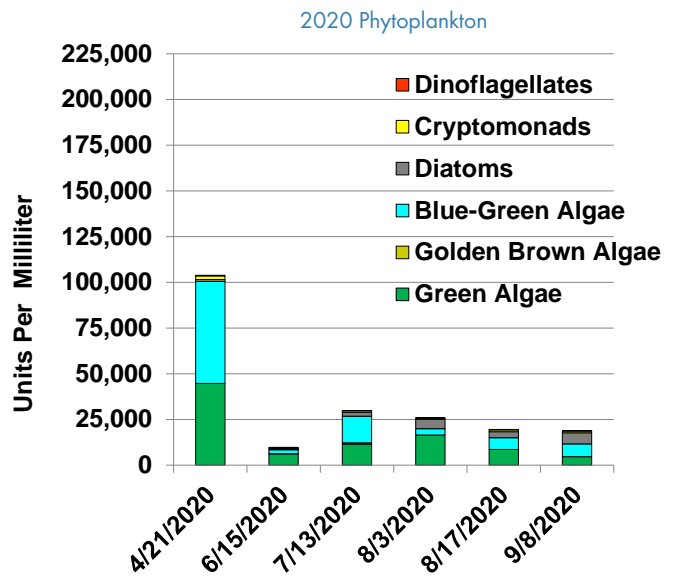
As shown in the figure at right, phytoplankton numbers declined in June, increased in July, and then consistently declined through September. The community was generally dominated by green algae and/or blue-green algae. Blue-green algae are a poor quality food because they may be toxic and may not be assimilated if ingested by zooplankton. Blue-green algae can also produce algal toxins, which can be harmful to humans or other animals. Green algae are a better quality food source than blue-green algae and contribute towards a healthier zooplankton community.

2020 phytoplankton numbers were within the range observed since 1982. Numbers in June through September were lower than those in 2017 (see figure on page 10). The lower phytoplankton numbers in 2020 are consistent with the lower average summer chlorophyll a concentration observed in 2020 (see figure on page 3).

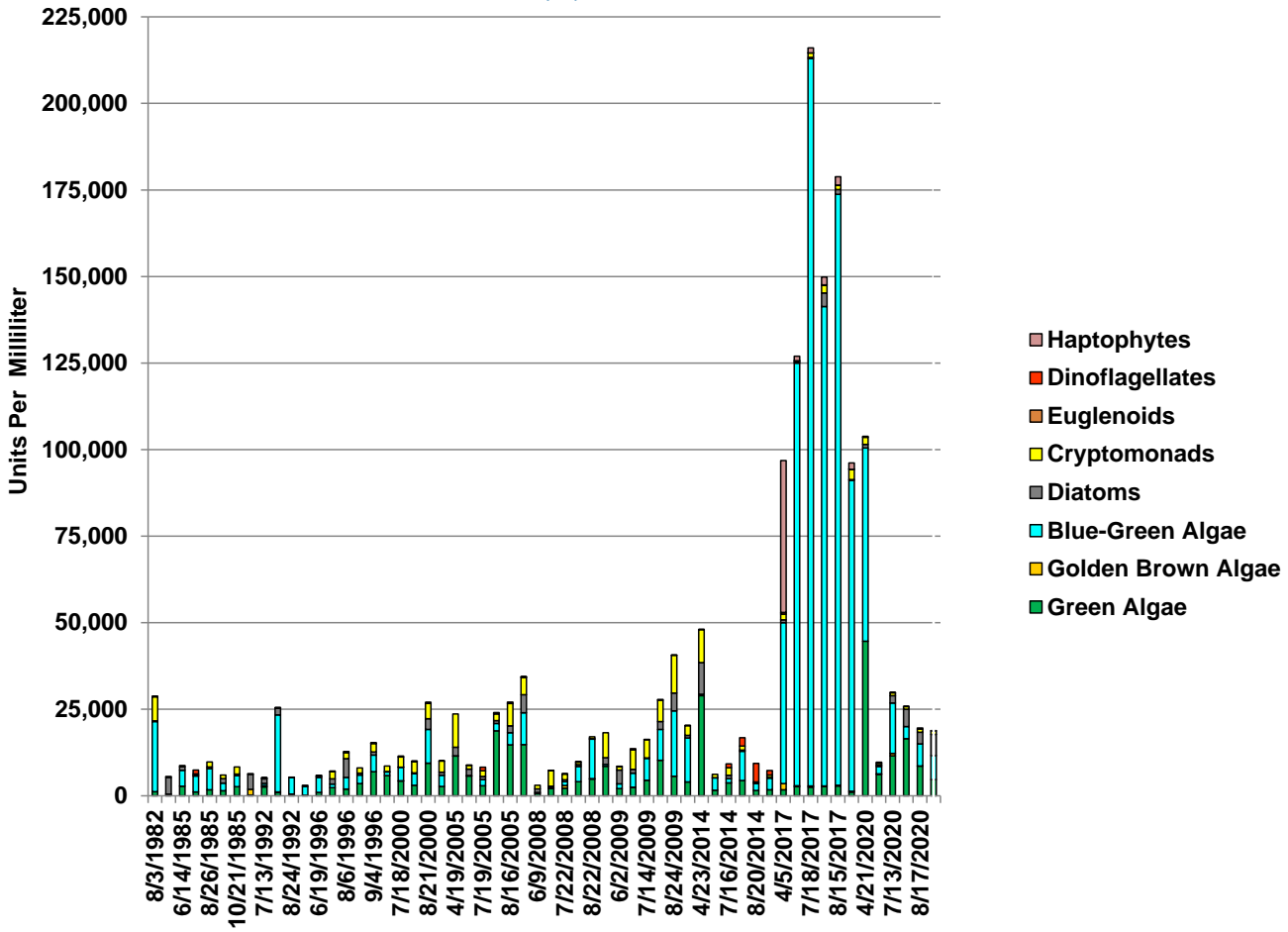
Unlike phytoplankton, zooplankton do not produce their own food. As “filter feeders,” they eat millions of small algae; given the right quantities and species, they can filter the volume of an entire lake in a matter of days. They are also valuable food for planktivorous fish and other organisms. Fish generally select the largest zooplankters they see and prefer cladocerans to copepods because they swim slowly and lack the copepods’ ability to escape predation by jerking or jumping out of the way.

The 2020 community composition reflects the impact of fish predation. Copepods dominated the zooplankton community in April, and the community was fairly balanced between copepods, cladocerans, and rotifers in June (see figure at right). The number of copepods and cladocerans plummeted in July and remained low for the duration of the monitoring period. Small rotifers, the least preferred food for fish, increased in number in July and dominated the community for the duration of the monitoring period.

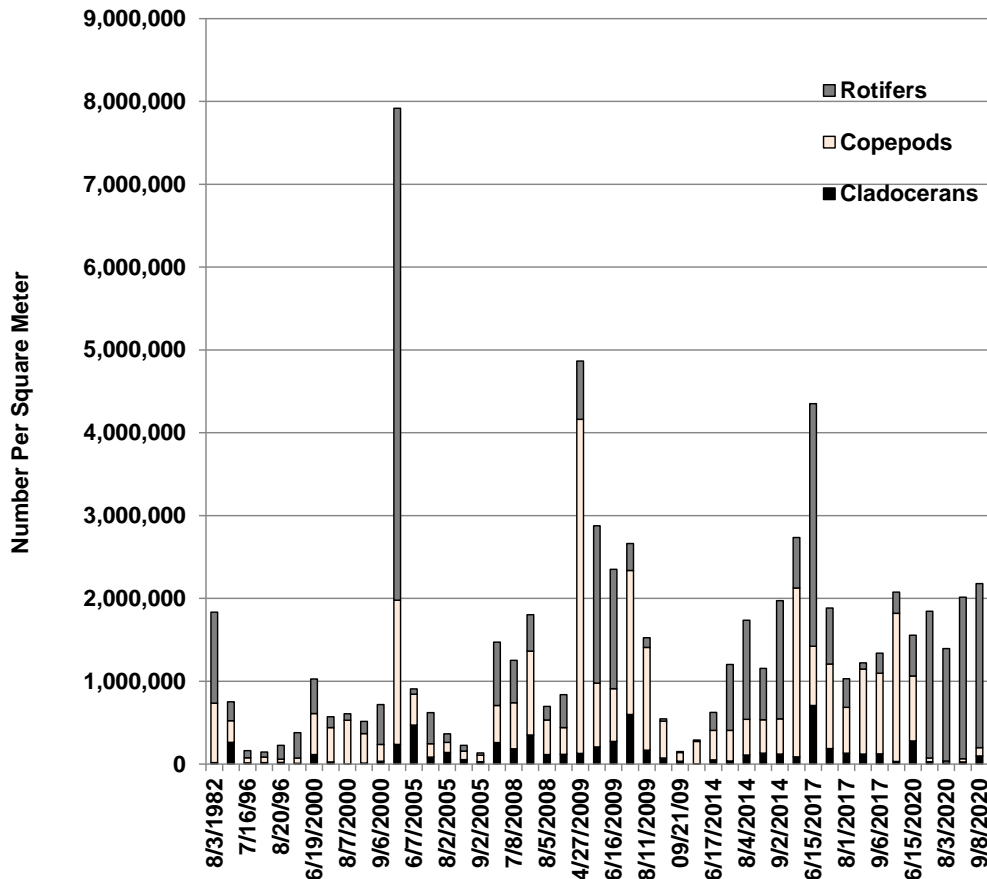
The 2020 numbers of zooplankton in Sweeney Lake were within the range observed since 1982 (see figure on page 10). Copepod numbers in July through September 2020 were lower than during July through September of 2014 and 2017. The lower numbers are likely a result of increased fish predation in 2020 due to improved water clarity, a favorable change for the lake’s fishery since fish growth is directly related to the quantity of food they consume. As noted previously, trend analyses showed improving water quality with significant increases in water clarity. Summer average Secchi disc increased from 1.5 meters in 2014 to 1.6 meters in 2017 to 1.7 meters in 2020. Improved water clarity in 2020 helped fish to see and prey upon zooplankters.



Historical Phytoplankton



Historical Zooplankton



Suitability of Sweeney Lake for Aquatic Invasive Species (AIS)

A large number of AIS residing in Minnesota have not yet been observed in Sweeney Lake but could be introduced. For example, both zebra mussels and starry stonewort are present in nearby Medicine Lake but have not been observed in Sweeney Lake. To evaluate whether Sweeney Lake water quality would support the introduction of six AIS (starry stonewort, zebra mussels, spiny waterflea, faucet snail, Chinese mystery snail, and rusty crayfish), a suitability analysis for each species was performed.

The analysis compared water quality data collected during 2020 and April of 2021 with the water quality conditions required for each species, specifically evaluating total phosphorus, chlorophyll *a*, Secchi disc depth, trophic state index, water temperature, dissolved oxygen, specific conductance, calcium, magnesium, sodium, alkalinity, hardness, and calcium carbonate. The results indicate the water quality of Sweeney Lake meets the suitability requirements for rusty crayfish, faucet snail, zebra mussel, spiny waterflea, and starry stonewort. However, the water quality of Sweeney Lake only partially meets the suitability requirements for the Chinese mystery snail. This species would likely survive but may not thrive in Sweeney Lake.



Starry Stonewort



Zebra Mussels



Spiny Waterflea



Faucet Snail



Chinese Mystery Snail

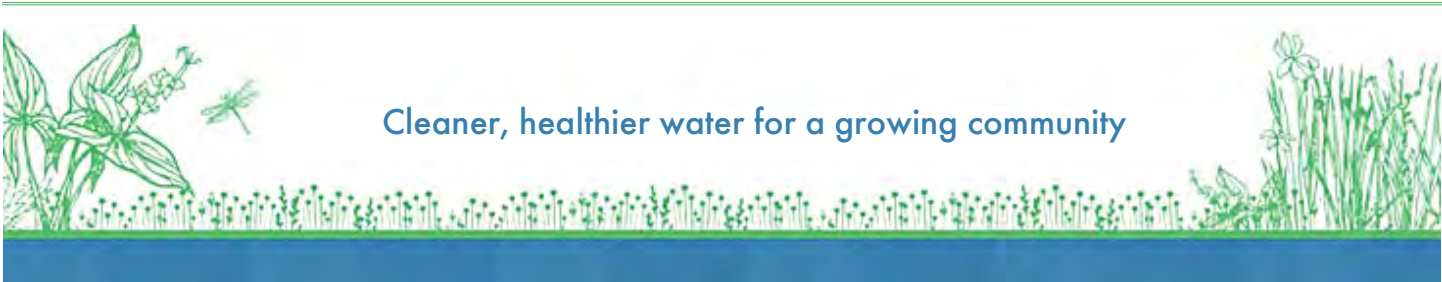


Rusty Crayfish



Channel from Sweeney to Twin Lake

Bassett Creek Watershed Management Commission
bassettcreekwmo.org



Cleaner, healthier water for a growing community

Twin Lake 2020 water quality monitoring



Monitoring water quality in Twin Lake

The Bassett Creek Watershed Management Commission (BCWMC) has monitored water quality conditions in the watershed's 10 priority lakes since 1972. The purpose of this monitoring is to detect changes or trends in water quality and evaluate the effectiveness of efforts to preserve or improve water quality

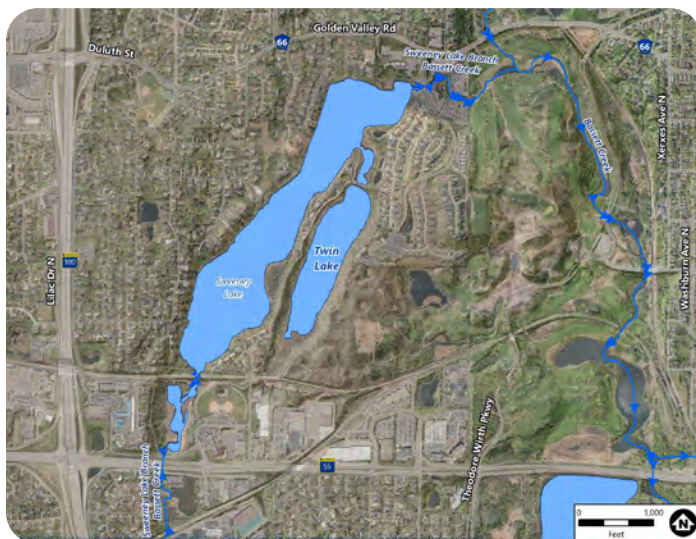
At a glance: 2020 monitoring results

In 2020, the BCWMC monitored Twin Lake for:

- Water chemistry (nutrients, chlorophyll a, chloride).
- Water clarity and dissolved oxygen.
- Phytoplankton and zooplankton (microscopic plants and animals).
- Macrophytes (aquatic plants).

About Twin Lake

BCWMC classification	Priority-1 deep lake
Watershed area	131 acres
Lake size	21 acres
Average depth	25.7 feet
Maximum depth	56 feet
MNDNR ordinary high water level	827.9
Normal water level	827.2 feet
Downstream receiving waterbody	Sweeney Lake
Location (city)	Golden Valley
MPCA impairments	None
Aquatic invasive species	Curly-leaf pondweed
Public access	Yes, via park land



Results of 2020 monitoring show that Twin Lake met the applicable Minnesota Pollution Control Agency (MPCA) and BCWMC water quality standards for Secchi disc (a measure of clarity), total phosphorus, and chlorophyll a. The good water quality in 2020 documented the continued effectiveness of the 2015 alum treatment. Trend analyses show no significant change in water quality over the last 11 years.

Other results include:

- In 2020, Twin Lake chloride concentrations met the MPCA maximum and chronic chloride standards.
- 2020 numbers of phytoplankton were within the range observed since 1982. The 2020 summer average zooplankton number was the highest to date, a favorable change for the lake.
- Both the number of plant species in the lake and Floristic Quality Index (FQI) values, a measure of plant species quality, were better than the Minnesota Department of Natural Resources (MNDNR) Plant Index of Biotic Integrity (IBI) thresholds.
- Aquatic invasive species (AIS) observed in 2020 were curly-leaf pondweed, purple loosestrife, reed canary grass, and narrow-leaved cattail.
- An AIS Suitability Analysis indicates the water quality of Twin Lake meets the suitability requirements for rusty crayfish, faucet snail, zebra mussel, spiny waterflea, and starry stonewort and partially meets the suitability requirements for the Chinese mystery snail.

Recommendations

- Continue to provide education and information to residents and lake users to reduce the chance of AIS introduction.
- Continue water quality and biological monitoring at a 3-year frequency

Water chemistry monitoring: 2020

Total phosphorus levels

While phosphorus is necessary for plant and algae growth, too much phosphorus leads to excessive algae, decreased water clarity, and water impairment. Some common sources of phosphorus are fertilizers, leaves and grass clippings, atmospheric deposition, soil erosion, and plant die-off (such as curly-leaf pondweed). Phosphorus can also be released from lake sediments when oxygen concentrations are absent or very low.

- **BCWMC/MPCA standard:** 40 micrograms per liter ($\mu\text{g/L}$) or less.
- **Range:** Total phosphorus concentrations in Twin Lake ranged from a low of 3 $\mu\text{g/L}$ on August 17 to a high of 50 $\mu\text{g/L}$ on October 1. Twenty-seven percent of total phosphorus concentrations were in the oligotrophic category, indicating low levels of nutrients; 53 percent were in the mesotrophic category, indicating medium levels of nutrients; and 20 percent were in the eutrophic category, indicating high levels of nutrients. Values in the eutrophic category were measured in April and October.
- **Summer average of North and South Basins:** 12 $\mu\text{g/L}$ (met BCWMC/MPCA standard).

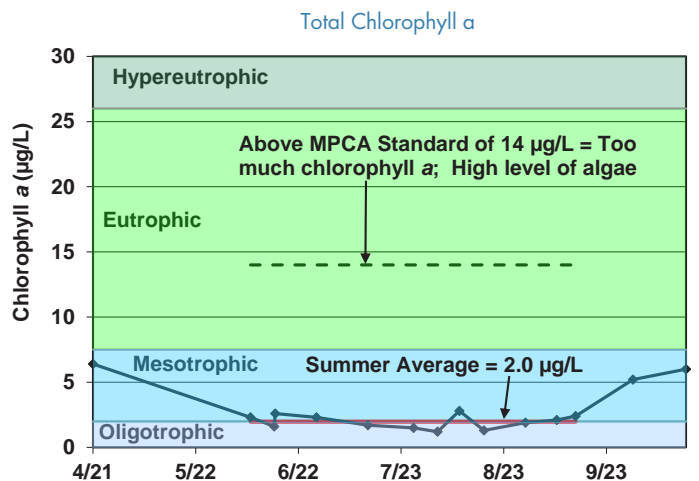
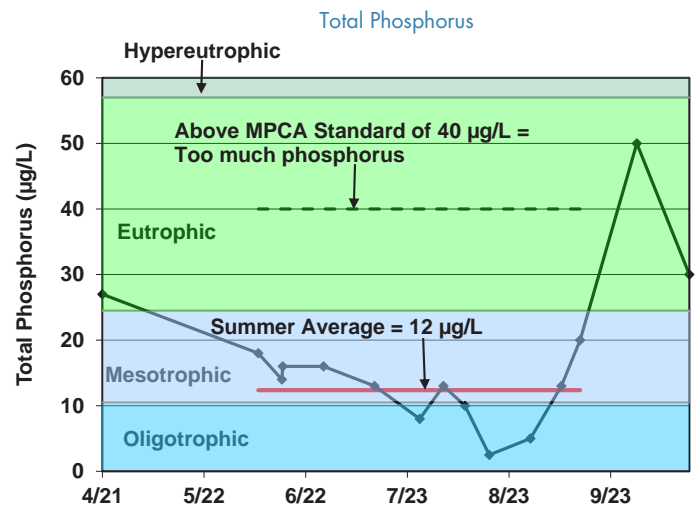
Chlorophyll a levels

Chlorophyll a is a pigment in algae and generally reflects the amount of algae growth in a lake. Lakes which appear clear generally have chlorophyll a levels less than 15 micrograms per liter ($\mu\text{g/L}$).

- **BCWMC/MPCA standard:** 14 $\mu\text{g/L}$ or less.
- **Range:** Chlorophyll a concentrations ranged from a low of 1.2 $\mu\text{g/L}$ on August 3 to a high of 6.4 $\mu\text{g/L}$ on April 21. Forty percent of chlorophyll a concentrations were in the oligotrophic category, indicating very clear water; 60 percent were in the mesotrophic category, indicating clear water.
- **Summer average:** 2 $\mu\text{g/L}$ (met BCWMC/MPCA standard).

Definitions

- **Hypereutrophic:** Nutrient-rich lake conditions characterized by frequent and severe algal blooms and low water clarity; excessive algae can significantly reduce lake oxygen levels
- **Eutrophic:** Lake condition characterized by abundant accumulation of nutrients supporting dense growth of algae and other organisms; decay of algae can reduce lake oxygen levels
- **Mesotrophic:** Lake condition characterized by medium levels of nutrients and clear water
- **Oligotrophic:** Lake condition characterized by a low accumulation of dissolved nutrients, high oxygen content, sparse algae growth, and very clear water



Water clarity

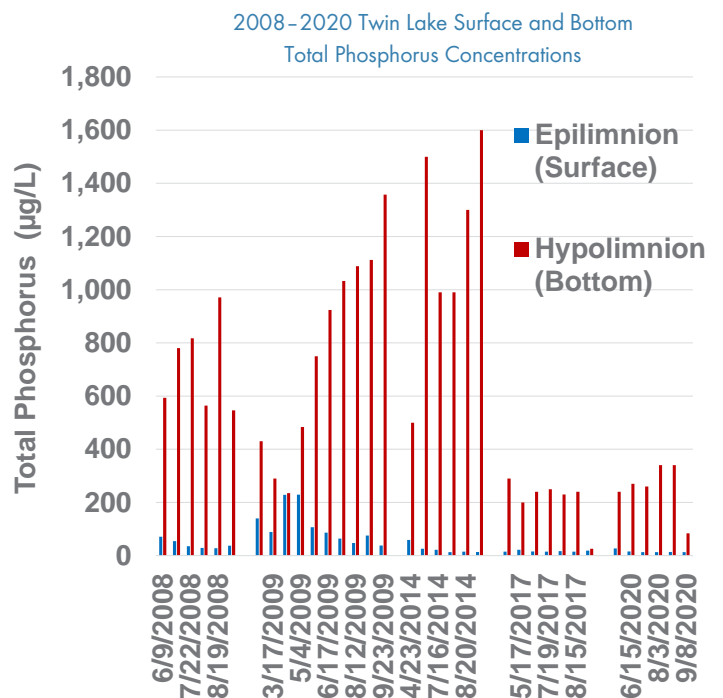
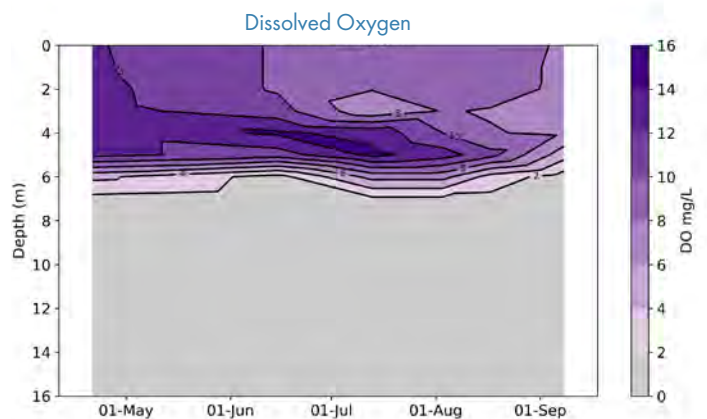
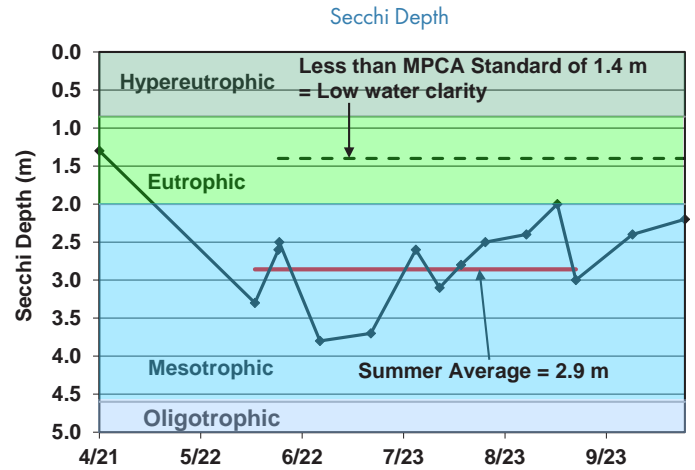
Water clarity is often affected by sediment and the amount of algae in a lake. It is usually measured by lowering an 8-inch "Secchi" disc into the lake; the depth at which the disc's alternating black-and-white pattern is no longer visible is considered a measure of the water's transparency. The higher the Secchi number, the better the water clarity.

- **BCWMC/MPCA standard:** 1.4 meters or more.
- **Range:** Secchi disc depth ranged from a low of 1.3 meters on April 21 to a high of 3.8 meters on June 27. Ninety-three percent of Secchi disc depths were in the mesotrophic category, indicating good water quality. The single Secchi disc measurement in the eutrophic category occurred in April.
- **Summer average:** 2.9 meters (met BCWMC/MPCA standard).

Phosphorus loading from sediment

When oxygen levels are low, phosphorus stored in sediment is released (internal loading), causing higher total phosphorus concentrations in near-bottom waters. In 2008 and 2009, summer-average surface water concentrations of phosphorus in Twin Lake increased significantly. This increase prompted the BCWMC to conduct a study to determine the causes. The study, Twin Lake Phosphorus Internal Loading Investigation, March 2011, identified internal loading from sediment as the primary cause. In response, the BCWMC performed an alum treatment on Twin Lake in 2015 to reduce the internal loading.

Monitoring since the alum treatment indicates good water quality and reduced phosphorus levels, documenting the continued effectiveness of the treatment. Even though the 2020 near-bottom oxygen levels were low (<2 mg/L, figure middle right), the 2020 near-bottom total phosphorus concentrations remained lower than concentrations measured prior to the treatment, documenting the treatment's continued effectiveness (figure bottom right). From 2008 through 2014, average near-bottom total phosphorus concentrations measured during the April through September period ranged from 712 µg/L to 1,147 µg/L. Average concentrations after the alum treatment were 211 µg/L in 2017 and 256 µg/L in 2020.



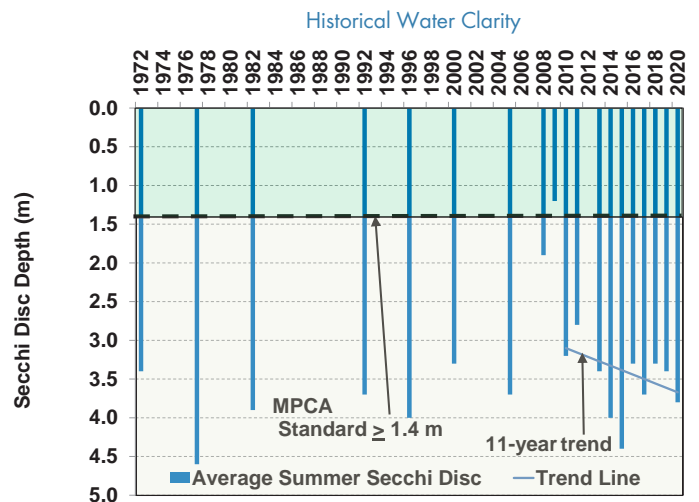
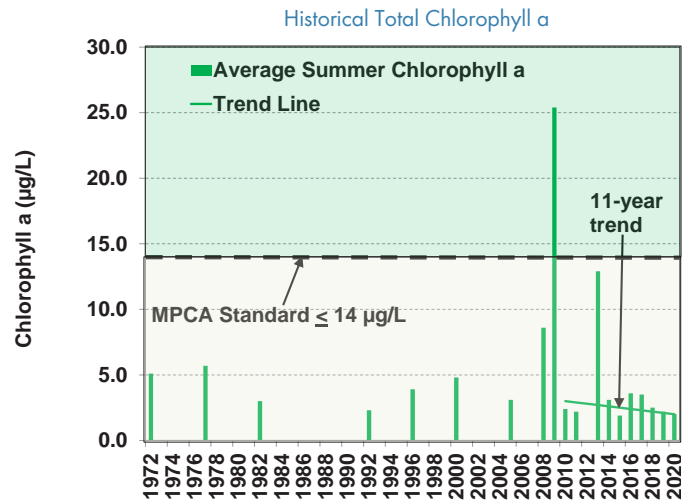
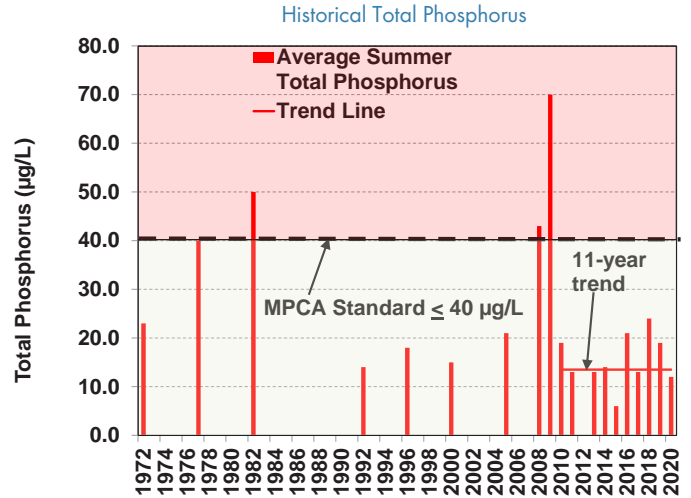
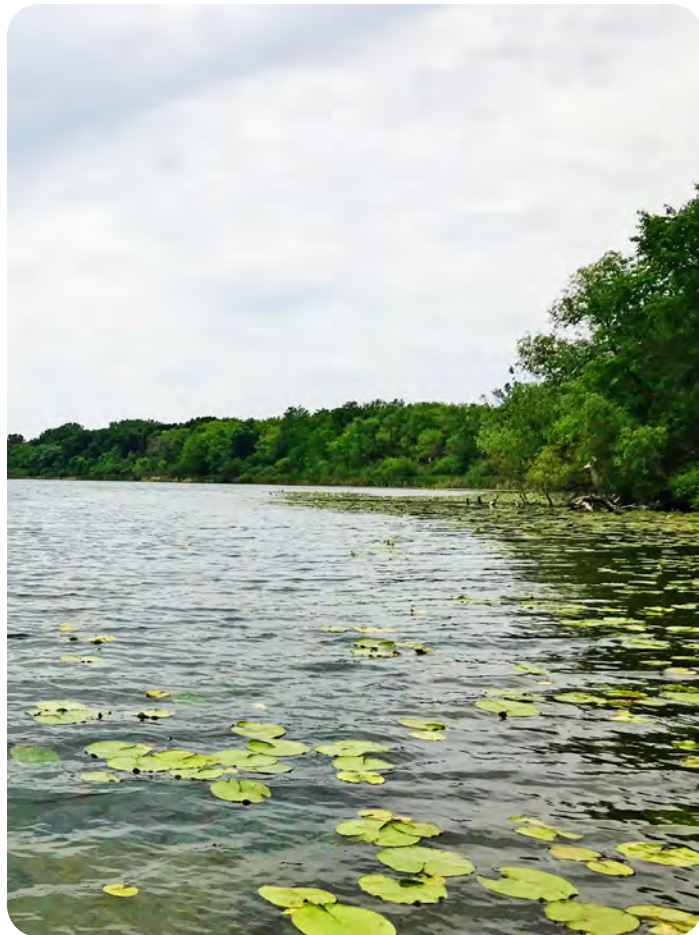
Water chemistry monitoring from 1972–2019: historical trends

Water quality in Twin Lake has been monitored since 1972. Summer averages (June through September) of total phosphorus, chlorophyll a, and Secchi disc depth from 1972–2020 are shown in the figures at right. During the period of record, 16 percent of total phosphorus, 5 percent of chlorophyll a, and 5 percent of Secchi disc summer averages failed to meet Minnesota State Water Quality Standards for lakes in the North Central Hardwood Forest Ecoregion published in Minnesota Rules 7050 (Minn. R. Ch. 7050.0222 Subp 4). All values measured after the 2015 alum treatment have met the MPCA standard.

Trend analyses indicate no significant change in water quality over the past 11 years, showing:

- No change in summer average total phosphorus concentrations.
- Declining summer average chlorophyll a concentrations.
- Increasing summer average Secchi disc depths.

None of the changes are at statistically significant levels.



Chloride levels

Chloride concentrations in lakes and streams have increased since the early 1990s when winter maintenance practices largely switched from using sand and/or sand/salt mixtures to salt for roads and parking lots. When snow and ice melts, the salt goes with it, washing into lakes, streams, wetlands, and groundwater. It only takes 1 teaspoon of salt to permanently pollute 5 gallons of water. And, once in the water, there is no way to remove chloride.

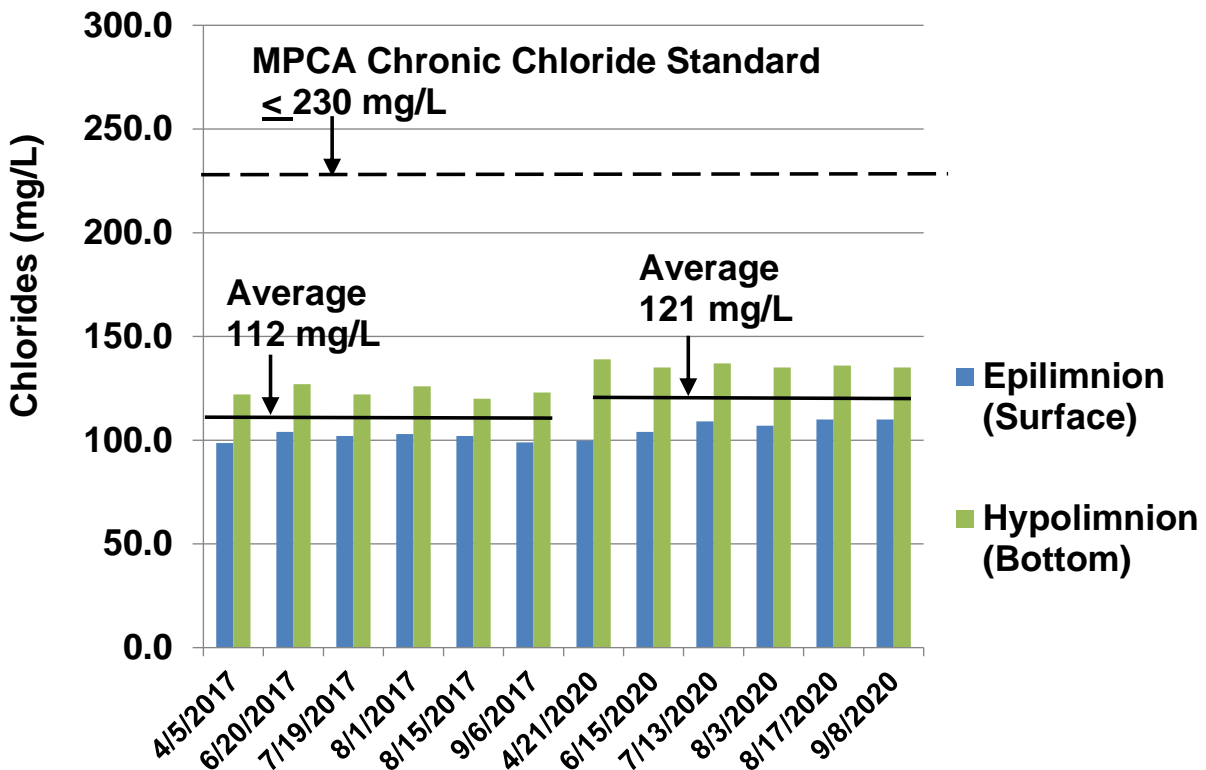
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The chronic standard is the highest chloride concentration that aquatic life can be exposed indefinitely without causing chronic toxicity. Chronic toxicity is defined as a stimulus that lingers or continues for a long period of time, often one-tenth the life span or more. A chronic effect can be mortality, reduced growth, reproduction impairment, harmful changes in behavior, and other nonlethal effects. A lake is considered impaired if two or more measurements exceed chronic criterion (230 mg/L or less) within a 3-year period or one measurement exceeds maximum criterion (860 mg/L).

All measurements during 2017 and 2020 were well below both the maximum and chronic chloride standards. Although not significant, there was an increase in chloride between 2017 and 2020. The 2020 average annual chloride concentration (121 mg/L) was eight percent higher than the 2017 average (112 mg/L), but well below the maximum and chronic chloride standards.



Surface and Bottom Chlorides



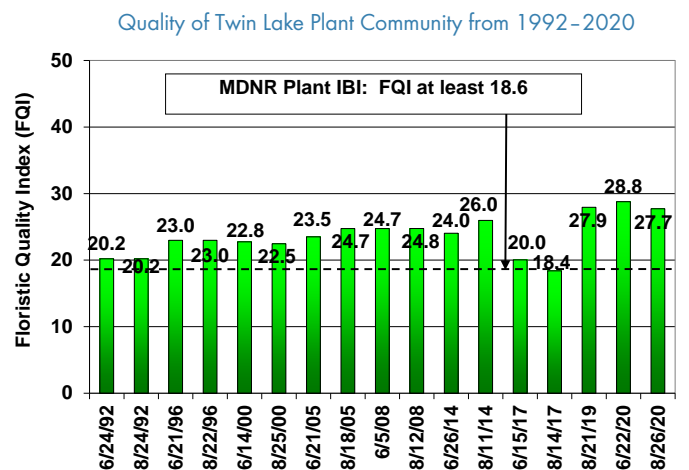
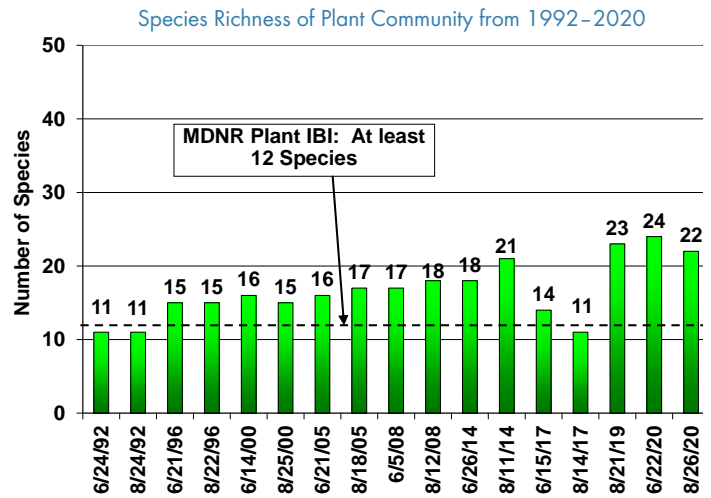
Macrophytes

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Eutrophication (excessive nutrients) may have detrimental effects on a lake, including reductions in the quantity and diversity of aquatic plants. The MNDNR developed a Lake Plant Eutrophication Index of Biological Integrity (IBI) to measure the response of a lake plant community to eutrophication. The Lake Plant Eutrophication IBI includes two metrics: (1) the number of species in a lake and (2) the “quality” of the species, as measured by the floristic quality index (FQI). The MNDNR has determined a threshold for each metric. Lakes that score below the thresholds contain degraded plant communities and are likely stressed from anthropogenic (human-caused) eutrophication.

Plant survey data from 1992 to 2020 were assessed to determine plant IBI trends. The figures at right show Twin Lake FQI scores and the number of species for that period compared to the MNDNR Plant IBI thresholds.

- Number of species:** A deeper water lake, such as Twin Lake, fails to meet the MNDNR Plant IBI threshold when it has fewer than 12 species. During the period examined, the number of species in Twin Lake ranged from 11 to 24, meeting or exceeding the MNDNR Plant IBI threshold from 1996 through June 2017 and 2019 through 2020. Twenty-two to 24 species were observed in the lake in 2019 and 2020, the highest number to date.
- FQI values (quality of species):** The MNDNR Plant IBI threshold for deeper water lakes, as measured by FQI, is a minimum value of 18.6. During the period examined, FQI values in Twin Lake ranged from 18.4 to 28.8, bettering the MNDNR Plant IBI threshold during all but August 2017. FQI scores from 27.7 to 28.8 were observed in August 2019 and June 2020, respectively, the highest scores to date.
- 2020 results:** Both the number of species in the lake and FQI values were better than the MNDNR Plant IBI thresholds and improved in 2019 and 2020.



Aquatic invasive species

In 2020, four invasive species were found in Twin Lake.

- **Curly-leaf pondweed (*Potamogeton crispus*):** Curly-leaf pondweed (CLP) has been sporadically observed in the lake at a low density since first appearing in June 2000 along the eastern side of the lake. It has been found at different locations in the lake without increasing in extent or density over the past 20 years. In 2020 the plant was observed on the western side of the lake in June and the north side in August.
- **Reed canary grass (*Phalaris arundinacea*):** Reed canary grass was first observed in Twin Lake in June 2014 at one location along the southeastern shoreline. It was found at this same location in August 2014, August 2019, and June 2020; it has not expanded its footprint.
- **Purple loosestrife (*Lythrum salicaria*):** Purple loosestrife was first observed along the southeastern shoreline of Twin Lake in 1992. In 2020, it was found at the southern end of the lake and along the western shoreline. Considerable damage to the plants from beetles was observed in 2020, suggesting the beetles were controlling the purple loosestrife.
- **Narrow-leaved cattail (*Typha angustifolia*):** Narrow-leaved cattail was first observed in June 2014. It was seen again in 2019 and 2020 at similar locations along all shorelines. In 2020, it was collected on the rake at five locations and observed at three other locations.



Phytoplankton and zooplankton

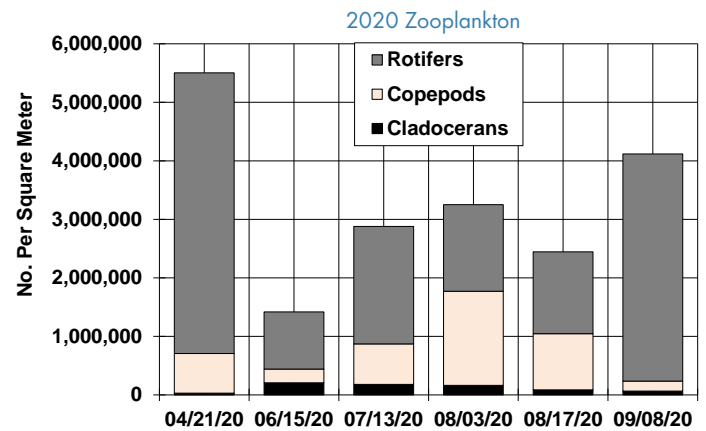
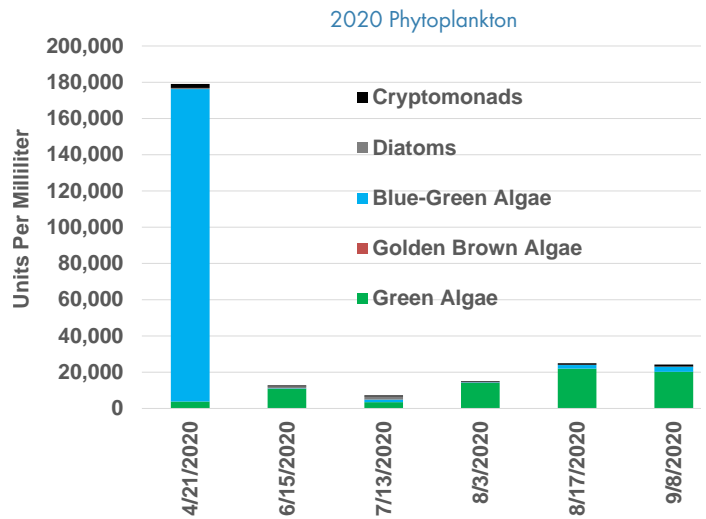
Samples of phytoplankton (microscopic aquatic plants) were collected from Twin Lake to evaluate water quality and the quality of food available to zooplankton (microscopic animals). As shown in the figure (top right), phytoplankton numbers declined from April to June and then remained low through September, an indication of good water quality throughout the summer. The community was dominated by blue-green algae in April and by green algae from June through September. Blue-green algae are a poor quality food because they may be toxic and may not be assimilated if ingested by zooplankton. Blue-green algae can also produce algal toxins, which can be harmful to humans or other animals. Green algae are a better quality food source than blue-green algae and contribute towards a healthier zooplankton community.

2020 phytoplankton numbers were within the range observed since 1982. Numbers in 2020 were lower than in 2017 (see figure on page 10). The lower phytoplankton numbers in 2020 are consistent with the lower average summer chlorophyll a concentration in 2020 (see figure on page 3).

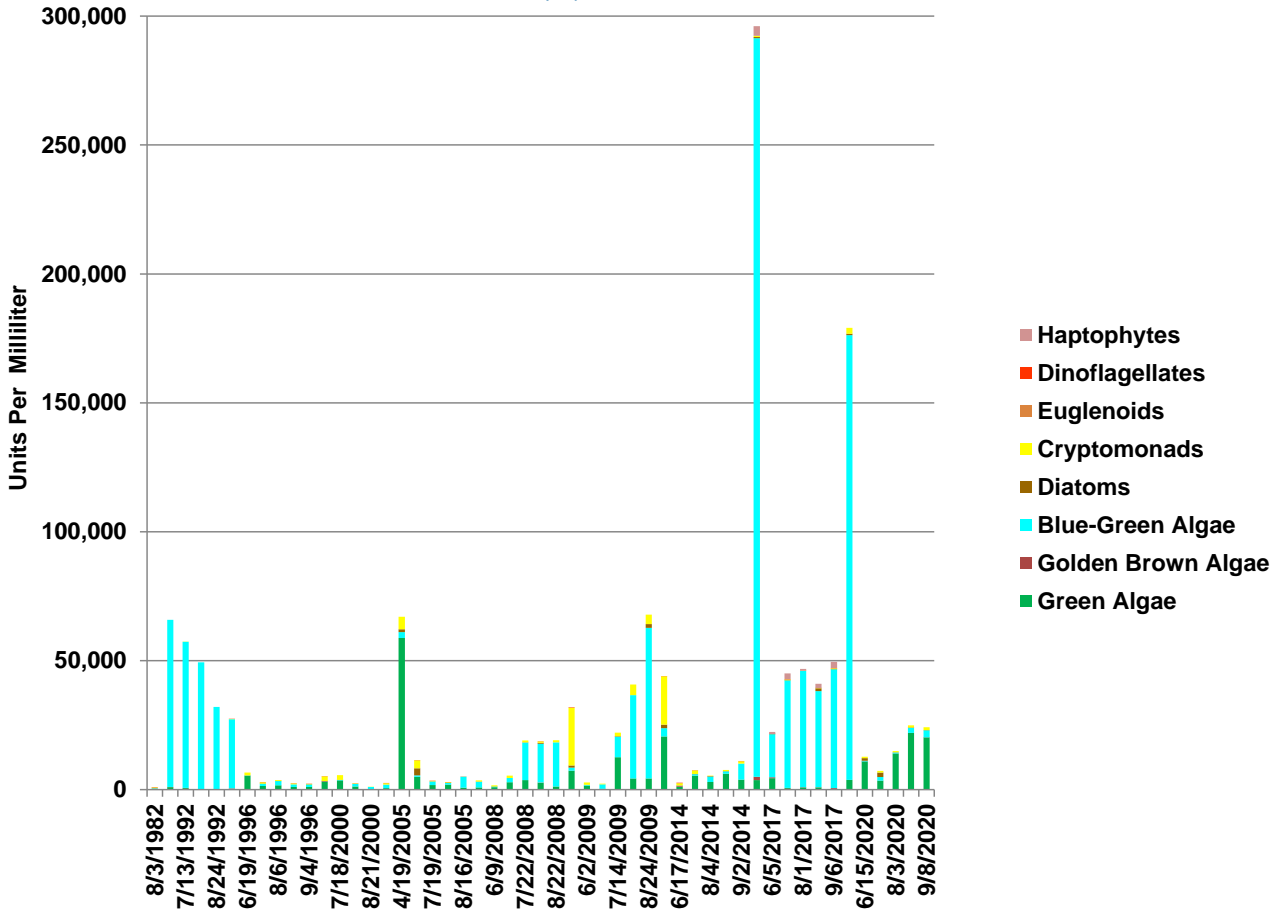
Unlike phytoplankton, zooplankton do not produce their own food. As “filter feeders,” they eat millions of small algae; given the right quantities and species, they can filter the volume of an entire lake in a matter of days. They are also valuable food for planktivorous fish and other organisms.

The 2020 community composition reflects the impact of fish predation on the community. Fish generally select the largest zooplankters they see and prefer cladocerans to copepods because they swim slowly and lack the copepods’ ability to escape predation by jerking or jumping out of the way. Rotifers, the least preferred food for fish, dominated the community throughout 2020 (except for August 3) and copepods consistently occurred in higher numbers than cladocerans (see figure at right).

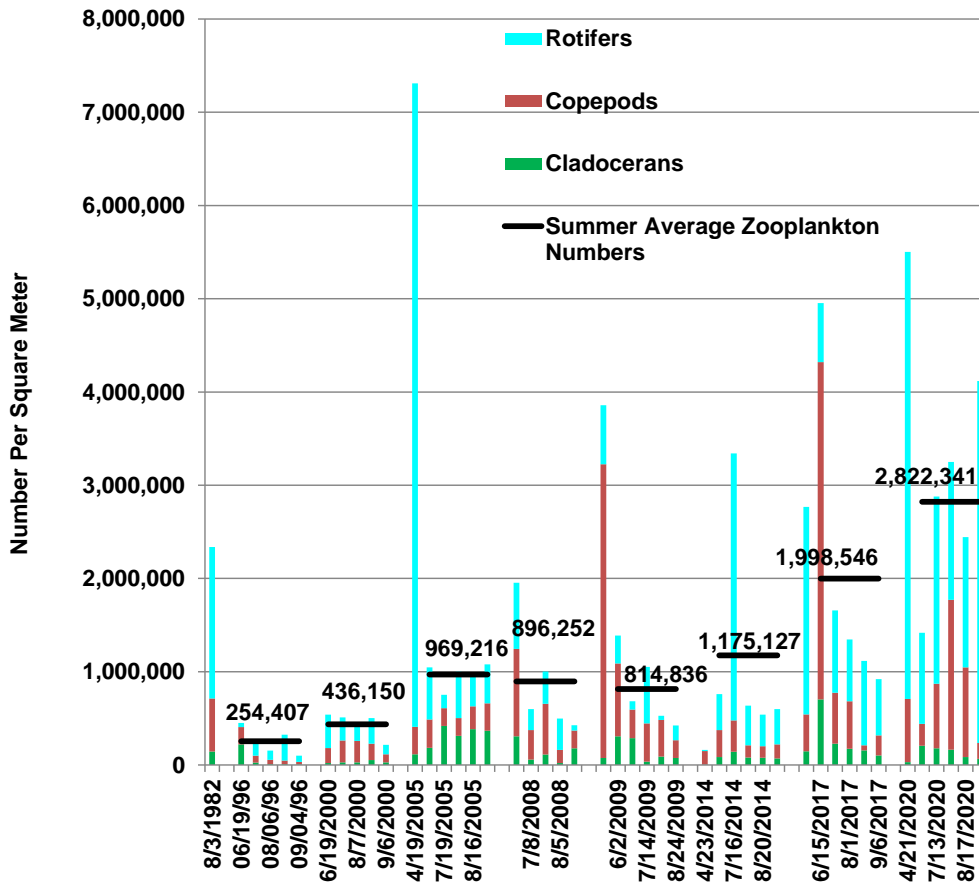
Summer-average zooplankton numbers increased from 1996 to 2005, declined in 2008 and 2009, and then increased from 2014 through 2020. The decline in summer average zooplankton numbers in 2008 and 2009 coincided with a decline in lake water quality. The 2020 summer average zooplankton number was the highest to date, a favorable change for the lake (see figure on page 10).



Historical Phytoplankton



Historical Zooplankton



Suitability of Twin Lake for Aquatic Invasive Species (AIS)

A large number of AIS residing in Minnesota have not yet been observed in Twin Lake, but could be introduced. For example, both zebra mussels and starry stonewort are present in nearby Medicine Lake, but have not been observed in Twin Lake. To evaluate whether Twin Lake water quality would support the introduction of six AIS (starry stonewort, zebra mussels, spiny waterflea, faucet snail, Chinese mystery snail, and rusty crayfish), a suitability analysis for each species was performed.

The analysis compared water quality data collected in 2020 and April of 2021 with the water quality conditions required for each species, specifically evaluating total phosphorus, chlorophyll *a*, Secchi disc depth, trophic state index, water temperature, dissolved oxygen, specific conductance, calcium, magnesium, sodium, alkalinity, hardness, and calcium carbonate. The results indicate the water quality of Twin Lake meets the suitability requirements for rusty crayfish, faucet snail, spiny waterflea, zebra mussel, and starry stonewort. However, the water quality of Twin Lake only partially meets the suitability requirements for the Chinese mystery snail. Hence, this species would likely survive, but may not thrive in Twin Lake.



Starry Stonewort



Zebra Mussels



Spiny Waterflea



Faucet Snail



Chinese Mystery Snail



Rusty Crayfish



Bassett Creek Watershed Management Commission
bassettcreekwmo.org



Cleaner, healthier water for a growing community

Medicine Lake 2020 water quality monitoring



Monitoring water quality in Medicine Lake

The Bassett Creek Watershed Management Commission (BCWMC) has monitored water quality conditions in the watershed's 10 priority lakes since 1972. The purpose of this monitoring is to detect changes or trends in water quality and evaluate the effectiveness of efforts to preserve or improve water quality. Three Rivers Park District (TRPD) annually monitors the water quality of Medicine Lake (Figure 1), and BCWMC periodically partners with TRPD on additional monitoring in the lake.

About Medicine Lake

BCWMC classification	Priority-1 deep lake
Watershed area	11,014 acres
Lake size	902 acres
Average depth	17.5 feet
Maximum depth	49 feet
MNDNR ordinary high water level	889.3 feet
Normal water level	887.9 feet
Downstream receiving waterbody	Bassett Creek
Location (city)	Medicine Lake, Plymouth
MPCA impairments	Mercury in fish tissue, nutrients
Aquatic invasive species	Eurasian watermilfoil, curly-leaf pondweed, zebra mussels (Nov. 2017), starry stonewort (Aug. 2018)
Public access	Yes (boat launch)

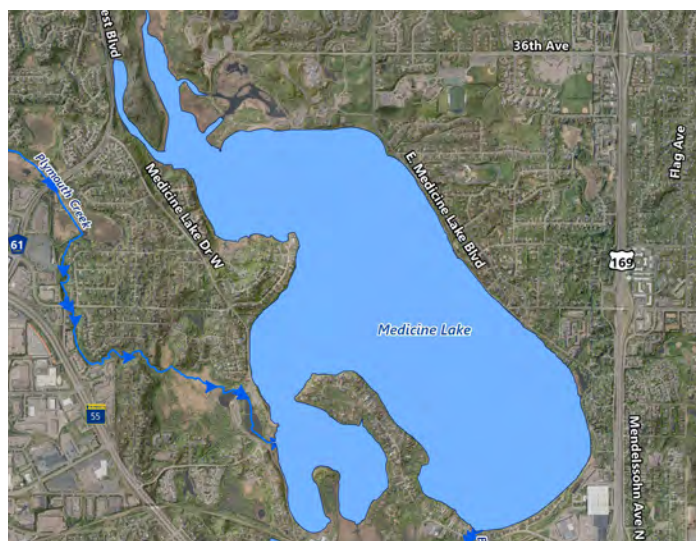


Figure 1

At a glance: 2020 monitoring results

In 2020, TRPD monitored Medicine Lake for:

- Water chemistry (nutrients, chlorophyll *a*, chloride).
- Water clarity and dissolved oxygen, temperature, and specific conductance.
- Macrophytes (aquatic plants).

In 2020, BCWMC partnered with TRPD to add phytoplankton and zooplankton to the monitoring program. TRPD collected the samples which were analyzed by BCWMC.

Results of 2020 monitoring show that Medicine Lake met the applicable Minnesota Pollution Control Agency (MPCA) and BCWMC water quality standards for Secchi disc (a measure of clarity) and total phosphorus, but did not meet the MPCA and BCWMC water quality standard for chlorophyll *a*. Trend analyses show no significant change in water quality over the last 10 years.

Other results include:

- All measurements during 2020 were well below the maximum chloride standard and all measurements except the May 5, 2020, measurement from the hypolimnion (bottom) were well below the chronic chloride standard.
- Both the number of species in the lake and Floristic Quality Index (FQI) values were better than the MNDNR Plant IBI thresholds and were the highest scores observed during the period of record.
- Four aquatic invasive species were observed in Medicine Lake in 2020: curly-leaf pondweed, Eurasian watermilfoil, starry stonewort, and zebra mussels.
- In spring of 2020, 49 acres of curly-leaf pondweed were treated with herbicide. In June, the plant's frequency was 65 percent, the second-highest frequency to date, exceeded only in 2004. The 2010 TMDL implementation plan for Medicine Lake specified that curly-leaf pondweed should continue to be managed annually.
- Eurasian watermilfoil was not problematic in 2020, ranging in frequency from 23 to 27 percent of the sample locations.
- A 2020 plant survey documented that starry stonewort has spread from its original infestation area

near the boat landing to areas along the western side of the lake.

- A 2020 zebra mussel survey documented that zebra mussels have spread from the southern end of the lake to the eastern and northern sides of the lake. The number of zebra mussels collected during surveys increased from three in 2019 to 278 in 2020. Zebra mussel veligers (planktonic larvae) were observed in zooplankton samples collected in April, May, June, August, and September 2020. On the dates when veligers were observed, numbers ranged from to 5,217 to 95,316 per square meter.
- 2020 numbers of phytoplankton were, on average, lower than 2010 and 2016, consistent with the lake's lower average summer chlorophyll a concentrations in 2020 compared with 2010 and 2016.
- Green algae numbers observed in Medicine Lake in April 2020 were more than an order of magnitude lower than numbers observed in April 2010 and 2016. Because green algae are a preferred food for zebra mussels, the lower numbers of green algae observed in Medicine Lake in April 2020 may be due to predation by zebra mussels.
- In 2020, cladocerans, the preferred food for fish, were found in lower numbers than copepods and rotifers.
- Fewer rotifers and copepods were observed in 2020 than 2010 and 2016, consistent with lower chlorophyll concentrations in 2020. Copepods and rotifers are less impacted by fish predation and changes in their numbers may indicate reductions in chlorophyll concentration in the lake.
- The Minnesota Department of Natural Resources (MNDNR) completed a standard fish survey of Medicine Lake in July 2020. Survey results indicated northern pike, walleye, bluegills, black crappie, and yellow bullhead were abundant. Other species caught in low abundance included brown bullhead, black bullhead, bowfin, common carp, hybrid sunfish, green sunfish, pumpkinseed, yellow perch, and white sucker.
- On September 1, 2020, the MNDNR Fisheries staff conducted a targeted survey of the nearshore fish community in Medicine Lake. Data from this survey were combined with data from the standard fish survey to compute a Fish Index of Biological Integrity (IBI) score of 30. This score is below the impairment threshold of 45, but better than the 2012 Fish IBI score of 25.

Recommendations

- Consider an alum treatment to reduce internal loading and improve water quality.
- Consider completing a Vegetation Management Plan for the lake.
- Assess feasibility of a partial lake drawdown to expose the littoral lake bed to a winter freeze, freezing out curly-leaf pondweed plants and turions (reproductive structures that act like seeds). If feasible and implemented, we recommend working with MNDNR and the Minnesota Aquatic Invasive Species Research Center to monitor impacts of the winter freeze on zebra mussels and starry stonewort.
- Complete an annual herbicide treatment of CLP to reduce total phosphorus loading during plant die off in mid-summer.
- Complete an annual herbicide treatment of starry stonewort to reduce abundance near the boat launch and help minimize its spread.
- Continue water quality and biological monitoring at a 3-year frequency.

Water chemistry monitoring: 2020

Total phosphorus levels

While phosphorus is necessary for plant and algae growth, too much phosphorus leads to excessive algae, decreased water clarity, and water impairment. Some common sources of phosphorus are fertilizers, leaves and grass clippings, atmospheric deposition, soil erosion, and plant die-off (such as curly-leaf pondweed). Phosphorus can also be released from lake sediments when oxygen concentrations are absent or very low.

- **BCWMC/MPCA standard:** 40 micrograms per liter ($\mu\text{g/L}$) or less.
- **Range:** Total phosphorus concentrations in Medicine Lake ranged from a low of $10 \mu\text{g/L}$ on June 2 to a high of $78 \mu\text{g/L}$ on September 9 (Figure 2). Eight percent of total phosphorus concentrations were in the oligotrophic category, indicating low levels of nutrients; 15 percent were in the mesotrophic category, indicating medium levels of nutrients; 62 percent were in the eutrophic category, indicating high levels of nutrients; and 15 percent were in the hypereutrophic category, indicating very high levels of nutrients.
- **Summer average:** $39 \mu\text{g/L}$ (met BCWMC/MPCA standard)

Chlorophyll a levels

Chlorophyll a is a pigment in algae and generally reflects the amount of algae growth in a lake. Lakes which appear clear generally have chlorophyll a levels less than 15 micrograms per liter ($\mu\text{g/L}$).

- **BCWMC/MPCA standard:** $14 \mu\text{g/L}$ or less.
- **Range:** Chlorophyll a concentrations ranged from a low of $3.4 \mu\text{g/L}$ on June 2 to a high of $44.0 \mu\text{g/L}$ on September 9 (Figure 3). Thirty-eight percent of chlorophyll a concentrations were in the mesotrophic category, indicating clear water; 23 percent were in the eutrophic category, indicating poor water quality; and 38 percent were in the hypereutrophic category, indicating very poor water quality.
- **Summer average:** $25.1 \mu\text{g/L}$ (did not meet BCWMC/MPCA standard)

Definitions

- **Hypereutrophic:** Nutrient-rich lake conditions characterized by frequent and severe algal blooms and low water clarity; excessive algae can significantly reduce lake oxygen levels
- **Eutrophic:** Lake condition characterized by abundant accumulation of nutrients supporting dense growth of algae and other organisms; decay of algae can reduce lake oxygen levels
- **Mesotrophic:** Lake condition characterized by medium levels of nutrients and clear water
- **Oligotrophic:** Lake condition characterized by a low accumulation of dissolved nutrients, high oxygen content, sparse algae growth, and very clear water

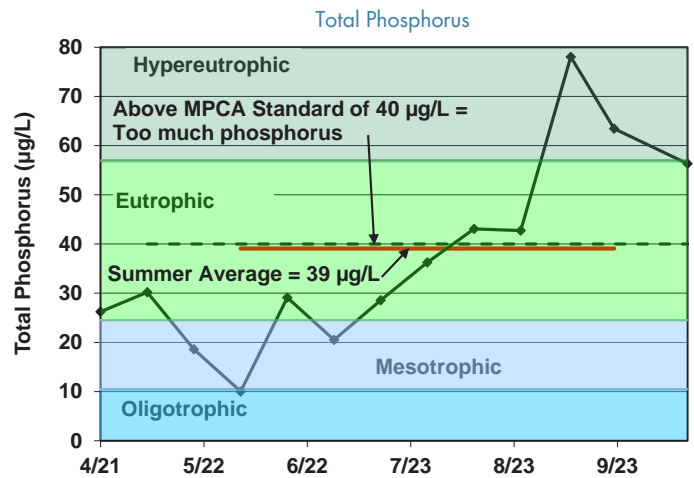


Figure 2 (Data collected by TRPD)

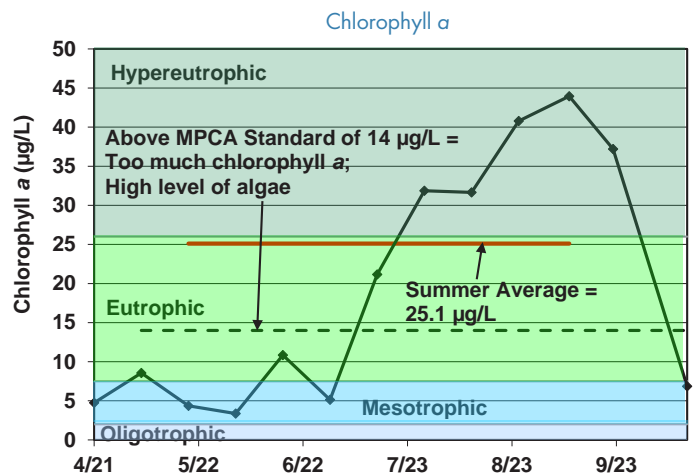


Figure 3 (Data collected by TRPD)

Water clarity

Water clarity is often affected by sediment and the number of algae or other photosynthetic organisms in a lake. It is usually measured by lowering an 8-inch “Secchi” disc into the lake; the depth at which the disc’s alternating black-and-white pattern is no longer visible is considered a measure of the water’s transparency.

- **BCWMC/MPCA standard:** 1.4 meters or more.
- **Range:** Secchi disc depth ranged from a low of 1.0 meter on August 25 to a high of 5.6 meters on May 19 (Figure 4). Eight percent of Secchi disc depths were in the oligotrophic category, indicating very good water quality; 46 percent were in the mesotrophic category, indicating good water quality; and 46 percent were in the eutrophic category, indicating poor water quality.
- **Summer average:** 1.9 meters (met BCWMC/MPCA standard).

Phosphorus loading from sediment

When oxygen levels are low, phosphorus stored in sediment is released (internal loading), causing higher total phosphorus concentrations in near-bottom waters. The Medicine Lake total maximum daily load (TMDL) study (LimnoTech, 2010) found internal phosphorus loading from sediment to be a significant source of lake phosphorus—about one-third of the lake’s total annual phosphorus load. According to the study, phosphorus from Medicine Lake’s sediment is conveyed to the surface either by diffusion or wind mixing. Wind-mixing events completely mix the water column several times each year, typically in July, August, and September. BCWMC’s capital improvement program includes a project to perform an alum treatment in Medicine Lake in the future.

The 2020 data are consistent with the TMDL findings. Near-bottom oxygen levels in Medicine Lake were low in the Main Basin from June through August (Figure 5). Internal phosphorus loading from sediment during this period caused near-bottom phosphorus concentrations to consistently increase (Figure 6). Temperature and dissolved oxygen data indicate that the lake mixed between late August and early September, resulting in increased surface water phosphorus concentrations and lower near-bottom phosphorus concentrations.

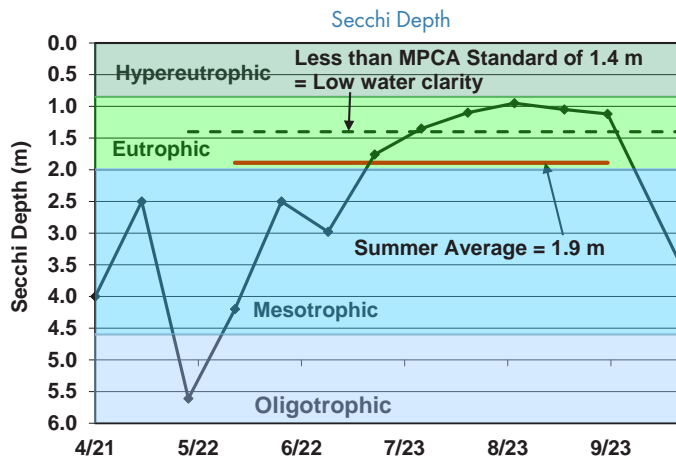


Figure 4 (Data collected by TRPD)

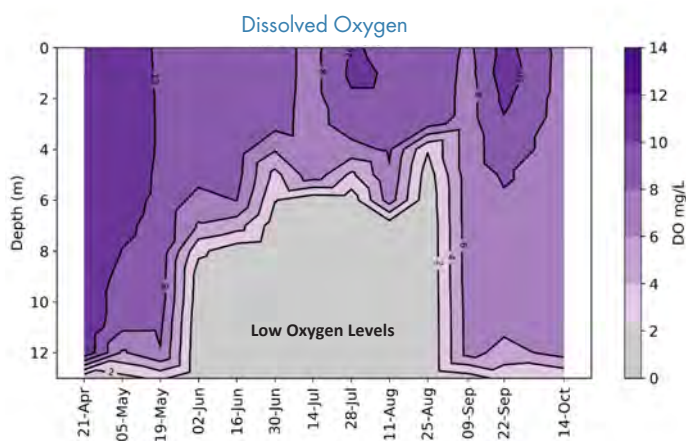


Figure 5 (Data collected by TRPD)

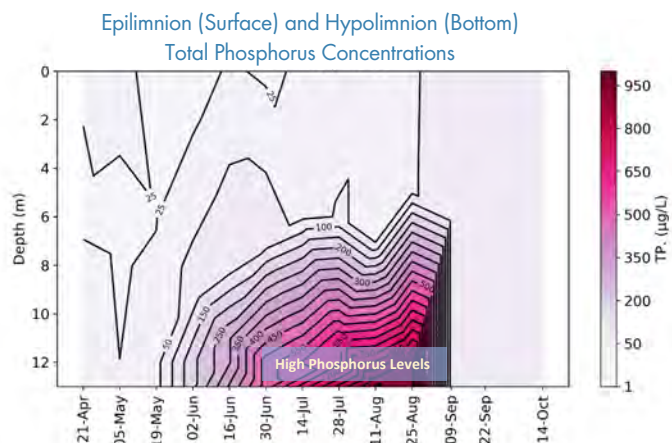


Figure 6 (Data collected by TRPD)

Water chemistry monitoring from 1972–2020: historical trends

Water quality in Medicine Lake has been monitored since 1972. Summer averages (June through September) of total phosphorus, chlorophyll *a*, and Secchi disc depth from 1972–2020 are shown in the Figures 7–9. During the period of record, 94 percent of total phosphorus, 100 percent of chlorophyll *a*, and 31 percent of Secchi disc summer averages failed to meet Minnesota State Water Quality Standards for lakes in the North Central Hardwood Forest Ecoregion published in Minnesota Rules 7050 (Minn. R. Ch. 7050.0222 Subp 4). The 2020 summer average total phosphorus concentration was the lowest concentration observed during the period of record, a favorable change for the lake.

Trend analyses over the past 10 years show:

- Declining summer average total phosphorus concentrations.
- Declining summer average chlorophyll *a* concentrations.
- Declining summer average Secchi disc depths.

However, none of the changes are at statistically significant levels.

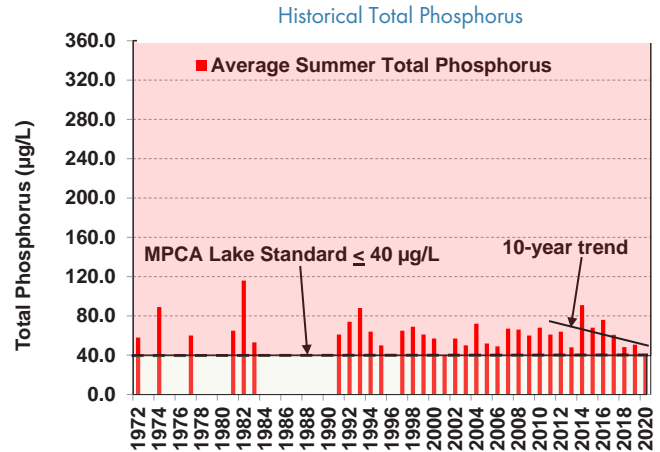


Figure 7 (Data collected by TRPD)

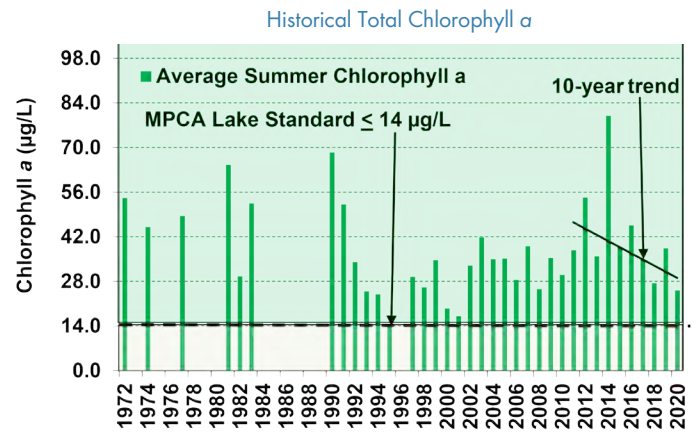


Figure 8 (Data collected by TRPD)

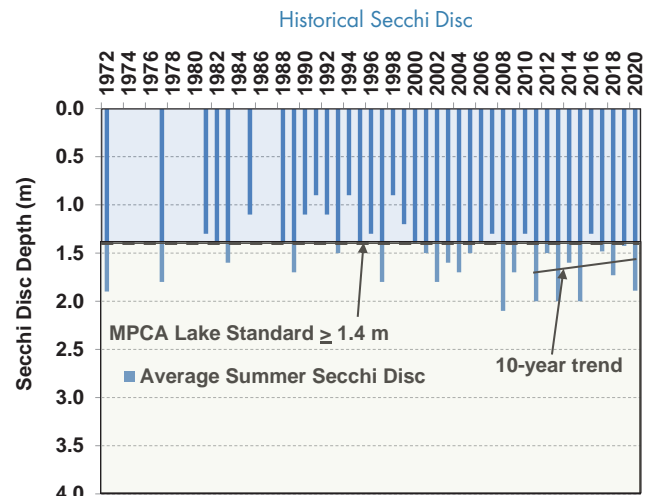


Figure 9 (Data collected by TRPD)



Chloride levels

Chloride concentrations in lakes and streams have increased since the early 1990s when winter maintenance practices largely switched from using sand and/or sand/salt mixtures to salt for roads and parking lots. When snow and ice melts, the salt goes with it, washing into lakes, streams, wetlands, and groundwater. It only takes 1 teaspoon of salt to permanently pollute 5 gallons of water. And, once in the water, there is no way to remove chloride.

Because high concentrations of chloride can harm fish and plant life, the MPCA has established maximum and chronic chloride standards. The maximum standard is the highest concentration of chloride that aquatic organisms can be exposed to for a brief time with zero to slight mortality. The chronic standard is the highest chloride concentration that aquatic life can be exposed to indefinitely without causing chronic toxicity. Chronic toxicity means a condition that lingers or continues for a long period of time, often one-tenth the life span or more. A chronic effect can be mortality, reduced growth, reproduction impairment, harmful changes in behavior, and other nonlethal effects. A lake is considered impaired if two or more measurements exceed chronic criterion (230 mg/L or less) within a 3-year period or one measurement exceeds maximum criterion (860 mg/L).

All measurements from 2016 through 2020 were well below the maximum chloride standard. And, all measurements from 2016 through 2020, except the May 5, 2020, measurement from the hypolimnion (bottom), were well below the chronic chloride standard (Figure 10). The 2020 average annual chloride concentration (150 mg/L) was the same as the 2019 average annual chloride concentration, and well below the maximum and chronic chloride standards.

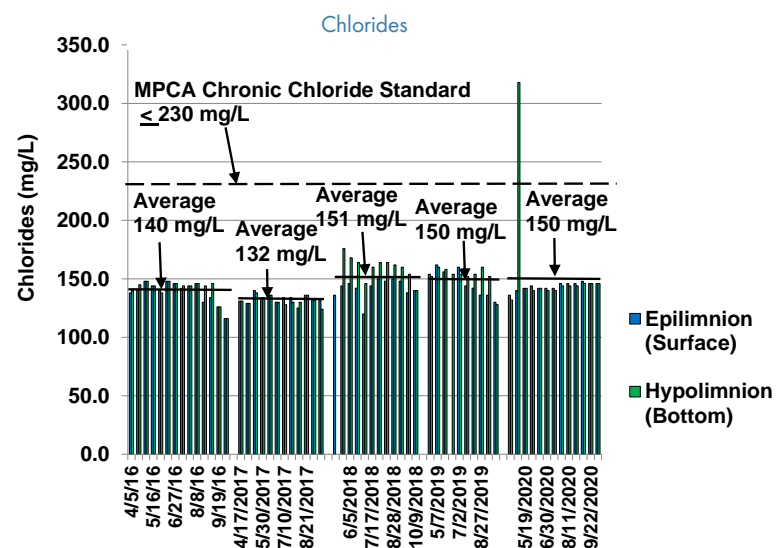


Figure 10 (Data collected by TRPD)

Macrophytes

Lake Plant Eutrophication Index of Biological Integrity (IBI)

Eutrophication (excessive nutrients) may have detrimental effects on a lake, including reductions in the quantity and diversity of aquatic plants. The MNDNR developed a Lake Plant Eutrophication Index of Biological Integrity (IBI) to measure the response of a lake plant community to eutrophication. The Lake Plant Eutrophication IBI includes two metrics: (1) the number of species in a lake and (2) the “quality” of the species, as measured by the floristic quality index (FQI). The MNDNR has determined a threshold for each metric. Lakes that score below the thresholds contain degraded plant communities and are likely stressed from anthropogenic (human-caused) eutrophication.

Plant survey data from 2009 to 2020 were assessed to determine plant IBI trends. The figures at right show Medicine Lake FQI scores and the number of species for that period compared to the MNDNR Plant IBI thresholds.

- Number of species:** A deeper water lake, such as Medicine Lake, fails to meet the MNDNR Plant IBI threshold when it has fewer than 12 species. During the period examined, the number of species in Medicine Lake ranged from 15 to 24 (Figure 11), meeting or exceeding the MNDNR Plant IBI threshold during the entire period of record. Twenty-three to 24 species were observed in the lake in 2020, the highest number to date.
- FQI values (quality of species):** The MNDNR Plant IBI threshold for deeper water lakes, as measured by FQI, is a minimum value of 18.6. During the period examined, FQI values in Medicine Lake ranged from 20 to 28, bettering the MNDNR Plant IBI threshold during the entire period of record (Figure 12). An FQI score of 28 was observed during June and August 2020, the highest score to date.
- 2020 results:** Both the number of species in the lake and FQI values were better than the MNDNR Plant IBI thresholds and were the highest scores observed during the period of record.

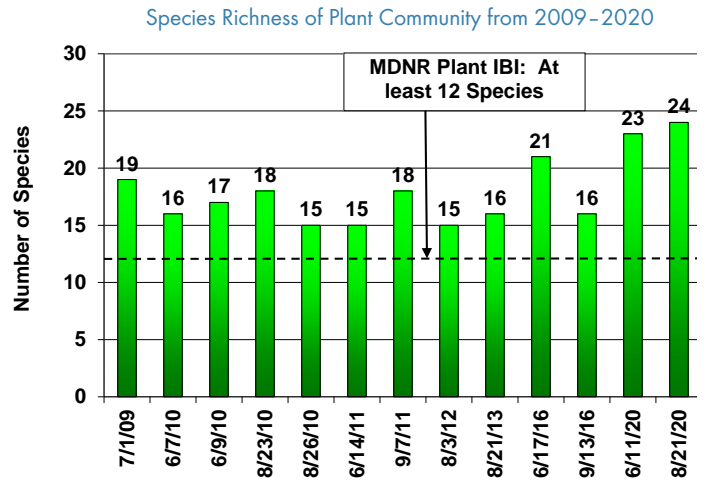


Figure 11 (Data collected by TRPD)

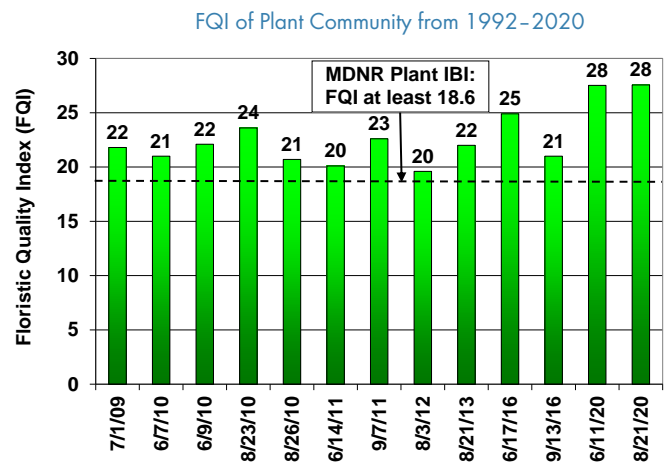


Figure 12 (Data collected by TRPD)



Coontail, one of the species found in Medicine Lake

Aquatic invasive species

In 2020, four invasive species were found in Medicine Lake.

Curly-leaf pondweed (*Potamogeton crispus*)

Curly-leaf pondweed has been a consistent problem in Medicine Lake. As shown in Figure 13, with the exception of 2007, the herbicide endothall was used to control the plant each year from 2004 through 2015 and the herbicide diquat was used to control the plant annually from 2018 through 2020. The 2010 TMDL implementation plan for Medicine Lake specified that curly-leaf pondweed should continue to be managed annually to prevent it from exceeding 2006 levels (22 percent of sample locations).

As shown in Figure 13, in spring of 2020, 49 acres of curly-leaf pondweed were treated with herbicide. Figure 14 shows the treatment area and pre-treatment density. In June, the plant's frequency was 65 percent, the second-highest frequency to date (Figure 15). The plant's frequency exceeded the TMDL threshold in 2010, 2011, 2012, 2017, 2019, and 2020. Because die-off of curly-leaf pondweed is an internal source of nutrients for Medicine Lake, control of the plant helps reduce the lake's internal loading.

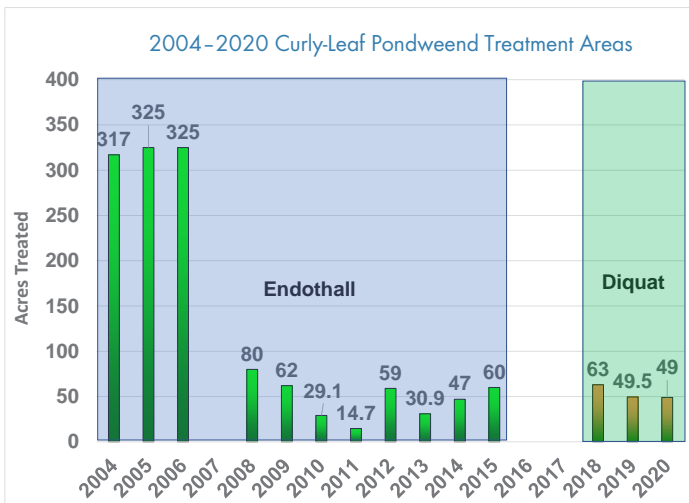


Figure 13 (Data Collected by TRPD)

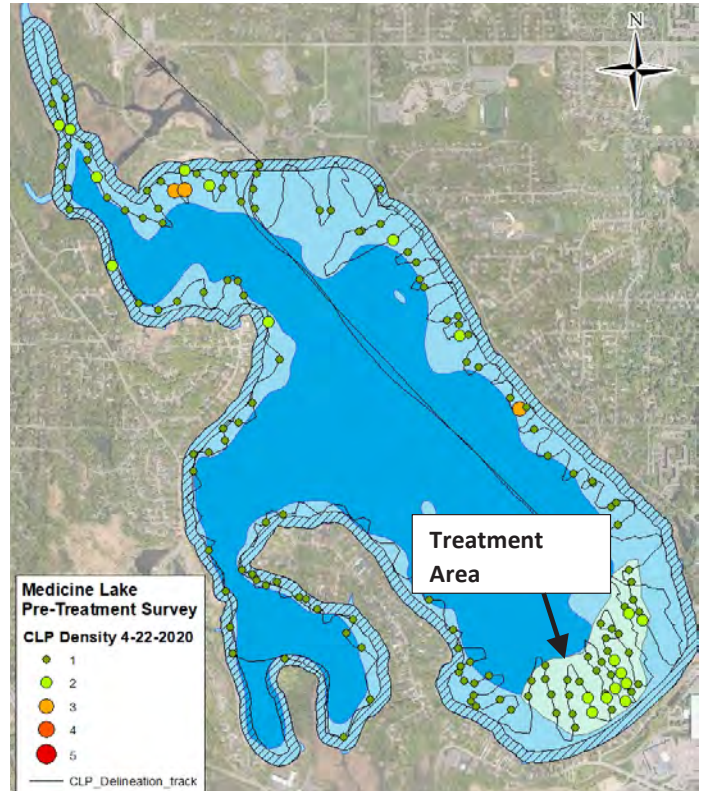


Figure 14: 2020 CLP Delineation and Treatment Area (TRPD)

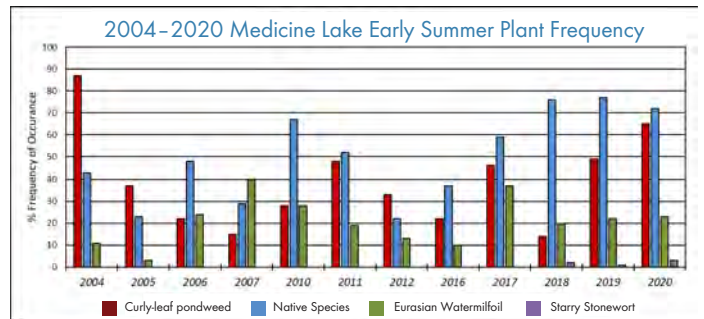


Figure 15 (Data Collected by TRPD)

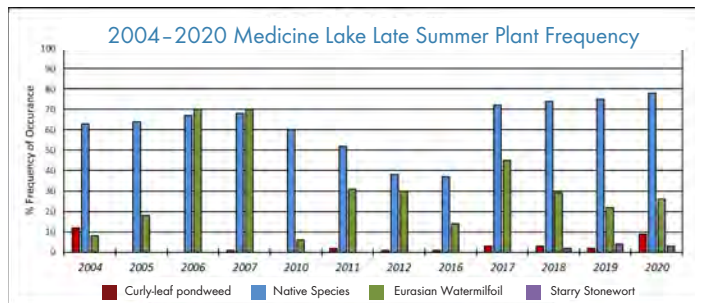


Figure 16 (Data Collected by TRPD)

Eurasian watermilfoil (*Myriophyllum spicatum*)

Eurasian watermilfoil was not problematic in 2020, ranging in frequency from 23 to 27 percent of the sample locations. From 2004 through 2020, Eurasian watermilfoil frequency has ranged from 3 to 70 percent (Figures 15 and 16, page 9).

Starry stonewort (*Nitellopsis obtusa*)

Starry stonewort was first observed in Medicine Lake in 2018 after a boat inspector recognized the plant on a boat leaving the lake. The MNDNR completed a plant survey on August 1, 2018 and confirmed that a 14-acre area of starry stonewort was present on the northern side of the lake near the boat landing (Figure 17). The MNDNR funded treatment of the plant with herbicide (copper sulfate and endothall) from 2018 through 2020. Despite the treatments, a 2020 plant survey documented the plant has spread to areas along the western side of the lake (Figure 18).

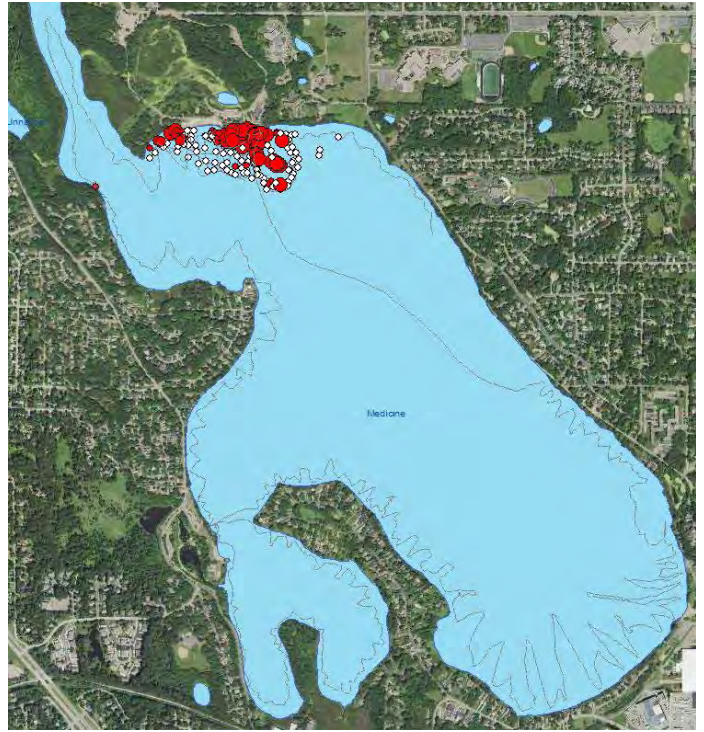


Figure 17: Starry Stonewort Delineation in August 2018 (MNDNR)

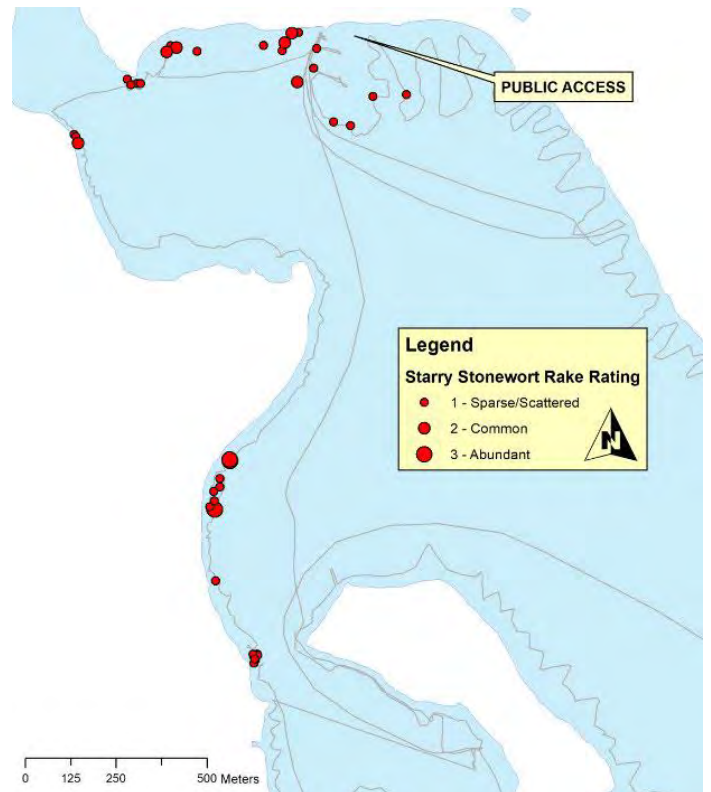


Figure 18: Starry Stonewort Delineation in October 2020 (MNDNR)

Zebra mussels (*Dreissina polymorpha*)

Zebra mussels were first observed in Medicine Lake when a resident living on the south end of the lake found a zebra mussel on a dock. On November 2, 2017, MNDNR staff examined docks removed from the southern end of the lake and found zebra mussels on two additional docks (Figure 19). Surveys from 2018 through 2020 found that zebra mussels remained at low numbers through 2019 and then increased by nearly an order of magnitude. Five zebra mussels were observed in 2018, three in 2019, and 278 in 2020. During this period, zebra mussels spread from the southern end of the lake to the eastern and northern sides). Zebra mussel veligers (planktonic larvae) were observed in the zooplankton samples collected from Medicine Lake in April, May, June, August, and September 2020. On the dates when veligers were observed, numbers ranged from to 5,217 to 95,316 per square meter (Figure 20).

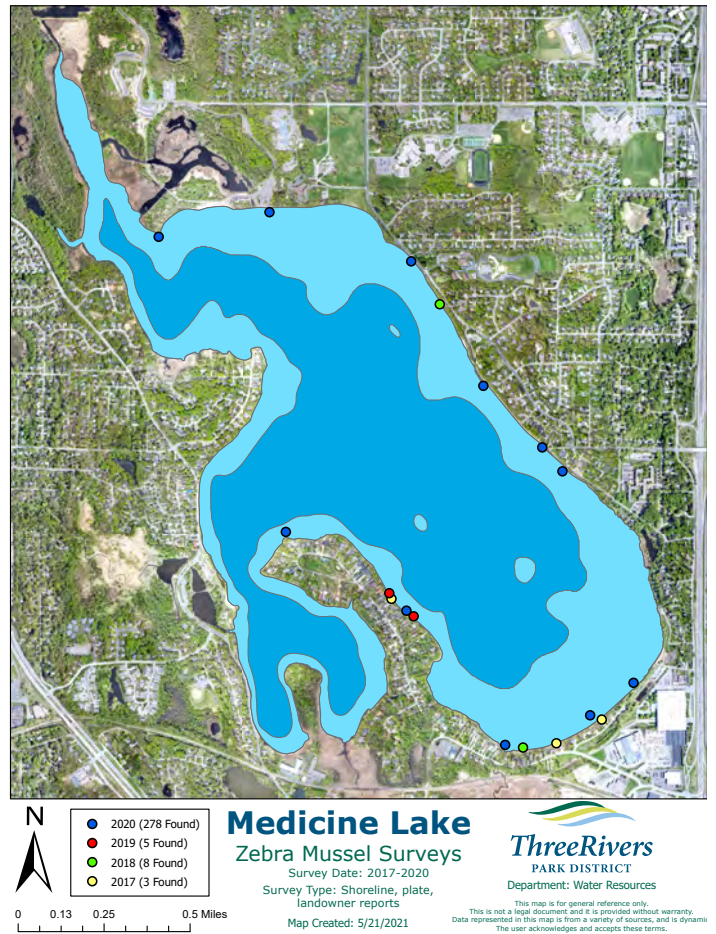


Figure 19 (Data Collected by TRPD)

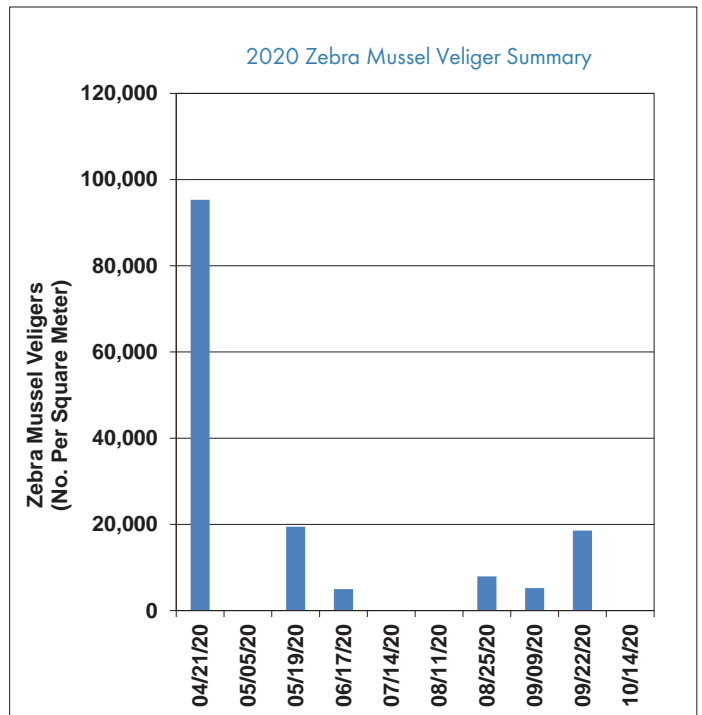


Figure 20

Phytoplankton and zooplankton

Reductions in numbers of phytoplankton (microscopic aquatic plants) and rotifers (a type of zooplankton—microscopic animal) between 2016 and 2020 are likely due to predation by zebra mussels. Zebra mussels primarily feed on algae, but also consume rotifers, which are small. From 2016 to 2020, algae and rotifer numbers both declined. Reductions in algae limit the quantity of food available to the larger zooplankters (cladocerans and copepods). Copepod numbers declined between 2016 and 2020, but it is not known whether their decline was due to fish predation or food limitation from reduced numbers of phytoplankton. Cladoceran numbers increased from 2016 to 2020, indicating they were not impacted by the reductions in algae.

Samples of phytoplankton were collected from Medicine Lake to evaluate water quality and the quality of food available to zooplankton and zebra mussels. As shown in Figure 21, phytoplankton numbers were low from April through June and October and increased from July through September due to increasing numbers of blue-green algae. While blue-green numbers increased with higher concentrations of phosphorus during this period other types of algae did not. This is because:

- Blue-green algae can move up and down the water column while other types of algae cannot.
- Blue-green algae can grow in a wider variety of light conditions than other algae.
- Blue-green algae can capture atmospheric nitrogen while other types of algae cannot.

Lower phytoplankton numbers in 2020 compared with 2016 and 2010 are likely due to zebra mussel consumption of algae. A comparison of 2020 phytoplankton numbers with 2010 and 2016 indicates that 2020 numbers were, on average, 34 to 38 percent lower than 2010 and 2016 numbers—with an April through September average of 13,536 units per milliliter in 2020 compared with 21,826 in 2016 and 20,394 in 2010 (Figure 21). As noted previously, zebra mussels were first observed in the lake in 2017. Zebra mussels consume all types of algae, although they prefer the more palatable types such as diatoms, green algae, and cryptomonads.

Zebra mussel grazing of green algae reduced early spring numbers in Medicine Lake by more than an order of magnitude in 2020 and seasonal average numbers by more than half compared with 2010 and 2016. In spring, zebra mussel filtration rates rise dramatically as waters warm from 41° F to 50° F and then stabilize. Green algae numbers observed in Medicine Lake during April 2020 were more than an order of magnitude lower than



numbers observed in April 2010 and April 2016—with 1,493 units per milliliter in 2020 compared with 15,335 in 2016 and 19,413 in 2010 (Figure 22). The 2020 April through September average number of green algae was less than half the average observed in 2010 and 2016: 1,774 per milliliter in 2020 compared with 4,290 in 2010 and 4,643 in 2016 (Figure 22).

Unlike phytoplankton, zooplankton do not produce their own food. As “filter feeders,” they eat millions of small algae; given the right quantities and species, they can filter the volume of an entire lake in a matter of days. They are also valuable food for planktivorous fish and other organisms. Zebra mussels prey upon small zooplankton (rotifers), but do not consume the larger cladocerans and copepods.

Lower numbers of rotifers in Medicine Lake during 2020 were likely due to zebra mussel predation. The April through September 2020 average number of rotifers was less than half the 2010 and 2016 averages—with 558,898 per square meter in 2020 compared with 1,651,848 in 2010 and 1,410,935 in 2016 (Figure 23 and Figure 24).

Although zebra mussels do not prey upon larger zooplankton, they can impact numbers and sizes by limiting their food supply. Cladocerans and copepods consume algae and may be impacted by food limitation caused by zebra mussels grazing on algae. The April through September 2020 average number of copepods was 30 percent lower than the 2010 average and 20 percent lower than the 2016 average. However, it is not known whether the reduced numbers of copepods in 2020 was due to food limitation or fish predation (Figure 23 and Figure 25). 2020 cladoceran numbers were within the range of 2010 and 2016 numbers (Figure 23 and Figure 26), indicating cladocerans were not impacted by food limitation from zebra mussels grazing on algae.

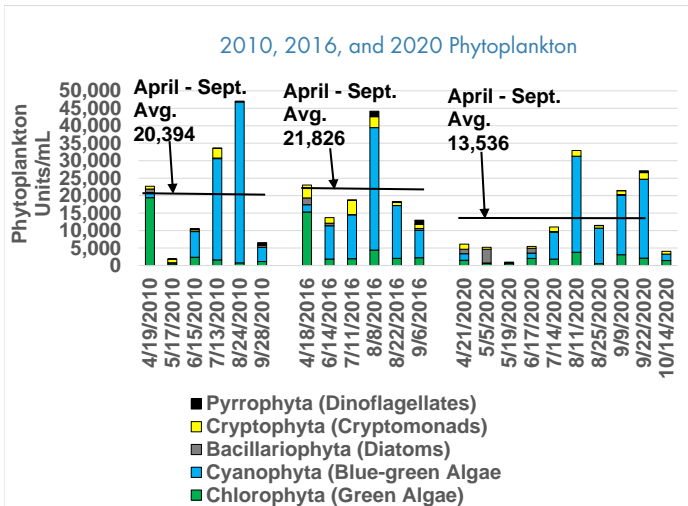


Figure 21

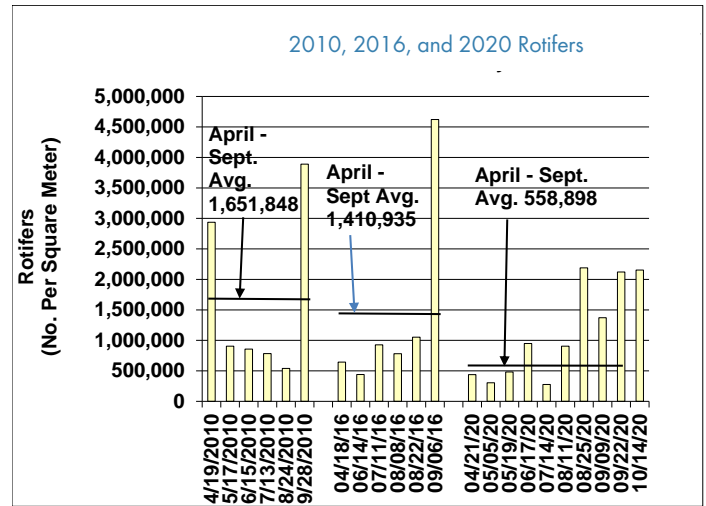


Figure 24

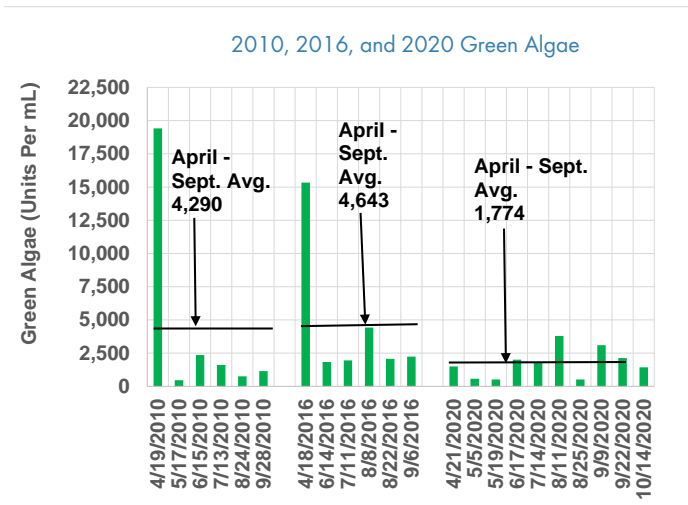


Figure 22

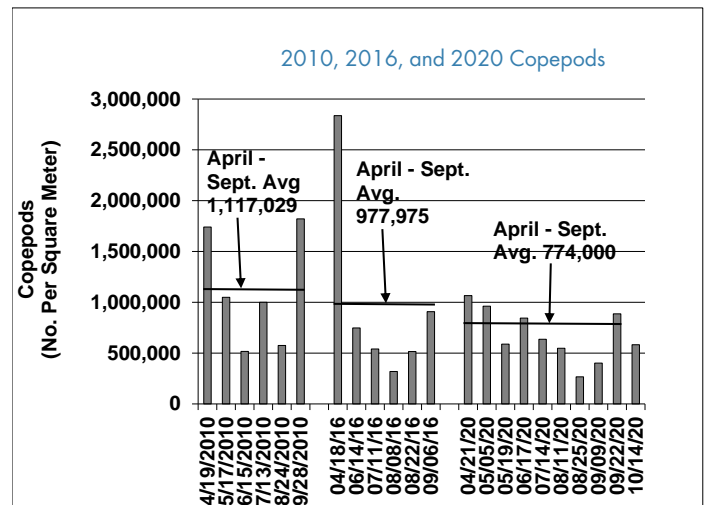


Figure 25

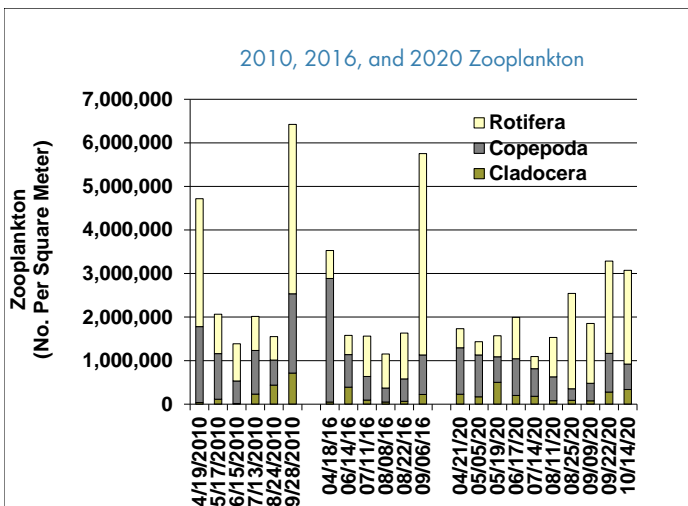


Figure 23

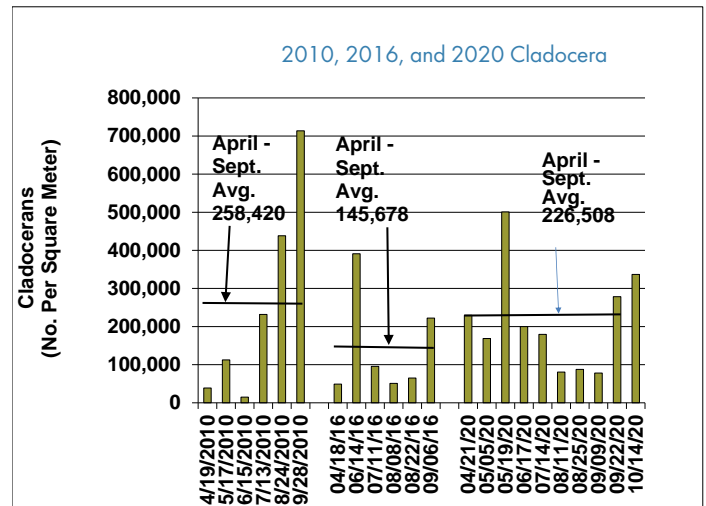


Figure 26

Fish

In July 2020, the MNDNR conducted a standard fish survey of Medicine Lake using trap and gill nets. Survey results indicate:

- Northern pike were highly abundant. Forty-four percent of the 255 pike sampled were less than 22 inches and 22 percent exceeded 26 inches. The MNDNR survey report stated “with lots of smaller fish, and a good chance of catching a few larger fish, Medicine Lake would be the place for a harvest-oriented angler.”
- Good numbers of walleye were present and fish size ranged from 10 to 28 inches. The average size of walleye in Medicine Lake was 17.8 inches and 2.35 pounds.
- Medicine Lake supports a strong population of bluegill. In 2020, the largest bluegill in the lake was 9.2 inches and a good proportion of the fish were larger than 7 inches. Because the lake supports large bluegill, a special regulation will be implemented in 2021 to reduce the limit on harvesting bluegill from 20 per day to five per day. The regulation will keep bluegills in the lake longer and hopefully allow a greater proportion of bluegills to attain a large size.
- Black crappie are abundant in the lake and of modest size. A special regulation will be implemented in 2021 to reduce the limit on harvesting of black crappie to five per day. The regulation will keep black crappie in the lake longer and hopefully improve the size of these fish.
- Yellow bullhead in Medicine Lake are both abundant and of quality size. The average-size yellow bullhead was 11.8 inches and 0.9 pound. More than half of the sample exceeded 12 inches.
- Other species caught in low abundance included brown bullhead, black bullhead, bowfin, common carp, hybrid sunfish, green sunfish, pumpkinseed, yellow perch, and white sucker.



Northern pike

Fish IBI

Recent fish surveys and metrics indicate Medicine Lake has a fishery impairment, meaning it does not meet the State thresholds for a thriving and healthy fish community. However, it appears the fish community improved since the last survey in 2012.

An index of biological integrity (IBI) is a group of metrics that, combined, depict the overall biological integrity or condition of a system. The MNDNR has developed four fish-based Index of Biotic Integrity (IBI) tools to assess Minnesota lakes from 100 to 10,000 acres in size. The Fish IBI tools have been used by the MNDNR since 2015 to assess whether lake waters are impaired for fish (i.e., do not support a lake’s fish population).

On September 1, 2020, the MNDNR Fisheries Index of Biological Integrity (FIBI) staff conducted a targeted survey of the nearshore fish community in Medicine Lake. Fifteen native species were captured in the nearshore survey including three species that are intolerant of disturbance (banded killifish, Iowa darter, and least darter). Data from the targeted nearshore fish survey were combined with data from the standard fish survey completed in July 2020 to compute a Fish IBI score, assessing the aquatic life use in Medicine Lake.

Tool 2 was used to compute Fish IBI in Medicine Lake, resulting in a score of 30 which was below both the impairment threshold of 45 and the lower confidence limit of 36. The relatively low species diversity in general and the trap net community metrics were the main negative influences on the Fish IBI score. Positive influences on the Fish IBI score were the number of small benthic-dwelling species (Iowa darter, Johnny darter, least darter, and tadpole madtom) and the somewhat high proportional biomass of top carnivores in the gill net catch (78 percent). Because the 2020 Fish IBI score was below both the impairment threshold and the lower confidence limit, Medicine Lake is impaired for fish. The MNDNR had previously computed Fish IBI from Medicine Lake fish data collected in 2012. The 2012 Fish IBI score was 25. Although both the 2012 and 2020 Fish IBI scores were below the Fish IBI impairment threshold and lower confidence limit, the higher score in 2020 suggests the fish community has improved.

Bassett Creek Watershed Management Commission | bassettcreekwmo.org

Cleaner, healthier water for a growing community



Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 5B – Consider Approval of 90% Design Plans for 2021 Mt. Olivet Stream Restoration & Parkers Lake Drainage Improvement Projects, Plymouth (CIP 2021 ML-20 and PL-7) -- BCWMC August 19, 2021 Meeting Agenda
Date: August 11, 2021
Project: 23270051.52-2021-644&645

5B Consider Approval of 90% Design Plans for 2021 Mt. Olivet Stream Restoration & Parkers Lake Drainage Improvement Projects, Plymouth (CIP 2021 ML-20 and PL-7)

Summary:

Proposed Work: 2021 Mt. Olivet Stream Restoration & Parkers Lake Drainage Improvement Projects, Plymouth (CIP 2021 ML-20 and PL-7)

Basis for Commission Review: 90% Design Plans Review

Change in Impervious Surface: N.A.

Recommendations:

- 1) Conditional approval of 90% drawings
- 2) Authorize BCWMC Engineer to provide administrative approval after final plans have been revised and comments have been sufficiently addressed

At their September 2020 meeting, the BCWMC entered into an agreement with the City of Plymouth to design and construct these BCWMC CIP projects. The 2021 Mount Olivet Stream Restoration & Parkers Lake Drainage Improvement Projects (CIP 2021 ML-20 and PL-7) are being funded by the BCWMC's ad valorem levy (via Hennepin County). The City of Plymouth provided the combined 90% design plans for both projects to the BCWMC for review and comment, per the agreement with the City.

Feasibility Study Summary

The BCWMC completed the Feasibility Report for Mount Olivet Stream Stabilization and Parkers Lake Drainage Improvement Projects (Barr, June 2020) to examine the feasibility of restoring sites within these two separate project areas in the City of Plymouth. The Mount Olivet Stream Stabilization project area is located along an unnamed stream adjacent to Mount Olivet Lutheran Church and Clifton E. French Regional Park of the Three Rivers Park District (Figure 1). The Parkers Lake Drainage Improvement project area is located on an unnamed stream within Parkers Lake Community Playfields, upstream of Parkers Lake (Figure 2). At both sites, the feasibility report identified multiple locations where bank erosion, bank failure, and infrastructure repairs were needed, in addition to removal of debris and fallen trees.

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Date: August 11, 2021
Page: 2

The feasibility report also included evaluation of potential projects that would improve the water quality of stormwater leaving the Parkers Lake Community Playfield site by reducing total phosphorus and total suspended solids (Alternatives 5a/5b) and chloride loading into Parkers Lake (Alternative 6).

The feasibility report identified 2 to 3 design options and a final recommendation for each project site. For most of the individual restoration sites, the feasibility report included two alternative designs: 1) a bioengineering (or soft armoring) approach using techniques that rely primarily on vegetation; 2) a more structural (or hard armoring) approach using rock and other non-vegetative materials. Some of the individual restoration sites included additional alternatives that did not focus on preserving the existing alignment or channel configuration, such as re-meandering the channel or conveying flow through a pipe rather than the stream channel. At their May 21, 2020 meeting, the Commission approved the following:

- Mount Olivet Stream Stabilization project: implementing Alternative 1—stream stabilization using bio-engineering techniques, wetland restoration, and installation of a manhole drop structure at the Mount Olivet Church parking lot
- Parkers Lake Drainage Improvement project:
 - For stream stabilization portion of the project, implementing Alternative 3—stream stabilization using bio-engineering techniques (this is the project included in the 90% design plans under current review)
 - For water quality improvement portion of the project, implementing Alternative 6—chloride reduction demonstration project for the northern tributary watershed (this is a separate project not included in the 90% design plans under current review)

The feasibility study also estimated that project implementation would reduce the total phosphorus load from the two sites combined by 25.4 pounds per year (5.3 pounds TP per year from the Mount Olivet site and 20.1 pounds TP per year at the Parkers Lake site) and the total suspended sediment load by 50,700 pounds per year (10,560 pounds per year TSS from the Mount Olivet site and 40,140 pounds TSS per year at the Parkers Lake site).

90% Design Plans

The 90% design plans follow many of the recommendations from the feasibility study and include the use of slope grading with bioengineering, stabilization of stormwater outlets, debris clearing, and vegetation management. Notable differences between the 90% design plans and the feasibility study recommendations for the selected alternatives were addressed in a May 19, 2021 submittal memorandum from the design engineers (WSB). The differences between the design plans and the feasibility study were noted during the 60% review and have not changed. Based on the 90% design plans, the Commission Engineer does not consider any of the changes to represent a significant departure from the intent of the project as evaluated in the feasibility study.

The 90% design plans show the removal of approximately 57 trees for the two sites combined (23 trees for the Mt. Olivet site and 34 trees for the Parkers Lake site), which is unchanged from the 60% design plans and is similar to the total estimated tree removal numbers in the feasibility study. No tree plantings

have been proposed based on the City of Plymouth's desire to open up the tree canopy in these areas and remove undesirable species and falling/diseased trees.

Previous Reviews

The City of Plymouth submitted the 60% design plans for this project, and the BCWMC conditionally approved the 60% plans at its June 17, 2021 meeting. Following the conditional approval of the 60% design plans, the City of Plymouth revised and submitted the 90% design drawings with the inclusion of the comments from the BCWMC's review of the 60% design plans. The 90% design drawings and associated submittals sufficiently addressed and provided responses to the BCWMC Engineer's comments on the 60% design plans. The Commission Engineer's June 21, 2021 60% design comment letter requested the following additional information. The Commission Engineer's June 21, 2021 comments are noted below, followed by the City's consultant's (WSB) responses dated June 25, 2021 in *italics*:

A) Comments that apply to both the Mount Olivet Streambank Restoration and Parkers Lake Drainage Improvements projects:

- 1) The two-dimensional modeling results submitted with the 60% drawings show areas of high velocity during the 100-year flood event, with velocities reaching 6.1 ft/s at the Mount Olivet site and 9.0 ft/s at the Parkers Lake site. Many of the highest-velocity areas are proposed for stabilization with fieldstone riprap armoring on the channel banks and as a component of rock ditch checks. We understand from communication with the design engineer that MNDOT Class III fieldstone riprap is proposed for these applications. Please confirm the proposed riprap gradation and provide additional detail to document that the proposed materials are adequately sized to meet the design stability criteria based on the hydraulic modeling results.

WSB Response: *Class III fieldstone riprap is proposed for the hard armoring as shown in the detail on page 14. The hydraulic modeling indicates velocities between 6-9 fps on the high end. Per the MnDOT Drainage Manual, Class II riprap can be used for areas with velocities of 6-8 fps, while Class III riprap should be used for areas with velocities of 8-10 fps. For construction supply purposes and to provide a factor of safety, Class III riprap is proposed for the entire project area.*

Commission Engineer comment: Comment addressed.

- 2) The plans do not provide a design typical cross section or detail for riprap bank stabilization applications. Please include a design riprap section on the design drawings, including proposed riprap sizes, thickness, filter, and side slopes.

WSB response: *See detail added to Sheet 14.*

Commission Engineer comment: Comment addressed.

- 3) The plans call for the use of geotextile fabric beneath ditch checks and in plunge pools; however, for in-stream applications, geotextile fabric can allow for the development of preferential flow paths beneath the fabric. Please revise the design to use a granular filter in place of the proposed geotextile fabric. This comment does not apply at flared end sections, where the use of the City-standard detail and geotextile fabric is appropriate.

WSB response: *Granular filter has replaced geotextile fabric beneath the ditch checks (see details on Sheet 13) and rock plunge pools (see notes on Sheet 12).*

Commission Engineer comment: Comment addressed.

- 4) The plans include trees anchored to the side slope to provide protection against toe erosion, with the trees anchored by duckbill cable anchors. Please provide additional detail on the proposed cable anchors, including the number of anchors required per log to counteract buoyancy forces.

WSB response: *Model 68 duckbill earth anchors are proposed every 3 feet along the tree's length, as indicated in the detail on Sheet 13. Model 68 anchors go 30" into the ground and have a capacity of 1100 lbs per anchor. This greatly exceeds the buoyant force for a 12-18" diameter tree (approx. 1600 lbs total).*

Commission Engineer comment: Comment addressed. Concur that the proposed anchors are sufficient at the spacing proposed, which will result in multiple anchors per individual tree.

- 5) The plans call for rock and rock-log ditch checks at multiple locations, with a typical height of 30 inches above the existing channel bed. Please consider whether the ditch checks have the potential for downstream scour hole development and whether scour protection through material embedment in the channel bottom, flattening of the downstream slope of the ditch check, or a decrease in ditch check height is required.

WSB response: *The rock and rock-log ditch check details have been modified to a typical height of 18 inches to better reflect actual field conditions and prevent downstream scour.*

Commission Engineer comment: Comment addressed.

- 6) The plans do not provide a design cross section or allowable slope limits for areas with grading only ("blend side slope into the ditch bottom"). Please include a design typical section on the design drawings, including proposed maximum slope and stabilization extents (erosion control blanket or other stabilization).

WSB response: *The extents of the stabilization will follow the plans and be confirmed in the field by the engineer. The maximum allowable slope is 3:1 as shown in the detail on page 14.*

Commission Engineer comment: Comment addressed.

- 7) The plans include the use of bioroll (sediment control log) at the toe of graded areas and downstream floating silt curtain for erosion and sedimentation control. We understand from communication with the design engineer that bioroll is also proposed at the downstream locations to provide sedimentation control during very low-flow conditions. Please include the proposed bioroll/silt curtain combination on the drawings.

WSB response: *See the updated legend on all proposed conditions plan sheets, indicating that bioroll will be installed with floating silt curtain.*

Commission Engineer comment: Comment addressed.

- 8) The plans do not show any construction staging areas within the construction limits or on adjacent areas. Please identify construction staging areas that will be required and provide appropriate erosion and sedimentation control measures on the plans.

WSB response: *Construction staging areas surrounded by bioroll have been added to Sheets 10, 11, and 12.*

Commission Engineer comment: Comment addressed.

- 9) Please include on the plans instructions for the contractor to limit tree clearing as much as possible and only at the direction of the Engineer. We understand from communication with the City that additional tree plantings are not proposed at this time, as discussed above.

WSB response: *See Note 1 on the Proposed Site Plan & Profile sheets.*

Commission Engineer comment: Comment addressed.

- 10) Please include on the plans the elevations and upstream/downstream stationing for all proposed toe stabilization measures.

WSB response: *See the tables added to the stabilization details on Sheets 13 and 14. Exact limits of stabilization will be verified by the engineer in the field.*

Commission Engineer comment: Comment addressed.

- 11) The proposed seed mixes in the wetland restoration area are BWSR mix 34-271 (wet meadow south and west) and BWSR mix 34-181 (emergent wetland). Stream bank bioengineering areas call for "seeding special" with a seed mix referenced in the specifications (not provided with the 60% drawings). Please provide the custom seed mix proposed for use on the stream bank areas for Commission review.

WSB response: *The Minnesota Native Landscapes Minnesota Woodland Mix (or approved equal) is proposed.*

Commission Engineer comment: Comment addressed.

B) Comments that apply only to the Mount Olivet Streambank Restoration site:

- 1) The plans do not specify any outlet protection or stilling basin at the proposed storm sewer outlet from the Mount Olivet parking lot at station 4+10. We understand from communication with the City that a City-standard outlet protection detail is proposed; please include the standard detail on the plans.

WSB response: *See note on Sheet 8 and City standard detail on Sheet 14.*

Commission Engineer comment: Comment addressed.

- 2) The plans call for widening of the stream channel to eight feet wide from station 7+00 to 9+00; however, a design cross section or proposed channel side slopes are not provided. Please specify a design cross section or side slopes and indicate the extent of the disturbance on the plans.

WSB response: *See the stream typical section added to Sheet 9. The area of disturbance will be limited to that area within the construction limits.*

Commission Engineer comment: Comment addressed.

- 3) The plans do not show any downstream erosion control measures at the proposed wetland restoration and access route at the Mount Olivet site (downstream and to the south of the proposed construction areas). Please provide downstream erosion control, such as silt fence or bioroll along the access and at the wetland restoration location.

WSB response: *A double layer of silt fence has been added to the downstream edge of the wetland restoration area as shown on Sheet 10. Construction of the project is planned for winter when the ground will be frozen. No erosion control measures are proposed along the access path above and beyond the rock construction entrance. Silt fence will be added to this area during construction if it is necessary.*

Commission Engineer comment: Comment addressed.

- C) Comments that apply only to the Parkers Lake Drainage Improvements site:

- 1) The plans call for grading of the stream channel bottom from station 13+00 to 14+80; however, only a portion of this length has accompanying bank stabilization measures shown. We understand from communication with the design engineer that the remaining length is proposed for sediment removal and reshaping of the bottom of the channel only and will not require additional bank grading. Please provide clarification regarding the proposed grading in the drawings, including a design slope and direction to the contractor to limit bank disturbance in this area.

WSB response: *See updated note on Sheet 11.*

Commission Engineer comment: Comment addressed.

- D) In addition to the above comments, the BCWMC requested the inclusion of the following additional information as part of the 90% plan submittal (WSB responses are dated June 25 and 29, 2021):

- 1) Regarding the HEC-RAS 2D model, provide additional model documentation including the following:
- a) Boundary conditions and inflow hydrographs, including any 1D/2D model interaction
 - b) Existing and post-project Manning's roughness values for channel and overbanks
 - c) 2D model cell sizes and justification for the selected size

- d) A review of areas with high velocity adjacent to the model boundary to determine whether the boundary should be extended or cell sizes reduced
- e) Discussion of areas where model results do not match observed erosion patterns

WSB response: *HEC-RAS 2D was used to determine areas of potential erosion based on the existing condition of the two stream stabilization locations. There are no 1D/2D interactions, the model is full 2D computation. The Parkers Lake part of the project is split up into two separate 2D simulations (upstream and downstream). The following steps outline the modeling process:*

1. Existing survey data was merged with LiDAR data to create an existing condition terrain Data Elevation Model (DEM). This DEM was imported into HECRAS to create a terrain data file.

2. This HEC RAS 2D Model only simulates existing conditions. Manning's n values were determined based on existing site conditions, based on guidance from Table 2-1 of the HECRAS 6.0 2D Modeling Users Manual. A Manning's n land cover layer was created in HEC-RAS to provide spatially varied manning's n values across the modeled area.

*Main channel = 0.05
Overbanks = 0.1
Outside channel area = 0.15*

3. A 2D perimeter was created and computation points were generated within the perimeter based on an average 2D cell size. Refinement Regions were used to create smaller 2D cell sizes within areas of interest, such as steep slopes within the main channel of the stream and areas of high velocity. After an iterative process of decreasing cell sizes in areas of high velocities/steep slopes using refinement regions, adjusting the time step for the computation, and analyzing the courant number, we determined the following to be acceptable for each location:

*Mt. Olivet: Computation interval time step – 2 second, refinement region cell size = 5'x5',
perimeter cell size = 10'x10'
Parkers Lake (upstream): Computation interval time step – 1 second, refinement region cell size = 2'x2', perimeter cell size = 10'x10'
Parkers Lake (downstream): Computation interval time step – 1 second, refinement region cell size = 5'x5', perimeter cell size = 10'x10'*

4. Inflow boundary conditions were set as a constant inflow hydrograph for the 100-year storm event from the feasibility report and from computed full pipe flow. To simulate the peak flow through the unsteady state scenario which is required for 2D, we use a constant peak flow over a 48 hour time period.

*Mt. Olivet: upstream peak inflow = 45.1 cfs
Parkers Lake (upstream): upstream peak inflow = 115 cfs
Parkers Lake (downstream): upstream peak inflow = 206 cfs*

5. Downstream boundary conditions were set as Normal Depth type, which computes the water surface elevation in each 2D cell along the boundary condition line. The computed water surface elevation is used as the downstream boundary for each modeled area. A friction slope of 0.002 was

used for all downstream locations; a friction slope of 0.05 was used for the tunnel outflow from the Parkers Lake (downstream) model.

6. The computation settings for the unsteady state plan in HEC-RAS were refined to produce a stable unsteady state model with acceptable Courant number results.

Since it is a trunk conveyance, the design storm selected for the stabilization improvements was the 100-year event. The City has chosen to use stabilization in areas where both the model and site observations show the need for hard armoring. In areas where the field conditions do not reveal issues we are not proposing fixes to accommodate the Commission request to minimize hard armoring.

Commission Engineer comment: Comment addressed.

- 2) Show nearest mapped FEMA floodplain area(s) (SFHAs)

WSB response: *The construction limits of both Mt. Olivet and Parkers Lake project sites are outside of FEMA floodplain areas.*

Commission Engineer comment: Concur.

- 3) Provide the updated construction cost estimate

WSB response: *The updated estimate for the construction cost of the Mt. Olivet Streambank Restoration is \$154,120.00, with an additional \$14,938.00 for the optional culvert crossing. The updated estimate for the construction cost of the Parkers Lake Drainage Improvements is \$101,683.00.*

Commission Engineer comment: Comment addressed (the attached table from WSB shows the detailed cost estimate for the projects).

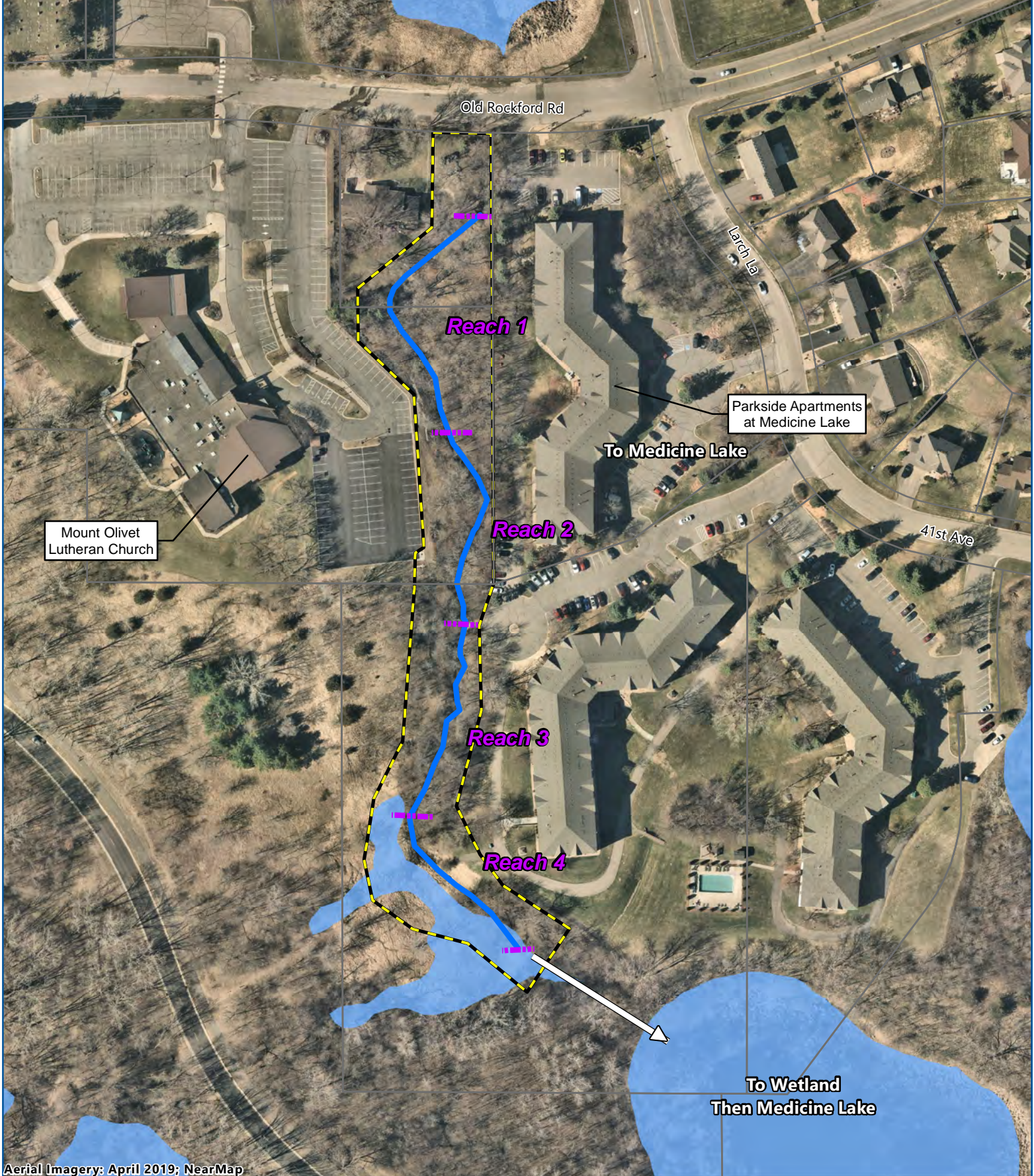
Recommendations

- A) Conditional approval of 90% drawings based on the following comments:
 - 1) Restoration/seeding requirements and appropriate erosion control shall be provided for access and staging areas.
 - 2) Notes must be included on the plans to address the following BCWMC erosion and sediment control requirements:
 - a) Require that soils tracked from the site be removed from all paved surfaces within 24 hours of discovery throughout the duration of construction.
 - b) Require that exposed soil areas be stabilized as soon as possible, but in no case later than 14 days after the construction activity has temporarily or permanently ceased or within 7 days if the project is within 1 mile of a special or impaired water.
 - c) Require a temporary vegetative cover consisting of a suitable, fast-growing, dense grass seed mix spread at a minimum at the MnDOT-specified rate per acre. If temporary cover is


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Date: August 11, 2021
Page: 9

to remain in place beyond the present growing season, two-thirds of the seed mix shall be composed of perennial grasses.

- 3) The final plans must be submitted to the BCWMC Engineer for review and approval after modifications have been completed.
- B) Authorize BCWMC Engineer to provide administrative approval after final plans have been revised and comments have been sufficiently addressed.



Aerial Imagery: April 2019; NearMap

-  Stream Path
-  Reach Boundary
-  Project Area
-  Ponds and Wetlands
-  Parcels

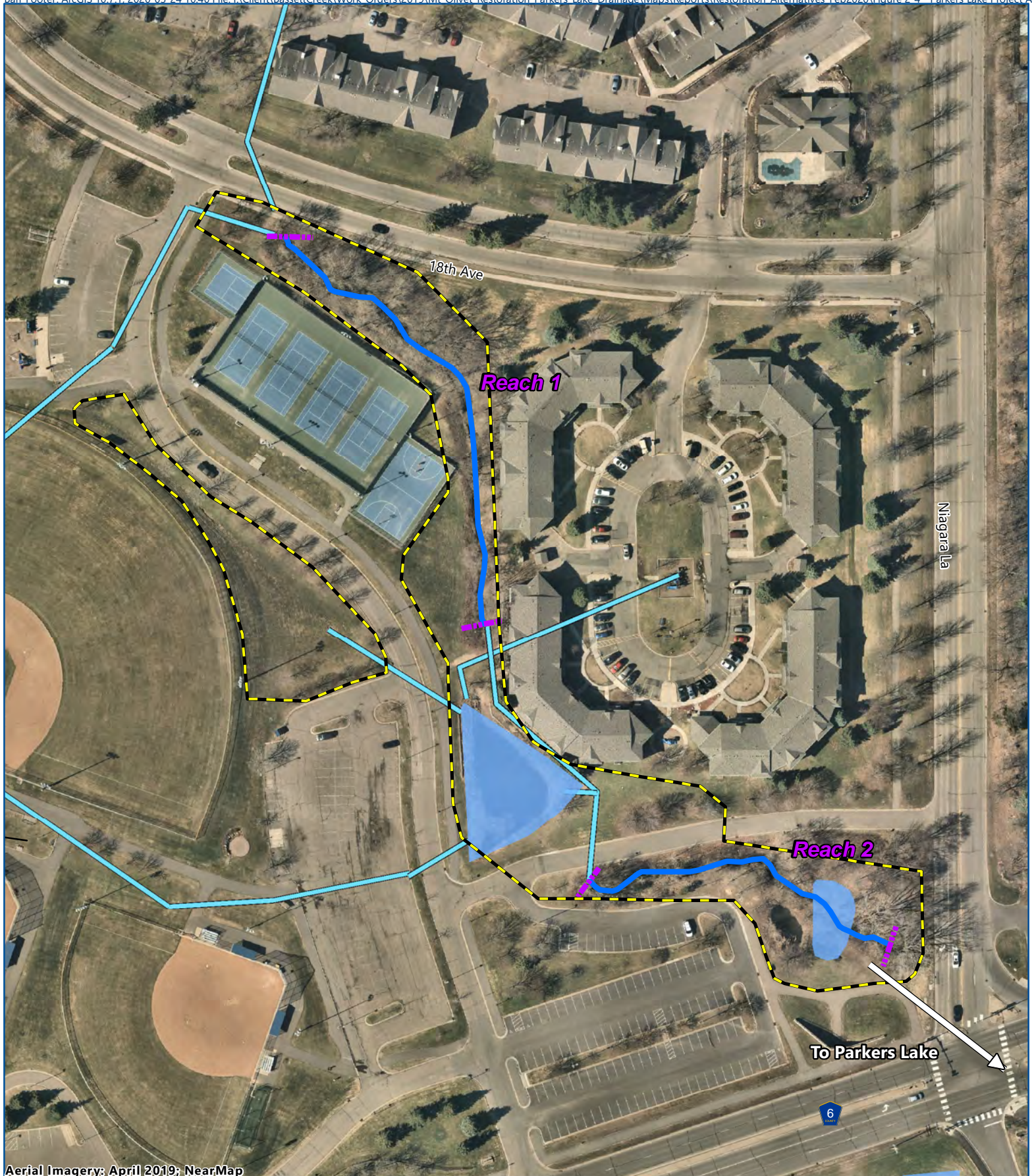


Feet



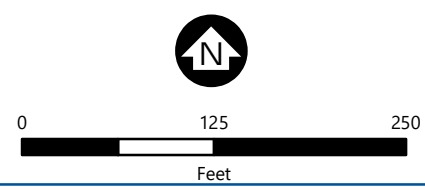
**MT. OLIVET
PROJECT AREA**
Mt. Olivet/Parkers Lake
Design Project Review

FIGURE 1



Aerial Imagery: April 2019; NearMap

- Stream Path
- Reach Boundary
- Project Area (Stream/BMPs)
- Ponds and Wetlands
- Storm Sewer



PARKERS LAKE
PROJECT AREA
Mt. Olivet/Parkers Lake
Design Project Review

FIGURE 2

Drainage Improvement Project						
WSB Project: Mt. Olivet Streambank Restoration and Parkers Lake Drainage Improvements				Design By: LGR		
Project Location: City of Plymouth				Checked By: JHN		
WSB Project No: 016857-000				Date: 6/25/2021		
Item No.	MNDOT Specification No.	Description	Unit	Estimated Total Quantity	Estimated Unit Price	Estimated Total Cost
Schedule A. Mt. Olivet Streambank Restoration						
	2021.501	MOBILIZATION	LUMP SUM	1	\$10,000.00	\$10,000.00
	2101.524	CLEARING	TREE	23	\$350.00	\$8,050.00
	2101.524	GRUBBING	TREE	23	\$250.00	\$5,750.00
	2104.502	REMOVE DRAINAGE STRUCTURE	EACH	1	\$800.00	\$800.00
	2104.503	REMOVE SEWER PIPE (STORM)	LIN FT	45	\$10.00	\$450.00
	2104.609	REMOVE DEBRIS	TON	15	\$75.00	\$1,125.00
	2105.504	GEOTEXTILE FABRIC TYPE 4	SQ YD	26	\$6.00	\$156.00
	2105.507	COMMON EXCAVATION (LV)	CU YD	1500	\$24.00	\$36,000.00
	2105.601	SITE GRADING	LUMP SUM	1	\$10,000.00	\$10,000.00
	2360.502	BITUMINOUS PAVEMENT PATCHING	SQ YD	50	\$75.00	\$3,750.00
	2501.502	18" RC PIPE APRON	EACH	1	\$1,500.00	\$1,500.00
	2503.503	18" RC PIPE SEWER	LIN FT	40	\$90.00	\$3,600.00
	2506.502	CASTING ASSEMBLY	EACH	1	\$1,100.00	\$1,100.00
	2506.503	CONST DRAINAGE STRUCTURE DES 48-4020	LIN FT	15	\$800.00	\$12,000.00
	2511.507	GRANULAR FILTER	CU YD	9	\$75.00	\$675.00
	2511.509	RIPRAP CLASS III (FIELDSTONE)	TON	51	\$90.00	\$4,590.00
	2531.503	CONCRETE CURB & GUTTER DESIGN B612	LIN FT	40	\$40.00	\$1,600.00
	2571.524	DECIDUOUS TREE 2.5" CAL B&B	EACH	5	\$850.00	\$4,250.00
	2573.503	FLOTATION SILT CURTAIN TYPE MOVING WATER	LIN FT	60	\$40.00	\$2,400.00
	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER	LIN FT	530	\$4.50	\$2,385.00
	2573.503	SILT FENCE, TYPE HI	LIN FT	275	\$5.00	\$1,375.00
	2573.602	ROCK DITCH CHECK	EACH	3	\$2,000.00	\$6,000.00
	2573.602	ROCK LOG DITCH CHECK	EACH	1	\$2,500.00	\$2,500.00
	2573.602	TEMPORARY ROCK CONSTRUCTION ENTRANCE	EACH	1	\$1,500.00	\$1,500.00
	2575.504	EROSION CONTROL BLANKETS CATEGORY 3N	SQ YD	410	\$3.00	\$1,230.00
	2575.508	SEED MX 25-131	POUND	29	\$8.00	\$232.00
	2575.508	SEED MX 34-181	POUND	2	\$300.00	\$600.00
	2575.508	SEED MX 34-271	POUND	5	\$100.00	\$500.00
	2575.603	ANCHORED SLOPE PROTECTION	LIN FT	71	\$60.00	\$4,260.00
	2575.505	SEEDING	ACRE	0.73	\$5,000.00	\$3,650.00
	2575.605	SEEDING SPECIAL	ACRE	0.09	\$10,000.00	\$900.00
	2577.502	LIVE STAKES, DOGWOOD	EACH	110	\$10.00	\$1,100.00
Schedule A Construction Total						\$134,028.00
Contingency Total (15%)						\$20,100.00
Schedule A Subtotal						\$154,128.00
Schedule B. Mt. Olivet Streambank Restoration - Optional Culvert Crossing						
	2105.601	SITE GRADING	LUMP SUM	1	\$2,000.00	\$2,000.00
	2501.502	28" SPAN GS PIPE-ARCH APRON	EACH	4	\$500.00	\$2,000.00
	2501.503	28" SPAN CS PIPE-ARCH CULVERT	LIN FT	60	\$95.00	\$5,700.00
	2105.504	GEOTEXTILE FABRIC TYPE 4	SQ YD	33	\$6.00	\$198.00
	2511.509	RIPRAP CLASS III (FIELDSTONE)	TON	31	\$90.00	\$2,790.00
	2575.607	LANDSCAPE ROCK	CU YD	2	\$150.00	\$300.00
Schedule B Construction Total						\$12,988.00
Contingency Total (15%)						\$1,950.00
Schedule B Subtotal						\$14,938.00
Schedule C. Parkers Lake Drainage Improvements						
	2021.501	MOBILIZATION	LUMP SUM	1	\$10,000.00	\$10,000.00
	2101.524	CLEARING	TREE	34	\$350.00	\$11,900.00
	2101.524	GRUBBING	TREE	35	\$250.00	\$8,750.00
	2104.609	REMOVE DEBRIS	TON	8	\$75.00	\$600.00
	2105.504	GEOTEXTILE FABRIC TYPE 4	SQ YD	51	\$6.00	\$306.00
	2105.507	COMMON EXCAVATION (LV)	CU YD	10	\$25.00	\$250.00
	2105.601	SITE GRADING	LUMP SUM	1	\$10,000.00	\$10,000.00
	2501.602	REPAIR TRASH RACK	EACH	1	\$300.00	\$300.00
	2511.507	GRANULAR FILTER	CU YD	19	\$75.00	\$1,425.00
	2511.509	RIPRAP CLASS III (FIELDSTONE)	TON	113	\$90.00	\$10,170.00
	2571.524	DECIDUOUS TREE 2.5" CAL B&B	EACH	5	\$850.00	\$4,250.00
	2573.503	FLOTATION SILT CURTAIN TYPE MOVING WATER	LIN FT	60	\$40.00	\$2,400.00
	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER	LIN FT	730	\$4.50	\$3,285.00
	2573.602	ROCK DITCH CHECK	EACH	4	\$2,000.00	\$8,000.00
	2573.602	ROCK LOG DITCH CHECK	EACH	1	\$2,500.00	\$2,500.00
	2573.602	TEMPORARY ROCK CONSTRUCTION ENTRANCE	EACH	2	\$1,500.00	\$3,000.00
	2575.504	EROSION CONTROL BLANKETS CATEGORY 3N	SQ YD	385	\$3.00	\$1,155.00
	2575.508	SEED MX 25-131	POUND	14	\$8.00	\$112.00
	2575.603	ANCHORED SLOPE PROTECTION	LIN FT	132	\$60.00	\$7,920.00
	2575.505	SEEDING	ACRE	0.06	\$5,000.00	\$300.00
	2575.605	SEEDING SPECIAL	ACRE	0.08	\$10,000.00	\$800.00
	2577.502	LIVE STAKES, DOGWOOD	EACH	100	\$10.00	\$1,000.00
Schedule C Construction Total						\$88,423.00
Contingency Total (15%)						\$13,260.00
Schedule C Subtotal						\$101,683.00



Bassett Creek Watershed Management

MEMO

To: BCWMC Commissioners and Alternate Commissioners
From: BCWMC Technical Advisory Committee
Date: August 9, 2021

RE: Recommendations on XP-SWMM and Four Seasons Mall

The BCWMC Technical Advisory Committee met on July 29th at Brookview to discuss several items. Discussion and recommendations included below. Attendees included:

City/Partner	Technical Advisory Committee Members and Others
Crystal	Mark Ray
Golden Valley	Eric Eckman
Medicine Lake	Susan Wiese
Minneapolis	Liz Stout
Minnetonka	Leslie Yetka, Sarah Schweiger
New Hope	Megan Hedstrom
Plymouth	Ben Scharenbroich
Robbinsdale	Marta Roser, Richard McCoy
St. Louis Park	Erick Francis (partial)
Others	Laura Jester, Administrator; Karen Chandler and Jen Koehler, Commission Engineers; Stacy Harwell, TAC Liaison (partial)

1. XPSWMM Model Update and Adoption

The TAC discussed the tasks and appropriate timing for updating and formally adopting a new BCWMC hydraulic and hydrologic (H&H) model as the official BCWMC jurisdictional floodplain.

Background:

The BCWMC adopted the (Phase 2) XPSWMM model as its jurisdictional model in 2017. It is based on data current through 2015. Starting in 2018 and ending earlier this year, Commission Engineers worked under a MnDNR grant to create a new H&H model for FEMA. For that work, Commission Engineers started with the Phase 2 XPSWMM model and updated it to include survey data and other changes through 2018. However, the new model prepared for FEMA has not yet been adopted by the BCWMC (or FEMA) and thus is not the official jurisdictional model. Therefore, the Commission is not using or providing the model with the most up-to-date data for evaluating flood impacts of potential developments and projects.

It was noted that the intent of the official BCWMC model is to be a useful tool for the BCWMC, member cities, developers, MnDOT and others. The TAC discussed the best timing and frequency of model updates moving forward including budget implications and the number and scale of changes in the landscape that would warrant an official update.

TAC Recommendations:

- A. The TAC recommends that the BCWMC direct Commission Engineers to begin the process of updating the H&H model in 2021, starting with the model recently prepared for FEMA (the “storage maintained” version), and complete the update and adopt the updated model as the Commission’s official H&H model in 2022. (Work in 2021 would be covered under the Surveys and Studies budget line; the proposed 2022 Operating Budget already includes this modeling work). The Commission Engineer would start by requesting that cities submit 2019 – 2021 data on landscape changes, developments, or projects that would impact the model.
- B. The TAC recommends that the Commission Engineers annually request that cities submit data for future model updates and that model updates be scheduled not on a regular timeline, but once every few to several years, depending on the amount of new data and changing conditions.
- C. The TAC recommends that the Commission’s Operating Budget include an annual, steady budget for model maintenance to save for years when the more time-consuming (i.e., expensive) model updates are needed and to minimize significant fluctuations in the budget.

2. Discuss Four Seasons Mall CIP and Redevelopment Future

Background:

The City of Plymouth recently purchased the Four Seasons Mall property and is exploring the idea of demolishing the mall structure and constructing some or all of the [previously approved stormwater BMPs](#) including multiple ponds (one with an iron enhanced sand filter and one with a forebay), underground filtration, and wetland restoration. All combined, the BMPs were expected to remove approximately 130 pounds of TP, which was 101 pounds “above and beyond” the required TP removal for the proposed redevelopment project. The BCWMC had approved an agreement with the previous redevelopment company to utilize CIP funds (approximately \$800,000) to capture at least 100 pounds of TP above and beyond BCWMC requirements.

The city proposes to enter an agreement with the BCWMC to construct the stormwater BMPs and complete the wetland restoration, similar to the normal BCWMC CIP process, and to use the \$800,000 in CIP funds for components that would capture at least 100 pounds of TP. City construction of the BMPs would likely begin in spring of 2022. The city would assume maintenance of all of the BMPs. The city requests permission from the BCWMC to allow future redevelopment to utilize any treatment capacity above 100 pounds of TP. It’s anticipated that a redevelopment proposal will be submitted for city review in fall 2022, but it could be several years out. However, if the BMPs are constructed now, the downstream waters (Northwood Lake and the North Branch of Bassett Creek) could start seeing benefits right away.

While this isn’t a typical situation, it may help to think about a similar situation without the CIP project component involved. BCWMC requirements do not prohibit a developer from utilizing a previously built city-owned BMP or regional treatment area to meet requirements.

Further, if the structure is demolished and vegetation is established in its place prior to construction of a redevelopment project, the city requests that the current impervious surface coverage of the site (11.93 acres) be set as the “existing condition” for purposes of applying the BCWMC water quality treatment requirements for the future redevelopment.

TAC Recommendations:

- A. The TAC recommends that the Commission enter an agreement with the city of Plymouth to construct the previously approved BMPs, provide CIP-fund reimbursement for construction of structures that capture the first 100 pounds of TP, and allow future redevelopment to utilize any TP removals above 100 pounds to meet BCWMC water quality treatment requirement.
- B. The TAC reinforced the point that no BCWMC funding should be used to create storage or water quality benefits that would be required of any proposed development.
- C. The TAC recommends that the current impervious surface area of 11.93 acres be set as the “existing condition” upon which future stormwater management requirements would be based, with a sunset clause of 20 years.

3. Other Items

The TAC discussed the idea of setting a threshold for certain types or sizes of projects that should be brought to the Commission’s attention ahead of a formal project application. It was recognized that Commission Engineer review and consideration of projects at a Commission meeting can be streamlined with early discussions about complicated or controversial projects. TAC members were reminded that the Commission’s Operating Budget includes a line item for “preliminary or non-fee reviews” for these types of situations. After discussion, there was consensus among TAC members and Commission staff that a formal policy or process wasn’t needed; that city staff can sense when projects fall into a “complicated or controversial” category and will plan to engage Commission staff earlier in the development process; and that projects that are likely to seek a variance from Commission requirements should automatically be brought to Commission attention before plan submittal.

Administrator Jester asked TAC members about their ability and willingness to host a potential BCWMC intern from Dougherty Family College on a rotating basis among cities including providing office space, assisting with mentoring, utilizing the intern’s talents and abilities on water-related projects, and explaining careers and opportunities in the water management field. Most cities were agreeable to that scenario including the cities of Plymouth, Minneapolis, Minnetonka, New Hope, and Golden Valley.

PROPOSED 2022 OPERATING BUDGET

	2017 Budget	2017 Actual	2018 Budget	2018 Actual	2019 Budget	2019 Actual	2020 Budget	2020 Actual	2021 Budget	2022 Proposed Budget	See Notes
ENGINEERING & MONITORING											
Technical Services	125,000	140,702	125,000	126,154	130,000	156,941	130,000	143,081	134,000	145,000	(A1)
Development/Project Reviews	65,000	71,791	75,000	45,070	80,000	56,420	75,000	94,267	68,000	75,000	(A)
Non-fee and Preliminary Reviews	15,000	20,906	10,000	23,073	15,000	32,937	20,000	16,851	24,000	22,000	(B)
Commission and TAC Meetings	14,000	11,753	12,000	10,575	12,000	13,207	12,000	10,478	12,000	14,000	(C)
Surveys and Studies	20,000	16,347	12,000	-	20,000	16,316	10,000	3,745	9,000	10,000	(D)
Water Quality / Monitoring	74,300	70,855	80,700	120,728	78,000	76,754	102,600	119,397	129,000	110,000	(E)
Water Quantity	11,500	8,570	6,300	5,678	10,000	9,998	6,500	6,229	7,000	8,000	(F)
Assistance on Erosion Control Inspections	1,000	-	1,000	-	-	-	-	-	-	-	(G)
Annual Flood Control Project Inspections	12,000	7,678	48,000	20,279	48,000	26,744	12,000	69,149	12,000	12,000	(H)
Municipal Plan Review	8,000	1,835	8,000	26,779	4,000	5,406	2,000	1,548	2,000	2,000	(I)
Watershed Outlet Monitoring Program	15,500	19,994	20,500	18,145	20,500	19,530	20,500	20,837	23,000	28,500	(J)
Annual XP-SWMM Model Updates/Reviews	10,000	5,650	10,000	8,918	-	-	-	-	-	5,000	(K)
APM/AIS Work	35,000	34,920	32,000	35,977	32,000	21,246	30,000	11,634	14,000	13,000	(L)
Subtotal Engineering & Monitoring	\$406,300	\$411,001	\$440,500	\$441,376	\$449,500	\$435,499	\$420,600	\$497,215	\$434,000	\$444,500	
PLANNING											
Next Generation Plan Development	-				12,000	12,000	18,000	18,000	18,000	18,000	(M)
Subtotal Planning	\$0		\$0	\$0	\$12,000	\$12,000	\$18,000	\$18,000	\$18,000	\$18,000	

Item	2017 Budget	2017 Actual	2018 Budget	2018 Actual	2019 Budget	2019 Actual	2020 Budget	2020 Actual	2021 Budget	2022 Proposed Budget	See Notes
ADMINISTRATION											
Administrator	67,200	60,559	67,200	59,955	69,200	64,926	69,200	64,764	67,400	70,848	(N)
MAWD Dues							500	500	3,750	7,500	(O)
Legal	18,500	16,249	17,000	13,313	17,000	14,428	15,000	20,996	15,000	17,000	(P)
Financial Management	3,200	3,200	3,200	3,200	3,500	3,500	3,500	3,500	4,000	13,500	(Q)
Audit, Insurance & Bond	15,500	17,304	15,500	17,648	18,000	15,892	18,000	18,684	18,000	18,700	(R)
Meeting Catering	2,000	1,198	1,600	1,295	1,500	1,341	1,500	317	1,300	1,300	(S)
Administrative Services	18,000	13,346	15,000	14,240	15,000	12,992	15,000	11,887	8,000	8,000	(T)
Subtotal Administration	\$124,400	\$111,856	\$119,500	\$109,651	\$124,200	\$113,079	\$122,700	\$120,648	\$117,450	\$136,848	
OUTREACH & EDUCATION											
Publications / Annual Report	2,500	1,138	1,500	937	1,300	1,263	1,300	1,069	1,300	1,300	(U)
Website	4,400	1,228	4,200	443	3,000	1,617	1,000	1,264	1,800	1,800	(V)
Watershed Education Partnerships	15,500	12,354	13,850	13,454	15,850	13,810	15,850	16,535	17,350	18,350	(W)
Education and Public Outreach	20,000	19,302	22,000	18,585	25,000	23,588	22,000	38,321	26,000	28,000	(X)
Public Communications	2,500	732	2,500	563	1,000	878	1,000	1,113	1,000	1,100	(Y)
Subtotal Outreach & Education	\$44,900	\$34,754	\$44,050	\$33,982	\$46,150	\$41,156	\$41,150	\$58,302	\$47,450	\$50,550	
MAINTENANCE FUNDS											
Channel Maintenance Fund	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	20,000	25,000	(Z)
Flood Control Project Long-Term Maint.	25,000	25,000	25,000	4,000	25,000	25,000	25,000	25,000	25,000	25,000	(AA)
Subtotal Maintenance Funds	\$50,000	\$50,000	\$50,000	\$29,000	\$50,000	\$50,000	\$50,000	\$50,000	\$45,000	\$50,000	
TMDL WORK											
TMDL Implementation Reporting	20,000	19,209	10,000	4,668	10,000	215	10,000	263	7,000	7,000	(BB)
Subtotal TMDL Work	\$20,000	\$19,209	\$10,000	\$ 4,668	\$10,000	\$10,000	\$10,000	\$263	\$7,000	\$7,000	
GRAND TOTAL	\$645,600	\$626,820	\$664,050	\$618,677	\$691,850	\$661,734	\$662,450	\$744,428	\$668,900	\$706,898	

2022 Proposed Revenues			
Expected Income		Proposed Income	
Assessments to cities		\$	565,998
Use of fund balance		\$	-
CIP Administrative Funds (2.0% of est. requested levy of \$1.79M)		\$	35,800
Project review fees		\$	60,000
Transfer from Long-term Maint Fund for Flood Control Proj Inspections		\$	12,000
WOMP reimbursement		\$	5,000
TRPD reimbursement		\$	1,400
TMDL Studies Long Term Account Close Out (One Time Allocation)		\$	27,149
		\$	707,347
Expected Expenses			
Total operating budget		\$	706,898
Fund Balance Details			
Est. Beginning Fund Balance (Jan 31, 2022)		\$	404,513
Change in Fund Balance (income - expenses)		\$	449
Est. Remaining Fund Balance (Jan 31, 2023)		\$	404,962

City Assessments

Community	For Taxes Payable in 2021	2021 Percent of	Area Watershed	Percent of	Average	2015	2016	2017	2018	2019	2020	2021	2022 Proposed Assessments (2.0% increase)
	Net Tax Capacity	Valuation	in Acres	of Area	Percent	\$490,345	\$490,345	\$500,000	\$515,050	\$529,850	\$550,450	\$554,900	\$565,998
Crystal	\$10,436,901	5.59	1,264	5.09	5.34	\$25,868	\$25,771	\$25,704	\$26,904	\$27,877	\$29,062	\$29,898	\$30,206
Golden Valley	\$48,278,560	25.84	6,615	26.63	26.23	\$121,964	\$127,675	\$131,270	\$134,649	\$138,553	\$144,693	\$145,228	\$148,477
Medicine Lake	\$1,136,635	0.61	199	0.80	0.70	\$3,543	\$3,600	\$3,561	\$3,783	\$3,846	\$3,975	\$3,928	\$3,988
Minneapolis	\$13,106,438	7.01	1,690	6.80	6.91	\$33,235	\$32,885	\$33,609	\$34,763	\$35,805	\$37,631	\$37,983	\$39,103
Minnetonka	\$11,762,188	6.30	1,108	4.46	5.38	\$28,121	\$27,536	\$28,199	\$28,053	\$28,989	\$29,967	\$29,622	\$30,437
New Hope	\$10,448,489	5.59	1,252	5.04	5.32	\$25,681	\$25,627	\$25,917	\$26,740	\$27,987	\$28,987	\$29,464	\$30,087
Plymouth	\$79,203,316	42.39	11,618	46.77	44.58	\$225,159	\$220,974	\$224,531	\$231,682	\$237,986	\$245,942	\$247,860	\$252,307
Robbinsdale	\$3,537,475	1.89	345	1.39	1.64	\$7,587	\$7,843	\$7,747	\$8,189	\$8,523	\$8,937	\$9,299	\$9,288
St. Louis Park	\$8,938,699	4.78	752	3.03	3.91	\$19,184	\$18,433	\$19,463	\$20,287	\$20,284	\$21,257	\$21,618	\$22,105
TOTAL	\$186,848,701	100.00	24,843	100.00	100.00	\$490,345	\$490,345	\$500,000	\$515,050	\$529,850	\$550,450	\$554,900	\$565,998

NOTES

(A1) General technical services by Barr Engineering; amount based on actual expenditures in 2019 and 2020.

(A) Partially funded by application fees; with the creation of the preliminary and non-fee budget category, most of the review costs will be covered by application fees. 2021 budget assumes 30 submittals at average cost of \$2,000 - \$2,500 per review. 2022 budget based on 2019 and 2020 actuals

(B) Based on actual expenses in 2019 and 2020. This was a new line item in 2015 used to cover reviews for which either we do not receive an application fee or it's too early in the process for us to have received an application fee. Includes DNR application reviews, MnDOT project reviews, and other prelim reviews requested by administrator and member cities.

(C) Includes attendance at BCWMC meetings, TAC meetings and other committee meetings, as needed. 2017 budget increased to allow for additional BCWMC Engineer staff to attend Commission/TAC meetings (total of 3 assumed). 2018 - 2020 budgets were reduced from 2017 and assumed 12 BCWMC meetings and 5 other meetings (TAC, etc.). 2021 budget also assumes 17 meetings including BCWMC meetings (12), TAC meetings (3), Administrative Services Committee meetings (1), Budget Committee meetings and other meetings (1). 2022 budget increased to reflect likely return to in-person meetings, plus additional staff attendance at meetings

(D) For Commission-directed surveys and studies not identified in other categories - e.g., past work has included watershed tours, Medicine Lake outlet work, Flood Control Project Maintenance and Responsibilities, Sweeney Lake sediment monitoring, stream monitoring equipment purchase. 2018 budget was reduced from previous years for overall budget savings. 2019 budget is more in line with previous years and gives Commission flexibility to investigate or tackle unforeseen issues that arise. Lowered again in 2020, 2021, and 2022 for budget savings.

(E) Routine lake and stream monitoring. See details on next page. Costs are considerably lower than normal stream monitoring due to partnering with city of Plymouth's Plymouth Creek Monitoring by TRPD.

(F) Water Quantity (lake level) monitoring. 2018 budget lowered for budget savings and resulted in fewer data points. 2019 budget back to earlier budget levels. 2020 budget lowered again for budget savings. 2022 budget increase allows for additional measurements and benchmark checks, beyond the once/month lake level measurements

(G) After recommendations from the TAC and Budget Committee, the Commission's ended the erosion and sediment control inspection program (Watershed Inspection) in 2014 due to duplication with activities required by the member cities. Some budget remained here to provide, as requested by the Commission, some oversight of city inspection activities (reports of inspections are available from each city). However, little or no expenses have been incurred since 2014. In 2019 it was removed from budget. If inspections are needed they can be charged to general technical services.

(H) 2022 budget includes annual typical inspection of Flood Control Project (FCP) features without tunnel inspections. Does not include follow-up work on the deep tunnel inspection, such as developing cost estimates for recommended repair work, and the box culvert repairs, such as development of plans and specifications.

http://www.bassettcreekwmo.org/application/files/4514/9637/1815/2016_FCP_Policies.pdf

(I) Municipal plan approvals completed in 2019; however, this task has also included review of adjacent WMO plan amendments, and review of city ordinances; \$2,000 budget recommended in 2021 for these types of reviews.

(J) Monitoring at the Watershed Outlet Monitoring Program (WOMP) site in Minneapolis through an agreement with Met Council (MCES). Commission is reimbursed \$5,000 from Met Council. Met Council pays for equipment, maintenance, power, cell service, and lab analyses. Monitoring protocol changed in 2017 with collection of bi-monthly samples (up from once-per-month sampling). Both Barr and Wenck have tasked related to WOMP activities. Barr's 2020 & 2021 budget = \$4,500. Actual spent in 2020 = \$4,265. Station was moved in late 2020. In 2022, Barr work is proposed at \$10,000 because MCES requests additional high flow measurements (doubling from about 6 to 12), due to the new station location. The MCES recommends 9 routine scheduled flow measurements (range of flows beyond base flow), plus up to 3 additional for special events such as high flow, drought, or backwater. The additional budget would also allow for the measurement of up to two higher flows, as needed, using an Acoustic Doppler unit (StreamPro) that allows for measurement of higher flows than was possible using past equipment. Wenck portion is similar to previous years at \$18,500 due to similar sampling regime.

(K) This item is used to make updates to the XP-SWMM model, coordinate with P8 model updates, and assist cities with model use. No XP-SWMM updates were performed 2019 - 2021 due to work on the grant funded FEMA modeling project. 2022 budget assumes the Commission adopts the "FEMA model" as the Commission's model, including flood elevations. Then would need to re-start XP SWMM model updates. The last update was in 2018. Engineers will begin updating process in 2021 with "Surveys and Studies" budget. Process will likely be completed in FY2022.

(L) Funds to implement recommendations of Aquatic Plant Management/Aquatic Invasive Species Committee likely including curly-leaf pondweed control in Medicine Lake and small grant program for launch inspectors, education/outreach, etc. by other organizations including TRPD, AMLAC, others. 2020 expenses \$11,400 due to grant funding and cost sharing with TRPD. 2021 and 2022 budget set to be in line with actual expected costs.
(M) Funding that will be set aside and accrued over next 5 years to pay for 2025 Watershed Plan development which will start in 2023.
(N) Typically includes \$72/hour for average of 80 hours per month. In 2021 reduced to an average of 78 hours per month for overall budget savings and to reflect actual annual expenses. Budget committee recommended same for 2022. Increased to 82 hours per month (pending approved contract amendment) due to increasing workload.
(O) MN Association of Watershed District Annual dues. New budget item. 2019 and 2020 dues were \$500 because WMOs were newly allowed to join the organization. 2021 dues \$3,750. 2022 dues expected to be \$7,500 similar to other Metro watersheds.
(P) For Commission attorney. 3% hourly rate increase over 2021 + more work expected. High legal costs for CIP projects will be charged to specific CIP budgets, as warranted.
(Q) Reflects new agreement with Redpath. \$1,000/mo + up to 10 hours audit assistance at \$150/hr
(R) Insurance and audit costs have risen considerably in the last few years.
(S) Meeting catering expenses from Triple D Espresso (includes delivery). Assumes 12 in-person meetings
(T) Recording Secretary \$45/hr rate * 8 hrs/mo for meeting attendance and minutes (\$4,320 total) + \$290 annual mileage + \$250/mo meeting packet printing/mailing + \$390 contingency.
(U) Budget was decreased in last few years to be more in line with actual expenses. Costs associated with Commission Engineer assistance with annual report
(V) Based on 2017-2019 agreement with HDR for website hosting and maintenance activities and closer to actual funds spent in 2019.
(W) Includes CAMP (\$7,000), River Watch (\$2,000), Metro Watershed Partners (\$3,500), Metro Blooms Workshops (\$1,500; a decrease from previous years), Children's Water Festival (\$350). Does not allow for additional partnerships or increases in contributions. CAMP costs set by Met Council increased significantly in 2019 (after 16 years w/o increases). In 2021 moved \$4,000 in annual support to Metro Blooms for resident engagement in Harrison Neighborhood, MPLS from Education & Outreach line item (X)
(X) Includes funding for West Metro Water Alliance at \$13,000 and \$10,310 for other educational supplies and materials including educational signage, display materials, Commissioner training, etc. In 2021, moved social media (\$480 FB ads + \$3,510 for 1.5 hr/week*52 wks*\$45/hour) and moved educational newspaper column writing (\$2,700 for 5 hr/mo*12 months*\$45/hour) from Administrative Services line item (T).
(Y) Public Communications covers required public notices for public hearings, etc.
(Z) Will be transferred to Channel Maintenance Fund for use by cities with smaller projects along main streams. Reduced in 2021 for one-time budget savings. TAC recommends fully funding this line item at \$25,000
(AA) Will be transferred to Long-Term Maintenance Fund (less actual costs of FCP inspections in line (H)).
(BB) Budget reduced since 2018 for overall budget savings. Task includes reporting on TMDL implementation and updating P8 model to include new BMPs. Reduced in 2021 for overall budget savings. Updates did not occur in 2020; this budget will be needed especially if the XP SWMM model is updated.

BCWMC 2022 Water Quality Monitoring Budgets - by item		
Item	Budget	Notes
Reporting on 2020 Sweeney Branch biotic index monitoring	\$7,000	Coincides with, and included in, the Sweeney Branch stream flow and quality monitoring report below – this budget is as shown in the 2021 budget documentation.
Reporting on 2021 monitoring:		
Westwood and Crane Lake	\$12,000	this budget is as shown in the 2021 budget documentation.
Parkers Lake	\$6,000	this budget is as shown in the 2021 budget documentation.
Sweeney Branch stream flow and quality monitoring	\$7,000	this budget is as shown in the 2021 budget documentation.
2022 monitoring:		
Year 1 of Plymouth Creek stream flow and quality monitoring	\$20,000	This budget is lower than typical stream monitoring budgets due to a partnership with city of Plymouth (through TRPD monitoring). Assumptions: 1) the BCWMC's 2022-2023 Plymouth Creek monitoring will use the City of Plymouth's Plymouth Creek monitoring site (site IP2), rather than set up a new location and TRPD performs the monitoring on behalf of the City of Plymouth; 2) TRPD staff will perform all monitoring, except for DO monitoring (continuous for 1 – 2 weeks) and quarterly metals/hardness sampling, which the Commission Engineer will perform; 3) rental of dissolved oxygen probe for continuous dissolved oxygen monitoring at assumed cost of \$100/day; 4) \$5,000 budget for one-time purchase of specific conductance and temperature monitoring equipment to support the TRPD monitoring efforts (may not be required) – the BCWMC's continuous temperature/specific conductance monitoring equipment is not compatible with the TRPD's equipment; 5) TRPD will maintain the current rating curve for the TRPD monitoring site; 6) the Commission Engineer will verify/modify the TRPD rating curve for the old downstream IP1 station (60" pipe) (assists with understanding impacts of flows from large inflow pipe on the downstream biological monitoring station; and 7) Commission Engineer review of TRPD data
Northwood Lake (Priority 1 Shallow lake) & Lost Lake (Priority 2 Shallow lake)	\$40,000	Assumptions: 6 sample events from Northwood Lake and 6 Sample events from Lost Lake; 2 TP samples per event (epilimnetic composite and bottom); all other WQ samples only 1 sample per event. AIS suitability parameters sampled in June and August; all other WQ parameters sampled on all 6 events. Plant surveys in June and August by Endangered Resource Services. Budget does not include report and presentation to Commission, which will occur in 2023 (and be included in 2023 budget).
Plymouth Creek biological monitoring	\$8,000	identification/ enumeration by subconsultant (Dr. Dean Hansen); and 3) MPCA computes MIBI at no cost to BCWMC. Budget does not include report and presentation to Commission, which will likely occur in 2024 (and be included in 2024 budget), to coincide with the reporting on the Sweeney Branch stream flow and water quality monitoring. This monitoring could be deferred to 2023, if needed.
General water quality	\$10,000	
Total Water Quality Monitoring	\$110,000	

Table 5-3 BCWMC 2015-2027 CIP (Amended August 2020) (Proposed additions and deletions in gray)

BCWMC ID	Capital Project Description	Estimated Capital Cost ¹	Year													
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
Watershed-wide																
WS-1	Remove sediment deltas in lakes downstream of intercommunity watersheds to reduce phosphorus and sediment loading, following evaluation of sediment sources and upstream source control (Policy 56)										TBD	TBD	TBD	TBD	TBD	
	Implementation of water quality improvement projects resulting from Metro Chloride TMDL (pending) to address chloride loading (Policy 18)										TBD	TBD	TBD	TBD	TBD	
	Implementation of water quality improvement projects resulting from the Upper Mississippi River Bacteria TMDL (Policy 7, generally)										TBD	TBD	TBD	TBD	TBD	
	Implementation of water quality improvement projects resulting from future TMDLs (Policy 7, generally)										TBD	TBD	TBD	TBD	TBD	
Medicine Lake																
ML-12 ¹⁷	Projects address phosphorus load reduction requirements in Medicine Lake TMDL	Medley Park Stormwater Treatment Facility, Golden Valley	\$ 2,000,000								\$400,000	\$300,000	\$ 800,000			
ML-14 ³		Medicine Lake shoreland restoration	\$ 100,000													
ML-15		Wet pond (0.5 acre) at downstream end of each major subwatershed	\$ 2,000,000													
ML-16		Water quality retrofits to existing ponds upstream of Medicine Lake	\$ 11,000,000													
ML-17		In-lake alum treatment (Option 18 in Medicine Lake Plan)	\$ 1,400,000													
ML-19 ⁴		Chemical treatment of inflow to Medicine Lake from watershed	\$ 1,000,000													
ML-20		Mt. Olivet Stream Restoration Project	\$ 178,100							\$178,100						
ML-21		Jevne Park Stormwater Pond, City of Medicine Lake to alleviate flooding/improve	\$ 500,000							\$ 500,000						
ML-22		Ponderosa Woods Stream Restoration	\$ 475,000											\$475,000		
ML-23		Cost Sharing Purchase of High Efficiency Street Sweeper for city of Plymouth	\$ 75,000								\$75,000					
Plymouth Creek																
2017CR-P ⁵		Plymouth Creek Restoration, from Annapolis Lane to 2,500 feet upstream (east) of Annapolis Lane to reduce phosphorus and sediment loading, and improve habitat	\$ 863,573			\$ 580,930	\$ 282,643									
2026CR-P		Plymouth Creek Restoration Project, Old Rockford Road to Vicksburg Lane	\$ 500,000												\$500,000	
2027CR-P		Plymouth Creek Restoration Project, Dunkirk Ln to Yuma Ln & Vicksburg Ln to Cty Rd 9	\$ 600,000												\$600,000	
Sweeney Lake																
SL-3 ⁶	horus load reduction requirements in Lake TMDL	Schaper Pond Diversion Project	\$ 612,000													
SL-4		Sweeney Lake shoreland restoration	\$ 300,000													
SL-5		Water quality retrofits to existing ponds upstream of Sweeney Lake	\$ 800,000													
SL-6		Dredging of Spring Pond and diversion of Sweeney Lake branch into Spring Pond.	\$ 1,000,000													
SL-7		Projects to reduce loading from untreated Hennepin County and MnDOT right-of-way	\$ 400,000													
SL-8		Sweeney Lake Water Quality Improvement Project (alum + carp management) ¹⁵	\$ 568,080							\$568,080						

Table 5-3 BCWMC 2015-2027 CIP (Amended August 2020) (Proposed additions and deletions in gray)

BCWMC ID	Capital Project Description		Estimated Capital Cost ¹	Year												
				2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
SL-9 ⁴	Projects to address phosphorus in Sweeney	Chemical treatment of inflow to Sweeney Lake from Sweeney Lake Branch of Bassett Creek	\$ 1,000,000													
SL-10		Impervious area runoff retention and retrofits, including bioretention, rainwater gardens, and soil restoration (various locations)	\$ 500,000													
SL-11		Stormwater treatment system for dissolved phosphorus removal in Golden Valley	\$ 400,000													
Twin Lake																
TW-2 ⁶		In-lake alum treatment of Twin Lake to reduce internal phosphorus loading	\$ 160,000													
Bassett Creek Park Pond																
BCP-2		Dredging of Bassett Creek Park Pond and upstream channel improvements for water quality treatment to reduce phosphorus loading	\$1,000,000				\$1,000,000									
Northwood Lake																
NL-1 ⁷		Northwood Lake Water Quality Project to reduce phosphorus loading	\$ 1,769,070		\$ 676,000	\$ 1,093,070										
NL-2 ⁸		Four Seasons Mall Area Water Quality Improvements to reduce phosphorus loading	\$ 990,000													
		Implementation of water quality improvement projects recommended in future Northwood Lake TMDL study								TBD	TBD	TBD	TBD	TBD		
Bassett Creek Main Stem																
2015CR-M ⁹		Restore Main Stem channel, 10th Avenue to Duluth Street, Golden Valley to reduce phosphorus and sediment loading	\$ 1,503,000	\$ 1,503,000												
2017CR-M ¹⁰		Main Stem Channel Restoration, Cedar Lake Road to Irving Ave to reduce phosphorus and sediment loading	\$ 1,064,472			\$ 400,000	\$ 664,472									
2024CR-M		Main Stem Channel Restoration, Regent Ave. to Golden Valley Road (in Golden Valley) to reduce phosphorus and sediment loading	\$ 700,000										\$ 100,000	\$ 600,000		
BC2,3,8, 10		Medicine Lake Road and Winnetka Avenue Long Term Flood Mitigation Plan Implementation	\$ 4,200,000					\$ 1,100,000	\$ 500,000		\$ 300,000	\$ 1,000,000		\$ 600,000	\$ 700,000	
BC-4 ¹²		Honeywell Pond Expansion, Main Stem Watershed (Golden Valley) to reduce phosphorus loading and provide water quantity benefits	\$ 1,202,000		\$ 1,202,000											
BC-5 ¹³		Water Quality Improvements (phosphorus reduction) in Bryn Mawr Meadows, Main Stem Watershed (Minneapolis) ¹⁶	\$ 912,000						\$ 100,000	\$ 812,000						
BC-7 ¹⁸		Dredging of accumulated sediment in Main Stem of Bassett Creek just north of Highway 55, Theodore Wirth Regional Park, to reduce phosphorus loading and improve habitat	\$ 2,759,000								\$ 600,000	\$ 1,100,000	\$ 859,000	\$ 200,000		
BC-9		Restoration and stabilization of historic Bassett Creek channel, Main Stem Watershed (Minneapolis) to reduce phosphorus and sediment loading														
BC-11		Bassett Creek Park Water Quality Improvement Project	\$ 500,000										\$ 200,000	\$ 300,000		
BC-12		Cost share purchase of high efficiency street sweeper	\$ 150,000											\$ 150,000		
BC-13		Toledo Ave/Minnaqua Pond Stormwater Improvements & Flood Reduction	\$ 700,000													\$ 700,000

Table 5-3 BCWMC 2015-2027 CIP (Amended August 2020) (Proposed additions and deletions in gray)

BCWMC ID	Capital Project Description	Estimated Capital Cost ¹	Year											2026	2027
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025		
Westwood Lake															
WST-2	Westwood Lake Water Quality Improvement Project in Westwood Hills Nature Center	\$300,000					\$ 300,000								
Parkers Lake															
PL-7	Parkers Lake Drainage Improvement Project to reduce erosion, suspended solids, and total phosphorus to Pakers Lake	\$485,000							\$ 485,000						
Crane Lake															
CL-3 ¹⁴	Retention of impervious area drainage at Ridgedale area (e.g., bioswales, tree trenches, rain gardens) to reduce phosphorus loading	\$300,000						\$ 300,000							
CL-4	Crane Lake Chloride Reduction Demonstration Project at Ridgedale Mall	\$300,000												\$ 300,000	
Flood Control Project															
FCP-1	Flood Control Project Double Box Culvert Repairs	\$1,200,000													\$1,200,000
Total Annual Estimated Project Cost²		\$46,681,295	\$1,503,000	\$1,878,000	\$2,074,000	\$1,947,115	\$1,400,000	\$1,968,080	\$2,150,100	\$1,800,000	\$2,159,000	\$1,775,000	\$1,650,000	\$1,500,000	\$2,500,000

Notes:

TBD = To be determined, usually at the time the project is listed in the working (5-year) CIP.

1. Project costs presented in 2015 - 2020 dollars, depending on when project was added to CIP.

2. Includes estimated costs for projects not yet assigned an implementation year. Annual Estimated Costs do not necessarily reflect actual Hennepin County levy amount due to grants, financial contributions from cities, and use of CIP fund

3. ML-14: Project may include lakeshore restoration projects administered by the BCWMC. The City of Plymouth has already performed lakeshore restoration on some properties adjacent to Medicine Lake.

4. Estimated cost of projects ML-19 and SL-9 do not include the annual cost of chemical precipitant and operation/maintenance of treatment facility.

5. 2017CR-P: Project is based on recommendations in the 2009 Plymouth Creek Restoration feasibility study.

6. SL-3 and TW-2: Projects already levied, to be constructed in 2015.

7. NL-1: Project based on Option 4 of the 1996 Northwood Lake Watershed and Lake Management Plan. Project includes construction of a pond upstream of Northwood Lake and installation of underground stormwater treatment and reuse system, and bioinfiltration cells.

8. NL-2: The Four Seasons Mall Area Water Quality Project could include construction of stormwater treatment ponds, restoration of an eroding stream channel, alum treatment of stormwater, or other projects to address phosphorus loading. The projects stem from recommendations from the 1996 *Northwood Lake Watershed and Lake Management Plan*. The BCWMC levied for the project defined as option 1 in the 2012 feasibility study. Now project planned to coincide with redevelopment of the Four Seasons Mall area.

9. 2015CR-M: Project is based on recommendations in the Feasibility Study for 2015 Bassett Creek Main Stem Restoration Project (2014). Project already levied: the BCWMC certified a levy to the county for 2015 (\$1,000,000); remaining

10. 2017CR-M: Project is based on recommendations in the Feasibility Study for 2012 Bassett Creek Main Stem Restoration Project (2011).

12. BC-4: Project diverts currently untreated stormwater runoff to the pond.

13. BC-5: Project based on Option 7 in the Bassett Creek Main Stem Watershed Management Plan to treat currently untreated stormwater runoff to reduce phosphorus loading.

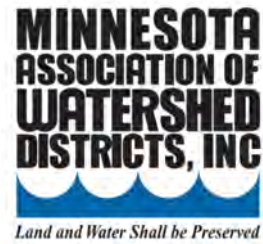
14. CL-3: Project is based on recommendations in the Crane Lake Watershed and Lake Management Plan (1995).

15. Project now involves carp management and includes federal grant funding through MPCA.

16. Estimated cost increased from original estimate of \$500,000; State grant funds awarded

17. City of Golden Valley to provide \$500,000

18. Grant funds of \$325,000 secured from state and county



MEMORANDUM

DATE: July 1, 2021
TO: MAWD Members
FROM: Sherry Davis White, Resolutions Committee Chair
RE: **2021 REQUEST FOR MAWD RESOLUTIONS**

It is that time of year for MAWD members to submit their policy recommendations through our resolutions process. This is YOUR organization and policy statements start with YOU! Here are the next steps and timeline:

- July / August** Members write, discuss, and approve resolutions at their WD/WMO meetings. The more detail you can provide, the easier it will be for the committee to make a recommendation.
- September 1** Administrators submit resolutions and background information documents to the MAWD office at emily@mnwatershed.org by September 1 if possible. If more time is needed, please contact us to let the resolutions committee know another resolution may be coming. The latest possible date to submit a resolution is 60 days before the annual meeting (October 4). We ask for your help to submit resolutions early to give us enough time to turn them back around for discussion by your boards in November.
- September / October** The Resolutions Committee will review the resolutions, gather more information or ask for further clarification when deemed necessary, work with the submitting watersheds to combine similar resolutions, throw out resolutions already active, discuss and make recommendations on their passage to the membership.
- October 31** Resolutions (with committee feedback) will be emailed to each district by Oct. 31
- November** Members should discuss the resolutions at their November meetings and decide who will be voting on their behalf at the annual meeting (2 voting members and 1 alternate are to be designated per watershed organization)
- December 3** Delegates discuss and vote on resolutions at the annual resolutions hearing. Please be prepared to present and defend your resolution.
- December / January** Legislative Committee will review existing and new resolutions and make a recommendation to the MAWD Board of Directors for the 2022 legislative platform
- January 2022** MAWD Board of Directors will finalize the 2022 legislative platform
- January 31, 2022** First day of the 2nd half of 92nd legislative biennium

NOTE: Resolutions passed by the membership will remain MAWD policy for five years upon which time they will sunset. If a member wishes to keep them on the books, they need to be resubmitted and passed again by the membership. Enclosed with this memorandum are the active resolutions and those that will sunset 12/31/21.

Please feel free to contact me at sherrywhite@mediacombb.net or (952) 215-6963 or our Executive Director Emily Javens if you have any questions at emily@mnwatershed.org or (651) 440-9407.

THANK YOU FOR YOUR EFFORTS IN OUR POLICY DEVELOPMENT!

Background Information

2021 MAWD Resolution

Proposing District: _____

Contact Name: _____

Phone Number: _____

Email Address: _____

Resolution Title: _____

Background that led to the submission of this resolution:

Describe the problem you wish to solve and provide enough background information to understand the factors that led to the issue. Attach statutory or regulatory documents that may be helpful.

Ideas for how this issue could be solved:

Describe potential solutions for the problem. Provide references to statutes or rules if applicable.

Efforts to solve the problem:

Document the efforts you have taken to try to solve the issue. For example: have you spoken to state agency staff, legislators, county commissioners, etc? If so, what was their response?

Anticipated support or opposition:

Who would be willing to partner with us on the issue? Who may be opposed to our efforts? (Ex. other local units of government, special interest groups, political parties, etc.)?

This issue: (check all that apply)

_____ Applies only to our district

_____ Applies only to 1 or 2 regions

_____ Applies to the entire state

_____ Requires legislative action

_____ Requires state agency advocacy

_____ Impacts MAWD bylaws or MOPP

(MOPP = Manual of Policies and Procedures)



Active MAWD Resolutions

July 1, 2021

FINANCE ISSUES

2019-06: Oppose Legislation that Forces Spending on Political Boundaries

MAWD opposes legislation that establishes spending requirements or restricts watershed district spending by political regions or boundaries.

2018-02 Increase the \$250k General Fund Tax Levy Limit

MAWD supports legislation to increase or remove the \$250,000 general fund ad valorem tax levy limit set in MN statute 103D.905 subd. 3. If the limit is raised to a new dollar amount, MAWD supports an inflationary adjustment be added to statute.

2019-08: Heron Lake Watershed District General Operating Levy Adjustment

MAWD supports an increase in Heron Lake Watershed District's general operating levy cap from \$250,000 to an amount not to exceed \$500,000.

2019-09: Shell Rock River Watershed District General Operating Levy Adjustment

MAWD supports an increase in Shell Rock River Watershed District's general operating levy cap from \$250,000 to an amount not to exceed \$500,000.

2019-10: Pelican River Watershed District General Operating Levy Adjustment

MAWD supports an increase in Pelican River Watershed District's general operating levy cap from \$250,000 to an amount not to exceed \$500,000.

2019-11: Buffalo Red River Watershed District General Operating Levy Adjustment

MAWD supports an increase in Buffalo Red River Watershed District's general operating levy cap from \$250,000 to an amount not to exceed \$500,000.

2017-05 Middle Fork Crow River Watershed District General Operating Levy Adjustment

MAWD supports the efforts of Middle Fork Crow River Watershed District to draft and advance special legislation affecting a change in its general fund levy cap.

2017-06 Obtain Stable Funding for the Flood Damage Reduction Program

MAWD supports stable funding (as opposed to the current even year bonding process) for the DNR's Flood Damage Reduction Program. A suggested sustainable level of funding is \$25 million per year for the next 10 years.

2016-03 Tax Law Treatment of Conservation Easements

MAWD supports a legislative initiative to define "riparian buffer" for purposes of conservation easements in state tax code and to establish an administrative procedure whereby a watershed organization would certify, for purposes of section 273.117, a conservation easement or restriction as meeting the water quantity and quality purposes cited in the tax law and therefore be eligible for a reduction in estimated market value.

URBAN STORMWATER

2017-04 Limited Liability for Certified Commercial Salt Applicators

MAWD supports passage and enactment of state law that provides a limited liability exemption to commercial salt applicators and property owners using salt applicators who are certified through the established salt applicator certification program who follow best management practices.

2017-07 Creation of a Stormwater Reuse Task Force

MAWD supports legislation requiring creation of a Stormwater Reuse Task Force with membership from Watershed Districts, Cities, Counties, State Agencies and other Stormwater Reuse implementers; and that the Stormwater Reuse Task Force should be charged with developing recommendations that further clarify and/or replace the information in the Water Reuse Report that relates to stormwater reuse best management practices.

PUBLIC DRAINAGE LAW

2019-02: Add a Classification for Public Drainage Systems that are Artificial Watercourses

MAWD supports removal of the default Class 2 categorization for public drainage systems that are artificial watercourses and supports a default Class 7 categorization for public drainage systems that are artificial watercourses.

2019-04: Clarify County Financing Obligations and/or Authorize Watershed District General Obligation Bonding for Public Drainage Projects.

MAWD supports legislation to achieve one or both of the following:

- a) To clarify that an affected county must finance a watershed district drainage project on project establishment and request of the watershed district; and
- b) To authorize watershed districts to finance drainage project establishment and construction by issuance of bonds payable from assessments and backed by the full faith and credit of the watershed district; and further provide for adequate tax levy authority to assure the watershed district's credit capacity.

2018-08 Reinforce Existing Rights to Maintain/Repair 103E Drainage Systems

MAWD supports legislation modeled after House File 2687 and Senate File 2419 of the ninetieth legislature (2017-2018) reinforcing that the DNR cannot restrict existing rights to maintain and repair 103E public drainage systems.

LAKES AND WETLANDS

2020-01 Appealing Public Water Designations

MAWD supports legislation that would provide landowners with a more formal process to appeal decisions made by the DNR regarding the designation of public waters including the right to fair representation in a process such as a contested case proceeding which would allow landowners an option to give oral arguments or provide expert witnesses for their case.

2020-02 Limiting Negative Impacts from Wake Boats

MAWD supports:

- a) limiting wake boating to areas of lakes sufficiently distanced from shorelines to allow boat generated waves to adequately dissipate and lessen energy before coming into impact with lake shorelines;

- b) banning wake boats wakes in shallow lake areas where waves created by wake boats detrimentally impact sediment, aquatic vegetation, and aquatic habitat; and
- c) requiring new and existing wake boats to be able to completely drain and decontaminate their ballast tanks.

2020-04 Temporary Water Storage on DNR Wetlands during Major Flood Events

MAWD supports the temporary storage of water on existing DNR-controlled wetlands in the times of major flood events.

2019-07 Chinese Mystery Snail Designation Change and Research Needs

MAWD supports Chinese Mystery Snail prevention and control research and to change the Chinese Mystery Snail designated status in Minnesota as a regulated species to a prohibited species.

2017-02 Temporary Lake Quarantine Authorization to Control the Spread of AIS

MAWD supports legislation granting to watershed districts, independently or under DNR oversight, the authority, after public hearing and technical findings, to impose a public access quarantine, for a defined period of time in conjunction with determining and instituting an AIS management response to an infestation.

WATERSHED MANAGEMENT AND OPERATIONS

2020-03 Soil Health Goal for Metropolitan Watershed Management Plans

MAWD supports amending Minnesota Rule 8410.0080 to include a goal for soil health in watershed management plans and ten-year plan amendments.

2019-01 Streamline the DNR permitting process

MAWD supports legislation, rules, and/or agency policies to streamline the DNR permitting process by increasing responsiveness, decreasing the amount of time it takes to approve permits, providing a detailed fee schedule prior to application, and conducting water level management practices that result in the DNR reacting more quickly to serious, changing climate conditions.

2019-03 Support for Managing Water Flows in the Minnesota River Basin Through Increased Water Storage and Other Strategies and Practices.

MAWD supports efforts to manage the flow of water in the Minnesota River Basin and the Minnesota River Congress in its efforts to increase water storage on the landscape; and

MAWD supports the Minnesota River Congress in its efforts to secure state and federal programs targeted specifically to increase surface water storage in the Minnesota River Watershed.

2019-05 Watershed District Membership on Wetland Technical Evaluation Panels.

MAWD supports legislation to allow technical representatives of watershed districts to be official members of wetland technical evaluation panels (TEPs).

2018-04 Require Watershed District Permits for the DNR

MAWD supports an amendment to the MN Statute § 103D.315, subd. 5, to include the MN Department of Natural Resources as a state agency required to get permits from watershed districts when applicable.

2018-06 Ensure Timely Updates to Wildlife Management Area (WMA) Plans

MAWD supports that Wildlife Management Area (WMA) operation and maintenance plans and/or management plans are either drafted or brought current in a timely fashion, with input from local governmental entities, to ensure their consideration in future One Watershed One Plan efforts.

2018-03 Require Timely Appointments to the BWSR Board

MAWD supports legislation that requires the Governor to make BWSR board appointments within 90 days of a vacancy or board member term expiration.

2018-09 Clean Water Council Appointments

MAWD may ask the representative of the Clean Water Council to resign when they lose their direct association to a watershed district; and that MAWD will recommend to the Governor's office that managers and/or administrators in good standing with MAWD be appointed to the Clean Water Council.

2016-01 Making Human Resources Expertise Available to Districts through MAWD

MAWD supports making human resources expertise available to districts and make every effort to assure districts have access to the expertise they need to effectively manage their organizations.

Resolutions to Sunset

Effective December 31, 2021

In accordance with MAWD's Sunset Policy, the following resolutions will be archived at the end of 2021 and will no longer be considered for future legislative and administrative platforms. The Sunset Policy says that resolutions older than five years old shall be removed from the books. If your watershed feels any of these issues should continue to be actively pursued with MAWD resources, then your watershed board needs to write up a new resolution and the issue will need to be voted on and renewed by the membership at the annual meeting in December 2021.

2016-01 Making Human Resources Expertise Available to Districts through MAWD

MAWD supports making human resources expertise available to districts and make every effort to assure districts have access to the expertise they need to effectively manage their organizations.

2016-03 Tax Law Treatment of Conservation Easements

MAWD supports a legislative initiative to define "riparian buffer" for purposes of conservation easements in state tax code and to establish an administrative procedure whereby a watershed organization would certify, for purposes of section 273.117, a conservation easement or restriction as meeting the water quantity and quality purposes cited in the tax law and therefore be eligible for a reduction in estimated market value.



Bassett Creek Watershed Management

MEMO

Date: August 10, 2021
From: Laura Jester, Administrator
To: BCWMC Commissioners
RE: **Administrator's Report**

Aside from this month's agenda items, the Commission Engineers, city staff, committee members, and I continue to work on the following Commission projects and issues.

CIP Projects (more resources at <http://www.bassettcreekwmo.org/projects.>)

2019 Medicine Lake Road and Winnetka Avenue Area Long Term Flood Mitigation Plan Implementation Phase I: DeCola Ponds B & C Improvement Project (BC-2, BC-3 & BC-8) Golden Valley (no change since Feb): A feasibility study for this project was completed in May 2018 after months of study, development of concepts and input from residents at two public open houses. At the May 2018 meeting, the Commission approved Concept 3 and set a maximum 2019 levy. Also in May 2018, the Minnesota Legislature passed the bonding bill and the MDNR has since committed \$2.3M for the project. The Hennepin County Board approved a maximum 2019 levy request at their meeting in July 2018. A BCWMC public hearing on this project was held on August 16, 2018 with no comments being received. Also at that meeting the Commission officially ordered the project and entered an agreement with the City of Golden Valley to design and construct the project. In September 2018, the City of Golden Valley approved the agreement with the BCWMC. The [Sun Post](#) ran an article on this project October 2018. Another public open house and presentation of 50% designs was held February 6, 2019. An EAW report was completed and available for public review and comment December 17 – January 16, 2019. At their meeting in February 2019, the Commission approved the 50% design plans. Another public open house was held April 10th and a public hearing on the water level drawdown was held April 16th. 90% Design Plans were approved at the April Commission meeting. It was determined a Phase 1 investigation of the site is not required. The City awarded a contract to Dahn Construction for the first phase of the project, which involves earthwork, utilities, and trail paving and extends through June 2020. Dewatering began late summer 2019. Tree removal was completed in early winter; excavation was ongoing through the winter. As of early June 2020, earth work and infrastructure work by Dahn Construction is nearly complete and trail paving is complete. Vegetative restoration by AES is underway including soil prep and seeding. Plants, shrubs, and trees will begin soon along with placement to goose protection fencing to help ensure successful restoration. The construction phase of this project was completed in June with minor punch list items completed in September. The restoration and planting phase is complete except for minor punch list items and monitoring and establishment of vegetation over three growing seasons. A final grant report for BWSR's Watershed Based Implementation Funding was submitted at the end of January. Project website: <http://www.bassettcreekwmo.org/index.php?cID=433> .

2020 Bryn Mawr Meadows Water Quality Improvement Project (BC-5), Minneapolis: A feasibility study by the Commission Engineer began last fall and included wetland delineations, soil borings, public open houses held in conjunction with MPRB's Bryn Mawr Meadows Park improvement project, and input from MPRB's staff and design consultants. At their meeting in April, the Commission approved a TAC and staff recommendation to move this project from implementation in 2019 to design in 2020 and construction in 2021 to better coincide with the MPRB's planning and implementation of significant improvements and redevelopment Bryn Mawr Meadows Park where the project will be located. The final feasibility study was approved at the January 2019 Commission meeting. Staff discussed the maintenance of Penn Pond with MnDOT and received written confirmation that pond maintenance will occur prior to the park's reconstruction project with coordination among the BCWMC, MPRB, and MnDOT. A public hearing for this project was held September 19, 2019. The project was officially ordered at that meeting. An agreement with the MPRB and the city of Minneapolis will be considered at a future meeting. In January 2020 this project was awarded a \$400,000 Clean Water Fund grant from BWSR; a grant work plan was completed and the grant with BWSR was fully executed in early May. The project and the grant award was the subject of an article in the Southwest Journal in February: <https://www.southwestjournal.com/voices/green-digest/2020/02/state-awards-grant-to-bryn-mawr-runoff-project/>. In early September, Minneapolis and MPRB staff met to review the implementation agreement and maintenance roles. BCWMC developed options for contracting and implementation which were presented at the November meeting. At that meeting staff was directed to

develop a memorandum of understanding or agreement among BCWMC, MPRB, and city of Minneapolis to more formally recognize and assign roles and responsibilities for implementation. The draft agreement was developed over several months and multiple conversations among the parties. At the May meeting the Commission approved to waive potential conflict of the Commission legal counsel and reviewed a proposal for project design by the Commission Engineer. The updated design proposal and the design agreement among all three parties were approved at the June 2021 meeting. CIP Project design is underway. A public open house was held in the park on July 27th, and another open house on potential designs will be held September 7th (location and time TBD). Project website: <http://www.bassettcreekwmo.org/projects/all-projects/bryn-mawr-meadows-water-quality-improvement-project>

2020 Jevne Park Stormwater Improvement Project (ML-21) Medicine Lake (No change since Oct 2019): At their meeting in July 2018, the Commission approved a proposal from the Commission Engineer to prepare a feasibility study for this project. The study got underway last fall and the city's project team met on multiple occasions with the Administrator and Commission Engineer. The Administrator and Engineer also presented the draft feasibility study to the Medicine Lake City Council on February 4, 2019 and a public open house was held on February 28th. The feasibility study was approved at the April Commission meeting with intent to move forward with option 1. The city's project team is continuing to assess the project and understand its implications on city finances, infrastructure, and future management. The city received proposals from 3 engineering firms for project design and construction. At their meeting on August 5th, the Medicine Lake City Council voted to continue moving forward with the project and negotiating the terms of the agreement with BCWMC. Staff was directed to continue negotiations on the agreement and plan to order the project pending a public hearing at this meeting. Staff continues to correspond with the city's project team and city consultants regarding language in the agreement. The BCWMC held a public hearing on this project on September 19, 2019 and received comments from residents both in favor and opposed to the project. The project was officially ordered on September 19, 2019. On October 4, 2019, the Medicine Lake City Council took action not to move forward with the project. At their meeting on October 17th, the Commission moved to table discussion on the project. The project remains on the 2020 CIP list. Project webpage: <http://www.bassettcreekwmo.org/index.php?cID=467>.

2019 Westwood Lake Water Quality Improvement Project (WST-2) St. Louis Park (No change since October 2020): At their meeting in September 2017, the Commission approved a proposal from the Commission Engineer to complete a feasibility study for this project. The project will be completed in conjunction with the Westwood Hills Nature Center reconstruction project. After months of study, several meetings with city consultants and nature center staff, and a public open house, the Commission approved Concept 3 (linear water feature) and set a maximum 2019 levy at their May meeting. 50% designs were approved at the July meeting and 90% design plans were approved at the August meeting. The Hennepin County Board approved a maximum 2019 levy request at their meeting in July. A BCWMC public hearing on this project was held on August 16th with no comments being received. At that meeting the Commission officially ordered the project and entered an agreement with the City of St. Louis Park to design and construct the project and directed the Education Committee to assist with development of a BCWMC educational sign for inside the nature center. The draft sign was presented at the October 2017 meeting and was finalized over the winter. The Sun Sailor printed [an article](#) on the project in October 2018. A ribbon cutting by the city was held September 13th. The building and site are open to the public and being used to educate students. The system is capturing stormwater runoff from roof and paving, and the runoff is being stored underground and pumped via solar or hand pumps into the engineered creek. None of the captured water is flowing over land into Westwood Lake. The educational sign indoors is installed. Project website: <http://www.bassettcreekwmo.org/projects/all-projects/westwood-lake-water-quality-improvement-project>.

2017 Main Stem Bassett Creek Streambank Erosion Repair Project (2017CR-M) (no change since Feb): The feasibility study for this project was approved at the April Commission meeting and the final document is available on the project page at: <http://www.bassettcreekwmo.org/index.php?cID=281>. A Response Action Plan to address contaminated soils in the project area was completed by Barr Engineering with funding from Hennepin County and was reviewed and approved by the MPCA. The Commission was awarded an Environmental Response Fund grant from Hennepin County for \$150,300 and a grant agreement is in the process of being signed by the county. A subgrant agreement with the City will be developed. The City hired Barr Engineering to design and construct the project. Fifty-percent and 90% designs were approved at the August and October Commission meetings, respectively. In September 2017, design plans were presented by Commission and city staff to the Harrison Neighborhood Association's Glenwood Revitalization Team committee and through a public open house on the project. Construction was to begin summer of 2018 but was delayed until due to the unanticipated need for a field based cultural and historical survey of the project area required by the Army Corps of Engineers and ongoing negotiations with Pioneer Paper.

Construction began in November 2020 with clearing and grubbing to have access to the creek and to remove trees from the work area. In the Fruen Mill Reach work was completed per design plans on the south side of the creek, including stabilizing

the existing MPRB trail, installing riprap toe protection and grading the bank. In the Cedar Lake Road to Irving Avenue Reach, the City was unable to come to an agreement with Pioneer Paper to get the amount of access needed to install the VRSS on the north side of the creek. The property owner allowed access to the streambank but instead of installing VRSS through this reach the City installed riprap toe protection, removed debris, completed bank grading and live staking and seeding, and installed the in-stream rock vanes to divert flows away from the steep banks. In Irving Avenue to the tunnel reach, the work was completed according to design plans with the installation of live staking, rock vanes within the stream channel, removal of brush and invasive species, and the installation of live stakes and fascines to encourage native plant growth and minimize bank erosion. Construction was completed in December 2020. An ERF grant report and RAP report are currently being developed. Vegetation will be established this spring. Project Website: www.bassettcreekwmo.org/projects/all-projects/bassett-creek-main-stem-erosion-repair-project-cedar-lake-ro

2014 Schaper Pond Diversion Project and Carp Management, Golden Valley (SL-3) (no change since March): Repairs to the baffle structure were made in 2017 after anchor weights pulled away from the bottom of the pond and some vandalism occurred in 2016. The city continues to monitor the baffle and check the anchors, as needed. Vegetation around the pond was planted in 2016 and a final inspection of the vegetation was completed last fall. Once final vegetation has been completed, erosion control will be pulled and the contract will be closed. The Commission Engineer began the Schaper Pond Effectiveness Monitoring Project last summer and presented results and recommendations at the May 2018 meeting. Additional effectiveness monitoring is being performed this summer. At the July meeting the Commission Engineer reported that over 200 carp were discovered in the pond during a recent carp survey. At the September meeting the Commission approved the Engineer's recommendation to perform a more in-depth survey of carp including transmitters to learn where and when carp are moving through the system. At the October 2020 meeting, the Commission received a report on the carp surveys and recommendations for carp removal and management. Carp removals were performed through the Sweeney Lake Water Quality Improvement Project. Results were presented at the February 2021 meeting along with a list of options for long term carp control. Commission took action approving evaluation of the long-term options to be paid from this Schaper Pond Project. Commission and Golden Valley staff met in March 2021 to further discuss pros and cons of various options. Evaluation results will be presented at a future meeting. Project webpage: <http://www.bassettcreekwmo.org/index.php?cID=277>.

Sweeney Lake Water Quality Improvement Project, Golden Valley (SL-8) (No change since March): This project was added to the 2020 CIP list after receiving a federal 319 grant from the MPCA. It is partially a result of the carp surveys completed through the Schaper Pond Diversion Project and a study of the year-round aeration on Sweeney Lake. This project will treat curly-leaf pondweed in spring 2020, will remove carp in summer 2020, and will perform an alum treatment on Sweeney Lake in late summer 2020. The project was officially ordered by the Commission after a public hearing in September 2019. A public open house on this project was held via Webex on April 8th with approximately 20 people joining. The open house presentation and a question and answer document are available online. The curly-leaf pondweed herbicide treatment was completed in May. Carp Solutions performed carp tracking and setting nets in early June. The first round of netting resulted in 334 carp removed from Sweeney Lake (mean length 620 mm, mean weight 3.1 kg), representing an estimated 29% of the total population. From Schaper Pond 82 carp removed which likely represents about 17% of the initial population. After another round of carp removals in late July, 118 additional carp were netted from Sweeney. Based on preliminary estimates, approximately 40% of the carp population was removed from Sweeney this summer. The carp biomass was reduced from approximately 129 kg/ha to 79 kg/ha, which is below the threshold where adverse impacts on water quality are expected. The first round of alum treatment was completed in late October. A grant report and payment request were submitted at the end of January. A report on the results of the carp removals and recommendations for future management were presented at the February 2021 meeting. Long term carp management evaluation will happen through the Schaper Pond Diversion Project funding. A one-page overview of 2020 activities and outcomes was developed for the Sweeney Lake Association and [posted online](#) in March. The project website: [Sweeney Lake Water Quality Improvement Project, SL-8](#)).

2014 Twin Lake In-lake Alum Treatment, Golden Valley (TW-2): (No change since June 2018) At their March 2015 meeting, the Commission approved the project specifications and directed the city to finalize specifications and solicit bids for the project. The contract was awarded to HAB Aquatic Solutions. The alum treatment spanned two days: May 18- 19, 2015 with 15,070 gallons being applied. Water temperatures and water pH stayed within the desired ranges for the treatment. Early transparency data from before and after the treatment indicates a change in Secchi depth from 1.2 meters before the treatment to 4.8 meters on May 20th. There were no complaints or comments from residents during or since the treatment. Water monitoring continues to determine if and when a second alum treatment is necessary. Lake monitoring results from 2017 were presented at the June 2018 meeting. Commissioners agreed with staff recommendations to keep the CIP funding

remaining for this project as a 2nd treatment may be needed in the future. Project webpage: <http://www.bassettcreekwmo.org/index.php?cID=278>.

2013 Four Seasons Area Water Quality Project (NL-2) (See Item 5C): At their meeting in December 2016, the Commission took action to contribute up to \$830,000 of Four Seasons CIP funds for stormwater management at the Agora development on the old Four Seasons Mall location. At their February 2017 meeting the Commission approved an agreement with Rock Hill Management (RHM) and an agreement with the City of Plymouth allowing the developer access to a city-owned parcel to construct a wetland restoration project and to ensure ongoing maintenance of the CIP project components. At the August 2017 meeting, the Commission approved the 90% design plans for the CIP portion of the project. At the April 2018 meeting, Commissioner Prom notified the Commission that RHM recently disbanded its efforts to purchase the property for redevelopment. In 2019, a new potential buyer/developer (Dominium) began preparing plans for redevelopment at the site. City staff, the Commission Engineer and I have met on numerous occasions with the developer and their consulting engineers to discuss stormwater management and opportunities with “above and beyond” pollutant reductions. Concurrently, the Commission attorney has been working to draft an agreement to transfer BCWMC CIP funds for the above and beyond treatment. At their meeting in December, Dominium shared preliminary project plans and the Commission discussed the redevelopment and potential “above and beyond” stormwater management techniques. At the April 2020 meeting, the Commission conditionally approved the 90% project plans. The agreements with Dominium and the city of Plymouth to construct the project were approved May 2020 and project designers coordinated with Commission Engineers to finalize plans per conditions. In June 2021, the City of Plymouth purchased the property from Walmart. The TAC discussed a potential plan for timing of construction of the stormwater management BMPs by the city in advance of full redevelopment. TAC recommendations are included on this meeting agenda. Project webpage: <http://www.bassettcreekwmo.org/index.php?cID=282>.

2021 Parkers Lake Drainage Improvement Project (PL-7) (See Item 5B): The feasibility study for this project was approved in May 2020 with Alternative 3 being approved for the drainage improvement work. After a public hearing was held with no public in attendance, the Commission ordered the project on September 17, 2020 and entered an agreement with the city of Plymouth to design and construct the project. The city hired WSB for project design which is currently underway. 60% design plans were approved at the June meeting. 90% plans will be presented at this meeting. www.bassettcreekwmo.org/projects/all-projects/parkers-lake-drainage-improvement-project

2021 Parkers Lake Chloride Reduction Project (PL-7): The feasibility study for this project was approved in May 2020 with Alternative 3 being approved for the drainage improvement work. After a public hearing was held with no public in attendance, the Commission ordered the project on September 17, 2020 and entered an agreement with the city of Plymouth to implement the project in coordination with commission staff. City staff and I have had an initial conversation about this project. The city plans to collect additional chloride data this winter in order to better pinpoint the source of high chlorides loads within the subwatershed. Partners involved in the Hennepin County Chloride Initiative (HCCI) are interested in collaborating on this project. A proposal from Plymouth and BCWMC for the “Parkers Lake Chloride Project Facilitation Plan” was approved for \$20,750 in funding by the HCCI at their meeting in March. The project will 1) Compile available land use data and chloride concentrations, 2) Develop consensus on the chloride sources to Parkers Lake and potential projects to address these sources, and 3) Develop a recommendation for a future pilot project to reduce chloride concentrations in Parkers Lake, which may be able to be replicated in other areas of Hennepin County, and 4) help target education and training needs by landuse. The first technical stakeholders meeting was held July 26th. Project website: www.bassettcreekwmo.org/projects/all-projects/parkers-lake-drainage-improvement-project

2021 Mt. Olivet Stream Restoration Project (ML-20) (See Item 5B): The feasibility study for this project was approved in May 2020 with Alternative 3 being approved for the drainage improvement work. After a public hearing was held with no public in attendance, the Commission ordered the project on September 17, 2020 and entered an agreement with the city of Plymouth to design and construct the project. The city hired WSB for project design which is currently underway. 60% design plans were approved in June. 90% plans will be presented at this meeting. www.bassettcreekwmo.org/projects/all-projects/mt-olivet-stream-restoration-project

2021 Main Stem Lagoon Dredging Project (BC-7) (No change since May): The feasibility study for this project was approved in May 2020 with Alternative 2-all (dredge all three lagoons to 6-foot depth) being approved. After a public hearing was held with no public in attendance, the Commission ordered the project on September 17, 2020. Rather than entering an agreement with a separate entity to design and construct this project, the Commission will implement the project in close coordination

with the MPRB. At their meeting in November, the Commission approved a timeline for implementation and the Commission Engineer was directed to prepare a scope of work for project design and engineering. That scope is presented in 5C at this meeting. Design and permitting should get underway in summer 2021. Dredging of all three lagoons is planned for winter 2022/2023. A grant agreement for the \$250,000 Watershed Based Implementation Funding grant was approved at the January meeting. The project work plan was approved by BWSR. The Commission recently approved a grant agreement for a Hennepin County Opportunity Grant for this project. Project website: www.bassettcreekwmo.org/projects/all-projects/bassett-creek-main-stem-lagoon-dredging-project

2021 Cost-share Purchase of High Efficiency Sweeper (ML-23) (No change since Dec): Because the Commission had not entertained a project like this in the past (to cost share equipment purchase), this proposed project was discussed by the Commission in February and April, 2020 after being recommended for approval by the TAC. The Commission approved a [policy](#) regarding the use of CIP funds for equipment purchases at their April 2020 meeting. The project was added to the CIP through a Watershed Plan Amendment adopted in August 2020 and was officially ordered by the Commission on September 17, 2020 after a public hearing. The Commission entered an agreement with the city of Plymouth which includes reporting requirements for street sweeper use and effectiveness. The first report is expected summer 2021.

2022 Medley Park Stormwater Treatment Facility (ML-12): The feasibility study for this project is complete after the Commission Engineer’s scope of work was approved last August. City staff, Commission Engineers and I collaborated on developing materials for public engagement over the fall/early winter. A project kick-off meeting was held in September, an internal public engagement planning meeting was held in October, and a Technical Stakeholder meeting with state agencies was held in November. A [story map of the project](#) was created and a survey to gather input from residents closed in December. Commission Engineers reviewed concepts and cost estimates have been reviewed by city staff and me. Another public engagement session was held in April to showcase and receive feedback on concept designs. The feasibility report was approved at the June meeting with a decision to implement Concept #3. At the July meeting the Commission directed staff to submit a Clean Water Fund grant application, if warranted. A grant application was developed and submitted. Funding decisions are expected in early December. www.bassettcreekwmo.org/projects/all-projects/medley-park-stormwater-treatment-facility

2022 SEA School-Wildwood Park Flood Reduction Project (BC-2, 3, 8, 10): The feasibility study for this project is complete after the Commission Engineer’s scope of work was approved last August. A project kick-off meeting with city staff was held in late November. Meetings with city staff, Robbinsdale Area School representatives, and technical stakeholders were held in December, along with a public input planning meeting. A virtual open house video and comment form were offered to the public including live chat sessions on April 8th. The feasibility study report was approved in June with a decision to implement Concept #3. www.bassettcreekwmo.org/projects/all-projects/sea-school-wildwood-park-flood-reduction-project.

Administrator Report July 7 – August 10, 2021

Subject	Work Progress
Education	<ul style="list-style-type: none"> • Prepared and sent agenda and materials for Education Committee meeting; facilitated meeting which included Tony Brough with Hennepin County to discuss AIS signage options for fishing piers • Attended WMWA meeting and proposed minor revisions to education and outreach plan as suggested by Education Committee • Posted volunteer opportunities in online calendar and sent emails to Commissioners • Attended Salt Symposium and free Smart Salting for Property Managers class • Corresponded with key folks re: BCWMC bike tour and social gathering, secured date and sent “save the date” email • Reviewed script and commented on AIS educational video; researched issues with AIS in/on fishing gear
CIP	<ul style="list-style-type: none"> • <u>Medley Park Stormwater Improvement Project</u>: Reviewed Clean Water Fund grant RFP materials, met with Commission Engineers regarding possible grant application; wrote and submitted application (with Commission Engineer review) • <u>Bryn Mawr Water Quality Improvement Project</u>: Updated project webpage and participated in public open house and project design kick-off meeting with Commission engineers, and all partners and their consultants

	<ul style="list-style-type: none"> • <u>Parkers Lake Chloride Reduction Project</u>: Participated in first meeting of facilitation project; helped introduce the project and Commission’s and HCCI’s involvement • <u>Sweeney Lake Water Quality Improvement Project</u>: Developed and submitted interim grant and budget report • Began developing a fact sheet on the BCWMC CIP selection and implementation process for general public audience (in response to comments received at May 2021 Public Hearing) • Developed initial drafts of agreements with Golden Valley for 2022 CIP projects; sent to Attorney Anderson for revisions • Discussed Jevne Park Project with Commissioner Carlson
Henn Co. Chloride Initiative	<ul style="list-style-type: none"> • Reviewed edits to HCCI “small group” communication plan and finalized plan • Facilitated “small group” meeting, prepared meeting notes and sent follow up email • Set meeting for large group • Reviewed/commented on draft chloride management templates with Fortin Consulting re: Chloride Management Template Project
MAWD	<ul style="list-style-type: none"> • Assisted with updates to MAWD Handbook and participate in MAWA Handbook Committee meeting • Attended Metro MAWD meeting • Listened to recording of MAWD’s Summer Meeting
Environmental Justice	<ul style="list-style-type: none"> • Participated in Blue Thumb’s Environmental Justice Committee and helped brainstorm methods for advancing the conversation and putting plans into action • Corresponded with Alt. Commissioner McDonald Black re: internship possibility
Administration	<ul style="list-style-type: none"> • Participated in Administrative Services Committee meeting and prepared meeting notes • Coordinated meeting with Hennepin County Commissioner Fernando and developed talking points; attended the meeting with her, her staff, Golden Valley staff, and Commission Engineers. She encourages the Commission to continue to implement bold projects (even if price tags are high) and would like to convene a group to discuss floodplain management issues in the Bassett Creek Valley. I reviewed and sent her staff the Bassett Creek Valley Floodplain Study completed in December 2019. • Attended the meeting of the Hennepin County Board of Commissioners Public Works Committee of the Whole on BCWMC plan amendment and 2022 levy. Both were approved without comments or questions except for Commissioner Fernando complimenting the Commission’s work. • Worked to secure September – December in person meeting space for monthly meetings; toured West Medicine Lake Community Club and Plymouth Maintenance Facility; corresponded with Golden Valley staff re: Brookview availability in 2022 • Prepared and sent TAC agenda and materials; participated in TAC meeting and drafted TAC memo with recommendations • Corresponded with Commission officers, Attorney Anderson and other watersheds about moving August meeting from in-person to online; sent declaration document for signature; sent email to commissioners and TAC members; cancelled catering order and venue reservation; updated online calendar and meeting announcement • Drafted September 16th public hearing notice and sent to city clerks • Developed invoice for project review expenses in excess of \$5,000 and sent to Hollydale developer; discussed charges with developer and discussed with Commission Engineers and Plymouth staff • Developed agenda; reviewed and submitted invoices; reviewed financial report; finalized minutes; reviewed presentation on water monitoring results; reviewed other memos and documents for Commission meeting; disseminated Commission meeting information to commissioners, staff, and TAC; updated online calendar; participated in pre-meeting call with Chair Cesnik and Commissioner Engineer; drafted meeting follow up email
Other Issues & Projects	<ul style="list-style-type: none"> • Toured Lost Lake by canoe with CAMP volunteer; delivered new equipment to different CAMP volunteer • Corresponded with Lost Lake CAMP volunteer via email re: summer aeration plans and permit needs • Assisted with tracking down entity responsible for installing stop logs at Hwy 55 Flood Control Project Structure (MnDOT installed the stop logs in order to perform maintenance on the culverts; removed them until a future maintenance window with better conditions; they will coordinate with all permitting/reviewing agencies including MPRB, GV, and BCWMC before future work) • Corresponded with Plymouth resident re: grease/oil discharge into creek (2nd time)