BOARD OF WATER AND SOIL RESOURCES

2018 Nonpoint Priority Funding Plan

July 1, 2018 – June 30, 2020
6/29/2018

The final version of this draft document is posted on BWSR's Nonpoint Priority Funding Plan web page at www.bwsr.state.mn.us/planning/npfp as of July 1, 2018.

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Introduction

The Nonpoint Priority Funding Plan (NPFP) is a criteria-based process to prioritize Clean Water Fund nonpoint implementation investments. It provides state agencies with a coordinated, transparent, and adaptive method to ensure that Clean Water Fund implementation allocations are targeted to cost-effective actions with measurable water quality results.

Version 1.0 of the NPFP (Appendix A) was foundational and continues to provide guidance on how to prioritize nonpoint implementation actions at the state level. With two biennium of funding distributed thus far, this update does not evaluate, reassess or change the three high-level State priorities or the nine criteria established in the first version. However, BWSR is committed to working with a task force consisting of but not limited to state agencies, local governments, private organizations, and nonprofits to review and evaluate the purpose and scope of the NPFP over the course of the next 18 months.

The primary focus of this update is to:

- Provide specific examples of the progress made to date on how the NPFP is being used to guide and prioritize nonpoint implementation actions at the State level.
- Provide updated financial information from the FY20-21 biennial budget request (BBR).

The intent of this update is not to provide accountability of Clean Water Fund programs, nor track the progress made using Clean Water Funds. Two case studies are provided (on Page 15; in Section 4 of this update) as examples of efforts currently underway, demonstrating how statewide water quality goals translate to local sub-watershed actions.

Section 1: Nonpoint Priority Funding Plan Summary

1.1 Purpose

Preparation of a Nonpoint Priority Funding Plan (NPFP) is required by the *Clean Water Accountability Act* (Act). The Act placed into law the Minnesota Pollution Control Agency (MPCA) Watershed Restoration and Protection Strategy (WRAPS), which required the MPCA to produce a biennial report of progress in achieving pollutant reductions, and required the Minnesota Board of Water and Soil Resources (BWSR) to prepare a priority funding plan to prioritize how Clean Water Funds are used, with updates required on both of these reports every two years.

Specifically, the Act amends Minnesota Statutes 2012, section 114D.50 to read:

Subd. 3a. Nonpoint Priority Funding Plan.

(a) Beginning July 1, 2014, and every other year thereafter, the Board of Water and Soil Resources shall prepare and post on its Web site a priority funding plan to prioritize potential nonpoint restoration and protection actions based on available WRAPS, TMDLs and local water plans. The plan must take into account the following factors: water quality outcomes, cost-effectiveness, landowner financial need, and leverage of nonstate funding sources. The plan shall include an estimated range of costs for the prioritized actions.

(b) Consistent with the priorities listed in section 114D.20, state agencies allocating money from the clean water fund for nonpoint restoration and protection strategies shall target the money according to the priorities identified on the nonpoint priority funding plan. The allocation of money from the clean water fund to projects eligible for financial assistance under section 116.182 is not governed by the nonpoint priority funding plan.
M.S. 2013, Chapter 137, Article 2, Section 14.

1.2 Version 1.0

Version 1.0 of the NPFP (June 25, 2014) was foundational and continues to provide guidance on how to prioritize nonpoint implementation actions at the State level. The NPFP sets forth:

- High-level State priorities for investing Clean Water Fund nonpoint implementation funding
- Criteria for evaluating proposed activities for purposes of prioritizing nonpoint funding
- High-level *Keys to Implementation*
- Estimated costs for implementing nonpoint pollution reduction practices and activities

BWSR and other State agencies that use the Clean Water Fund to implement nonpoint source implementation actions are required to use the NPFP when making nonpoint investment decisions. The NPFP does not include a single scoring system with weighted criteria. Instead, it allows State agencies the flexibility to apply the NPFP priorities and criteria in ways that meet their strategic and legislative goals.

1.3 Scope of Update

Only two biennium of funding has been distributed since the first publication of the NPFP. As a result, the three high-level state priorities and the nine criteria are not being reassessed or changed in this update. Version 1.0 of the NPFP will continue to provide guidance on the prioritization of Clean Water Fund nonpoint implementation allocations for the July 1, 2018 to June 30, 2020 time frame (Appendix A). One focus of this update is to highlight progress made to date, including:

- Status update from state agencies using the NPFP
- MPCA's Watershed Restoration and Protection Strategies and program progress
- BWSR's watershed-based local water plans and program progress
- Minnesota Department of Health's (MDH) Groundwater Restoration and Protection Strategies and program progress
- New and improved tools for targeting management practices and measuring practice effectiveness

Updated financial information from the FY20-21 biennial budget request (BBR) is included in this report. Finally, two case studies were selected to show how Comprehensive Watershed Management Plans use science-based information from Total Maximum Daily Load Studies (TMDLs) and Watershed Restoration and Protection Strategies (WRAPS) to produce local lists of prioritized, targeted actions capable of achieving measurable results.

1.4 High-Level State Priorities and Criteria

Leadership from the state agencies that are tasked with protection and restoration of Minnesota's water resources came together and agreed on a set of high-level state priorities that align their programs and activities, working to reduce nonpoint source pollution as follows:

- Restore those impaired waters that are closest to meeting state water quality standards
- Protect those high-quality unimpaired waters at greatest risk of becoming impaired
- Restore and protect water resources for public use and public health, including drinking water

The first version of the NPFP established the following nine criteria as a guide for evaluating program or project activities that are under consideration for receiving nonpoint implementation funding from the Clean Water Fund. Integrating the criteria into decision-making ensures that the uses of Clean Water Funds are cost-effective and will result in measurable water quality improvements. Currently, drinking water management is integral to both groundwater and surface water restoration and protection efforts. Over the next biennium, criteria will be evaluated in relation to how they align with groundwater and drinking water projects.

- **Aligned with State Priorities:**
  Alignment of proposed activities with state priorities.
- **Locally Prioritized and Targeted:**
  Effective prioritization and targeting of proposed activities at the watershed scale.
- **Measurable Effects:**
  Capability of the proposed activities to produce measurable results at the watershed scale.
- **Multiple Benefits:**
  Secondary water quality or other environmental benefits of the proposed activities.
- **Longevity:**
  Expected lifespan of the proposed activities with proper maintenance or, for annual management practices, assurance that practices will be maintained for a specified period of time.

- **Capacity:**
  Readiness and ability of local water management authorities and partners to execute the proposed activities.
- **Leverage:**
  All non-Clean Water Fund dollars contributed for every dollar of Clean Water Fund money. Non-Clean Water Fund dollars include non-state dollars as well as state dollars from sources other than the Clean Water Fund.
- **Cost-Effectiveness:**
  Cost per unit of pollutant load reduced or prevented as compared against specific water quality goals – Clean Water Fund cost and total project cost.
- **Landowner Financial Need:**
  Increased financial assistance for low-income landowners.

Section 2: Update

While there have been advancements in the development of Watershed Restoration and Protection Strategies (WRAPS), watershed-based local water plans, and other water resource data since the first version of the NPFP was published, there is not yet a place in the state where all these pieces align. Noteworthy progress of key actions necessary for meeting clean water goals, in addition to the strategic allocation of funding, is detailed in this section.

2.1 Agency Status Update: Criteria and High Level State Priorities

The NPFP provides state agencies receiving nonpoint implementation Clean Water Funds with a process for working together to align program decisions and ensure that Clean Water Funds are used efficiently and effectively. The process can help agencies identify gaps and needs in existing programs, and connects project-related funding decisions to cost-effective water quality outcomes. Although not all agencies receive on-the-ground implementation dollars through the Clean Water Fund, their program work aligns well with, and supports, the purpose of the NPFP.

This status update is intended to share how BWSR and other agencies are working to integrate the high-level state priorities and nine criteria into their program decisions. This does not track progress made with Clean Water Funds. The Clean Water Performance Report helps clarify connections between Clean Water Funds invested, actions taken and outcomes achieved. Read the report at: https://www.pca.state.mn.us/sites/default/files/lrp-f-3sy18.pdf

Board of Water and Soil Resources

In 2016, BWSR began using the NPFP in grant and easement programs that invest funding in on-the-ground conservation. In the Clean Water Fund Request for Proposals, BWSR emphasized the three high-level state priorities and added Cost Effectiveness to the Clean Water Fund Competitive Grant and Targeted Watershed ranking criteria. The criteria aligned with state priorities, locally prioritized and targeted, measurable effects, and multiple benefits have previously been and remain in the ranking criteria. Leverage and capacity are addressed through eligibility requirements and longevity through program policy. Landowner financial need is addressed through providing increased financial assistance for low-income landowners.

Minnesota Department of Agriculture

In 2016, the MDA began using the NPFP to document how their Clean Water Fund projects and activities support specific statewide goals and keys to implementation. The Department of Agriculture's current Clean Water Fund implementation activities, including technical assistance, research and groundwater protection, align with the NPFP.

Metropolitan Council

The Metropolitan Council does not receive nonpoint source implementation funding from the Clean Water Fund. However, Clean Water funds are used to fund efforts in water supply planning and water conservation.

Minnesota Department of Natural Resources

The DNR continues to apply NPFP high-level priorities, criteria, and keys to implementation in the following ways, to activities supported by a DNR Nonpoint Restoration and Protection appropriation:

- Focusing technical assistance to local governments on clean water implementation projects that are likely to achieve measurable watershed health effects and helping apply scientific information to the selection, targeting, and design of these projects. DNR staff typically assist around 80 multi-year implementation projects in any given year.
- In the Tullibee Lakes program, applying fisheries science to target forest stewardship efforts to watersheds of high-quality lakes sensitive to degradation from development pressures. The program protects water quality by keeping forests healthy. A similar targeted approach is being applied in several southeastern Minnesota watersheds.
- Maximizing existing laws and regulations by (a) developing tools to help local governments update and strengthen local land use ordinances that protect water quality; and, (b) offering information to culvert permit applicants about the option of designing new or replacement culverts to protect floodplains, which in turn helps protect water quality and watershed health.

Minnesota Department of Health

The Department of Health's Clean Water Fund-supported initiatives focus primarily on drinking water protection and most closely align with the high-level state priority to restore and protect water resources for public use and public health, including drinking water.

Minnesota Pollution Control Agency

The high-level state priorities of the NPFP were used to develop the draft protection strategy for lakes, and are also being reviewed for the development of a protection strategy for streams. The MPCA, in cooperation with DNR, BWSR, MDA, and MDH created a protection strategy for lakes in 2015 to help systematically identify protection opportunities for unimpaired but possibly vulnerable lakes in WRAPS projects. To date, the strategy has been piloted in several watersheds in the Upper Mississippi River, Red River, Lake Superior, and Rainy River Basins to help prioritize lake protection needs.

MPCA Clean Water Funds are used for statewide monitoring and assessment, HSPF modeling of each HUC8 watershed, identification of stressors and sources of nonpoint source pollution, development of TMDL studies, research and tool development projects, and of course, the WRAPS. WRAPS strategies are heavily based on the science collected in the watershed, and NPFP priorities are incorporated.

2.2 Keys to Implementation: Status Updates

The following discussion includes updated, supplemental information for state-level programs and activities working to reduce sources of nonpoint pollution and are identified in the *Keys to Implementation;* from the NPFP, 2014-2016.

Accelerate Watershed Scale Implementation

Implementation will be most effective when Clean Water Fund money for the highest-priority actions follows local government adoption of watershed-based local water plans.

Comprehensive Watershed Management Planning Program

In 2015, the Minnesota Legislature passed Minnesota Statutes §103B.801, the Comprehensive Watershed Management Planning Program. This legislation defined the purposes and further outlined the structure for the One Watershed, One Plan Program.

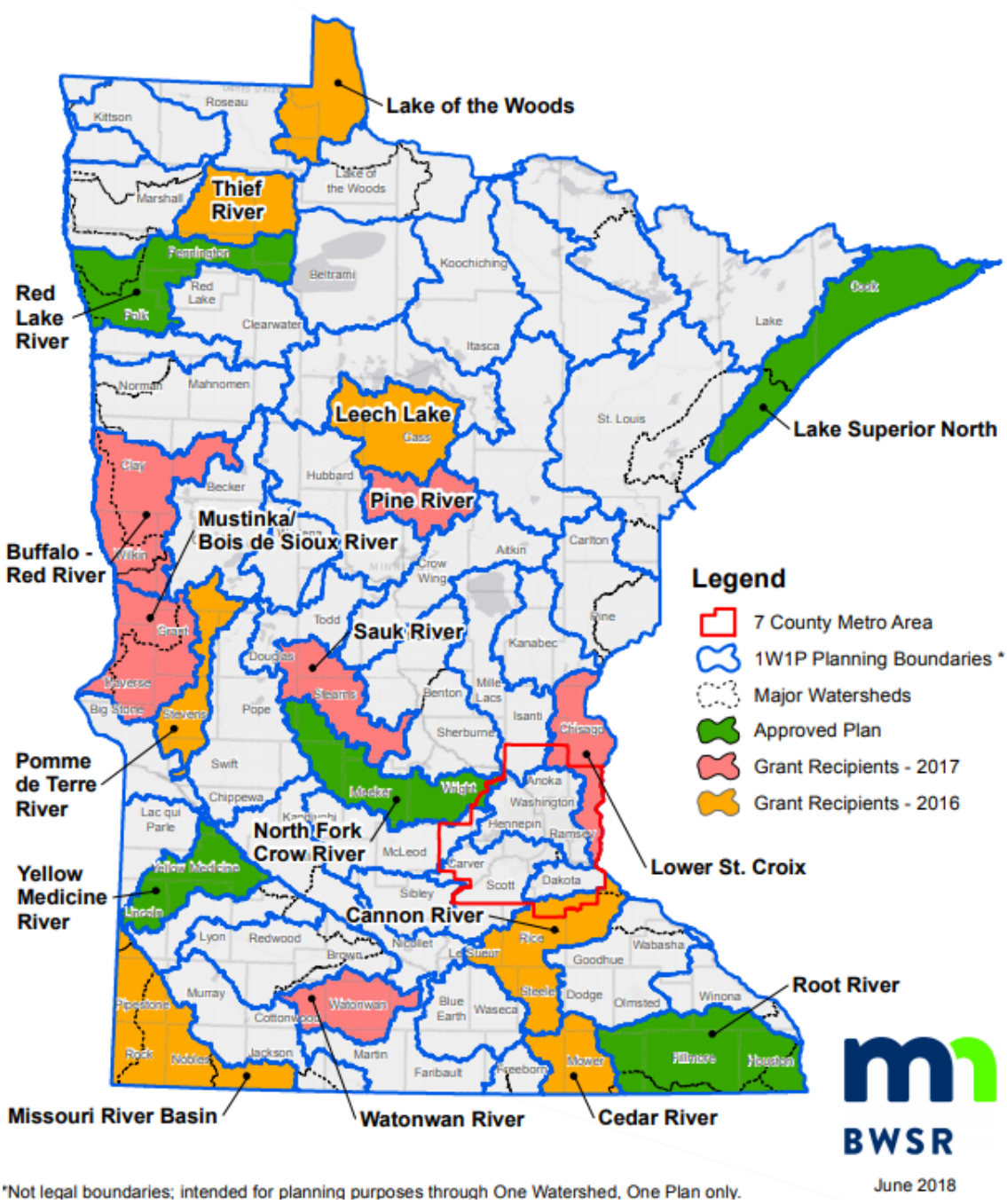
In 2016, BWSR adopted the One Watershed, One Plan *Content Requirements* and *Operating Procedures*. These documents where updated in 2018.

Five One Watershed, One Plan Pilot Projects were initiated in 2014.

- Root River Pilot Watershed (see case study on page 11 for more information about this project)
- Red Lake River Pilot Watershed
- Lake Superior Pilot Watershed
- Yellow Medicine Pilot Watershed
- North Fork Crow Pilot Watershed

All pilot projects have completed their plans and BWSR has approved them. As shown in Figure 1, there are now an additional 13 comprehensive watershed management plans underway.

Figure 1. Participating Watersheds in the One Watershed, One Plan Program



Prioritize and Target at the Watershed Scale

The key to developing watershed-based project implementation schedules and estimated costs is to first prioritize surface and groundwater strategies at the watershed scale and then target practices within subwatersheds or similar-scale units, using the best available science.

Surface Water Quality Models & Tools Interagency Discussion

Models and tools are useful for watershed prioritization and for identifying potential impacts to surface and groundwater. They are often capable of targeting which actions, locations, and management practices are most effective at addressing water quality goals and project objectives. Models and tools are used to project outcomes of specific actions, locations, and management practices to forecast measurable results. Using these models and tools together with the best available science can efficiently inform Minnesota's Water Quality Framework.
In order to develop a broader understanding of how Minnesota's agencies are using models and tools for watershed prioritization and implementation targeted to critical areas that provide the largest water quality benefits, the Clean Water Fund Interagency Research Team hosted the Surface Water Quality Models & Tools Interagency Discussion in February 2016. The event, consisting of 14 coordinated presentations and attended by over 250 participants, promoted dialogue and enhanced collaboration between state employees involved in Minnesota's Water Management Framework activities through the sharing of information about surface water quality models and tools currently being used or funded by agency programs.

Measure Results at the Watershed Scale

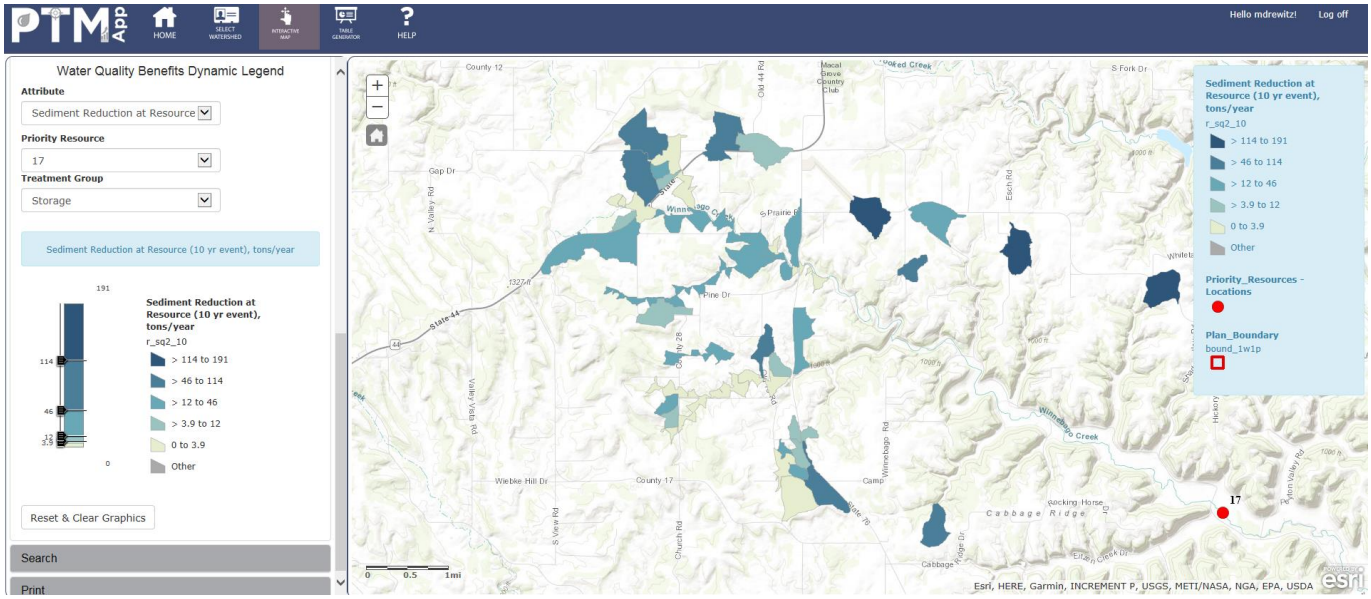
Similar to prioritizing and targeting, measuring results is best achieved at the watershed scale. Watershed-based local water plans capable of producing measurable results are essential to adaptive management and accountability to the public.

Accountability Report

As required by the Act, MPCA will provide the second accountability report in July 2018, and every other year thereafter. The report will describe the progress toward implementation milestones for Minnesota watersheds that align with completed WRAPS. In the future, MPCA will relate the progress made in the watersheds to the reduction strategies identified in the Minnesota Nutrient Reduction Strategy Report, and other statewide efforts.

Prioritization, Targeting, and Measuring Water Quality Improvement Application (PTMA)

A newer tool that is now available, and leverages scientific data is the PTMA. The PTMA is a GIS web and desktop application that can be used by local decision makers to prioritize subwatersheds for implementation, target specific fields for best management practices, and project water quality improvement by cost and expected load reductions within the watershed. An example of the PTMA is included in the Root River One Watershed, One Plan case study.



An example of PTM App.

Use Science-Based Information

A key to developing prioritized implementation schedules for projects with targeted actions, and measuring results of these actions, is to incorporate the wealth of science-based information, summarized in WRAPS, other technical reports, and practice effectiveness research into local water planning and project development processes.

The goal of the One Watershed, One Plan Program is to align local water planning on major watershed boundaries with watershed-based WRAPS, GRAPS, and state strategies towards prioritized, targeted, and measurable implementation plans.

Watershed Restoration and Protection Strategies (WRAPS)

According to the MPCA's 2018 Environmental and Performance Measures' Dashboard (https://www.pca.state.mn.us/sites/default/files/Dashboard-MPCA-2018.pdf), watershed monitoring has been completed in 100 percent of the 80 watersheds. Currently, all 80 watersheds have WRAPS projects underway and 86 percent of the 80 watershed have a completed assessment.

Protection Strategies in WRAPS

Guidance has been developed to help systematically identify protection opportunities in WRAPS projects, local water plans, and/or 1W1P that follow the priorities outlined in the NPFP. Ranked, prioritized lists are now available for lakes and streams in need of protection efforts. For each lake, a phosphorus loading reduction target was computed with the expectation that local governments might find the estimates useful for their lake conservation efforts. The goal was to identify lakes that were not resilient to additional phosphorus loading; the most sensitive lakes identified would most likely see substantial declines in water clarity with increasing nutrient pollution load. For each stream the risk of the biological community becoming impaired was determined. Analysis included a review of near shore and contributing watershed risks and level of protection already underway in the watershed. Data is provided to the WRAPS process and is also available through the DNR's Watershed Health Assessment Framework.

Groundwater Restoration and Protection Strategies (GRAPS)

GRAPS reports are an analogue to the WRAPS reports. The GRAPS Program is an interagency effort led by the Minnesota Department of Health. While the focus of the WRAPS reports are on assessment and diagnostic work that can be used to prioritize actions and strategies for implementation relative to surface water, the emphasis for GRAPS reporting is groundwater and drinking water resources.

These reports will summarize known conditions based on existing data and information from state agencies. One of the primary objectives is to provide a baseline understanding of groundwater conditions and associated resource management concerns for the watershed. The expectation is that the information and strategies identified will aid local prioritization and targeting efforts to protect and restore groundwater resources. Five GRAPS reports have been completed (Pine River, North Fork Crow River, Cannon River, Missouri River, and the Lower St. Croix River) and four are currently underway (Buffalo Red River, Mustinka and Bois de Sioux, Sauk River, and the Watonwan River) .

Tillage and Erosion Survey Program

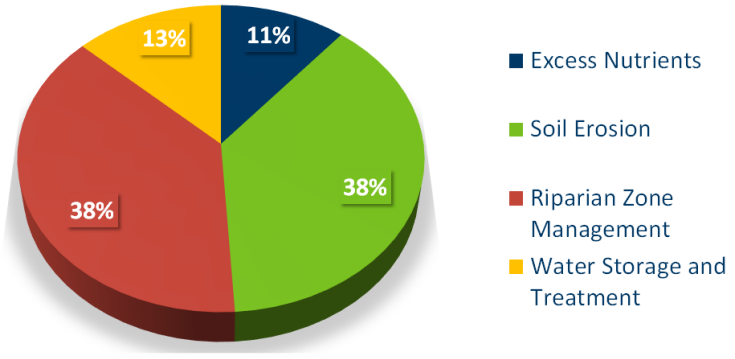
The purpose of this program is to systematically collect spring crop residue and tillage practice data, fall cover crop adoption rates, and daily and annual cropland soil erosion estimates in order to analyze trends in adoption and retention of agricultural soil and water management practices. The University of Minnesota Department of Soil, Water, and Climate Department is leading this project, along with assistance from staff at the Iowa State University Department of Biosystems and Agricultural Engineering Department. Data has been collected and analyzed for 2016 and 2017 crop residue levels and cover crop adoption rates with preliminary data being reviewed by project stakeholders. Later in 2018, the Daily Erosion Project website for Minnesota will be deployed for counties in Minnesota that have a minimum of 30% cropland acres. For more information, go to the BWSRs Soils webpage for future updates.

Build Local Capacity

The work of nonpoint implementation rests on the shoulders of local governments. As WRAPS proliferate and local water planning begins shifting to a watershed-based framework, success is dependent on highly capable local government staff to develop, prioritize, and target projects at the local level.

Build Staffing Capacity for Soil and Water Conservation Districts (SWCDs)

SWCDs have received $44 million in increased funding from FY2016-FY2018 to build local capacity. The increase recognizes the role SWCDs play in providing technical assistance to private landowners and focuses on increasing SWCD capacity to address four resource concern areas—Soil Erosion, Riparian Zone Management, Water Storage and Treatment, and Excess Nutrients.



Soil and Water Conservation District Capacity Funding by Resource Areas

Technical Service Area (TSA) Shared Services

Funding has been made available since 2016 to help SWCDs provide technical and engineering assistance to landowners. These funds are used for building regional capacity across the state to efficiently accelerate on-the-ground projects and practices that improve or protect water resources.

Willie Peters of Scott Soil & Water Conservation District worked with the NRCS and SWCD staff during a grassed waterway training last September in Scott County.

Technical Training and Certification Strategy

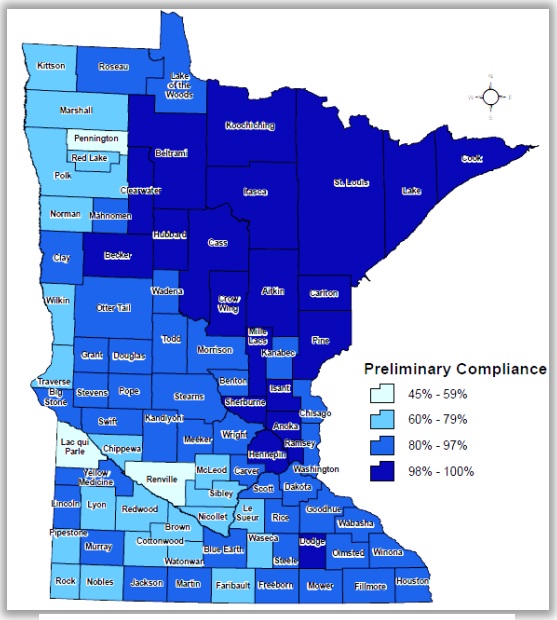
BWSR, the Minnesota Association of Soil and Water Conservation Districts, the Minnesota Association of Conservation District Employees, and the Natural Resources Conservation Service are committed to providing resources for increased technical training and certification of local SWCD staff to maintain and enhance conservation. In 2018, BWSR expanded the cadre of technical trainers in the Minnesota Conservation Partnership by hiring two regional training engineers and two regional training conservationists.

Maximize Existing Laws and Regulations

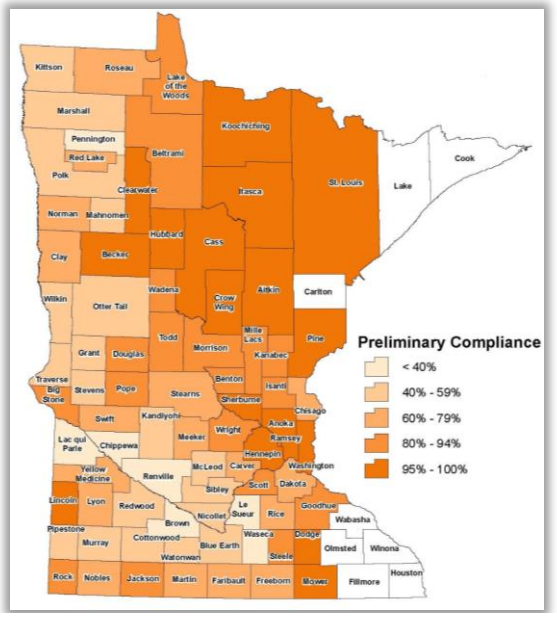
Customary approaches to nonpoint pollution implementation include regulation as well as financial incentives and education. A key to developing effective Watershed Restoration and Protection Strategies is maximizing the effectiveness of existing laws and regulations.

Buffer Law

Governor Mark Dayton's landmark buffer initiative was signed into law in 2015 and amended in 2016. The law establishes perennial vegetation buffers along rivers, streams, and ditches that will help filter out phosphorus, nitrogen, and sediment.



Statewide, compliance numbers for Public Waters have now exceeded 98%.



The Public Ditch compliance is November 1, 2018 and preliminary statewide compliance is 73%.

Support Innovative Non-Regulatory Approaches

One of several keys to leveraging Clean Water Fund implementation money is to support the development of market-driven and reward-driven approaches.

Minnesota Agricultural Water Quality Certification Program (MAWQCP)

This program is the product of a state-federal partnership that includes the MDA, MPCA, BWSR, DNR, the U.S. Department of Agriculture's Natural Resource Conservation Service, and the U.S. Environmental Protection Agency. The MAWQCP has transitioned from its initial four pilot areas to a program available to all farmers statewide. It is a voluntary program that supports the implementation of conservation practices on a field-by-field, whole-farm basis through its process of identifying and mitigating agricultural risks to water quality. The MAWQCP is incorporated in the Minnesota Nutrient Reduction Strategy as a key strategy for increasing the adoption of Minnesota's Agricultural Best Management Practices.

Integrate Hydrologic Management Systems into Watershed Management Plans

Much of Minnesota's natural hydrology has been altered for agricultural, forestry, urban/suburban, and industrial development. Increased runoff volumes and rates – due to drainage, removal of perennial vegetation, surface water alterations, and the addition of impervious surfaces – contribute significantly to water quality problems.

Multipurpose Drainage Management Program

This BWSR Clean Water Fund grant program was established in 2016 and continues to target multipurpose drainage management for priority Chapter 103E drainage systems and the associated watersheds. Specific purposes include reducing erosion and sedimentation, detaining runoff to reduce peak flows and flooding, improving water quality and decreasing vulnerabilities to extreme rainfall, while protecting drainage system efficiency and reducing drainage system maintenance. This program integrates public and private funding for these purposes through project partnerships between county and watershed district drainage authorities and soil and water conservation districts.

Section 3: Estimated Cost Updates

Biennial Budget Request

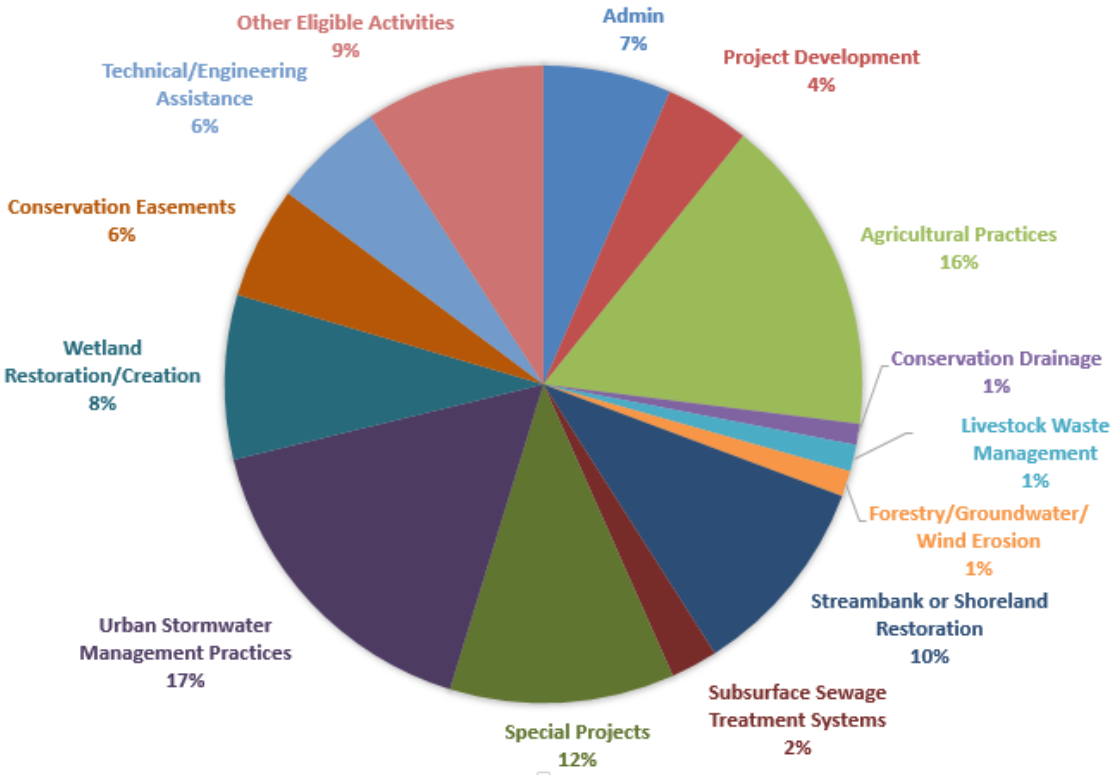
The NPFP law states "the plan shall include an estimated range of costs for the prioritized actions." Meeting this requirement will be a challenge until the state is blanketed by watershed-based local water plans that incorporate the best available WRAPS and pre-WRAPS information and contain project implementation schedules with estimated costs. Presently, the best source of data for estimating nonpoint implementation costs for the state is BWSR's Biennial Budget Request (BBR).

The BBR is a process for collecting data voluntarily submitted by local governments based on local water plans. The Biennial Budget Request reflects the diversity of water resource and conservation concerns across Minnesota. Local governments are asked to provide their best estimate of the projects and activities that could be implemented during the next biennium along with the most likely source of the funds available. The bulk of the requests are for existing programs, including regulatory administration and technical/financial assistance to landowners along with Clean Water Fund opportunities with a primary emphasis on water quality. For all categories and programs, the amount requested across the state exceeds the anticipated amount of funding currently available.

To be included in the estimate for the NPFP, projects have to directly address water quality priorities or strategies identified in local water plans, TMDL studies and implementation plans, WRAPS, surface water intake plans, or wellhead management plans. They should be able to realistically be "shovel ready" and accomplished during the FY 2020-21 biennium. In addition to data about activities eligible for funding from BWSR, the BBR also collects data about activities eligible for funding from other state agencies.

For the FY 2020-21 biennium, the total estimated statewide cost to implement a wide range of high-priority, shovel-ready nonpoint activities that are eligible for funding through appropriations to BWSR and other State agencies is more than $408 million or $204 million per year (Fig. 1). Clean Water Fund implementation requests make up over half of that total amount: $239 million for the biennium or approximately $120 million per year. Local government participation in statewide data collection, community engagement, and future water management planning using Clean Water Funds is included in the overall BBR request.

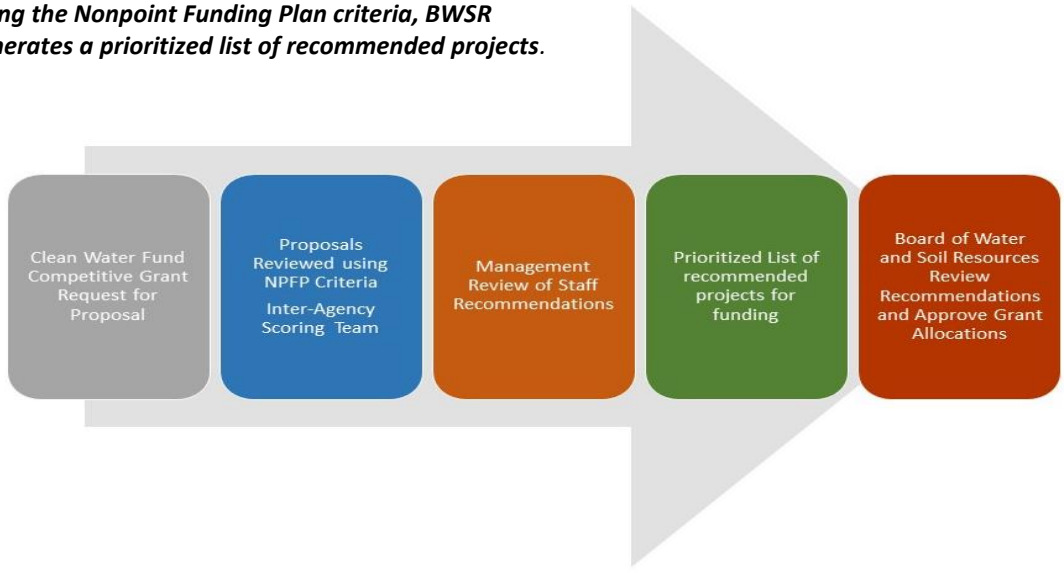
Figure 1. Statewide estimated costs to implement various Clean Water Fund eligible nonpoint activities during the FY 2020-21.



Clean Water Fund Competitive Grants

The BWSR Clean Water Fund Competitive Grants Program publishes an annual request for proposals for projects that protect, enhance, and restore water quality in lakes, rivers, and streams in addition to protecting ground water and drinking water sources from degradation. To be eligible, proposals must demonstrate significant, measureable project outputs and outcomes that will help achieve these water quality objectives.

Using the Nonpoint Funding Plan criteria, BWSR generates a prioritized list of recommended projects.



Section 4: Case Studies

Minnesota is still early in the process of transitioning to statewide coverage of comprehensive watershed management plans. These plans, grounded in science-based information collected and analyzed by the state, are a critical part of Minnesota's Water Management Framework. The result will be watershed-based implementation actions that align with state priorities, are targeted to the most critical areas of the landscape, and are capable of achieving measurable water quality results. When the statewide cycle is complete, each watershed planning boundary will have a detailed 10-year implementation plan.

While there is not statewide coverage yet, several local governments throughout the state do have comprehensive watershed management plans. The three case studies below are provided as examples of efforts currently underway, demonstrating how statewide water quality goals translate to local sub-watershed actions.

Root River One Watershed, One Plan Pilot Project

The Root River in Southeast Minnesota contains some of the most diverse natural and geologic resources in Minnesota. This diversity makes the Root River excellent for trout fishing, hunting, hiking and biking. With its scenic bluffs and deeply carved river valleys, the outdoor recreation associated with the river is a significant driver of the local economy, drawing visitors from the Upper Midwest. However, the very features that make this river system unique also make it vulnerable to nonpoint source pollution.

The watershed is underlain by karst geology characterized by thin soils over soluble limestone and dolomite bedrock. Karst landscape features include sinkholes, springs, caves and disappearing streams that provide complex interconnections between surface water and groundwater. Surface contaminants can bypass soil filtration processes and quickly reach karst aquifers used for drinking water.

The steep landscape is susceptible to heavy water runoff, soil erosion, and nutrient leaching, which if unchecked could degrade the river. Keeping the Root River healthy is a top priority for local governments in Southeast Minnesota. Doing so will help sustain and enhance recreation opportunities and tourism while preventing some of the worst impacts of flooding.

Watershed Planning

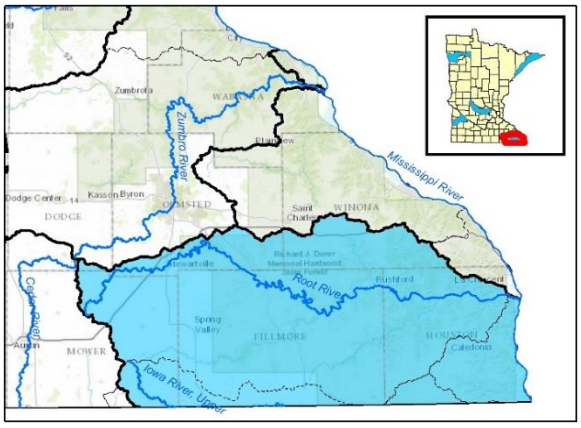
Establishing plans with clear implementation timelines, milestones, and cost estimates that will address the largest resource threats and provide the greatest environmental benefit unique to each watershed is one of the guiding principles of the One Watershed, One Plan Program.

In 2014, the Root River watershed was selected by BWSR as a One Watershed, One Plan pilot project; to demonstrate the transition from county-based water management planning into a comprehensive watershed management approach. The Root River Watershed One Watershed, One Plan, approved in December of 2016, was developed by a coalition of counties, soil and water conservation districts, and the Crooked Creek Watershed: http://www.fillmoreswcd.org/rootRiverWatershed.html.

Science-Based Watershed Assessment

As part of Minnesota's Watershed Approach, intensive watershed monitoring and stressor identification were performed for the Root River watershed by the MPCA beginning in 2008. Results from this monitoring data evaluation were used to inform the WRAPS. These strategies, including associated scales of adoption and

timelines, are based on what is likely needed to meet the water quality goals for restoration and protection within the Root River watershed.



The primary assessment findings indicate that nonpoint source pollution is the main source of water quality problems in the watershed. Recommendations include reducing sediment, bacteria, and nitrate levels as well as restoring habitat. For the purposes of this case study, a subwatershed of the Root River, the South Fork, will be the focus. In the South Fork Root River, poor macroinvertebrate communities and high suspended sediment concentrations are the main issues identified in the draft WRAPS. Nitrate was also identified as one of the stressors for the macroinvertebrate communities.

Reduction Goals

The WRAPS was not final when the One Watershed, One Plan pilot began, so numeric reduction goals are not yet established. However, reduction goals are incorporated into the Plan using surrogate water quality goals from the Minnesota's Nutrient Reduction Strategy. The Minnesota Nitrogen Fertilizer Management Plan includes groundwater goals that are applicable to the watershed. Those goals are reflected in the current draft of the plan. For example, for the South Fork Root River planning region, water quality goals were set at 45% reduction in sediment and 45% reduction in nitrogen to meet identified water quality goals.

Strategies

The WRAPS identified the following primary strategies for improving water quality within the South Fork Root River:

- Pasture and Nutrient Management
- Increased Living Cover
- Soil Erosion Control and Improving Soil Health
- Water Retention and Treatment
- Streambank Protection

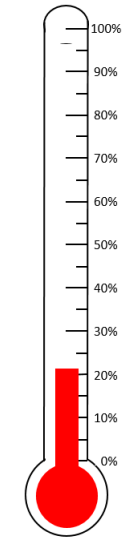
One Watershed, One Plan

For the Root River watershed, to ensure progress toward achieving the goals for the South Fork Root River, action items are consistent with recommendations identified in the Nutrient Reduction Strategy and the WRAPS and include such actions as increasing water storage and minimizing erosion.
Measurable goals were established for the Root River, using the goals from the Nitrogen Fertilizer Management Plan and Nutrient Reduction Strategy. Using the PTMapp, the benefits of the actions listed in the implementation plan can be compared to the measurable goals at one or more locations. The estimated benefits of the targeted implementation plan can then be compared to water quality goals from watershed, State, or regional strategies, such as those found in the State Nutrient Reduction Strategy or the Root River Watershed WRAPS.

The results of this detailed analysis, conducted by local governments, estimate that implementing the 100 most effective practices for both sediment and nutrients would provide a 21% of the reductions needed to reach the sediment reduction goal for the South Fork Root River set by the Root River Watershed One Watershed, One Plan (**Table 1**).

Table 1:

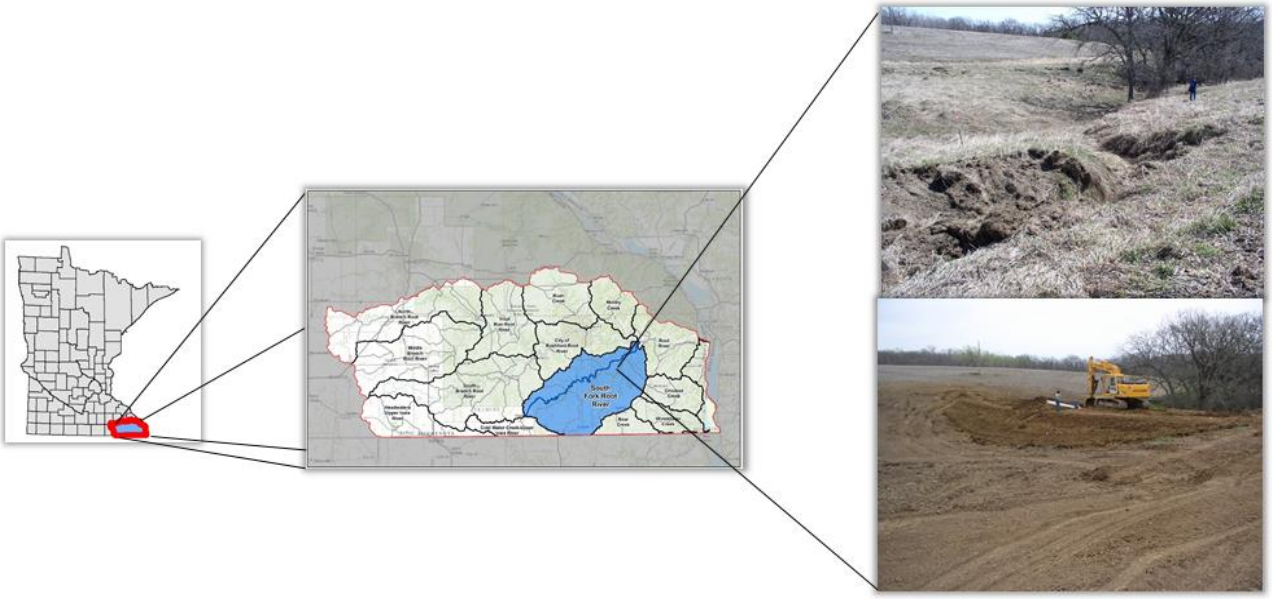
South Fork Root River	Sediment (tons/yr.)
Current Estimated Load	69,602
Desired Future Condition Goal (% reduction)	45
Goal Load Reduction (mass)	31,321
10 – year Plan Estimated Load Reduction	6,440
10- year Plan Progress toward desired future condition	21



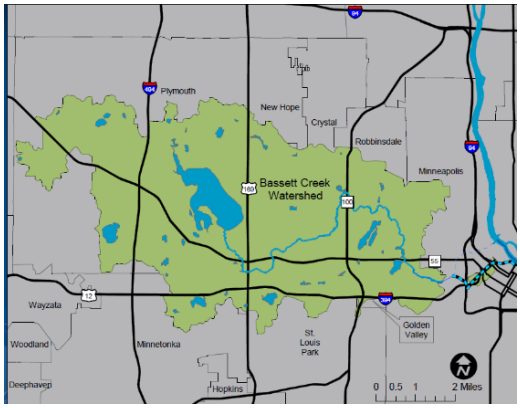
21% of goal

Watershed Based Funding

Reducing soil erosion through gully stabilization projects, like the one pictured below in the Root River, are one example of projects that are identified as a strategy in the WRAPS, an action item in the One Watershed, One Plan implementation plan, and then submitted as part of their work plan for the Clean Water Fund Watershed-Based Funding Pilot Program. This funding will help achieve 6% of the 10-year sediment reduction goal for the South Fork of the Root River.



Bassett Creek Watershed Management Commission



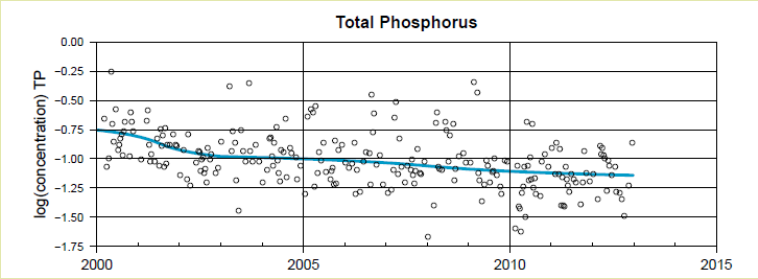
Bassett Creek is located in the north central metropolitan area of Hennepin County and is a tributary to the Mississippi River. The creek's headwaters are at Medicine Lake, the second largest lake in Hennepin County and a major recreational resource for the area that includes French Regional Park, public beaches, and a public boat landing.

The Bassett Creek Watershed Management Commission (BCWMC) has been working collaboratively with State and local stakeholders to improve the water quality of Medicine Lake and Bassett Creek for many years as part of its comprehensive watershed planning efforts.

Watershed Planning

The BCWMC has spent the past 10 years actively using their Capital Improvement Plan to improve water resources within the watershed. Many implementation actions have occurred, including the construction of water quality basins and innovative stormwater practices upstream of lakes and perform streambank restoration projects along Bassett Creek and its tributaries.

The Metropolitan Council analyzed monitoring data collected at the outlet of Bassett Creek over a 15-year period. This trend analysis indicates a downward trend in both sediment and phosphorus concentration since 2000 and thus improving water quality in the creek.



**Metropolitan Council. 2014. Bassett Creek. In Comprehensive water quality assessment of select metropolitan area streams. St. Paul: Metropolitan Council.*

Science-Based Watershed Assessment

The BCWMC has been collecting monitoring information within the watershed since the 1970s and its partner, the Metropolitan Council, has collected water quality and continuous flow data at the watershed outlet since 2000; as part of the WOMPII monitoring program. Extensive monitoring data and computer models have been used to understand the relationship between pollutant sources and water quality within watershed. Based on this information, it was determined that Bassett Creek is impaired from Medicine Lake to the Mississippi River for aquatic life due to stressors affecting the fish community, excess chloride, and aquatic recreation due to high fecal coliform counts. In addition, Medicine Lake is impaired for excess nutrients. The vast majority of pollution reaching the BCWMC waters comes from nonpoint sources.

The BCWMC completed a Resource Management Plan in 2009 for water quality improvement projects within the watershed. In 2010, a Total Maximum Daily Load (TMDL) study was completed on Medicine Lake to determine the amount of reduction in phosphorus necessary to improve or maintain water transparency and reduce algal blooms.

Reduction Goals

The Medicine Lake TMDL identified the need for a 28% reduction in phosphorus (1,287 pounds per year) in order to restore the lake and meet water quality standards.

Strategies

The implementation strategy for the Medicine Lake TMDL describes actions necessary to achieve these reductions goals and include:

- Water quality retrofits to existing stormwater ponds;
- Construction of the West Medicine Lake water quality ponds;
- Reduction in impervious area;
- New wet pond at downstream end of each sub-watershed;
- Bioretention, rain gardens, soil restoration;
- Continued streambank stabilization efforts; and
- Continued shoreline restoration efforts.

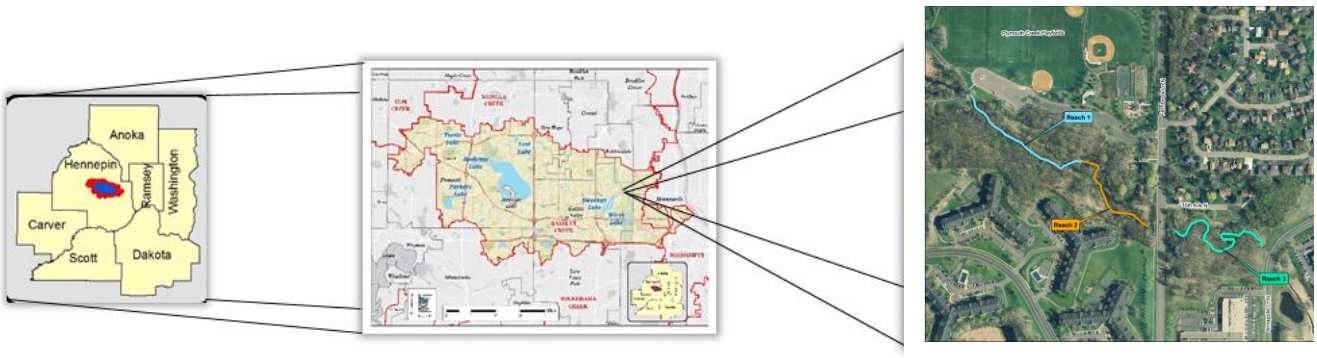
Comprehensive Watershed Management Plan

In 2015, the BCWMC updated their Watershed Management Plan (Plan). This Plan outlines applicable regulations, assesses watershed-wide and resource-specific issues, sets goals and policies for the BCWMC, and lists implementation tasks to achieve the goals. The Plan includes a comprehensive list of the projects and programs that comprise the implementation program. Specifically, the BCWMC identified strategic waterbodies, such as Medicine Lake, and associated implementation actions consistent with the TMDL.

Medicine Lake		
ML-12	Projects address phosphorus load reduction requirements in Medicine Lake TMDL	Medley Park Stormwater Treatment Facility, Golden Valley
ML-14 [3]		Medicine Lake shoreland restoration
ML-15		Wet pond (0.5 acre) at downstream end of each major subwatershed
ML-16		Water quality retrofits to existing ponds upstream of Medicine Lake
ML-17		In-lake alum treatment (Option 18 in Medicine Lake Plan)
ML-19 [4]		Chemical treatment of inflow to Medicine Lake from watershed
ML-20		Mt. Olivet Stream Restoration Project
ML-21		Jevne Park Stormwater Pond, City of Medicine Lake to alleviate flooding/improve water quality
Plymouth Creek		
2017CR-P [5]		Plymouth Creek Restoration, from Annapolis Lane to 2,500 feet upstream (east) of Annapolis Lane to reduce phosphorus and sediment loading, and improve habitat

FY2018 Clean Water Fund Grant

In 2017, the Bassett Creek Water Management Commission received Clean Water Funds to restore a portion of Plymouth Creek. The project will improve water quality in Plymouth Creek and Medicine Lake, the creek's primary receiving water and is estimated to remove 52 pounds per year of total phosphorus. The estimated cost of this project is $860,000. The BCWMC was awarded a $400,000 Clean Water Fund grant and a $50,000 Opportunity Grant from Hennepin County.



Appendix A