2022

# CARNELIAN-MARINE-ST. CROIX
# WATERSHED MANAGEMENT PLAN

Carnelian-Marine-St. Croix Watershed District
11660 Myeron Road North, Stillwater, MN 55082

www.cmscwd.org

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## i. Approvals and Acknowledgements

The 2022 CMSCWD Watershed Management Plan was approved by the Minnesota Board of Water and Soil Resources on March 23, 2022.

It was adopted by the Carnelian-Marine-St. Croix Watershed District April 13, 2022.

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## ii. Acronyms

AIS – Aquatic invasive species

BMP – Best Management Practice

BWSR – (Minnesota) Board of Water and Soil Resources

CAC – Citizen Advisory Committee

CAMP – Citizen Assisted Monitoring Program

CIP – Capital Improvement Program

CMSCWD – Carnelian Marine St. Croix Watershed District (aka District)

CRP – Conservation Reserve Program

CSP – Conservation Stewardship Program

District – Carnelian Marine St. Croix Watershed District

EMWREP – East Metro Water Resources Education Program

EQIP – Environmental Quality Incentive Program

FEMA – Federal Emergency Management Agency

GW – Groundwater

IBI – Index of biotic integrity

IESF – Iron-Enhanced Sand Filter

Lb/yr – Pounds per year

LSC – Lower St. Croix

LGUs – Local Government Units

LWMP – Local Water Management Plan

M — Meter

MCD – Metro Conservation Districts

MDA – Minnesota Department of Agriculture

MDH – Minnesota Department of Health

MIDS – Minimal Impact Design Standards

MLCCS – Minnesota Land Cover Classification System

MnDNR – Minnesota Department of Natural Resources

MnDoT – Minnesota Department of Transportation

MS4 – Municipal Separate Storm Sewer System

MOU – Memorandum of Understanding

MPCA – Minnesota Pollution Control Agency

NPS – National Park Service

NRCS – Natural Resource Conservation Service

PCB – Polychlorinated biphenyls

PC-SWMM – Personal Computing Storm Water Management Model

PRAP – Performance Review and Assistance Program

PTM – Prioritize, Target, and Measure

SSTS – Subsurface Sewage Treatment System

SWA – Subwatershed Analysis

SWCD – Soil and Water Conservation District

TEP – Technical Advisory Panel (for WCA applications)

TMDL – Total Maximum Daily Load

TP – Total phosphorus

TSS – Total suspended solids

TWP - Township

Ug/L – Micrograms per liter

USACE – United States Army Corp of Engineers

WBIFs – Watershed Based Implementation Funds

WCA – Wetland Conservation Act

WCD – Washington Conservation District

WD – Watershed District

WOMP – Watershed Outlet Monitoring Program

WRAPS – Watershed Restoration and Protection Strategies

# I. EXECUTIVE SUMMARY

- This Carnelian-Marine-St. Croix Watershed Management Plan (Plan) sets the guidelines for managing the water resources within the boundaries of the CMSCWD (District) to achieve the organization's vision and goals. This Plan provides data and background information, assesses watershed issues, outlines implementation programs, sets goals and policies for the District and its members, and lists implementation activities to achieve the goals. The following subsections provide a summary of the content found in this Plan.

**CMSCWD VISION**

Protect and improve water resources of the Carnelian–Marine–St. Croix Watershed District through coordination with local units of government, citizens, and other government agencies.

# A. INTRODUCTION, PURPOSE, RESOURCE DESCRIPTION

The Carnelian-Marine-St. Croix Watershed District covers 81.4 square miles in northeastern Washington County, Minnesota and operates under the authority of MN Statutes Chapters 103B and 103D. The District uses a variety of tools to address water resource issues including regulation, structural practices, incentive programs, and education. As a fully functioning, permitting body, the District works to protect and improve the water resources, natural habitat, and personal property to fulfill the statutory purposes of watershed management organizations.

## The purposes of the water management programs required by sections 103B.205 to 103B.255 are to:

1. protect, preserve, and use natural surface water and groundwater storage and retention systems;
2. minimize public capital expenditures needed to correct flooding and water quality problems;
3. identify and plan for means to effectively protect and improve surface water and groundwater quality;
4. establish more uniform local policies and official controls for surface water and groundwater management;
5. prevent erosion of soil into surface water systems;
6. promote groundwater recharge;
7. protect and enhance fish and wildlife habitat and water recreational facilities; and
8. secure the other benefits associated with the proper management of surface water and groundwater.

# RESOURCE DESCRIPTION

The original Carnelian-Marine Watershed District was formed in 1981 to address specific flooding problems in the Big Marine Lake drainage area. The current CMSCWD was established in 2007 when smaller watershed organizations were combined and enlarged to cover today's District political boundary. The District is governed by a seven-person Board of Managers and guided by its citizen and technical advisory committees (CAC and TAC). A roster of District managers since its inception is found in Appendix H. The District accomplishes much of its work through partnerships and collaboration with local governments, lake associations, agencies, Lower St. Croix Watershed Partnership, Washington Conservation District, Washington County, St. Croix River Association, and others.

One of the primary roles of the District is to regularly inspect and maintain the series of channels and outlets built by the District to facilitate unimpeded flow from Big Marine Lake through Little Carnelian Lake and the outlet pipe to the St. Croix River.

The District is rich in water and natural resources with 31 lakes, 21 streams (including 10 with brook trout populations), hundreds of acres of wetlands, and more than 17 miles of St. Croix River shoreline (Figure 1-1). Section II includes a summary of the CMSCWD land and water resource inventory. The complete inventory is found in Appendix A.

Figure 1-1.


CMSCWD Boundary
Municipal Boundary
Lakes
Streams
Wetlands
MN
WI
Scandia
May Township
Marine on Saint Croix
Stillwater Township
Stillwater
Hugo
Grant
Goose
German
Fish
Hay
Sand
Jellums
Long
Big Marine
Alice
Long
Barker
Mud
Staples
Turtle
Terrapin
Maple Marsh
Mays
Bass
East Boot
West Boot
Clear
Square
Twin
Big Carnelian
Louise
Little Carnelian
Loon
Silver
Carol
North Twin
South Twin
0
1
2 mi

# B. WATERSHED ISSUES & GOALS

The District engaged a variety of stakeholder groups to gather input on watershed issues including agencies and organizations, their CAC and TAC, and watershed residents including shoreline property owners and others. Issues were also gathered from existing plans and programs. Issues were identified across eight major categories including water quality; climate change, water quantity, and flood risk; groundwater; aquatic invasive species; upland resources; wetlands; education and outreach; and watershed management and operations. A complete list of issues and related goals is found in Section IV.

Water quality in lakes, streams, and the St. Croix River is a primary issue identified in the Plan with acknowledgement that high quality resources deserve protection, while others need restoration. Runoff from agricultural and developed areas; eroding bluffs, streambanks, and shorelines; and the need for monitoring, assessments, and cost share programs were key issues. Goals developed to address the issues include specific water quality goals for lakes; specific goals for stream health scores; and implementation of shoreline restoration projects and other best management practices in critical locations. The District's Water Monitoring Program for lakes and streams is found in Appendix B.

Issues identified as relating to water quantity revolve around potential flooding, the challenges of changing precipitation due to climate change, and the need for regular inspection and maintenance of the Carnelian channel and outlet. Increasing floodplain capacity and evaluating strategies to address a changing climate are among the related goals.

Groundwater-related issues identified by stakeholders included decreased groundwater quality and quantity, and the impacts of failing and non-conforming septic systems. Goals developed to address these issues include

protection of groundwater-dependent resources, proper use and disposal of contaminants, and education of residents with septic systems.

Issues regarding the spread and impacts of aquatic invasive species (AIS) included threats to ecosystems, recreation, and property values. Decreasing the size and density of AIS populations and deterring further spread of AIS by watercraft are related goals.

The impacts of expanding terrestrial invasive species and loss of native species were identified as primary issues for uplands and shorelands. The goals to address these issues include increased upland management and land restoration where water quality benefits are also realized.

Issues regarding wetlands include degradation and loss from land use practices and the need for periodic assessments. Improving wetland quality, ensuring no net loss of wetlands, and evaluating functional changes to wetlands are among the related goals. The District's Wetland Protection and Management Plan is found in Appendix D.

Stakeholders identified issues related to a lack of knowledge and understanding among residents and public officials on water quality issues and connections to activities on land along with a lack of knowledge about the District itself. A 10-year communications and outreach plan was developed with goals and activities to improve education among a variety of stakeholders on critical topics (Appendix G.)

Finally, five different issues were identified with watershed management and operations including the need for strong partnerships with various communities and entities, streamlined and consistently enforced rules, and regular inspections and maintenance of past projects. Related goals include good communication with partners and local governments, establishment of a Shoreland Compliance and Enforcement Team, advocacy for adoption of Minimal Impact Design Standards, and continued inspection and maintenance program.

## C. IMPLEMENTATION & PRIORITIZATION STRATEGIES

The District categorized its lakes and streams as "focused" or "routine" for purposes of concentrating implementation where the most benefit could be achieved. The designation is partially based on whether a waterbody is considered impaired. Eleven lakes, three streams, and the St. Croix River are currently listed as impaired on the MPCA's 2020 303(d) list.

The **Focused Implementation Strategy** is assigned to lakes and streams meeting one of two thresholds:

1. Impaired waters which are closest to meeting state water quality standards
2. High quality unimpaired waters that have a declining trend in water quality

The purpose of Focused Implementation is to provide an additional level of protection for non-impaired resources so they do not become impaired, and to boost effort for barely impaired resources that might easily return to an unimpaired state. In addition to the District's Routine program activities that will be implemented throughout the entire District, program activities are enhanced in "Focused Implementation" areas.

The **Routine Implementation Strategy** is assigned to lakes and streams meeting one of two thresholds:

1. Unimpaired waters that do not show any water quality trend
2. Waters that are not otherwise assigned for "Focused Implementation"

The purpose of Routine Implementation is to provide a basic level of protection of these non-impaired resources so they do not become impaired. Activities and assessments are robust enough in routine implementation to identify when water resources need to be assigned focused management strategies to prevent further decline in quality.

Improvements to District water resources and stabilization of bluffs along the St. Croix River will help the District make progress toward meeting the allocated pollutant reduction goal assigned in the Lake St. Croix TMDL.

The District will work to further prioritize and target its projects and programs through a variety of assessment tools including pollutant hot spot evaluation, subwatershed analyses, targeted monitoring, diagnostic assessments, internal load analyses, stressor identification, and stream condition assessments. Due to the dynamic nature of the drivers of water resources conditions, adaptive management will be used to evaluate the impact of District implementation and take further action, if needed.

The District will evaluate progress towards achieving its goals on an annual basis. The District's Annual Report will be approved by the Board of Managers, transmitted to BWSR, and posted on the District website. The District will also annually assess District operations and management through internal processes.

Section VI.A. includes a full review of prioritization tools and adaptive management techniques that will be employed by the District. Section VI.D. includes information on evaluation and annual reporting.

# D. PLAN IMPLEMENTATION & RESULTS

Overall, the implementation of this Plan should result in significant benefits to water resources including (see Figure 5-1):

### REMOVAL OF SEVEN LAKES FROM IMPAIRED WATERS LIST:

- East Boot (2023)
- South Twin (2023)
- Hay (2023)
- Jellum's (by 2023)
- Goose (by 2030)
- Long (by 2030) (Scandia)
- Fish (by 2030)

### PROGRESS MADE TOWARD GOALS ON THREE LAKES:

- Loon
- Louise
- Mud

### IMPROVED CONDITIONS ON SIX LAKES:

- Square (clarity)
- Clear (clarity)
- Big Marine (algae & clarity)
- Big Carnelian (algae & clarity)
- Hay (clarity)
- Long (clarity) (May Township)

### RESTORATION OF FOUR STREAMS:

Mill Stream
Willow Brook
Gilbertson's
Swedish Flag

### IMPROVED CONDITIONS ON SEVEN STREAMS:

Arcola
Falls
Marine Landing
Spring
Carnelian Creek
Cedar Bend Trout
Zavoral's

*The District will continue implementation through a variety of programs, often using collaborative partnerships. District programs are described in Section VI.B. and include:*

- Administration & Operations
- Regulation
- Inspection & Maintenance
- Monitoring
- Analysis & Prioritization
- Aquatic Invasive Species
- Cost Share
- Communications & Education
- Capital Improvements

Through these programs, the District will continue implementing many of the same activities as prior years. The more significant additions or changes to District activities are listed below with high priority outcomes and program budgets shown in Table 1-1. See Table 6-3 in Section VI.F. for the complete Implementation Plan including estimated costs, scheduling, and priority of activities.

- Annual tracking of progress toward improvement and restoration goals
- Enforcing unpermitted shoreland violations
- Updating District Rules
- Working with local officials and staff to update local ordinances
- Provide technical assistance to landowners and local units of government
- Evaluating shoreline conditions
- Creating and distributing newsletters and informational publications annually
- Updating (maintaining) the hydrologic & hydraulic model
- Expanding stream water quality monitoring
- Supporting volunteer monitoring
- Completing St. Croix River and Spring Streams Subwatershed Analysis
- Monitoring degraded wetlands with historic intensive land use to identify contributing nutrient loads to high priority water resources
- Modeling, reporting, and engagement on climate resiliency
- Expanding partnership with Washington County to support enforcement of AIS laws
- Scheduling and coordinating volunteer events

Table 1-1.

High Priority Activities, Outcomes, and Anticipated Budget for Plan Implementation

| Anticipated 10-Year Budget | Activities & Outcomes |
|---|---|
| Administration<br>$1,189,958 | Improved communications, streamlined and transparent budgeting, and strengthened partnerships throughout the watershed |
| Regulatory Program<br>$517,236 | Consistent enforcement of District Rules |
| | Enforcement of shoreline alteration rules and annual Shoreland Compliance and Enforcement Team meetings |
| Technical Assistance & Cost Share<br>$2,055,805 | 30 rural/agricultural water quality BMPs reducing 300 lbs./year of phosphorus installed |
| | 20 In-lake AIS management activities completed for water quality benefit |
| | 60 projects or 200 acres of shoreline with invasive species controlled |
| | 180 projects used District technical assistance |
| | 27 urban water quality and rate control BMPs installed reducing phosphorus by 40 lbs./yr |
| | 19 shorelines or streambanks (2,000 linear feet) restored; Increase parcels that have 50% or greater natural shoreline on 6 water resources |
| Inspections & Maintenance<br>$1,093,975 | Annual inspections and maintenance on Carnelian Channel |
| | Repairs to underperforming or non-performing BMPs and $500,000 contributed to Carnelian Outlet Pipe inspection and maintenance fund |
| | Inspection and maintenance recorded for all District BMPs |
| | Inspections of Carnelian Outlet Pipe in 2022 and 2027 |
| | Inspections, reports, and follow up communications with 40+ construction sites; 600 inspections |
| Monitoring<br>$1,246,958 | Evaluation of shoreline vegetative cover on 10 lakes in 2022, 2024, and 2030; measurement of progress toward the majority of lakeshores having 50% natural vegetative cover |
| | Annual monitoring of Goose Lake and Sand Lake IESFs |
| | Annual macroinvertebrate monitoring on 3 streams by volunteers |
| | Water quality and water level monitoring in 30 lakes |
| | Water quality, quantity and macroinvertebrate monitoring in 21 streams |

Table 1-1. (continued)

High Priority Activities, Outcomes, and Anticipated Budget for Plan Implementation

| Anticipated 10-Year Budget | Activities & Outcomes |
|---|---|
| | |
| Analysis & Prioritization<br>$332,000 | Subwatershed analysis completed for: direct drainage to the St. Croix River (including spring streams) |
| | Floodplain Vulnerability Assessment |
| | 5 rapid assessments to evaluate stream stability |
| | Stressor identification on Big Carnelian Lake |
| | Data collected on 14 degraded wetlands discharging focused waters |
| Aquatic Invasive Species<br>$ 426,236 | Coordinated AIS prevention and management plan and rapid response plan |
| | 2,000 hours of watercraft inspections on public boat launches located on Big Carnelian, Big Marine, Goose, and Square Lakes and the St. Croix River |
| | Partnership with Washington County to support enforcement of AIS laws |
| | Continued management of AIS infestations that impact water quality |
| Communications & Outreach<br>$490,411 | Implementation of robust communications and outreach plan including continued partnership with EMWREP, CAC coordination, targeted engagement activities, events, meetings, and publications (Appendix E) |
| Capital Improvement Program<br>$2,644,000 | Design, construction and maintenance of 18 CIP projects |

Most implementation activities will be funded through leveraged collaboration, ad valorem taxes levied across the District, and grant funding. Additional funding sources include special assessments, water management districts, District reserve fund, bonds, and loans. See Section VI.C. for a description of these funding sources.

As noted, partnerships, collaboration, and coordination with other entities is critically important to the operation and impact of the District. The District works regularly with local governments, including municipalities, Washington County, and the Washington Conservation District; with the Lower St. Croix Partnership and the St. Croix River Association; with many different lake associations and organizations; and with multiple federal, state, and regional agencies. Section VI.E. provides detailed information on how the District partners with others.

# E. IMPACTS ON LOCAL GOVERNMENTS

There are no changes to expectations and requirements of local governments resulting from this Plan's adoption. The Local Water Management Plans (LWMPs) of District cities and township must conform to the policies and provisions of this Plan. A recent change to Minnesota Rules Chapter 8410 revised the schedule for LWMPs updates: local water management plans must be revised once every 10 years in alignment with the local comprehensive plan schedule. Updated local comprehensive plans are due December 31, 2028. As a result, all cities and townships in the District must complete and adopt their local water plan between January 1, 2027 and December 31, 2028. Given that this Plan will be adopted (and implemented) well before the statutory requirement for the LWMP update, the District will encourage its member communities to revise their LWMPs sooner than required. A city or township may, at its discretion, choose to adopt this Watershed Management Plan in whole or part to satisfy its statutory local water management plan requirement.

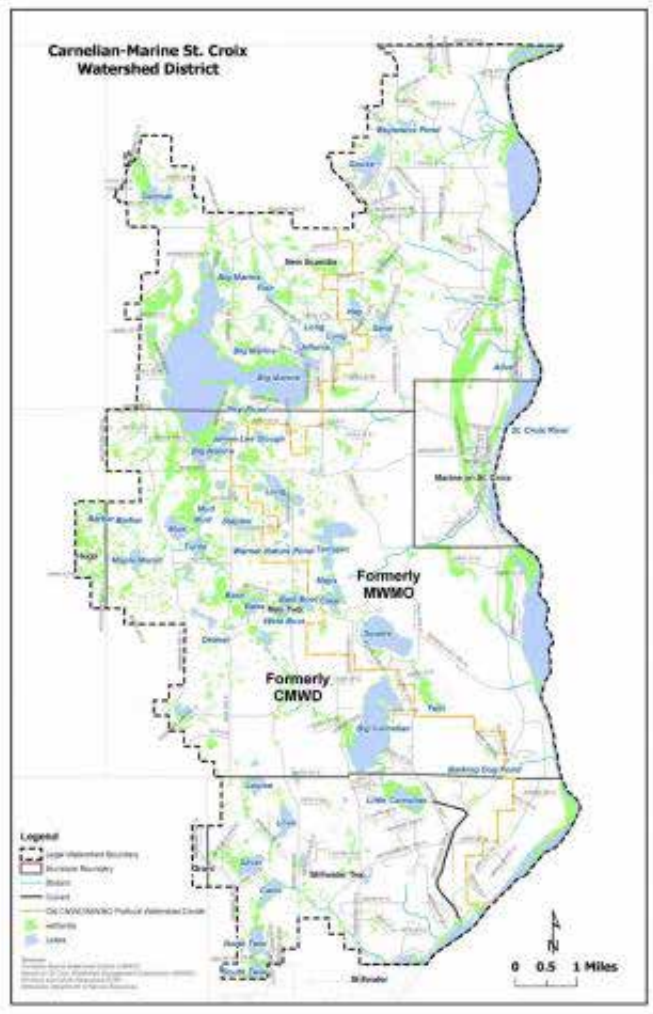
The District's guidance for LWMP documents includes a request for language on local issues and implementation actions that affect the concerns stated in this Plan or which require District collaboration. The District notes it will work with cities and townships regarding financial considerations, implementation priorities, and programs for plan elements of mutual concern. Finally, each local government can assume as much management and regulatory control as it wishes through its approved LWMP.

# II. INTRODUCTION

The Carnelian-Marine-St. Croix Watershed District operates under the authority of Minnesota Statutes Chapters 103B and 103D. The District is a fully functioning, permitting body with intent to protect and improve the water resources, natural habitat, and personal property within its boundaries; to educate property owners and the community on the value of water resources; and to use partnerships, collaboration, science, and consistency to implement its projects and programs. The District uses a variety of tools to address water resource issues including regulation, structural practices, incentive programs, and education.

## LOCATION AND BOUNDARIES

The Carnelian-Marine-St. Croix Watershed District covers 81.4 square miles in northeastern Washington County, Minnesota. The watershed is bordered on the east by the St. Croix River, where many of its wetlands, lakes, and streams drain. The watershed comprises seven cities and townships including City of Scandia to the north; City of Marine on St. Croix, May Township, and a small part of City of Hugo in the middle; and Stillwater Township, and small parts of the cities of Grant and Stillwater to the south (Figure 3-1). The major land uses in the watershed are hay/pasture (26.8%) and deciduous forest (26.6%). Parks, recreation and preserves make up 11.1% of the watershed (National Land Cover Database, 2016). Residential uses are concentrated around the watershed's many lakes.

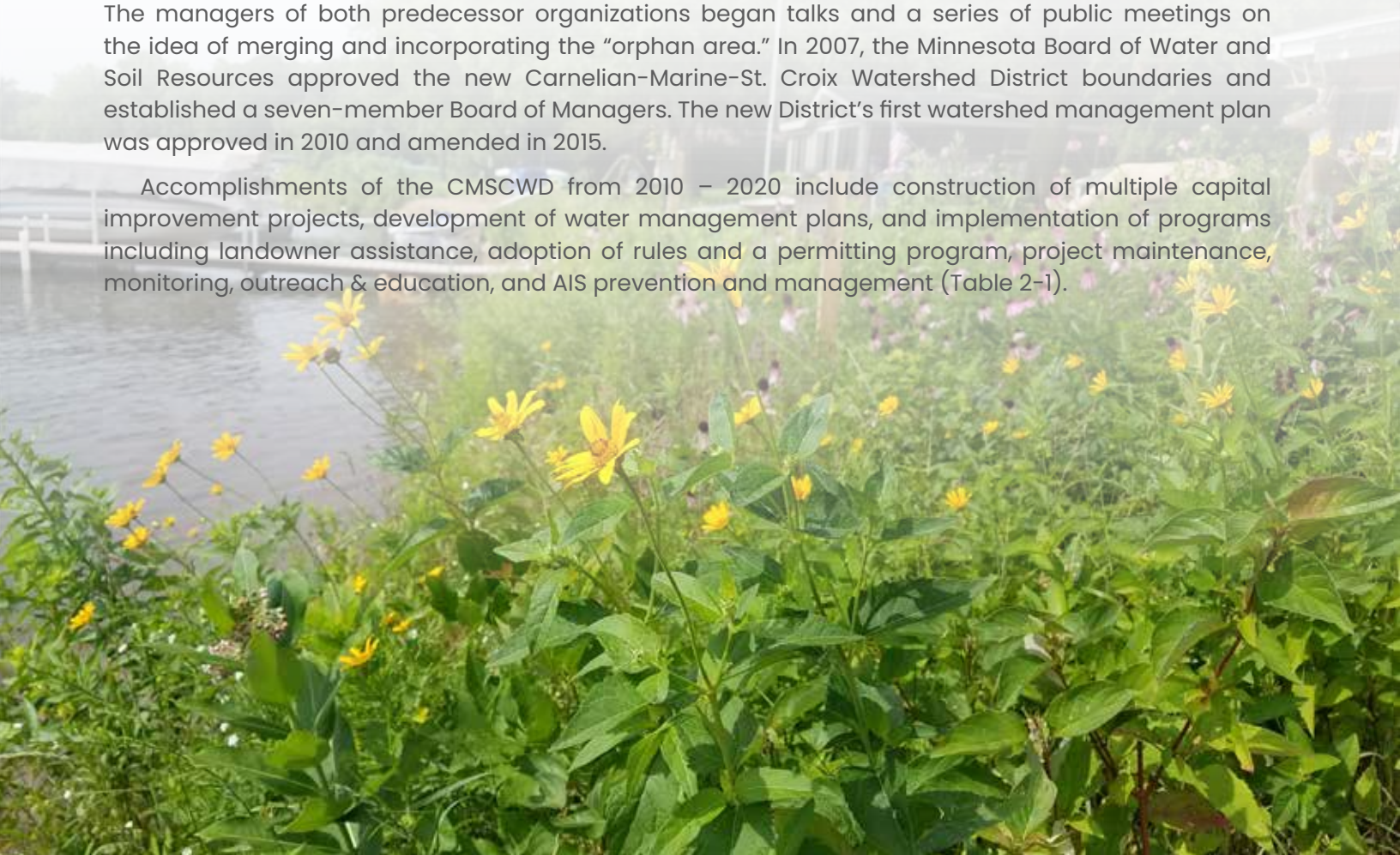


# HISTORY AND ACCOMPLISHMENTS

The Carnelian-Marine-St. Croix Watershed District (District) has a long history of working on flood reduction and the protection and improvement of water resources. The District was established in 2007 when smaller watershed organizations were combined and enlarged to cover today's District political boundary. The original Carnelian-Marine Watershed District was formed in 1981 to address specific flooding problems in the Big Marine Lake drainage area. The Marine Watershed Management Organization was formed around the same time in order to satisfy the requirements of Minnesota Statute 103B which required all the land within the seven county Twin Cities Metropolitan Area to be covered by a water management organization. Addressing local concerns at the time, the founders of the organization chose to omit the northeasterly portion of the county, thereby creating an "orphan area" not covered by watershed management.

In 2001, Washington County completed a comprehensive study of water management governance within its jurisdiction and recommended that some watershed organizations in the county consider merging to achieve economies of scale and combined tax base to support professional administration. The managers of both predecessor organizations began talks and a series of public meetings on the idea of merging and incorporating the "orphan area." In 2007, the Minnesota Board of Water and Soil Resources approved the new Carnelian-Marine-St. Croix Watershed District boundaries and established a seven-member Board of Managers. The new District's first watershed management plan was approved in 2010 and amended in 2015.

Accomplishments of the CMSCWD from 2010 – 2020 include construction of multiple capital improvement projects, development of water management plans, and implementation of programs including landowner assistance, adoption of rules and a permitting program, project maintenance, monitoring, outreach & education, and AIS prevention and management (Table 2-1).



## Table 2-1. CMSCWD Summary of Major Accomplishments 2010-2020

| | | |
|---|---|---|
| **Capital Improvement Projects** | 2012 | Goose Lake Stormwater Basin and Ravine Stabilization reduces 15.5 tons of sediment and 24 lbs. or phosphorus to Goose Lake each year. |
| | 2012 | Silver Creek Ravine Stabilization |
| | 2014 | NPS Ravine Stabilization reduces 4.33 tons of sediment and 3.7 lbs. of phosphorus to the St. Croix River per year. |
| | 2015 | 197th St. Ravine Stabilization reduces 33 tons of sediment and 43 lbs. of phosphorus discharging to the St. Croix River each year. |
| | 2015 | Sand Lake Iron Enhanced Sand Filter reduces an average of 40 lbs. of phosphorus to Sand Lake each year. |
| | 2017 | Marine on St. Croix 16 Bioretention Basins and 2 Iron Enhanced Sand Filters reduce 3.7 tons of sediment and 13.3 lbs. of phosphorus to the St. Croix River each year. |
| | 2019 | Goose Lake Iron Enhanced Sand Filter reduces and average of 40.3 lbs. of phosphorus to Goose Lake each year. |
| | 2020-2021 | Marine Ravine Stabilization reduces 13.0 tons of sediment and 17.0 lbs. of phosphorus discharging to the St. Croix River per year.<br>Marine on St. Croix Village Center Revitalization project pretreatment and filtration facility, 3 bioretention basins, one wetland restoration, and one channel stabilization project reduces 7 tons of sediment and 16.7 lbs. of phosphorus to the St. Croix each year |
| **Inspections & Maintenance** | Inspect and maintain 14 District water quality improvement projects constructed by the District over the last 20 years (in partnership with WCD) | |
| **Landowner Assistance & Cost Share** | Provided technical assistance to 290 landowners and provided cost share to help landowners complete 72 voluntary water quality improvement projects on private lands (in partnership with WCD) | |
| **Permit Program** | Assisted landowners (mostly shoreland properties) in meeting the standards for 176 projects and completed 14 after the fact permit actions. | |
| **Aquatic Invasive Species** | Since 2016, partnered with Washington County to increase public boat ramp inspections at 7 locations. Increased inspections by 3,680 hours from 2016-2019. In partnership with lake associations and landowners, supported Eurasian watermilfoil control on Long Lake and Big Marine Lake (reducing by 48 acres in total); and supported curly-leaf pondweed control on Square Lake. | |
| **Monitoring** | The District has monitored its lakes and streams since its inception. It participates in the Metropolitan Council's Watershed Outlet Monitoring Program (WOMP) for both Carnelian and Silver Creeks. The District monitors 31 lakes and numerous streams. Water monitoring reports found at: www.cmscwd.org/lakes-streams | |
| **Education & Outreach** | With the support of District funding, the East Metro Water Resource Education Program, published 468 weekly articles, staffed 153 events, held 90 water focused workshops, and coordinated 20 clean up events. | |
| **Operations & Maintenance** | Regularly inspected and maintained the Silver Creek and Carnelian Creek drainage ways; cleared obstructions and beaver dams to prevent localized flooding | |
| **Federal and State Grants** | Was awarded and successfully implemented 14 state and federal grants totaling $1.1 million | |
| **Planning** | 2011 | 10 Lakes Total Maximum Daily Load (East Boot, Fish, Goose, Hay, Jellum's, Long, Loon, Louise, Mud South Twin Lakes) |
| | 2013 | Sand and Long Lakes Diagnostic Studies |
| | 2015 | Watershed Management Plan Major Amendment |
| | 2016 | Terrapin, Mays Diagnostic Studies |
| | 2017 | Square Lake Trout Stocking Study |
| | 2018 | Streams Bacterial Assessments (Carnelian, Gilberts, Swedish Flag) |
| | 2020 | Lower St. Croix One Watershed One Plan |

These program and project efforts contributed to water quality improvements across the District over the past decade. Changes in the average total phosphorus (TP) and clarity, measured by secchi depth, for the District's four focused and ten impaired lakes (Table 2-2) shows modest to substantial changes in water quality between the periods of 2004 – 2013 and 2010 - 2019.

**Table 2-2. CMSCWD Summary of 2010 Focused and Impaired Implementation Strategy Lakes Average TP and Secchi Results for Periods 2004-2013 and 2010-2019**

| Lake Name | 2004-2013 June-September Average | | 2010-2019 June-September Average | | 2010 Implementation Strategy |
|---|---|---|---|---|---|
| | TP (µg/L) | Secchi (m) | TP (µg/L) | Secchi (m) | |
| Long (May TWP) | 37 | 2.5 | 35 | 3.23 | Focused |
| Sand | 45 | 2 | 41 | 1.53 | Focused |
| Square | 14 | 5.3 | 11 | 5.24 | Focused |
| Barker | 121 | 1 | 67 | 1.07 | Impaired |
| East Boot | 41 | 2.6 | 24 | 3.53 | Impaired |
| Fish | 101 | 1.1 | 64 | 1.38 | Impaired |
| Goose | 57 | 1.6 | 41 | 1.61 | Impaired |
| Hay | 68 | 1.6 | 38 | 1.48 | Impaired |
| Jellums | 96 | 1.2 | 50 | 1.53 | Impaired |
| Long Lake (Scandia) | 77 | 1.2 | 69 | 0.9 | Impaired |
| Loon Lake | 142 | 0.4 | 82 | 0.44 | Impaired |
| Louise | 149 | 1 | 80 | 1.55 | Impaired |
| Mud | 98 | 0.8 | 87 | 0.46 | Impaired |
| South Twin | 70 | 1.4 | 40 | 1.87 | Impaired |

From 2010-2020 the majority of programmatic and implementation efforts were focused on lakes identified as "impaired" or "focused" implementation strategies. This prioritization of implementation enabled the District to set measurable condition targets for District lakes for the next decade. While the District completed or made progress on a majority of the lakes (Table 2-2), several stream programmatic and implementation items were not completed or started.

In this "fourth generation" watershed management plan, the District aims to set and achieve measurable water quality targets for lakes. Additionally, the District aims to refocus efforts on streams and tributary areas to the St. Croix River by establishing measurable goals. Early in the implementation of this Plan, the District will address programmatic and implementation items through evaluation of current conditions for focused streams, and by prioritizing targeted practices to improve water quality for all streams tributary to the St. Croix River.

# GOVERNANCE STRUCTURE AND DISTRICT ROLE

The District is governed by a seven-person Board of Managers appointed to staggered, three-year terms by the Washington County Board of Commissioners. Local units of government are encouraged to submit their recommendations to the County Board when seats become available. The Board of Managers is responsible for creating the goals, objectives, and policies of the organization as well as overseeing their implementation. In 2007, a full-time administrator was hired to implement the District's policies and programs and to manage daily operations. In 2020, the District added an administrative/program assistant to the staff. The District retains the services of contractors and consultants to assist the Board and the administrator with District operations including engineers, attorneys, accountants, auditors, and education specialists. Professional service contracts are solicited on a bi-annual basis.

The District is also guided by input from its active Citizen Advisory Committee (CAC) and Technical Advisory Committee (TAC). The CAC is a resident-led volunteer advisory group to the District which provides guidance and input on issues important to them in order to continually improve District programs. The CAC assists the Board of Managers on matters affecting the District such as providing feedback on the District's strategic initiatives, organizational plans, policy priorities, educational needs, and volunteer events. CAC members are appointed by the Board of Managers.

The TAC includes representatives from the District's cities and counties, Washington Conservation District, state and federal agencies, and neighboring watershed districts. The TAC aids in the development of the District's watershed management and capital improvement plans, District Rules, and specific projects.

The District maintains an office with regular business hours currently at 11660 Myeron Rd North, Stillwater, MN 55082. This office contains the written records of the organization available to the public and serves as a point of contact for the District's residents. In addition, the District maintains a website at www.cmscwd.org where it posts its meeting schedule, contact information, meeting minutes and agendas, and relevant documents and reports. Information on District Rules and permitting requirements can be found on the District website or obtained at the District office.

The role of the District is reflected in its mission statement: ***"Protect and improve water resources within the jurisdiction of the Carnelian–Marine–St. Croix Watershed District through coordination with local units of government, citizens, and other government agencies."***

The District accomplishes much of its work through partnerships and collaboration with local governments, lake associations, agencies, Lower St. Croix Watershed Partnership, Washington Conservation District, Washington County, St. Croix River Association, and others. These partnerships foster knowledge sharing, improve efficiency, and expand the capacity of the District to meet its goals.

# THE DISTRICT'S ROLE ENCOMPASSES MULTIPLE RESPONSIBILITIES AND KEY ACTIVITIES TO ACHIEVE ITS MISSION AND GOALS INCLUDING:

## Flood Prevention & Channel Maintenance

The early activities of the former Carnelian Marine Watershed District involved solving the flooding issues in the Big Marine Lake sub-watershed which included Big Carnelian Lake, Little Carnelian Lake and a series of wetland systems connecting them. A period of high precipitation in the late 1970's and early 1980's increased water levels in this land-locked basin to unacceptable levels which flooded lake-side houses and saturated private septic systems. The District built and maintains a series of channels and outlets to facilitate unimpeded flow from Big Marine Lake through Little Carnelian Lake and the outlet pipe to the St. Croix River. The range of elevations that the District maintains is a result of negotiations with riparian property owners and the Department of Natural Resources to protect both private property and wetlands within the watershed. The only variable in the system is an adjustable weir downstream of the fixed outlet at Turtle Lake.

## Water Monitoring

Understanding the condition of water resources is critical to effective watershed management. The District has monitored its lakes and streams since its inception with the purpose of detecting water quality trends, prioritizing funding, evaluating implementation projects, and aiding in accomplishing the Districts objectives. It participates in the Met Council's WOMP (Watershed Outlet Monitoring Program) for both Carnelian and Silver Creeks and regularly monitors 31 lakes and numerous streams. The trends established through monitoring are used to set priorities and evaluate performance of its District programs and practices.

## Education

Education has always been a priority of the District and is considered an integral piece of the focused watershed management concept. The District continues to partner with the East Metro Water Resources Education Program to provide consistent and timely education to watershed residents. This collaboration eliminates duplication among various water management organizations and municipalities, provides a consistent education messages, and provides financial savings to residents. In addition, the District is fortunate to have the St. Croix Watershed Research Station, Arcola Mills, and William O'Brien State Park within its boundaries. Each of these institutions has expertise in environmental sciences and provide additional partnering opportunities.

## Studies and Plans

The District's resource management is driven by developing plans and subsequent implementation programs for individual water resources. Individual lake watershed management plans have been prepared for each lake in the District. The major components of the individual lake watershed management plans include lake status, resource goals, and overall assessment. Plans for individual lakes are developed with a great deal of community input and reflect the values that are most important to the lakeshore owners, lake users, and the best science that the District can bring to the process.

Individual stream watershed management plans have been prepared for twenty-two streams throughout the watershed. The major components of the individual stream plans include stream status, macro-invertebrate data, water chemistry data, and overall assessment.

A Comprehensive Wetland Protection and Management Plan and general groundwater management plan have also been developed since 2010. All the plans are updated on a regular basis so they continue to represent current priorities.

## Best Management Practices

In 2001, the District began implementing its newly developed Cost Share Program to share the costs of projects built by private property owners and local governments that have water quality benefits. Policies for implementing the Cost Share Program and ranking criteria to target the best projects are included on the District's website. Through the Cost Share Program, experts in water quality, erosion, and restoration help plan and implement projects such as shoreline stabilization, gully repairs, habitat restoration, stormwater management, and feedlot improvements to protect and improve water resources. Participating landowners must maintain the constructed improvements for a minimum of ten years.

In addition to providing technical and financial assistance to others, the District implements its own Capital Improvement Program to help treat and manage stormwater through large-scale projects. These projects are typically partially grant funded. Recent examples include the Downtown Marine on St. Croix Stormwater Quality Improvements, Marine Ravine Stabilization, and Goose Lake Iron Enhanced Sand Filter.

## Regulatory Program

The goals of the District's regulatory program are to protect and improve the quality of water resources within the District, prevent future property losses due to flooding, and efficiently coordinate District permitting with local, county, state, and federal permitting and enforcement efforts. Development and redevelopment projects, shoreline alterations, and work within the 100-year floodplain are some examples of projects that require a District permit. The program aims to balance property owners' use of their property while ensuring the protection and management of water and surrounding resources.

# III. LAND & WATER RESOURCES INVENTORY

## SEE APPENDIX A FOR COMPLETE INVENTORY

- The Carnelian-Marine-St. Croix Watershed District (CMSCWD) covers 81.4 square miles in northeastern Washington County, Minnesota with 31 lakes, 21 streams, including 10 with brook trout populations, hundreds of acres of wetlands, and more than 17 miles of St. Croix River shoreline (Figure 3-1). Many of its lakes and streams have excellent water quality and significant ecological importance. Unfortunately, 11 lakes and 3 streams do not currently meet state water quality standards and are included on the MPCA's 2020 Impaired Waters List. The watershed is bordered on the east by the St. Croix River, classified by the State of Minnesota as an Outstanding Resource Value Water for its water quality, wildness and other benefits. Unfortunately, the St. Croix River below Taylors Falls dam is included on the state's list of impaired waters because of high levels of phosphorus which can create nuisance algae blooms, decreasing water clarity and degrading habitats and recreational suitability.

The steep terrain along the St. Croix River features many streams, some which drain multiple lakes and numerous spring-fed creeks. Fall's Creek, Mill Stream, Silver Creek, and Willow Brook are some of the larger streams in this section of the watershed. Fall's Creek is considered to be the finest and most ecologically diverse natural area in Washington County. It has state-wide significance and is home to a naturally reproducing population of Brook Trout.

Further to the west, many lakes and wetlands are interconnected, but ultimately landlocked as they do not flow into the St. Croix River. These areas likely serve as important groundwater recharge areas. There are few well defined drainage systems in this area, indicating the permeable nature of the soils and the relatively flat relief of the terrain. One well-defined drainage system includes Carnelian Creek. This extensive waterway traverses almost 9 miles through three communities and connects numerous wetlands along its path from Big Marine Lake through Turtle, Bass and Big Carnelian Lakes and finally into Little Carnelian Lake. The natural watercourse of Carnelian Creek was modified by a major project completed in 1985, referred to as the "Carnelian-Marine Lakes Gravity Outlet." The main

purpose of the project was to alleviate flooding around Big Marine Lake, Big Carnelian Lake and along the entire watercourse.

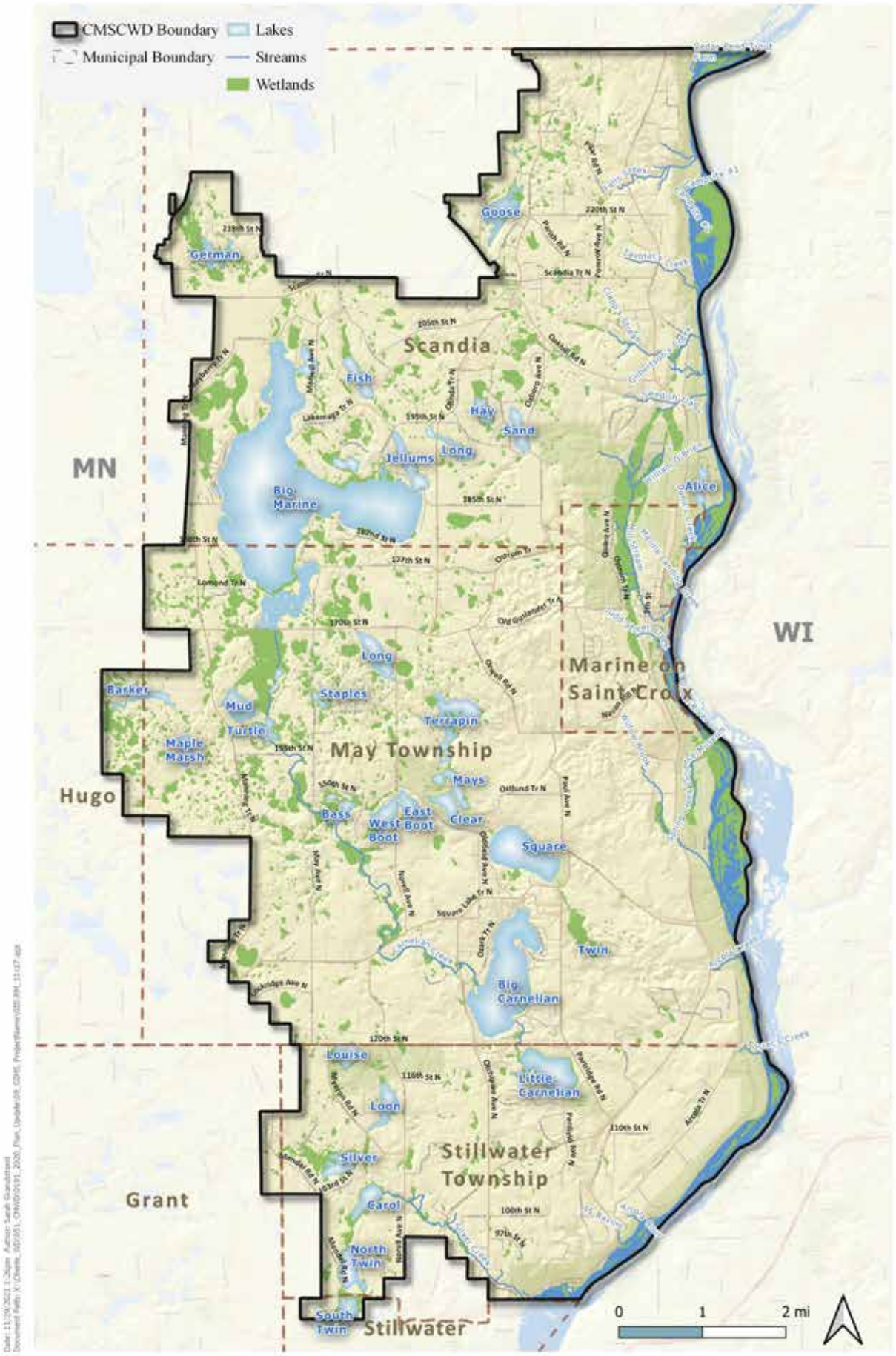
Many of the 31 named lakes in the District, lie within parkland or protected areas including Big Marine Lake, Terrapin Lake, Mays Lake, Clear Lake, Lake Alice and portions of Square Lake. The remaining lakes are generally surrounded by large lot residential homes, including Big Carnelian and Little Carnelian Lakes.

Likely the most notable hydrologic feature within the District is Square Lake. Square Lake is heavily researched and consistently has excellent water quality of any lake in the seven-county metro area with an average Secchi disk reading of 17.06 feet (2010-2019).

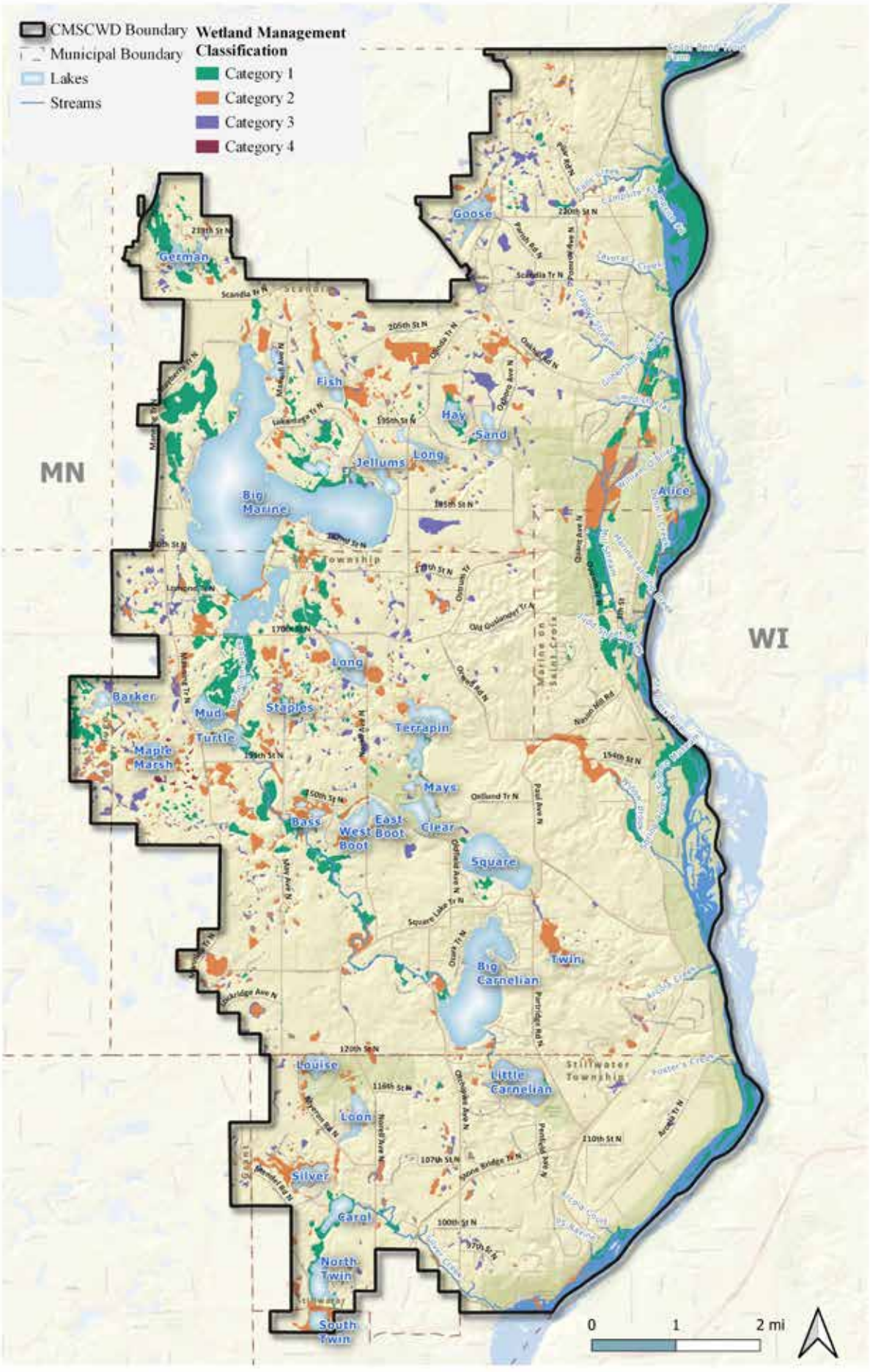
In addition to water resources, the District has many areas of valuable natural communities including high quality woodlands, floodplain forests, prairies, and wetlands. There are over 2,200 distinct wetlands within the District. Overall, Washington County is estimated to have lost about 50% of its presettlement wetlands, however, a desktop analysis of wetland restoration potential in the District found little evidence of excessive wetland draining due to agricultural activities including row crop cultivation, sod farms, and pastures. Many wetlands in the District are categorized as high-quality wetlands with exceptional vegetative diversity/integrity and other functions and values (Category 1) (Figure 3-2).

A complete Land and Water Resources Inventory is found in Appendix A. Data and information on each of the District's lakes and streams can be found at www.cmscwd.org/lakes-streams.

## Figure 3-1. Carnelian-Marine-St. Croix Watershed District



## Figure 3-2. Wetland Locations and Classifications



# IV. WATERSHED ISSUES & GOALS

## A. ASSESSMENT OF ISSUES

Developing an effective watershed management plan begins with a comprehensive review of current issues, concerns, and priorities that should be addressed through plan implementation. The District engaged a variety of stakeholder groups to gather input on watershed issues, and reviewed existing plans and programs. District staff, the Board of Managers, and the Citizen Advisory Committee reviewed and considered this information in their assessment of issues. The issues included in this Plan reflect the most pressing concerns in the watershed which will be addressed through District projects, programs, and partnerships.

To develop issue statements, the concerns identified by stakeholder groups and issues identified in existing plans were examined for commonality and, where available, for congruent priority levels. Issue categories were assigned as an overarching theme and sub-categories were developed in some cases. Broad statements describing the issue and impact on watershed resources were formulated to help inform the goals and implementation activities included in the Plan.

The initial planning meeting (required under MN Rules 8410.0045) was held with the CMSCWD Board of Mangers on November 12, 2020. Legal notice of the meeting was provided two weeks prior to the meeting on the CMSCWD website. During the meeting, all comments received from agencies and the public were reviewed. No members of the public or agencies provided comment at the meeting. The CMSCWD Board of Managers discussed and considered the draft issue statements and determined general priority levels for each issue. Issues were assessed by the Board based on stakeholder input and on the board members' knowledge of existing and successful District programs and activities, along with District capacity for addressing the issue. Each lake and stream in the District was placed in a "focused" or "routine" implementation strategy category based on current water quality, water quality trends, and proximity to water quality standard thresholds (Section VI.A.). Later in the plan development process, additional prioritization exercises were completed by the Board for specific implementation activities (Section VI.A. and Table 6-3).

## i. AGENCY AND STAKEHOLDER INPUT

At the outset of the plan development process, and in accordance with MN Rule 8410.0045, Minnesota state agencies including the Board of Water and Soil Resources, Pollution Control Agency, Department of Natural Resources, and Department of Agriculture, along with the Metropolitan Council listed their priority issues and provided ideas for addressing issues and collaborating on solutions. Common themes among their input included the need for targeted and measurable implementation, the impacts of climate change, and the importance of project maintenance. Agency input letters are found in Appendix G.

The District's Technical Advisory Committee (TAC) identified a long list of watershed issues and data needs to consider for inclusion in the Plan. They also assigned a priority level for each issue to help District staff and Managers in developing the final list of issues to address.

Input from the public was gathered through two public listening sessions, a survey for shoreland homeowners, and a general landowner survey. The surveys included questions related to the values, issues, and priority actions related to water resources and land conservation. The shoreland survey was mailed to the 820 shoreland owners in the District and a link to the general landowner survey was included in the District's newsletter which is distributed to all 3,680 property owners in the District. Responses from 146 shoreland owners and 169 additional residents were received, resulting in an overall response rate of 8.5%.

Residents identified aquatic and terrestrial invasive species, and pollution from stormwater runoff as the most pressing concerns with bluff, stream, and lake shore erosion listed near the top as well. Further, the survey shows that residents believe the most important actions the District should take include preventing the spread of aquatic invasive species (AIS), enforcing rules, and ensuring clean and safe lakes, streams, and wetlands. Survey results are found in Appendix G.

The District's Citizen Advisory Committee (CAC) provided their priority issues and recommendations to the District Board after consideration of the survey results and given their own desires for the watershed. The CAC recommendations included expanding public outreach and education; increasing protection from and management of AIS; enforcing District Rules; evaluating, protecting, and restoring water resources; constructing and providing technical assistance on water quality projects; increasing groundwater monitoring; and enhancing shoreland programs. Complete CAC recommendations are found in Appendix G.

## ii. REVIEW OF RELEVANT PLANS AND PROGRAMS

In addition to incorporating input from stakeholders, this Plan directly or collaboratively addresses priority concerns found in local surface water management plans and the Lower St. Croix River Comprehensive Watershed Management Plan. Consistency among plans is an important consideration that allows for more robust, focused, and coordinated implementation.

Further, this Plan builds on the successful implementation of the 2010 Carnelian-Marine-St. Croix Watershed Management Plan and the important updates incorporated into the Plan in 2015. Issues were reviewed in the context of past District accomplishments along with the latest monitoring and assessment data. Issues that continue to impact natural resources in the watershed are included again in this Plan. And, new issues, such as the impact of climate change and the increasing need for climate resiliency, were added.

## B. WATER QUALITY ISSUES AND GOALS

Protecting and improving the quality of lakes, streams, wetlands, and the St. Croix River is paramount to the vision and function of the District and a primary driver for the District's very existence. Eleven District lakes and three District streams do not currently meet water quality standards and are listed as impaired on the State's 303(d) list for 2020. (Although some waterbodies are being considered for delisting, or being removed from the 303(d) list, in 2022.) Other lakes and streams are near the impairment threshold, while still other waterbodies have good water quality and deserve protection from future degradation.

The St. Croix River was recently added to the list of impaired waters due to excess nutrients. Thirteen District streams flow into the St. Croix, providing the District an opportunity to help improve the River as stream water quality improves.

Water quality is most often impacted by point and non-point sources of pollution. Point source pollutants discharge to surface waters at a specific location from a specific identifiable source. Non-point source pollution cannot be traced to a single source or pipe. Instead, pollutants are carried from land to water in stormwater or snowmelt runoff, in seepage through the soil, and in atmospheric transport. Water quality also impacts the ecological health of waterbodies as does the quality of habitat, including shoreline or streambank quality, and abundance of native vs. non-native plant and animal populations.

The most common and concerning non-point source pollutants impacting District waterbodies include phosphorus and other nutrients, sediment, pathogens, and chlorides. Pesticides, oil, grease, litter, and other pollutants are also a concern in some areas. Non-point sources of pollution in the watershed are multiple and varied. The most common sources include runoff from row crop agriculture and feedlots; runoff from construction sites, residential and urban lawns, roads, driveways, rooftops, and other impervious surfaces.

In District lakes and some wetlands, phosphorous is the pollutant of highest concern.

Eleven District lakes are considered impaired due to high phosphorus concentrations and some other lakes are near the impairment threshold. As total phosphorus (TP) loads increase, water quality degradation often accelerates, resulting in excess algae growth or algal blooms. Algal blooms, overabundant aquatic plants, and nuisance or exotic species, such as Eurasian watermilfoil, purple loosestrife, and curly-leaf pondweed, will flourish and interfere with ecological function as well as recreational use and the aesthetics of waterbodies.

Sediment pollution often originates from eroding streambanks or shorelines and eroding agriculture fields, roads and construction sites. Sediment contributes to poor water clarity that affects vegetation growth and deposits onto stream and lake beds, smothering aquatic habitats. It is also a substrate to which phosphorus and other pollutants bind.

Chloride enters waterbodies when winter deicers (salt) wash off roads, parking lots, sidewalks, and driveways during rain or snowmelt events. Chloride is toxic to aquatic life, just one teaspoon per five gallons of water will render the water too salty for freshwater organisms. Further, it's a permanent pollutant; once fully dissolved in water and cannot be removed without reverse osmosis.

Water quality monitoring, long term trend analyses, subwatershed assessments, and other diagnostic tools can and will help the District identify pollutants and their sources in order to target appropriate programs, projects, and protection measures.

The following table lists issues impacting water quality and the goals aimed at addressing the issue. Across the District, Plan implementation is expected to reduce total phosphorus loading to District lakes, streams, and the St. Croix River by an estimated 434 pounds per year through capital projects, regulatory programs, and technical assistance/cost share programs. Water quality goals for specific District lakes and streams are found in Section V.

| | WATER QUALITY ISSUE STATEMENTS | WATER QUALITY GOALS |
|---|---|---|
| WQ1 | Water quality of lakes, streams, and the St. Croix River need protection and improvement | High quality and unimpaired lakes and streams continue to meet State standards |
| WQ2 | St. Croix River water quality deserves priority protection and improvement | Water quality of District tributaries to the St. Croix River improves<br>Reduce total phosphorus loading to St. Croix River by 100 pounds per year |
| WQ3 | Bluff lands require stabilization and protection to reduce erosion | Completed St. Croix and Spring Streams subwatershed analysis, inventory and prioritization of unstable bluffs to reduce phosphorus loading by 30 pounds per year within catchments directly flowing into the St. Croix River |
| WQ4 | Multiple lakes and streams do not meet water quality standards for aquatic life and/or recreational use | Ten-year trend in water quality improves in impaired waters where quality is near threshold: Fish Lake, Long Lake (Scandia), Goose Lake, Barker Lake |
| WQ5 | High stormwater volume contributes to erosion, pollution, and exacerbates flooding | Total volume of stormwater runoff per acre decreases for 1 year storm events (for estimated 100 acres) |
| WQ6 | Polluted runoff from agricultural and rural lands contributes to poor water quality in some lakes and streams | District CIP projects and cost share programs in agricultural and rural lands annually result in total phosphorus reduction of 360 pounds per year with targeted projects for focused resources, including St. Croix River |
| WQ7 | Pollutants in urban and residential stormwater runoff contribute to poor water quality in some lakes and streams | District CIP projects and cost share programs in urban and residential lands annually result in total phosphorus reduction of 74 pounds per year with targeted projects for focused resources, including St. Croix River |
| WQ8 | Technical and financial assistance programs for BMP implementation are a critical mechanism for reducing pollution | District partners with landowners to install BMPs through its cost share program, resulting in total phosphorus reduction of 310 pounds per year |
| WQ9 | Shorelands and riparian areas are degraded by landuse practices and erosion and should be protected and stabilized to prevent erosion and improve habitat | • Establish baseline natural shoreline on 10 water resources<br>• Increase natural shoreline area and quality on 6 water resources<br>• Complete 19 shoreline restoration projects during life of plan (WQ2, WQ9, WQ10)<br>• Discourage alteration of stable shorelines or streambanks |
| WQ10 | Lake monitoring should target high priority lakes and water quality goals should be reassessed | All lakes are monitored consistent with the 10-year lake monitoring plan |
| WQ11 | Stream monitoring should be expanded and water goals reassessed | All streams are monitored to identify stream health trends |
| WQ12 | Project targeting and prioritization is needed through subwatershed analyses and other assessments | St. Croix and Spring Streams Subwatershed Analyses for the areas tributary to the St. Croix River is completed in 2023 and targeted monitoring of 14 priority degraded wetlands is completed in priority areas to target District projects and practices |

# C. WATER QUANTITY, FLOOD RISK, AND CLIMATE RESILIENCY ISSUES AND GOALS

In natural, undeveloped settings, the landscape provides vast areas where precipitation infiltrates into the ground or is stored in large areas of wetlands where it flows out through meandering streams and connected lakes. Conversely, developed areas and agricultural fields significantly alter the hydrology of surface waters by allowing precipitation and snowmelt to runoff faster over unvegetated areas and/or through ditches and off acres and acres of impervious surfaces like roads, parking lots, and buildings. The less water that infiltrates into the ground, the more water is pushed through the ditches and storm sewers, and often into lakes, streams, and remaining wetlands. In addition, climate change has resulted in larger and more intense rain events, further exacerbating the problems which sometimes overwhelms water conveyance systems. As water rises on landlocked basins, streams or rivers throughout the District, surrounding properties are increasingly at risk for incurring structural or ecological damage.

Evaluating and managing the risk of flooding is an important function of the District, County and State due to the potential threat to public health and safety, infrastructure, and the environment. In addition to property damage, flooding may cause other impacts that are harder to quantify, including:

- Flooding of roads making them impassable to emergency vehicles and residents
- Shoreline and streambank erosion and the destruction or alteration of riparian habitats
- Restricted recreational use of waterbodies, trails, and adjacent lands

The District will work to coordinate with local, county and state entities to minimize potential flood damage through planning and development efforts. Regular inspection and maintenance of the Carnelian Outlet Pipe and Channel is a critical mechanism to help alleviate flooding and manage flows.

| | CLIMATE CHANGE, WATER QUANTITY AND FLOOD RISK ISSUE STATEMENTS | CLIMATE CHANGE, WATER QUANTITY AND FLOOD RISK GOALS |
|---|---|---|
| FLOOD1 | Increasing rainfall and storm intensity presents challenges for water management | Adapt to changing climate by evaluating impacts and collectively adapting strategies to address emerging issues driven by a changing climate through completion of Floodplain Resiliency and Engagement Activity |
| FLOOD2 | Implementation of Carnelian Outlet Pipe and Channel inspection and maintenance plan is critical to a well-functioning drainage system | Ensure the Carnelian Channel and Outlet Pipe adequately and safely convey flows through implementation of the Carnelian Channel Operation and Maintenance Plan |
| FLOOD3 | Flooding threatens structures, land uses, and native ecosystems around landlocked basins and along other waterbodies | Increase floodplain capacity through implementation of rules, implementation of resiliency evaluation strategies, and landowner actions. (Also see related goals for WQ5) |

# D. GROUNDWATER ISSUES AND GOALS

Groundwater is an important resource throughout the District as it accounts for 100% of the region's drinking water and many streams, lakes, and wetlands are directly connected to groundwater aquifers. Currently, groundwater quality in both the private and public wells is good to excellent. And, at present, groundwater quantity is sufficient to provide adequate volume to private and public sources and maintain base flow to local natural resources. However, due to the District's topography and soils, large areas of the water table aquifer and near surface materials are vulnerable to contamination. Further, as the District's population grows, groundwater use is likely to rise and recharge areas (where water is allowed to soak into groundwater aquifers) are more likely to be covered by development, thereby threatening groundwater availability.

The District seeks opportunities to improve groundwater quality and quantity, particularly as a secondary benefit to surface water management activities. The District also collaborates with Washington County in the implementation of the Washington County Groundwater Plan.

| | GROUNDWATER ISSUE STATEMENTS | GROUNDWATER GOALS |
|---|---|---|
| GW1 | Groundwater quality is threatened by known and existing contaminants | Groundwater quality is protected through proper disposal of chemicals and pharmaceuticals, reduction of chloride deicers, and expanded use integrated pest management and regenerative agriculture |
| GW2 | Groundwater supply may be impacted by overuse, diminished recharge areas, or drought | • Connections between groundwater and groundwater dependent natural resources are understood<br>• Groundwater dependent natural resources are protected |
| GW3 | Failing and non-conforming Subsurface Sewage Treatments systems (SSTS) may contribute to groundwater pollution from chemicals and pharmaceuticals | Residents are educated about the impacts of failing and nonconforming Subsurface Sewage Treatment Systems (SSTS) through implementation of District Communication and Outreach Plan |

# E. AQUATIC INVASIVE SPECIES ISSUES AND GOALS

Perhaps one of the greatest threats to the ecological health of a waterbody is the overabundance of invasive species. Aquatic invasive species (AIS) continue to spread throughout the region. While the pathways by which each AIS is spread continue to be studied, the ecological harm caused by those organisms is well documented. Transport by humans and other vectors is certainly a cause. In other cases, environmental anomalies such as high-water levels reduce existing vegetation and provide opportunities for new colonies of AIS to establish. Regardless of the species, once established AIS threaten the ecological integrity of natural communities and often the recreational suitability of a waterbody.

| | AQUATIC INVASIVE SPECIES (AIS) ISSUE STATEMENTS | AQUATIC INVASIVE SPECIES GOALS |
|---|---|---|
| AIS1 | AIS infestations threaten aquatic ecosystems, recreation, and property values | Known populations of AIS that impair water quality are declining in size and or density including Eurasian watermilfoil, curlyleaf pondweed. |
| AIS2 | AIS should be prevented from spreading to new waterbodies | Deter AIS from being introduced to District lakes by watercraft through collaborative inspections, education, and enforcement. |

## F. UPLAND RESOURCES ISSUES AND GOALS

The ecological integrity of prairies, forests, shorelands, and riparian areas is directly tied to the overall health of the watershed and water resources. Threats to upland resources are as varied and widespread as those that impact lakes and streams including development, agriculture, pesticides, and invasive species. Land protection and restoration activities are needed, particularly when they directly or indirectly impact the health of adjacent water resources. Shoreland and bluffland property owners have a unique role in improving and protecting steep slopes, lakeshores, and riparian areas. The intricate connection between water resources health and riparian health should be a cornerstone of education and outreach to shoreland owners and lake, river, and stream users.

Natural Resources Inventories are periodically completed by the District and can provide valuable information to help target critical management needs and

| | UPLAND RESOURCES (UP) ISSUE STATEMENTS | UPLAND RESOURCES GOALS |
|---|---|---|
| UP1 | Shoreland and upland habitat are degraded from loss of native species or infestation of terrestrial invasive species, like buckthorn, can impact water quality and threaten ecosystem health | Increase terrestrial invasive species management and/or native vegetation restoration of private and public lands around focused lakes and streams including 60 projects or 200 acres of shoreline |

# G. WETLANDS ISSUES AND GOALS

Wetlands serve critical functions on the landscape including a habitat for fish and wildlife, flood storage and attenuation, filtration and absorption of pollutants, and groundwater recharge. Development and agriculture threaten the quality and quantity of wetlands. Historic land use contributed high amounts of sediment and nutrients to some wetlands. These legacy pollutants have degraded wetlands and sometimes transitioned them to be a source of nutrients to lakes and streams.

In 2008, the District completed a Comprehensive Wetland Management Plan that included a complete inventory and functional assessment for all the wetlands in the District and supplemented existing state and federal regulations to add additional protection and flexibility to wetland management in the District. Emphasis was placed on maintaining and protecting the diverse array of high value and high function wetlands within the District. Updated surveys and assessments are needed in the coming years, particularly to determine critical restoration or protection needs.

Periodic monitoring of wetlands can provide accurate information on the extent of nutrient loading to lakes and streams.

| | WETLANDS (WTL) ISSUES STATEMENTS | WETLANDS GOALS |
|---|---|---|
| WTL1 | Wetland water quality and habitat is degraded and hydrology impacted by land-use practices. | • Increase the quantity and quality of wetlands within the CMSCWD<br>• Ensure no net loss of wetland functions and values within CMSCWD<br>• Limit alterations of natural hydrology of wetland basins<br>• Collaborate to facilitate native tree transition of black ash wetlands that will be decimated by Emerald Ash Borer. |
| WTL2 | Periodic wetland surveys and assessments are needed to assess changes and ensure protections | • Evaluate 14 wetlands and mitigate nutrient contributions from high loading wetlands to focused water resources |

# H. EDUCATION, OUTREACH, ENGAGEMENT ISSUES AND GOALS

Since most land in the District is privately owned and the actions of each resident may positively or negatively impact natural resources, education of watershed residents is clearly an important endeavor. The District and other governments and agencies can only regulate so many activities or install so many projects. It is up to the collective actions of all residents to help protect and improve natural resources. Currently, the District partners with the East Metro Water Resource Education Program (EMWREP) through the Washington Conservation District to provide a wide array of educational opportunities and materials. EMWREP seeks to educate community residents, businesses, staff and decision-makers about issues affecting local lakes, rivers, streams, wetlands and groundwater resources and to engage people in projects that will help to protect and improve the health of these water resources.

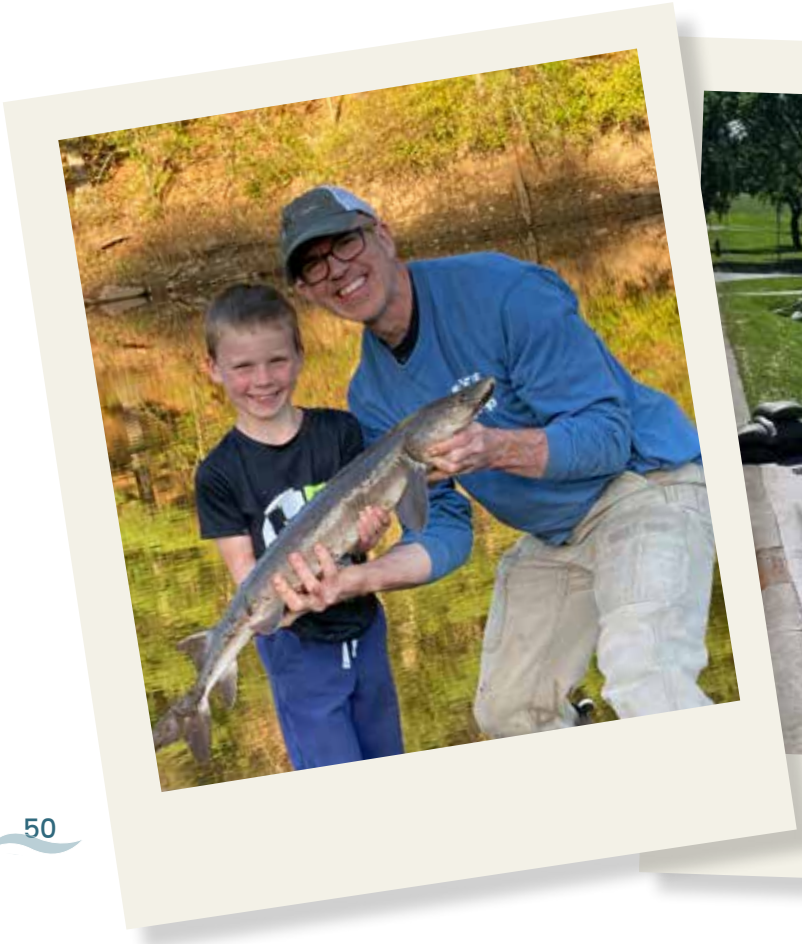
Additional opportunities for education may be needed in the future. In their review of survey responses to gather input for this Plan, the District's Citizen Advisory Committee (CAC) noted a "strong overarching need for improved public education and engagement." CAC members believed the survey results revealed a general lack of understanding among many landowners as to the District's agenda, programs, and resources. CAC members recommended an expansion of existing programs and development of new education programs and approaches to increase knowledge and to inspire and engage communities and landowners in resource protection and restoration.

| | EDUCATION & OUTREACH (E&O) ISSUE STATEMENTS | EDUCATION & OUTREACH GOALS |
|---|---|---|
| E&O1 | Watershed residents and public officials do not fully understand their impacts and actions they can take to protect water resources | Implement 10-year Communication and Outreach Plan: Disseminate information on District current and ongoing work, outcomes, and water quality data and trends |
| E&O2 | Watershed District's work is not fully visible to our stakeholders and residents | Implement 10-year Communication and Outreach Plan: Disseminate information to various stakeholders and engage landowners in high priority areas |

# I. WATERSHED MANAGEMENT AND OPERATIONS ISSUES AND GOALS

The Carnelian-Marine-St. Croix Watershed District has always streamlined its operations while providing crucial management of water resources. The District's proper implementation of this Plan and its programs, the consistent and proper enforcement of rules, and continued streamlined operation of its core functions will be maintained. Partnerships and collaboration with local governments, state agencies, the Lower St. Croix Partnership, the St. Croix River Association, and watershed residents will also be critical to successful watershed management.

While the enforcement of existing District Rules is an important tool for improving and protection resources, expanded controls such as local ordinances or District Rules may also be sought including the use of Minnesota Minimal Impact Design Standards (MIDS) and strengthened bluff protections and erosion control.



| | WATERSHED MANAGEMENT & OPERATIONS ISSUE STATEMENTS | WATERSHED MANAGEMENT & OPERATIONS GOALS |
|---|---|---|
| O&M1 | The District's partnership with all levels of governments, the agricultural community, and organizations is critical to reaching its goals | • The District will actively foster and maintain communications and partnerships with governments, organizations, and landowners.<br>• The District will react in a timely manner to the concerns of citizens, agencies, and local government |
| O&M2 | Streamlined planning, transparency, responsiveness, and focus are critical to effective and efficient District operations | The District will maintain and follow a publicly published annual budget and work plan reflecting District priorities and targeted implementation |
| O&M3 | District rules should be clear, impactful, streamlined, and enforced | • District Rules and permit program reflect current science and are reviewed for applicability and consistency.<br>• Consider adopting portions of Minimal Impact Design Standards (MIDS) to streamline permitting and incorporate consistent standards without jeopardizing the District's resource protection goals.<br>• Establish Shoreland Compliance and Enforcement Team. |
| O&M4 | Inconsistent standards create confusion and reduce effectiveness and efficiency of permitting | • Support member community's adoption of MIDS or more restrictive requirements into local ordinance.<br>• Support member community's adoption of shoreland management ordinance. |
| O&M5 | Past District projects require annual inspection and maintenance to ensure expected pollutant removals. | The District will continue to implement an annual inspection and maintenance program |
| O&M6 | Erosion and sediment control is needed for land disturbing activities | All land disturbing activities that meet applicability criteria are reviewed and inspected for proper erosion and sediment control. |

# V. WATER RESOURCE MANAGEMENT STRATEGIES & SPECIFIC WATER QUALITY GOALS

The improvement and protection of District water resources is the main priority of the District. The majority of the projects and programs laid out in this Plan are aimed at identifying and addressing pollutant loads to District lakes and streams and the St. Croix River; and protecting wetland health and function. Tables 5-1 and 5-2 list the measurable goals and outcomes anticipated for each lake and stream resulting from the Plan's implementation over the next 10 years. The map in Figure 5-1 shows outcomes across the watershed.

## FOCUSED VS. ROUTINE IMPLEMENTATION

The District categorized its lakes and streams as "focused" or "routine" for purposes of concentrating implementation where the most benefit could be achieved (Tables 5-1 and 5-3). The designation is partially based on whether a waterbody is considered impaired. Impaired resources are included on the State's 303(d) list as not meeting State water quality standards. Eleven lakes, three streams, and the St. Croix River are listed as impaired on the MPCA's 2020 303(d) list.

The purpose of Focused Implementation is to provide an additional level of protection for non-impaired resources so they do not become impaired, and to boost effort for barely impaired resources that might easily return to an unimpaired state. Examples of the former include Big Marine and Big Carnelian Lakes which were recently found to be "nearly impaired" for aquatic life. In addition to the District's Routine program activities that will be implemented throughout the entire District, program activities are enhanced in "Focused Implementation"

The **Focused Implementation Strategy** is assigned to lakes and streams meeting one of two thresholds:

1. **Impaired waters** which are closest to meeting state water quality standards
2. **High-quality unimpaired** waters that have a declining trend in water quality

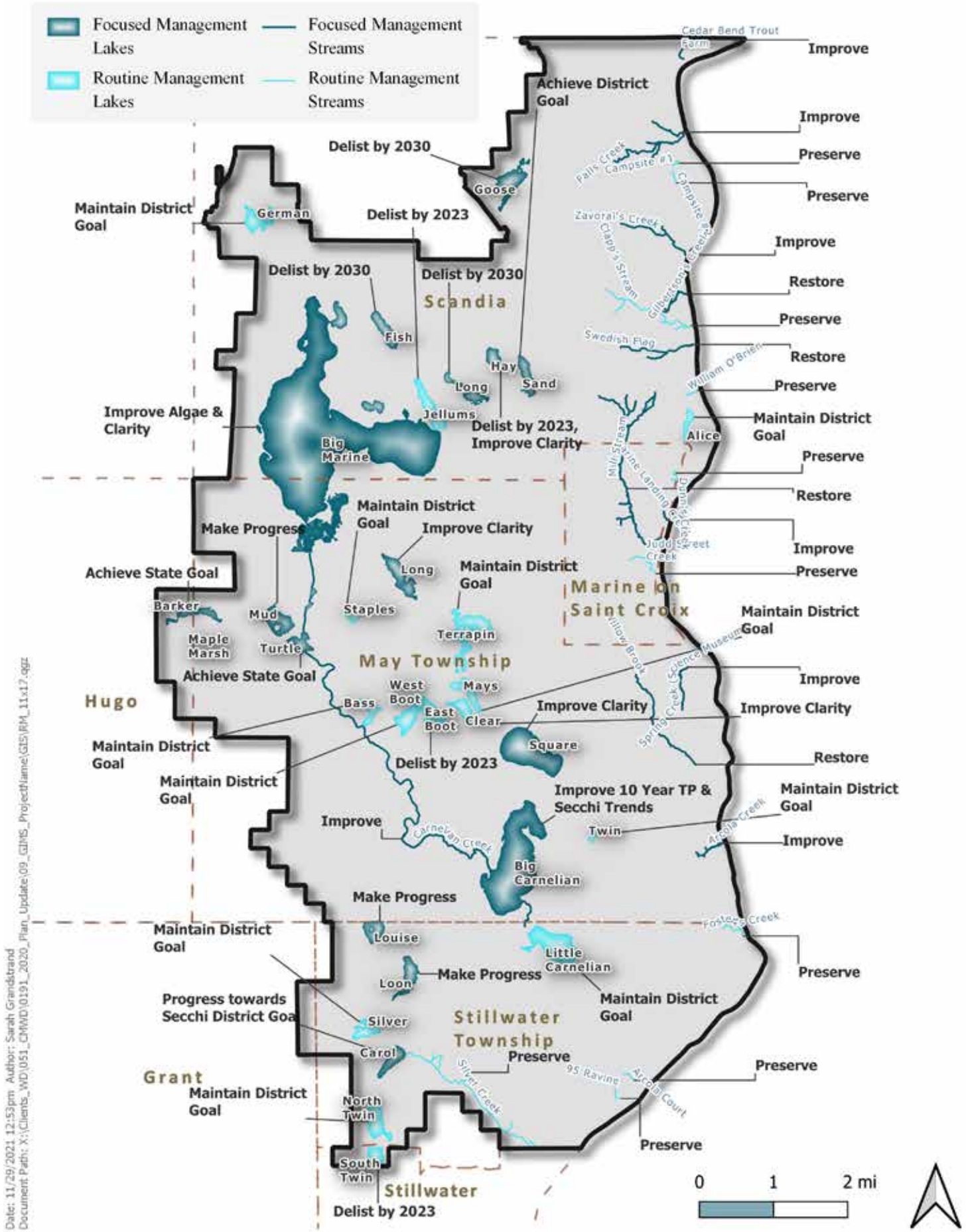
The **Routine Implementation Strategy** is assigned to lakes and streams meeting one of two thresholds:

1. **Unimpaired waters** that do not show any water quality trend
2. **Other waters** that are not assigned for "Focused Implementation"

areas. As an example, the District actively works to identify and prioritize cost-share projects, apply for competitive grants, and engage with property owners to help solve an identified problem. Likewise, the Education Program concentrates on the issues in the "Focused Implementation" resource watershed through resident meetings, workshops, mailings, signage, promotions, etc.

Routine Implementation is the basic management strategy implemented throughout the District for each of the District programs. For example, "Routine" District Cost Share Program activities consider applications for implementation of BMP projects but not actively solicit them. The purpose of Routine Implementation is to provide a basic level of protection of these non-impaired resources so they do not become impaired. This basic level of service is robust enough to identify when water resources need to be assigned focused management strategies to prevent further decline in quality.

## Figure 5-1


Focused Management Lakes
Routine Management Lakes
Focused Management Streams
Routine Management Streams
Cedar Bend Trout Farm
Improve
Achieve District Goal
Improve
Preserve
Preserve
Delist by 2030
Goose
Falls Creek Campsite #1
Campsite
Maintain District Goal
German
Delist by 2023
Zavoral's Creek
Clapp's Stream
Improve
Restore
Delist by 2030
Delist by 2030
Scandia
Fish
Gilbertson Creek
Preserve
Swedish Flag
Restore
Hay
Sand
Long
William O'Brien
Preserve
Improve Algae & Clarity
Jellums
Delist by 2023, Improve Clarity
Big Marine
Alice
Maintain District Goal
Preserve
Mill Stream
Marine Landing Creek
Restore
Maintain District Goal
Make Progress
Improve Clarity
Judd Street Creek
Improve
Preserve
Achieve State Goal
Long
Maintain District Goal
Marine on Saint Croix
Barker
Mud
Staples
Maintain District Goal
Terrapin
Willow Brook
Science Museum
Maple Marsh
Turtle
May Township
Achieve State Goal
Improve
West Boot
Mays
Hugo
Bass
East Boot
Clear
Improve Clarity
Improve Clarity
Spring Creek
Square
Maintain District Goal
Delist by 2023
Restore
Maintain District Goal
Improve 10 Year TP & Secchi Trends
Maintain District Goal
Improve
Carnelian Creek
Twin
Arcola Creek
Improve
Big Carnelian
Make Progress
Maintain District Goal
Louise
Forestedge Creek
Little Carnelian
Preserve
Loon
Make Progress
Maintain District Goal
Progress towards Secchi District Goa
Silver
Stillwater Township
Carol
Preserve
Preserve
95 Ravine
Arcola Court
Grant
Maintain District Goal
Silver Creek
North Twin
Preserve
South Twin
Stillwater
Delist by 2023
0
1
2 mi
Date: 11/29/2021 12:53pm Author: Sarah Grandstrand
Document Path: X:\Clients_WD\051_CMWD\0191_2020_Plan_Update\09_GIMS_ProjectName\GIS\RM_11x17.qgz

# OUTCOMES OF PLAN IMPLEMENTATION

**(SEE FIGURE 5-1)**

## LAKES

### DELIST

*East Boot (2023)*
*South Twin (2023)*
*Hay (2023)*
*Jellum's (by 2023)*
*Goose (2030)*
*Long (by 2030) (Scandia)*
*Fish (by 2030)*

### IMPROVE

*Square (clarity)*
*Clear (clarity)*
*Big Marine (algae & clarity)*
*Big Carnelian (algae & clarity)*
*Hay (clarity)*
*Long (clarity) (May Township)*

### MAKE PROGRESS

*Loon, Louise, Mud*

---

## STREAMS

### RESTORE

*Mill Stream*
*Willow Brook*
*Gilbertson's*
*Swedish Flag*

### IMPROVE

*Arcola*
*Falls*
*Marine Landing*
*Spring*
*Carnelian Creek*
*Cedar Bend Trout*
*Zavoral's*

# TOTAL MAXIMUM DAILY LOADS (TMDLS) & POLLUTANT REDUCTIONS

Ten lakes and streams in the District have completed TMDL studies that prioritize, budget, and schedule implementation activities to improve water quality to meet State standards. Activities within TMDL Implementation Plans are incorporated into this Plan along with additional diagnostic analyses to further target projects, as needed. See Section VI.A. for additional information on prioritizing and targeting.

## ST. CROIX RIVER

The District was allocated a phosphorus reduction of 1,802 lb/yr (or 32%) as part of the Lake St. Croix TMDL and basin-wide phosphorus reductions goals. Implementation of this Plan is expected to reduce annual total phosphorus loading to the St. Croix River by 100 pounds. Projects and programs resulting in phosphorus load reductions in subwatersheds contributing to the St. Croix will be tracked for progress toward this goal and the TMDL load reduction allocation. The TMDL report, implementation plan and other documents can be found at: www.pca.state.mn.us/water/tmdl/lake-st-croix-excess-nutrients-tmdl-project.

The St. Croix River is also impaired for aquatic consumption because of mercury and PCBs in fish tissue. Mercury is a multimedia pollutant: transported by air, stored in soil, and chemically transformed and bioaccumulated in aquatic organisms. PCBs, or polychlorinated biphenyls, were often used in manufacturing from the 1950's until 1978. In 2007, the MPCA completed a statewide TMDL study and implementation plan to address mercury impairments statewide. The PCB TMDL study expected completion date is 2021. The St. Croix River was not assigned an impaired implementation strategy since District management capabilities and authority are not sufficient to address these impairments.

## WETLANDS

Appendix D of this plan contains the CMSCWD Wetland Management Plan which supplements existing state and federal regulations and adds additional protection and flexibility to manage the wetlands in the District. The overall goal of the District's Wetland Management Plan is the protection of the functions and diversity of District wetlands, and to lay the groundwork for enhancement of these resources. The District acknowledges both the ecological value of high-quality wetlands such as vegetative integrity and the watershed services wetlands provide such as groundwater recharge and flood protection.

Similar to high quality lakes in the District, priority is assigned to the higher functioning wetlands. In the case of wetlands, utmost emphasis is placed on maintaining and protecting the diverse array of highly valued and high functioning wetlands within the District, with secondary focus on restoration.

The Wetland Management Plan includes a prioritized list of wetland functions shown in the order of priority as:

1. Ground Water Interaction
2. Maintenance of Characteristic Vegetative Diversity/Integrity
3. Maintenance of Hydrologic Regime
4. Maintenance of Wetland Water Quality
5. Flood/Stormwater Attenuation
6. Downstream Water Quality
7. Maintenance of Characteristic Wildlife Habitat Structure
8. Maintenance of Characteristic Amphibian Habitat
9. Maintenance of Characteristic Fishery Habitat

This ranking combined with the results of the Wetland Functional Assessment serves as the basis for District's wetland classification system that establishes four management categories. These management categories are defined in the wetland plan and in the District Rules. (See Appendix D for a complete description of the four management categories and associated criteria.)

In summary, the management categories in decreasing level of protection are listed below. Further prioritization of protection and restoration activities will be accomplished through subwatershed assessments and other diagnostic activities implemented during the life of this plan.

Category 1. High Quality/Highest Priority wetlands that in general have high quality vegetative communities, are groundwater dependent, and/or provide exceptional wildlife habitat.

Category 2. Stream Corridor & Shoreland Wetlands that are not Category 1.

Category 3. Isolated Wetlands that are not Category 1.

Category 4. Utilized Wetlands that include basins that have been severely degraded by anthropogenic sources.

Early in 2021 the Washington Conservation District performed a simple GIS desktop analysis to determine the lack or presence of restorable wetlands in Washington County, including within CMSCWD. Soils data and MLCCS landcover data were used to determine restoration potential. The analysis found little evidence of excessive wetland draining for agricultural activities, sod farms, grazing, or lawns. Overall, less than 50 acres were identified as having good restoration potential with the highest concentrations of sites occurring around Big Marine Lake, near Hay Lake, and a few larger sites southwest of Big Carnelian Lake.

## LAKES

Table 5-1 lists the measurable water quality goals for District lakes and articulates this Plan's measurable goals as either maintenance of, progress toward, or achievement of a District or State water quality goal. Lakes are also classified as "routine" or "focused" with regards to implementation prioritization. Table 5-2 shows the specific load reductions needed in lakes not meeting water quality standards. This table also includes load reductions designated for Big Carnelian and Big Marine Lakes, both of which were found to be "nearly impaired" by the MPCA in 2021. A 10% load reduction is slated for these lakes to help reverse declining trend toward impairment or increase improving water quality trends. Finally, Table 5-4 shows the total phosphorus load reduction goals for specific lakes expected to be achieved through various District program areas including the capital improvement program, technical assistance and cost share program, and regulatory program.

## STREAMS

Table 5-3 list the measurable stream health goals for District streams and articulates this Plan's measurable goals to preserve, restore, or improve current stream health goals. Streams are also classified as "routine" or "focused" with regards to implementation prioritization.

- Preserve: Maintain stream health grade determined from 2014 evaluations
- Improve: Increase stream health grade determined from 2014 evaluations
- Restore: Achieve district stream health goal during life of this Plan

Measurable progress to address bacteria impairments on Carnelian Creek will be accomplished through the Carnelian Creek Cattle Exclusion Project (#68, Table 6-3). Following exclusion of bacteria sources and subsequent bacteria monitoring identified in 2027 in the streams monitoring plan (Appendix B), progress toward delisting will be evaluated. The goal of removing Swedish Flag and Gilbertson's Creeks from the impaired waters list for bacteria will start with the confirmation of non-anthropogenic sources of bacteria through molecular biomarker testing identified in 2025 in the streams monitoring plan (Appendix B) .

As with lakes, Table 5-4 shows the total phosphorus load reduction goals for specific streams expected to be achieved through various District program areas including the capital improvement program, technical assistance and cost share program, and regulatory program. Total load reductions are not currently known. Additional assessments are needed to determine final estimated load reductions.

## Table 5-1. Lake Water Quality Goals

| Lake | DNR Lake ID | Current Conditions (2010-2019 Jun-Sep. Avg.) | | Short-Term (10-year) Trend 2010-2019 | | State Goals | | District Goals | | 2022 WRMP Measurable Goals | | | Implementation Strategy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TP (µg/L) | Secchi (m) | TP | Secchi | TP (µg/L) | Secchi (m) | TP (µg/L) | Secchi (m) | TP (µg/L) | Secchi (m) | Outcomes | |
| Alice | 82-0287-00 | 21 | 1.7 | Insufficient Data | Insufficient Data | 60 | 1.0 | 25 | 1.5 | 25 | 1.5 | Maintain District Goal | Routine |
| Barker Lake* | 82-0076-00 | 67 | 1.1 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 60 | 1.0 | Achieve State Goal | Focused |
| Bass Lake | 82-0035-00 | 28 | 2.3 | Insufficient Data | Insufficient Data | 60 | 1.0 | 40 | 1.7 | 40 | 1.7 | Maintain District Goal | Routine |
| Big Carnelian Lake | 82-0049-00 | 18 | 4.8 | Strongly Worsening | Strongly Worsening | 40 | 1.4 | 16 | 3.0 | 16 | 3.0 | Improve 10 Year TP and Secchi Trends | Focused |
| Big Marine Lake | 82-0052-04 | 16 | 3.8 | Minimally Improving | Minimally Improving | 40 | 1.4 | 15 | 3.8 | 15 | 3.8 | Maintain Improving 10 Year Trends | Focused |
| Carol Lake | 82-0017-00 | 31 | 0.8 | Insufficient Data | Insufficient Data | 60 | 1.0 | 29 | 1.1 | 30 | 0.9 | Progress towards Secchi District Goal | Focused |
| Clear Lake | 82-0045-00 | 13 | 4.4 | Insufficient Data | Strongly Worsening | 40 | 1.4 | 23 | 4.0 | 23 | 4.0 | Maintain District Goal | Routine |
| East Boot Lake* | 82-0034-00 | 24 | 3.5 | Minimally Improving | Minimally Worsening | 40 | 1.4 | 35 | 2.7 | 35 | 2.7 | Maintain District Goal | Routine |
| Fish Lake* | 82-0064-00 | 64 | 1.4 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 60 | 1.0 | Achieve State Goal | Focused |
| German Lake | 82-0056-00 | 20 | 2.2 | Insufficient Data | Insufficient Data | 60 | 1.0 | 30 | 1.8 | 30 | 1.8 | Maintain District Goal | Routine |
| Goose Lake* | 82-0059-00 | 41 | 1.6 | Minimally Improving | Minimally Improving | 40 | 1.4 | 40 | 1.4 | 40 | 1.4 | Achieve State Goal | Focused |
| Hay Lake* | 82-0065-00 | 38 | 1.5 | Strongly Improving | Minimally Worsening | 60 | 1.0 | 45 | 2.0 | 45 | 2.0 | Achieve District Secchi Goal | Focused |
| Jellum's Lake* | 82-0052-02 | 50 | 1.5 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 60 | 1.0 | Maintain District Goal | Routine |
| Little Carnelian Lake | 82-0014-00 | 11 | 6.1 | Insufficient Data | Minimally Worsening | 40 | 1.4 | 13 | 5.2 | 13 | 5.2 | Maintain District Goal | Routine |
| Long Lake (May Twp) | 82-0030-00 | 35 | 2.2 | Insufficient Data | Insufficient Data | 60 | 1.0 | 34 | 2.4 | 34 | 2.4 | Achieve District Goal | Focused |
| Long Lake (Scandia)* | 82-0068-00 | 69 | 0.9 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 60 | 1.0 | Achieve State Goal | Focused |
| Loon Lake* | 82-0015-02 | 82 | 0.4 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 80 | 0.6 | Progress toward State Goal | Focused |
| Louise Lake* | 82-0025-00 | 80 | 1.5 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 75 | 1.0 | Progress toward State Goal | Focused |
| Maple Marsh | 82-0038-00 | N/A | N/A | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | N/A | N/A | | |
| Mays Lake | 82-0033-00 | 19 | 4.0 | Insufficient Data | Minimally Worsening | 40 | 1.4 | 20 | 4.0 | 20 | 4.0 | Maintain District Goal | Routine |
| Mud Lake* | 82-0026-02 | 87 | 0.5 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 80 | 0.8 | Progress toward State Goal | Focused |
| North Twin Lake | 82-0018-00 | 24 | 1.0 | Insufficient Data | Insufficient Data | 60 | 1.0 | 35 | 1.0 | 35 | 1.0 | Maintain District Goal | Routine |
| Sand Lake | 82-0067-00 | 41 | 1.5 | Minimally Improving | Minimally Worsening | 60 | 1.0 | 38 | 1.9 | 38 | 1.9 | Achieve District Goal | Focused |
| Silver Lake | 82-0016-00 | 23 | 1.6 | Insufficient Data | Insufficient Data | 60 | 1.0 | 40 | 1.4 | 40 | 1.4 | Maintain District Goal | Routine |
| South Twin Lake* | 82-0019-00 | 40 | 1.9 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 60 | 1.0 | Maintain District Goal | Routine |
| Square Lake | 82-0046-00 | 11 | 5.2 | Minimally Improving | Minimally Improving | 40 | 1.4 | 10 | 7.0 | 10 | 6.0 | Progress toward Secchi District Goal | Focused |
| Staples Lake | 82-0028-00 | 22 | 2.7 | Insufficient Data | Insufficient Data | 60 | 1.0 | 25 | 2.7 | 25 | 2.7 | Maintain District Goal | Routine |
| Terrapin Lake | 82-0031-00 | 18 | 3.0 | Insufficient Data | Insufficient Data | 60 | 1.0 | 20 | 3.0 | 20 | 3.0 | Maintain District Goal | Routine |
| Turtle Lake | 82-0036-00 | 70 | 0.9 | Insufficient Data | Insufficient Data | 60 | 1.0 | 60 | 1.0 | 65 | 0.9 | Progress toward State Goal | Focused |
| Twin Lake (May Twp) | 82-0048-00 | 13 | 4.3 | Insufficient Data | Minimally Worsening | 60 | 1.0 | 20 | 4.0 | 20 | 4.0 | Maintain District Goal | Routine |
| West Boot Lake | 82-0044-00 | 20 | 3.5 | Insufficient Data | Insufficient Data | 40 | 1.4 | 25 | 2.7 | 25 | 2.7 | Maintain District Goal | Routine |

**Impaired for nutrients*

*"Insufficient Data" indicates lack of monitoring data for trend analysis*

## Table 5-2. Phosphorus Load Reduction Goals for District Lakes

| Lake | Most Recent 10-year Summer Mean Phosphorus Concentration [ug/L] | Years of Data | 10-year Summer Mean Concentration Goal [ug/L] | Load Reduction Needed to Achieve Goal (approximate) [lb/yr]*** | Load Reduction Achieved by CIPs (approximate) [lb/yr] | Remaining Load Reduction Needed to Achieve Goal* (approximate) [lb/yr]* |
|---|---|---|---|---|---|---|
| Alice | 21 | 5 | 25 | 0 | | 0 |
| Barker Lake | 67 | 3 | 60 | 15 | | 15 |
| Bass Lake | 28 | 6 | 40 | 0 | | 0 |
| Big Carnelian Lake** | 18 | 10 | 16 | 89 | | 89 |
| Big Marine Lake** | 16 | 10 | 15 | 92 | | 92 |
| Carol Lake** | 31 | 5 | 29 | 8 | | 8 |
| Clear Lake | 13 | 5 | 23 | 0 | | 0 |
| East Boot Lake | 24 | 9 | 35 | 0 | | 0 |
| Fish Lake | 64 | 6 | 60 | 69 | | 69 |
| German Lake | 20 | 6 | 30 | 0 | | 0 |
| Goose Lake | 41 | 10 | 40 | 117 | 20 | 97 |
| Hay Lake** | 38 | 9 | 45 | 12 | | 12 |
| Jellum's Lake | 50 | 6 | 60 | 0 | | 0 |
| Little Carnelian Lake | 11 | 7 | 13 | 0 | | 0 |
| Long Lake (May Twp) | 35 | 6 | 34 | 30 | | 30 |
| Long Lake (Scandia) | 69 | 6 | 60 | 34 | | 34 |
| Loon Lake | 82 | 5 | 80 | 107 | | 107 |
| Louise Lake | 80 | 5 | 75 | 58 | | 58 |
| Maple Marsh | NA | 0 | N/A | No Data | | No Data |
| Mays Lake | 19 | 5 | 20 | 0 | | 0 |
| Mud Lake | 87 | 5 | 80 | 29 | | 29 |
| North Twin Lake | 24 | 5 | 35 | 0 | | 0 |
| Sand Lake | 41 | 8 | 38 | 72 | 40 | 32 |
| Silver Lake | 23 | 3 | 40 | 0 | | 0 |
| South Twin Lake | 40 | 3 | 60 | 0 | | 0 |
| Square Lake** | 11 | 10 | 10 | 28 | | 28 |
| Staples Lake | 22 | 5 | 25 | 0 | | 0 |
| Terrapin Lake | 18 | 6 | 20 | 0 | | 0 |
| Turtle Lake | 70 | 6 | 60 | 58 | | 58 |
| Twin Lake (May Twp) | 13 | 5 | 20 | 0 | | 0 |
| West Boot Lake | 20 | 6 | 25 | 0 | | 0 |

** The District and it's partners have implemented numerous cost-share projects that will be inventoried during the lifetime of this plan. Annual phosphorus load reductions associated with these cost-share projects will be estimated in concurrence with the loading assumptions of the respective TMDL or Diagnostic Study.*

*** Load Reduction to achieve an extra 5% reduction (Big Marine, Carol, Hay) and 10% reduction (Big Carnelian, Square) to improve or maintain TP or Secchi trends even though goals may be currently met.*

**** "0" indicates no assigned load reductions because standard is already being met*

## Table 5-3. Stream Health Goals

| Stream/ River | 2003 Stream Health Grade** | 2014 Stream Health Grade** | 2022 Plan Goal | Trout Stream | Implentation Strategy | 2032 Outcome |
|---|---|---|---|---|---|---|
| Arcola | A- | B+ | A- | Yes | Routine | Improve |
| Arcola Court | C- | C- | C- | | Routine | Preserve |
| Campsite No. 1 | B+ | B | B | | Routine | Preserve |
| Campsite No. 2 | A | B | B+ | Yes | Routine | Preserve |
| Carnelian Creek* | B- | B- | B- | | Focus | Improve |
| Cedar Bend Trout Farm | B | C | C+ | | Routine | Improve |
| Clapp's | A+ | A+ | A+ | Yes | Routine | Preserve |
| Dunn's | B | B | B | | Routine | Preserve |
| Fall's | B | B | B+ | Yes | Routine | Improve |
| Foster's | A- | A- | A- | Yes | Routine | Preserve |
| Gilbertson's* | A | B- | A | Yes | Focus | Restore |
| Highway 95 Ravine | C- | C- | C- | | Routine | Preserve |
| Judd Street | A- | A- | A- | | Routine | Preserve |
| Marine Landing | A- | B- | A | | Focus | Improve |
| Mill Stream | A | B | A | Yes | Focus | Restore |
| Silver | B- | B- | B- | | Routine | Preserve |
| Spring | A | C | B | Yes | Focus | Improve |
| Swedish Flag* | A- | C | B+ | | Focus | Restore |
| William O'Brien State Park | B | B- | B- | | Routine | Preserve |
| Willow Brook | A- | C | B+ | Yes | Focus | Restore |
| Zavoral | A | B+ | A | Yes | Routine | Improve |

* Impaired for bacteria

** Stream Health Grade is based macroinvertebrate surveys used to determine an IBI score

## Table 5-4. Total Phosphorus Reduction Goals by Program

| Lakes | TP Load Reduction Goals by Program (lbs./yr.) | | | |
|---|---|---|---|---|
| | Capital Improvement Program (CIP) | Technical Assitance & Cost Share Program | Regulatory Program | TP Load Reduction Goals Per Table 5.3 |
| Alice | 0 | 0 | 0 | |
| Barker Lake | 0 | 15 | 0 | 15 |
| Bass Lake | 0 | 0 | 0 | |
| Big Carnelian Lake | 15 | 52 | 13.3 | 89 |
| Big Marine Lake | 16.6 | 40 | 25.9 | 92 |
| Carol Lake | 0 | 0 | 0 | 8 |
| Clear Lake | 0 | 0 | 0 | |
| East Boot Lake | 0 | 0 | 0 | |
| Fish Lake | 45 | 16 | 8 | 69 |
| German Lake | 0 | 0 | 0 | |
| Goose Lake | 64.4 | 23 | 9.6 | 97 |
| Hay Lake | 0 | 7 | 5 | 12 |
| Jellum's Lake | 0 | 0 | 0 | |
| Little Carnelian Lake | 0 | 0 | 0 | |
| Long Lake (May Twp) | 0 | 25 | 5 | 30 |
| Long Lake (Scandia) | 6 | 14 | 14 | 34 |
| Loon Lake | 0 | 9 | 3 | 107 |
| Louise Lake | 0 | 10 | 0 | 58 |
| Maple Marsh | | | | No Data |
| Mays Lake | 0 | 0 | 0 | |
| Mud Lake | 0 | 10 | 0 | 29 |
| North Twin Lake | 0 | 0 | 0 | |
| Sand Lake | 0 | 25 | 7 | 32 |
| Silver Lake | 0 | 0 | 0 | |
| South Twin Lake | 0 | 0 | 0 | |
| Square Lake | 4 | 9 | 12 | 28 |
| Staples Lake | 0 | 0 | 0 | |
| Terrapin Lake | 0 | 0 | 0 | |
| Turtle Lake | 0 | 5.8 | 0 | 58 |
| Twin Lake (May Twp) | 0 | 0 | 0 | |
| West Boot Lake | 0 | 0 | 0 | |

## Table 5-4. Total Phosphorus Reduction Goals by Program (continued)

| Streams | TP Load Reduction Goals by Program (lbs./yr.) | | | |
|---|---|---|---|---|
| | Capital Improvement Program (CIP) | Technical Assitance & Cost Share Program | Regulatory Program | TP Load Reduction Goals Per Table 5.3 |
| Clapp's Creek | | | | Uknown until the completion of stream monitoring in 2022 and the St. Croix and Spring Streams Subwatershed Analysis in 2023 and Stream Stability and Tributary Analysis Evaluations in 2022 and 2025 |
| Zavoral | Yes | 9 | | |
| Foster's | | | | |
| Judd Street | | | | |
| Arcola | | Yes | | |
| Campsite No. 1 | | | | |
| Campsite No. 2 | | | | |
| Dunn's | | | | |
| Fall's | Yes | 29 | Yes | |
| Silver | | | | |
| William O'Brien State Park | | | | |
| Marine Landing | | 5.5 | | |
| Mill Stream | Yes | 8.7 | Yes | |
| Spring | | Yes | | |
| Willow Brook | 19.5 | Yes | Yes | |
| Cedar Bend Trout Farm | | Yes | | |
| Arcola Court | | | | |
| Highway 95 Ravine | | | | |
| Gilbertson's | | | Yes | |
| Swedish Flag | | | Yes | |
| Carnelian Creek | Yes | Yes | Yes | |
| St. Croix | 45 | 50 | 5 | 100 |
| **Total** | **196** | **311** | **108** | **858** |

# VI. IMPLEMENTATION

## A. PRIORITIZING, TARGETING, AND ADAPTING

- Methods to focus implementation where it has the greatest improvements, prioritize these areas based on sound sciences, and collect measurable results that show pace of progress toward water quality goals is a critical component of effective watershed management. Multiple approaches are utilized to evaluate and measure the effectiveness of actions and projects.

Prioritizing implementation activities for this 10-year Plan was accomplished during a workshop with the CMSCWD Board of Managers. Managers considered implementation activities along a scale of level of impact vs. level of effort. "Level of effort" was evaluated by considering barriers or challenges to successful implementation including resources like funding, staffing, and partnerships; along with political will, landowner willingness, technical hurdles, etc. "Level of impact" was evaluated by considering the overall impact of successful implementation on making progress toward a specific goal or outcome. Activities scored as having high impact with a low amount of effort were considered high priorities (or, the low hanging fruit). Activities scored as having low impact despite the need for a high level of effort were considered a lower priority. Priority rankings varied for high impact activities that require high effort and low impact activities with low effort needed. The Implementation Schedule in Table 6-3 includes priority levels for implementation activities.

## i. PRIORITIZING, TARGETING, AND MEASURING TOOLS

### a. Pollutant Delivery Assessment

*Identifying pollutant loading hotspots on the landscape is often an effective way to target projects for watershed improvement.*

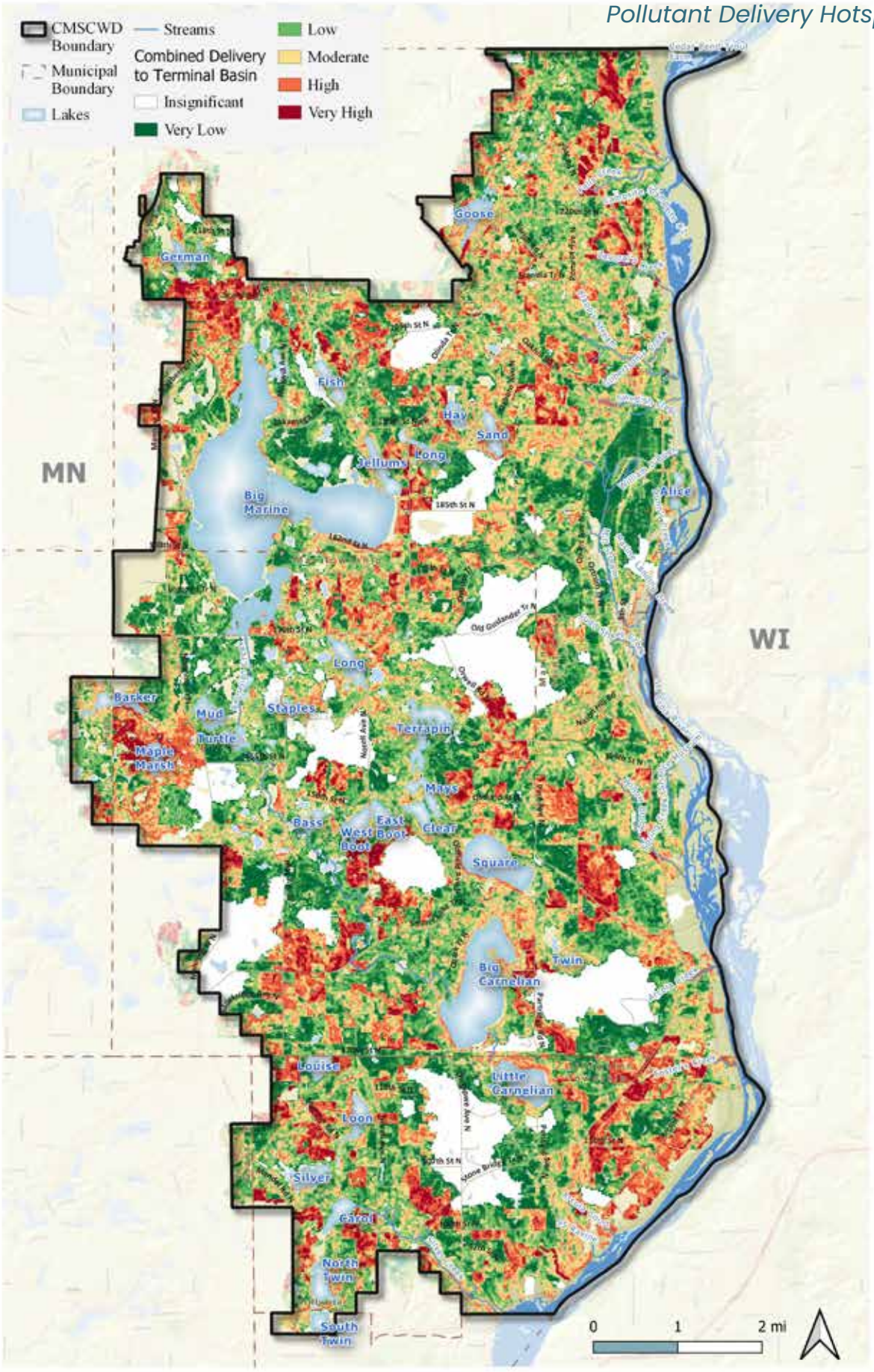
However, as the scale and complexity of a watershed increase, pollutant loading estimates alone become decreasingly useful. While it is relatively straightforward to estimate pollutant loading using lookup tables and well-established empirical formulae, there are complex phenomena that factor into whether or not pollutants contained in runoff actually reach a given downstream resource. Proximity is one part of that equation, but such characteristics as the slope and curvature of a given flowpath, or the presence of landlocked or semi-landlocked basins between a pollutant source and a downstream resource are significant determining factors in the answer to the question: where are the optimal locations to place best management practices in order to protect or improve a given resource in a watershed?

The District completed a watershed-wide pollutant delivery assessment using a combination of several GIS techniques to estimate both sediment and total phosphorus delivery from any point in the watershed to specific resources of interest. In contrast to previous work that was performed to estimate pollutant loads, the pollutant delivery estimates that were developed to take into account these more complex phenomena, including both the travel time along a flow path and the extent of upstream-to-downstream disconnectedness due to the presence of landlocked and semi-landlocked basins.

Pollutant hotspot mapping is used by the District to prioritize catchments for BMP retrofitting or for cost share assistance. The assessment includes delivery efficiency of pollutants to water resources and the resulting data are used to conduct subwatershed analyses to target and prioritize water quality improvement practices. The District also utilizes this data to prioritize outreach, technical assistance, and cost share for voluntary water quality improvements.

With the aim of providing a high-level GIS product that can be used to target specific locations on the landscape for improvement, Figure 6-1 shows the resulting hotspots of both sediment and phosphorus loading identified across the watershed through this process. Results of the assessment are shown in the District's online interactive map (see the "pollutant hot spots" layer).

## Figure 6.1.
## Pollutant Delivery Assessment
*Pollutant Delivery Hotspots*



## b. Subwatershed Analyses

*Minimum components of a subwatershed analysis include:*

- Spatial analysis that includes pollutant delivery evaluation to the targeted waterbody
- Desktop analysis that includes historical aerial photo review
- Water quality modeling or monitoring for load reduction analysis
- Field evaluation for BMP feasibility and potential
- Cost benefit analysis completed based on the total project cost/pound total phosphorus removed, both annualized for the anticipated life of the project based on accepted standards

*A subwatershed analysis (SWA) is a method to systematically analyze and assess a subwatershed to determine the location and cost benefit of best management practices that can be implemented to reduce pollution to a specific waterbody or surface water system. Specific protocols for completing SWAs in urban areas and rural areas were developed by the Metro Conservation Districts and are being refined by the Lower St. Croix Partnership. The current MCD SWA protocol can be found at:* www.metrotsa4.org/swa.

## c. Targeted Monitoring

*Flow and water quality sampling used to characterize annual loads coming from a specific point or area (e.g., tile outlet or wetland).*

Targeted monitoring will be implemented, as appropriate, based on the findings of SWAs completed by the District.

## d. Lake Diagnostic Study

*A Lake Diagnostic Study include three main components:*

- Historic and current water quality trends,
- Identification of pollutant sources and loads, and
- Validation of or reassignment of numerical goals and quantification of pollutant reductions needed to meet State or District goals.

Historic and current water quality trends in lakes are based on phosphorus, chlorophyll-a, and Secchi transparency depth data. In addition, the condition of lake sediments, aquatic plants and fish community also strongly influences water quality. Therefore, lake diagnostic studies usually include a survey of aquatic plants to identify presence of invasive or nuisance aquatic plants, analysis of lake-bottom sediments for phosphorus release estimates, and bathymetry (to determine lake depths and volume) when needed. In addition, plankton data may be collected to understand the biology of the lake and the impacts that the fishery may be having on water quality. Further

detail on data and methodology used in diagnostic studies can be found in Appendix C.

Identification of pollutant sources and loads to the waterbody of interest will usually be based on the District's Pollutant Delivery Assessment, unless the lake was previously studied as part of a TMDL.

A basic lake response model will also be developed in conjunction with the watershed-loading model and will be calibrated to the water quality monitoring data for the lake. The model will be used to predict the quality of the lake in the future (based on the findings of the future conditions watershed-loading model) and to determine the response of the lake to potential nutrient load reductions. The overall phosphorus load reduction needed to meet the goal scenario will be estimated. In addition, this lake model can be used to validate or reassign numeric goals.

## e. Internal Load Analysis

***An Internal Load Analysis builds on the understandings of a Diagnostic Study, and focuses on the dynamics of internal Phosphorus loading. An Internal Load Analysis typically includes two primary tasks: Data Collection and Data Analysis.***

Data Collection includes sampling of bottom and surface water phosphorus concentrations from May through October to identify seasonal in-lake phosphorus trends that indicate seasonal sediment phosphorus release. Additional data collection includes a May (pre-CLP senescence) and August aquatic point intercept survey to determine the extent of submerged vegetation across the lake bottom. Finally, 4-10 cm sediment cores are collected at representative sampling locations in the lake to analyze for phosphorus fractions at 2-cm intervals.

Data Analysis includes review of historic and current water quality, and the seasonal bottom and surface TP trends to determine the extent of internal loading. Watershed phosphorus reductions from completed projects since TMDL approval (if applicable) will be documented to verify appropriate reduction of external loads. Aquatic plant and fishery survey data will be reviewed to determine the extent of alum dosing across the lake bottom and timing to correspond with the lowest submerged aquatic plant growth. The sediment phosphorus fraction data will be used to determine an appropriate alum dose and estimated cost.

The District will coordinate on internal load evaluations and potential treatment options with the District's BWSR Board Conservationist, MPCA staff, and MnDNR's East Metro Area Fisheries Supervisor. The District will also coordinate with landowners and contractors to determine lake access and alum staging areas. In-lake data supporting internal loading, completed watershed load reductions, and a preliminary alum dosing plan will be summarized in a short, technical memorandum.

## f. Stream Rapid Assessment

*A Stream Rapid Assessment is intended as an initial assessment of District streams or spring creeks to determine if a full geomorphological survey is warranted to support a Stream Diagnostic Study.*

Stream Rapid Assessments are scheduled for implementation on all streams identified for improvement or restoration. A Stream Rapid Assessment typically includes:

- Walking the stream to identify and evaluate streambank erosion, undercut banks, active channelization/headcuts leading to stream.
- Surveying each bank with a handheld GPS (sub-meter), measuring bank height and length of eroded segments, and documenting debris/log jams & other obstructions.
- Surveying will also include riparian vegetation assessment & dominant species, document bed/bank soils composition (silt, sand, gravel, etc.), and instream habitat.
- Collecting GPS data of problematic invasive species (garlic mustard, purple loosestrife, Dame's rocket, buckthorn, honeysuckle, etc.) within riparian corridor.
- Making observations on biota and habitat including species present, streambed conditions, embeddedness, overhanging vegetation, riffle-pool-run sections
- Notation of other riparian conditions including land use, overstory, and understory.
- A summary of findings and recommendations for further investigation, assessment and/or restoration.

## g. Stream Diagnostic Study (or Corridor Study)

*A Stream Diagnostic Study may be conducted on streams that have not met State or District goals and have been categorized as an Improve or Restore resource, according to the criteria in Section III of the District Watershed Management Plan (Plan).*

Implementation of this study will evaluate historic and current water quality trends, channel stability, condition of riparian corridor, sediment contributions and sources of impairment or degradation to habitat, and two public open houses.

## ii. ADAPTIVE MANAGEMENT

Water resources management requires an adaptive approach due to the dynamic nature of the drivers of water resources conditions including weather and climate, development pressures, biological responses, invasive species infestations, etc. Adaptive management is an iterative approach of implementation, analysis and prioritization, implementation, and course correction, if needed (Figure 6-2). Using adaptive management ensures the District will continue making progress towards its long-term goals. If monitoring and evaluation indicates a certain project or program does not result in the fully expected improvement, additional analyses and revised implementation planning may be needed. The District is well poised to implement the adaptive management approach through its robust Monitoring Program (Section VI.B. and Appendix B), lake and stream diagnostic studies (Table 6-1), Analysis and Prioritization Program (Section VI.B.) and plans for evaluation and reporting (Section VI.D.).

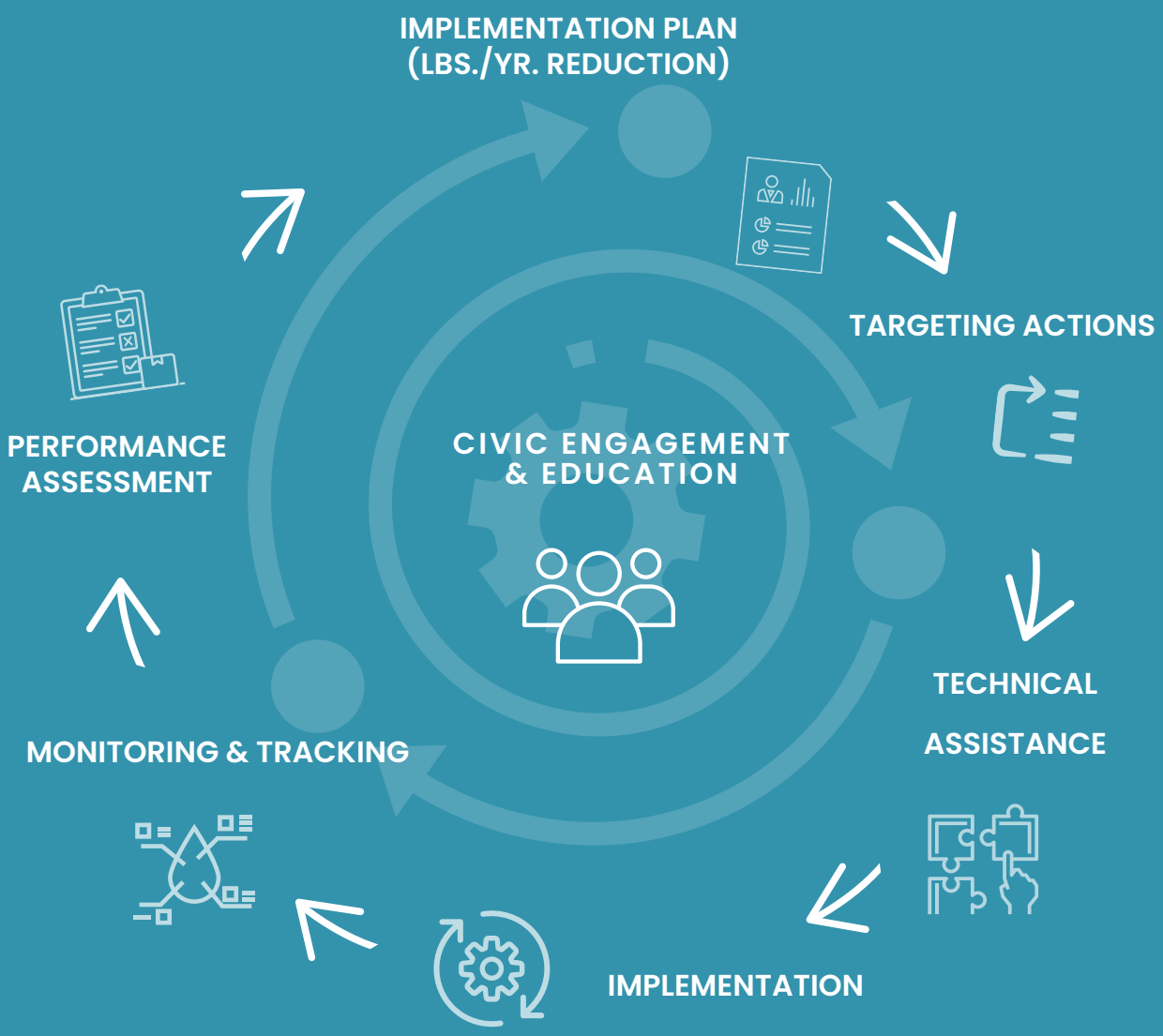
The vast majority of this Plans' implementation and the resource improvements it seeks will be accomplished through voluntary actions by landowners. The importance of engaging and educating various stakeholders will be measured in order to track the direct correlation between education and improving understanding, awareness, motivation and behavior change.

Additional forces can also come into play when working to effectively and efficiently manage water resources. Funding availability, landowner interest, partnerships, and unexpected opportunities can also impact the implementation schedule and priority of certain projects or programs.

The District will continue to evaluate its progress toward meeting goals and will adjust to changing conditions and opportunities as warranted. At times, an amendment to this plan may be needed to maintain current and appropriate policies, projects, and programs. See Section VII for more information on the Plan Amendment process.

Figure 6-2 Adaptive Management

*Adopted from Washington County Conservation District*



# B. DISTRICT PROGRAMS

The nine programs described in this section capture the varied tasks and activities of the District that are performed to address the watershed issues and work towards watershed goals. The Implementation Plan (Table 6-3) and District budget are arranged by these programs.

## i. ADMINISTRATION AND OPERATIONS

### Program Description

The administration and operations program encompass the overarching and ongoing "behind the scenes" work of the District. Program activities include the work necessary to maintain partnerships, build relationships, support and manage the District programs and projects, support the Board of Managers, coordinate the Citizen Advisory Committee (CAC) and Technical Advisory Committees (TAC), and meet statutory requirements. Annual and routine activities are captured in this program including developing annual reports, budgets and levies; assisting with and reviewing the annual audit; and preparing communications and materials for monthly Board meetings, workshops, and CAC and TAC meetings. Additional activities include reviewing local water management plans, preparing proposed plan amendment documentation, attending training and conferences, and managing staff, volunteers, or interns.

Perhaps the most important and consistent work included in the overall operation of the District includes building relationships and maintaining partnerships. The protection and improvement of water resources is a science-driven enterprise, but it doesn't happen without people and their willingness to be a partner in the work. Building relationships and trust across a wide variety of individuals and stakeholder groups is a critical activity for District staff and managers. Building and maintaining partnerships with local governments, state agencies, Lower St. Croix Partnership, Washington County, Washington Conservation District, lake associations, and other groups is a key function of the District. Successful watershed management relies on these partnerships to expand the District's impact and implementation.

## Program Objectives and Policies

The goal of the District's administration and operation is to provide accountability, transparency, open communications and efficiency in its efforts to manage District water resources. Overall program objectives include:

- Manage the affairs of the District in an open, accessible, and transparent manner
- Operate in an efficient, cost-effective, collaborative way to minimize costs to citizens
- React in a timely manner to the concerns of citizens, agencies, and local governments
- Use the best science available to set goals and obtain measurable results
- Practice flexibility while striving to achieve the Mission of the District
- Anticipate future issues and proactively search for solutions
- Seek feedback from citizens and other constituents

In carrying out the program, it is the policy of the District to:

- Employ professional administration, staff, and/or consultants to implement this Plan and policies of the District
- Actively solicit public input
- Utilize public opinion through active involvement of a Citizens' Advisory Committee
- Seek financial partners both private and public at the local, regional, state and national level to leverage funding
- Solicit Board of Managers representation that is diverse and distributed evenly throughout the District

## ii. REGULATORY PROGRAM

### Program Description

Minnesota Rules 103D provides for and requires watershed districts to adopt Rules. Watershed rules and requirements are an important tool used to protect and improve water resources. District Rules are aimed at regulating development and redevelopment to minimize impacts to water resources including water quality, riparian quality, habitat, and ecological health. Sometimes redevelopment of a site or maintenance of infrastructure offers an opportunity to improve conditions, particularly if the site originally developed before stormwater management regulations existed.

The District recognizes that the primary control and determination of appropriate land uses is the responsibility of the municipalities. Accordingly, the District will coordinate permit application reviews with the municipality where the land is located. Proposed projects will be reviewed for compliance with District Rules concurrently with reviews performed by LGUs and Washington County in instances where the proposed project is within a township and a shoreland zone.

The District's regulatory program includes rules covering several areas including: management and treatment of stormwater runoff; erosion and sediment control, lake, river, stream, and wetland buffer requirements; shoreline and streambank alterations; watercourse and basin crossings; floodplain and drainage alterations; and wetland management. The program includes project review and issuance of permits, consideration of variances, and enforcement. The enforcement process for violations to District Rules is included in Section 10 of the Rules document.

District Rules may be significantly revised in 2024/2025 in conjunction with a voluntary grant program for communities to update stormwater and shoreland ordinances and other controls by local government units. The Minnesota Minimal Impact Design Standards (MIDS), or similar, may be incorporated at that time for consistency among neighboring entities.

District Rules, permit program guidance, application forms, and fee schedules can be found at https://www.cmscwd.org/rules-permits.

## Program Objectives and Policies

The over-arching goal of the District's regulatory program is to balance property owners' use of their property with ensuring the protection and management of water and surrounding resources so that residents and visitors can enjoy local lakes, rivers, and streams. Supporting goals of the District's regulatory program are to:

- Protect the water resources of the CMSCWD for all current and future users
- Prevent property loss by reducing the severity and frequency of flooding
- Preserve floodplain and wetland storage capacity
- Improve the chemical and physical quality of surface water
- Reduce sediment build-up to preserve the flow of lakes and streams
- Minimize public expenditures to correct damage in the future
- Preserve natural shoreline and habitat for aquatic life

## Guiding principles and policies of the regulatory program include:

- Rules are streamlined and permitting and enforcement is coordinated with local, county, state, and federal permitting
- Rules are a reflection of current science
- Rules are reviewed for applicability and consistency on a regular basis

## iii. INSPECTION AND MAINTENANCE PROGRAM

### Program Description

The District's inspection and maintenance program incorporates two main components: 1) ensuring an unimpeded flow along the channels from Big Marine Lake through Little Carnelian Lake and the outlet pipe to the St. Croix River (the "Carnelian Channel"); and 2) ensuring that best management projects (BMPs) installed through District programs or its Capital Improvement Program are maintained and properly functioning.

### Carnelian Channel

In the early years of the District, activities related to solving the flooding issues in the Big Marine Lake sub-watershed were paramount to the District's purposes and work. Significant flooding along Big Carnelian Lake, Little Carnelian Lake, and a series of wetlands resulted in property damage in the late 70's and early 80's during a period of high precipitation. These issues were alleviated by the installation of a three-mile gravity pipe, the "Carnelian Channel," which outlets this large, landlocked sub-watershed.

Along the Carnelian Channel, the range of elevations that the District maintains is a result of negotiations with riparian property owners and the Department of Natural Resources to both protect property and protect wetlands within the watershed. The only variable in the system is an adjustable weir downstream of the fixed outlet at Turtle Lake. The current management plan

for the weir has evolved over the years and was approved by the Board of Managers on April 12, 2017 after receiving considerable public input. Carnelian Channel management plans dating back to 1985 and other maintenance program information are available at: www.cmscwd.org/maintenance-program.

The District contracts with the Washington Conservation District for much of its inspection and maintenance work. A long-term maintenance fund is kept by the District to provide for needed maintenance along the Carnelian Channel. However, it's likely additional funding from other sources would be needed for major repairs or rehabilitation.

### District Projects

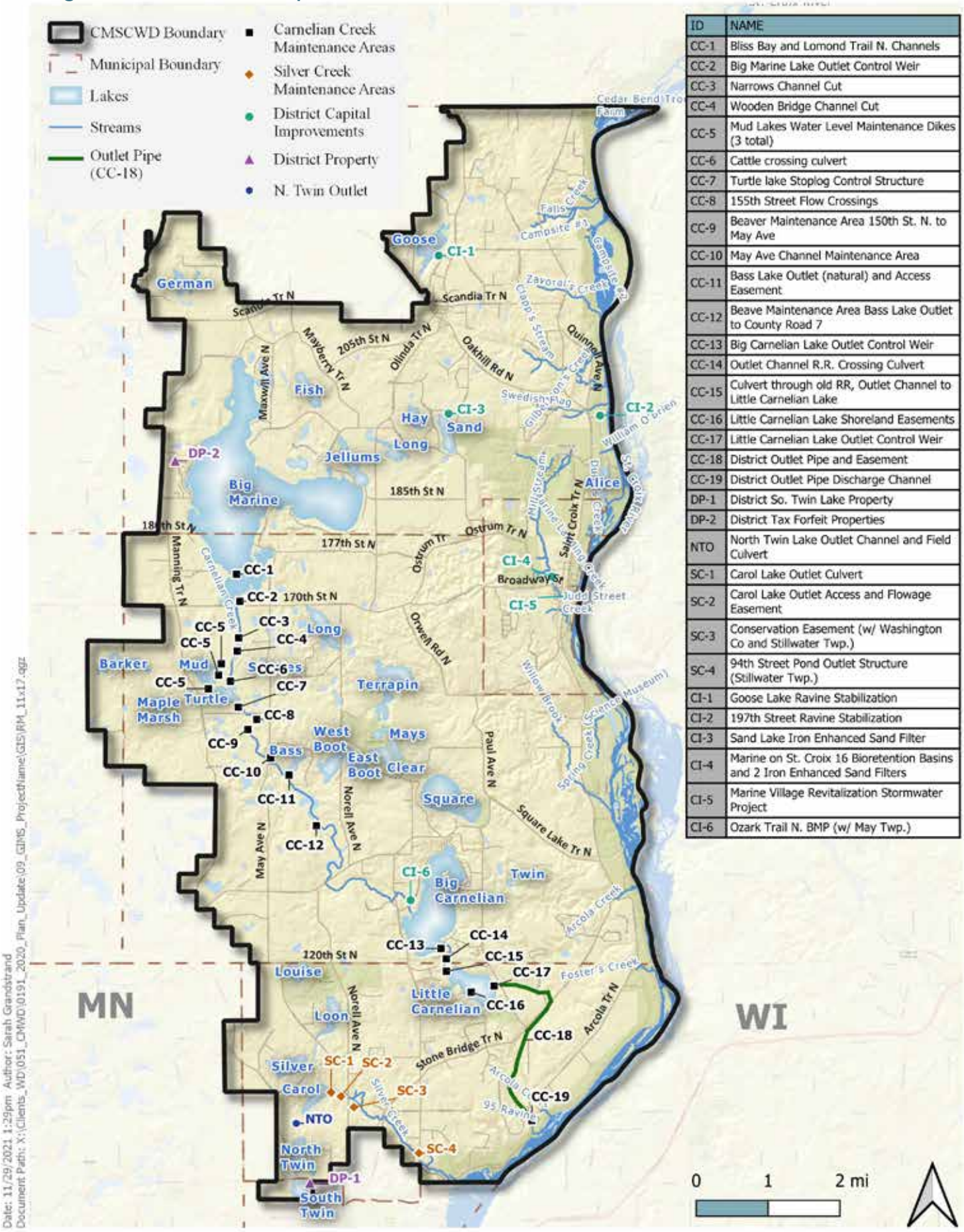
The District maintains an inventory of all District projects (BMPs) constructed or installed through its various programs including its cost share program and capital improvement program.

## PROGRAM OBJECTIVES AND POLICIES

The goals of the inspection and maintenance program are to ensure proper flow through the Carnelian Channel to alleviate flooding and property damage, and to ensure proper functioning of best management practices such that expected pollutant removals and other outcomes are realized. Maintenance of private and public drainage structures such as culverts, storm sewers, bridges, etc. are the responsibility of the owner. Maintenance of all public road culverts are the responsibility of the road authority including those that cross major drainage ways and streams. Private property owners are responsible for maintenance of culverts on their land. When maintenance needs are observed by the District that are expected to adversely impact District resources, staff will notify the owner and relay information regarding the owner's responsibility. The District will consider requests for participation in maintenance activities on a case-by-case basis.

The District will use easement acquisition or other appropriate means to ensure the access to areas requiring periodic or regular maintenance.

## **Figure 6-3** CMSCWD Inspection and Maintenance Locations for Carnelian Channel




| ID | NAME |
|---|---|
| CC-1 | Bliss Bay and Lomond Trail N. Channels |
| CC-2 | Big Marine Lake Outlet Control Weir |
| CC-3 | Narrows Channel Cut |
| CC-4 | Wooden Bridge Channel Cut |
| CC-5 | Mud Lakes Water Level Maintenance Dikes (3 total) |
| CC-6 | Cattle crossing culvert |
| CC-7 | Turtle lake Stoplog Control Structure |
| CC-8 | 155th Street Flow Crossings |
| CC-9 | Beaver Maintenance Area 150th St. N. to May Ave |
| CC-10 | May Ave Channel Maintenance Area |
| CC-11 | Bass Lake Outlet (natural) and Access Easement |
| CC-12 | Beave Maintenance Area Bass Lake Outlet to County Road 7 |
| CC-13 | Big Carnelian Lake Outlet Control Weir |
| CC-14 | Outlet Channel R.R. Crossing Culvert |
| CC-15 | Culvert through old RR, Outlet Channel to Little Carnelian Lake |
| CC-16 | Little Carnelian Lake Shoreland Easements |
| CC-17 | Little Carnelian Lake Outlet Control Weir |
| CC-18 | District Outlet Pipe and Easement |
| CC-19 | District Outlet Pipe Discharge Channel |
| DP-1 | District So. Twin Lake Property |
| DP-2 | District Tax Forfeit Properties |
| NTO | North Twin Lake Outlet Channel and Field Culvert |
| SC-1 | Carol Lake Outlet Culvert |
| SC-2 | Carol Lake Outlet Access and Flowage Easement |
| SC-3 | Conservation Easement (w/ Washington Co and Stillwater Twp.) |
| SC-4 | 94th Street Pond Outlet Structure (Stillwater Twp.) |
| CI-1 | Goose Lake Ravine Stabilization |
| CI-2 | 197th Street Ravine Stabilization |
| CI-3 | Sand Lake Iron Enhanced Sand Filter |
| CI-4 | Marine on St. Croix 16 Bioretention Basins and 2 Iron Enhanced Sand Filters |
| CI-5 | Marine Village Revitalization Stormwater Project |
| CI-6 | Ozark Trail N. BMP (w/ May Twp.) |

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# CARNELIAN CHANNEL

The following District properties and locations for Carnelian Channel regular inspections and maintenance are shown in Figure 6-3. A list of District Capital Improvement Projects are included in Section VI.B.ix. below.

## *CC-1. Bliss Bay and Lomond Trail N. Channels*

The District constructed a channel at Lomond Trail N. as part of the 1984 Outlet Channel Project. Work included removal of a collapsed culvert and an old road bed to improve flow to the District Outlet Channel and allow small boat access to the lake area south of Lomond Trail N. Maintenance activities include occasional removal of debris as needed to maintain flow. This area is now located within the boundaries of the Big Marine Park Reserve. The District cooperates with Washington Co. Parks to access the site. In 1990 the District assumed the MNDNR Permit for maintenance of the channel into Bliss Bay.

## *CC-2. Big Marine Lake Outlet Control Weir*

The Big Marine Outlet Control Weir, constructed by the District as part of the 1984 Outlet Channel Project, consists of a fixed crest-weir concrete drop structure and an outlet culvert under Washington Co. Hwy No. 4. Maintenance consists of occasional removal of debris from the trash rack and removal of floating bog material that accumulates in front of a wooden post on each side of control weir. Washington Co. is responsible for maintenance of the culvert portion of the structure.

## *CC-3. Narrows Channel Cut*

The Narrows Channel Cut was constructed by the District as part of the 1984 Outlet Channel Project. Maintenance includes removal of blockages from floating debris and beaver activity. The District owns an access easement to the site. The site is monitored on a regular basis by the District with maintenance work required approximately every other year.

## *CC-4. Wooden Bridge Channel Cut*

The Wooden Bridge Channel Cut was constructed by the District as part of the 1984 Outlet Channel Project. Maintenance activities include removal of blockages from floating debris and beaver activity. The District owns an access easement to site and the area is monitored on a regular basis by the District with maintenance work required approximately every other year. The wooden bridge referred to in the project name was privately constructed and was owned by landowner. The bridge was removed and the property is now part of the Big Marine Park Reserve.

# CARNELIAN CHANNEL CONTINUED

## CC-5. Mud Lakes Water Level Maintenance Dikes (3)

The Mud Lake dikes were constructed as part of the District's 1984 Outlet Channel Project. The dikes maintain water levels in Mud Lake and the associated wetlands. Surface water from Mud Lake flows north through a series of wetlands prior to entering the outlet channel. The dikes need to be monitored on a regular basis and repaired as needed. Monitoring of dikes include regular inspection for seeps, slumps, holes, and general observations of the integrity of the dikes. The District owns an access easement to the site.

## CC-6. Cattle Crossing Culvert

The Cattle Crossing was constructed by the District as part of the 1984 Outlet Channel Project to provide livestock access to the east side of the outlet channel. The original culvert was replaced by the District in 2000 with a taller culvert to ease monitoring and maintenance of the structure. The taller culvert was replaced in-kind in 2021. The area is monitored on a regular basis by the District with maintenance work required approximately every other year. Maintenance consists of occasionally removing beaver dams and other debris from the culvert as well as removing any floating bog material that accumulates in front of the wooden posts upstream of the culvert. The District owns an access easement to the site.

## CC-7. Turtle Lake Stoplog Control Structure

The Turtle Lake Stoplog Control Structure was constructed by the District as part of the 1984 Outlet Channel Project. The structure maintains water levels upstream during periods of dry weather while allowing drainage via an outlet channel during periods of wet weather. The structure is operated by the District in accordance with a Minnesota Department of Natural Resources (MNDNR) permit and MNDNR approved the operating plan. The District owns an access easement to the site. Structure improvements are necessary in the future.

## CC-8. 155th Street Flow Crossing

Culverts under the private driveway of 12133 155th were constructed by the District as part of the 1984 Outlet Channel Project. The culverts were replaced in-kind in 2021. The area is monitored on a regular basis by the District. Maintenance consists of occasionally removing beaver dams and other debris from the culverts. The District established an access easement to the site in 2021.

## CC-9. Beaver Maintenance Area 150th St. N. to May Ave

Portions of the channel in this area were improved by the District as part of the 1984 Outlet Channel Project while the remainder is the natural channel of Carnelian Creek. The area is monitored on a regular basis by the District and maintenance includes removal of debris and beaver dams. Installation of Clemson Leveler or similar device to mitigate frequent beaver dam blockage of Carnelian Creek (District outlet channel) upstream of May Ave may be warranted.

### CC-10. May Ave. Channel Maintenance Area

District maintenance in this area includes removal of debris and beaver dams both upstream and downstream of May Avenue, typically once or twice a year. The District maintains the channel between May Avenue and the downstream railroad culvert by cleaning out vegetation and debris approximately every third year. The District has an access easement for maintenance work upstream of May Avenue and will seek an easement from the downstream property owner when the opportunity presents itself.

### CC-11. Bass Lake Outlet (natural) and Access Easement

Bass Lake outlets via a natural overflow and channel. On occasion, this overflow has been partially blocked by floating debris, which is typically removed by homeowners. There is an access easement to the overflow in case debris removal requires heavy equipment.

### CC-12. Beaver Maintenance Area Bass Lake Outlet to County Road 7

There are several areas along this stretch of Carnelian Creek which are occasionally blocked by beaver dams. A local landowner typically removes blockages if backwaters start flooding croplands.

### CC-13. Big Carnelian Lake Outlet Control Weir

Big Carnelian Outlet Control Weir was constructed by the District as part of the 1984 Outlet Channel Project and consists of a fixed crest concrete weir structure at the outlet from Big Carnelian Lake. Maintenance consists of occasional removal of debris in front of the weir and maintenance of the downstream channel. The District has easements over this site.

### CC-14. Outlet Channel R.R. Crossing Culvert

This section of the 1984 District Outlet Channel extends from the Big Carnelian Lake Outlet Weir to the downstream railroad culvert. Maintenance includes occasional removal of debris, primarily due to beaver activity, from the channel and in front of the railroad culvert. The District has easements over this site.

### CC-15. Culvert through old RR, Outlet Channel to Little Carnelian Lake

This section of the 1984 District Outlet Channel extends from the railroad culvert identified in Item 15 to Little Carnelian Lake. The section includes a culvert through an abandoned railroad bed which was installed by the District. Maintenance includes occasional removal of debris from the channel and in front of the railroad culvert primarily due to beaver activity. The District has easements over this site.

# CARNELIAN CHANNEL CONTINUED

## *CC-16. Little Carnelian Lake Shoreland Easements*

Flowage easements were obtained along the shoreland around Little Carnelian Lake as part of the 1984 District Outlet Channel Project. Shoreland maintenance is the responsibility of the individual property owners.

## *CC-17. Little Carnelian Lake Outlet Control Weir*

The Little Carnelian Outlet Control Weir was constructed by the District as part of the 1984 Outlet Channel Project and consists of a fixed crest weir concrete drop structure that discharges into the District's Outlet Pipe to the St. Croix River. Maintenance consists of regular removal of debris from the trash rack and occasional removal of sand from the front of the structure. District staff inspects the structure on a regular basis since the District has a permanent monitoring station at this location and an access easement to the structure.

## *CC-18. District Outlet Pipe and Easement*

The Outlet Pipe to the St. Croix River was constructed by the District as part of the 1984 Outlet Channel Project. The pipe runs approximately 15,000 feet from the Little Carnelian Lake Outlet Structure to a discharge channel that empties into the floodplain of the St. Croix River. The outlet pipe is constructed of reinforced concrete pipe ranging in size from 30 to 54 inches in diameter at a depth of four to thirty feet. Access and venting manholes are located approximately every 1,000 ft. The pipeline is located within District easements and road right-of-way. The District outlet pipe is strictly for providing an outlet for flows from Little Carnelian Lake. Storm sewer connections to the pipe are not allowed. Maintenance consists of annual visual inspections of manholes along the pipe and video inspections of the pipe every 5 years. Maintenance repairs are scheduled based on inspection results. The District has established a separate fund for major outlet pipe repairs.

## *CC-19. District Outlet Pipe Discharge Channel*

The District Outlet Pipe discharges into a stone and concrete lined channel that carries flows to the St. Croix River floodplain. The channel, which existed prior to the 1984 Outlet Channel Project, was cleaned and repaired as part of that project. Maintenance consists of visual inspections every 5 years or less with maintenance repairs scheduled based on inspection results.

# DISTRICT PROPERTIES

### *DP-1. District South Twin Lake Property*

The South Twin Lake property consists of a strip of land between Neal Avenue and the Northeast Shore of South Twin Lake. The property was donated to the District by the landowner to preserve the shoreland and protect South Twin Lake. Maintenance consists of improvements to the existing vegetative buffer and annual clean-up of trash.

### *DP-2. District Tax Forfeit Properties*

The District obtained, from Washington County, two adjacent lots near Big Marine Lake in Scandia. Lots were obtained to protect the high value tamarack bog located on the property.

# NORTH TWIN OUTLET

### *NTO. North Twin Lake Outlet Channel and Field Culvert*

North Twin Lake outlets to Carol Lake through a series of wetlands crossed by a field road that provides landowner access to property on the east side of the wetlands. The outlet channel is occasionally blocked by beaver activity causing some localized flooding of low-lying yards. The District does not inspect or maintain this area on a regular basis but does coordinate with the property owner to have blockages removed when complaints are received.

# SILVER CREEK MAINTENANCE AREAS

### *SC-1. Carol Lake Outlet Culvert*

Discharges from Carol Lake create the Silver Creek Flowage. South Twin Lake, North Twin Lake, Silver Lake and Loon Lake all flow to Carol Lake and then Silver Creek. The Carol Lake outlet is controlled by a culvert under a private driveway. The District inspects the culvert inlet on a regular basis throughout the year and removes blockages from floating bog and beaver activity. The District has installed a Clemson Leveler through the culvert to minimize beaver activity blockages and has installed posts in front of the culvert inlet to minimize floating bog blockages. Floating bog material is removed from posts approximately every 5-years. Debris that accumulates on the Clemson Leveler is removed several times during the summer. The Clemson Leveler also needs to be replaced when it becomes plugged and flow cannot be restored by cleaning. The District has access and flowage easements for this area.

# SILVER CREEK MAINTENANCE AREAS CONTINUED

### *SC-2. Carol Lake Outlet Access and Flowage Easement*

The District has access and flowage easements over a private driveway that follows Silver Creek from Norell Ave. N. to the Carol Lake Outlet Structure. Maintenance of the driveway is the responsibility of the property owner.

### *SC-3. Conservation Easement (w/ Washington Co and Stillwater Twp.)*

The District is a Party to the Kaye Conservation Easement on Silver Creek. Washington County is the lead partner and Stillwater Township is also a partner. The property is managed and maintained in accordance with the easement requirements defined in the Property Report dated September 24, 2004. The property is also located within the District's Silver Creek Corridor where the District has worked with the landowners to implement and maintain restoration projects identified in the Silver Creek Corridor Management Plan.

### *SC-4. 94th Street Pond Outlet Structure (Stillwater Twp.)*

The 94th Street Pond is part of the main channel for the Silver Creek Flowage. The District provided funding to Stillwater Township to install an outlet structure to reduce maintenance required to clear blockages of floating debris from the culvert and provide an emergency overflow for the 94th Street Pond. The outlet structure and culvert are owned and maintained by Stillwater Township. District staff checks on the outlet structure regularly during the summer and removes small debris from the outlet structure by hand when they can. The District notifies Stillwater Township when significant blockages are observed.

# DISTRICT CAPITAL IMPROVEMENT PROJECTS

### *CI-1. Goose Lake Ravine Stabilization*

The Goose Lake Ravine Stabilization Project was installed by the District in 2012. The BMPs included the installation of a stormwater detention dry pond on the east side of Olinda Lane North, replacement of a 48" manhole and 24" concrete pipe, and reshaping and stabilization of 220 feet of eroding ravine. The project reduces 15.5 tons of sediment and 24 lbs. or phosphorus discharging to Goose Lake each year. The District has a surface water drainage easement with private landowners and an encroachment easement with the City of Scandia. The District is responsible for maintenance of the basin and ravine stabilization.

### *CI-2. 197th Street Ravine Stabilization*

The 197th Street Ravine Stabilization project was installed by the District in 2015. The BMP included installation of raingarden in the City of Scandia right of way and a 130' long fused HDPE pipe and restoration of eroded area. The project reduces 33 tons of sediment and 43 lbs. of phosphorus discharging to the St. Croix River each year. The District has surface water drainage easement for the alignment of the pipe and is responsible for maintenance.

### *CI-3. Sand Lake Iron Enhanced Sand Filter*

The Sand Lake IESF was installed by the District in 2015. The BMP included the installation of a large basin filled with iron enhanced sand to bind soluble phosphorus before entering Sand Lake. Monitoring the basins performance from 2016-2020 indicates the project reduces 40 pounds per year of phosphorus discharging to Sand Lake. The District has a surface water drainage easement until 2045 and is responsible for maintenance.

### *CI-4. Marine on St. Croix Phase 1 BMPs (CSAH 4)*

16 Bioretention Basins and 2 Iron Enhanced Sand Filters were installed by the District and Washington County in 2017 and 2018. In total the projects reduce 3.7 tons of sediment and 13.3 lbs. of phosphorus to the St. Croix River each year. The County maintains the facilities within the county right-of-way. The District maintains the basins in city right-of-way in collaboration with residents (through landowner maintenance agreements).

### *CI-5. Marine Village Revitalization Stormwater Project*

The pretreatment and filtration facility, 3 bioretention basins, one wetland restoration, and one channel stabilization projects located within City and MnDOT right-of-way were installed through a joint agreement with the City of Marine on St. Croix during the Village Center Reconstruction Project in 2020 and 2021. In accordance with the October 28, 2020 agreement, the projects are maintained by the CMSCWD for the first two full growing seasons after project completion, then the City of Marine on St. Croix takes over maintenance.

### *CI-6. Ozark Trail N. BMP (w/ May Twp.)*

The Ozark Trail N. BMP was installed as a joint project between the District and May Township. The BMP included installation of a sediment basin and raingarden to treat road runoff from Ozark Trail N. prior to discharge to Carnelian Creek and Big Carnelian Lake. May Township paved a portion of Ozark Trail N. to direct flows into the treatment basin. May Township has a drainage and access easement for the treatment basin and is responsible for maintenance. The District assists by monitoring the basin to identify when and what type of maintenance is needed.

## iv. MONITORING PROGRAM

### Program Description

The District's water monitoring program is as old as the District itself and forms the basis of the District's scientific approach to watershed management. The District monitors the water quality of 31 lakes and multiple streams. Monitoring frequency and the parameters measured depends on a waterbody's classification as "focused" or "routine" a waterbody's existing condition, known or potential stressors to the waterbody, the amount of data already collected, and other factors. There are five different types of monitoring regimes for lakes including sentinel, routine, rotation, limited, and partnership and three different types of monitoring regimes for streams including preserve, improve, or restore.

Lake and stream monitoring is accomplished through a variety of means including volunteers, participation in the Metropolitan Council's Watershed Outlet Monitoring Program (WOMP) on Carnelian and Silver Creeks, and through annual contracts with the Washington Conservation District. Data analysis and reporting is an important component of the monitoring program. Data are reported to the State of Minnesota, included in District annual reports, used in the analysis and prioritization program (Section VI.B.v.), and provided to the public through online resources. The District's complete water monitoring plan can be found in Appendix B.

Other monitoring activities in the District include groundwater level monitoring in at least 10 key locations, lake level monitoring, and stream flow monitoring.

## Program Objectives and Policies

**The goals of the District's monitoring program include:**

- Evaluate waterbody baseline conditions
- Track water quality trends and progress toward meeting water quality goals
- Provide data to focus, prioritize, and target District work and funding
- Evaluate the impact of District projects and programs
- Evaluate baseline conditions and track trends in groundwater levels

## Guiding principles and policies of the monitoring program include:

- Program will include assessment and refinement of parameters to improve the efficiency of monitoring program
- Citizen volunteers will be actively solicited to assist in collecting monitoring data and will be provided with on-going training, support, and feedback to ensure high quality data collection
- Monitoring will be integrated into District education programs

# v. ANALYSIS AND PRIORITIZATION PROGRAM

## Program Description

The District uses monitoring data, spatial analyses, and model outputs to analyze pollutant loads and flood risk and identify hot spots and critical areas for implementation. These areas are then targeted for more detailed study or monitoring, additional education and outreach, grant funding, or other targeted implementation. As presented in Section VI.A., the District prioritizes, targets, and measures implementation using a variety of tools including subwatershed analyses, targeted monitoring, diagnostic assessments, internal load analyses, stressor identification, and condition assessments.

A complete and robust hydrologic and hydraulic model is a critical component for use with prioritization tools. The District has developed and maintains a District-wide PC-SWMM model. The model is updated regularly and is used in project prioritization, District regulatory reviews, flood risk analyses, tracking impacts of climate change, and community and county planning.

Examples of recent or ongoing analysis and prioritization projects in the District include:

- Targeted monitoring of degraded wetlands that may contribute high nutrient loading to downstream waterbodies
- Flood risk modeling
- Hydraulic and hydrologic modeling
- Stream condition evaluation

**Table 6-1 lists specific diagnostic studies completed since 2000.** These studies have helped to target and prioritize District work. Diagnostic studies are planned during the life of this Plan for Turtle Lake, Maple Marsh Lake, Marine Landing Creek, Mill Stream, Spring Creek, and Willow Brook.

**Table 6-1 Completed District Diagnostic Studies**

| | |
|---|---|
| 2000 | Phosphorus Sensitivity Analysis: Analyzed 20 lakes and watersheds within the District and became a significant part of the District's 2000 Overall Management Plan. The methods used in this study were the Minnesota Lake Eutrophication Analysis Procedure and the Rickhow-Simpson spreadsheet that assigns a total phosphorus export coefficient to land uses with the watershed. (See "District Wide Technical Report") |
| 2011 | Carnelian-Marine-St. Croix Multi-Lake TMDL: Examined 12 lakes in the District (some of which were included in the study cited above). This work used the EPA's simple method similar to the analysis tool above but also evaluated in-lake characteristics using core sampling, fish surveys, and macrophyte studies to arrive at loading contributions from these factors also. (See "District Wide Technical Report") |
| 2002 & 2013 | Square Lake Clean Water Partnership Diagnostic Studies |
| 2013 | Sand and Long Lakes Diagnostic Study |
| 2015 | Carnelian Creek Flowage Diagnostic Study for Bacterial Impairment |
| 2016 | Swedish Flag Creek Bacterial Impairment Rapid Assessment |
| 2016 | Gilbertson's Creek Bacterial Impairment Rapid Assessment |
| 2016 | Clear, Mays, Terrapin Lakes Diagnostic Study |
| 2017 | German and Alice Lakes Diagnostic Study |
| 2021 | District PC-SWMM Model Update, Calibration, and Validation |

## Program Objectives and Policies

The overarching goal of the analysis and prioritization program is to realize true water quality and flood reduction outcomes by targeting implementation where it can have the biggest impact for the lowest cost to taxpayers.


## vi. AQUATIC INVASIVE SPECIES PROGRAM

### Program Description

The District works to prevent the spread and address the impacts of aquatic invasive species (AIS) primarily through partnership and collaboration. (An AIS Prevention and Management Plan is an early implementation activity in this Plan.) Efforts are focused on a few key species including Eurasian watermilfoil, curly leaf pondweed, zebra mussels, and other AIS that may be deemed critically threatening to the health of lakes, streams and the St. Croix River. In 2015, a new AIS program was adopted by the District which focuses on four main implementation strategies:

- Conducting regular assessments of District lakes to determine the presence and prevalence of AIS
- Developing a prioritized list of known AIS with corresponding protection and management strategies
- Developing and implementing a ten-year education, assessment, inspection and management plan in collaboration with relevant stakeholders including state and federal agencies, county and local governments, lake associations and other district residents
- Exploring ways to mitigate the effects of native vegetation on recreational usage

These strategies have been and will be employed, primarily in partnership with Washington County and the Washington Conservation District (WCD), but also in collaboration with the State, lake associations, and riparian landowners. The District plans to adopt the WCD AIS Rapid Response Plan and will set aside funds to implement the District's responsibilities identified in that plan. The District works to prevent the spread of AIS by contributing funds to watercraft inspection programs and by training volunteers to be certified AIS detectors. Additionally, the District continues to manage Eurasian watermilfoil on Long Lake, cost share the treatment of curly leaf pondweed in Square Lake, and cost share the management of Eurasian watermilfoil on Big Marine Lake.

## Program Objectives and Policies

**The goals of the AIS program include:**

- Collaborate to prevent AIS from spreading to District waterbodies
- Detect infestations early and employ rapid response activities
- Manage aquatic invasive species where infestations impact water quality or ecological health

**Guiding principles and policies of the AIS program include:**

- Priority will be given to interventions in lakes that show declining water clarity and increase in phosphorous loading
- Focus will be on high quality lakes and waterbodies with public access
- District will manage those species which are known to increase phosphorus loading (curly leaf pondweed)
- Species focus will be on Eurasian watermilfoil, curly leaf pondweed, zebra mussels and others deemed most threatening to the health of lakes, streams and the St. Croix River
- Management strategies deemed appropriate and effective by research shall be employed, understanding that interventions and technologies will have environmental impacts
- District will manage upstream resources before downstream resources
- District will employ management techniques to preserve hydrologic function and drainage systems throughout the District

## vii. COST SHARE PROGRAM

### Program Description

The District's cost share program is another important tool to help protect and improve water quality in lakes, rivers, streams, and other valuable natural resources throughout the watershed. The program provides funds to landowners for the implementation of conservation practices in agricultural, rural, suburban, and urban setting. Examples of projects include lakeshore and stream bank buffer restorations, rain gardens installations, feedlot improvements, soil health improvements, and native prairie restorations. Cost sharing the management of aquatic invasive species are also included in the cost share program.

Projects will be actively pursued in the watersheds of "focus" lakes and streams and will be targeted in specific areas as determined through prioritization analyses such as SWAs. The Seven Lakes Subwatershed Analysis, St. Croix and Spring Streams Subwatershed Analysis, existing pollutant hot spot mapping, and future subwatershed analyses will help identify possible projects where cost share will be targeted. Landowners, citizen groups, and local units of government can request financial and technical assistance from the District.

## Program Objectives and Policies

The overarching goal of the cost share program is to incentivize restoration projects and best management practices (BMPs) in targeted areas to make progress toward meeting water quality, habitat improvement, and flood reduction goals. Other program goals include:

- Protection or improvement of water resource quality
- Reduction and prevention of non-point source pollution
- Protection, restoration, and management of the District's wetlands and unique upland resources
- Public's increased understanding of land use and its effect on water quality
- Increased changes in behavior and social norms as they relate to land use
- Increased resident collaboration through promotion of neighborhood and group projects
- Education of residents about the District's work and impact

District cost share program information and policies are available online at: https://www.cmscwd.org/technical-assistance. Policies cover a range of items including eligible projects and practices, eligible applicants, scoring and ranking proposed projects, cost share and incentive payment rates and limits, and project maintenance requirements. Cost share recipients are required to enter an agreement with the District and is responsible for the operation and maintenance of the conservation practice for the minimum lifespan listed in the specific provisions of this document and as detailed in the cost share agreement.

## viii. EDUCATION AND OUTREACH PROGRAM

### Program Description

The District's education and outreach program provides the third tool for improving water resources: educate and engage the public on the condition of our waters, and how, why, and where environmentally friendly practices are needed. The education and outreach program spans a wide variety of topics and works to reach multiple audiences. Education and outreach activities are concentrated on disseminating information, hosting and sponsoring events and trainings, making connections within communities, and fostering action to spur behavior change with positive environmental impacts.

The District utilizes the expertise and partnership if the East Metro Water Resources Education Program (EMWREP) to help carry out the education programming and messages. This collaboration eliminates duplication and provides consistent and timely messages to residents and others. The District is also fortunate to have an active Citizen Advisory Committee who helps guide the education programming and assists with events and information dissemination. Additionally, the St. Croix Watershed Research Station, Arcola Mills, and William O'Brien State Park are within the District's boundaries. Each of these institutions has expertise in environmental sciences and the District and EMWREP often collaborate with them through co-marketing and co-programming.

It is often difficult to measure the effectiveness of an education program. The District will evaluate the impact of the program through surveys to measure changes in knowledge

and behavior over time. The first survey is planned for 2022 with additional surveys mid-way through the life of this Plan and again near the end of the Plan's implementation. A complete and detailed 10-year District Education and Outreach Plan can be found a in Appendix E.

## Program Objectives and Policies

**The overarching goal of the District's education and outreach program is to get the public's assistance in making progress toward meeting water quality, habitat improvement, and flood reduction goals. Other program goals include:**

- Increase public awareness and participation in the District's activities, plans, and programs
- Add to public's knowledge of water and natural resource issues
- Enable and promote natural resource-based neighborhood groups such as Lake Homeowner's Associations
- Concentrate education efforts in areas of impaired waters and "focus" resources

**General guidance and policies related to the education and outreach program include:**

- The District's Citizen Advisory Committee will provide guidance and assistance to the program
- Collaboration and partnership with other organizations is used to provide consistent messages and program efficiency
- Existing materials will be used, when applicable, to avoid duplication and "reinventing the wheel"
- Communication with the public about District work, condition of resources, and opportunities for involvement and input will be open, transparent, and timely

## ix. CAPITAL IMPROVEMENT PROGRAM

### Program Description

The District implements large, impactful projects that benefit water quality and flood potential through its Capital Improvement Program (CIP). The CIP is a statutory requirement for Metro watershed districts (Minn. Stat. 103B.231). Capital projects will be targeted in subwatersheds of "focus" resources and will be identified through the analysis and prioritization program (Section VI.B.v.). Table 6-3 includes the project name, location, and targeted resource, along with the estimated schedule and budget for known CIP projects. Additional projects will be added to the CIP through a minor plan amendment process (Section VII.) as projects and opportunities are identified. Examples of prior and ongoing capital projects are listed on the following pages.

### Program Objectives and Policies

The primary goal of the District's Capital Improvement Program is design and construct structural projects that have a significant impact on water quality, habitat, or flood potential. Projects that are currently listed in Table 6-3 or identified through future analysis and prioritization will be considered for inclusion in the CIP. The CIP list and schedule will be kept up to date through minor plan amendments. The Board of Managers will also annually review the CIP funding priorities when setting the annual budget and tax levy, making final decisions on project funding based on current conditions including opportunities to collaborate and construct in conjunction with adjacent projects, grant funding availability, etc.

### 1. MAJOR BLUFF AND GULLY EROSION CONTROL PROJECTS

District will implement up to two high priority projects as identified in the Lake St. Croix Direct Subwatershed Analysis planned to be completed in 2023.

### 2. BLISS ADDITION STORMWATER MANAGEMENT RETROFITS

In partnership with the City of Scandia, the District will implement stormwater BMPs to reduce nutrient and sediment loads to Big Marine Lake prioritized in the 2019 Bliss Addition Stormwater Planning report

### 3. PANORAMA/133RD STREET STORMWATER MANAGEMENT BMPS

In partnership with the Carnelian Heights Association and May Township, the District will implement a large stormwater bioretention basin to reduce nutrient and sediment loading to Big Carnelian Lake from township and private roads on the east side of the lake

### 4. WILLOW BROOK STORMWATER RETROFITS

With permission from MnDOT and private landowners the District will implement stormwater BMPs to reduce nutrient and sediment loads from HWY 95 discharging into Willow Brook and the St. Croix River.

### 5. BIG MARINE EAST BOAT LAUNCH STORMWATER CONTROLS

In partnership with May Township and the Department of Natural Resources implement drainage and stormwater quality retrofits to reduce large sediment loads to Big Marine Lake from the Big Marine East Boat Launch.

### 6. STREAM AND ST. CROIX RIVER SEDIMENT MANAGEMENT

Implement projects prioritized in the St. Croix Direct Discharge Subwatershed Analysis (to be completed in 2023) to reduce sediment and nutrient discharges to spring streams and the St. Croix River.

### 7. WASHINGTON COUNTY REGIONAL PARK BMP RETROFITS

In partnership with Washington County Parks, the District will pursue water quality BMP retrofits at the Big Marine Park Reserve and Square Lake Regional Park prioritized in the 2021 Seven Lakes Subwatershed Analysis

### 8. FAIRY FALLS STORMWATER & EROSION MANAGEMENT

In partnership with the National Parks Service the District will pursue projects to reduce erosion and nutrients to Silver Creek and the St. Croix River

### 9. MILL STREAM RESTORATION

In partnership with William O'Brien State Park and the City of Marine on St. Croix, implement stream restoration to reduce sediment and nutrients and improve the biotic stream grade for this popular trout stream.

### 10. FEASIBILITY STUDIES AND PRELIMINARY PROJECT ENGINEERING

Includes costs associated with on-going District Engineer services, providing technical advice and assistance to District Staff and Managers on watershed management issues and planning, and preliminary feasibility studies to advance on-the-ground initiatives and installation of water quality project with due minor plan amendments.

### 11. WETLAND LEGACY LOAD MITIGATION

Wetlands with historic nutrient and sediment loads identified in subwatershed analyses will be monitored to measure contributing phosphorus loading to priority lakes, streams, and the St. Croix River. Two projects will be implemented to address the highest contributing wetlands.

## C. FUNDING SOURCES

The District has several methods available to fund the implementation of District activities. These methods include special assessments, ad-valorem taxes (property tax levy), the establishment of water management districts (similar to a storm water utility), private and public grants, and collaboration with partners to leverage technical and financial assistance.

Funding mechanisms for watershed districts are described in Minnesota Statutes chapters 103B and 103D. A brief overview of each mechanism is provided below. Additionally, the District recognizes its responsibility to follow Washington County's Financial and Budget Policy #2403 for implementation of capital projects that require Washington County funding through its own taxing authority. The Districts current CIP does not require County funding, but should it be required for future projects the District will follow the policy and guidelines set forth in Washington County Policy #2403.

The District's ad valorem levy comprises the largest percentage of stable funding for District activities. However, the District's annual operational and project budgets are generally greater than the District levy, as the District supplements its annual levy through its reserve fund and grants. Upon adoption of the Capital Improvement Plan (CIP) in 2012, the District adopted a level, multi-year levy strategy that built reserves for future project work. The reserve fund and the annual levy are also supplemented with grant dollars. It is the District's intention to continue this practice along with maintaining partnerships with counties, cities, and the Lower St. Croix Partnership to leverage multi-governmental funding and grant opportunities for appropriate projects and programs, including the use of sub-watershed levies and bonding.

## i. SPECIAL ASSESSMENTS

For certain types of projects, the District may assess costs to property owners solely on the basis of benefits received. This form of taxation generally must follow exacting legal procedures by the Board to authorize a project and determine damages and benefits to specific properties resulting from the project. Under Minnesota Statutes chapter 103D, projects initiated or funded in a variety of ways may use special assessment to fund local costs. At this time, the District does not have specific plans to utilize this funding mechanism to implement projects or programs in this Plan. However, special assessment remains an option should the Board determine this to be a fair and effective means to implement an important project or program.

## ii. AD VALOREM TAXES

An ad valorem levy is a tax on real property in which the levy is in proportion to property value. The watershed-wide ad valorem levy produces tax revenue from all taxable properties within the watershed. The District legal boundary defines the area of land that comes under the District's jurisdiction, and the area upon which the ad valorem tax is applied. The legal boundary follows the hydrological boundary generally but must follow property boundaries or other legally definable boundaries (e.g., roads), and a single property cannot be in more than one watershed district. The District's ad valorem levy comprises its largest percentage of stable funding for administration, education, construction, and maintenance activities that benefit all water resources and watershed residents.

The District historically maintained a relatively flat levy over several years, only making significant increases when needed to fund major water resource studies and projects. Over the next ten years, the District anticipates modest levy increases in order to fund the activities in this Plan and fully achieve long-term water resource goals. The District anticipates property values to continue increasing as they have steadily over recent years, which will keep the tax impact relatively stable.

Prior to certifying its levy each year, the District will estimate tax impacts and adjust the proposed levy in order to balance water resource funding needs with taxpayer impact.

## iii. WATER MANAGEMENT DISTRICTS

Water Management District funding is used as a supplemental financing tool for the District in situations where residents express a desire for a mechanism of localized charges. Water Management Districts differ from assessments and ad-valorem tax in that the charges are based on a property's contribution of water and/or pollutants, and can be established on a subwatershed basis. To establish a Water Management District, the Watershed District Plan must describe the project, the properties included, the financial amount needed for implementation, the methods used to determine financial charges, and duration of the charges.

## iv. DISTRICT RESERVE FUND

Upon adoption of the Capital Improvement Plan (CIP) in 2012, the District adopted a level, multi-year levy strategy that built a reserve fund for future project work. The District maintains this reserve fund for use on programs and projects in order to 1) take advantage of unforeseen project opportunities as they occur, 2) minimize fluctuations in tax levies to its residents. Balance in this fund is reviewed and adjusted by the Board annually.

## v. GRANTS

Over the past several years the District has successfully leveraged State Clean Water Fund grants and Minnesota Pollution Control Agency 319 grants to offset the cost of large capital improvement projects. Approximately $1.1 million has been received from the state since 2011. Although the availability of Clean Water Fund competitive grant funding is likely to decrease, the District will continue to seek grants and partnerships for grant-funded projects. Additionally, the District will collaborate with the Lower St. Croix Partnership to access and utilize the State's Watershed Based Implementation Funding. Grant funding may also be sought from other state agencies or other sources including the Metropolitan Council, the federal government, non-profit organizations, private businesses, etc.

## vi. BONDS AND LOANS

The District has the authority to finance large capital projects by selling bonds or securing loans. At this time, the District does not have specific plans to utilize this funding mechanism to implement projects in this Plan. However, bonding or loans remain options should the Board determine this to be an effective means to implement an important project or program.

# D. EVALUATION AND REPORTING

## i. ANNUAL REPORTING

The District is responsible for evaluating progress towards achieving its goals and reporting annually to the Minnesota Board of Water and Soil Resources (BWSR), per MN Rules 8410 within the first 120 days of the calendar year. Annual reporting requirements include:

- A list of the organization's board members, names of designated officers, and the governmental organization that each board member represents for joint powers organizations and the county that each member is appointed by for watershed districts
- Identification of a contact person capable of answering questions about the organization including a postal and electronic mailing address and telephone number
- An assessment of the previous year's annual work plan that indicates whether the planned activities were performed, including the expenditures of each activity with respect to the approved budget (unless included in the audit report)
- A work plan and budget for the current year specifying which activities will be undertaken
- A summary of significant trends of lake, stormwater, and climate monitoring data
- A copy of the annual communication required by part 8410.0105, subpart 4
- The District's activities related to the biennial solicitations for interest proposals for legal, professional, or technical consultant services
- An evaluation of the status of local water plan adoption and local implementation of activities required by the District during the previous year;
- The status of any locally adopted ordinances or rules required by the District including their enforcement
- A summary of the permits and variances issued or denied and violations under rule or ordinance requirements of the organization or local water plan.
- The BWSR Level 1 Performance Review and Assistance Program (PRAP) review

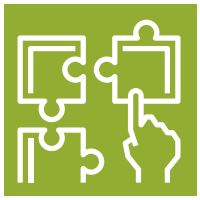
The District's Annual Report will include an evaluation of progress toward 10-year goals and the implementation actions, including the capital improvement program, to determine if amendments to the implementation actions are needed (see Progress Assessment section below). A template of progress tracking for the annual report, which will satisfy the Biennial Progress Report is found in Appendix F.

The District's Annual Report is approved by the Board of Managers, transmitted to BWSR, and posted on the District website. The District will also annually prepare and submit to BWSR and the State auditor's office a financial audit report for the preceding fiscal year as per MN Rules 8410.0150 Subp 1. The District will internally assess the operations and management of the District on an annual basis when Managers review the administrator and the results of the previous year's annual work plan. These results will be used to aid in the development of the work plan for the following year.

## ii. PROGRESS ASSESSMENT

Although only required biennially, the District will annually perform a detailed evaluation to assess the level of progress achieved on each of the District's stated goals and implementation actions (per MN Rules 8410.0080 & 8410.0150 Subp3.E). The evaluation will be based on District goals, cross referenced with implementation activities and the associated measurable outputs (Section VI.F.) and will be included in the Annual Activity Report. The biennial progress evaluation will be used in annual work planning and to assess the need for plan amendments. And if, during the life of the Plan, BWSR assesses District performance through a Level II PRAP, the results will be incorporated into future implementation actions.

Some of the District's goals have clear and quantifiable metrics to assess progress. The District's Monitoring program is used to measure the success of District efforts to meet the water quality goals established for the District's water resources. In other cases, the scope of District goals and the complexity of the affected resources limit the applicability of a singular, quantitative metric. In these cases, progress assessment may include quantitative values with regards to the established metrics or a narrative discussion of progress towards each goal. Narrative discussions may include the level of effort used, the effort leveraged through partnerships, etc. Additionally, the District's Education and Outreach Program will be used to assess success and seek input from residents on District operations and progress toward goals. The Education and Outreach Program input will include a survey of residents every 5-years. Overall, these evaluation activities may help focus District efforts where progress has stalled and may help re-prioritize individual implementation activities.



# E. COORDINATION WITH GOVERNMENTS AND STAKEHOLDERS

Partnership, collaboration, and coordination with local governments - including municipalities, Washington County, and the Washington Conservation District; and with the Lower St. Croix Partnership and state and regional agencies is paramount to the success of the District. The District's Technical Advisory Committee (TAC) is comprised of representatives of many of these groups, and representatives from groups are welcome on the TAC. The TAC aided in the development of this Plan, and provides input on the District's capital improvement program, rules, and specific projects. It also provides support to the Citizen Advisory Committee (CAC).

This section describes how the District collaborates with these entities, and the impact this Plan's implementation is expected to have on local governments.

## i. COORDINATION WITH LOCAL UNITS OF GOVERNMENT

Minnesota Statutes 103B.231 (Watershed Plans) and 103B.235 (Local Water Management Plans) provide a framework establishing roles and responsibilities for the District and local government units (LGU) such as townships, cities, and counties. Upon adoption of this Plan by the District, LGUs having land use planning and regulatory responsibility for land within the watershed must prepare or update their existing local water management plans (LWMPs).

While none of the communities in the District is a regulated MS4 community, each LGU has existing local controls and ordinances that regulate various levels and types of land development and land-altering activities. The District recognizes shared objectives and some potential overlapping activities with LGUs. The District will work to ensure that its activities coordinate with and build on, but do not duplicate, those of the LGUs. The District will work to serve as a resource for LGUs, and to coordinate with, and support efforts of LGUs toward the protection and improvement of water and natural resources. The District will continue to work in partnership with the LGUs and to seek input through its Technical Advisory Committee which includes representatives from LGUs.

## AREAS WITH POTENTIAL FOR COOPERATION BETWEEN AN LGU & THE DISTRICT INCLUDE:

- Zoning and Land Use Planning
- Stormwater Treatment & Water Quality Improvement
- Hydrologic and Hydraulic Modeling
- Water Monitoring
- Public Works
- Flood Protection
- Natural Areas and Parks
- Regulation
- Public Education

## ii. IMPACT ON LOCAL UNITS OF GOVERNMENT

### Local Water Management Plans

Local water management plans (LWMPs) must provide conformance with the policies and provisions in this Plan. An amendment of MN Rules Chapter 8410 became effective in July 2015. One of the more significant changes of Chapter 8410 is the schedule for cities' and towns' LWMP updates. Under the amended rule, local water management plans must be revised once every 10 years in alignment with the local comprehensive plan schedule. A municipality has two years before its local comprehensive plan is due to adopt an updated local water management plan. Prior to adoption, a municipality must prepare its local water plan, distribute it for comment, and have it approved by the organizations with jurisdiction in the municipality. Updated local comprehensive plans are due December 31, 2028. As a result, all cities and townships in the District must complete and adopt their local water plan between January 1, 2027 and December 31, 2028.

The District understands the challenges that may arise when an LGUs lies in multiple watersheds. If requested, the District will work closely with the LGU to help prepare a LWMP that both ensures consistency with this Plan, and works to balance the requirements of adjacent watersheds.

The District is especially interested in LWMP issues and implementation actions that affect the concerns stated in this Plan or require District collaboration. Furthermore, the District will work with cities and townships regarding financial considerations, implementation priorities, and programs for plan elements of mutual concern. Each local government can assume as much management and regulatory control as it wishes through its approved LWMP. Each LWMP shall

follow MN Rules 8410.0160 and 8410.0170 requirements for LWMPs. The District will require each LWMP to include the following:

- The current approved LWMPs for each of the local governments indicate the desire for the District to continue being responsible for implementation of its rules and permitting program. Each LWMP will include a process for coordination between the District plan activities (including regulatory and enforcement when needed) and the local governments other land use review and permitting responsibilities, to help minimize the permit approval timeline and minimize duplication of efforts. A separate memorandum of understanding (MOU) or other agreement with the District detailing the cooperative process is also acceptable. Refer to District Rules for information on District permitting requirements and procedures.
- The District's Wetland Management Plan (Appendix D) serves as a supplement to the Wetlands Conservation Act (WCA). Local governments shall incorporate the District's Wetland Management Plan into their implementation of WCA. The District will assist local governments in coordinating their implementation of WCA with the District's Wetland Management Plan and the District's Wetland Rules, documenting the process in a MOU or other such letter of agreement.

Further, LWMPs should include the following components for compliance with the Metropolitan Council Surface Water Management Act:

- Describe existing and proposed physical environment and land use.
- Define drainage areas and the volumes, rates, and paths of stormwater runoff.
- Identify areas and elevations for stormwater storage adequate to meet performance standards established in the watershed plan.
- Define water quality and water quality protection methods adequate to meet performance standards established in the watershed plan.
- Identify regulated areas.
- Set forth an implementation program, including a description of official controls and, as appropriate, a capital improvement program.

After the District approves a LWMP, the municipality shall adopt and implement the LWMP within 120 days. Within 180 days, it shall amend its official controls (ordinances, etc.) and policies to provide protection of water resources at least as effective as provided by the District Rules or defer exercise of sole regulatory authority to the CMSCWD. If a municipality later wishes to amend its plan, it must submit the proposed amendment to the District for review of consistency with the District's management plan.

Given that this Plan will be adopted (and implemented) well before the statutory requirement for the local water management plan update, the District will encourage its member communities to revise their LWMPs sooner than required. A city or township may, at its discretion, choose to adopt this Watershed Management Plan in whole or part to satisfy its statutory local water management plan requirement. The current status of LWMP approval and adoption is presented in Table 6-2.

### Table 6-2. Local Water Management Plan Status

| MUNICIPALITY | DATE OF DISTRICT APPROVAL |
|---|---|
| City of Scandia | March 20, 2019 |
| City of Marine on St. Croix | March 20, 2019 |
| May Township | March 20, 2019 |
| City of Hugo | January 10, 2018 |
| Stillwater Township | January 10, 2018 |
| City of Grant | Comments on May 2019 Draft provided District on May 9, 2019 |
| City of Stillwater | January 10, 2018 |

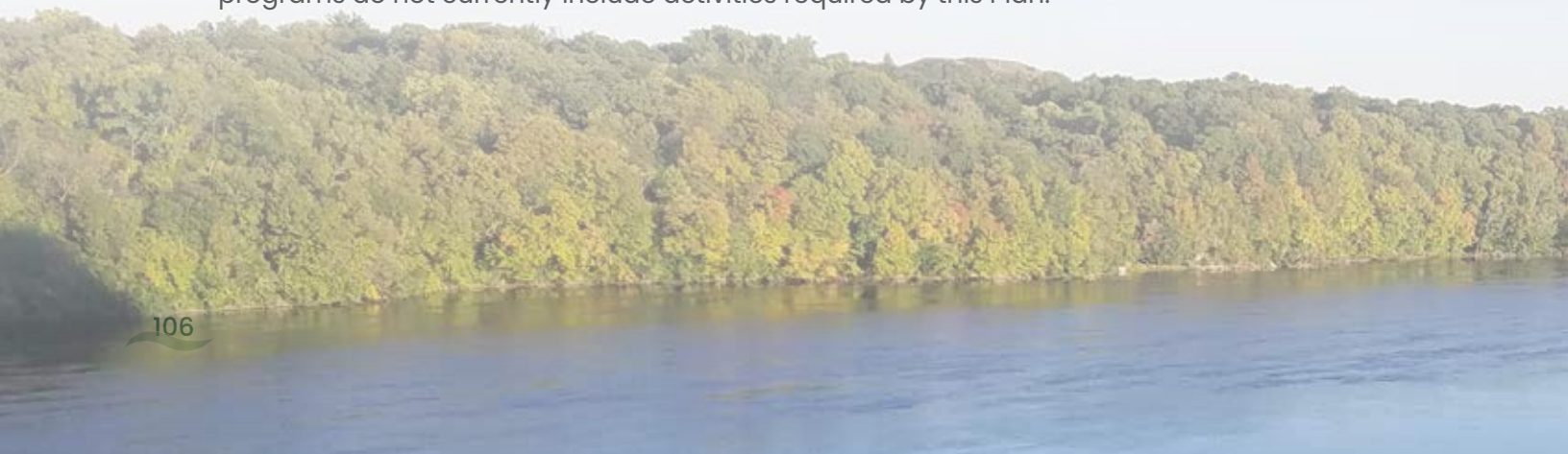
The District will periodically review LGU compliance with the goals, policies, and requirements established in this Plan. This action will include:

- Evaluation of the status of local water plan adoption and local implementation of activities
- Review of LGU ordinance revisions addressing management of water resources, including enforcement in 2023 and 2024 (Table 6-3, Activity #3).

If review of LGU practices reveals implementation inconsistent with this Plan, the District will take administrative or legal action to ensure that District Rules and policies are being implemented by the LGU.

## *Fiscal Impact*

Minnesota Rules 8410.0110 requires that this Plan assess the financial and administrative impacts of the Plan on local units of government (LGUs). The primary fiscal impacts to LGUs from the implementation of this Plan come in the form of possible increased costs for municipal projects (e.g., road reconstruction work) resulting from the need to comply with District Rules, the cost of responding to comments and making revisions to receive District approval of a local water management plan, and the cost of implementing local water management plans if local programs do not currently include activities required by this Plan.



## iii. COORDINATION WITH WASHINGTON COUNTY, WASHINGTON CONSERVATION DISTRICT, AND LOWER ST. CROIX PARTNERSHIP

Much of the District's work is done in collaboration or cooperation with Washington County, the Washington Conservation District, and the Lower St. Croix Partnership (LSC Partnership). The District participates as a member of the Washington County Water Consortium. This group works on surface and groundwater issues that cross local governmental boundaries. The consortium is an ad hoc organization of representatives from watershed districts, watershed management organizations, cities and townships, the Washington Conservation District, county departments, state and regional agencies, and interested citizens.

The **Washington County** Board of Commissioners appoints District managers and the District provides an annual update to Commissioners on District activities and the budget. Further, the District supports the County's implementation its comprehensive Groundwater Plan (2014 –2024) which serves as a link that "ties the governance of surface and groundwater together in an effort to focus on researching the level of connection between surface water and groundwater, identifying groundwater recharge and discharge zones, and developing policies and rules to protect and holistically manage water resources," (Washington County, 2014). The County has land use authority in several areas including those listed below. In addition, the County regulates well drilling and well sealing.

- Subsurface Sewage Treatment Systems
- St. Croix River Management Overlay District
- Shoreland Management Overlay District
- Mining Operations
- Riparian Vegetative Buffers
- Floodplains

The District collaborates with the **Washington Conservation District (WCD)** on a variety of activities. The WCD houses the East Metro Water Resources Education Program which implements the bulk of the District's education and outreach plan. The District contracts with WCD to implement much of its water monitoring program and inspection and maintenance program. The District also collaborates with the WCD on natural resources mapping, inventories, planning, and assessments.

The **LSC Partnership** is a newly formed joint powers collaboration comprised of 16 local units of government, including the District. The LSC Partnership works together to implement the Lower St. Croix Comprehensive Watershed Management Plan, approved by BWSR on October 28, 2020. The Plan includes activities to be implemented across the entire Lower St. Croix Watershed to make progress toward specific water and natural resources goals. Many of the activities include new and expanded services to be shared across the whole LSC Watershed (LSC Partnership, 2020). The new Implementation Policy Committee, which includes one CMSCWD District Manager, began meeting in January 2021.

## iv. COORDINATION WITH STATE AND REGIONAL AGENCIES

The District interacts with, collaborates with, and seeks input from several state agencies and the Metropolitan Council on issues of water and natural resource management.

The **Board of Water and Soil Resources** (BWSR) oversees watershed districts and their activities. BWSR also oversees soil and water conservation districts, watershed management organizations, and county water managers. Directly relevant to watershed district activities, BWSR reviews and approves watershed management plans, assists in administration of the Wetland Conservation Act, and administers a number of grant and easement programs. The BWSR also coordinates various Clean Water Fund Grant programs and oversees the distribution of Watershed Based Implementation Funds through the implementation of Comprehensive Watershed Management Plans based on the One Watershed One Plan Program. This includes the Lower St. Croix Comprehensive Watershed Management Plan described above.

The **Minnesota Department of Natural Resources** (MnDNR) manages a variety of natural resource and water related issues and activities in Minnesota. MnDNR activities that relate most closely with the goals of the District include:

- Collection of water resource-related data (e.g. fisheries, aquatic vegetation, surface and groundwater levels, stream flow)
- Oversight and issuance of permits for shoreline alterations, alterations in public waters and public wetlands, management of aquatic vegetation (including native plants, invasive plants, and floating bogs), and management of streams
- Establishment and review of floodplain and shoreland standards
- Issuance of permits for surface- and groundwater use appropriations
- Collection and management of data on native plant communities and rare plants and animals
- Fish stocking and fisheries management
- Wetland management and enforcement

The **Minnesota Pollution Control Agency** (MPCA) manages and tracks water resources and other natural resources such as air and soil from a pollution prevention perspective. The MPCA implements the Federal Clean Water Act within Minnesota and through that program, evaluates lakes and streams for compliance with state water quality standards. Water bodies that do not meet state standards are listed as "impaired." Measures to improve water quality are enacted through total maximum daily load (TMDL) standards implemented through MPCA permits to dischargers including Municipal Separate Storm Sewer Systems (MS4), construction and industrial stormwater, feedlots, and wastewater. The MPCA also oversees volunteer programs to monitor lakes and streams and acts as a repository for collected water quality data throughout the state. The District works with the MPCA to address impaired waters and engages local volunteers to assist in water resource monitoring through the MPCA's programs.

The **Metropolitan Council** is a regional planning agency providing guidance and oversight of municipal plans for growth within the seven-county metropolitan area. The Metropolitan Council provides guidance addressing a number of topics for municipal comprehensive plans including land use and surface water

management. Municipal comprehensive plans, local water management plans and watershed district watershed management plans for communities are reviewed by the Metropolitan Council. The Metropolitan Council also provides numerous services and programs including the Watershed Outlet Monitoring Program (WOMP) and the Citizen Assisted Monitoring Program (CAMP).

The **Minnesota Department of Transportation** (MnDOT) is responsible for the state's transportation system including freeways and trunk highways. The MnDOT is the designated government unit responsible for implementing the Wetland Conservation Act within the state road right-of-way.

The **Minnesota Department of Agriculture** (MDA) coordinates the Minnesota Agricultural Water Quality Certification Program, a voluntary program that supports the implementation of conservation practices on a field by field, whole farm basis. The program delivers on-farm conservation to help protect and restore surface waters and groundwater. The MDA also developed the Nitrogen Fertilizer Management Plan and works with local partners to monitor groundwater, implement prevention strategies in areas of high nitrate concentrations.

The **Minnesota Department of Health** (MDH) is the official state agency responsible for addressing all public health matters, including drinking water protection. The MDH administers the Well Management Program, the Wellhead Protection Program, and the Safe Drinking Water Act rules. The MDH also issues fish consumption advisories and is responsible ensuring safe drinking water sources and limiting public exposure to contaminants. Through implementation of the federal Safe Drinking Water Act, the MDH conducts the Public Water Supply Program, which allows the MDH to monitor groundwater quality and train water supply system operators. The 1996 amendments to the federal Safe Drinking Water Act require the MDH to prepare source water assessments for all of Minnesota's public water systems and to make these assessments available to the public.

## v. COORDINATION WITH FEDERAL AGENCIES

The U.S. Department of Agriculture's **Natural Resource Conservation Service** (NRCS) uses cost share programs to protect water quality, improve wildlife habitat, and conserve soil resources. Cost share funding from these programs is often used to leverage funds or technical assistance from local partners like the District. NRCS programs include the Conservation Reserve Program (CRP), the Environmental Quality Incentives Program (EQIP), and Conservation Stewardship Program (CSP).

The District collaborates with the **National Park Service** on their lands to protect and enhance water quality.

The **United States Army Corps of Engineers** (USACE) regulates activities such as dredging and filling in waters of the United States through Section 404 of the Federal Clean Water Act. Examples of activities that require a Section 404 Permit include: construction of boat ramps, placement of riprap for erosion protection, placing fill in a wetland, building a wetland, construction of dams or dikes, stream channelization, and stream diversion.

The District also interacts with the **Federal Emergency Management Agency** (FEMA) through floodplain determinations and regulation. Standards for building and filling activities near or within the floodplain are implemented locally by municipalities enrolled in the FEMA National Flood Insurance Program. In support of the National Flood Insurance Program, 100-year flood elevations for local lakes are determined by FEMA through modeling efforts.

## vi. COORDINATION WITH NON-GOVERNMENTAL STAKEHOLDERS

The District partners with many organizations and groups on a variety of activities including education and outreach; research, studies, and monitoring; aquatic invasive species management and prevention; and project implementation. Building and maintaining relationships with these groups is integral to the successful implementation of this plan. Collaboration with these entities provides opportunities for the District to stretch its budget, participate in broader discussions and studies, and less accessible audiences.

### The District regularly partners with:

#### *BIG MARINE LAKE ASSOCIATION*

The purpose of the Big Marine Lake Association is to educate, inform, and unite BML lakeshore property owners, those with neighborhood private lake access rights, and other concerned parties in an effort to monitor, identify, control, and (if possible) eradicate problematic aquatic invasive species in the waters of the lake.

#### *SQUARE LAKE ASSOCIATION*

The Square Lake Association is a four-decade old non-profit home-owners organization, committed to natural resource preservation, conservation, stewardship, and community collaboration.

#### *ST. CROIX RIVER ASSOCIATION*

The St. Croix River Association is the official non-profit partner of the St. Croix National Scenic Riverway. They work to protect, restore and celebrate the St. Croix River and its watershed through land conservation, water quality protection, and river corridor and watershed stewardship.

#### *ST. CROIX WATERSHED RESEARCH STATION*

The St. Croix Watershed Research Station is part of the Science Museum of Minnesota. It is home to a team of scientists who study water around the world, seeking to better understand challenges facing clean water and humanity's relationship with water. Their research provides essential data to improve water quality and reduce pollution of lakes and rivers.

#### *ST. CROIX BASIN WATER RESOURCES PLANNING TEAM*

The St. Croix Basin Water Resources Planning Team (Basin Team) is made up of dedicated water resource professionals from both Minnesota and Wisconsin who are united in the mission to "share science and policy to guide partners and citizens who restore, manage, and protect the land and water resources of the St. Croix Basin."

#### *WARNER NATURE CENTER*

The District once partnered with the Warner Nature Center on a variety of education programs. Although the center officially closed in 2019, possible future collaborations exist and will be explored when and if they are available.

## F. 10-YEAR IMPLEMENTATION PLAN

Table 6-3 on the following pages comprise the activities, budget, and schedule for this Plan's implementation. The table is arranged with information including:

- Annual budget category or program
- Priority level of the District (A = high priority; B = lower priority; C = lowest priority)
- Cross reference to the issues and goals found in Section IV
- Activities to be implemented annually (unless budget figures indicate non-annual implementation)
- Estimated budget for each year over the life of the plan. Asterisked figures include expected inflation increases over time. Non-asterisked figures are shown in 2021 dollars only.
- 10-year measurable outputs and outcomes

## Table 6-3. Ten-Year Implementation Plan

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ADMINISTRATION** | 1 | A | O&M1<br>O&M2<br>FLOOD1<br>GW3 | • Statutory compliance for government organizations<br>• Management Plan progress toward goals tracking & reporting<br>• State, regional, and county technical & policy committees<br>• Grant applications, tracking, and reporting<br>• Community and stakeholder group engagement & coordination<br>• Financial reserve<br>• Grant management<br>• Community engagement<br>• Lower St. Croix Partnership | $86,366 | $88,956 | $91,625 | $114,374 | $117,805 | $130,121 | $134,025 | $138,046 | $142,187 | $146,453 | 1. Annual workplans, reports, and newsletters published and accessible to the public and partners (O&M2)<br>2. Annual budgeting process completed with public hearing and input invited from communities and residents (O&M2)<br>3. Up to date website with meeting calendar, meeting minutes and agendas (O&M2)<br>4. Response to inquiries and concerns of residents, agencies, and LGUs within 72 hours (O&M1)<br>5. Policy developed for landlocked basin outlet petitions (FLOOD1)<br>6. Assistance provided to County to implement SSTS strategies from Washington Co. Groundwater Plan (GW3) | Improved progress tracking toward measurable goals (new state requirements), Grants, community engagement, and Lower St. Croix Partnership. Legal, accounting, and engineering administrative services. |
| **ADMINISTRATIVE SUBTOTAL*** | | | | | $86,366 | $88,956 | $91,625 | $114,374 | $117,805 | $130,121 | $134,025 | $138,046 | $142,187 | $146,453 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REGULATORY PROGRAM | 2 | A | WQ1<br>WQ5<br>O&M3<br>O&M4<br>O&M6<br>FLOOD3<br>WTL1<br>GW2 | • Implement the following rules for qualifying activities:*<br>- Erosion control<br>- Stormwater<br>- Shoreland<br>- Buffers<br>- Wetland Protections<br>- Floodplain<br>• Review groundwater appropriations<br>• Review WCA applications Participate on WCA TEPs | $35,000 | $36,050 | $37,132 | $38,245 | $39,393 | $40,575 | $41,792 | $43,046 | $44,337 | $45,667 | 1. Management of payments, sureties, easement recordings<br>2. Evaluation of rules in 2023 and 2030 (O&M3)<br>3. Maintenance of existing floodplain capacity (FLOOD3)<br>4. Enforcement of wetland protection and buffer rules; review of all WCA applications; participation on TEP; enforcement of wetland violations (WTL1)<br>5. Technical and/or financial support to LGUs to update and synchronize local stormwater management and shoreland controls (O&M4)<br>6. Enforcement of rules to promote infiltration and groundwater recharge to support groundwater dependent natural resources (GW2)<br>7. Volume of runoff for the 1 year stormm event decreases for 100 acres (WQ5) | • Implementing rules<br>• Managing payments, sureties, easement recordings<br>• Evaluating rules in 2023 and 2030<br>• Enforcing unpermitted land disturbance/construction<br>• Enforcing wetland violations |
| | 3 | A | O&M3 | District Rule Updates | | | $10,000 | $10,000 | | | | | | | Assessed and Updated District Rules in 2025 (O&M3) | New activity: CMSCWD assessment of existing rules, rules update, and grants to local communities to update local controls to improve consistency. |
| | 4 | A | WQ9<br>UP1 | Shoreland Alteration Rules Enforcement | $4,000 | $5,000 | $6,000 | $6,000 | $6,000 | $6,000 | $6,000 | $6,000 | $6,000 | $6,000 | 1. Implementation of shoreline restoration rules to discourage use of unnecessary riprap (WQ9)<br>2. Ten Shoreland Compliance & Enforcement Team meetings (O&M3)<br>3. Enforcement of major and minor shoreland violations | New activity: Enforcing unpermitted major shoreland violations (entire shorelines rip-rapped, sand blankets entire property lines, shoreland walls, etc.) and enforcing minor shoreland violations (patios, partial shoreline rip-rap placement). |
| | 5 | B | FLOOD 1 | Hydrologic and Hydraulic Model Maintenance | | | | | $4,000 | $5,000 | $5,000 | $5,000 | $10,000 | $10,000 | | New activity: Calibration activities to update based on infrastructure changes, monitoring data, and new survey data. |
| **REGULATORY SUBTOTAL** | | | | | $39,000 | $41,050 | $53,132 | $54,245 | $49,393 | $51,575 | $52,792 | $54,046 | $60,337 | $61,667 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TECHNICAL ASSISTANCE AND COST SHARE | 6 | A | WQ1 WQ2 WQ4 WQ8 | Agricultural/Rural Practices* | $30,000 | $40,000 | $40,000 | $50,000 | $51,500 | $53,045 | $54,636 | $56,275 | $57,964 | $59,703 | 30 rural/agricultural water quality BMPs reducing 227 lbs./year of phosphorus installed (WQ8) | 30 rural/agricultural water quality improvement cost share projects to reduce phosphorus by 227 lbs. per year. |
| | 7 | A | AIS1 | Aquatic Invasive Species Cost Share* | $15,000 | $20,000 | $20,000 | $20,000 | $20,600 | $21,218 | $21,855 | $22,510 | $23,185 | $23,881 | 1. 20 In-lake AIS management activities completed for water quality benefit (AIS1)<br>2. Partnerships with landowners, lake associations, LGUs utilized to help manage AIS" | Partner with landowners, associations, or local units of government to cost share 20 in-lake AIS management activities for water quality benefit. |
| | 8 | A | WQ9 UP1 | Shoreland Invasive Species Cost Share* | $20,000 | $30,000 | $30,000 | $30,000 | $30,900 | $31,827 | $32,782 | $33,765 | $34,778 | $35,822 | 1. 60 projects or 200 acres of shoreline with invasive species' controlled (WQ9)<br>2. Partnerships with landowners, lake associations, LGUs utilized to help manage and restore riparian buffers | Partner with landowners, association, or LGUs to manage AIS and restore native riparian buffer vegetation on 60 parcels totaling 200 acres. |
| | 9 | A | WQ1 WQ2 WQ4 WQ6 | Technical Assistance for Landowners* | $40,000 | $45,000 | $45,000 | $55,000 | $56,650 | $58,350 | $60,100 | $61,903 | $63,760 | $65,673 | 180 projects used District technical assistance (WQ6) | Provide technical assistance to landowners, associations, and local units of government for 180 potential water quality improvement projects. |
| | 10 | B | WQ1 WQ2 WQ4 WQ8 | Urban Water Quality Practices* | $10,000 | $30,000 | $20,000 | $30,000 | $30,900 | $31,827 | $32,782 | $33,765 | $34,778 | $35,822 | 27 urban water quality and rate control BMPs installed reducing phosphorus by 59 lbs./yr.(WQ8) | Cost share 27 urban stormwater quality improvement projects that reduce phosphorus by 59 lbs./yr. in partnership with landowners and associations. |
| | 11 | B | WQ9 UP1 | Shoreland Stabilization Practices* | $10,000 | $20,000 | $20,000 | $20,000 | $20,600 | $21,218 | $21,855 | $22,510 | $23,185 | $23,881 | 1. 19 shorelines or streambanks (2,000 linear feet) restored (WQ9)<br>2. Increase parcels that have 50% or greater natural shoreline on 6 water resources | Cost share the bioengineered stabilization and restoration of 19 shorelines. |
| | 12 | B | WTL1 | Black Ash Seep Restoration (80 acres) | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | 80 acres of native tree plantings in black ash seeps impacted by Emerald Ash Borer (WTL1) | New Activity: Partner with landowners and local units of government to accelerate the restoration of native trees for floodplains blighted by Emerald Ash Borer. |
| | 13 | C | GW3 | 2 High Risk SSTS Replacement Incentive | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | | New Activity: Consider potential to incentivize high risk septic replacement. Strongly supported by the CAC. |
| **TECHNICAL ASSISTANCE & COST SHARE SUBTOTAL** | | | | | $125,000 | $185,000 | $175,000 | $205,000 | $211,150 | $217,485 | $224,009 | $230,729 | $237,651 | $244,781 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INSPECTIONS AND MAINTENANCE | 14 | A | FLOOD2 | Channel and Outlet Inspections and Maintenance* | $15,000 | $15,450 | $15,914 | $16,391 | $16,883 | $17,389 | $17,911 | $18,448 | $19,002 | $19,572 | 1. Operation and Maintenance Plan developed for Carnelian channel and outlet pipe (FLOOD2)<br>2. Annual inspection and maintenance reports for Carnelian Channel and Silver Creek Areas (FLOOD2) | 2022 development of a maintenance plan. Carnelian channel inspections and maintenance channel inspections ($7,500/yr.) and maintenance ($5,000/yr.). |
| | 15 | A | O&M5 | Maintenance Fund Savings | $40,000 | $40,000 | $30,000 | $32,500 | $60,000 | $50,000 | $50,000 | $50,000 | $80,000 | $85,500 | 1. Repairs to underperforming or non-performing BMPs (O&M5)<br>2. Minimum of $500,000 contributed to Carnelian Outlet Pipe and BMP maintenance fund (FLOOD2) | New Activity: Establish annual savings for major repairs to District CIPs and Carnelian Channel and Outlet Pipe maintenance and repairs. CIPs include Sand Lake IESF, Goose Lake IESF, 197th Street Ravine, Marine Ravine, Marine on St. Croix BMPs. |
| | 16 | A | O&M5 | District BMP Inspections and Maintenance | $5,000 | $5,000 | $5,000 | $5,000 | $7,500 | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 | Inspection and maintenance recorded for all District BMPs (O&M5) | Inspection of temporary erosion and sediment controls for District permitted projects. |
| | 17 | A | FLOOD2 | Pipe Outlet Inspection and Maintenance | $22,500 | | | | | $22,500 | $40,000 | $40,000 | $40,000 | $40,000 | 1. 2022 and 2027 inspection reports for Carnelian Outlet Pipe.<br>2. 2028-2031 high priority maintenance activities for Carnelian Outlet Pipe (FLOOD2) | Televise the Carnelian Channel Outlet Pipe to evaluate for structural issues. Repair pipe deficiencies determined to reduce the effective life of the pipe. |
| | 18 | A | O&M6 | Construction Inspections* | $10,600 | $10,918 | $11,246 | $11,583 | $11,930 | $12,288 | $12,657 | $13,037 | $13,428 | $13,831 | 1. Inspections, reports, and follow up communications with 30+ construction sites; 600 inspections in 10 years (O&M6)<br>2. 10 spring and fall erosion control reminder emails | Inspect and communicate with 30+ construction sites per year. Send spring and fall erosion control reminder emails. |
| | 19 | B | O&M5 | Inspection of regulatory BMPs | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | 1. Inspection of past permitted projects to ensure stormwater BMPs are in place and functioning (O&M5)<br>2. Communication and cooperation with landowners with nonfunctioning BMPs<br>3. Maintenance declarations recorded | New activity: Inspect past permitted projects to ensure stormwater BMPs are in place and functioning. Work with landowners if they are not in place or functioning. |
| | 20 | B | O&M5 | Inspection of regulatory buffers and easements | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | | New Activity: Inspect past buffer easements to confirm they are still in native vegetation. 20 sites per year and summary report and communications with landowners. |
| **INSPECTIONS AND MAINTENANCE SUBTOTAL** | | | | | $93,100 | $71,368 | $62,159 | $65,474 | $96,313 | $112,177 | $130,568 | $131,485 | $162,429 | $168,902 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MONITORING | 21 | A | UP1 | Shoreline Monitoring | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | 1. Evaluation of shoreline vegetative cover on 10 lakes in 2022, 2024, and 2030<br>2. Measurement of progress toward the majority of lakeshores having 50% natural vegetative cover | New activity: Evaluate shoreline vegetative cover on 10 lakes annually to measure progress toward the goal of 75% of lakeshores having 50% natural vegetative cover and contact landowners modifying shoreline without a permit. |
| | 22 | A | WQ7 | BMP Performance Monitoring | $20,000 | $20,000 | $20,000 | $20,000 | $20,000 | $20,000 | $20,000 | $20,000 | $20,000 | $20,000 | 1. Annual monitoring of Goose Lake IESF and Sand Lake IESF or other high impact capital improvement projects<br>2. Pollutant load reductions quantified and tracked in project database (WQ7) | Annual monitoring of Goose Lake IESF and Sand Lake IESF or other high impact capital improvement projects. |
| | 23 | A | WQ11 | Volunteer Stream Monitoring | $2,000 | $2,000 | $2,000 | $4,000 | $4,000 | $4,000 | $4,000 | $6,000 | $6,000 | $6,000 | Macroinvertebrate data collected by volunteers from three streams annually (WQ11) | New activity: Volunteers monitor three streams for macroinvertebrates each year. Led by WCD staff. (started first group in 2020) Strongly supported by the CAC. |
| | 24 | A | WQ10<br>FLOOD1 | Lake Monitoring (10 yr. monitoring plan)* | $41,515 | $43,231 | $42,644 | $48,675 | $45,149 | $46,459 | $47,947 | $49,197 | $55,237 | $50,827 | 1. Known and tracked water quality on 30 District lakes (WQ10)<br>2. Lake level data collected on 30 District lakes (FLOOD1) | Monitor lake chemistry, levels, and New activity: chlorides. (Reduced from $100,000 per year.) |
| | 25 | A | WQ11 | Stream Monitoring (10 yr. monitoring plan)* | $70,000 | $5,000 | $5,000 | $70,000 | $43,890 | $46,839 | $37,971 | $58,110 | $117,775 | $41,492 | 1. Known and tracked water quality and quantity on 22 District streams (WQ11)<br>2. Stream health evaluated through macroinvertebrate monitoring (WQ11) | New activity: Conduct stream flow and macro-invertebrate monitoring in 2022, 2025, and 2030 to establish baseline health and measure changes over 10 years. |
| | 26 | B | GW3 | Shoreline septic and 201 inventory based on Washington County Septic Risk Assessment and infrared GIS data | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | SSTS and Community 201 Inventory | |
| | 27 | B | GW2<br>FLOOD3 | Groundwater watersheds and level monitoring (for resiliency planning) | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | 1. Monitoring and tracking of GW levels in at least 10 wells (GW2)<br>2. Map of GW watersheds of existing GW-dependent natural resources (GW2)<br>3. Identification of GW monitoring locations in GW watersheds of high risk GW-dependent natural resources (GW2)<br>4. Expansion of GW monitoring network to improve predictive modeling for climate resiliency (FLOOD3) | New activity: Map groundwater watersheds of existing groundwater dependent natural resources and identify and expand groundwater monitoring network to improve predictive modeling for climate resiliency. |
| **MONITORING SUBTOTAL** | | | | | $137,515 | $74,231 | $73,644 | $146,675 | $117,039 | $121,298 | $113,918 | $137,307 | $203,012 | $122,319 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYSIS AND PRIORITIZATION | 28 | A | WQ3 WQ12 | St. Croix and spring streams subwatershed analysis | $15,000 | $5,000 | | | | | | | | | Subwatershed analysis completed for: direct drainage to the St. Croix River (including spring streams); Square Lake, Hay Lake, Long Lake (Scandia), and Loon Lake (WQ12) | New activity: Annualized- to be completed in 2023. Grant funding from LSC |
| | 29 | A | FLOOD1 FLOOD3 | Floodplain Resiliency and Engagement | | $48,000 | | | | | | | | | 1. Completed Floodplain Vulnerability Assessment with results provided to Washington County and District communities (FLOOD3)<br>2. Complete vulnerability assessment of climate change scenarios (FLOOD1) | New activity: Annualized- to be completed in one to two years. |
| | 30 | A | WQ12 WTL2 | Degraded wetland monitoring | | | $15,000 | $15,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | 1. Data collected on 14 priority degraded wetlands discharging to Big Marine, Fish, Goose, Jellum's, Long (Scandia), Long (May Township) and locations identified and prioritized in the St. Croix Direct Discharge Subwatershed Analysis (WQ12)<br>2. Identification of contributing load to high priority water resource for implementation prioritization (WTL2) | New activity: Monitor 14 degraded wetlands with historic intensive landuse each year. Identify contributing load to high priority water resource for implementation prioritization |
| | 31 | A | | District Hydraulic Boundary Evaluation | $9,000 | | | | | | | | | | Hydrologic boundaries are corrected based on more accurate elevation information generated from Lidar | |
| | 32 | B | FLOOD3 | Flood capacity expansion evaluation | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | Completed evaluation of floodplain capacity expansion to make progress toward the Lower St. Croix 1W1P goal of expanding flood plain by 0.16" per acre (FLOOD3) | New activity: Evaluation of locations to increase water storage to work toward Lower St. Croix goal of increasing flood storage on the St. Croix by 0.16" per acre. The 2021 Restorable Wetlands Inventory revealed few significant opportunities to improve storage. |
| | 33 | B | WQ2 WQ11 | Stream stability and tributary evaluations | $10,000 | | | $15,000 | | | | | | | 5 rapid assessments per stream monitoring plan (WQ11) | New activity: 5 rapid assessments completed per the 10 year stream monitoring plan. |
| | 34 | B | WQ2 WQ11 | Stream stability and tributary evaluations | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | 5 rapid assessments, 5 targeted tributary, and 2 corridor studies per stream monitoring plan (WQ11) | New activity: Additional activities to guide stream improvement and restoration management decisions. |
| | 35 | B | WQ12 | Stressor identification evaluation on Big Carnelian Lake | | | | | $20,000 | | | | | | Complete stressor identification evaluation on Big Carnelian Lake | |
| | 36 | B | WTL2 | Prioritize high-quality wetlands for evaluation of decadal changes to level and vegetation | Currently not planned to be completed | | | | | | | | | | Evaluation of 3 high priority wetlands for changes in function each year | |
| **PRIORITIZATION AND ANALYSIS SUBTOTAL** | | | | | $34,000 | $53,000 | $15,000 | $30,000 | $50,000 | $30,000 | $30,000 | $30,000 | $30,000 | $30,000 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COMMUNICATIONS & OUTREACH (page 1 of 2) | 37 | | E&O1<br>E&O2<br>E&O2 | Pre/Post Surveys | $2,500 | | | $3,000 | | | | | $4,000 | | 1. Pre-post surveys in 2022, 2025, and 2030 will demonstrate improvement in knowledge and understanding of water resources, best management practices, and District work among targeted communities. | New activity: Targeted communications and outreach to landowners who may need permits, new landowners on riparian properties, agricultural and riparian landowners in high priority catchments. |
| | 38 | | O&M1 | Citizen Advisory Committee | $1,500 | $1,500 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | 30 CAC meetings held with recommendations to Board of Managers coming from at least 10 meetings | Development of 20 newsletters and 20 publications. |
| | 39 | | E&O1<br>E&O2<br>O&M1<br>E&O2<br>O&M1 | Website | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | 1. Website is updated weekly with current events and articles.<br>2. Each lake and stream has a webpage populated with water quality data, reports and management plans." | |
| | 40 | | E&O1<br>E&O1<br>E&O2<br>WQ!<br>WQ2<br>WQ4<br>GW1<br>GW3<br>UP1<br>O&M1<br>O&M4<br>FLOOD1<br>WQ!<br>WQ2<br>WQ4<br>GW1<br>GW3<br>UP1<br>O&M1<br>O&M4<br>FLOOD1 | East Metro Water Resource Education Program* | $13,477 | $13,477 | $13,477 | $14,285 | $14,285 | $14,285 | $15,150 | $15,150 | $15,150 | $16,550 | **Implementation of Communications & Outreach Plan (Appendix E)**<br><br>**Audiences include:** District residents, general public, visitors, water users; urban, rural, riparian and bluff landowners; LGU staff and decision makers; business owners, lawn care & winter maintenance professionals<br><br>**OUTPUTS INCLUDE:**<br>• Meetings, events and community engagements including 30 community events, 300 site visits, and 30 engagement events (tours, volunteer events)<br>• 3 community meetings on climate change scenarios, impacts, and resiliency options. | 1. Five Annual targeted mailings promoting Washington County 0% interest loan for septic replacement and Washington County abandoned well sealing program<br>2. Promote the Washington County Natural Resource Protection and Stewardship System Framework.<br>3. Groundwater quality education materials are developed and disseminated Materials emphases on BMPs including fertilizer use, regenerative agriculture, and chemical/pharmaceutical disposal. |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COMMUNICATIONS & OUTREACH (page 2 of 2) | 41 | | E&O1<br>E&O1<br>E&O2<br>WQ!<br>WQ2<br>WQ4<br>GW1<br>GW3<br>UP1<br>O&M1<br>O&M4<br>FLOOD1 | Targeted Engagement | $2,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 | **OUTPUTS INCLUDE (CONTINUED):**<br>• Targeted communications and outreach to landowners who may need permits, new riparian landowners, agricultural and riparian landowners in high priority catchments<br>• Printing and mailing of 20 newsletters and 20 publications with variety of topics and messages including water quality and trends, non-point source pollution and BMPs, AIS, groundwater quantity and quality<br>**OUTCOMES INCLUDE:**<br>• Partnerships built, strengthened, and maintained with member communities, lake associations, and others<br>• All road authorities have Smart Salting certificatied winter maintenance crews<br>• Participation in events, meetings, and trainings increase over the life of the plan<br>• Interest in BMP cost share program increases over life of plan<br>• Habitats are improved through community volunteer events<br>• Some residents take actions to reduce non-point source pollution and build resiliency to climate change<br>• Local communities take actions to address stormwater issues, impacts, and adopt or consider adopting MIDS | 1. 5 Annual targeted mailings promoting Washington County 0% interest loan for septic replacement.<br>2. Promote the Washington County Natural Resource Protection and Stewardship System Framework.<br>3. Groundwater quality education materials are developed and disseminated Materials emphases on BMPs including fertilizer use, regenerative agriculture, and chemical/pharmaceutical disposal. |
| | 42 | | | Newsletters and Publications | $8,000 | $8,000 | $10,000 | $10,000 | $12,000 | $12,000 | $12,000 | $12,000 | $12,000 | $12,000 | | Printing and mailing of 20 newsletters and 20 publications. |
| | 43 | | | Printing/Mailing* | $8,000 | $8,000 | $10,000 | $10,000 | $10,300 | $10,609 | $10,927 | $11,255 | $11,593 | $11,941 | | Printing and mailing of 20 newsletters and 20 publications. |
| | 44 | | | Volunteer Event Coordination | $1,500 | $1,500 | $3,000 | $4,000 | $5,000 | $5,000 | $5,000 | $5,000 | $5,000 | $5,000 | | Scheduling and coordinating 18 volunteer events. |
| | 45 | | | Presentations-Public Meetings | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | | |
| **COMMUNICATIONS & OUTREACH TOTAL** | | | | | $38,977 | $38,477 | $45,477 | $50,285 | $50,585 | $50,894 | $52,077 | $52,405 | $56,743 | $54,491 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10–Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AQUATIC INVASIVE SPECIES | 46 | A | AIS1 AIS2 | Planning and coordinated management | | | | | | | | $10,000 | | | 1. Develop coordinated AIS prevention and management plan (AIS1)<br>2. Develop and implement AIS Rapid Response Plan in conjunction with Washington County (AIS2) | New activity: Develop a coordinated AIS plan prevention and rapid response plan with Washington County |
| | 47 | A | AIS2 | Watercraft Inspections* | $24,000 | $24,720 | $25,462 | $26,225 | $27,012 | $27,823 | $28,657 | $29,517 | $30,402 | $31,315 | 2,000 hours of watercraft inspections on public boat launches located on Big Carnelian Lake, Big Marine Lake, Goose Lake, St. Croix River, and Square Lake (AIS2) | 2,000 hours of watercraft inspections on public launches |
| | 48 | A | AIS2 | AIS Enforcement | $5,000 | $5,000 | | | | | | | | | Work with Washington County to support enforcement of AIS laws | New activity: Work with Washington County to support enforcement of AIS laws |
| | 49 | B | AIS1 | AIS Management* | $11,000 | $11,330 | $11,670 | $12,020 | $12,381 | $12,752 | $13,135 | $13,529 | $13,934 | $14,353 | Continue to manage existing infestations of AIS that impact water quality (AIS1) | Manage AIS where water quality is impacted |
| | 50 | B | AIS2 | AIS Detectors | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | Enrollment of 50 new AIS detectors through incentives and offering free registrations to training (AIS2) | Incentivize local residents to become certified AIS detectors by covering the registration cost of enrollment for 5 residents per year. |
| | 51 | C | AIS1 | Lake Vegetation Surveys | Currently no funding identified. This activity may be completed as partnerships and funding is available | | | | | | | | | | AIS surveys completed in 10 high priority lakes through point intercept surveys (AIS1) | Lake surveys of existing and new aquatic invasive species. 13 lakes were evaluated in 2013. Terrapin, Mays and Clear evaluated in 2016. German and Alice in 2017. |
| **AQUATIC INVASIVE SPECIES SUBTOTAL** | | | | | $40,000 | $41,050 | $42,132 | $38,245 | $39,393 | $40,575 | $41,792 | $53,046 | $44,337 | $45,667 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPITAL IMPROVEMENTS (page 1 of 5) | 52 | A | WQ1<br>WQ2<br>WQ3<br>WQ4<br>WQ5<br>WQ6<br>WQ7<br>WQ8<br>WQ9<br>FLOOD1 | Project Feasibility and Engineering | $20,000 | $28,000 | $30,000 | $40,000 | $50,000 | $50,000 | $50,000 | $80,000 | $80,000 | $80,000 | Capital projects are designed and constructed in compliance with the law by qualified professionals | Capital projects feasibility and engineering. |
| | 53 | | | Project Legal Services | $5,000 | $5,000 | $5,000 | $6,000 | $6,000 | $7,000 | $7,000 | $7,000 | $7,000 | $7,000 | All necessary easements and agreements are established | Capital project legal assistance. |
| | 54 | A | | Marine Phase 2 | $10,000 | $2,500 | | | | | | | | | Marine Ravine and Marine Village Center Redevelopment Stormwater Projects are completed and restored with native vegetation. | Two years vegetative establishment maintence for the Village Center Redevelopment Stormwater Projects per agreements. |
| | 55 | A | | Marine Phase 3 | $10,000 | $2,500 | | | | | | | | | | |
| | 56 | A | | Goose Lake Wetland Restoration | $49,000 | $2,500 | | | | | | | | | Phosporus load reduction of 22.4 lbs./ yr. to Goose Lake, | Restore a 0.4 acre wetland with a 51 acre agricultural drainage area discharging directly to Goose Lake, an MPCA listed Impaired Water. In 2020, an annual contribution of 28lbs./ year was monitored flowing out of he wetland to Goose Lake. Long term monitoring data on Goose Lake shows a strong improving trend as a result of past projects. Multiple past projects on Goose Lake have resulted in improving water quality. The District goal is to complete the remaining projects to delist the lake by 2028. |
| | 57 | A | | Goose Lake Internal Load Eval. and Treat | $0 | $0 | $0 | | $30,000 | $45,000 | | | | | Cost estmtae to reduce internal loading by 42 lb./yr. in Goose Lake. | After the watershed load of 75 lbs./yr. is completed (in 2022) collect 4-10 cm sediment cores to analyze for phosphorus fractions at 2-cm intervals to determine an appropriate alum or iron dose and estimated cost. Implement alum or iron treatment to achieve the 42 lb./ yr. internal load reduction goal from the 2012 CMSCWD Multi-Lakes TMDL. Coordinate with BWSR, MnDNR, MPCA. |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPITAL IMPROVEMENTS (page 2 of 5) | 58 | A | WQ1<br>WQ2<br>WQ3<br>WQ4<br>WQ5<br>WQ6<br>WQ7<br>WQ8<br>WQ9<br>FLOOD1<br>WTL1<br>WTL2 | Big Marine East Boat Launch | $40,000 | $2,500 | | | | | | | | | Reduce sediment plumes at the East Boat Launch and reduce phosphorus by 1.1 lbs./yr. to Big Marine Lake. | Address 3.4 acres of stormwater drainage currently causing high turbidity sediment plume into Big Marine Lake. Stormwater will be routed into vegetated drainage swales, to an infiltration basin for treatment prior to outletting to a wetland. This project will eliminate large plumes of sediment into Big Marine Lake during storm events and reduce phosphorus by 1.1 lbs./yr. Big Marine is a high quality recreational lake with a public boat launch that is connected and flows to the St. Croix River. |
| | 59 | A | | Big Marine, Hay, Sand Road SW Retrofits | | $80,000 | $50,000 | | | | | | | | 1. Reduce phosphorus by 4.0 lbs./year to Hay and Sand Lakes.<br>2. Reduce phopsphorus to Big Marine Lake by 4.0 lbs./yr. | In partnership with the City of Scandia implement stormwater quality improvement projects in conjunction with 2023 reconstruction projects on 197th Street and 202nd Street within the watersheds of Hay and Sand Lakes to reduce phosphorus by 4.0 lbs./year.<br>In partnership with the City of Scandia implement stormwater quality improvement projects in conjunction with 2024 reconstruction of Maxwell Avenue N within the watersheds of Big Marine Lake to reduce phosphorus by 4.0 lbs./yr. |
| | 60 | A | | Bliss Addition SW Retrofits | | | $50,000 | $40,000 | $10,000 | | | | | | Reduce phosphorus discharging to Big Marine Lake by 11.5 lbs./yr. | Partner with the City of Scandia to implement the findings of the 2019 Bliss Addition Stormwater Planning findings to treat 18 acres of urban stormwater flowing into Big Marine Lake. The project is projected to reduce phosphorus discharging to the lake by 11.5 lbs./yr. |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPITAL IMPROVEMENTS (page 3 of 5) | 61 | A | WQ1 WQ2 WQ3 WQ4 WQ5 WQ6 WQ7 WQ8 WQ9 FLOOD1 WTL1 WTL2 | Big Car 133rd and Panorama | | | $70,000 | $35,000 | $35,000 | | | | | | Reduce phosphorus by 7.0 lbs./yr. to Big Carnelian Lake. | Collect 32 acres of stormwater drainage discharging directly to Big Carnelian Lake and convey it to an infiltration basin designed to infiltrate 87% of the annual stormwater volumes. Routing road drainage into a treatement basin will reduce phosphorus by an estimated 7.0lbs per year. Big Carnelian is a high use recreational lake with a public boat launch and a declining water quality trends. |
| | 62 | A | | Seven Lakes Targeted BMPs | | | | | $55,000 | $50,000 | $15,000 | $50,000 | $60,000 | $45,000 | Implement highly ranked water quality best management practices to reduce annual total phosphorus loads by 22.0 lbs./yr.for the following lakes: Long Lake in Scandia, Fish Lake, and continued phosphorus and sediment reductions to Big Carnelian Lake , Big Marine Lake , Little Carnelian Lake and Square Lake | Implement highly ranked cost/ benefit ranked water quality best management practices to reduce annual total phosphorus loads by 22.0 lbs./yr.for the following lakes: Long Lake in Scandia (impaired), Fish Lake (impaired), Big Carnelian Lake (high public use and declining water quality trends), Big Marine Lake (high public use), Little Carnelian Lake (high public use and declining water quality trend), and Square Lake (high public use and declining water quality trend). |
| | 63 | A | | St. Croix and Spring Streams Targeted BMPs | | | | | | $50,000 | $50,000 | $100,000 | $50,000 | | Reduce annual phosphorus discharges by 30.0 lbs./yr. and sediment discharges to Falls or Zavoral' s streams (flow to the St. Croix) or directly to the St. Croix River. | Stabilize the two highest priority gullies/ravines identified in the St. Croix Direct Subwatershed Analysis. These projects will stabilized channels and reduce annual phosphorus discharges by 30.0 lbs./yr. and sediment discharges to Falls or Zavoral' s streams (flow to the St. Croix) or directly to the St. Croix River. |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPITAL IMPROVEMENTS (page 4 of 5) | 64 | A | WQ1 WQ2 WQ3 WQ4 WQ5 WQ6 WQ7 WQ8 WQ9 FLOOD1 WTL1 WTL2 | Willow Brook Stormwater Projects | | | | | | $50,000 | $80,000 | $20,000 | | | Reduce phosphorus by 19.5lbs per year to Willow Brook, which flows directly to the St. Croix River. | Install three infiltration basins to intercept and treat stormwater from 81 acres directly flowing into the Willow Brook, a 2,000 foot long spring stream, and to the St. Croix River. The project is projected to reduce phosphorus by 19.5l bs./yr. Willow Brook has a macroinvertebrate stream health grade of C with a District goal of A. It has documented brook trout. This project addresses the largest pollutant load to the stream. |
| | 65 | A | | Mill Stream and Willow Brook Restorations | | | | | | | $50,000 | $50,000 | $50,000 | $50,000 | Reduce phosphorus by 4.0 lbs./yr. to the St. Croix River and Mill Stream. | Mill Stream and Willow Brook targeted stabilization and restoration of riparian corridor. |
| | 66 | A | | Spring Stream Restorations | | | | | | | | $20,000 | $50,000 | $60,000 | Restore two highly impacted stream reaches on Willow Brook, Mill Stream, Falls Creek, or Zavoral's Streams. | Implement the two highest priority stream restoration projects on Willow Brook, Mill stream, Falls Creek, or Zavoral's. Restoration project targeting will be based on outcomes of the St. Croix Direct Subwatershed Analysis, stream health evaluation, and stream corridors rapid assessments. |
| | 67 | A | | Targeted Wetland Restorations | | | | | | | $60,000 | $85,000 | | | 2 wetland restorations mitigaating nutrient loading reducing phosphorus by 40.0 lbs./year<br><br>1 wetland restoration for at least 5 acres wetland banking. | 2 wetlands mitigated for legacy loading and reducing phosphorus by 40.0 lbs./yr. 1 wetland restoration for at least 5 acres wetland banking credits. Wetlands will be selected for restoration based on outcomes of the Degraded Wetland Monitoring program. |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPITAL IMPROVEMENTS (page 5 of 5) | 68 | A | WQ6 | Carnelian Creek Cattle Exclusion | | | | | | | $21,000 | $9,000 | | | Cattle excluded along Carnelian Creek (imaired for E. Coli) | Implement high priority cattle exclusions along Carnelian Creek to address the primary source of E. Coli identified in the 2016 Stream Bacteria Assessment. |
| | 69 | A | WQ7 | Mill Stream and St. Croix Urban Stormwater BMPs | | | | | | $50,000 | $40,000 | | | | Mill Stream riparean cooridor improvements improve stream health | Mill Stream and Willow Brook targeted stabilization and restoration of riparian corridor. |
| | 70 | A | WQ12 | Fish Lake Internal Load Evaluation and Treatment | | | | | | | | $30,000 | | $70,000 | After the watershed loads are addressed, implement treatments to achieve the 31 lb./yr. internal load reduction goal | After the watershed load of 38 lbs./yr. is addressed collect 4-10 cm sediment cores to analyze for phosphorus fractions at 2-cm intervals to determine an appropriate alum or iron dose and estimated cost. Implement alum or iron treatment to achieve the 31 lb./yr. internal load reduction goal from the 2012 CMSCWD Multi-Lakes TMDL. Coordinate with BWSR, MnDNR, MPCA. |
| | 71 | B | FLOOD1 | High Priority Climate Resiliency Projects | | | | | | | | $20,000 | $60,000 | $60,000 | Two high priority climate resiliency projects are implemented | Partner with Washington County or local units of government to implement the two highest ranked resiliency projects identified in the floodplain resiliency evaluation. |
| **CAPITAL IMPROVEMENT SUBTOTAL** | | | | | $134,000 | $123,000 | $205,000 | $121,000 | $186,000 | $302,000 | $373,000 | $471,000 | $357,000 | $372,000 | | |

| Budget Category | Item Number | Draft Priority | Issues Goals | Annual Activity | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 10-Year Measurable Outputs & Outcomes | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PLANNING | 72 | A | | Management Plan Technical Services | | | | $10,000 | | | | | $30,000 | $90,000 | 1. Minor plan ammendment is completed in 2025<br>2. 2032-2042 Watershed Management Plan is completed" | |
| | 73 | A | | Management Plan Writing | | | | $10,000 | | | | | $20,000 | $40,000 | | |
| **PLANNING SUBTOTAL** | | | | | **$0** | **$0** | **$0** | **$20,000** | **$0** | **$0** | **$0** | **$0** | **$50,000** | **$130,000** | | |
| DEBT SERVICE | 74 | | | 319 Loan Repayment | $31,700 | $31,700 | $31,700 | $31,700 | $31,700 | $31,700 | $31,700 | $31,700 | $31,700 | $31,700 | 0% interest loan is repaid in 10 years | |
| | 75 | | | Reserve Repayment | | | | $20,000 | $42,500 | $12,500 | | | | | | |
| **DEBT SERVICE SUBTOTAL** | | | | | **$31,700** | **$31,700** | **$31,700** | **$51,700** | **$74,200** | **$44,200** | **$31,700** | **$31,700** | **$31,700** | **$31,700** | | |
| STAFFING | 76 | A | | Administrative Staffing | $42,861 | $44,147 | $45,472 | $46,836 | $48,241 | $49,688 | $51,179 | $52,714 | $54,296 | $55,924 | | |
| | 77 | A | | Implementation Staffing | $177,445 | $182,768 | $188,251 | $193,899 | $199,716 | $205,707 | $211,879 | $218,235 | $224,782 | $231,525 | | |
| **STAFFING SUBTOTAL** | | | | | **$220,306** | **$226,916** | **$233,723** | **$240,735** | **$247,957** | **$255,395** | **$263,057** | **$270,949** | **$279,078** | **$287,450** | | |
| Total | | | | | $979,964 | $974,748 | $1,028,591 | $1,137,733 | $1,239,835 | $1,355,720 | $1,446,938 | $1,600,712 | $1,654,474 | $1,695,429 | | |

*Figures include expected inflation increases over time. Non-asterisked figures are shown in 2021 dollars only.

# VII. PLAN AMENDMENTS

- This Plan will guide District activities and will be in effect for 10 years from the date of BWSR Board approval unless an updated plan is approved prior to that date. During the life of the Plan, the District may revise its Plan through an amendment procedure, as needed. Amendments to this Plan will follow the procedures described in this section and will proceed in accordance with the process provided in Minnesota Rules 8410.0140. Plan amendments may be proposed by any person to the Board of Managers, but only the Board of Managers may initiate the amendment process. All recommended Plan amendments must be submitted to the District in writing, along with a statement of the problem and need, the rationale for the amendment, and an estimate of the cost. Amendments identified by District staff will similarly be presented to the Board of Managers for approval.

The District anticipates that only significant changes or additions to goals, issues, administrative procedures, or implementation (i.e., programs, projects, and capital improvements) will prompt the District to amend the Plan, although final discretion resides with the Board of Managers. Minnesota Rules 8410.0140 subp. 1a defines changes that do not require an amendment (e.g. reformatting/ reorganization of the Plan, clarification of existing Plan goals or policies, and adjustment to how the District will carry out program activities within its discretion).

Amendments to this Plan are subject to the review process provided in Minnesota Statutes 103B.231 subd. 11, except when the proposed amendments are determined to be minor amendments by satisfying all of the following criteria:

A. BWSR has either agreed that the amendments are minor or failed to act within five working days of the end of the 30-day comment period specified in item B (unless an extension has been mutually agreed upon).

B. The District has sent copies of the amendments to the Plan review authorities for review and comment allowing at least 30 days for receipt of comments, has identified that the minor amendment procedure is being followed, and has directed that comments be sent to the District board.

C. The Washington County Board has not filed an objection to the amendments with the District and BSWR within the comment period specified in item B (unless an extension is mutually agreed upon).

D. The District has held a public meeting to explain the amendments and published a legal notice of the meeting twice, at least seven days and 14 days before the date of the meeting.

E. The amendments are not necessary to make the plan consistent with an approved and adopted county groundwater plan.

The District will prepare and distribute plan amendments in a format consistent with Minnesota Rules 8410. The District will maintain a distribution list of everyone who receives a copy of the Plan. Within 30 days of adopting an amendment, the District will distribute copies of the amendment to everyone on the distribution list and post the amendment on the District website.

Approximately 2 years prior to the expiration date of this Plan, the District will begin the process of updating its Plan (unless a revised schedule is developed by BWSR in accordance with Minnesota Statutes section 103B.231, subdivision 3a).