PREPARED FOR THE LANDOWNERS, CITIZENS, AND LOCAL GOVERNMENTS OF THE LOWER MINNESOTA RIVER EAST PLANNING AREA

Lower Minnesota River East

COMPREHENSIVE WATERSHED MANAGEMENT PLAN

60-Day Comment Draft Review | January 3, 2024

Funding for this Project was Provided by

CLEAN WATER LAND & LEGACY AMENDMENT

Acknowledgments

Lower Minnesota River East Watershed One Watershed, One Plan Partners

- Le Sueur County
- Le Sueur Soil and Water Conservation District
- Rice County
- Rice Soil and Water Conservation District
- Scott County
- Scott Soil and Water Conservation District

Watershed Districts and Watershed Management Organizations

- Lower Minnesota River Watershed District
- Prior Lake-Spring Lake Watershed District
- Scott Watershed Management Organization

State Agencies

- Minnesota Board of Water and Soil Resources
- Minnesota Department of Agriculture
- Minnesota Department of Health
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Minnesota Environmental Quality Board
- Metropolitan Council

ISG

- Bailey Griffin
- Paul Marston
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- Sarah Boser
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Disclaimer

All maps included in the Plan are neither a legally recorded map nor a survey and is not intended to be used as one. This drawings are a compilation of records, information, and data located in various city, county, and state offices and other sources affecting the area shown and is to be used for reference purposes only. Plan partners are not responsible for any inaccuracies herein contained. If discrepancy are found, please contact the Lower Minnesota East Watershed Coordinator.

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Glossary and Acronyms

Glossary and Acronyms

ACRONYMS

Acronym	Definition
1W1P	One Watershed One Plan
ACPF	Agricultural Conservation Planning Framework
AC	Advisory Committee
AIS	Aquatic Invasive Species
AUID	Assessment Unit Identification Number
BMP	Best Management Practice
BWSR	Board of Water and Soil Resources
CAFO	Confined Animal Feedlot Operations
CD	County Ditch
CED	Contaminates of Emerging Concern
CIP	Capital Improvement Project
CRP	Conservation Reserve Program
CWMP	Comprehensive Watershed Management Plan
DEM	Digital Elevation Model

Acronym	Definition
DFC	Desired Future Condition
DNR	Department of Natural Resources (Minnesota)
DWSMA	Drinking Water Supply Management Area
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FSA	Farm Service Agency
GIS	Geographic Information Systems
GPR	Groundwater Protection Rule
GRAPS	Groundwater Restoration and Protection Strategies
HSPF	Hydrologic Simulation Program—Fortran
HUC	Hydrologic Unit Code
IBI	Index of Biological Integrity

Acronym	Definition
JD	Joint or Judicial Ditch
JPA	Joint Powers Agreement
JPE	Joint Powers Entity
LGU	Local Government Unit
LiDAR	Light Detection and Ranging
LSOHC	Lessard-Sams Outdoor Heritage Council
LMREWJPB	Lower Minnesota River East Watershed Joint Powers Board
MAWQCP	Minnesota Agricultural Water Quality Certification Program
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MDM	Multipurpose Drainage Management
MGS	Minnesota Geological Survey
MOA	Memorandum of Agreement
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer System
NGO	Non-Governmental Organization
NLCD	National Land Cover Database

Acronym	Definition
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRBG	Natural Resources Block Grant
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWS	National Weather Service
O&M	Operation and Maintenance
PC	Policy Committee
RIM	Reinvest in Minnesota
SAM	Scenario Application Manager
SSTS	Subsurface Sewage Treatment System
ST	Steering Team
SWA	Subwatershed Assessment
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus

Acronym	Definition
TSS	Total Suspended Solids
Ug/L	Micrograms per Liter
UMN	University of Minnesota
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WASCOB	Water and Sediment Control Basin
WBIF	Watershed-Based Implementation Funding
WD	Watershed District
WMO	Watershed Management Organization
WRAPS	Watershed Restoration and Protection Strategies

GLOSSARY

Term	Definition
Best Management Practice	Structural and nonstructural practices and methods that can be used in both agricultural and urban settings that decrease runoff, erosion, and pollutants in order to improve and protect water quality, soil health, habitat, and natural resources.
Desired Future Condition	The long-term outcome or goal; the attributes (water quality, water availability, habitat quality), the Partnership is striving to attain, regardless of the time frame. The desired future condition (DFC) sets the direction for planning and future management. It should be described for priority water resources and reflect stakeholder interests.
Emerging Issue	A concern that lacks the detailed information that is necessary to assess the current or imminent impact to the resources in the Watershed.
Hydrologic Unit Code (HUC):	A Hydrologic Unit Code (HUC) is assigned by the USGS for each watershed. HUCs are organized in a nested hierarchy by size. For example, the Upper Mississippi River Basin is assigned a HUC-4 of 0701.
HSPF (Hydrological Simulation Program – FORTRAN)	A model for simulation of watershed hydrology and water quality for pollutants.
Impairment	The specific component of a waterbody that is not meeting state water quality standards, such as aquatic life, aquatic recreation, and aquatic consumption.
Index of Biological Integrity (IBI)	A way of measuring the fish and aquatic macroinvertebrates in the water body. The measurement is a scale of 0 to 100, with 0 being the lowest quality and 100 being the highest quality.
Indicator	A metric, benchmark, or measuring stick used to determine progress towards goals. In some cases, when a metric is not clear or feasible, the indicator might be the number of inputs or outputs themselves.
Judicial Ditch	A ditch that crosses county lines.
Measurable Goal	The 10-year Plan goal; the quantifiable change in resource condition expected after implementation of the 10-year Plan. The measurable goal should relate to the DFC, and express what percent of progress toward the DFC is intended to be made during the Plan period.
Objective	A general result that a person or local government aims to achieve, relative to a specific issue, within a time frame and with available resources.
Outcome	The specific result of an implementation activity. Collectively, the outcomes from Plan activities should achieve the stated measurable goals. Outcomes may also express changes in knowledge or behavior which lead to actions that contribute to measurable goals.

Term	Definition
Output	Countable projects, activities, services, or products. These are often referred to as 'widgets' and are the countable items that are useful for tracking the steps towards achieving the goals. Outputs are not goals in and of themselves because they do not quantify a change in the resource condition.
Prioritize	Determining the relative importance and precedence of the resources and issues in the Watershed.
Priority Issue	The agreed upon concern that is identified as the focus of the Plan through an evaluation and ranking process.
Protect (Management Focus)	A minor or subwatershed where the natural resources are generally in good condition, risks to natural resources are low, and the management focus is to maintain and increase protection levels with strategies, such as private forest stewardship and conservation easements.
Protected	Land uses including public lands, public waters, wetlands on private lands, buffers required through the buffer law, easements, other conservation lands, Sustainable Forest Incentive Act (SFIA) that have a high conservation value and should not be altered.
Protection	This term is used to characterize actions taken to maintain or improve conditions and beneficial uses of waterbodies not known to be impaired.
Restoration	This term is used to characterize actions taken in watersheds to improve conditions, and in impaired watersheds to eventually meet water quality standards and achieve beneficial uses of the waterbodies.
Resource	A natural, economic, biotic, aesthetic, or similar asset. Resources are generally considered something that can be 'managed' and are generally broad, such as surface water or groundwater.
Resource Concern	A physical, biological, chemical, or geological subset or component of a natural feature. Resource concerns are typically a refinement of a resource. For example, the resource surface water can be refined into several resource concerns, including streams, lakes, rivers, and wetlands.
Resource Goals	Specific goals related to an individual resource need.
Source (or Pollutant Source)	This term is distinguished from 'stressor' to mean only those actions, places or entities that deliver/discharge pollutants (e.g., sediment, phosphorus, nitrogen, pathogens).
Strategy	A chosen approach that a person or local government implements to meet the objective.
Stressor (or Biological Stressor)	This is a broad term that includes both pollutant sources and non-pollutant sources or factors (e.g., altered hydrology, dams preventing fish passage) that adversely impact aquatic life.

Term	Definition
Target	There are three facets to targeting implementation activities: • Activity type • Timing • Location **Activity type** The Best Management Practices (BMPs), conservation practices, outreach and education, monitoring, technical assistance or other action that will be the most effective in addressing the prioritized issues. **Timing** The scheduling of implementation activities across the 10-year Plan period, based on which priority issues will be addressed in which order. **Location** The area where a specific activity will be implemented to address a priority issue. Sometimes, the location of the implementation activity will not be the same location of the priority resource that is being addressed. For instance, reducing sediment concentrations in the main stem of a river may require actions to be taken at the headwaters of minor watersheds.
Total Maximum Daily Load (TMDL)	The amount of a particular pollutant that a body of water can handle without violating state water quality standards.
Watershed	A land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean.
WRAPS (Watershed Restoration and Protection Strategy)	A watershed approach to restoring and protecting Minnesota's rivers, lakes, and wetlands implemented by the Minnesota Pollution Control Agency on a 10-year cycle (https://www.pca.state.mn.us/water/watershed-approach-restoring-and-protecting-water-quality).

Executive Summary

Executive Summary

INTRODUCTION

The Lower Minnesota River East Comprehensive Watershed Management Plan (Plan) is a unifying strategy for water management in the Lower Minnesota River East watershed (Planning Area). It was developed by, and will be implemented by, local government units across the Watershed, as well as their partners from state and federal agencies, non-profits, citizens, and other stakeholders. The Plan focuses on restoring impaired waters, addressing altered hydrology, understanding and protecting groundwater quality, and protecting and restoring quality habitat through holistic management.

634
Square miles
in the Planning Area

405,789
Acres

0.1 PLANNING AREA OVERVIEW

The Planning Area is located in south-central Minnesota and is 634 square miles (405,789 acres). The watershed is predominately agriculture; however, there are metropolitan areas and municipalities located within the Planning Area. There are 117 lakes and over 800 miles of streams. This watershed is both diverse and greatly altered from its original land cover. As part of its transformation, many of the wetlands were drained and a majority of its streams were channelized (WRAPS, 2020). The Planning Area includes portions of Le Sueur, Scott, and Rice counties and includes SOIL AND WATER CONSERVATION DISTRICTS, watershed districts, municipalities (including MS4 communities), and one tribal government-the Shakopee Madewakanton Sioux Community-located within the planning area. Figure 0.1 displays the Planning Area with jurisdictional boundaries of local governmental units.

Planning Terminology

A set of planning terms were adopted at the beginning of the planning process to ensure consistency and application of planning terms. These definitions are provided throughout the Plan, as well as in the glossary located at the beginning of the Plan.

SOIL AND WATER CONSERVATION DISTRICT PURPOSE
To conserve soil, water, and related natural resources on private land

0.2 PARTICIPATING LOCAL GOVERNMENTS

The local government units (LGUs) involved in managing the Planning Area resources recognized that the Minnesota Board of Water and Soil Resources (BWSR) One Watershed, One Plan (1W1P) program provided a unique opportunity to develop a management plan that unifies and accelerates the restoration of degraded resources and protection of high-quality resources.

The following entities recognized the need to increase coordination, reduce potential duplication of activities, and provide greater assurances for meeting goals and measurable outcomes:

- Le Sueur County
- Le Sueur Soil and Water Conservation District (SWCD)
- Lower Minnesota River Watershed District
- Prior Lake Spring Lake Watershed District
- Rice County
- Rice SWCD
- Scott SWCD
- Scott Watershed Management Organization

The Lower Minnesota River East 1W1P planning team (Partnership) was established, and a collaborative arrangement was formalized through a Memorandum of Agreement (MOA) and subsequent bylaws.

DID YOU KNOW?

Watershed Districts are a special purpose unit of local government whose boundary is based on the flow of water.

Watershed Management Organizations are required in the seven county metropolitan area and are responsible for developing and implementing comprehensive watershed management plans.

Soil and Water Conservation Districts are a subdivision of state government used to conserve natural resources on private land.

Learn more about BWSR!
Scan the QR code or click here: bwsr.state.mn.us

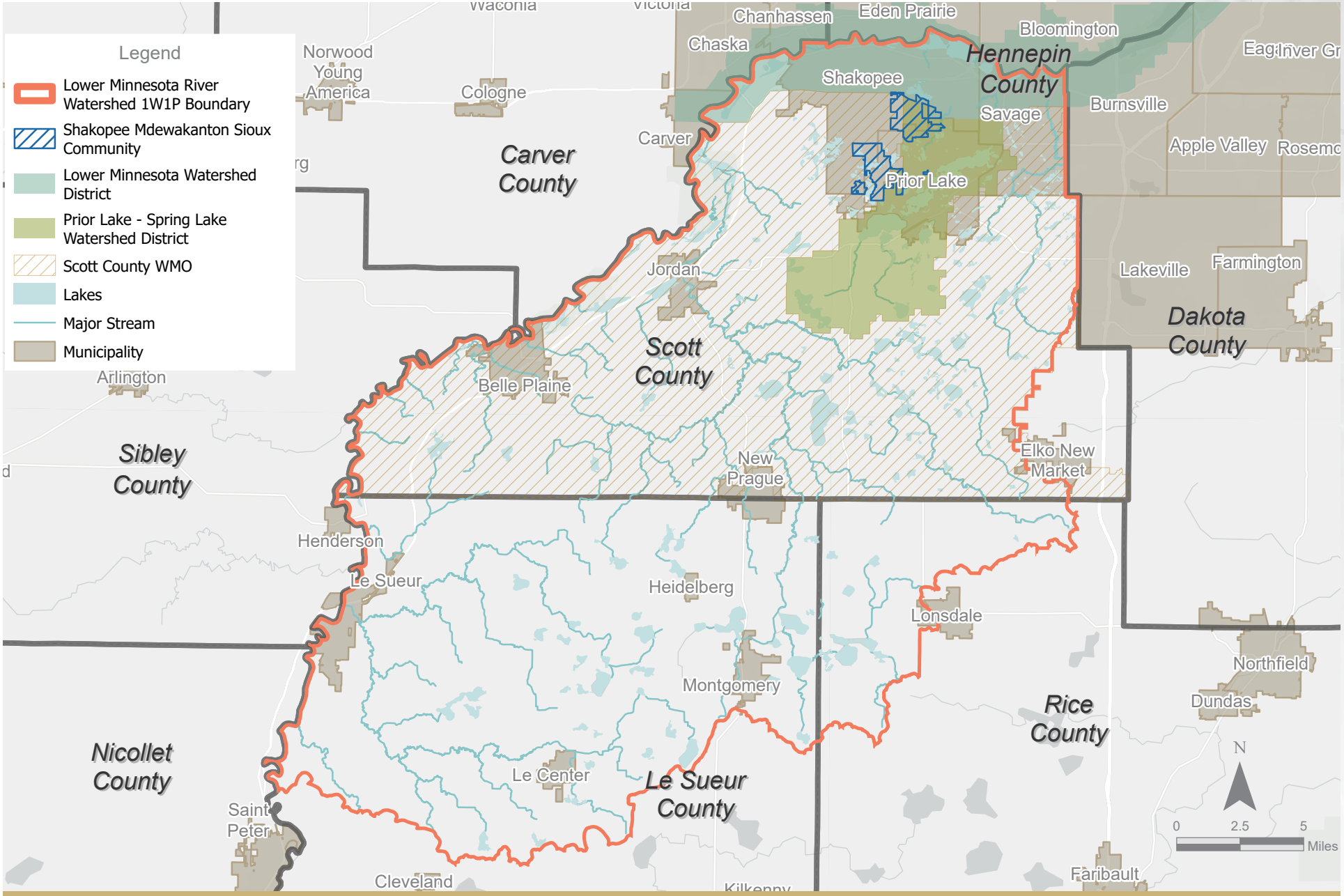


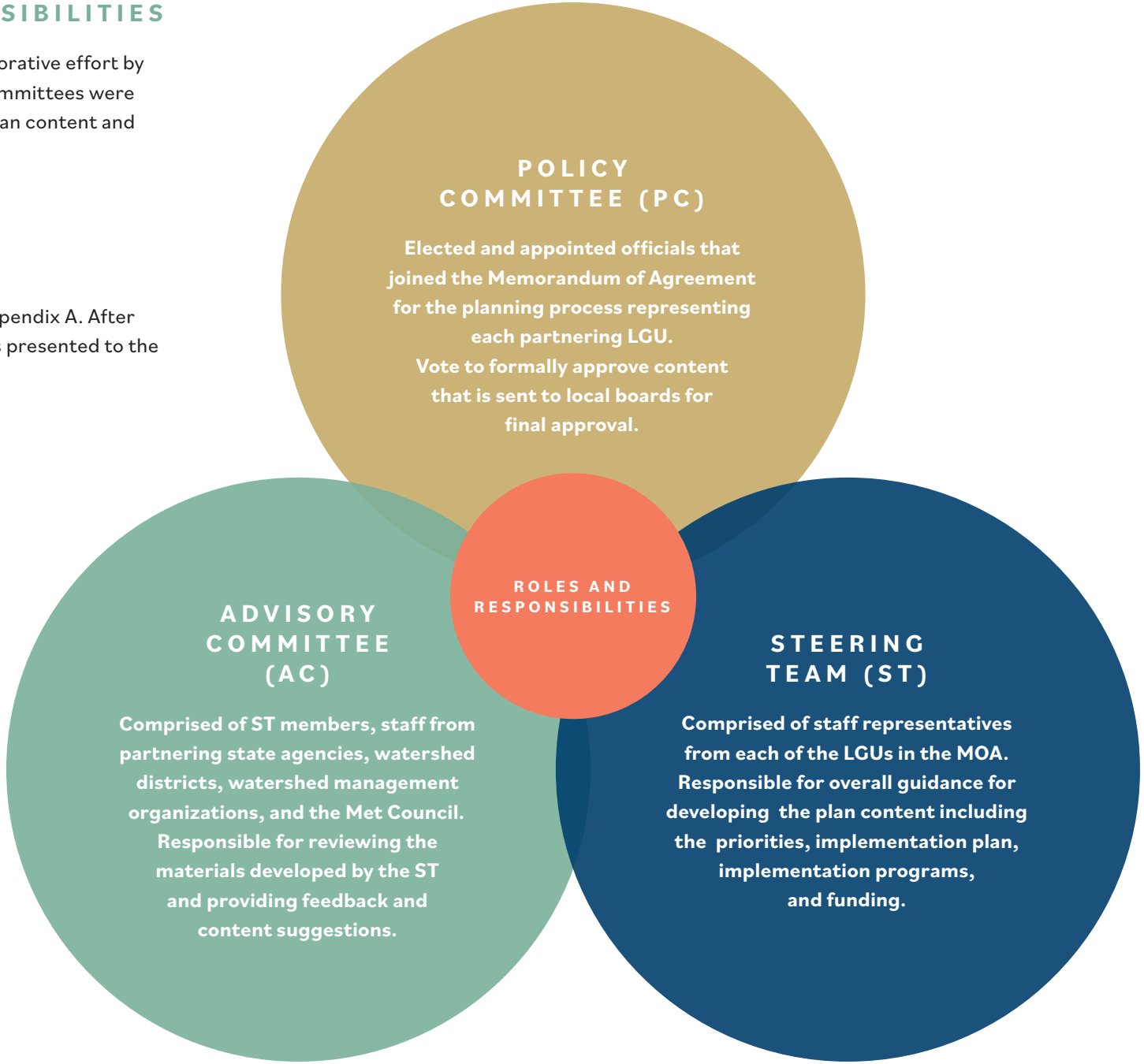
Figure 0.1: Lower Minnesota River East Comprehensive Watershed Management Plan Planning Area

0.3 ROLES AND RESPONSIBILITIES

The development of the Plan was a collaborative effort by all members of the Partnership. Three committees were established to facilitate the creation of Plan content and manage day-to-day operations:

- Advisory Committee (AC)
- Steering Team (ST)
- Policy Committee (PC)

Committee membership is detailed in Appendix A. After review and approval by the PC, the Plan is presented to the local boards for final approval.

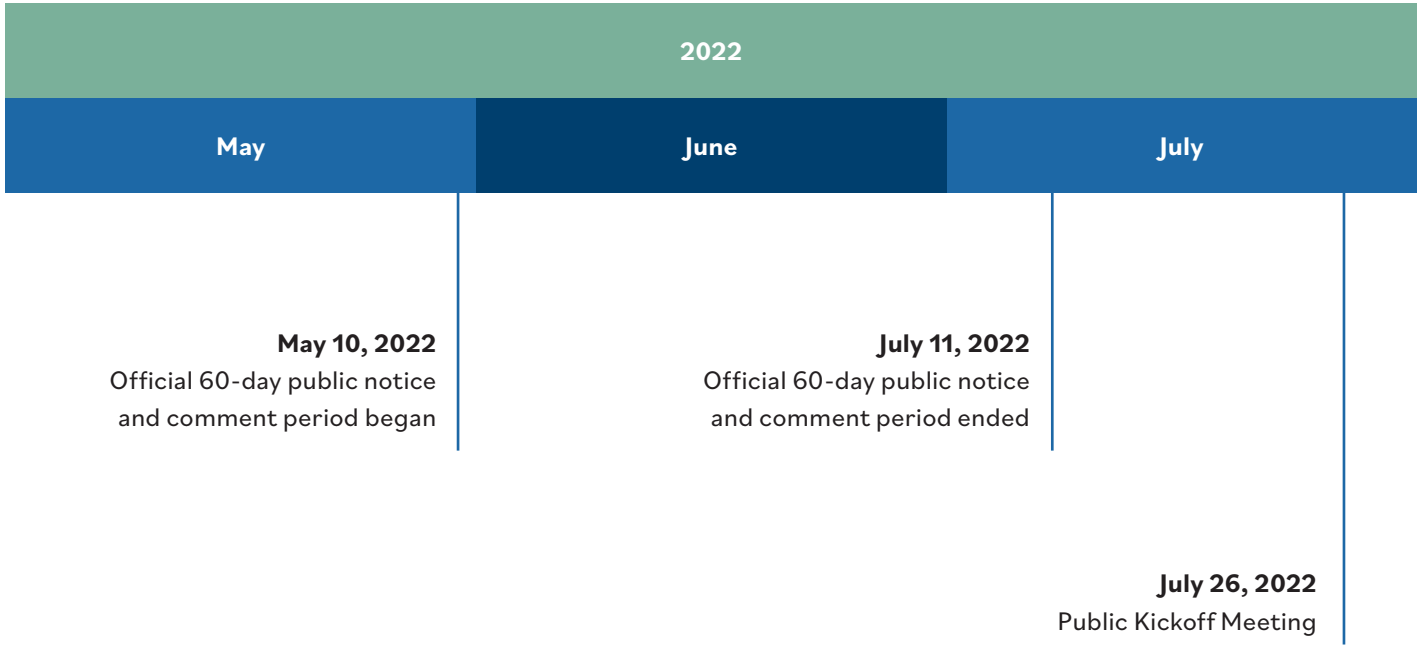


0.4 COMMUNITY ENGAGEMENT

Public Notices

This Plan is governed by Minnesota Statute 103B, and public notices were published in each local government's designated legal newspaper. The official 60-day public notice and comment period began on May 10, 2022 and ended on July 11, 2022. **Six letters identifying the respective entities' priority concerns were received** (Appendix B).

A final public notice and comment period was held from *date*, with the public hearing taking place at *enter location* on *date*.



Public Input Meetings

The ST members planned and facilitated the public engagement portion of the planning process which consisted of a kickoff meeting and virtual open house. The in-person kickoff meeting was held at a local park at the beginning of the planning process. A corresponding online survey was compiled and drafted into a virtual open house format to allow STAKEHOLDERS to provide feedback at their convenience in the weeks before and after the in-person meeting.

The information gathered from the kickoff meeting and corresponding virtual open house was used as a starting point for developing a list of priority issues and concerns that was later AGGREGATED and filtered into the Plan document.

Learn more about Minn. Stat. 103B!

Scan the QR code or click here:
revisor.mn.gov/statutes/cite/103B

6 LETTERS
were received identifying the respective entities' priority concerns

STAKEHOLDER
A person or group that has an interest in natural resources, specifically water resources.

AGGREGATED
Formed by the conjunction or collection of particulars into a whole mass or sum; total; combined

0.5 PLAN DEVELOPMENT AT A GLANCE

Figure 0.2 represents the process of gathering, refining, and prioritizing issues, resources, and implementation actions related to watershed management throughout the planning process.

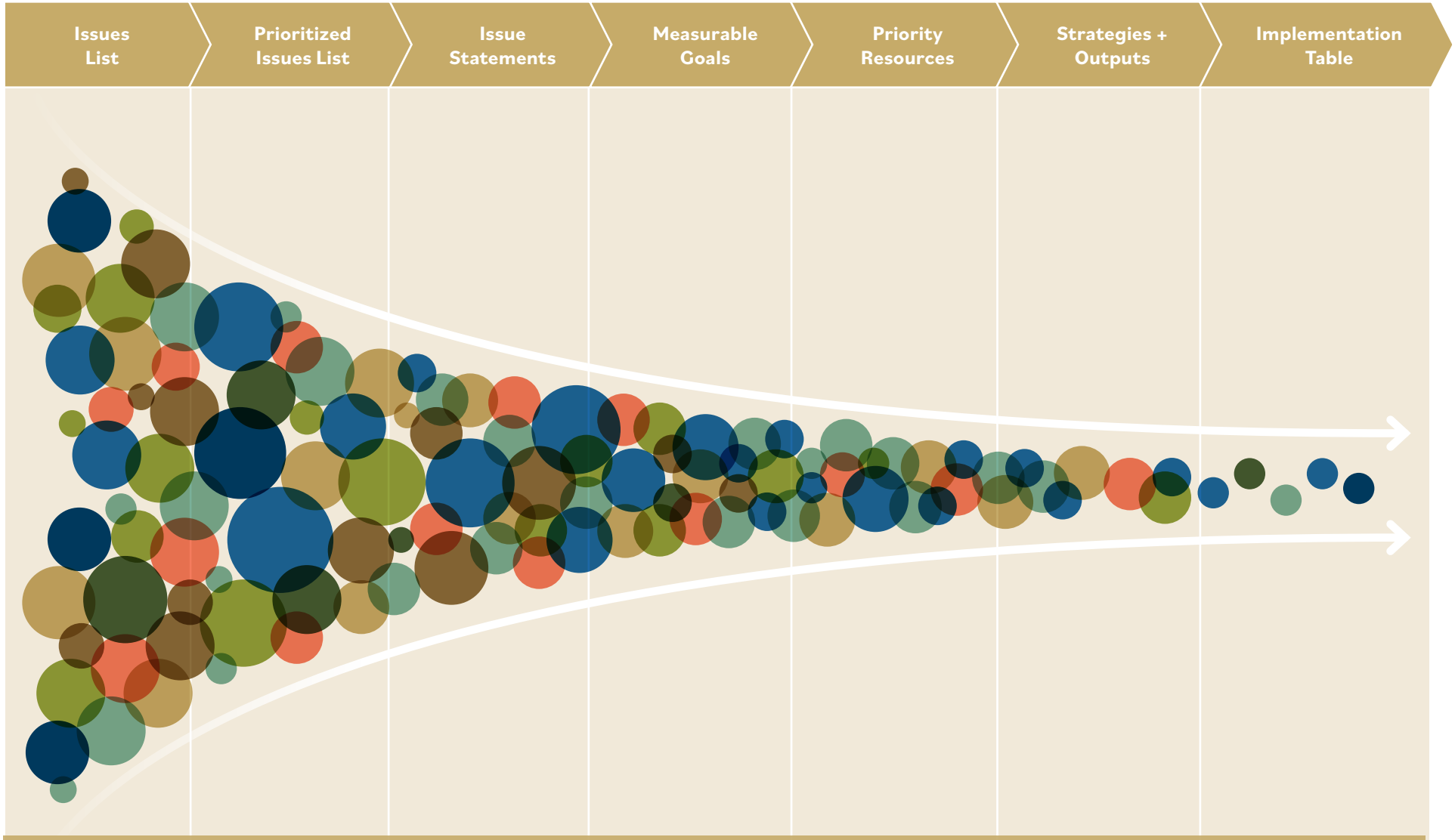
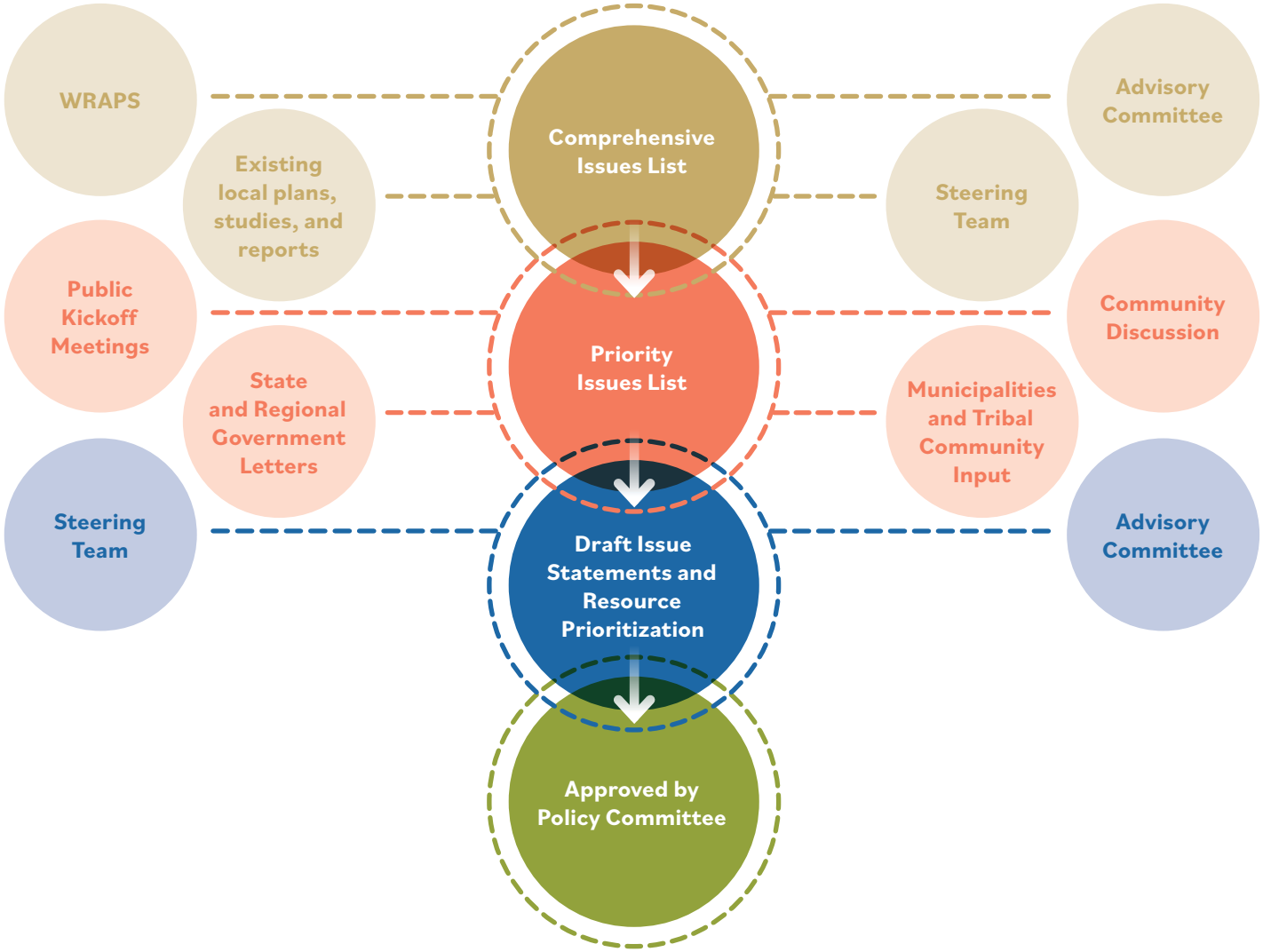


Figure 0.2: Plan Refinement Process

0.6 PRIORITIZED ISSUES LIST

The issues for the Plan were generated and prioritized with input from the public, ST, AC, PC, state agencies, municipalities, tribal community, regional government unit (Metropolitan Council), and existing local management plans and studies (Figure 0.3).

Figure 0.3: Prioritized Issues List

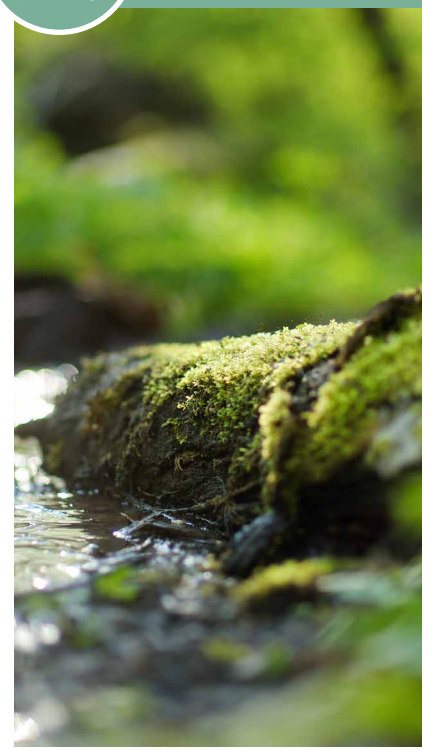


0.7 RESOURCE CATEGORIES

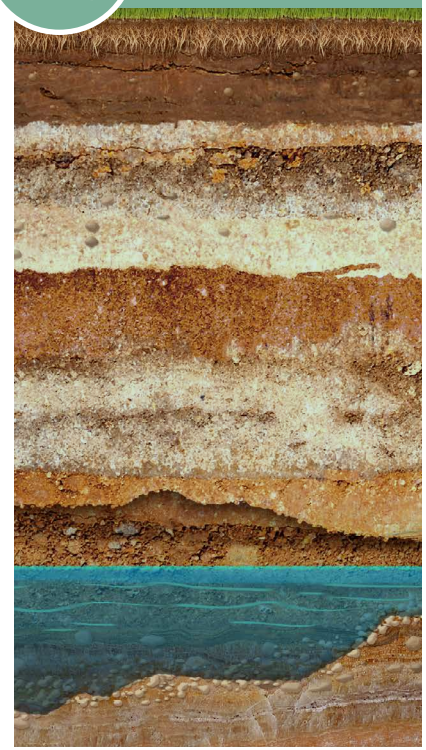
One of the first steps of the planning process was data aggregation. This process involved the review of all existing water and natural resource plans, studies, and related documents within the Planning Area and compiling priorities and key takeaways from each document. Comments from the public, state agencies, LGUs, and other interested parties were also reviewed and incorporated into this process. All the comments and data gathered during the data aggregation process were grouped according to the type of resource addressed. There were three broad resource types: surface water, groundwater, and habitat (Figure 0.4). Within each resource type, data were categorized according to major themes, such as the quality or quantity of the resource.

Figure 0.4: Resource Categories for Issue Statements

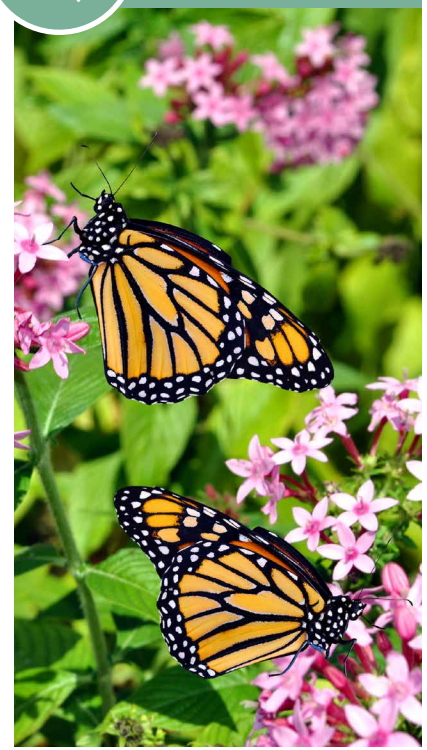
Surface Water



Groundwater



Habitat and Natural Resources



0.8 PRIORITY ISSUE STATEMENTS AND MEASURABLE GOALS

Issue Statements

Once a comprehensive list of issues was developed through the data aggregation process, the AC began drafting issue statements. Early in the development of individual issue statements. The AC drafted **six issues statements, two for each resource category.** The final issue statements are provided in Chapter 2: Issue Prioritization. The issue statement categories are:

- Surface Water Quality
- Surface Water Hydrology
- Groundwater Quality
- Groundwater Knowledge, Data, and Understanding
- Habitat and Natural Resource Restoration
- Habitat and Natural Resource Protection and Preservation.

Goals

Following the development of issue statements, measurable goals were established for each statement to guide the development of strategies and implementation action items (Tables 0.1-0.6). A review of previous studies and existing resources was also conducted to build a draft list of strategies and implementation actions. This list and issue statements were reviewed to determine what additional strategies and implementation actions were needed to fully address the priority issue statement goals.

This process led to a final list of strategies and implementation actions that would be used to develop the measurable outcomes. The Hydrologic Simulation Program – Fortran (HSPF) watershed model provided the ST with the necessary tools to simulate the impacts of their selected implementation actions and develop numeric, measurable outcomes. Existing and desired level of effort, along with addressing data acquisition needs, were used for measurable outcomes that lack appropriate models or studies to quantify, such as chloride management and groundwater knowledge.

Once the implementation tables were assembled, the goals and measurable outcomes were refined to better align with the anticipated level of effort and expected funding levels for each action item. Details for each priority issue and targeting approach are provided in Chapter 3.

The ST will reassess the plan goals at the five year plan review period to determine whether goals should be updated. The storage goal in particular will be evaluated due to the large scale and amount of resources necessary to complete these projects.

3
Resource Categories

6
Issue Statements

Learn more about HSPF!

Scan the QR code or click here:
epa.gov/ceam/hydrological-simulation-program-fortran-hspf

TABLE 0.1: SURFACE WATER QUALITY

Issue Statement: Lakes, streams, creeks, wetlands, and the Minnesota River are threatened or impaired by various pollutants which cause harmful impacts to aquatic life, habitat, and recreation.		
Goal A	Sediment/Erosion	Reduce upland and near channel erosion contributing sediment to priority streams by 1,885 tons per year.
Goal B	Nutrients in Impaired Lakes	Reduce total phosphorus (TP) loading to priority impaired lakes by 87 pounds per year.
Goal C	Nutrients in Unimpaired Lakes	Maintain total phosphorus (TP) levels in unimpaired priority lakes.
Goal D	Chloride	Develop and implement a chloride campaign for Rice and Le Sueur counties. Scott County will continue using their existing chloride campaign.
Goal E	E. coli	Complete 10 SSTS improvements/replacements.

TABLE 0.2: SURFACE WATER HYDROLOGY

Issue Statement: Hydrology has been significantly altered within the watershed due to land use changes which have altered flowrates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts.		
Goal A	Altered Hydrology/Storage	Reduce annual runoff by 0.09-inches through implementation of 3,165 acre-feet of storage in priority stream subwatersheds in an attempt to stabilize streams through reduced peak flowrates.

TABLE 0.3: GROUNDWATER QUALITY

Issue Statement: Groundwater quality is altered by naturally occurring and human-introduced pollutants which impact the safety of drinking water supplies.		
Goal A	Groundwater Protection - Nitrates	Reduce nitrate inputs to achieve a no net increase in groundwater well nitrate concentrations or trends in priority areas where data exists.
Goal B	Groundwater Protection – Source Contamination	Minimize groundwater source contamination by implementing 10 SSTS repairs/replacements and sealing 40 unused or abandoned wells.

TABLE 0.4: GROUNDWATER KNOWLEDGE, DATA, AND UNDERSTANDING		
Issue Statement: There is insufficient knowledge, data, and understanding of groundwater quality and quantity which is needed in order to protect vulnerable areas, resources, and communities within the watershed.		
Goal A	Groundwater Contamination	Develop and implement an education and outreach campaign for both public and political representatives to improve understanding of groundwater contamination and management.
Goal B	Data Collection and Monitoring	Complete County Geologic Atlas (CGA) for the entire Planning Area .
Goal C	Arsenic	Develop and implement an arsenic awareness and exposure prevention campaign for Rice, Le Sueur, and Scott Counties.

TABLE 0.5: HABITAT AND NATURAL RESOURCE RESTORATION		
Issue Statement: While all habitat types have been impacted, riparian areas in particular have been reduced, degraded, and fragmented due to land use practices, pollutants, and altered hydrology.		
Goal A	Riparian Restoration	Within priority stream subwatersheds, increase perennial cover by 300 acres or 50 miles within a half mile wide corridor on rivers and streams.

TABLE 0.6: HABITAT AND NATURAL RESOURCES PROTECTION AND PRESERVATION		
Issue Statement: Habitat that contains high ecological value is threatened due to land use changes, poor water quality, and altered hydrology. These impacts affect all existing natural habitat types, especially aquatic habitat, forests, native prairies, trout streams, and wetlands/fens.		
Goal A	Identify High Value Natural and Cultural Resources	Complete a study(s) to identify high value natural and cultural resources, determine sensitive habitat areas, and establish strategies for protection.
Goal B	Permanent Protection	Increase the amount of land in permanent protection through conservation easements by 800-acres.

0.9 IMPLEMENTATION ACTIONS AND PROGRAMS

Within the 10-year comprehensive plan, the partnership will focus on water quality, hydrology, groundwater, and habitat issues. Measurable goals have been set to make progress towards addressing these issues. Activities that will help the partnership achieve these goals include, but are not limited to: soil health practices, streambank stabilization projects, well sealings, septic upgrades, stormwater BMPs, wetland restorations, and education/outreach efforts.

Learn more BWSR One Watershed, One Plan Program

Scan the QR code or click here:
bwsr.state.mn.us/one-watershed-one-plancite/103B.315

The existing implementation programs are detailed in Chapter 5, and the anticipated efforts for implementation actions are summarized within the implementation tables in Chapter 4. To keep implementation efforts organized, separate tables were completed for best management practices (BMPs) and programs; policy and regulation; and data, studies, and monitoring efforts. Education and outreach efforts are presented in a menu-style approach designed to allow strategic selection of efforts for each campaign the ST designs. In addition to the menu style approach, a small implementation table was created to track efforts completed utilizing the education and outreach framework. Tracking implementation and completion of items within the implementation tables will assist the Partnership with reporting progress towards achieving the identified measurable goals detailed in Chapter 3. Tracking will be completed by calculating project reductions incorporating them into an expanded version of the implementation tables presented in Chapter 4.

The estimated cost to implement the 10 year comprehensive Plan is $22,678,272 (Table 0.7). The cost to implement the plan is allocated in different components which include agriculture and urban best management practices, education and outreach, technical assistance, data, studies, and monitoring, policy and regulation, administration costs.

TABLE 0.7: PLAN COSTS

Costs for Plan Implementation	
Best Management Practices	$15,356,825
Education and Outreach	$1,744,482
Technical Assistance	$3,488,965
Data, Studies, and Monitoring	$1,883,000
Policy and Regulation	$205,000
Total	**$22,678,272**

0.10 PLAN ADMINISTRATION AND COORDINATION

The Policy Committee recommended the establishment of a Joint Powers Entity with the powers and authorities outlined in the Joint Powers Agreement (JPA) and Bylaws.

The JPA for plan implementation established a new entity with a governing board that operates autonomously from the members. The Board is responsible for approving the budget, work plan, plan amendments, cost-share policies, bylaws, as well as establishing committees as necessary to implement the Plan. The ST will meet monthly and will assist with developing priorities for plan implementation efforts, implementing projects and practices, and developing draft budgets and work plans.

DID YOU KNOW?

Plan review authorities have 60 days to submit comments to the PC and to BWSR.

Chapter 1:
Land and Water Resources Narrative

Chapter 1: **Land and Water Resources Narrative**

ABOUT THE PLANNING AREA

The Planning Area covers approximately **405,789 acres** (634 square miles) and is within the Minnesota River Basin in south-central Minnesota (Figures 1.1 and 1.2).

For planning purposes, the Lower Minnesota River HUC 8 watershed used in the Minnesota Pollution Control Agency (MPCA)'s Watershed Restoration and Protection Strategy (WRAPS) and other state planning and modeling efforts was divided into **two sections**:

1. Eastern Planning Area
2. Western Planning Area

The top priority resources within the Planning Area is the Minnesota River, and its tributaries within the Planning Area include Sand Creek, Le Sueur Creek, Roberts Creek, and Eagle Creek. The Minnesota River drains into the Mississippi River and ultimately to the Gulf of Mexico.

Counties

The Lower Minnesota River East Planning Area includes portions of:

- Scott County
- Le Sueur County
- Rice County

Watershed Districts and Watershed Management Organizations

- Lower Minnesota River Watershed District
- Prior Lake-Spring Lake Watershed District
- Scott Watershed Management Organization

Tribal Organizations

- Shakopee Mdewakanton Sioux Community

Cities

The Planning Area's largest city is Shakopee, which is located southwest of the Twin Cities Metropolitan Area along the Minnesota River. Other cities within the Planning Area include:

- Prior Lake
- Savage
- Jordan
- New Prague
- Le Sueur
- Le Center
- Heidelberg
- Montgomery
- Portions of Lonsdale
- Portions of New Market
- Belle Plaine

405,789
Acres

3
Counties

11
Cities

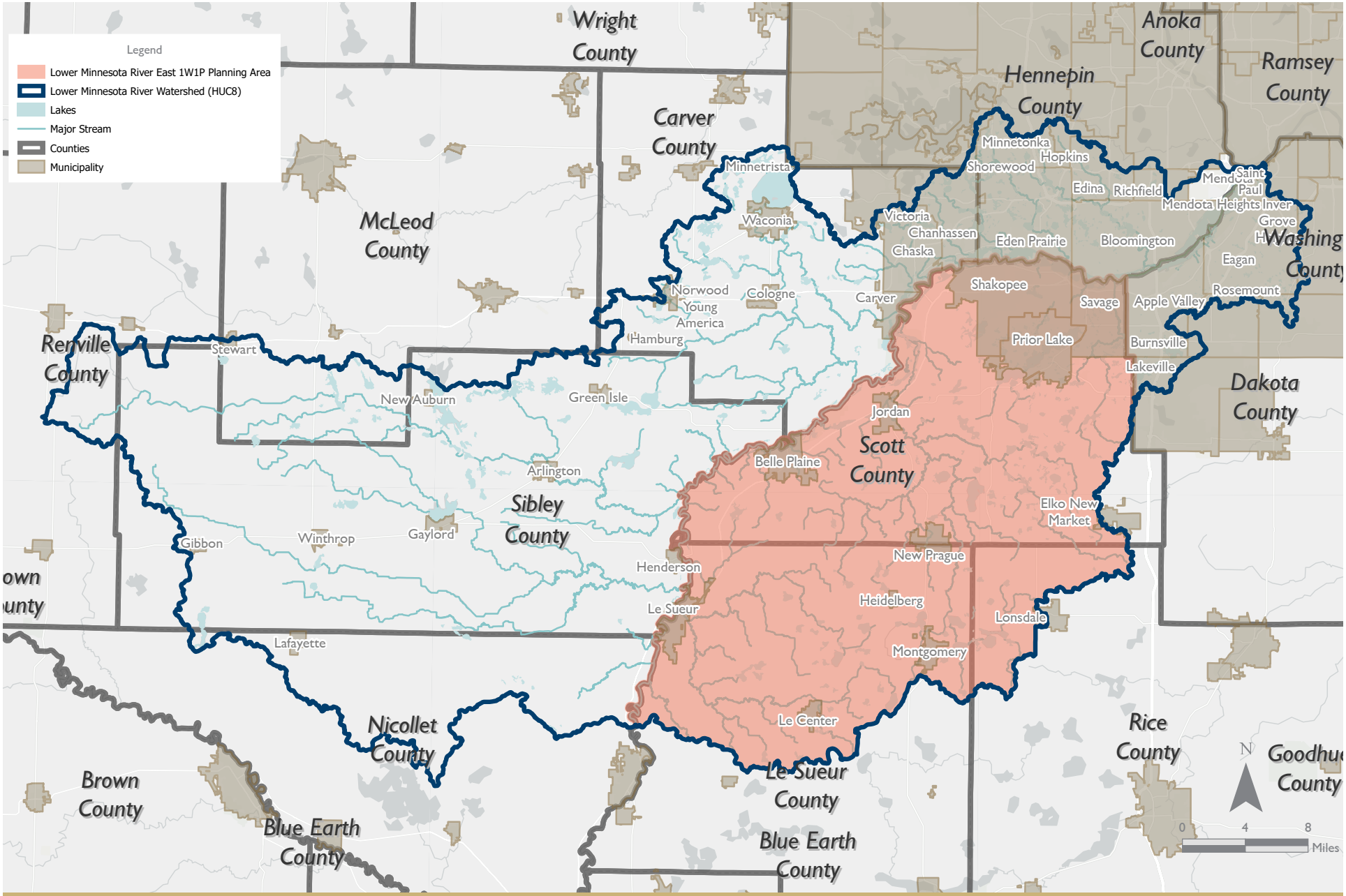


Figure 1.1: Lower Minnesota River Watershed (HUC8) and Lower Minnesota River East 1W1P Planning Area

PLANNING PARTNERS

Stakeholders within the Planning Area include:

- Le Sueur County
- Rice County
- Scott County
- Hidelberg
- Jordan
- Le Center
- Le Sueur
- Lonsdale
- Montgomery
- Elko New Market
- New Prague
- Prior Lake
- Savage
- The Lower Minnesota River Watershed District (LMRWD)
- The Prior Lake-Spring Lake Watershed District (PLSLWD)
- Scott Watershed Management Organization (WMO)
- Le Sueur County Soil and Water Conservation District (SWCD)
- Rice Soil and Water Conservation District (SWCD)
- Scott Soil and Water Conservation District (SWCD)
- The Native American Tribe of the Shakopee Mdewakanton Sioux Community (SMSC)
  A community of the Dakota people

DID YOU KNOW?

Each of these local stakeholder groups were invited to participate in the planning process.

The following groups opted to provide technical and informal support with planning efforts:

Shakopee Mdewakanton Sioux Community

Prior Lake-Spring Lake Watershed District

All municipalities

Staff from the Prior Lake-Spring Lake Watershed District have committed to attending and participating in Advisory Committee meetings.

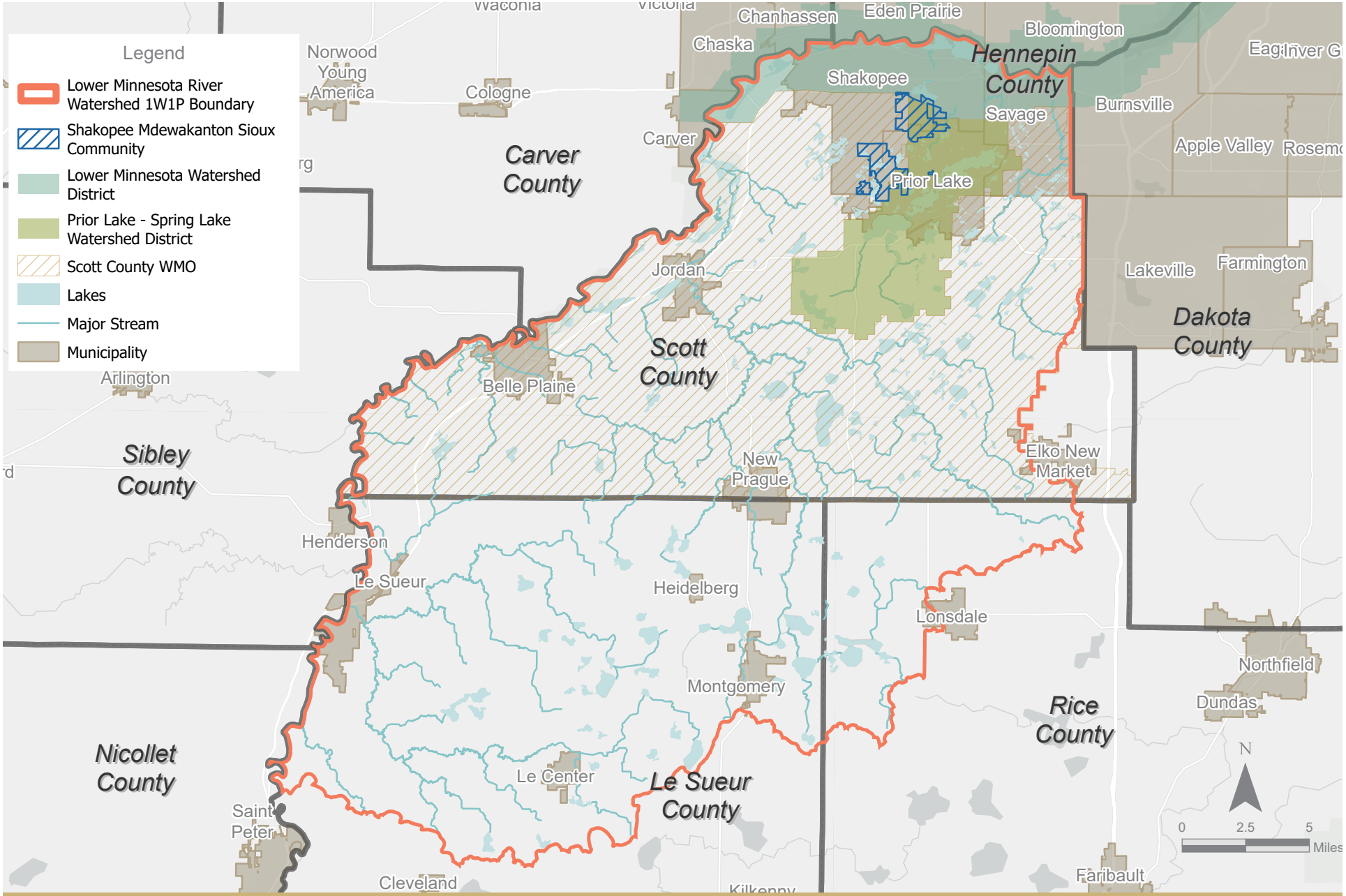


Figure 1.2: Lower Minnesota River East CWMP Planning Area

CULTURAL HERITAGE

This Plan aims to protect and restore natural resources in the Planning Area for future generations. In planning for the future, it is key to remember that the resources in the Planning Area have been important to past generations. These vital resources have provided a continuum of use for generations and have endured numerous events that have shaped the region:

Environmental

Social

Economic

The Early Years

The Minnesota River Valley has been home to the Dakota people for thousands of years. Its name is derived from the Dakota word Mni Sota Wakpa which translates to cloudy waters (Peterson and LaBatte, 2022). Dakota culture includes the value of living in harmony with surroundings. Historically, the Dakota fished from rivers and lakes, gathered wild rice, and hunted game on the prairies in the river valley woodlands (Minnesota Indian Affairs Council, 2021).

Many names that we see today are reminders of Dakota leaders, whose villages were located along the lower Minnesota River such as Black Dog, Shakopee, and Mazomani (State of Minnesota Parks, 2022).

1600's

In the early **1600's**, European explorers, fur traders, and missionaries traveled the Minnesota River.

1700's

By the **1860's**, early pioneers built homesteads and farmed along the river's fertile banks.

1800's

The U.S.-Dakota War took place in **1862** after failed treaty promises.

The Dakota battled for their homelands, way of life, and culture. As a result of the battle, the US Congress rescinded all treaties and exiled all Dakota from Minnesota. The Dakota people struggled to survive.

1900's

In the late **1880's**, the United States government purchased land from the Mdewakanton, including land in the Prior Lake area.

2000's

Finally, in **1969**, the federal government granted to Shakopee Mdewakanton Sioux Community official recognition as a Native American Tribe.

Learn more about the Dakota People!

Scan the QR code or click here:
bit.ly/thedakotapeople

GREAT IDEAS

The Shakopee Mdewakanton Sioux Community continue to be good stewards of the earth through many conservation and green initiatives, including the use of renewable energy, recycling plant-based materials at the Organics Recycling Facility, and the use of state-of-the-art technologies in drinking water and wastewater treatment facility to reduce pollutants.

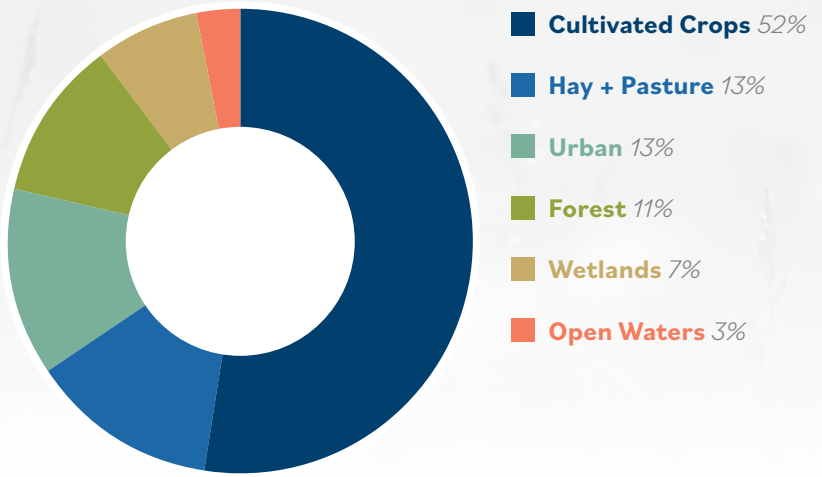
855+

Farms that are an average of 200 acres in size

LAND USE

The predominant land use within the Planning Area is agricultural with **52% cultivated crops** and **13% hay and pasture** (Figure 1.3). The next most predominant land use is **urban development at 13%** (USGS, 2016). Other land uses include forest, wetlands, and open waters (Figures 1.15–1.17).

Figure 1.3: Land Use Distribution



DID YOU KNOW?

The Twin Cities Metropolitan Area is expected to expand to the south and southwest (MPCA, 2020b). The total estimated population within the Planning Area based on the 2020 census was 166,298 and is projected to increase 0.71% from 2022-2027 (US Census Bureau, 2020).

Agriculture

Figure 1.4 shows land cover class according to the National Land Cover Database (NLCD, 2019). The southern portion of the Planning Area is primarily agricultural with traditional row crops including:

Corn

Soybeans

Small grains

Urban

The northern portion of the Planning Area is primarily urban landscape and lies within the greater Twin Cities Metropolitan Area. Cities include:

- Shakopee
- Prior Lake
- Savage

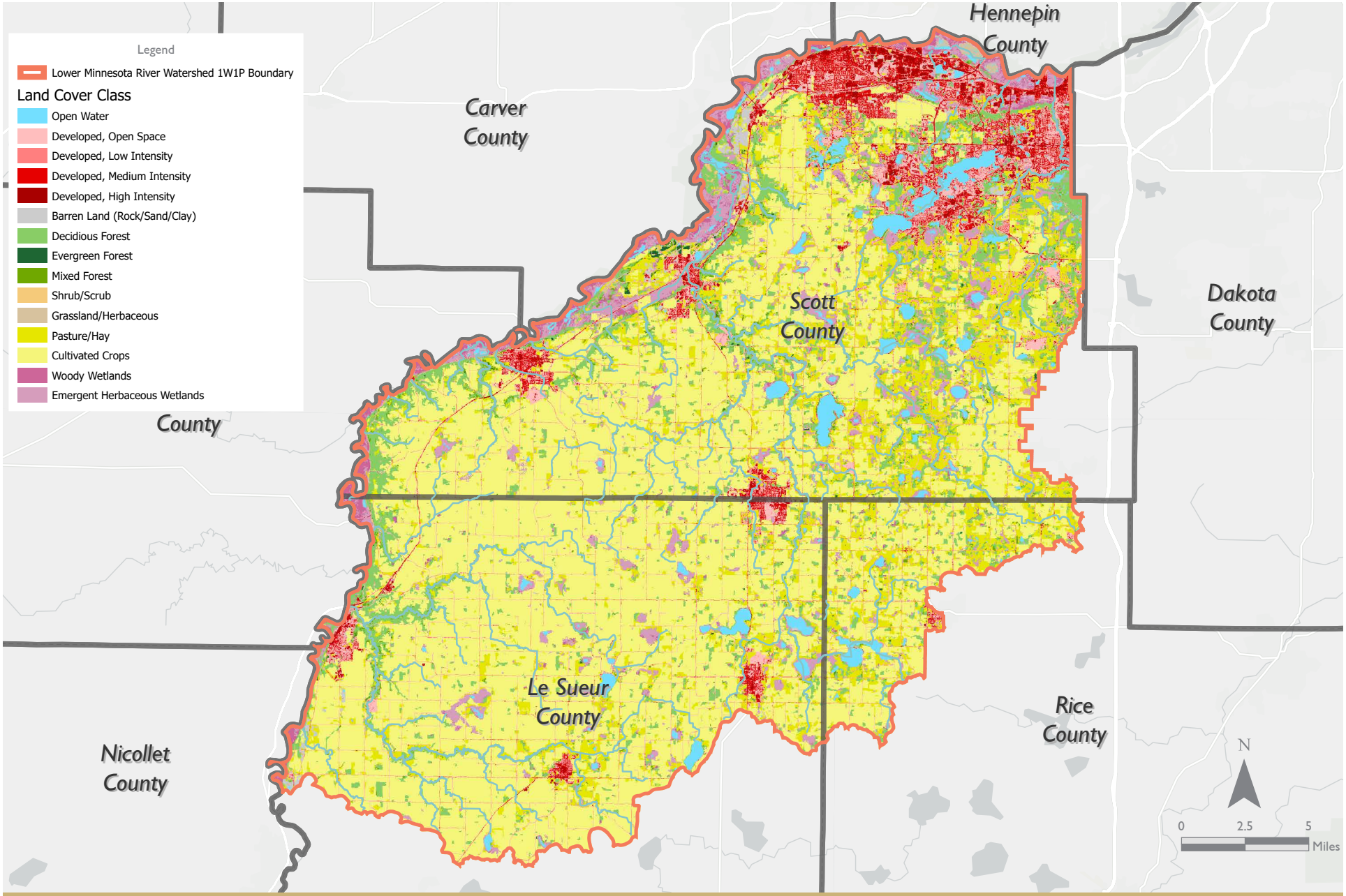


Figure 1.4: Land Cover Class (NLCD, 2019)

DID YOU KNOW?

An MS4 is a conveyance or system of conveyances such as roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, and storm drains, that is also owned or operated by a public entity, designed or used for collecting or conveying stormwater, not a combined sewer, and not part of a publicly owned treatment system.

Storm Sewer Systems (MS4)

This area has multiple municipal separate storm sewer systems (MS4). These entities must satisfy the requirements of the MPCA's MS4 general permit to manage pollutants associated with stormwater runoff. The Shakopee Mdewakanton Sioux Community MS4 is regulated by the EPA through a National Pollutant Discharge Elimination System (NPDES) individual permit.

MS4 areas include:

- City of Prior Lake
- City of Savage
- City of Shakopee
- Credit River Township
- Shakopee Mdewakanton Sioux Community
- Jackson Township
- Louisville Township
- Spring Lake Township
- Scott County
- Prior Lake-Spring Lake Watershed District
- MNDOT Metro District
- Portions of the City of Elko New Market MS4

Permitted wastewater facilities within the Planning Area are included in Figure 1.5.

Learn more about MS4s!
Scan the QR code or click here: bit.ly/mnms4

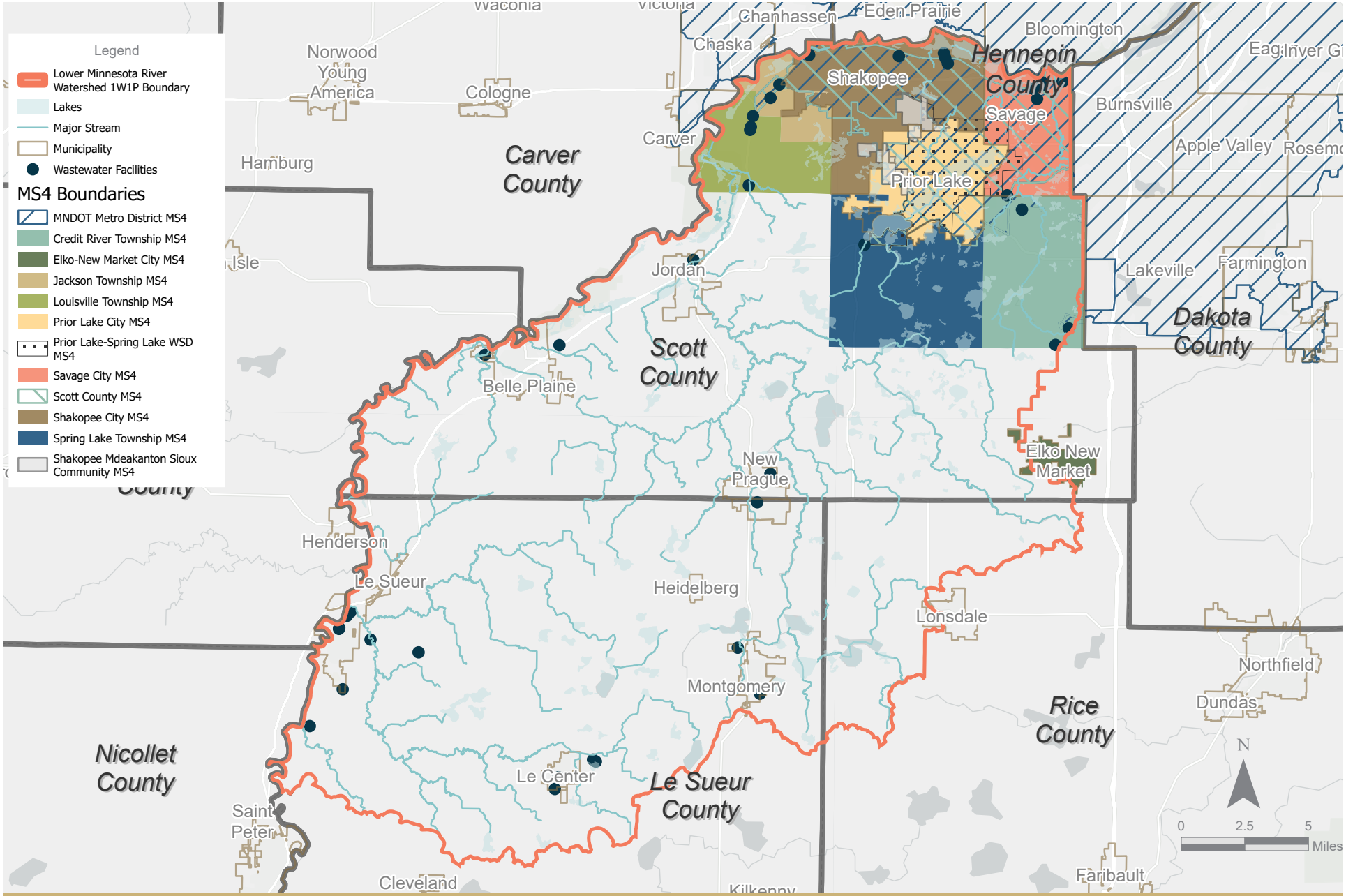


Figure 1.5: MS4 Boundaries and Wastewater Facilities

ANIMAL UNIT
A unit expressing the feed requirements of different kinds of animals on a common scale

FEEDLOT
Plot of ground, often near a stockyard, where livestock are gathered to be fattened for market

285
Active Feedlots

78%
of Feedlots have less than 300 Animal Units

10
Confined Animal Feeding Operations (CAFO)

Natural Features

After agriculture and urban, remaining land uses include natural features such as:

- Forest (11%)
- Wetlands (7%)
- Open waters (3%)

The Planning Area's natural features occur primarily within protected conservation areas along riparian corridors. The most predominant protection corridor within the planning boundary is located along the Minnesota Valley National Wildlife Refuge and Minnesota Valley State Recreation Area (USFWS, 2022b) (DNR, 2022). The areas connect communities with nature and wildlife while providing educational and recreational opportunities such as:

- Walking
- Hiking
- Biking
- Hunting
- Cross country skiing
- Horseback riding

Feedlots

There are **285 active** FEEDLOTS in the Planning Area (Figure 1.6). Approximately **78% of the feedlots have less than 300** ANIMAL UNITS, and there are **10 confined animal feeding operations (CAFO)**. While the total number of feedlots is decreasing over time, the size of those that remain is growing. This correlates with a larger trend in agriculture where smaller family farms are being replaced by larger corporate operations (MPCA, 2020a).

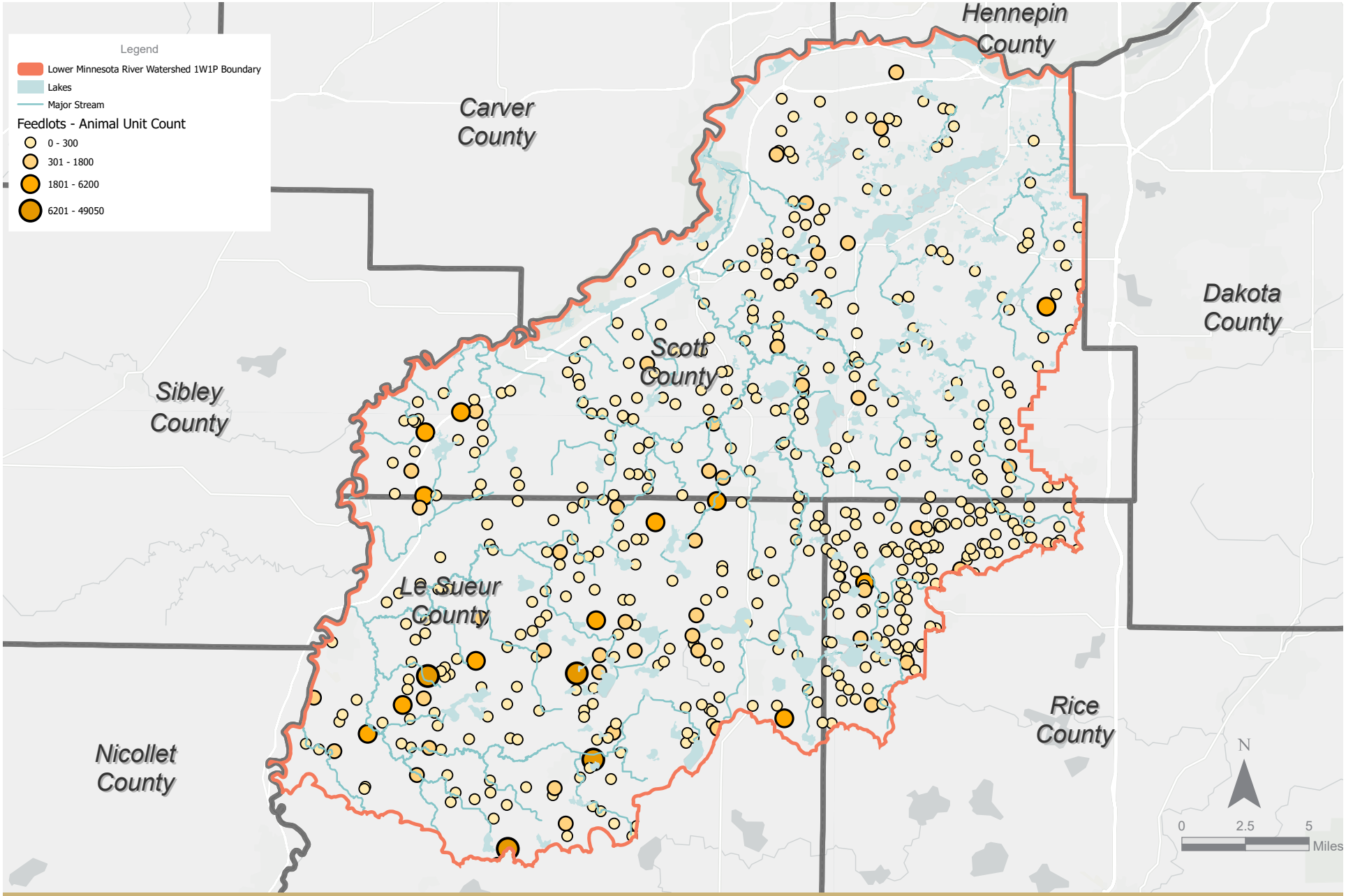


Figure 1.6: Active Feedlots

800+
Stream Miles

70
Stream Miles
of the Minnesota River

SURFACE WATER

Streams

There are roughly **800 stream miles** within the Planning Area. The main tributaries within the Planning Area include:

- Le Sueur Creek
- Robert Creek
- Sand Creek
- Credit River
- Eagle Creek

The Planning Area also includes **70 stream miles of the Minnesota River**, and many of those stream reaches are impaired (MPCA, 2022b)(Figure 1.7). The Minnesota River has been identified as a major contributor of sediment and nutrients to the Mississippi River, impacting downstream waters, such as Lake Pepin and the Gulf of Mexico.

WATER CONTROL

There are no water control structures, such as dams, on the Minnesota River within the Planning Area. During low flows, the lock and dammed Mississippi River can experience backflow into the Minnesota River, creating lake-like conditions. These conditions favor the production of algae and result in low dissolved oxygen levels.

NAVIGATION

While most of the Minnesota River is not typically used for navigation, the Minnesota River from Savage (river mile 14.7) to its outlet into the Mississippi River is dredged to provide a nine-foot-deep channel and a four-foot channel to river mile 25 for commercial barge navigation as authorized by the Federal Rivers and Harbors Act (USACE, 2023).

DID YOU KNOW?

The Minnesota River has been identified as a major contributor of sediment and nutrients to the Mississippi River impacting downstream waters.

Learn more about the Minnesota River Navigation Project.
Scan the QR code or click here: bit.ly/MNRiverNav

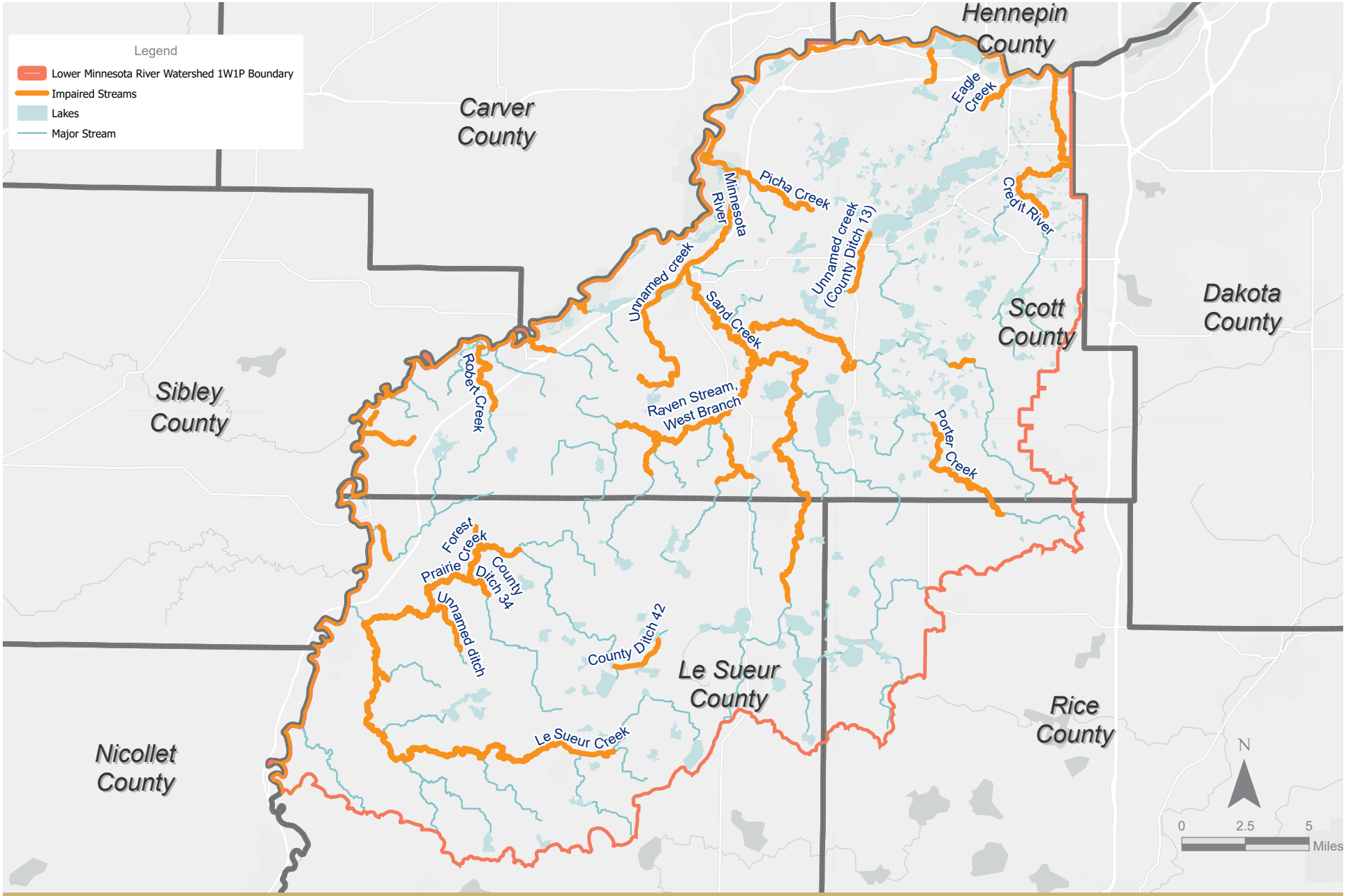


Figure 1.7: Impaired Streams

117
Lakes

7%
of the Planning Area is Wetland

46
Public Drainage Systems

Lakes

There are **117 lakes** in the Planning Area that provide recreational opportunities and waterfowl habitat (Figures 1.8-1.10). There are 17 lakes in the Planning Area deemed impaired for nutrients or fish bioassessments through monitoring efforts completed by the MPCA (MPCA, 2022b) (Figure 1.12). Only four lakes in the Planning Area met their designate use standards for aquatic life and/or aquatic recreation. These lakes include Lemay Lake, Lower Prior, McMahon Lake, and O'Dowd Lake. Popular recreational lakes include Spring Lake, Upper and Lower Prior Lakes, Cedar Lake, and O'Dowd Lake.

WETLANDS

Water control structures are commonly found controlling the outlets of lakes and wetlands within the Planning Area. **Wetlands account for approximately 7% of the total Planning Area** (USGS, 2016) with a large portion of the wetlands present along the Minnesota River and its floodplain.

DRAINAGE SYSTEMS

Public and private drainage is present in the Planning Area, mostly in the southern portion of the Planning Area where the need for artificial drainage is necessary to allow for productive agricultural lands. There are **46 public drainage systems**, including approximately 150 miles of open ditch and 23 miles of public drainage tile. Private drainage systems and tiles are not accounted for in these figures.

THE CHANGING LANDSCAPE

The significant change in landscape from both urban development and drained agricultural landscapes contributed to the significant amount of wetland loss since pre-settlement. The reduction in wetlands and altering of natural watercourse contributes to the impacts of altered hydrology within the Planning Area (Figure 1.11).

Figure 1.8: O'Dowd Lake

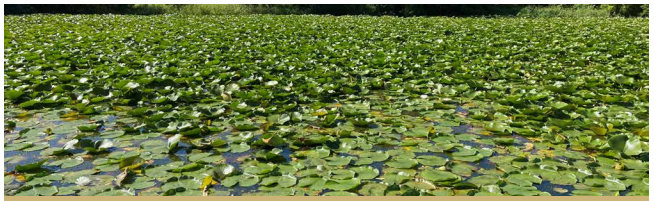


Figure 1.9: Thole Lake

Figure 1.10: Thole Lake

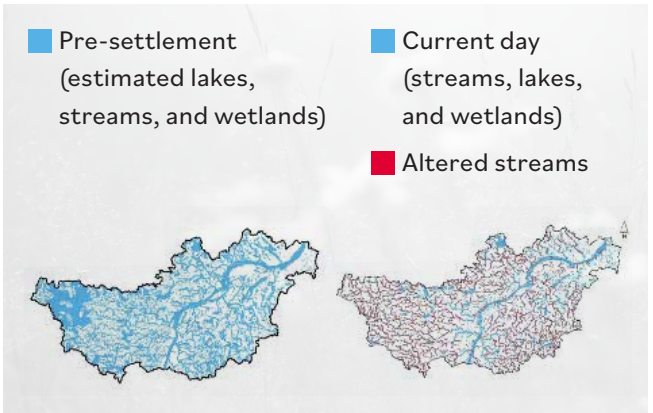


Figure 1.11: Pre-Settlement and Current Location of Streams, Lakes, and Wetlands in the Lower Minnesota River Watershed (HUC 8) (MPCA, 2020)

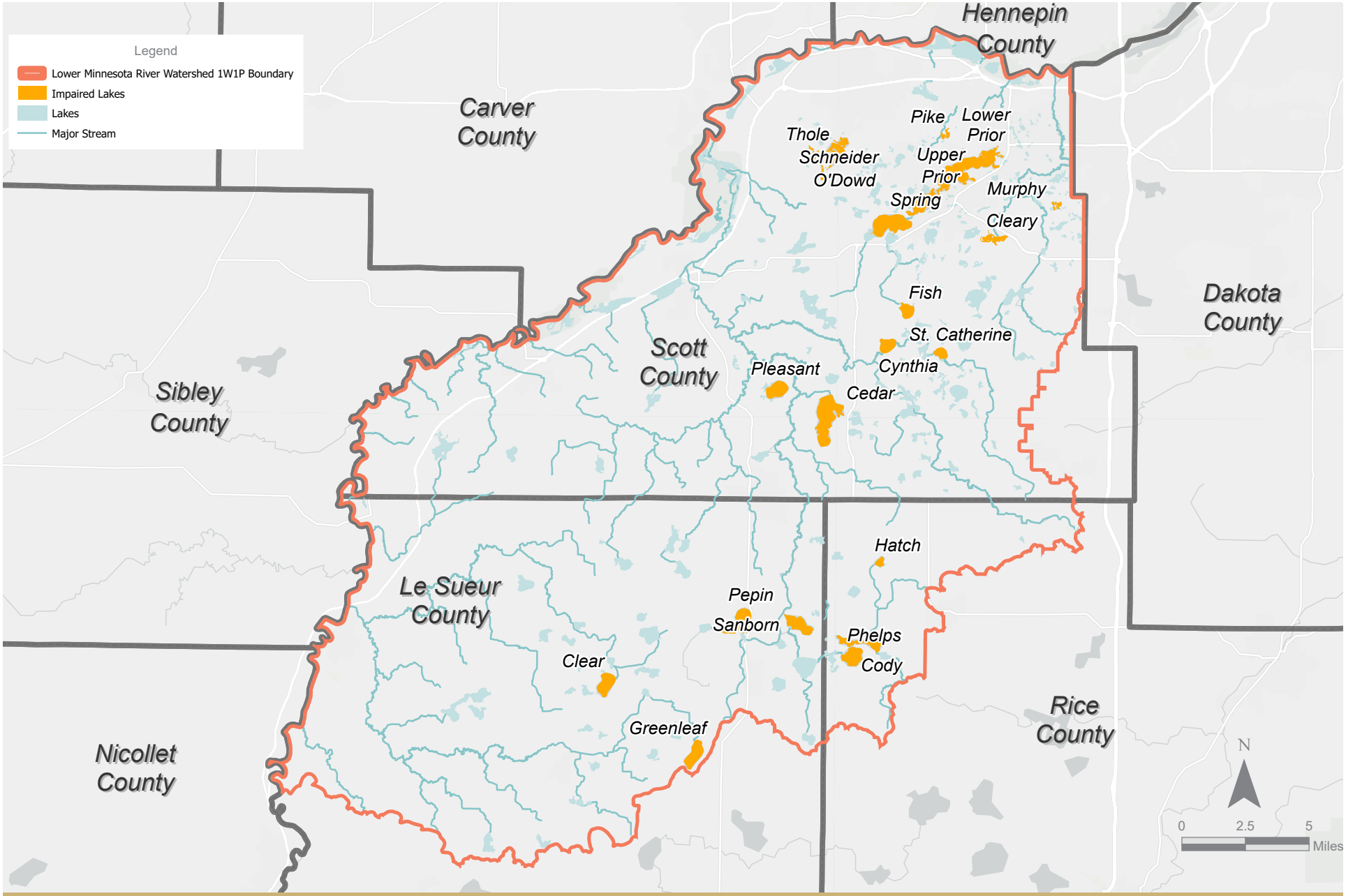


Figure 1.12: Impaired Lakes

WATER QUANTITY

There are two main streamflow gauge stations along the Minnesota River within the Planning Area:

- One located near Henderson which is managed by the Minnesota Department of Natural Resources (DNR)
- One near Jordan which is managed by the United States Geologic Survey (USGS) (Figure 1.13)

Samples

Water quality and quantity samples are measured at the Jordan monitoring station to evaluate loading, flow, and volume and provide valuable planning data for the Minnesota River before its outlet into the Mississippi River. Long term monitoring records from these sites show annual peak flow increases by 80% as compared to historic records that date back to 1935 (DNR, 2022). Additional water quantity monitoring occurs within the Planning Area and will be discussed in the monitoring section of this Plan.

Flooding

There is risk of flooding from the 100-year rain event, particularly along the Minnesota River. Primary areas at risk include transportation structures such as bridges and roadways along the Minnesota River. Local flooding areas are mapped for much of Planning Area through FEMA delineated maps.

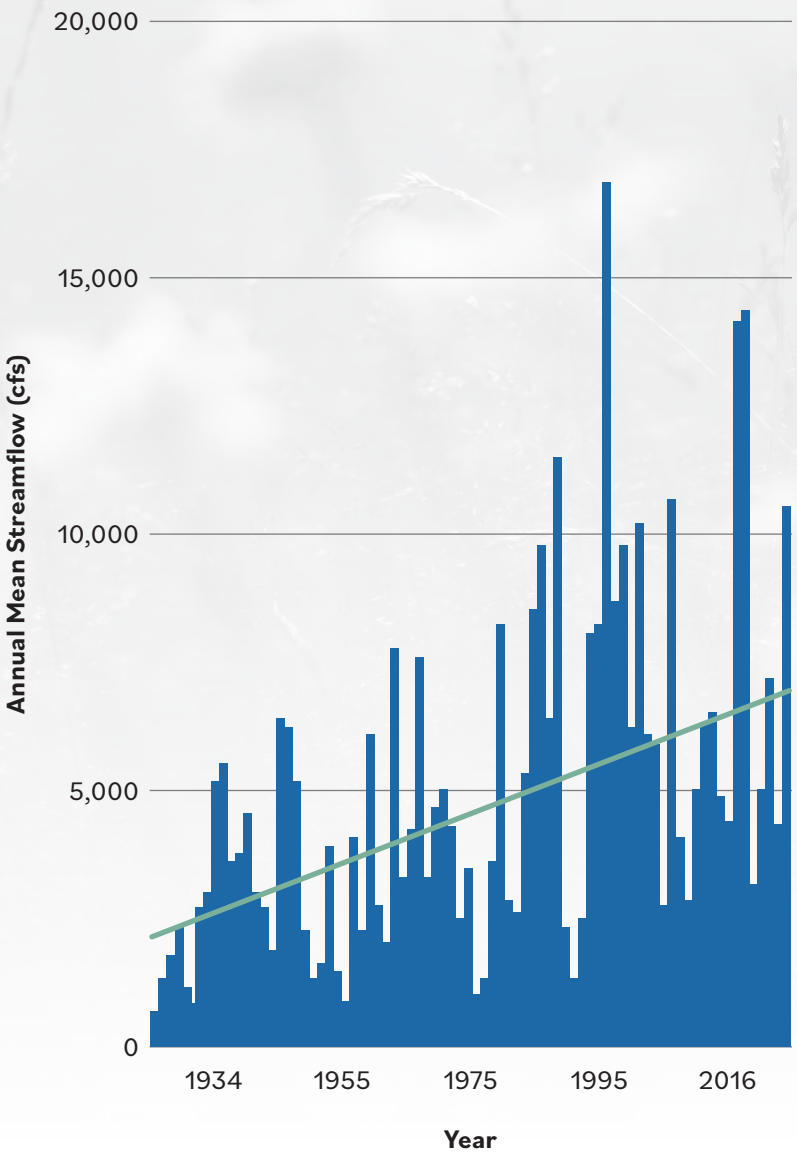
Altered Hydrology

The changes to the hydrology noted above can be attributed to increases in:

- Precipitation
  Amount and intensity of events
- Land conversion
- Development
- Artificial drainage

Altered hydrology has been identified as one of the primary stressors of biotic impairments in the Planning Area. Due to the complexity and connection of altered hydrology to other issues within the Planning Area, this topic will be discussed in detail throughout the Plan document.

Figure 1.13: Annual Mean Streamflow for the Minnesota River Near Jordan, Minnesota (Jennings, 2016)



WATER QUALITY

The MPCA conducts water quality assessments as a part of its intensive watershed monitoring program to determine the condition of the surface waters in the state.

The assessments show that surface waters in the Planning Area face stresses common to the region with elevated nutrients and fish and macroinvertebrate bioassessment, resulting in the majority of the impairments. Water quality monitoring shows that most of the waterbodies have declining water quality trends. In total, there are 96 impairments listed from 28 streams and 19 lakes. They are summarized in Table 1.1 and described in greater detail in Tables 1.2 and 1.3. (MPCA, 2022b).

TABLE 1.1: SUMMARY OF IMPAIRED STREAMS AND LAKES IN PLANNING AREA*

Water Body	Pollutant or Stressor	Number of Impairments
Streams	Bethic macroinvertebrates bioassessments	19
	Fish bioassessments	25
	Escherichia coli (E. coli)	14
	Fecal coliform	4
	Turbidity	9
	Total Suspended Solids (TSS)	1
	Chloride	6
	Nutrients	6
Lakes	Fish bioassessments	3
	Nutrients	17

**Does not include mercury impairments*

TABLE 1.2: IMPAIRED STREAMS IN THE PLANNING AREA*

*Does not include mercury impairments

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated Use	Pollutant or Stressor
Big Possum Creek	Unnamed Creek to Minnesota River	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
County Ditch 10	CD 3 to Raven Street	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments
				Aquatic Recreation	Fecal coliform
County Ditch 34	Unnamed Ditch to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
County Ditch 42	School Lake to Clear Lake Outlet	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Credit River	-93.3526 44.7059 to Minnesota River	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Eagle Creek	Headwaters to Minnesota River	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Forest Prairie Creek	CD 29 to Le Sueur Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Judicial Ditch 4	Unnamed Ditch to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Fish bioassessments

TABLE 1.2: IMPAIRED STREAMS IN THE PLANNING AREA*

*Does not include mercury impairments

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated Use	Pollutant or Stressor
Le Sueur Creek	CD 23 to West Prairie Stream	Stream	Le Sueur	Aquatic Life	Fish bioassessments
	West Prairie Stream to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Minnesota River	Cherry Creek to High Island Creek	Stream	Le Sueur	Aquatic Life	Turbidity; Nutrients
				Aquatic Recreation	Fecal Coliform
	High Island Creek to Carver Creek		Scott	Aquatic Life	Turbidity; Nutrients
				Aquatic Recreation	Fecal Coliform
	Carver Creek to RM 22		Scott	Aquatic Life	Turbidity; Nutrients
Picha Creek	Unnamed Creek	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
	Unnamed Creek to Sand Creek	Stream	Scott	Aquatic Life	Fish bioassessments
Porter Creek	Fairbanks Avenue to 250th Street East	Stream	Scott	Aquatic Life	Turbidity
	Langford Road/MN Highway 13 to Sand Creek	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Turbidity
				Aquatic Recreation	Escherichia coli (E. coli)

TABLE 1.2: IMPAIRED STREAMS IN THE PLANNING AREA*

***Does not include mercury impairments**

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated Use	Pollutant or Stressor
Raven Stream	East Branch Raven Stream to Sand Creek	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Raven Stream, East Branch	-93.6106 44.5532 to 255th Street West	Stream	Scott	Aquatic Life	Chloride
Raven Stream, West Branch	270th Street to East Branch Raven Stream	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Fecal coliform
Robert Creek	Unnamed Creek to Unnamed Creek (at Belle Plaine Sewage Ponds)	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments; Total suspended solids (TSS)
				Aquatic Recreation	Escherichia coli (E. coli)

TABLE 1.2: IMPAIRED STREAMS IN THE PLANNING AREA*

*Does not include mercury impairments

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated Use	Pollutant or Stressor
Sand Creek	Porter Creek to Minnesota River	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity
				Aquatic Recreation	Escherichia coli (E. coli)
	Raven Stream to Porter Creek	Stream	Scott	Aquatic Life	Fish bioassessments; Turbidity
	T112 R23W S23, south line to -93.5454 44.5226	Stream	Le Sueur	Aquatic Life	Chloride; Fish bioassessments; Nutrients; Turbidity
	-93.5454 44.5226 to Raven Stream	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Chloride; Fish bioassessments; Nutrients; Turbidity
Unnamed Creek	Headwaters to Sand Creek	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Unnamed Creek	Headwaters to Unnamed Creek	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek	Headwaters to Unnamed Creek	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek	Headwaters to Minnesota River	Stream	Scott	Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek	Unnamed Creek to JD 2	Stream	Le Sueur	Aquatic Recreation	Escherichia coli (E. coli)

TABLE 1.2: IMPAIRED STREAMS IN THE PLANNING AREA*

*Does not include mercury impairments

Water Body Name	Water Body Description	Water Body Type	County	Affected Designated Use	Pollutant or Stressor
Unnamed Creek	CD 56 to Le Sueur Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Unnamed Creek	Railroad Bridge to East Branch Raven Stream	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Unnamed Creek	Unnamed Ditch to -93.4251 44.6206	Stream	Scott	Aquatic Life	Fish bioassessments
Unnamed Creek (Brewery Creek)	US Highway 169 to Minnesota River	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	Escherichia coli (E. coli)
Unnamed Creek (County Ditch 13)	Unnamed Ditch to Spring Lake (70-0054-00)	Stream	Scott	Aquatic Life	Fish bioassessments
Unnamed Creek (Upper and Lower Prior Lakes Outlet Channel)	Dean Lake to Blue Lake	Stream	Scott	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments
Unnamed Ditch	Unnamed Ditch to Forest Prairie Creek	Stream	Le Sueur	Aquatic Life	Benthic macroinvertebrates bioassessments; Fish bioassessments

TABLE 1.3: IMPAIRED LAKES IN THE PLANNING AREA*

***Does not include mercury impairments. Lakes with aquatic consumption impairments from mercury in fish tissue in the Planning Area include: Cedar, Cleary, Fish, Lower Prior, McMahon, Murphy, O'Dowd, Schneider, Spring, Thole, and Upper Prior Lakes**

Water Body name	Water Body Type	County	Affected Designated Use	Pollutant or Stressor
Cedar	Lake	Scott	Aquatic Recreation	Nutrients
Clear	Lake	Le Sueur	Aquatic Recreation	Nutrients
Cleary	Lake	Scott	Aquatic Recreation	Nutrients
Cody	Lake	Rice	Aquatic Recreation	Nutrients
Cynthia	Lake	Scott	Aquatic Recreation	Nutrients
Fish	Lake	Scott	Aquatic Recreation	Nutrients
Greenleaf	Lake	Le Sueur	Aquatic Recreation	Nutrients
Hatch	Lake	Rice	Aquatic Recreation	Nutrients
Lower Prior	Lake	Scott	Aquatic Life	Fish bioassessments
O'Dowd	Lake	Scott	Aquatic Life	Fish bioassessments
Pepin	Lake	Le Sueur	Aquatic Recreation	Nutrients
Phelps	Lake	Rice	Aquatic Recreation	Nutrients
Pike	Lake	Scott	Aquatic Recreation	Nutrients
Pleasant	Lake	Scott	Aquatic Recreation	Nutrients
Sanborn	Lake	Le Sueur	Aquatic Recreation	Nutrients
Spring	Lake	Scott	Aquatic Life	Fish bioassessments
			Aquatic Recreation	Nutrients
St. Catherine	Lake	Scott	Aquatic Recreation	Nutrients
Thole	Lake	Scott	Aquatic Recreation	Nutrients
Upper Prior	Lake	Scott	Aquatic Recreation	Nutrients

Learn more about MPCA's WRAPS process!

Scan the QR code or click here:
bit.ly/mpca-wraps-strat

IMPAIRMENTS
Waters that fail to meet state water quality standards

Aquatic Life Impairments

Aquatic life IMPAIRMENTS, which include fish bioassessment, benthic macroinvertebrates, and bioassessment impairments, are determined through biologic monitoring and assessments. Assessment of aquatic life provides an overall measure of community and stream health. Stressor identification is a formal and rigorous process that identifies stressors to biological impairments, a key component in the MPCA WRAPS process. Stressors can be physical, chemical, or biological. Table 1.4 lists identified stressors for the 28 reaches with aquatic life impairments. One reach may have multiple identified stressors (MPCA, 2018).

TABLE 1.4: STRESSOR IDENTIFICATION SUMMARY FOR THE AQUATIC LIFE IMPAIRED STREAMS IN THE PLANNING AREA (MPCA, 2018)

Stressor	Number of Reaches
Altered hydrology / connectivity	8
Poor habitat	18
Low dissolved oxygen	8
Eutrophication	12
High turbidity/TSS	7
High Nitrates	9
Chloride	1

GROUNDWATER

Groundwater is the primary source of drinking water for the Planning Area. The major bedrock aquifers underlying the Planning Area include the Prairie Du Chien-Jordan Aquifer and the Franconia-Ironton-Galesville Aquifer (also called the Tunnel City-Wonewoc aquifer). Most domestic, municipal, and commercial wells in the Planning Areas draw water from these aquifers. The Planning Area crosses three of Minnesota's groundwater provinces, including Province I (east-central) in the northern part of the Planning Area, Province 2 (south-central) in the southern half of the Planning Area, and a small portion of Province 3: Karst along the Minnesota River (DNR, 2021) (Figure 1.14).

Province I
EAST-CENTRAL

- Buried sand aquifers and extensive surficial sand plains
- Thick layer of sediment deposited by glaciers over the bedrock
- Underlying sedimentary bedrock has good aquifer properties

Province 2
SOUTH-CENTRAL

- Thick loam and clay loam glacial sediment
- Fine-grained glacial sediment and limited extents of surficial and buried sand aquifers
- Contains sedimentary bedrock aquifers that are commonly used

Province 3
KARST

- Glacial sediment is thin or absent
- Underlying bedrock aquifers closest to the surface are often impacted by human activities

DID YOU KNOW?

Most domestic, municipal, and commercial wells in the Planning Areas draw water from the Prairie Du Chien-Jordan Aquifer and the Franconia-Ironton-Galesville Aquifer.

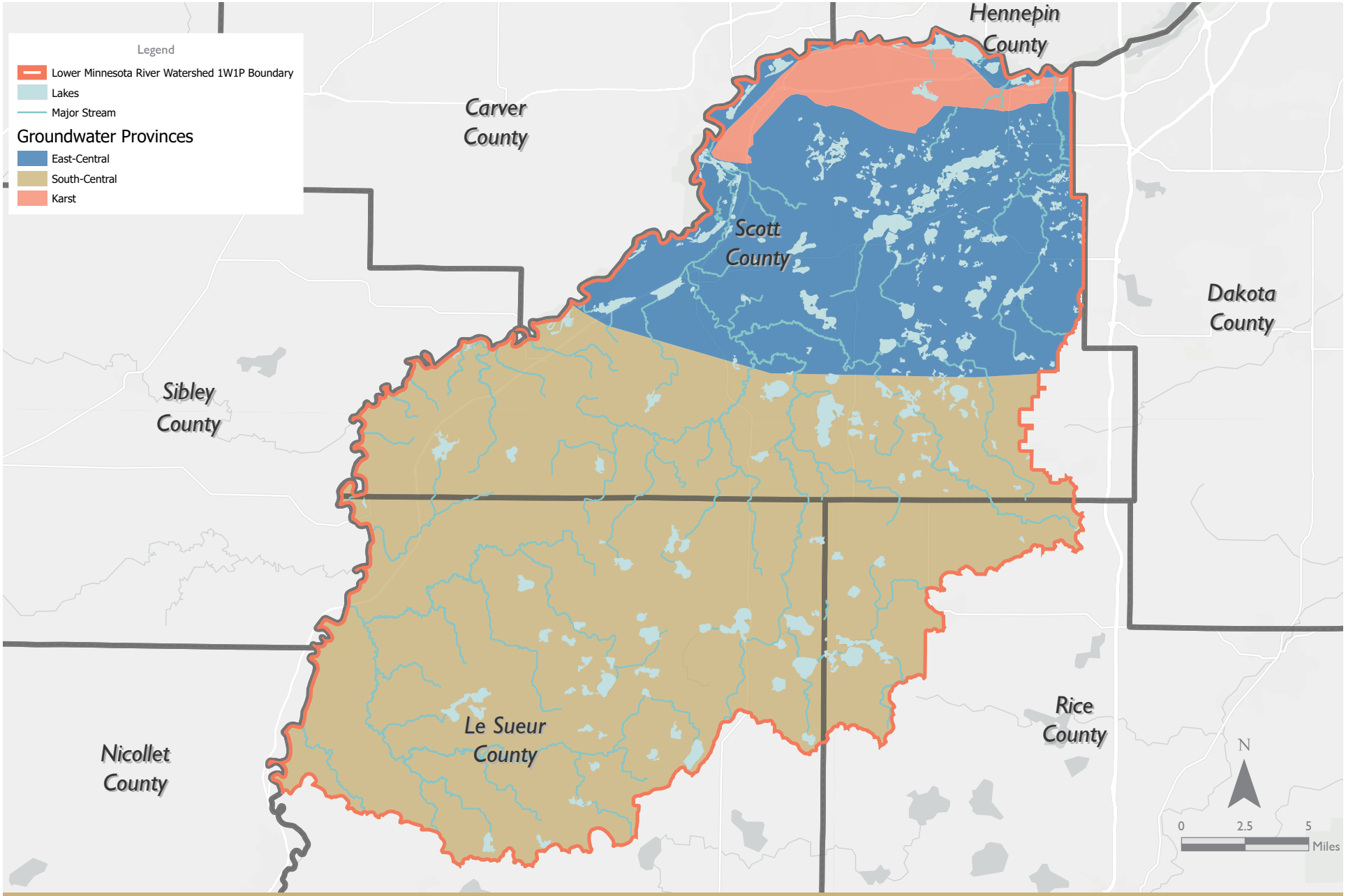


Figure 1.14: Minnesota Groundwater Provinces

Figure 1.15: Cedar Lake

Figure 1.16: Native Prairie

Figure 1.17: Corn Field

Contaminants

The primary groundwater quality contaminants of concern within the Planning Area are nitrates and arsenic.

NITRATE

Nitrate is a human influenced contaminant from feedlots, septic systems, fertilizers, and stormwater. Nitrates may also occur naturally in soil.

ARSENIC

Arsenic is a naturally-occurring element in rocks and soil across Minnesota and small amounts can dissolve into groundwater. An increased risk of cancer and other serious health effects is associated with drinking water containing arsenic. There are limited protection measures to prevent arsenic from entering drinking water, but exposure to arsenic can be reduced through testing, education, and home water treatment (MDH, 2021).

Contaminants of Emerging Concern

Various new contaminants, or contaminants that we are learning more about, are present throughout our environment, often at low levels. These contaminants are called contaminants of emerging concern (CECs) and are often manmade chemicals, although some may be naturally occurring. CECs are often unregulated or are regulated at a level that may no longer be considered protective of human health. Some CECs for drinking water in the Planning Area include: pesticides, chlorides, and Per- and Polyfluorinated Substances (PFAS).

County Geologic Atlases

Rice and Scott counties have completed county geologic atlases while Le Sueur County has not. County geologic atlases provide information about the geology and groundwater resources of a county and most are divided into two parts. The first part, Part A, is produced by the Minnesota Geological Survey and includes information on the County's geology, sand distribution, bedrock topography, and depth to bedrock. Part B is produced by the DNR once Part A is complete and includes more detailed information on groundwater and hydrogeologic properties, including maps and reports on groundwater flow direction, water chemistry, and pollution sensitivity (Figure 1.19). Scott County's hydrogeologic information is provided as a supplement to Part A, instead of its own Part B (DNR, 2023).

Water Table Aquifer Vulnerability

Most of the Planning Area has medium water table aquifer vulnerability except for the area along the Minnesota River corridor and its tributaries which have high water table aquifer vulnerability (MDA, 2016) (Figure 1.18). Vulnerability varies based on how easily surface water pollutants can move through the soil and into the groundwater with higher vulnerability coinciding with areas where it is easier for the pollutants to infiltrate into the aquifer. In areas where high water table aquifer vulnerability is present, restrictions to fall nitrogen fertilizer application are required except in locations where the conditions for exclusion are met. To help protect the groundwater from surface water pollutants, the MDA has established a Groundwater Protection Rule (GPR) to restrict the application of nitrogen fertilizer in the fall (after September 1) or on frozen soils in identified vulnerable groundwater areas (MDA, 2022).

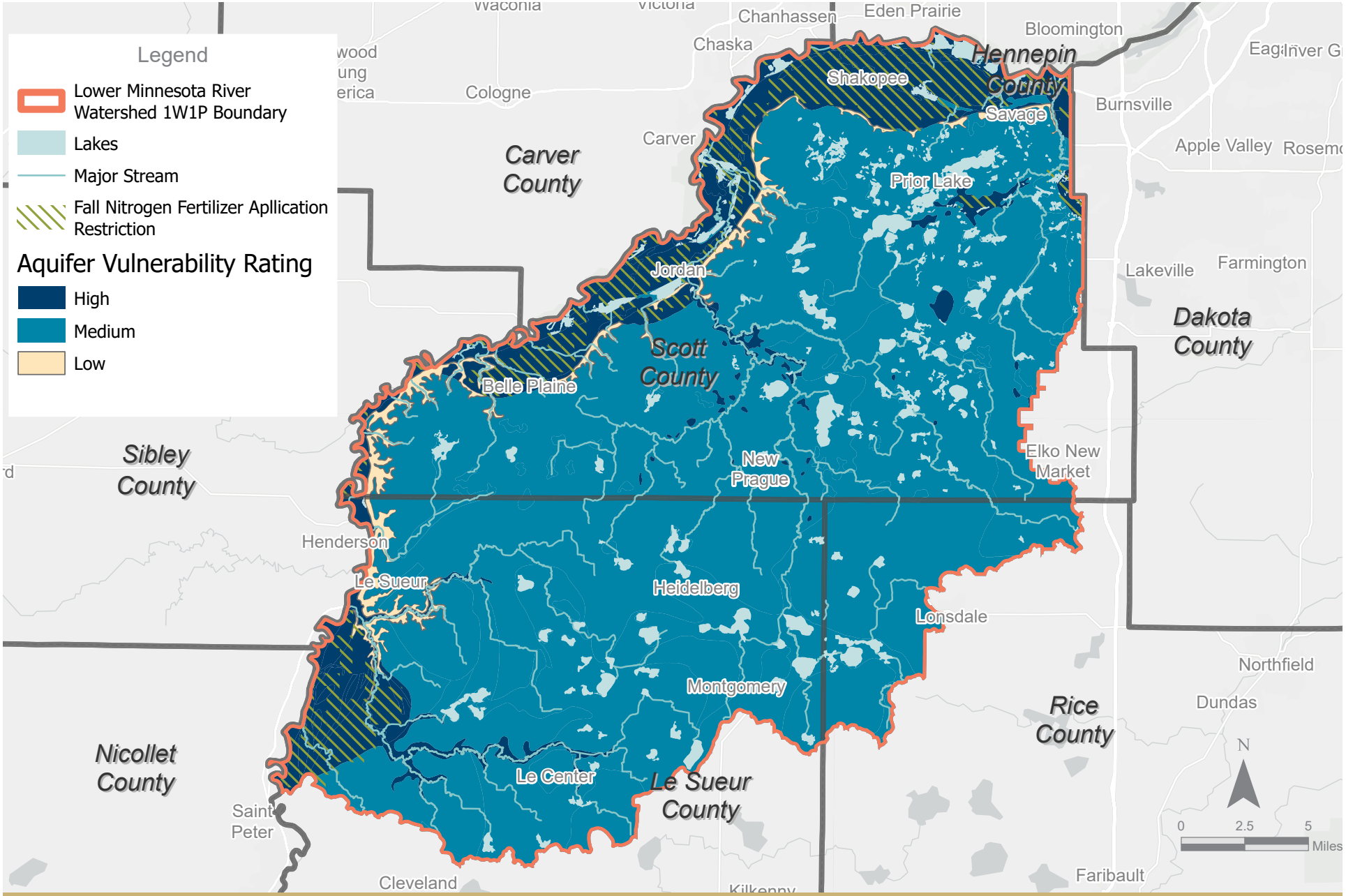


Figure 1.18: Water Table Aquifer Vulnerability and Fall Nitrogen Fertilizer Application Restriction Areas

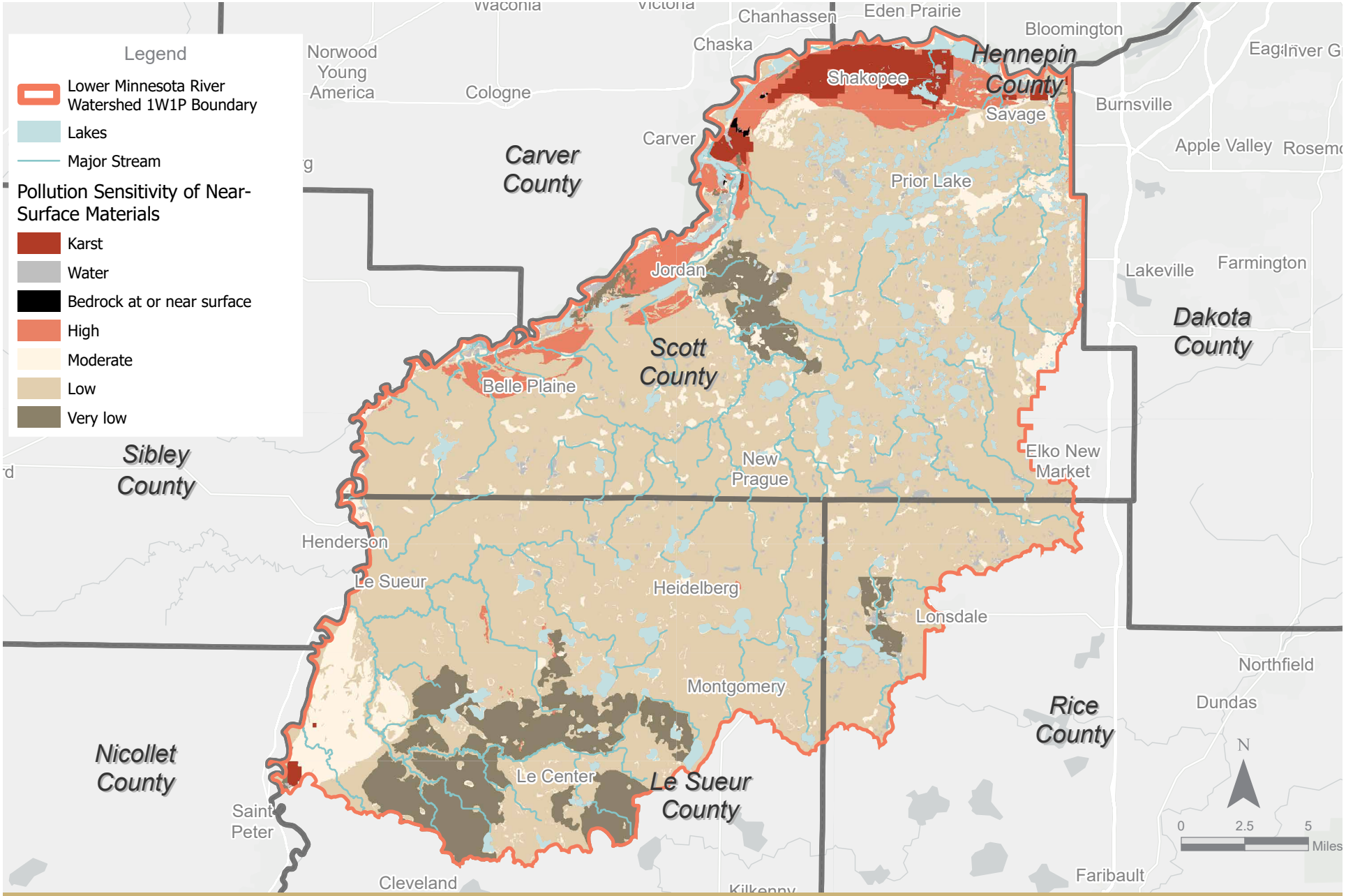


Figure 1.19: Near Surface Pollution Sensitivity

TOPOGRAPHY, SOILS, AND GEOLOGY

Approximately **10,000 years ago, the Des Moines Lobe glacier covered the Planning Area**. The retreat of the glacier left Lake Agassiz in its place, formed from ice melt in northwestern Minnesota, eastern North Dakota, and Canada. Eventually the Glacial River Warren was created at the outlet of Lake Agassiz carving the Minnesota River Valley (Figure 1.20).

The TOPOGRAPHY of the Planning Area is characterized as rolling in nature, with a dramatic change in elevation as it shifts to the lower reaches of the Minnesota River bluffs (approximately 1200 ft to 682 ft according to LiDAR). With the significant elevation change, tributaries, ravines, and bluffs that outlet into the Minnesota River experience significant erosion (Figure 1.21). The shift in the lower reaches gives rise to cold water springs that feed the Planning Area's unique natural resources such as Eagle Creek, a trout stream, and Savage Fen, a CALCAREOUS FEN wetland (MPCA, 2020b).

The Planning Area primarily consists of rich organic glacial prairie soils that are consistent with Central Iowa and Minnesota Till Prairie complex that are typically fine textured soils. The glacial deposit soils present characteristics that are prime for cultivation (MPCA, 2020b) (Figure 1.22).

Figure 1.20: Lake Agassiz

TOPOGRAPHY
Detailed mapping or charting of the features of a relatively small area, district, or locality

CALCAREOUS FEN
Rare and distinctive peat-accumulating wetlands that depend on constant supply of upwelling groundwater rich in calcium and other minerals

10,000
Years Ago the Des Moines Lobe glacier covered the Planning Area

DID YOU KNOW?

The Glacial River Warren was created at the outlet of Lake Agassiz carving the Minnesota River Valley.

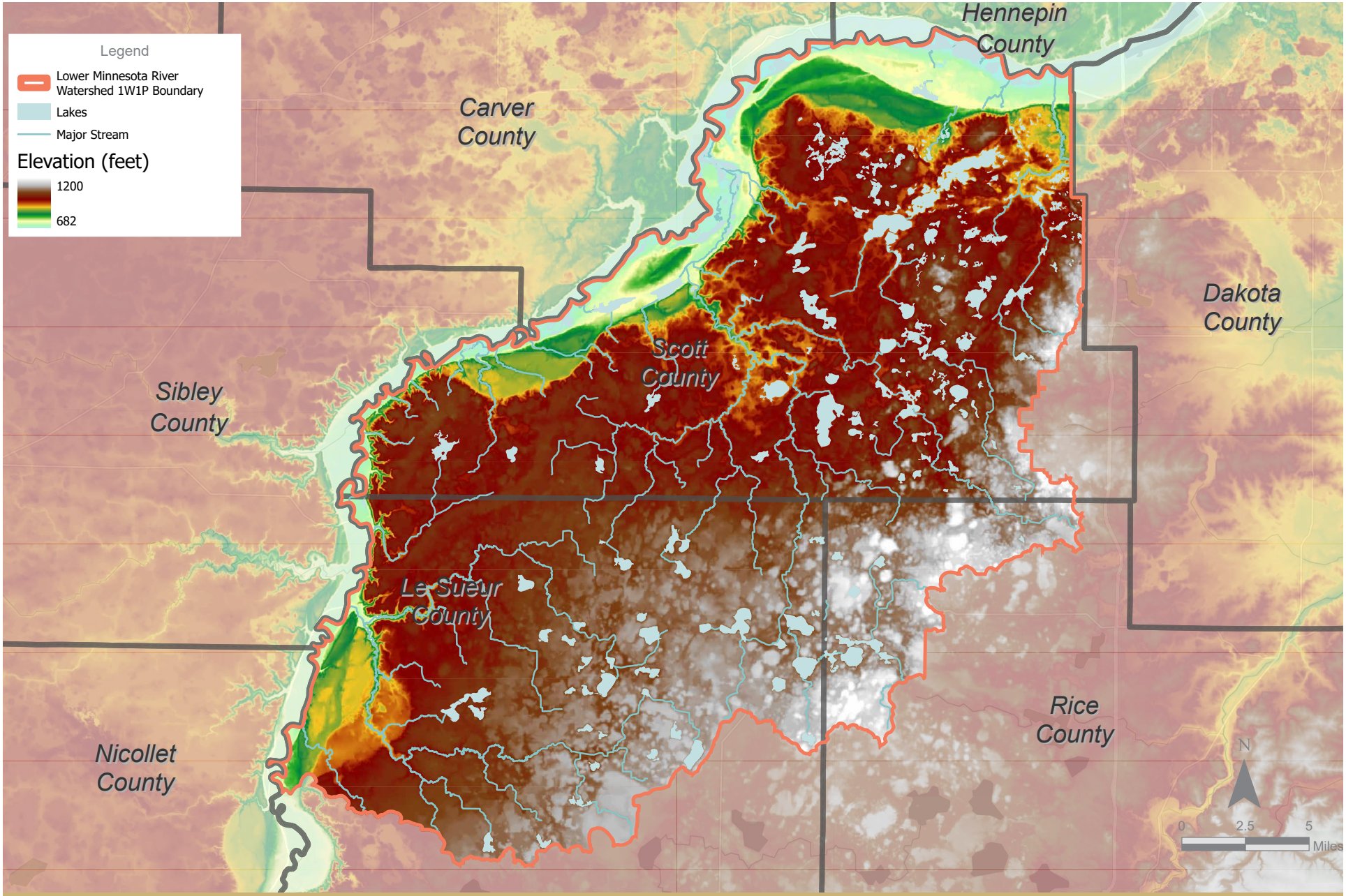


Figure 1.21: Surface Elevation

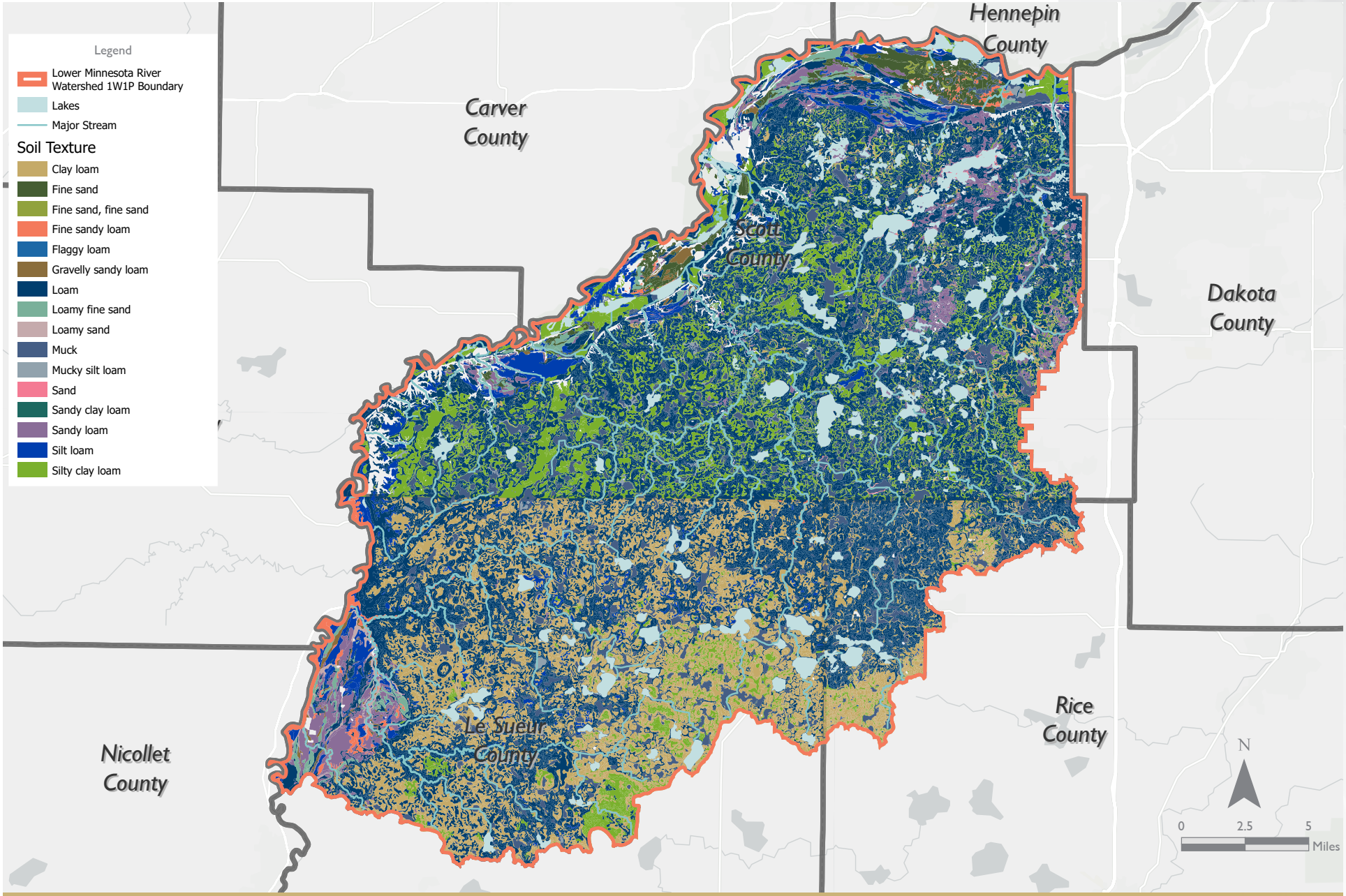


Figure 1.22: Soil Types

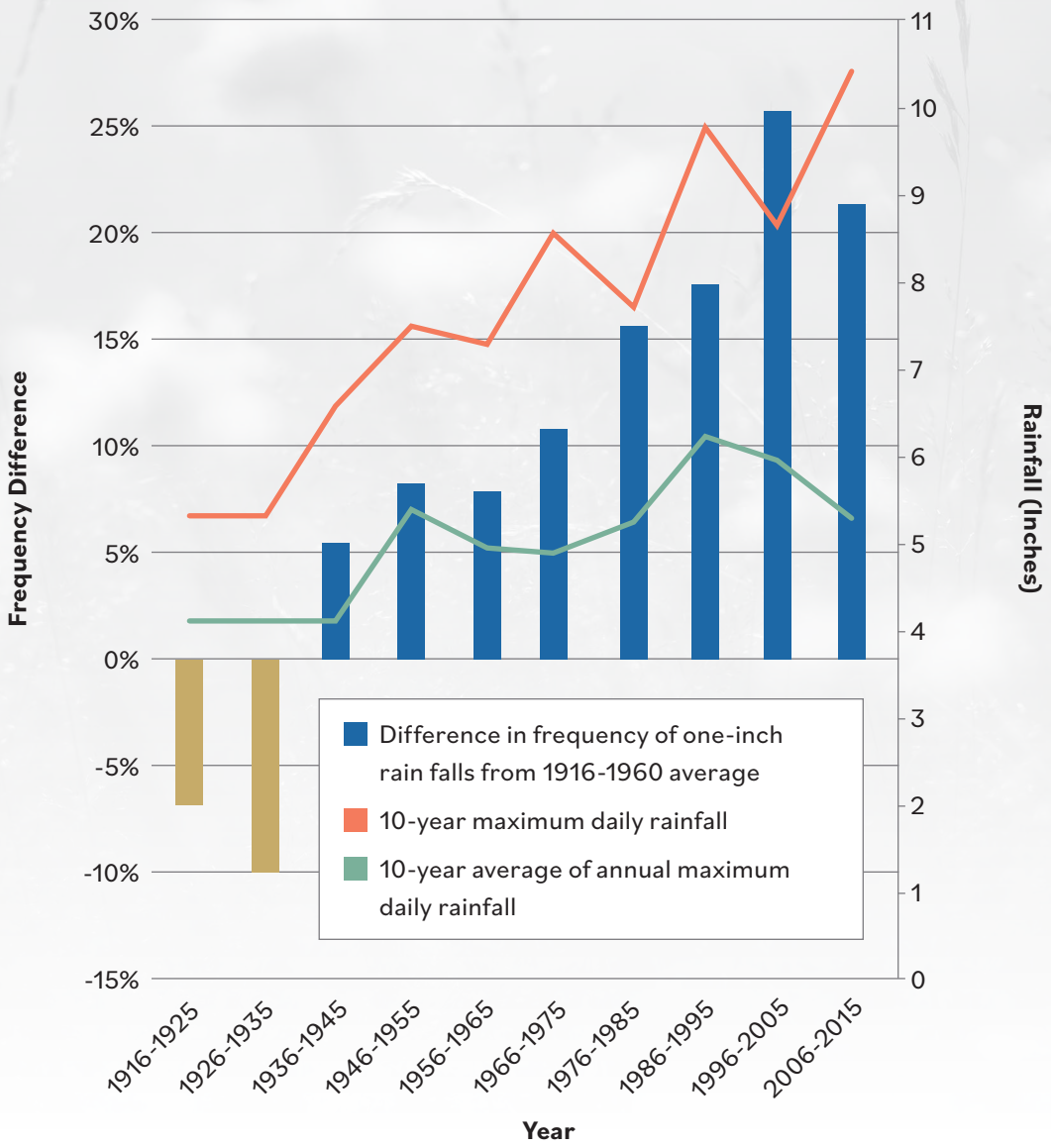
CLIMATE

A climate summary was completed for the Lower Minnesota River Watershed by the DNR in 2019. The precipitation information in Figure 1.23 includes areas east and west of the Planning Area consistent with the Lower Minnesota River HUC 8 watershed and is not explicit to the Planning Area.

Long term precipitation records show an annual rainfall average of roughly 32 inches in the north portions of the Lower Minnesota River Watershed and up to 33.6 inches in the southeastern portion of the Lower Minnesota River Watershed. When comparing the recent observations (1989-2018) to the long-term precipitation records (1895-2018), the annual average rainfall shows an increase in roughly 2.5-3.5 inches. This changing precipitation trend is expected to continue, which will result in additional stresses to the water resources in the Planning Area. In addition to an increasing trend in annual precipitation, precipitation events have become more intense with larger rainfall events occurring more frequently (BWSR, 2019).

Temperature across the Lower Minnesota River Watershed is generally uniform, however, slight differences are present due to variations in topography, vegetation, and soils. The average annual temperature from 1989 to 2018 for the area is 45.2° Fahrenheit (F) with winter temperatures (December through February) averaging 17.8°F and summer temperatures (June through August) averaging 69.9°F. Average annual temperatures have increased 0.3°F with average winter temps seeing the largest increase (1.6°F) and average summer temps slightly decreasing (-0.8°F) (DNR, 2019). These changes have taken place since 1989.

Figure 1.23: Changes in Heavy Precipitation Frequency and Intensity from 40 Long-Term Minnesota Stations, 1916-2015



SOCIO-ECONOMICS

Cities

Cities within the Planning Area include:

- Belle Plaine
- Heidelberg
- Jordan
- Le Center
- Le Sueur
- Montgomery
- New Prague
- Prior Lake
- Savage
- Shakopee
- Portions of Elko New Market
- Portions of Lonsdale

Population

Scott County is the second fastest growing county in Minnesota (US Census Bureau, 2020). Continued urban expansion is expected in the south and southwest region of the Twin Cities Metropolitan Area and the northern part of the Planning Area as demands for housing and development increase due to the growing population. Additionally, **Le Sueur and Rice counties have overall rising trends in population with 4.21% and 5.53% growth** since the 2010 census.

Growth projections are highest in the city of Shakopee while rural township areas are expected to have populations decline (US Census Bureau, 2020) (Figures 1.24-1.26). The age distribution of the population is relatively even with 12-15% of the population accounting for each ten-year age bracket from ages 0-59. From there, the percentages decrease with ages 60-69 accounting for 10% of the population, ages 70-79 accounting for 5% of the population, and age 80+ accounting for 3% of the population.

Figure 1.24: Race within the Planning Area

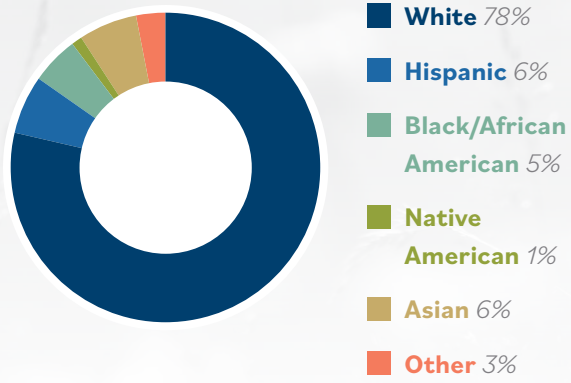
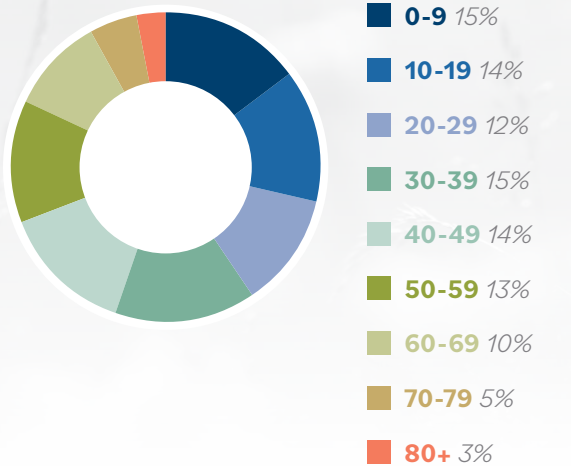


Figure 1.25: Age within the Planning Area



0.08%
Annual Growth Rate in Rice County

0.79%
Annual Growth Rate in Scott County

0.20%
Annual Growth Rate in Le Sueur County

DID YOU KNOW?

Scott County is the second fastest growing county in Minnesota.

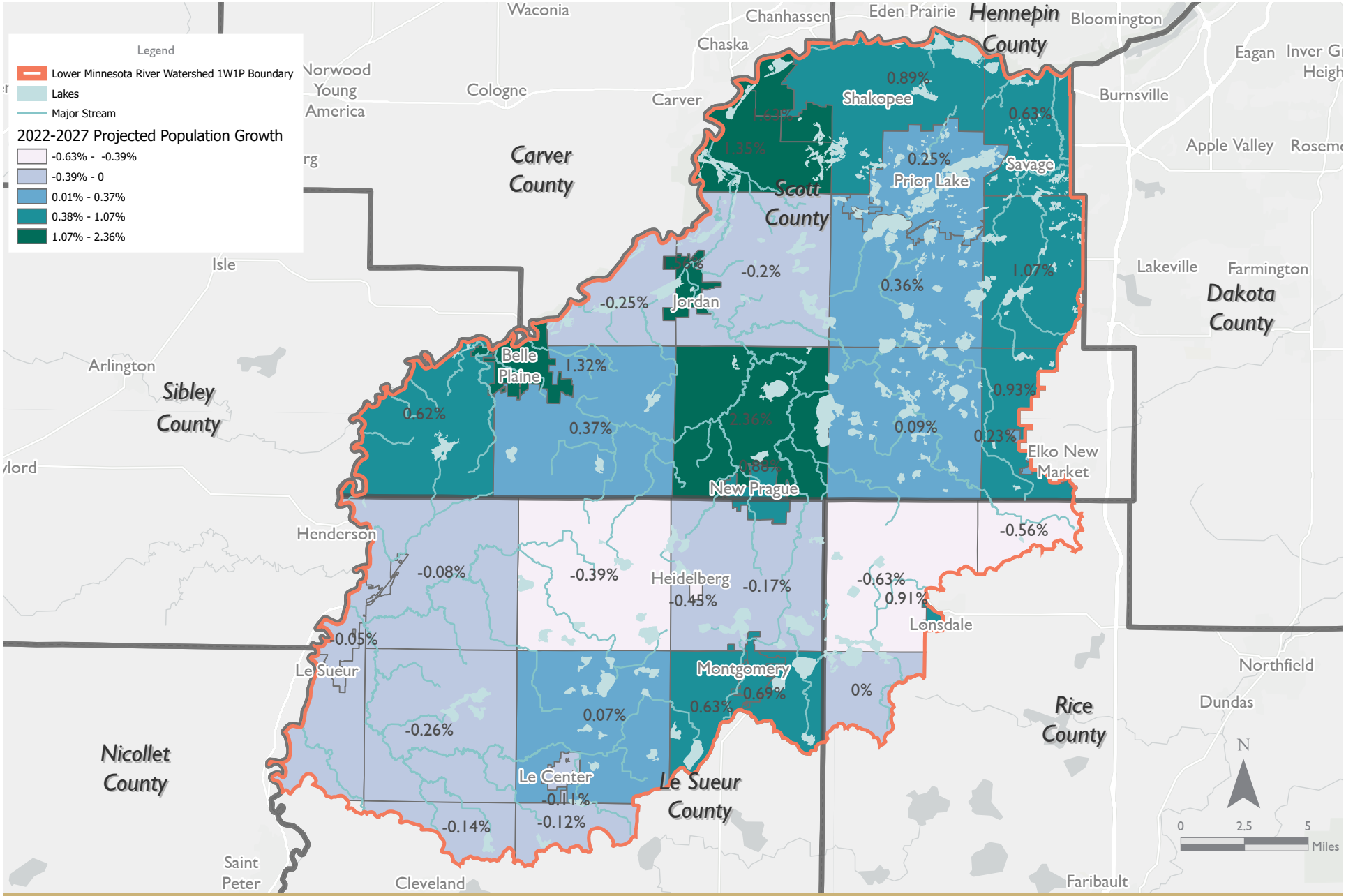
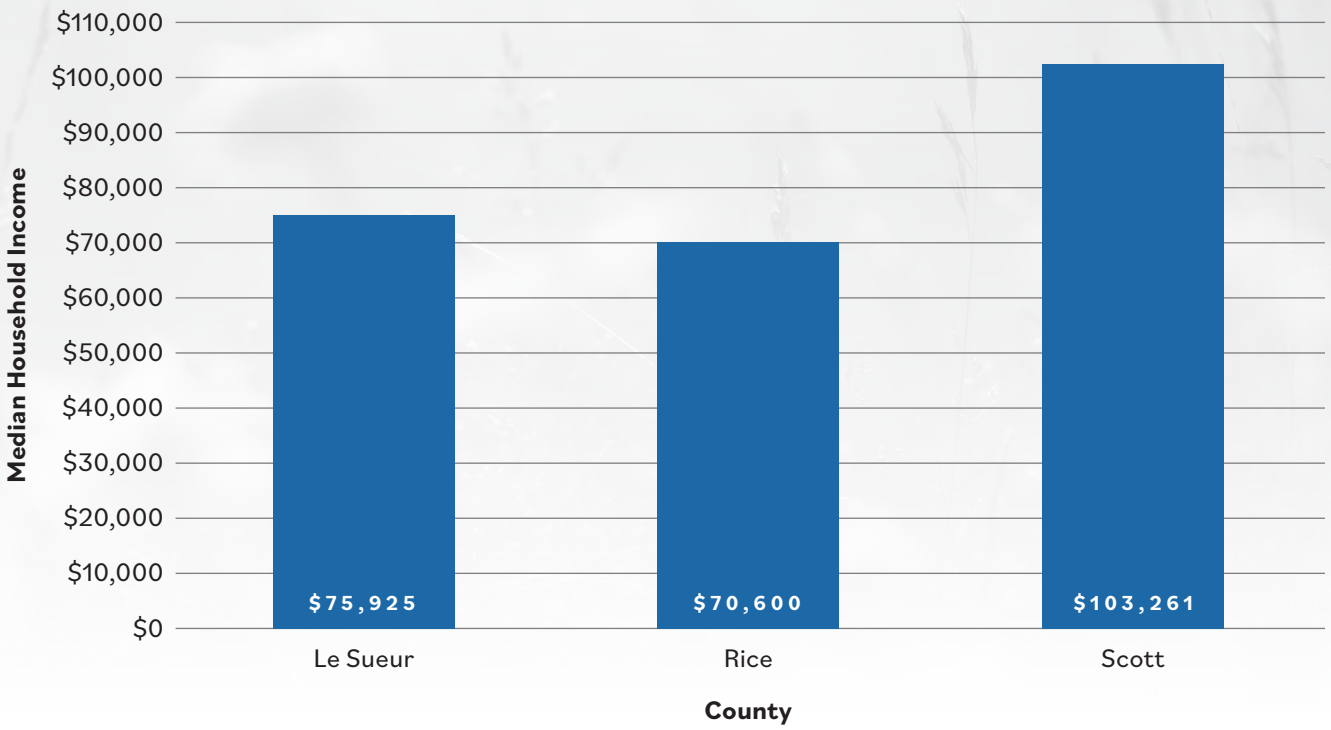


Figure 1.26: Projected Population Growth

Income

Approximately **5% of population in the Planning Area is below the poverty level**. The median household income for counties within the planning boundary ranges from $70,600 to $103,261 as shown in Figure 1.27. (US Census Bureau, 2020).

Figure 1.27: Median Household Income for Counties Within the Planning Boundary



Environmental Justice

Environmental justice means fair treatment and meaningful involvement regardless of race, color, national origin, or income. Fair treatment and meaningful involvement to communities of color, indigenous communities, and low-income communities with respect to the development, adoption, implementation, and enforcement of environmental laws, regulation, and policies forms the basis of the environmental justice focus. The MPCA screened areas of increased concern census tracts with higher concentrations of low-income residents, people of color, and tribal areas to ensure meaningful community engagement and evaluation for potential disproportionate adverse environmental impacts (MPCA, 2022a).

5 %
of the population is below the poverty level

Learn more about Environmental Justice in Minnesota

Scan the QR code or click here:
bit.ly/mnenvironjustice

HABITAT AND ENDANGERED SPECIES

2021 Minnesota Statutes, Chapter 88. Division of Forestry (Minn. Stat. § 84.0895) governs protection of threatened and endangered species (Figures 1.28-1.30) and defines species with special protection, as follows:

- Endangered species are those threatened with extinction throughout all or a significant portion of its range.
- Threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
- Species of special concern are those that are not endangered or threatened, but are extremely uncommon in Minnesota or have unique or highly specific habitat requirements and deserve careful monitoring.

The DNR is required to adopt rules designating species as endangered, threatened, or species of special concern. Species are also protected at the federal level and their protection status is determined by the US Fish and Wildlife Service (USFWS). Species with protection status at the state (as listed by DNR) and federal level (as listed by USFWS) present in Le Sueur, Rice, and Scott counties are listed in Table 1.5.

Learn more about Minn. Stat. § 84.0895!

Scan the QR code or click here:
revisor.mn.gov/statutes/cite/84.0895

TABLE 1.5: PROTECTED SPECIES WITHIN LE SUEUR, RICE, AND SCOTT COUNTIES (USFWS, 2022)

Common Name	Scientific Name	Group	Federal Status	State Status
Mucket	Actinonaias ligamentina	Mussel		Threatened
Elktoe	Alasmidonta marginata	Mussel		Threatened
Henslow's Sparrow	Ammodramus henslowii	Bird		Endangered
Rock Pocketbook	Arcidens confragosus	Mussel		Endangered
Rusty Patch Bumble Bee	Bombus affinis	Insect	Endangered	
Waterhyssop	Bacopa rotundifolia	Plant		Threatened
Kitten-Tails	Besseya bullii	Plant		Threatened
Sterile Sedge	Carex sterilis	Plant		Threatened
Ghost Tiger Beetle	Cicindela lepida	Insect		Threatened
Purple Wartyback	Cyclonaias tuberculata	Mussel		Endangered
Big Tick Trefoil	Desmodium cuspidatum var. longifolium	Plant		Threatened
Beaked Spikerush	Eleocharis rostellata	Plant		Threatened
Wolf's Spikerush	Eleocharis wolfii	Plant		Endangered

DID YOU KNOW?

Wild rice can be found in many of the floodplains lakes along the Minnesota River.

TABLE 1.5: PROTECTED SPECIES WITHIN LE SUEUR, RICE, AND SCOTT COUNTIES (USFWS, 2022)

Common Name	Scientific Name	Group	Federal Status	State Status
Butterfly	Ellipsaria lineolata	Mussel		Threatened
Elephant-Ear	Elliptio crassidens	Mussel		Endangered
Blanding's Turtle	Emydoidea blandingii	Reptile		Threatened
Minnesota Dwarf Trout Lily	Erythronium propullans	Plant	Endangered	
Spike	Eurynia dilatata	Mussel		Threatened
Black Buffalo	Ictiobus niger	Fish		Threatened
Butternut	Juglans cinerea	Plant		Endangered
Higgins Eye	Lampsilis higginsii	Mussel		Endangered
Yellow Sandshell	Lampsilis teres	Mussel		Endangered
Loggerhead Shrike	Lanius ludovicianus	Bird		Endangered
Fluted-Shell	Lasmigona costata	Mussel		Threatened
Prairie Bush-Clover	Lespedeza leptostachya	Plant	Threatened	
Washboard	Megalonaias nervosa	Mussel		Endangered
Northern Long-Eared Bat	Myotis septentrionalis	Mammal	Threatened	
Louisiana Broomrape	Orobanche ludoviciana var. ludoviciana	Plant		Threatened
Rough-Seeded Fameflower	Phemeranthus rugospermus	Plant		Threatened
Sheepnose	Plethobasus cyphyus	Mussel		Endangered
Round Pigtoe	Pleurobema coccineum	Mussel		Threatened
James' Polanisia	Polanisia jamesii	Plant		Endangered
Winged Mapleleaf	Quadrula fragosa	Mussel		Endangered
Wartyback	Quadrula nodulata	Mussel		Threatened
Ebonyshell	Reginaia ebenus	Mussel		Endangered
Hair-Like Beak Rush	Rhynchospora capillacea	Plant		Threatened
Short-Beaked Arrowhead	Sagittaria brevirostra	Plant		Endangered
Hooded Arrowhead	Sagittaria calycina var. calycina	Plant		Threatened

TABLE 1.5: PROTECTED SPECIES WITHIN LE SUEUR, RICE, AND SCOTT COUNTIES (USFWS, 2022)				
Common Name	**Scientific Name**	**Group**	**Federal Status**	**State Status**
Whorled Nutrush	Scleria verticillata	Plant		Threatened
Monkeyface	Theliderma metanevra	Mussel		Threatened
Pistolgrip	Tritogonia verrucosa	Mussel		Endangered
Edible Valerian	Valeriana edulis var. ciliata	Plant		Threatened

Figure 1.28: Northern Long-Eared Bat

Figure 1.29: Blanding's Turtle

Figure 1.30: Loggerhead Shrike

Chapter 2:
Issue Prioritization

Chapter 2: **Issue Prioritization**

INTRODUCTION

This chapter covers the information and data used to identify priority issues, refine the priority issues, and develop the resulting priority issue statements. The priority issues outlined in this chapter were used to inform the priority resources described in Chapter 3. Existing data, studies, and concerns brought forth by stakeholders were used to create an understanding of the context of resource conditions.

2.1 ISSUE PRIORITIZATION PROCESS

Multiple sources of information were used to compile and evaluate potential issues within the Planning Area. The issues were aggregated into eight categories, each with a subset of categories used to further organize the information. When reviewing the various studies and other sources of information, each time a category or subcategory was referenced it was logged as a data point. The data points were compiled to come up with a number of aggregated data points. An overview of the categories, number of subcategories, and number of aggregated data points is shown in Table 2.1.

Sources used for data aggregation include documents and reports based on data collected in the Planning Area, comment letters from state and local stakeholders, and notes from the public kickoff meeting and corresponding virtual open house.

Documents and Reports

Documents reviewed for the planning and prioritization process include, but are not limited to:

- Lower Minnesota River Watershed Restoration and Protection Strategies (WRAPS) Report *(MPCA, 2020)*
- Lower Minnesota River Watershed Monitoring and Assessment Reports *(MPCA, 2017)*
- Lower Minnesota River Watershed Streams Stressor Identification Reports *(MPCA, 2018)*
- Lower Minnesota River Watershed Lakes Stressor Identification Report *(MPCA, 2017)*
- Lower Minnesota River Watershed Total Maximum Daily Load (TMDL) Report Part I–Southern and Western Watersheds *(MPCA, 2020)*
- County, SWCD, WMO, and WD Water Plans
- Tribal and Municipal Water Plans
- Feasibility Studies
- Subwatershed Assessments

TABLE 2.1: SUMMARY OF DATA AGGREGATION

Categories	Number of Subcategories	Number of Occurrences
Surface Water	10	304
Groundwater	6	78
Habitat and Natural Resources	7	84
Emerging Concerns	6	49
Quality of Life	3	31
Data, Studies, and Monitoring	4	37
Outreach and Education	4	34
Policy and Regulation	4	33

The following sections describe the avenues used to gather data on issues and resources of concern within the watershed, and how the information was refined to develop the lists of priority issues and resources.

Public Kickoff Meeting

The public in-person kickoff meeting was held on July 26, 2022 at the Cedar Lake Farm Regional Park Pavilion in New Prague, Minnesota with approximately **55 attendees**. The kickoff meeting was hosted by the local government partners.

PURPOSE

The primary purpose of the meeting was to provide an opportunity for the public and interested stakeholders to share insight and guidance on water and natural resource issues of concern and importance.

VIRTUAL OPEN HOUSE

To maximize the amount of engagement and feedback from stakeholders, a virtual open house was also available for several weeks before and after the in-person meeting. The virtual open house received **23 responses**. The virtual open house and in-person meeting consisted of the same informational materials and interactive questions.

ACTIVITY

An activity was developed for stakeholders to indicate where they would like to see the partners prioritize funding.

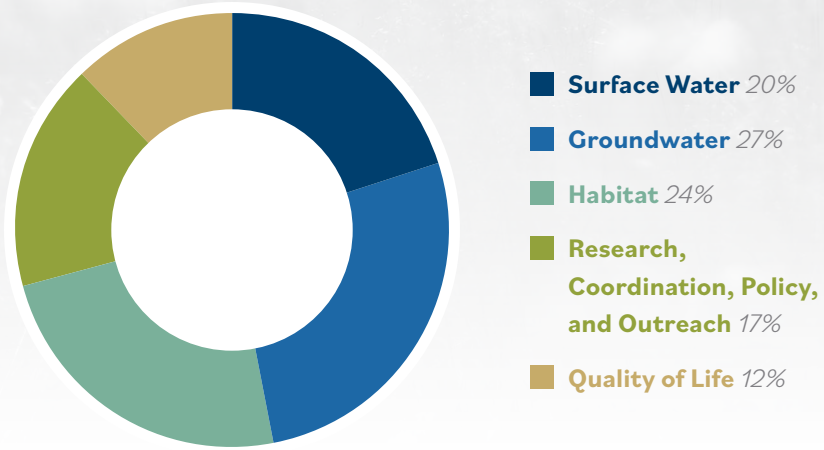
Options included:

- Surface water
- Groundwater
- Habitat
- Quality of life
- Research, coordination, policy, and outreach

Each participant received five bills to allocate to the categories.

The results of the activity are shown in Figure 2.1 with the final percentages of the total funds the participants allocated to each category.

Figure 2.1: Prioritizing Investments Activity Results



55
In-Person Kickoff Meeting Attendees

23
Virtual Open House Attendees

DISPLAY BOARDS

In addition to the prioritizing investments activity, display boards were developed for the kickoff meeting (Figure 2.2). Each board contained a resource topic:

- Surface water
- Groundwater
- Habitat
- Quality of life
- Research, coordination, policy, and outreach.

A brief overview of the resource topic, along with common resource concerns filled the boards. Each board also had an interactive question component that encouraged stakeholders to identify their top concerns related to each resource. The results which depict participants top concerns for each resource topic are displayed in Figures 2.3–2.6.

One of the display boards consisted of a map (Figure 2.6) for stakeholders to indicate where they live within the watershed, and to identify their greatest resource concerns by selecting a waterbody and providing notes about the resource and why they are concerned about it.

While the virtual and in-person meetings followed the same structure and presented the same content, the in-person meeting allowed for in-depth conversation about the information presented and the resource concerns brought forward by stakeholders. Some of the concerns identified by stakeholders included:

- Water storage
- Flooding, drainage, and increase in peak flows
- Bluff stabilization in the Le Sueur/Henderson area
- Invasive aquatic vegetation, carp, in-lake pollution, and incoming water pollution in Spring Lake
- Agricultural drainage runoff and overall water quality/health in the Minnesota River
- Overall quality of what we are putting in the Mississippi River
- Groundwater quality

Information gathered from the public in-person kickoff meeting and virtual open house was compiled and used by the ST and AC to identify and refine the lists of priority issues and resources.

Figure 2.2: Kickoff Meeting Posters

Figure 2.3: Surface Water Concerns

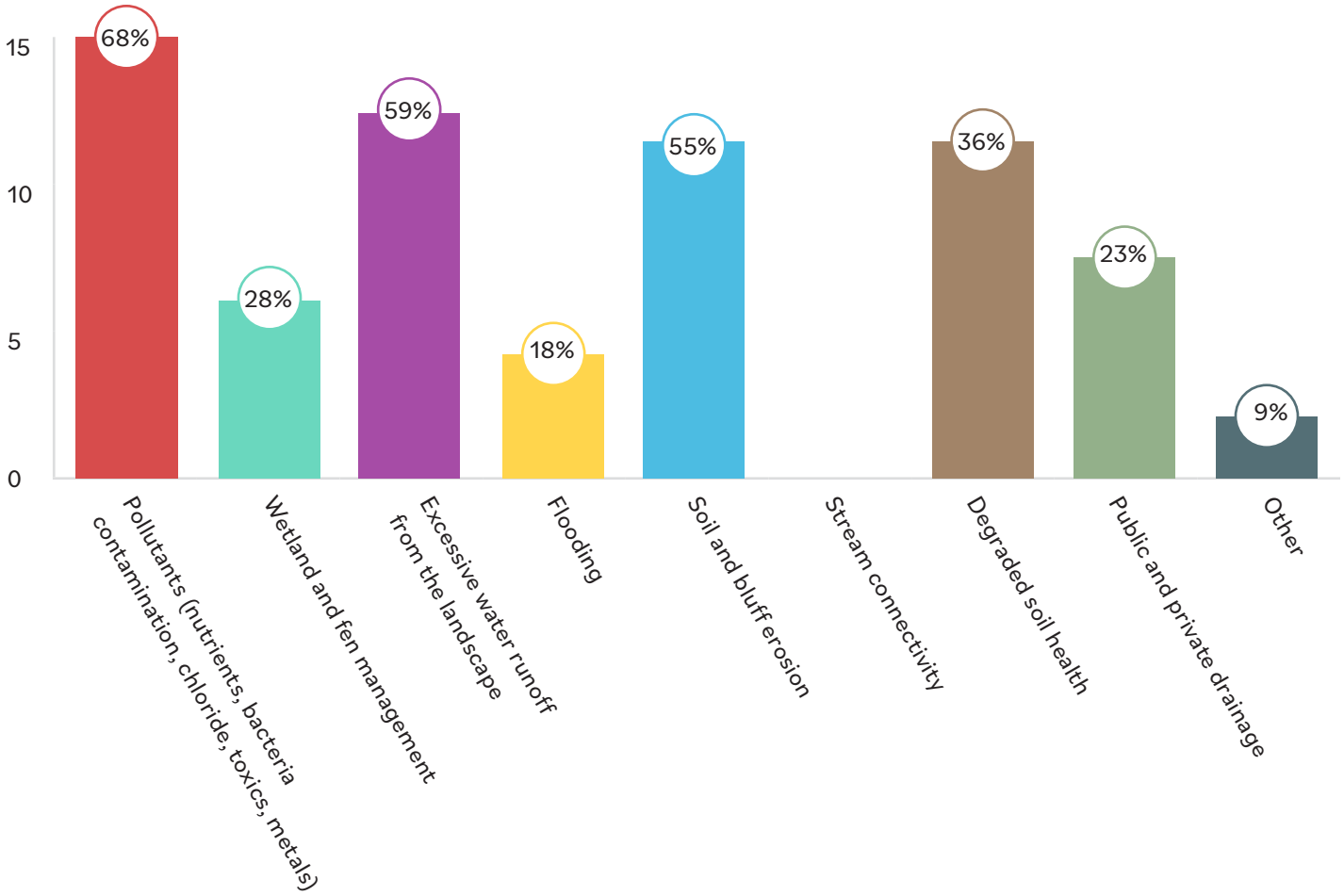


Figure 2.4: Groundwater Concerns

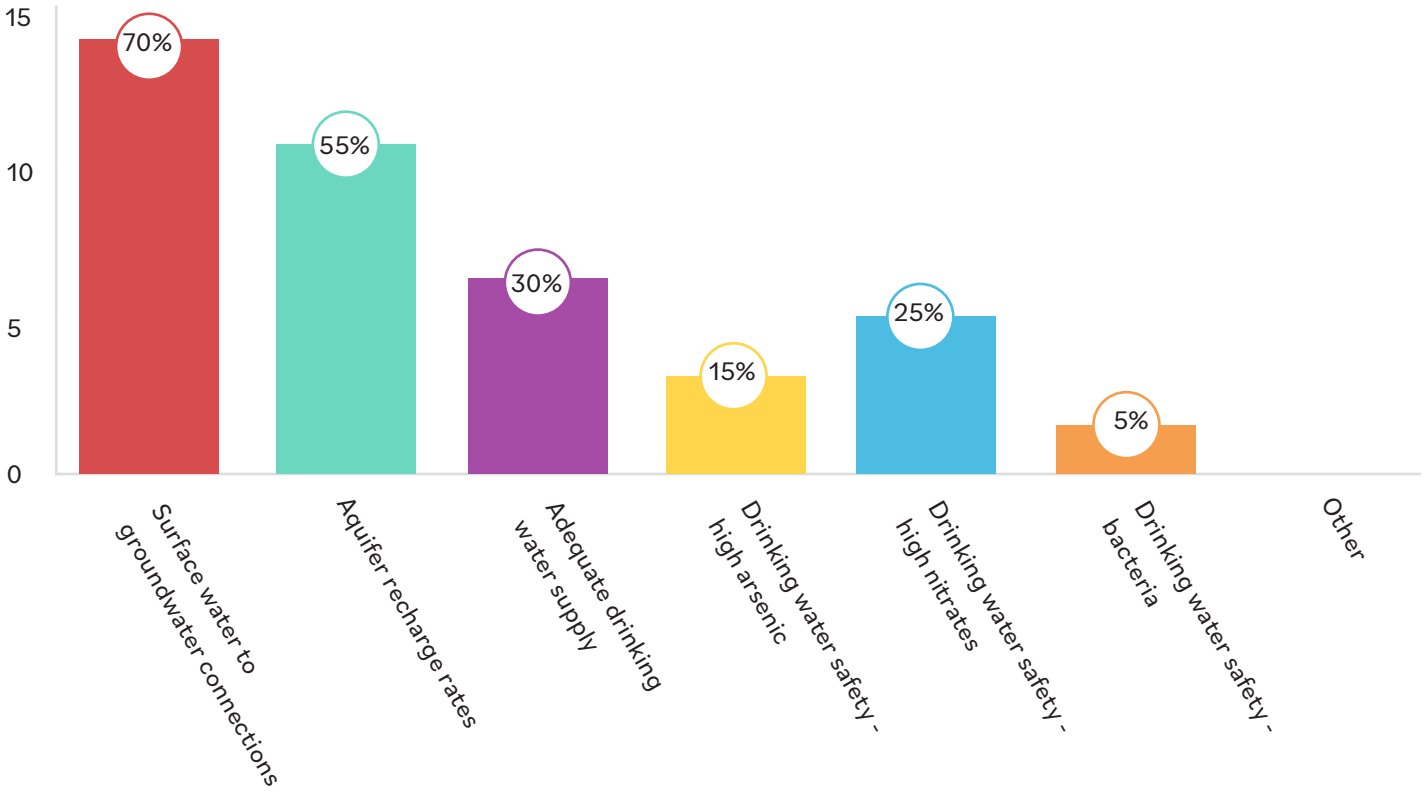
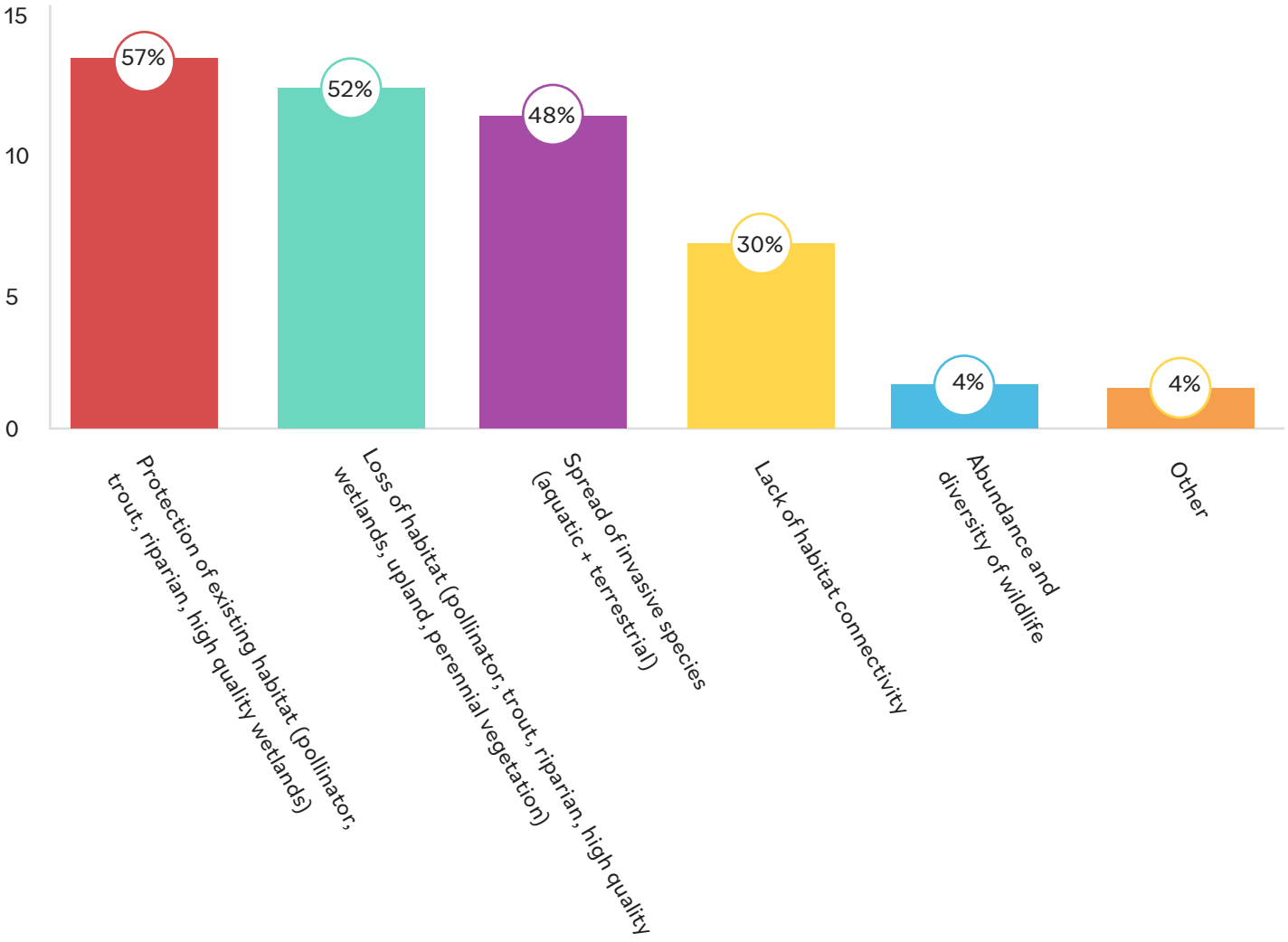


Figure 2.5: Habitat Concerns



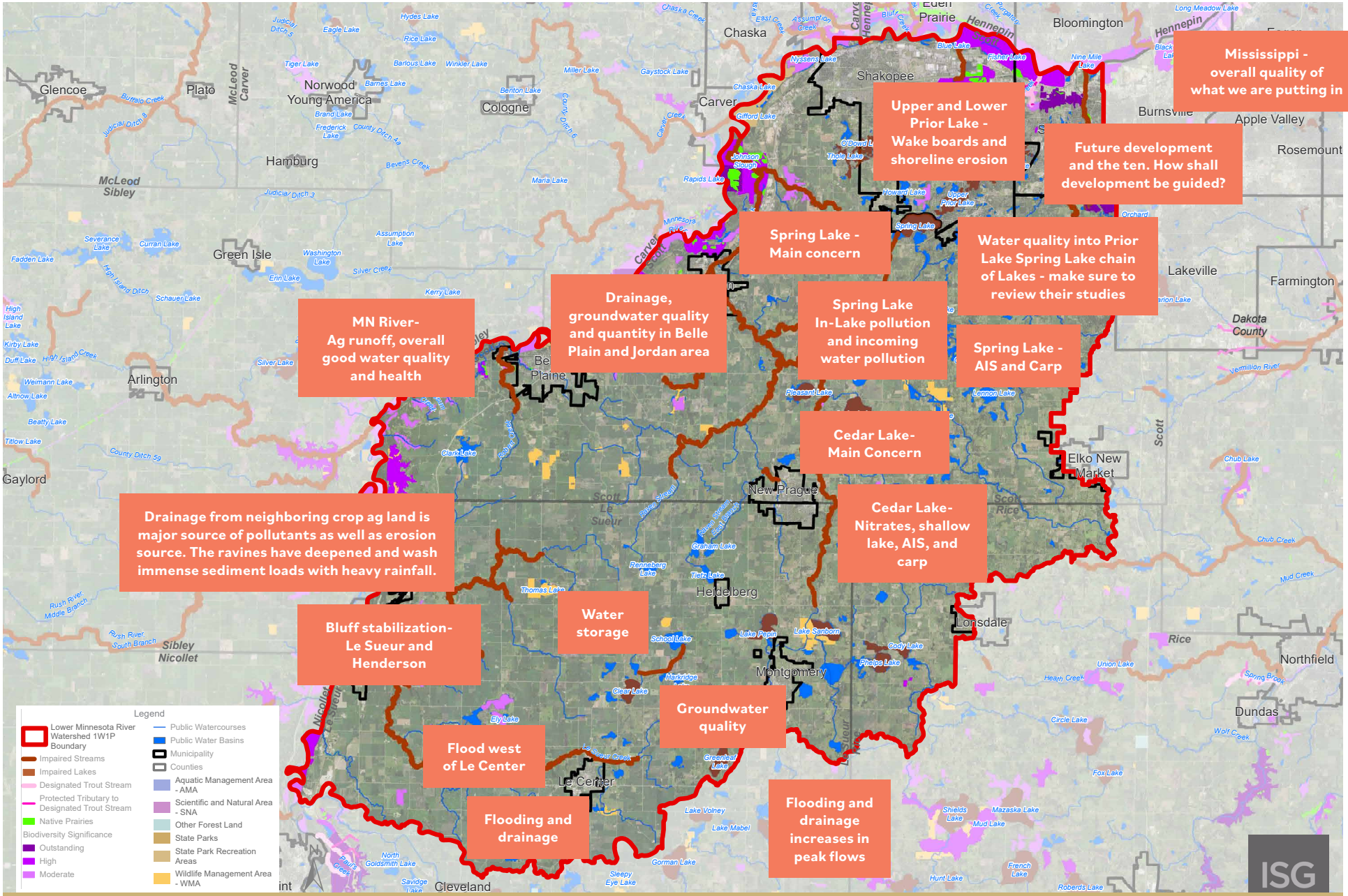


Figure 2.6: Public Kickoff Meeting Concerns

Official Comment Letters

Comment letters identifying priority concerns were collected from local and state stakeholders. These letters are included in Appendix B.

Comments were received from the following stakeholders:

- Minnesota Department of Natural Resources (DNR) - *July 6, 2022*
- Metropolitan Council - *July 7, 2022*
- Minnesota Board of Water and Soil Resources (BWSR) - *July 8, 2022*
- Minnesota Department of Health (MDH) - *July 8, 2022*
- Minnesota Department of Agriculture (MDA) - *July 11, 2022*
- Minnesota Pollution Control Agency (MPCA) - *July 11, 2022*

Each issue, resource, and priority gathered from the documents, reports, comment letters, and kickoff meeting were categorized as either a value, concern, or strategy. The values and concerns for each resource category were utilized in drafting the issue statements.

Strategies were considered later in the Plan development process when actions were selected to address the issue statements. The strategies are also referred to as implementation actions and are captured in the implementation tables in Chapter 4.

Issues were classified by resource category and subcategory. Categories included:

- Emerging concerns
- Groundwater
- Natural resources
- Quality of life
- Surface water
- Data, studies, and monitoring
- Outreach
- Education
- Policy and regulation

Subcategories for each of these are listed in Table 2.2, along with the corresponding number of occurrences of each subcategory.

6
Official Comment Letters

During the initial data aggregation process, chloride was included under emerging concerns. Further research and committee discussions resulted in shifting chloride from emerging concerns to surface water quality due to existing chloride impairments in the watershed.

TABLE 2.2: CATEGORIES AND SUBCATEGORIES USED TO GROUP BACKGROUND INFORMATION

Category	Subcategory	Number of Occurrences
Emerging Concerns	Chlorides	13
	Land Development and Changes	13
	Other	9
	Contaminants of Emerging Concern	7
	Climate Change and Resilience	5
	Reduce Pesticide and Fertilizer Impacts	2
Groundwater	Groundwater Quality	43
	Drinking Water Supply	15
	Other	9
	Groundwater Quantity	5
	Protect Groundwater Resources	5
	Infiltration and Recharge	1
Natural Resources	Fish Habitat	31
	Invasive Species	17
	Wetland Habitat	15
	Other	9
	Preserve Sites of High Ecological Value	7
	Manage, Enhance, and Restore Habitat	3
	Protect Soil Health	2
Quality of Life	Aquatic Recreation	16
	Other	9
	Aquatic Consumption	6

TABLE 2.2: CATEGORIES AND SUBCATEGORIES USED TO GROUP BACKGROUND INFORMATION

Category	Subcategory	Number of Occurrences
Surface Water	Surface Water Quality	140
	Erosion and Sediment Control	65
	Waste and Feedlots	23
	Stormwater Management	18
	Flooding and Floodplain	15
	Protect Surface Water Resources	14
	Drainage System Management	12
	Water Rate and Quantity	8
	Altered Hydrology	7
	Other	2
Data, studies, and Monitoring	Monitoring Needs	16
	Data Collection	9
	Other	9
	Modeling	3
Outreach and Education	Public Outreach	12
	Landowner Engagement	9
	Other	9
	Engagement Opportunities	4
Policy and Regulation	Administration Priorities	15
	Other	9
	Collaboration	6
	Land Use Management	3

2.2 PRIORITY ISSUES AND ISSUE STATEMENTS

Using the information gathered through the public in-person kickoff meeting, virtual open house, priority concern letters, and the data aggregation process, the AC identified priority issues and began formulating issue statements at their October 14, 2022, meeting.

To complete this task, the AC participated in an activity to further refine the resource categories and subcategories listed in Table 2.2. This assisted with development of issue statements and prioritization.

Resource concerns were assigned to one of three categories:


Surface Water


Groundwater


Habitat and Natural Resources

To begin the activity, the AC was given a list of issues, generated from the data aggregation, within each category of resource concerns. The issues were displayed on poster paper throughout the room and each AC member was given a specific number of colored sticky dots for each resource category to vote on the issues of highest priority.

This activity refined the list of issues and led to a decision to divide each issue category (surface water, groundwater, and habitat and natural resources) into two sections:

- Surface water became:
  - Surface water quality
  - Surface water hydrology
- Groundwater became:
  - Groundwater quality
  - Groundwater knowledge, data, and understanding
- Habitat and natural resources became:
  - Habitat and natural resources restoration
  - Habitat and natural resources protection/preservation

The issues were refined using professional judgment, while also considering staff capacity to adequately address the selected issues. Issues of highest importance were selected as a priority while issues of lower importance were rejected as priorities for this Plan. Once the list of issues had been refined, the AC developed issue statements for each category. The AC developed a total of six issue statements, two for each resource category, to accurately summarize the issues identified. Final issue statements are captured in Table 2.3. The PC reviewed the issue statements after they had been refined by the AC.

44
Aggregated issue Subcategories

14
Prioritized issue Concerns

6
Issue Statements

TABLE 2.3: ISSUE STATEMENTS

Category	Issue Statement	Relevance to Planning Area
Surface Water Hydrology	Hydrology has been significantly altered within the watershed due to land use changes which has altered flowrates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts.	Extensive altered hydrology exists within the watershed, and is a contributing factor to many of the other issues the watershed is facing.
Surface Water Quality	Lakes, streams, creeks, wetlands, and the Minnesota River are threatened or impaired by various pollutants which cause harmful impacts to aquatic life, habitat, and recreation.	Water quality impairments, especially sediment, nutrients, E. coli, and chloride, within the watershed impact how humans and animals utilize water resources.
Groundwater Quality	Groundwater quality is altered by naturally occurring and human-introduced pollutants which impacts the safety of drinking water supplies.	Groundwater is the primary source for drinking water within the watershed.
Groundwater Quantity	There is insufficient knowledge, data, and understanding of groundwater quality and quantity which is needed in order to protect vulnerable areas, resources, and communities within the watershed.	Groundwater is the primary source of drinking water within the watershed.
Habitat and Natural Resources Protection/Preservation	Habitat that contains high ecological value is threatened due to land use changes, poor water quality, and altered hydrology. These impacts affect all existing natural habitat types, especially aquatic habitat, forests, native prairies, trout streams, and wetlands/fens.	Habitat is often a component of surface water projects that enhances wildlife areas. Within the watershed, these areas are also popular outdoor recreation destinations.
Habitat and Natural Resources Restoration	While all habitat types have been impacted, riparian areas in particular have been reduced, degraded, and fragmented due to land use practices, pollutants, and altered hydrology.	Increasing habitat area and connectivity provides additional wildlife habitat, hunting land, and recreational destinations within the watershed.

EMERGING CONCERNS AND MAJOR ENVIRONMENTAL ISSUES

This Plan is based on existing knowledge and evaluation of existing concerns. A shift in focus may be required, or plan priorities and actions may be influenced by the need to address issues of emerging concern.

There were five general categories of emerging issues that were identified in the aggregated data:

- Climate Change Adaption and Building Resilience
- Contaminants of Emerging Concern
- Land Development and Changes
- Pesticide and Fertilizer Impacts
- Other Emerging Issues

Many of these issues have limited data, making it difficult to fully understand the extent and nature of the problem. Some of the emerging issues are also beyond the authorities or resources of the Partnership. As such, the Partnership did not elevate emerging issues as a priority issue for the Plan.

Surface water hydrology, an issue greatly impacted by climate change, has been identified as a priority issue in the Plan. To address the concerns associated with surface water hydrology, the Partnership integrated actions such as implementing water storage projects that aim to alleviate impacts of climate change. These are described in more detail in Chapter 5.

Due to the importance of emerging issues and climate change, the Partnership committed to developing their plan with a focus on resiliency throughout the various impacts that may develop from the unknown components of emerging issues and climate change. As such the Partnership will continue to monitor emerging issues throughout the planning period, especially during the five year review period, to ensure the implementation actions incorporate and address emerging issues when possible. Updates to the Plan will be made as deemed necessary to continue conservation work in a resilient capacity.

Chapter 3:

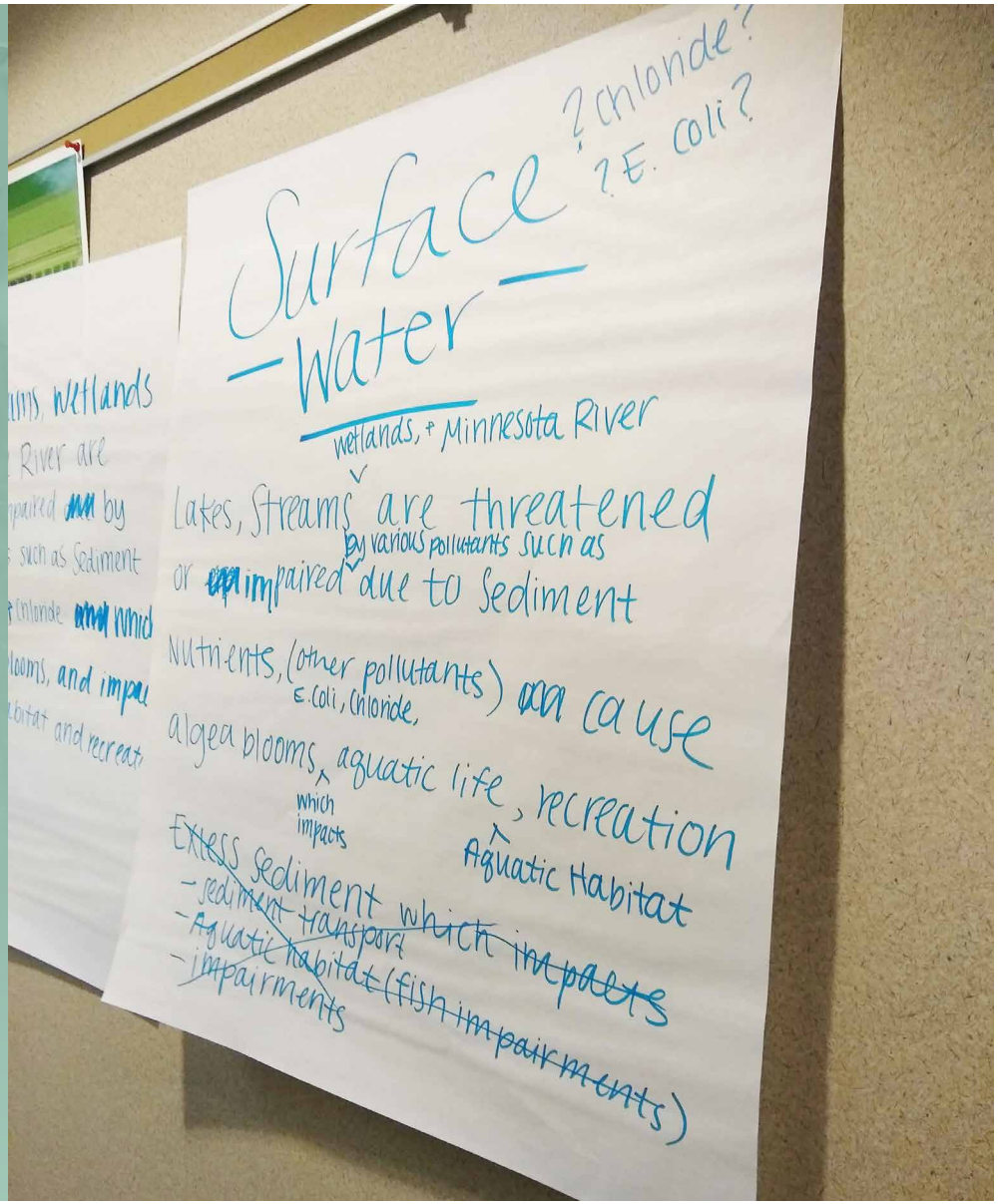
Priority Resources, Targeting, and Measurable Goals

Chapter 3: **Priority Issues, Targeting, and Measurable Goals**

INTRODUCTION

Following the selection of priority issue statements presented in Chapter 2, the Partnership developed a framework that defined measurable goals, priority resources, priority areas, targeting criteria, and strategies for addressing the issues associated with each issue statement. This framework guided the development of measurable goals and the targeted implementation schedules that were developed based on the 10-year implementation time frame for the Plan. Meetings were hosted both virtually and in-person, and the platforms for providing and incorporating feedback were adjusted to accommodate each meeting setting. The ST and AC utilized their professional experience and judgment to best align realistic expectations with ambitious goals to improve the water and natural resources in the Planning Area. Once the framework had been refined by the ST and AC, it was presented to the PC for approval.

The framework for each issue statement, including the priority resource targeting approach and final measurable goals, is summarized in this section, and organized in order of issue statement priority. For the entire issue framework document developed by the Partnership see Appendix D.



Issue Statement #1: Surface Water – Quality

Lakes, streams, creeks, wetlands, and the Minnesota River are threatened or impaired by various pollutants which cause harmful impacts to aquatic life, habitat, and recreation.

A wide range of issues are captured under the Surface Water Quality issues statement, which resulted in the development of five measurable goals designed to assist the partners with measuring progress throughout the implementation phase of the Plan.

CONCERN ADDRESSED

Sediment and Erosion

A

SURFACE WATER QUALITY GOAL A

Measurable Goal: Reduce upland and NEAR CHANNEL EROSION contributing sediment to priority streams by 1,886 tons per year.

Near channel sources (gully, ravine, and bank erosion) are the largest source of sediment to stream reaches in the Planning Area and the Minnesota River. Sand Creek is the second largest contributor of sediment to the Minnesota River. There are varying levels of data collection and monitoring available for the ravines and gullies along the Minnesota River in the Planning Area as well as the ability to model sediment delivery from near channel sources. By reducing sediment in the Minnesota River and its primary tributaries, fish and wildlife habitat will be protected and enhanced, which will directly benefit fish communities.

Cropland erosion is the second largest source of sediment to stream reaches in the Planning Area and the Minnesota River. The HSPF model analyzed overland erosion and found streams with the highest annual load to the Minnesota River from overland sources were Le Sueur Creek (33,327 tons/year) and Sand Creek (13,027 tons/year).

Due to the location of the Planning Area, partial contribution to the Minnesota River, and complexity of modeling the Minnesota River, the partners focused the measurable goal on sediment delivery to the Minnesota River from each of the major subwatersheds. Both upland and near channel erosion contributions were estimated for sediment delivery to the Minnesota River. Upland erosion was estimated utilizing simulated scenarios with the calibrated HSPF-SAM model. One limitation of HSPF-SAM was the inability to model near channel sources, so the BWSR Water Erosion Pollution Reduction Estimator was used to quantify the pollutant reductions for near channel sources. More detail about model assumptions can be found in Appendix G.

The Steering Team will reassess the sediment reduction goals at the five-year review period. The ST was intentionally cautious with reduction numbers due to the limitations of the HSPF model being unable to model channel/ravine erosion reduction numbers, using other models to make assumptions on reductions and evaluating associated costs and timeframes for implementing projects of this scale.

NEAR CHANNEL EROSION

sediment contributions from gullies, ravines, streambanks, and bluffs

Table 3.1 outlines estimated overland and near channel sediment delivery reductions for each HUC10 subwatershed. The chart is to be used as a guide to the partners during implementation on scale of efforts for each subwatershed. It is by no means meant to restrict partners in the location of implementation efforts or add additional tracking requirements.

TABLE 3.1: HSPF TSS REDUCTION ESTIMATES ACHIEVED THROUGH THE ACTIONS IDENTIFIED IN THIS PLAN

HUC 10 Subwatershed	Overland Sediment Delivery Reduction (tons TSS/yr)	Near Channel Sediment Delivery Reduction (tons TSS/yr)	Total Sediment Delivery Reductions (tons TSS/yr)
Le Sueur Creek	201	551	752
Sand Creek	412	252	665
City of Le Sueur - Minnesota River	21	313	334
City of Belle Plain - Minnesota River	48	26	73
Minnesota River Outlet	15	47	62
Total	**697**	**1,188**	**1,886**

DID YOU KNOW?

Clear, Cedar, and Cody/Phelps/LeMay chain lakes are candidates for internal loading treatments due to their internal load allocations from the TMDL studies?

Upper Prior and Spring Lake have completed multiple alum treatments in past years to address high levels of internal phosphorus.

See implementation table for details on anticipated plans for studies and internal loading treatments for the Planning Area.

B

SURFACE WATER QUALITY GOAL B

Measurable Goal: Reduce total phosphorus (TP) loading to priority impaired lakes by 87 pounds per year.

CONCERN ADDRESSED

Nutrients in Impaired Lakes

The goal for nutrients in impaired lakes is only measuring TP reductions from watershed contributions to lakes through conservation efforts. The reductions do not consider internal loading or in-lake treatment practices that may be completed through implementation of this Plan. There implementation actions outlined in the Plan that can be utilized to further understand internal loading issues and practices to reduce internal loading.

DID YOU KNOW?

One pound of excess phosphorus in a lake can produce 300-500 pounds of algae growth.

Table 3.2 outlines estimated TP reductions for each priority impaired lake. The chart is to be used as a guide to the partners during implementation on the scale of efforts for each priority impaired lake. It is not meant to restrict partners in the location of implementation efforts or add additional tracking requirements.

TABLE 3.2: HSPF TOTAL PHOSPHORUS REDUCTION ESTIMATES FOR PRIORITY IMPAIRED LAKES BASED ON HSPF-SAM MODEL

Lake Name	TP Reduction Pounds/Year
Fish	1
Thole	1
Upper Prior	3
Spring	5
Cedar	1
Clear	11
Cody/Phelps/LeMay*	65
Total	**87**

** LeMay lake currently meets its designated use and is a protection lake. It is listed under restoration due to connectivity to impaired lakes, Cody and Phelps. The HSPF model only contains one subcatchment for the three lakes and were analyzed together.*

CONCERN ADDRESSED

Nutrients in Unimpaired Priority Lakes

C

SURFACE WATER QUALITY GOAL C

Measurable Goal: Maintain total phosphorus (TP) levels in unimpaired priority lakes.

Priority Protection (Unimpaired for nutrients) Lakes in the Planning Area:

- LeMay
- Lower Prior
- McMahon
- O'Dowd

There have been recent nutrient delistings of impaired lakes in the Planning area. McMahon was listed as impaired for nutrients in 2002. A TMDL study was completed which informed targeted implementation work for the lake and subsequently led to the delisting of McMahon Lake in 2018. Most recently, LeMay Lake was delisted in 2022 which was listed as impaired since 2014. The partners wish to continue to protect lakes that have recently been delisted from impairment status as well as those that may be nearly impaired such as Lower Prior and O'Dowd.

SURFACE WATER QUALITY GOAL D

Measurable Goal: Develop and implement a chloride reduction campaign for Rice and Le Sueur counties. Scott County will continue using their existing chloride reduction campaign.

CONCERN ADDRESSED

Chloride

Of the goals identified, Surface Water Quality Goal D: Chloride, is unique in that it is still considered an emerging issue in portions of the state. Throughout the state of Minnesota, road authorities use chloride as a deicing agent during the winter months while homeowners and municipalities utilize it to soften drinking water. As data on these practices is collected and analyzed, concern for the future of our water resources grows due to the permanency of chloride contamination in water bodies. There is not a known, feasible method to reverse the impacts of chloride impairments and it only takes a small amount of chloride (salt), approximately one teaspoon, to permanently pollute five gallons of water (MPCA, July 2023).

Due to the growing urgency of chloride impairments, strategic education and outreach efforts will be conducted to increase knowledge, create awareness, and empower residents and municipalities to prevent future impairments. As such, Partners have identified chloride education as a priority for the Planning Area, which has already listed chloride impairments on a couple of public waters. By focusing on education and outreach for road authorities, citizens, and homeowners, the partners hope to prevent further impairments from occurring. With prevention and preservation of water resources from impacts of chloride being a focus for the partnership, campaign efforts will be implemented watershed wide.

The Partners plan to develop a watershed-wide campaign for chloride education and outreach efforts, coordinating with the existing campaign. The campaign developed will focus efforts on Le Sueur and Rice counties and include details on the following information:

1. Groups receiving chloride education: contractors, homeowners, private applicators, cities, decision makers, etc.
2. Number of trainings: 1-2 workshops anticipated per year, some may include sending attendees to an MPCA training while other workshops may be hosted by the partners
3. Other education and outreach efforts
    a. Awareness trainings, mailings, social media posts, and newspaper articles
    b. These efforts may target groups that are not targeted through a training or workshop

The partners also added chloride campaign efforts to the education and outreach framework to minimize additional chloride impairments from occurring in the Planning Area.

DID YOU KNOW?

E. coli is a bacteria that has a variety of different strains, some of which are soil decomposers while others can be dangerous to human health. Potential sources of E.coli known to be hazardous to human health include livestock, pet waste, septic systems, and wildlife.

SURFACE WATER QUALITY GOAL E

Measurable Goal: Complete 10 SSTS improvements/replacements.

CONCERN ADDRESSED

E. coli

E. coli impairments are widespread throughout the Planning Area. E. coli impairments can be very complex issues to address due to difficulty in conducting adequate source tracking analysis. As a result, the partners have focused efforts on areas with known sources of E. coli or reported concerns from landowners on a watershed-wide basis.

ANNUAL RUNOFF

The total quantity of water that is discharged (runoff) from a drainage basin in a year.

Large scale feedlots are registered as NPDES sites and will be regulated through that program. Smaller feedlot operations are not held to the same standards as those under NPDES and opportunities to assist smaller feedlots with reducing E.coli impacts whenever possible. The E.coli goal and corresponding implementation actions will be evaluated during the five year plan review period and additional implementation actions may be added at that time.

Issue Statement #2: Surface Water – Hydrology

Hydrology has been significantly altered within the watershed due to land use changes which have altered flowrates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts.

CONCERN ADDRESSED

Altered Hydrology/Storage

SURFACE WATER HYDROLOGY GOAL A

Measurable Goal: Reduce annual runoff by 0.09 inches through implementation of 3,165 acre-feet of storage in priority stream subwatersheds in an attempt to stabilize streams through reduced peak flowrates.

Hydrology has been significantly altered within the Planning Area due to land use changes which have altered flow rates, drainage, volumes, and storage causing flooding, erosion, and downstream impacts. The DNR recently completed the Evaluation of Hydrologic Change (EHC) for the Lower Minnesota River Watershed. The study found that runoff ratio for the Lower Minnesota River Watershed has nearly doubled since 1991 (DNR, 2022). The amount of precipitation has increased within the watershed, as a result, there is an increase in water flows and volumes, which increase the amount of erosion and runoff within the watershed. Land use changes with hydrology in the watershed only exacerbate and make erosion and runoff worse. Through various studies, water storage such as wetlands, perennial cover, and sediment basins, has been found to be the most cost-effective strategy to combat the impacts of altered hydrology. Water storage projects are also known to assist with groundwater recharge.

WATER STORAGE PRACTICES

Retention structures and basins

Acquisitions of flowage rights

Soil and substrate infiltration

Wetland restorations, creation or enhancements

Channel restoration or enhancement

Floodplain restoration or enhancement

Due to the location of the Planning Area, partial contribution to the Minnesota River, and complexity of modeling the Minnesota River, the partners focused the measurable goal on annual discharge reductions to the Minnesota River from each of the major contributing subwatersheds. Table 3.3 outlines estimated annual discharge reductions for each subwatershed.

TABLE 3.3: HSPF DISCHARGE REDUCTION ESTIMATES FOR HUC10 SUBWATERSHEDS BASED ON HSPF-SAM MODEL

HUC 10 Subwatershed	Annual Discharge Reduction (Acre-feet)
Le Sueur Creek	887
Sand Creek	1247
Minnesota River - City of Le Sueur	161
Minnesota River - City of Belle Plaine	78
Minnesota River Outlet	793
Total	**3,165**

The chart is to be used as a guide to the partners during implementation on the scale of efforts for each subwatershed. It is by no means meant to restrict partners in the location of implementation efforts or add additional tracking requirements.

The Partners will reassess the altered hydrology goal at the five year plan review point to determine whether there are resources available to increase this goal. Based on the complexity of altered hydrology projects, the Partners worked to develop an achievable goal as a starting point.

Priority Resources And Targeting

Priority resources were identified in the ST and AC meetings using the criteria described below. Once priority resource lists had been developed, they were brought to the PC for approval.

LAKE PRIORITIZATION

Priority lakes were identified using the following criteria: nearly/barely impairment status, recreational value and public health, connectivity, and professional judgment (Table 3.4). A brief description of each of these criteria is included below, followed by the lists of priority lakes. The primary pollutant that was reviewed for evaluating water quality in lakes is total phosphorus. Phosphorus enters lakes through regulated sources, such as treated wastewater, and non-regulated sources, such as erosion from field and streambanks, making it necessary to implement a series of projects to address the pollutant. A small amount of phosphorus is necessary to support aquatic life within a lake ecosystem; however, an excess amount leads to algae growth which may impact public health, aquatic life, swimming, boating, and aesthetic appeal. Some forms of algae are toxic to humans and animals.

Nearly/Barely Impaired Status

The primary consideration for the selection of priority lakes was lakes with a classification of nearly/barely impaired status. Nearly/barely impaired lakes are the lakes that are closest to meeting the water quality standard set by the MPCA for the North-Central Hardwood Forest (NCHF) ecoregion, which encompasses the Planning Area. The MPCA considers a lake to be impaired if there is an exceedance in the average total phosphorus (TP) concentrations and an exceedance in average value for one or both of the response variables, Chlorophyll-a (chl-a) and Secchi depth. The total phosphorus standard is 60 ug /L for shallow lakes and 40 ug/L for deep lakes. For the purposes of determining nearly/barely impairment status, only the average total phosphorus concentrations were considered. All lakes within one level of magnitude of the total phosphorus standard were considered nearly/barely impaired and were included for priority lake consideration. Table 3.4 lists each of these lakes.

DID YOU KNOW?

Chlorophyll is the green color found in plants that allows them to convert sunlight into usable energy through photosynthesis. High levels of chlorophyll-a are directly linked to the amount of algae in a lake and are a result of high phosphorus concentrations.

ug/L = micrograms per liter

DID YOU KNOW?

E. coli is a bacteria that can be dangerous to human health in large quantities. Potential sources include livestock, pet waste, septic systems, and wildlife.

Recreational Value and Public Health

Recreational value lakes were primarily classified as deep lakes, mostly used for boating and swimming, with at least one public access point, a public park adjacent to the lake, or a public beach for swimming. Lakes meeting these criteria were considered recreationally valuable and included for priority lake consideration. Algae blooms can be dangerous to swimmers and pets and have an impact on the recreational value of the lake. Special consideration was given to three lakes due to the potential impacts to recreational value and public health caused by algal blooms. Those three lakes are:

- Spring
- Cedar
- Clear

Connectivity

Lakes connected to nearly/barely impaired lakes were given special consideration. While efforts will focus on priority lakes, the Partnership may consider opportunities to implement conservation practices on lakes that connect to other priority water bodies. Lakes connected to nearly/barley impaired lakes include:

- Spring Lake, connected to Lower and Upper Prior Lake
- Cody and Phelps, connected to LeMay

Professional Judgment

The AC further refined the list of priority lakes using professional judgment, knowledge, and expertise about lakes within the watershed. They removed lakes rated low with local support, political support, availability of funding mechanism, momentum towards goals, and consideration for capacity and distribution of work.

The list of priority lakes includes three protection lakes, eight restoration lakes, and one lake, LeMay Lake, with insufficient data to determine impairment status. The assumption was made that implementation actions directed toward impaired lakes would be classified as restoration and implementation actions directed toward unimpaired lakes would be classified as protection efforts.

DID YOU KNOW?

Many lakes are connected to each other by another watercourse, such as a stream or river. When water bodies have hydrologic connectivity, they have the ability to move within the watershed and connect with other water resources. This impacts wildlife habitat, wetlands, groundwater recharge, flooding events, and drainage within a watershed.

SECCHI DEPTH

Secchi depth is a measurement of water transparency. Increased algae and algal blooms decrease water transparency in lakes.

TABLE 3.4: PRIORITY LAKES*

Lake Name	Lake ID	County	Nutrient Impairment Status (MPCA, 2022)	Nearly/ Barely Status	Recreational Value	Connectivity
Cedar	70-0091-00	Scott	Y		●	
Clear	40-0079-00	Le Sueur	Y		●	
Cody	66-0061-00	Rice	Y			●
Fish	70-0069-00	Scott	Y	●		
LeMay	19-0055-00	Rice	N**	●		●
Lower Prior	70-0026-00	Scott	N	●	●	
McMahon	70-0050-00	Scott	N**	●		
O'Dowd	70-0095-00	Scott	N	●		
Phelps	66-0062-00	Rice	Y			●
Spring	70-0054-00	Scott	Y		●	●
Thole	70-0120-00	Scott	Y	●		
Upper Prior	70-0072-00	Scott	Y	●	●	

**Priority lakes have an equal level of priority throughout the watershed and are listed alphabetically above*
***McMahon was delisted in 2018, and LeMay was delisted in 2022*

DID YOU KNOW?

Waterbodies can be removed from the impaired waters list when water quality improves and no longer exceeds the state standards. This process is called delisting.

TOTAL SUSPENDED SOLIDS

Total suspended solids are comprised of multiple types of materials such as decaying plant matter, silt, and industrial waste. It impacts the transparency of the water and can lead to degraded habitat problems based on the amount and type of certain plants or animals.

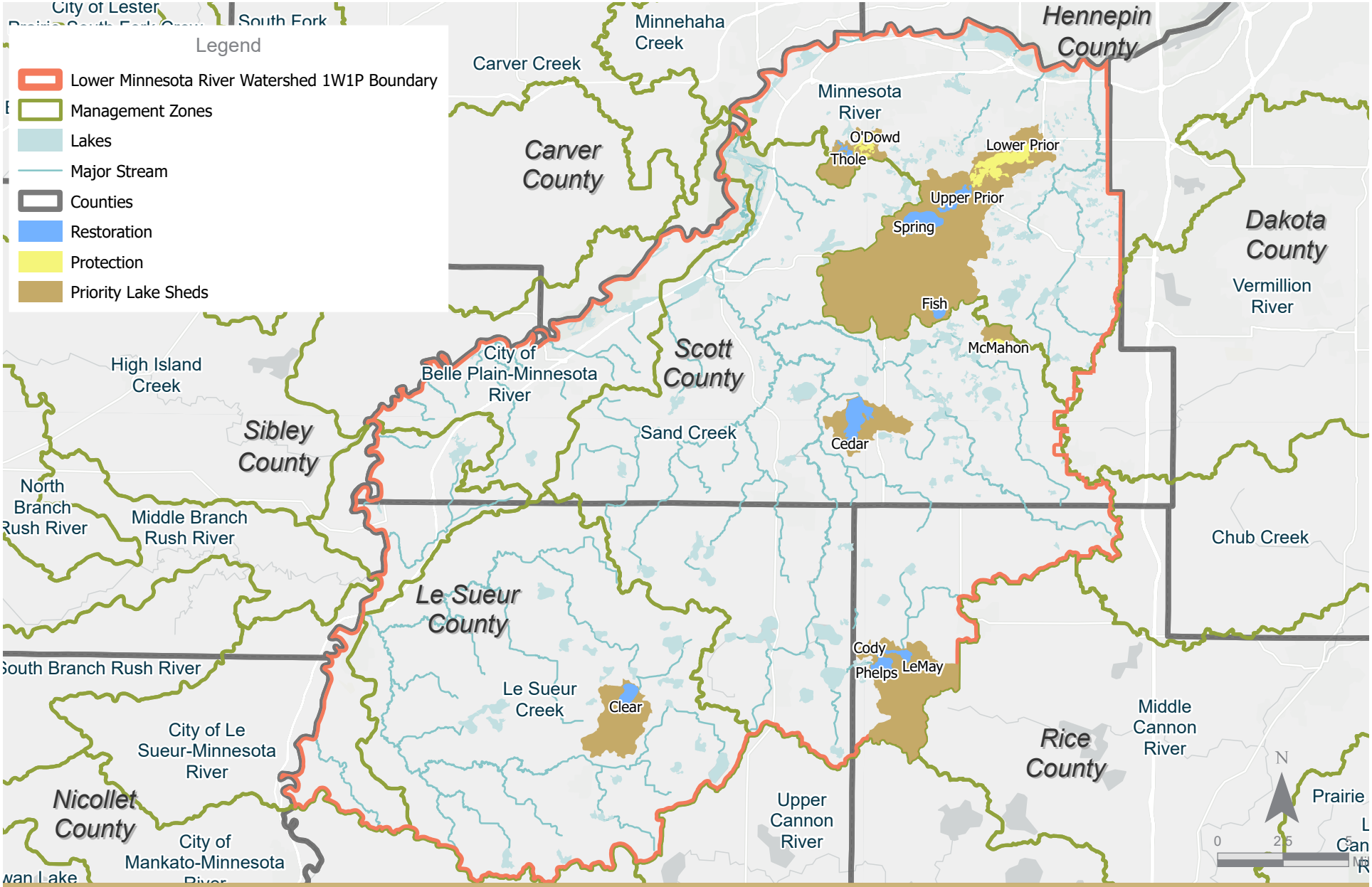


Figure 3.1: Priority Lakes and Lakesheds

Efforts will be targeted to within subwatershed of priority lakes.

STREAM PRIORITIZATION

When considering priority stream resources, the ST and AC primarily focused on pollutant loading and impacts to the Minnesota River, identifying the Minnesota River as the primary priority stream resource. The Minnesota River impacts downstream waters including the Mississippi River, Lake Pepin, and eventually the Gulf of Mexico, and has the greatest recreational value for streams within the Planning Area with multiple public accesses, refuges, and parks. The pollutants evaluated for stream water quality were total phosphorus, TOTAL SUSPENDED SOLIDS, and E. coli. The priority stream resources were separated into two tiers to assist the partners with prioritizing implementation efforts. **Tier A** includes streams with large sediment exports considering near channel and overland erosion sources to the Minnesota River. **Tier B** includes streams with other pollutant concerns, such as E. coli, as well as streams with IBI impairments or connectivity stressors. Table 3.5 and Figure 3.2 identify priority streams within the Lower Minnesota River East Planning Area.

TABLE 3.5: PRIORITY STREAMS

Stream	Stream AUID	Pollutant and Stressors	Priority Class	HUC10 Watershed
Upper Sand Creek	07020012-542, -611, -839, -840*	Fish bioassessments, Benthic macroinvertebrates bioassessments, Chloride, Nutrients, Turbidity	Tier A	Sand Creek
Middle Sand Creek	07020012-840*, -538, -513	Fish bioassessments, Benthic macroinvertebrates bioassessments, Chloride, Nutrients, Turbidity, E. coli	Tier A	Sand Creek
Le Sueur Creek	07020012-724, -824, -823	Fish bioassessments, Benthic macroinvertebrates bioassessments, E. coli	Tier A	Le Sueur Creek
Robert Creek	07020012-875	Fish bioassessments, Benthic macroinvertebrates bioassessments, TSS, E. coli	Tier A	City of Belle Plaine Minnesota River
Unnamed Creek (near Henderson)	07020012-761	E. coli	Tier A	City of Le Sueur Minnesota River
Forest Prairie Creek	07020012-725	Fish bioassessments, Benthic macroinvertebrates bioassessments, E. coli	Tier B	Le Sueur Creek
Raven Stream	07020012-716	Fish bioassessments, Benthic macroinvertebrates bioassessments, Chloride, E. coli	Tier B	Sand Creek
Unnamed Creek (County Ditch 13)	07020012-604	Fish bioassessments	Tier B	Minnesota River Outlet
Eagle Creek	07020012-519	E. coli	Local Priority Only Protection**	Minnesota River Outlet

**AUID 07020012-840 is divided between the Upper and Middle Sand Creek subwatersheds; **Eagle Creek is noted as a local priority due to its importance as a water resource, but also to acknowledge the conservation efforts other local entities are contributing beyond this Plan.; [1]The Credit River is included in the Metropolitan Council's list of priority waters. It has an increasing chloride trend, is on the State 303D list, and has a protection plan that has been written for it. Metropolitan Council and partners are working to implement the protection plan, and therefore the Credit River was not included as a priority stream for this plan.*

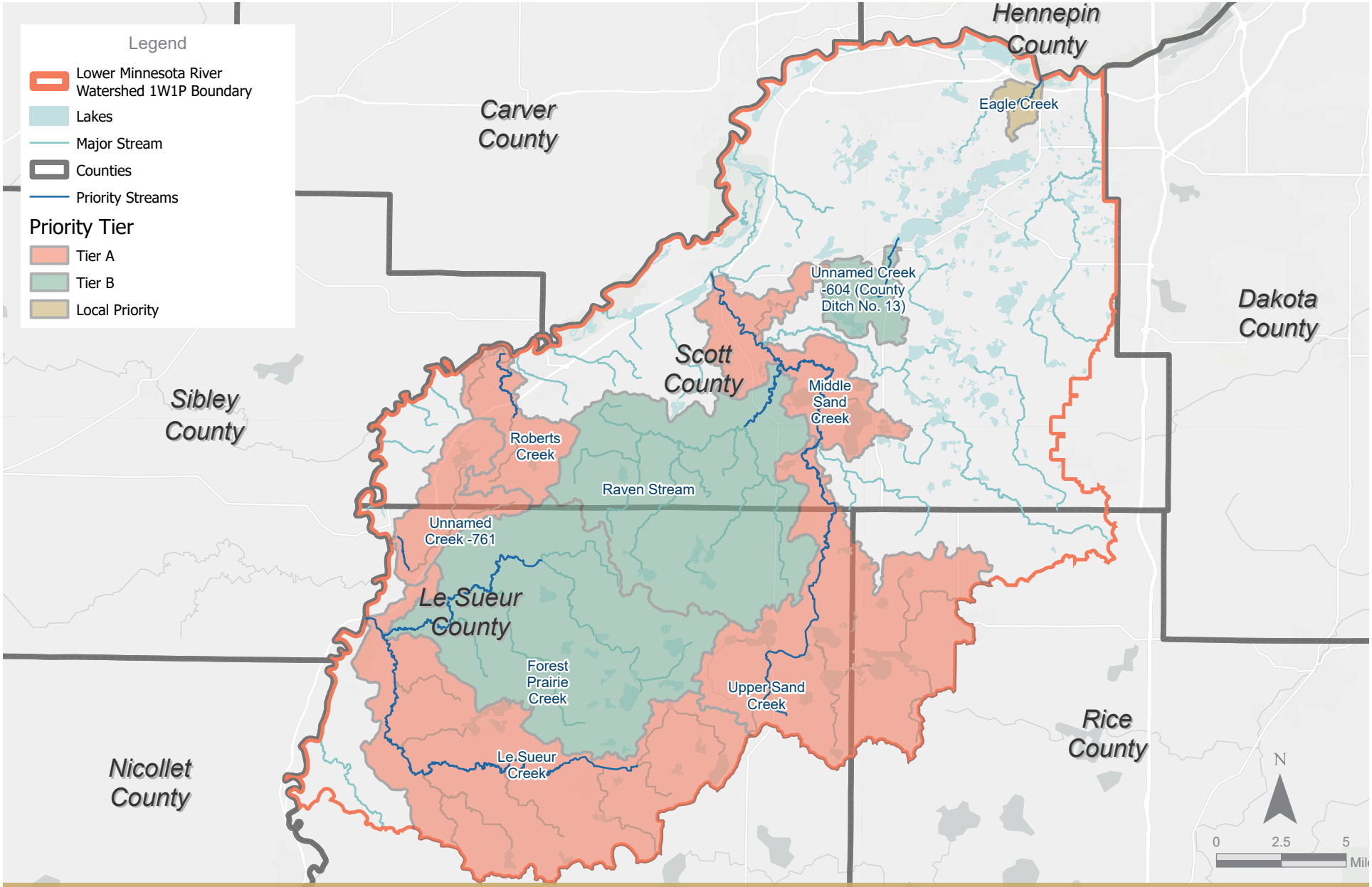


Figure 3.2: Priority Streams and Subwatersheds

Efforts will be targeted to within subwatershed of priority streams.

3.2 ISSUE CATEGORY 2: GROUNDWATER

Groundwater issues were also divided into two categories during the planning process. Those categories are groundwater quality and groundwater knowledge, data, and understanding. An issue statement was developed for each of the two categories, and measurable goals were created for each of the issue statements. Groundwater quantity was not selected as a standalone issue statement, but is being tracked through the DNR permitting program. Groundwater recharge will be discussed and reviewed again during the 5 year plan assessment period. Implementation actions that promote groundwater recharge will be preferred over similar practices that do not promote recharge.

Issue Statement #3: Groundwater Quality

Groundwater quality is impacted by naturally occurring and human-introduced pollutants which impacts the safety of drinking water supplies.

GROUNDWATER QUALITY GOAL A

Measurable Goal: Reduce nitrate inputs to achieve a no net increase in groundwater well nitrate concentrations or trends in priority areas, where data exists.

CONCERN ADDRESSED

Groundwater Protection – Nitrates

Nitrate is the primary contaminant of concern for groundwater in the Planning Area. Sources of nitrogen include agricultural and residential fertilizer, manure, and sewage. It is also found as a naturally occurring element in soils. The threshold for safe drinking water set by the EPA is 10 mg/L. Areas where drinking water is most susceptible to contamination are locations where surface water – groundwater connections exist (see Figure 3.5). Education and outreach efforts along with targeted implementation of best management practices that address nitrogen have been identified in the implementation tables to address this concern.

GROUNDWATER QUALITY GOAL B

Measurable Goal: Minimize groundwater source contamination by implementing 10 SSTS repairs/replacements and sealing 40 unused or abandoned wells.

CONCERN ADDRESSED

Groundwater Protection – Source Contamination

Unused, unsealed, or abandoned wells provide a direct conduit for contamination to reach the aquifer. This is a particular concern when the unused, unsealed well is in an area with low vulnerability and when the well is constructed in a confined aquifer, which would otherwise be protected from contamination on the surface. Failing SSTS are a concern in high vulnerability areas due to the potential for contamination of things like E. coli and nitrate. Targeting for well sealing is watershed wide due to the importance of sealing all entryways for contaminants into groundwater for protection of drinking water supply.

DRINKING WATER SUPPLY MANAGEMENT AREAS (SWSMA)

Land areas that contributes drinking water to municipal supply wells as opposed to private wells .

Other non-point contamination source such as feedlots and stormwater can impact groundwater and drinking water sources. While specific goals are not outlined in the Plan, activities that address these concerns are included in the implementation table in Chapter 4 as well as education and outreach topics in Chapter 5.

Issue Statement #4: Groundwater – Knowledge, Data, And Understanding

There is insufficient knowledge, data, and understanding of groundwater quality and quantity which are needed in order to protect vulnerable areas, resources, and communities within the watershed.

CONCERN ADDRESSED

Groundwater Contamination Education

A

GROUNDWATER KNOWLEDGE, DATA, AND UNDERSTANDING GOAL A

Measurable Goal: Develop and implement an education and outreach campaign for both public and political representative to improve understanding of groundwater contamination and management.

1. Groups receiving groundwater contamination and management education include residents, landowners, rural residents, political representatives/decision makers.
2. Examples of education and outreach activities to distribute information include, but are not limited to:
    a. Social media postings
    b. Mailings
    c. Open mic radio programs
    d. Educational workshops such as water testing clinics

CONCERN ADDRESSED

Data Collection and Monitoring

B

GROUNDWATER KNOWLEDGE, DATA, AND UNDERSTANDING GOAL B

Measurable Goal: Complete the county geologic atlas for the entire Planning Area.

Completing the county geologic atlas is important to understanding regional geology such as sand distribution, bedrock topography, and depth to bedrock as well as groundwater resources such as groundwater flow, aquifer properties, groundwater chemistry, and pollution sensitivity of aquifers. A county geologic atlas was completed for Rice and Scott counties. Le Sueur County is the only remaining county in the Planning Area to be completed.

CONCERN ADDRESSED

Arsenic

C

GROUNDWATER KNOWLEDGE, DATA, AND UNDERSTANDING GOAL C

Measurable Goal: Develop and implement an arsenic awareness and exposure prevention campaign for Rice, Le Sueur, and Scott Counties.

Arsenic is a groundwater contaminant and known carcinogen. Due to its state as a naturally occurring element in rocks and soil, it is difficult to take preventative measures for arsenic (Figure 3.3). Groundwater well monitoring found wells that exceed the arsenic drinking water standard of 10 ug/L throughout the Planning Area. Education on current drinking water arsenic concentrations and the dangers of arsenic are key to reducing its negative impacts. Education and outreach efforts regarding arsenic will be a watershed-wide initiative beyond the groundwater quality goals identified.

EDUCATION AND OUTREACH CAMPAIGN

A strategic plan to provide information and share knowledge about a particular topic to improve protection and restoration efforts on an individual and community basis.

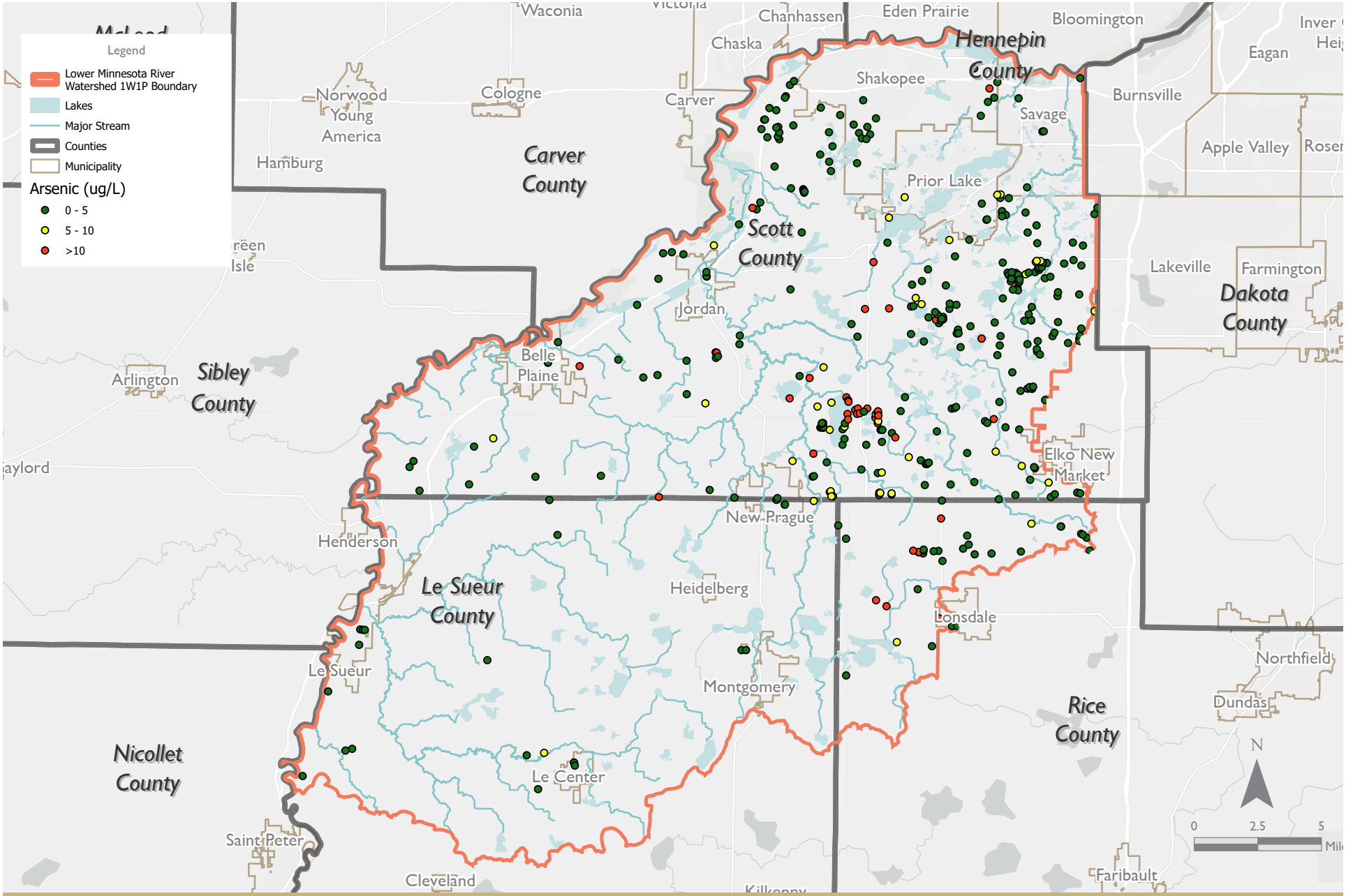


Figure 3.3: Arsenic Groundwater Monitoring Levels in Planning Area (Well index monitoring completed by MDH)

Groundwater Priority Areas

Groundwater is a crucial resource, as 100% of the residential drinking water within the Planning Area is supplied from groundwater resources. One of the primary criteria used for targeting groundwater was vulnerability to contamination through a connection to surface water, especially in drinking water supply areas where wells tested for nitrates were above the water quality standard (Figure 3.4). The groundwater targeting criteria are described in detail in the following paragraphs. Below are the criteria selected for groundwater priority areas.

DRINKING WATER SUPPLY MANAGEMENT AREAS (DWSMAS)

DWSMAs with high and moderate vulnerability ratings were targeted for groundwater efforts in the Plan. These areas are known to be more susceptible to contamination, and therefore have a greater need for protection and on-going monitoring efforts. If additional DWSMAs are classified as moderate or high vulnerability throughout the Plan implementation process the partners will evaluate groundwater efforts and include those newly identified areas of concern when feasible.

SHAKOPEE LEVEL 2 MITIGATION DWSMA

The Shakopee Level 2 DWSMA has a level 2 mitigation rating through the MDA's GPR, which indicates that the public water system has nitrate levels at or exceeding 8 mg/L at some point within the last 10 years or it is projected to exceed 10 mg/L within the next 10 years. This rating is significant because it means that the public water system had nitrate levels at or exceeding 8 mg/L at some point within the last 10 years or it is projected to exceed 10 mg/L within the next 10 years. Well monitoring for the Shakopee Level 2 DWSMA over the last 10 years has shown a steady decline in nitrate concentrations most likely due to the urban expansion and reduction of agricultural lands in the DWSMA. It is expected that nitrate levels should continue to fall as a result of legacy nitrate decline over time. Continued monitoring and implementation efforts should continue to ensure protection of this at risk area.

Although it is expected that nitrate levels will continue to fall, as they are likely the result of legacy nitrate, current nitrate levels are still high enough to suggest human influence. In addition to the area of high groundwater vulnerability, there is a large portion of Shakopee's DWSMA that is classified as a high vulnerability surface water contribution area, where surface runoff contaminants have the potential to drain into portions of the upper bedrock aquifer.

HIGH VULNERABILITY RANKING WATER TABLE AQUIFERS

High vulnerability aquifers are those with the highest pollution sensitivity, making them vulnerable to contamination. Contamination of the high vulnerability ranking aquifers would primarily impact drinking water accessed through private wells, leading to an increased need for infrastructure to provide treatment for the groundwater or to access another source of drinking water. Additionally, contamination of these aquifers can negatively impact surface water resources in areas where the impacted aquifer is connected to surface water.

TOWNSHIP TESTING PROGRAM

Two criteria from Township Testing Program were used as targeting criteria related to nitrate levels in the watershed. The first was the percentage of wells in the township that met or exceeded the drinking water standard of 10 mg/L. Townships with 10% or more wells at or above 10 mg/L are priority areas for plan implementation. The only township that meets this criteria in the planning area is Ottawa Township in Le Sueur County. The second were areas with wells at or above the 10 mg/L standard, as well as wells exceeding the halfway point of 5 mg/L, are priority areas for plan implementation. Wells with nitrate levels greater than 5 mg/L are at a higher risk of exceeding the 10 mg/L standard compared to wells with nitrate levels less than 5 mg/L.

It is important to note, however, that in the final results some of the data points were removed which lowered the number of wells in Ottawa Township to <20 wells which renders that townships data is inadequate to characterize a township for MDA purposes. The final dataset was intended only to include private drinking water wells potentially impacted by applied commercial fertilizer. Therefore wells with nitrate over 5 mg/L were removed if a potential non-fertilizer source or well problem was identified, there was insufficient information on the construction or condition of the well (MDA, 2020).

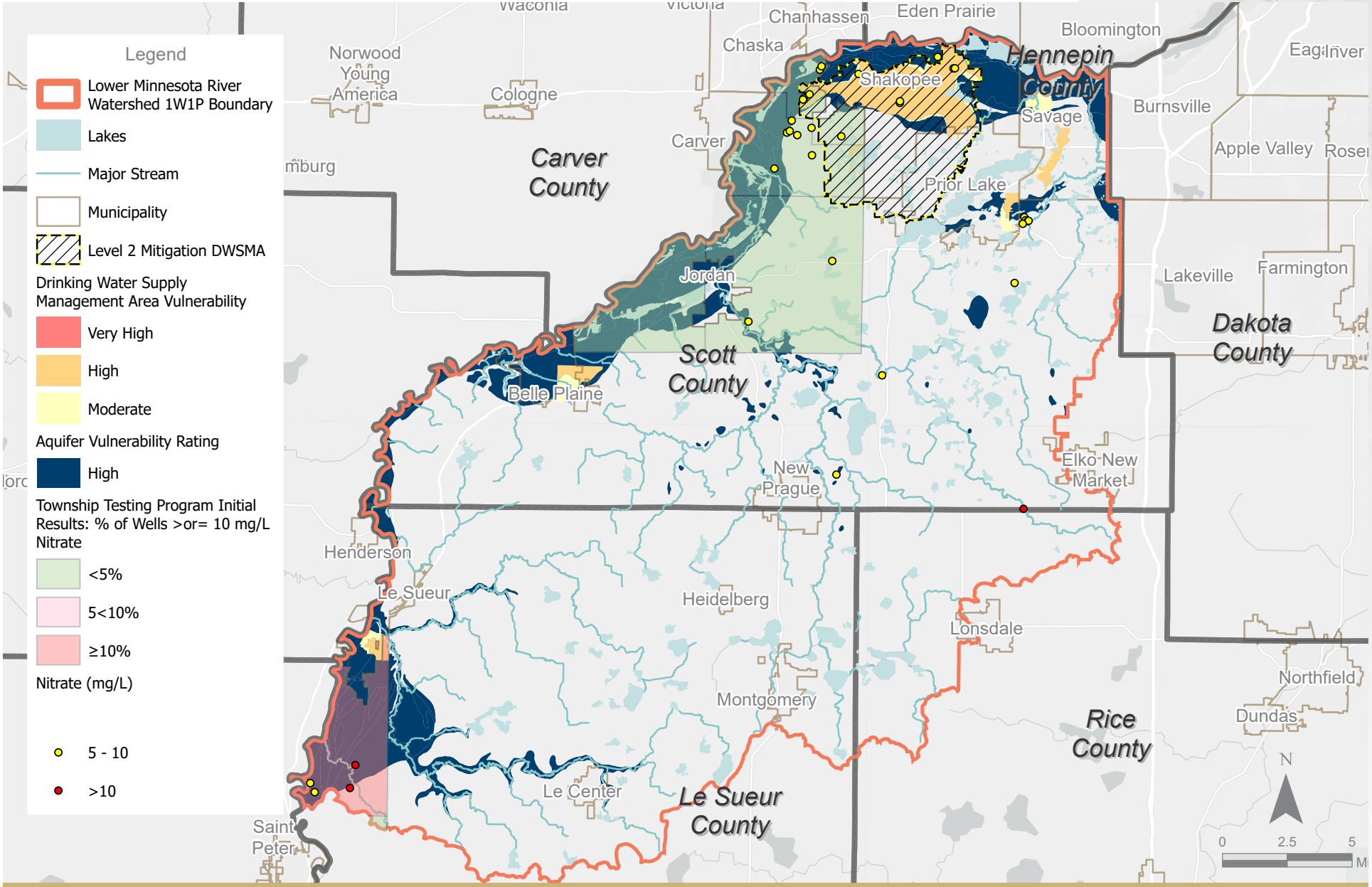


Figure 3.4: Groundwater Priority Areas

Efforts will be targeted in areas vulnerable to groundwater contamination meeting one of many of the criteria listed above.

3.3 ISSUE CATEGORY: HABITAT AND NATURAL RESOURCES

PRESERVATION
The practice of keeping threatened natural spaces and protecting native plant and animal biodiversity.

Habitat, both aquatic and terrestrial, is essential for wildlife, water quality, and quality of life. Many projects include habitat as a direct or indirect component of the project. Whether protection and PRESERVATION or RESTORATION, habitat projects provide immense benefits to the Planning Area, including but not limited to connectivity between natural resources. After evaluating the benefits provided to water quality through habitat restoration and PROTECTION, the partners decided that including habitat as a priority issue was essential to the success of the Plan.

Issue Statement #5: Habitat And Natural Resources – Protection And Preservation

Habitat that contains high ecological value is threatened due to land use changes, poor water quality, and altered hydrology. These impacts affect all existing natural habitat types, especially aquatic habitat, forests, native prairies, trout streams, and wetlands/fens.

CONCERN ADDRESSED
Identify High Value Natural and Cultural Resources

A

HABITAT AND NATURAL RESOURCES PROTECTION AND PRESERVATION GOAL A

Measurable Goal: Complete a study(s) to identify high value natural and cultural resources, determine sensitive habitat areas, and establish strategies for protection in Le Sueur and Rice counties.

During various committee meetings, the Partners determined that there were various gaps that needed to be addressed within the Planning Area regarding identifying and prioritizing areas of high value and cultural resources. The study would include working with communities to identify natural and cultural resources of high value. AC discussion considered topics that may be included in the study such as classifications of wild rice lakes, unidentified fens, high value community resources, and high value cultural resources inclusive of the Shakopee Mdewakanton Sioux Community. Priority areas identified through the study will be added as priority areas for protection and preservation. The study may also include specific actions for the protection and enhancement of fish and wildlife habitat and water recreational facilities as components of key habitat projects.

RESTORATION
The purposeful rehabilitation of an area to recreate a functioning ecosystem.

CONCERN ADDRESSED
Permanent Protection

B

HABITAT AND NATURAL RESOURCES PROTECTION AND PRESERVATION GOAL B

Measurable Goal: Increase the amount of land in permanent protection in priority areas through conservation easements by 800 acres.

Within the Planning Area, 800 acres is approximately a 5% increase in permanently protected land. Areas that were considered in existing permanently protected land included Reinvest in Minnesota (RIM), regional parks, wildlife management areas (WMA), waterfowl protection areas (WPA), national wildlife refuges, and state recreation areas. Targeting and priority areas are further explained in the Habitat Priority Areas section below. The map in Figure 3.5 outlines priority areas to increase amount of land in permanent protection. Permanent protection refers to land set aside for conservation purposes, often through a conservation easement, and is preserved from land development.

PROTECTION
Maintaining natural spaces in their original state.

Issue Statement #6: Habitat And Natural Resources - Restoration

While all habitat types have been impacted, riparian areas in particular have been reduced, degraded, and fragmented due to land use practices, pollutants, and altered hydrology.

C

HABITAT AND NATURAL RESOURCES - RESTORATION GOAL A

Measurable Goal: Within priority stream watersheds, increase perennial cover by 300 acres or 50 miles within a half mile wide corridor on rivers and streams .

CONCERN ADDRESSED

Riparian Restoration

Within the priority stream subwatersheds, 50 miles is approximately 5% of the stream miles. It is assumed that of 300 acres of restoration, 50 miles of riparian restoration will be implemented at a minimum width of 50-feet wide (in addition to any setbacks required by the Minnesota Buffer Law). Targeting and priority areas are further explained in the Habitat Priority Areas section below. The map in Figure 3.7 outlines priority location in black hashed areas for riparian restoration.

Habitat Priority Areas

To ensure that habitat restoration projects are protected, conservation easements will be used to secure the land. There are numerous options for conservation easements through programs such as RIM and agencies like USFWS, DNR, and watershed districts, providing a range of requirements and benefits for habitat projects. Priority areas for implementation will include expanding existing easement and habitat areas to improve connectivity to existing habitat and other natural resources.

Priority areas for habitat protection were developed in order to expand existing habitat corridors and connectivity within riparian areas. A half mile buffer was created around existing protection areas. Existing habitat protection areas that were considered include: RIM Easements, CRP, CREP, National Wildlife Refuges, Waterfowl Protection Areas, Wildlife Management Areas, Regional Parks, Minnesota State Parks and Recreation Areas, and calcareous fens (Figure 3.6).

The habitat restoration efforts will focus on riparian areas and connectivity of habitat corridors. Connectivity of habitats corresponds to greater diversity and stronger ecosystems. Riparian areas can have multiple benefits to water quality through filtering pollutants and water quantity via connectivity to floodplain (Figure 3.6).

For the purposes of this plan, if a parcel is 51% or greater within the priority area, the entire parcel will be considered eligible for the practice. Priority areas will also include high value natural and cultural resources identified in studies outlined in Goal 5A, once completed.

DRINKING WATER SUPPLY MANAGEMENT AREA (DWSMA)

The surface and subsurface area surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in a wellhead protection plan. This area is delineated using identifiable landmarks that reflect the scientifically calculated wellhead protection area boundaries as closely as possible (MPCA, 2021).

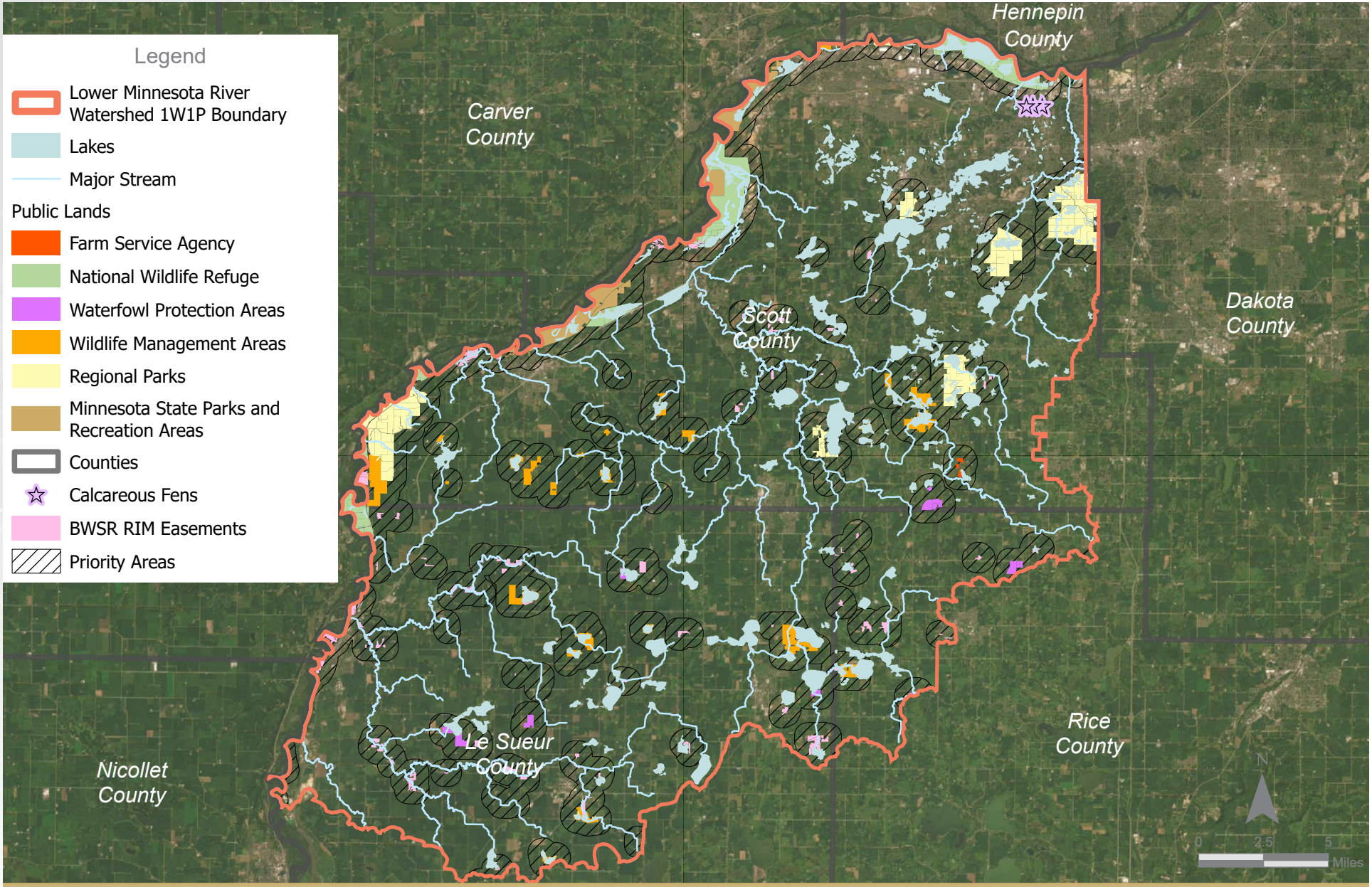


Figure 3.5: Habitat Protection and Preservation: Permanent Protection Targeting

Habitat protection efforts will be targeted within a half mile buffer area around existing protection areas.

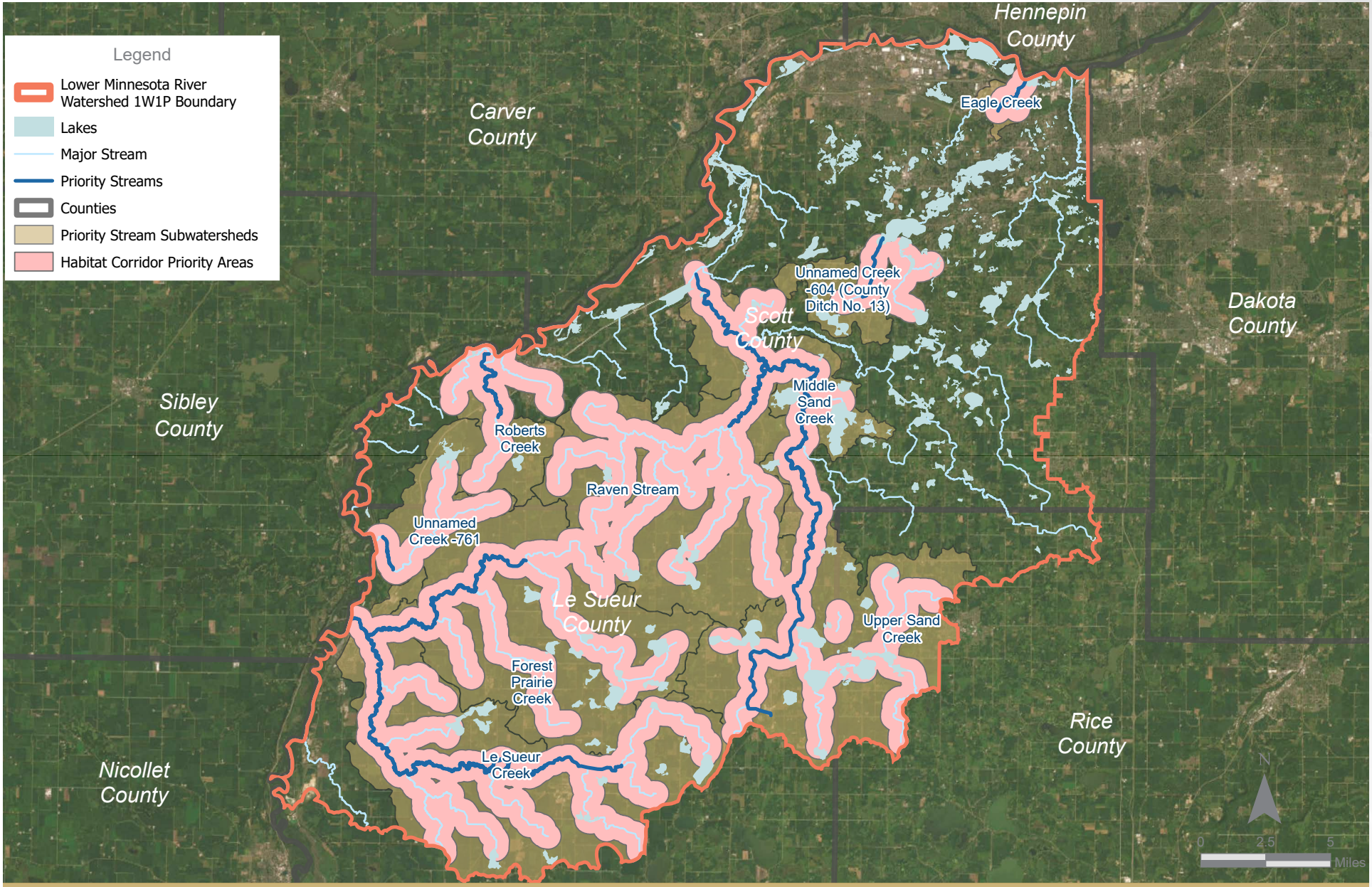


Figure 3.6: Habitat Restoration: Riparian Restoration Targeting

Habitat restoration efforts will be targeted within a half mile buffer area on rivers and streams within priority subwatersheds.

Chapter 4:
Implementation Schedules

Chapter 4: **Implementation Schedules**

INTRODUCTION

To develop implementation schedules, brainstorming sessions were held to The Plan has several different implementation schedules, organized by the following categories:

- **Best Management Practices (BMPs)**
- **Data, Studies, and Monitoring**
- **Policy and Regulation**
- **Education and Outreach**

OVERVIEW OF THE IMPLEMENTATION SCHEDULES

BMPs

The implementation schedule for BMPs is organized and separated by practice and BMP type. Within each practice type, efforts were initially separated by HUC10 subwatershed that the effort will be focused in, along with the specific priority areas that will be targeted. The table was simplified to provide flexibility in implementation, allowing the partners to achieve the maximum amount of targeted implementation. The more detailed implementation schedule is available for reference in Appendix E, and will be utilized to assist with tracking milestones throughout implementation. The implementation schedule also details what actions will be implemented, when, by whom, and the estimated costs (Table 4.1).

Data, Studies, and Monitoring

The Data, Studies, and Monitoring implementation schedule contains action items that will address current data gaps and provide feasibility documentation to develop the information necessary for the partners to effectively achieve the goals identified in this Plan (Table 4.2). This implementation schedule also details:

- When the actions will occur
- Which local government unit will lead the effort
- Estimated costs

Policy and Regulation

The Policy and Regulation implementation schedule (Table 4.3) contains action items to:

- Address gaps in existing policy
- Explore new policy concepts
- Develop materials needed to adequately evaluate new and existing policy
- To develop support of the necessary policy

Education and Outreach

Education and Outreach is a crucial component of plan implementation. To ensure the most effective education and outreach efforts take place, a menu approach option was selected by the Partnership. This provides flexibility during the implementation phase to develop tailored education and outreach campaigns for specific topics and audiences, creating the maximum impact towards the goals outlined within the Plan. Therefore, a brief, one line implementation table was developed (Table 4.4) to provide a cost estimate and implementation timeframe for the development of education and outreach campaigns. No single education and outreach activities were identified to maintain the flexibility to select from the menu of education and outreach opportunities that are available to the Partnership.

PROCESS

The process used to develop the implementation schedules began with first identifying strategies to address issues during the issue framework development (Figures 4.1–4.3) . The strategies were then expanded into detailed actions. Three subcommittee meetings took place to get further input on collaboration opportunities from tribal and municipal governments. The subcommittee meetings focused on subject areas for groundwater, urban BMPs, and shoreland.

GOALS

The goal of the planning committees was to establish a Plan that was realistic and achievable, while also striving to expand current efforts. To accomplish this an iterative approach was used that balanced expected staff capacity, funding, and resulting outcomes, ensuring that the actions detailed in the implementation tables met plan goals. Details on the targeting process for each issue statement are described in Chapter 3.

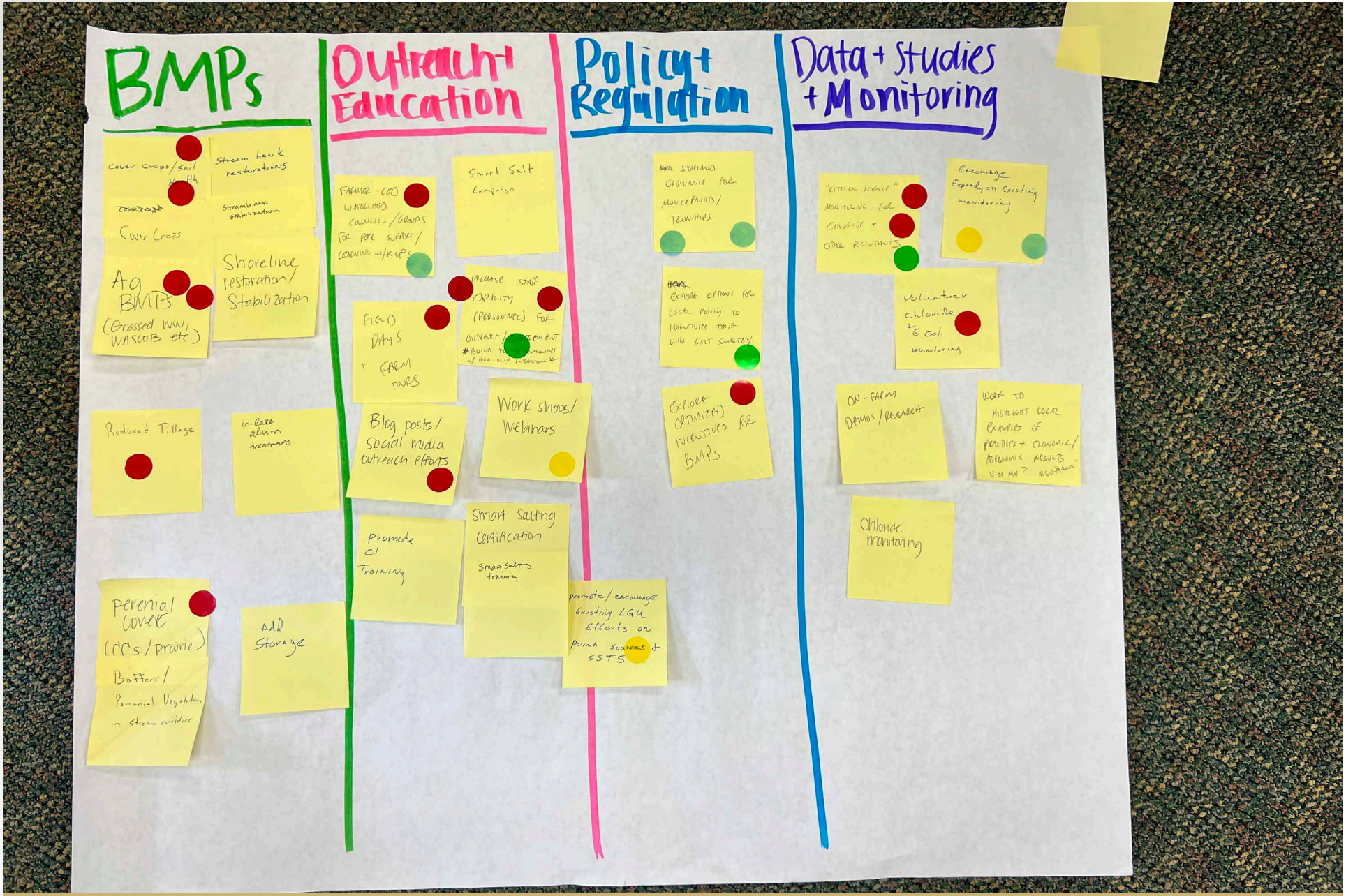


Figure 4.1: Water Quality Implementation Brainstorm

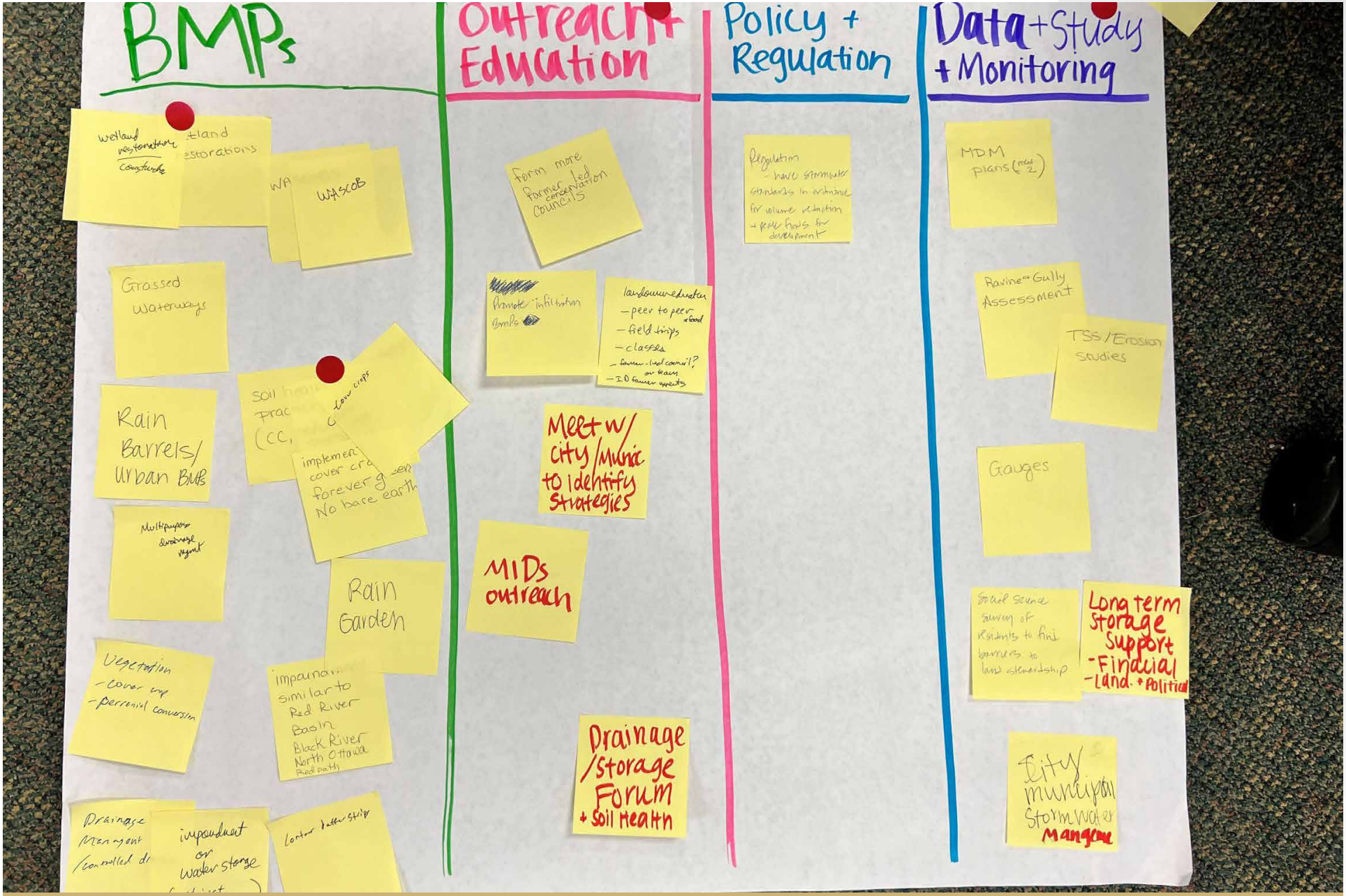


Figure 4.2: Altered Hydrology and Storage Implementation Brainstorm

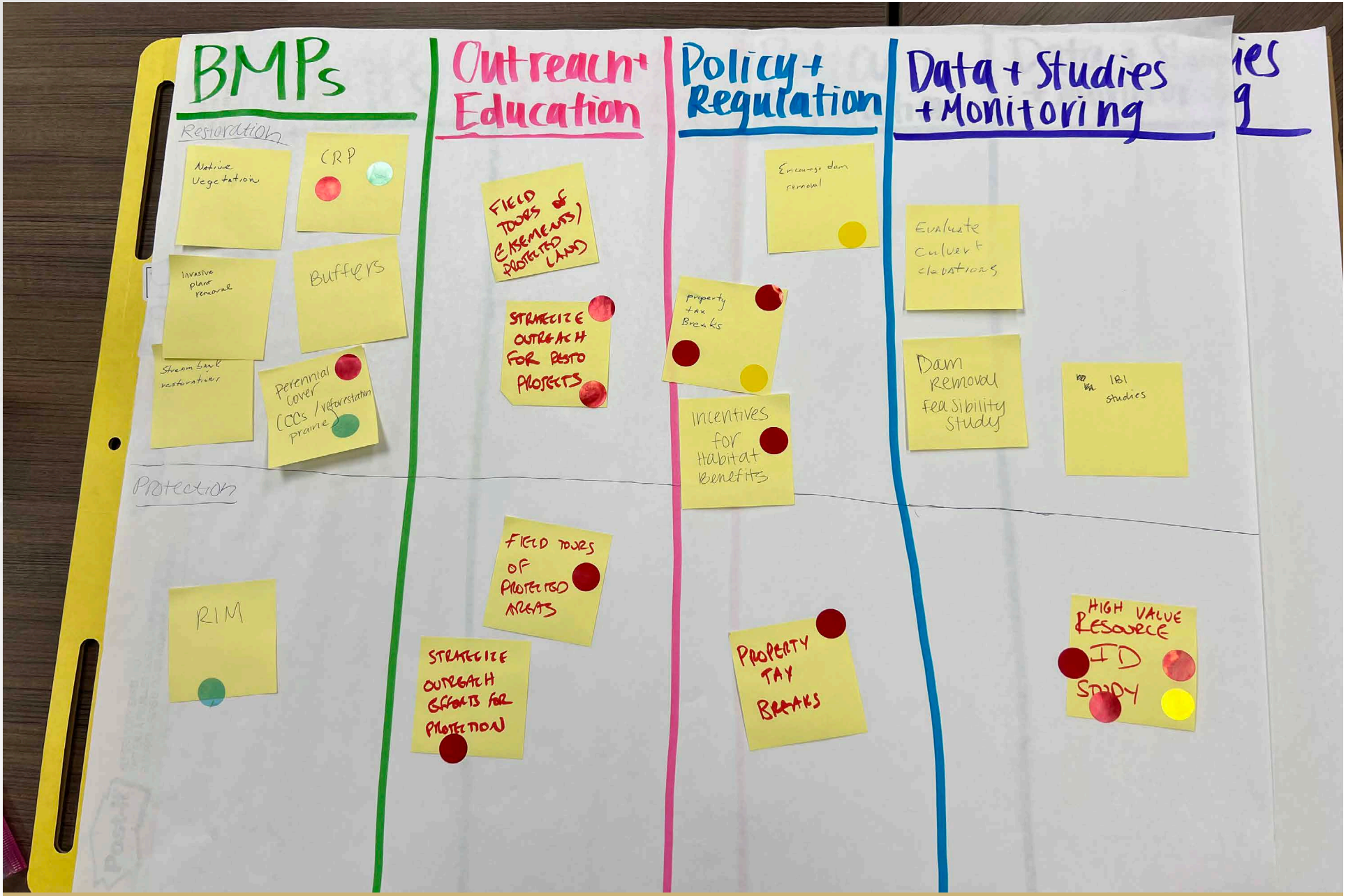


Figure 4.3: Habitat Implementation Brainstorm

TARGETING

Surface Water

Surface water issue targeting was divided into two categories to align with the corresponding issue statements:

- Surface water quality
- Surface water hydrology

Surface water issues are numerous and widespread; therefore, a tiered approach was used and priority lakes and streams were selected based on surface water quality and surface water hydrology parameters.

Groundwater

Groundwater targeting was based on:

- Existing drinking water supply management areas
- Water table aquifer vulnerability ratings
- Townships meeting the MDA township testing program criteria with at least 10% of wells exceeding 5 mg/L or 10 mg/L for nitrate

These criteria were mapped to provide a visual representation of the targeted areas (Figure 3.5).

Habitat and Natural Resources

Habitat targeting began with the priority streams and was expanded to include a set buffer area around each priority stream. Education based issue statements, such as the issue statements based on surface water – chloride and groundwater knowledge will be developed through the work plan creation process. This approach allows the JPE to align the targeting for education-based issue statements on the implementation actions occurring in a given biennium.

These criteria were mapped to provide a visual representation of the targeted areas (Figures 3.6 and 3.7).

COST ESTIMATES

Cost estimates are presented in 2023 value and will be updated throughout the planning effort and reflected in workplan development. The costs indicated in the BMP implementation table include total project costs for land, labor, and materials to implement. Costs not outlined in the implementation table include costs incurred for outreach and education efforts or technical assistance. It was assumed that an additional 20% of costs will be incurred for technical assistance and an additional 15% of costs will be incurred for outreach and education efforts. Cost assumptions for BMP costs are included in Appendix F. Best estimates based on past experience and expected total effort were also included for implementation actions in the Data, Studies, and Monitoring table as well as Policy and Regulation table. BMP projects will be prioritized for work planning and funding prior to implementation. Prioritization will be based on estimated reductions to priority waterbodies and top priority issues among other aspects to be decided by the partners.

MODELING APPROACH

The values presented in the implementation tables were developed using the Lower Minnesota and Lower Minnesota (Metro) HSPF models. The Lower Minnesota HSPF model includes Le Sueur Creek, City of Le Sueur – Minnesota River, and portions of the City of Belle Plaine – Minnesota River subwatersheds. The Lower Minnesota (Metro) model includes the remaining portions of the City of Belle Plaine – Minnesota River, Minnesota River Outlet, and Sand Creek subwatersheds.

The HSPF model simulates pollutant loading from the landscape and in-stream processes for the Planning Area with simulated pollutant values being calibrated to observed water quality data at key monitoring locations throughout the Planning Area and within the Minnesota River.

Pollutant reductions for the planned implementation actions were generated by using the Scenario Application Manager (SAM) software which allows the user to create scenarios through changing land uses and adding BMPs to treat a specified land use type and area. These scenarios were developed by applying BMPs in priority areas identified in the implementation table. The BMPs were entered into SAM to simulate pollutant reductions and assess the effectiveness of the BMPs.

Adjustments were made to the implementation actions by the ST to better reflect staff capacity and landowner willingness to adopt practices. Due to the location of the Planning Area, partial contribution to the Minnesota River, and complexity of modeling the Minnesota River, the partners focused the measurable goals for pollution reductions and discharge on delivery to the Minnesota River from each of the major subwatersheds.

One limitation of HSPF-SAM was the inability to model for the following major sediment sources of the Planning Area:

- Gullies
- Ravines
- Streambanks
- Bluff erosion

HSPF-SAM only models overland erosion, so the BWSR Water Erosion Pollution Reduction Estimator was used to quantify the pollutant reduction numbers for near channel and in-channel projects such as ravine stabilizations and stream restorations. Measurable goals within the Plan focused on pollutant delivery to the Minnesota River.

DID YOU KNOW?

HSPF models the pollutants below:

Sediment

Discharge

Nitrite and Nitrate

Total Nitrogen

Orthophosphate

Total Phosphorus

IMPLEMENTATION SCHEDULES

Strategy

The BMP implementation table is organized by strategy: Soil Health, Agricultural (Ag) BMPs, Storage, Stream, and Urban BMPs. Individual BMPs, such as cover crops and rain gardens, were aggregated into these respective BMP categories to provide flexibility for the partners during the implementation phase and to provide a simplified tracking system for reporting purposes. BMPs included under each BMP category are as follows:

Soil Health

- Nutrient Management
- Cover Crops
- Perennial Cover, Perennial Crops, Conservation Cover, Critical Area Planting, Prairie Restoration, Contour Buffer Strips, Buffer Expansion, Buffer Installation *(non-required buffers only)*
- Conservation Tillage
- Other Soil Health BMPs *(including but not limited to rotational/prescribed grazing, and perennial grains such as Kernza©, etc.)*

Ag BMPs

- Grassed Waterways
- WASCOBs
- Alternative Side Inlets
- Other Ag BMPs (including but not limited to controlled drainage)

Urban BMPs

- Stormwater Filtration Basins
- Stormwater Retention Basins
- Bioretention Basins
- Other Urban BMPs

Storage

- Wetland Restoration, Enhancements, Banks, and Constructed Wetlands
- Impoundments
- Other engineered storage practices *(including but not limited to in-channel storage, strategic culvert placement, ponds, set back existing levees, ditch plugging/abandonment, floodplain connectivity, etc.)*

Scott watershed management organization Comprehensive Water Resources Management Plan
bit.ly/Scott-County

Lower Minnesota River Watershed District Watershed Management Plan
bit.ly/Lower-MN

Prior Lake Spring Lake Watershed District Water Resources ManagementPlan
bit.ly/PL_SL

Other BMPs, such as sealing unused wells and streambank stabilization, remained as individual rows within the implementation table.

The implementation tables capture the efforts of numerous partners in the watershed. The priority issues and goals of those plans align with the Plan, and each plan captures the implementation activities the respective LGUs and supporting entities will use to achieve their goals.

Priority Area

This field identifies the physical area or resource where the implementation activity will take place. Some activities are watershed wide. This field may refer to targeting maps that are identified throughout the report.

Implementation Action

This field identifies the specific actions that will be completed and outlines specific details the partners wish to carry out during implementation.

Measurable Output and Outcome

This field identifies how performance of the implementation activity will be measured. Pollution reduction estimates may be included for some activities while some will be measured through widgets.

Timeframe

These fields indicate when an implementation activity will take place. The 10-year timeframe was subdivided into two-year periods. Expected outputs and costs are included for each two-year period. Some strategies have consistent implementation across the 10-year time frame while others vary. For example, the Partners plan to increase acres adopted into soil health efforts across the 10-year timeframe due to their increase in outreach and education effort completed in earlier years of the Plan.

Estimated Cost

This field represents the total estimated cost to implement the activity over the 10-year life of the Plan. Please refer to the Cost Estimate section in this Section for more details on how costs were determined.

Lead and Support LGU

This field indicates the entity responsible for leading each activity and anticipated entities, organizations, or agencies expected to cooperate, review, fund, regulate, or in other ways assist with implementation efforts. The lead LGU may not necessarily complete the activity, but is responsible for delegating and managing completion of the activity through the Plan. Supporting entities identified for an activity may not be limited to those included in the implementation tables. Lead entities identified in bolded text.

Funding Sources

This field indicates the source of funding for each implementation action. Sources of funding may include local, state, WBIF, or other funding. Many of the implementation actions may have multiple applicable funding sources.

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TABLE 4.1: BMP IMPLEMENTATION SCHEDULE

ID	Strategy	Priority Area	Implementation Action	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other
					1 and 2	3 and 4	5 and 6	7 and 8	9 and 10			
BMP.1	Soil Health	Priority streams, lakes, and groundwater priority areas	Implement soil health practices, including but not limited to no-till, strip till, cover crops, perennial cover, and nutrient management	Implement 18,870 acres of soil health practices or a reduction of 3,945 lbs TP/yr and 565 tons TSS/yr	2,423 acres	2,604 acres	3,834 acres	4,852 acres	5,157 acres	$2,844,050	**SWCDs,** WDs, MDA	All
BMP.2	Agricultural BMPs	Priority streams, lakes, and groundwater priority areas	Install Ag BMPs, including but not limited to grassed waterways, WASCOBs, alternative side inlets, controlled drainage, bioreactors, etc.	Implement 136 Ag BMPs or a reduction of 945 lbs TP/yr and 80 tons TSS/yr	26 BMPs	22 BMPs	33 BMPs	25 BMPs	30 BMPs	$1,149,435	**SWCDs,** WDs	All
BMP.3	Urban BMPs	Priority streams, lakes, and groundwater priority areas	Implement urban BMPs such as permeable pavers, filtration basins, retention basins/constructed stormwater ponds, bioretention basins/rain gardens, enhanced street sweeping, tree trenches, screening/straining/ separating processes	Implement 64 urban BMPs or a reduction of 60 lbs TP/yr and 20 tons TSS/yr	11 BMPs	12 BMPs	15 BMPs	12 BMPs	14 BMPs	$98,500	**WDs Municipalities.** SWCDs	All
BMP.4	Storage	Priority streams, lakes, and groundwater priority areas	Implement storage practices such as wetlands, impoundments, in-channel storage, strategic culvert placement, ponds, setback existing levees, ditch plugging/abandonment, floodplain connectivity	Implement 110 acres of storage or a reduction of 250 lbs TP/yr and 45 tons TSS/yr	0 acres	25 acres	35 acres	30 acres	20 acres	$1,452,500	**SWCDs, Le Sueur and Rice counties,** WDs, municipalities	All
BMP.5	Grade Stabilization	Priority streams and lakes	Implement grade stabilization practices	Implement 28 grade stabilization BMPs or a reduction of 901 lbs TP/ yr and 784 tons TSS/yr	4 BMPs	5 BMPs	7 BMPs	6 BMPs	6 BMPs	$330,090	**SWCDs,** WDs, municipalities	All
BMP.6	Native Plantings	Priority streams and lakes	Implement riparian native plantings along lakes and streams	Implement 3000 linear feet of native plantings or a reduction of 120 lbs TP/yr and 105 tons TSS/yr	500 LF	500 LF	500 LF	500 LF	500 LF	$6,000	**SWCDs, WDs,** Le Sueur and Rice counties, municipalities	All

TABLE 4.1: BMP IMPLEMENTATION SCHEDULE

ID	Surface Water Quality					Surface Water Hydrology	Groundwater Quality		Groundwater Knowledge		Habitat Restoration	Habitat Protection and Preservation	
	Sediment and Erosion	Nutrients in Impaired Lakes	Nutrients to Unimpaired Lakes	Chloride	E. coli	Altered Hydrology and Storage	Groundwater Protection - Nitrates	Groundwater Protection - Source Contamination	Groundwater Contamination Education	Data Collection and Monitoring	Riparian Restoration	Identify High Value Natural and Cultural Resources	Permanent Protection
BMP.1	●	●	●			●	●	●			●		●
BMP.2	●	●	●			●							
BMP.3	●	●	●			●							
BMP.4	●	●	●			●	●						●
BMP.5	●	●	●			●							
BMP.6	●	●				●					●		

TABLE 4.1: BMP IMPLEMENTATION SCHEDULE

ID	Strategy	Priority Area	Implementation Action	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other
					1 and 2	3 and 4	5 and 6	7 and 8	9 and 10			
BMP.7	Stream restorations	Priority streams	Implement stream restorations	Implement 16 stream restoration projects or 3,175 linear feet of stream restoration for a reduction of 22 lb TP/yr and 19 tons/yr	2 Projects	4 Projects	3 Projects	4 Projects	3 Projects	$476,250	**SWCDs, WDs,** municipalities, DNR	All
BMP.8	Stream stabilization	Priority streams	Implement stream stabilizations	Implement 5 stream stabilization projects or 1,500 linear feet of streambank stabilization for a of 127 lb TP/yr and 111 tons TSS/yr	1 Project	1 Project	1 Project	1 Project	1 Project	$300,000	**SWCDs, WDs,** municipalities, DNR	All
BMP.9	Lake alum treatment	Clear Lake and PLSLWD	Complete lake alum treatments	Complete 2 lake alum treatments					2 Projects	$400,000	**Le Sueur County and SWCD; PLSLWD;** municipalities	All
BMP.10	Well sealing	Watershed-wide	Complete well sealings	Complete 40 Well Sealings	8 Well Sealings	8 Well Sealings	8 Well Sealings	8 Well Sealings	8 Well Sealings	$80,000	**Le Sueur and Rice counties, SWCDs, WD,** municipalities	All
BMP.11	SSTS repairs/ replacements	Watershed-wide	Complete SSTS repairs/ replacements	Complete 10 SSTS repairs or Replacements	2 Projects	2 Projects	2 Projects	2 Projects	2 Projects	$280,000	**Le Sueur and Rice counties,** MPCA	Local, State, Other
BMP.12	Ravine stabilization	Priority stream and lakes	Complete ravine stabilization projects	Implement 8 ravine stabilization projects or a reduction of 193 lb TP/ yr and 168 tons TSS/yr		2 Projects	2 Projects	3 Projects	1 Project	$390,000	**SWCDs, WDs,** municipalities	All
BMP.13	Easements	Permanent protection priority areas	Increase land in permanently protected conservation easements by 5%	Enroll 800 acres in conservation easements	140 Acres	190 Acres	140 Acres	165 Acres	165 Acres	$6,800,000	**SWCDs, WD, Le Sueur and Rice counties,** BWSR, USFWS, DNR	Local, State, Other
BMP.14	Buffers/ riparian restoration	Riparian priority areas	Increase perennial cover by 5% within half mile wide corridor on rivers and steams	Convert 300 acres or 50 miles to perennial cover	60 Acres	60 Acres	60 Acres	60 Acres	60 Acres	$750,000	**SWCDs,** WDs, drainage authorities	All

TABLE 4.1: BMP IMPLEMENTATION SCHEDULE

ID	Surface Water Quality					Surface Water Hydrology	Groundwater Quality		Groundwater Knowledge		Habitat Restoration	Habitat Protection and Preservation	
	Sediment and Erosion	Nutrients in Impaired Lakes	Nutrients to Unimpaired Lakes	Chloride	E. coli	Altered Hydrology and Storage	Groundwater Protection - Nitrates	Groundwater Protection - Source Contamination	Groundwater Contamination Education	Data Collection and Monitoring	Riparian Restoration	Identify High Value Natural and Cultural Resources	Permanent Protection
BMP.7	●	●	●			●					●		●
BMP.8	●	●									●		
BMP.9		●	●										
BMP.10					●			●					
BMP.11					●		●	●					
BMP.12	●	●	●			●							
BMP.13	●	●	●			●							●
BMP.14	●	●	●			●					●		

TABLE 4.2: DATA, STUDIES, AND MONITORING IMPLEMENTATION SCHEDULE

ID #	Strategy	Priority Area	Implementation Action	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other
					1 and 2	3 and 4	5 and 6	7 and 8	9 and 10			
DSM.1	Groundwater quality monitoring	Start with groundwater priority areas first	Develop groundwater monitoring program	Develop groundwater monitoring program. Monitor up to 50 private wells annually for nitrates and arsenic. Develop annual report of groundwater results.	50 wells	50 wells	50 wells	50 wells	50 wells	$32,000	**Counties, SWCDs,** MDH	Local, State, Other
DSM.2	Groundwater quality testing	Watershed-wide	Host 10 well testing clinics (1 per year) to address a variety of pollutants	Types of testing clinics will vary and may not provide certified water test results. Clinics may be combined with other events (i.e., fairs, tree sales) to increase participation.	2 well testing clinics	2 well testing clinics	2 well testing clinics	2 well testing clinics	2 well testing clinics	$20,000	**Counties, SWCDs,** MDH	All
DSM.3	Groundwater geologic atlas	Le Sueur County	Complete county geologic atlas for Le Sueur County	Identify up to 1000 unverified wells in Le Sueur County and complete a Groundwater Geologic Atlas for Le Sueur County.	1,000 wells identified			1 geologic atlas		$570,000	**Le Sueur County,** DNR, and UMN	Local, State
DSM.4	SSTS inventory	Priority Streams- Unnamed Creek (761), Robert Creek, Raven Stream, Middle Sand Creek, Forest Prairie Creek, and Le Sueur Creek	Complete SSTS inventory on priority streams with E. Coli impairments	Complete up to 2 SSTS inventories on priority streams			1 SSTS inventory		1 SSTS inventory	$400,000	**Le Sueur County**	All

TABLE 4.2: DATA, STUDIES, AND MONITORING IMPLEMENTATION SCHEDULE

Surface Water Quality					Surface Water Hydrology	Groundwater Quality		Groundwater Knowledge		Habitat Restoration	Habitat Protection and Preservation	
Sediment and Erosion	Nutrients in Impaired Lakes	Nutrients to Unimpaired lakes	Chloride	E. Coli	Altered Hydrology and Storage	Groundwater Protection - Nitrates	Groundwater Protection - Source Contamination	Groundwater Contamination Education	Data Collection and Monitoring	Riparian Restoration	Identify High Value Natural and Cultural Resources	Permanent Protection
								●	●			
								●	●			
									●			
				●					●			

TABLE 4.2: DATA, STUDIES, AND MONITORING IMPLEMENTATION SCHEDULE

ID #	Strategy	Priority Area	Implementation Action	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other
					1 and 2	3 and 4	5 and 6	7 and 8	9 and 10			
DSM.5	Multipurpose Drainage Management (MDM) Plans	Drainage Systems within priority steam and lake subwatersheds. Further prioritization consideration based on local drainage system priorities Priority Streams - Le Sueur Creek, Forest Prairie Creek, Upper Sand Creek, Middle Sand Creek, Raven Stream, Unnamed Creek (761), Robert Creek, and Unnamed Creek (604) Priority Lakes - Clear, Cedar, Cody, Phelps, LeMay, Spring, Upper Prior, Lower Prior, O'Dowd, Thole, and McMahon	Complete multipurpose drainage management plans	Complete 2 multi-purpose drainage management plans			1 MDM plan		1 MDM plan	$40,000	**SWCDs,** counties	Local, State, WBIF
DSM.6	Stream erosion studies	Priority Streams - Le Sueur Creek, City of Le Sueur-Minnesota River, Minnesota River Outlet	Complete stream erosion studies	Complete 4 stream erosion studies (examples: geomorphic or stream power index or other stream erosion studies)		1 study	1 study	1 study	1 study	$200,000	**Counties, SWCDs,** consultants	Local, WBIF
DSM.7	Subwatershed analysis studies for priority lakes and streams - areas to target BMPs	Priority Streams - Le Sueur Creek, Forest Prairie Creek, Upper Sand Creek, Middle Sand Creek, Unnamed Creek (604), Unnamed Creek (761) Priority Lakes - Cody/Phelps, Le may, and Cedar	Complete stream and lake subwatershed assessments	Complete 6 stream and 4 lake subwatershed assessments (SWA)	2 SWA	2 SWA	2 SWA	2 SWA	2 SWA	$250,000	**Counties, SWCDs,** consultants	Local, WBIF

TABLE 4.2: DATA, STUDIES, AND MONITORING IMPLEMENTATION SCHEDULE

ID #	Surface Water Quality					Surface Water Hydrology	Groundwater Quality		Groundwater Knowledge		Habitat Restoration	Habitat Protection and Preservation	
	Sediment and Erosion	Nutrients in Impaired Lakes	Nutrients to Unimpaired lakes	Chloride	E. Coli	Altered Hydrology and Storage	Groundwater Protection - Nitrates	Groundwater Protection - Source Contamination	Groundwater Contamination Education	Data Collection and Monitoring	Riparian Restoration	Identify High Value Natural and Cultural Resources	Permanent Protection
DSM.5	●	●	●			●	●				●		●
DSM.6	●					●					●		
DSM.7	●	●	●	●	●	●	●				●		●

TABLE 4.2: DATA, STUDIES, AND MONITORING IMPLEMENTATION SCHEDULE

ID #	Strategy	Priority Area	Implementation Action	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other
					1 and 2	3 and 4	5 and 6	7 and 8	9 and 10			
DSM.8	Acquire surface water quantity data	Priority Streams - Le Sueur Creek, City or Le Sueur - Minnesota River	Establish streamflow monitoring station	Establish 1 permanent streamflow monitoring station and evaluate the monitoring results	1 station	evaluate results	evaluate results	evaluate results	evaluate results	$45,000	**Le Sueur County, DNR**	Local, Other
DSM.9	Acquire groundwater levels data	Le Sueur County	Establish permanent groundwater observation wells	Explore opportunities to establish permanent groundwater observation wells in coordination with county geologic atlas and GRAPS reports.					1 observation well	$50,000	**Le Sueur County, DNR**	Local, Other
DSM.10	Tillage surveys	Watershed-wide	Complete tillage surveys	Complete tillage survey every year for Scott County and every 5 years for Rice and Le Sueur counties	2 tillage surveys	2 tillage surveys	3 tillage surveys	2 tillage surveys	3 tillage surveys	$2,000	**SWCDs**	Local
DSM.11	Hydro-conditioned DEM	Watershed-wide	Complete hydro-conditioned DEM	Complete/finish hydro-condition/DEM process for Le Sueur, Rice, and Scott counties	1 county	1 county	1 county			$90,000	**Counties, SWCDS**	Local, Other
DSM.12	Drainage/ culvert inventory	Watershed-wide	Complete culvert inventories	Complete culvert inventories including elevations where possible	1 culvert inventory		1 culvert inventory			$54,000	**Counties, SWCDS,** drainage authority	Local, Other WBIF
DSM.13	Internal loading feasibility studies	Priority Lakes - Cody/Phelps, LeMay, and Cedar	Complete internal loading studies	Complete 4 internal loading feasibility studies External loading to be addressed prior to investigation of internal loading solutions. Subwatershed analysis studies and practice implementation to be completed prior.				2 internal loading studies	2 internal loading studies	$80,000	**Counties, SWCDs**	All
DSM.14	High value resource ID study	Watershed-wide	Complete high value resources ID survey	Complete a High Value Resource ID Study for Le Sueur and Rice counties.				1 resource study		$50,000	**Counties, SWCDs,** DNR	WBIF, Other

TABLE 4.2: DATA, STUDIES, AND MONITORING IMPLEMENTATION SCHEDULE

	Surface Water Quality					Surface Water Hydrology	Groundwater Quality		Groundwater Knowledge		Habitat Restoration	Habitat Protection and Preservation	
	Sediment and Erosion	Nutrients in Impaired Lakes	Nutrients to Unimpaired lakes	Chloride	E. Coli	Altered Hydrology and Storage	Groundwater Protection - Nitrates	Groundwater Protection - Source Contamination	Groundwater Contamination Education	Data Collection and Monitoring	Riparian Restoration	Identify High Value Natural and Cultural Resources	Permanent Protection
DSM.8						●							
DSM.9										●			
DSM.10	●					●	●						
DSM.11	●	●	●			●	●						
DSM.12						●					●		
DSM.13		●	●										
DSM.14												●	

TABLE 4.3: POLICY AND REGULATION IMPLEMENTATION SCHEDULE

ID#	Strategy	Priority Area	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other
				1 and 2	3 and 4	5 and 6	7 and 8	9 and 10			
PR.1	Compare and review (groundwater related) ordinances (SSTS)	Watershed-wide	Host 1 groundwater ordinance meeting/ workshop and develop a comparison report			1 meeting workshop			$5,000	**Counties, municipalities**	Local, WBIF
PR.2	Compare and review surface water ordinances (shoreland, drainage, buffers, SSTS, floodplain, others)	Watershed-wide	Host 4 surface water ordinance meetings/ workshops and develop a comparison reports	1 meeting workshop	1 meeting workshop	1 meeting workshop	1 meeting workshop		$20,000	**Counties, municipalities**	Local, WBIF
PR.3	Explore options for local policy to incentivize smart salting	Watershed-wide	Develop and implement a smart salting campaign	1 campaign	implement campaign				$150,000	**Counties, municipalities, commercial applicators,** highway and public works departments	All
PR.4	Compare and review stormwater standards in ordinances for volume reduction and peak flows for development	Watershed-wide	Host 4 stormwater ordinance meetings/ workshops and develop a comparison report	1 meeting workshop	1 meeting workshop	1 meeting workshop	1 meeting workshop		$20,000	**Counties, municipalities**	Local, WBIF
PR.5	Compare and review ordinances for municipalities/ townships	Watershed-wide	Host 1 meeting/ workshop to review ordinance for municipalities and townships and develop a comparison report		1 meeting workshop				$5,000	**Counties, municipalities**	Local, WBIF
PR.6	Compare and review of habitat, high value resources, and permanent protection land use and zoning changes	Watershed-wide	Host 1 habitat ordinance meeting/ workshop and develop a comparison report			1 meeting workshop			$5,000	**Counties, municipalities**	Local, WBIF

TABLE 4.3: POLICY AND REGULATION IMPLEMENTATION SCHEDULE

ID#	Surface Water Quality					Surface Water Hydrology	Groundwater Quality		Groundwater Knowledge		Habitat Restoration	Habitat Protection and Preservation	
	Sediment and Erosion	Nutrients in impaired Lakes	Nutrients to Unimpaired Lakes	Chloride	E. Coli	Altered Hydrology and Storage	Groundwater Protection - Nitrates	Groundwater Protection - Source Contamination	Groundwater Contamination Education	Data Collection and Monitoring	Riparian Restoration	Identify High Value Natural and Cultural Resources	Permanent Protection
PR.1							●	●	●				
PR.2	●	●	●	●	●								
PR.3				●									
PR.4	●	●	●										
PR.5	●	●	●	●	●	●	●	●	●	●			
PR.6													●

TABLE 4.4: OUTREACH AND EDUCATION IMPLEMENTATION SCHEDULE

**Outside funding not needed*

ID#	Strategy	Priority Area	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost*	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other
				1 and 2	3 and 4	5 and 6	7 and 8	9 and 10			
OE.1	Education and outreach	Watershed-wide	Develop and implement an education and outreach campaign	1 campaign	implement campaign				$403,750	**SWCDs, counties, WDs,** BWSR, DNR, MPCA, MDH, MDA, UMN, municipalities, Shakopee Mdewakanton Sioux Community	All

TABLE 4.4: OUTREACH AND EDUCATION IMPLEMENTATION SCHEDULE

**Outside funding not needed*

ID#	Strategy	Priority Area	Measurable Output and Outcome	Timeframe (in Years)					Estimated Cost*	Leads and Supporting Entities	Funding Sources Local, State, WBIF, Other	Surface Water Quality					Surface Water Hydrology	Groundwater Quality		Groundwater Knowledge		Habitat Restoration	Habitat Protection and Preservation	
				1 and 2	3 and 4	5 and 6	7 and 8	9 and 10				Sediment and Erosion	Nutrients in Impaired Lakes	Nutrients to Unimpaired Lakes	Chloride	E. Coli	Altered Hydrology and Storage	Groundwater Protection - Nitrates	Groundwater Protection - Source Contamination	Groundwater Contamination Education	Data Collection and Monitoring	Riparian Restoration	Identify High Value Natural and Cultural Resources	Permanent Protection
OE.1	Education and outreach	Watershed-wide	Develop and implement an education and outreach campaign	1 campaign	implement campaign				$403,750	**SWCDs, counties, WDs,** BWSR, DNR, MPCA, MDH, MDA, UMN, municipalities, Shakopee Mdewakanton Sioux Community	All	●	●	●	●	●	●	●	●	●	●	●	●	●

Chapter 5:
Plan Implementation Programs

Chapter 5: **Plan Implementation Programs**

INTRODUCTION

This chapter provides an overview of the key programs that will be used to support and implement the Plan. These programs include incentive programs, cost share programs, capital improvement projects, regulatory and enforcement programs, and education and outreach programs.

5.1 INCENTIVE PROGRAMS

Incentive programs are formal programs used to promote specific actions or behaviors. Various mechanisms can be used for conducting incentive programs, including financial assistance, or providing benefits for enrolling in programs (Table 4.1). The Partnership organizations will strive to coordinate incentive programs to provide consistency across the Planning Area while following the targeting approach identified in Chapter 4 to guide project selection and dispersal of funds. Implementing entities will follow local policies until and unless a watershed-wide policy is developed.

The partners have identified several criteria that will be used to assist with project selection and fund dispersal. These criteria include, but are not limited to, project location, pollutant reductions, water storage achieved, multiple benefits achieved, and implementation in environmental justice areas. The highest ranking projects will be selected to move forward as funding allows.

Cost Share Programs

In a cost share program, the costs of systems or practices that are designed to protect and improve water quality, groundwater, habitat, and soil and water resources are shared between the landowner and a sponsoring entity such as the local, state, or federal government. The BMPs and conservation practices typically eligible are those that avoid, control, and trap nutrients, sediment, and E. coli from entering surface water and groundwater.

Structural practices that may be eligible include sediment control structures or streambank stabilization projects. Nonstructural practices that may be eligible include soil health, cover crops, and manure management planning services as well as implementation of those plans. Eligibility may vary depending on local priorities and needs.

Learn more about the Minnesota Agricultural Water Quality Certification Program!

Scan the QR code or click here:
bit.ly/mn-ag-water-quality-cert-progam

Minnesota Agricultural Water Quality Certification Program

The Minnesota Agricultural Water Quality Certification Program (MAWQCP) provides an opportunity for producers to voluntarily enroll in a conservation based agricultural program. By enrolling, producers agree to participate in a farm review process, which will identify current conservation strengths as well as areas to improve conservation efforts on the farm. The producer then has the opportunity to receive financial assistance to implement and maintain approved farm management practices and obtain certification that their operation protects surface waters from the impacts of agricultural practices. Technical and financial assistance is prioritized for those who enroll but are not yet certified. After participants have been certified, they obtain regulatory certainty for a period of 10 years.

Fee Discounts

Local governments and nonprofit entities may offer reductions in fees for implementing projects and practices that align with program goals. For instance, fee discounts have been provided within the Planning Area through reducing or waiving permit fees for project implementation.

Low Interest Loans

Low interest loans may be available through various state agencies to landowners for ag BMPs, septic system replacement, or other projects that meet funding eligibility criteria. Typically, these funds are applied for by a local government unit, who then works with the landowners to approve the project and enroll the landowner in the low interest loan program. This process allows the local government units to be the day-to-day contact assisting landowners through the process.

TABLE 5.1: EXISTING INCENTIVE/COST SHARE PROGRAMS

Programs	Le Sueur		Rice		Scott		Scott WMO	Lower MN River WD
	County	SWCD	County	SWCD	County	SWCD		
Local Easements					●	●		
Stormwater/Urban BMP Costshare						●	●	
RIM/Federal Easements		●		●		●		
Shoreland BMPs Costshare						●	●	
Tree Sales Program		●		●		●		
Pollinator Programs	●	●		●		●		
Walk-In Access Program		●		●				
Wetland Restoration Program		●		●		●		
Ag BMP Loan Program		●		●	●			
Well Sealing Program		●				●		
Septic Loan program	●				●			
Ag Structural BMP Cost-Share		●		●	●	●		
Ag Nonstructural BMP Cost Share		●		●	●	●		
Minnesota Agricultural WQ Cert Program (MAWQCP)		●		●		●		
Project Maintenance Program						●	●	
Technical Assistance & Cost Share Program						●	●	●
Lawns 2 Legumes		●		●		●		

The partners also have a variety of equipment available, some of which may be rented by landowners. Table 5.2 provides a list of that equipment.

TABLE 5.2: EXISTING EQUIPMENT INVENTORY

Programs	Le Sueur		Rice		Scott		Scott WMO	Lower MN River WD
	County	SWCD	County	SWCD	County	SWCD		
Survey Equipment	●	●		●	●	●		
Dew Drop/Plot Master		●		●		●		
No Till Drill		●		●		●		
Water Monitoring Equipment	●			●		●	●	
Tree Planter		●						
Interseeder				●		●		
UTV		●				●		
Tractor						●		
Seed Drill		●				●		
Boom Spray						●		
ATV		●						
Mower						●		
Watercraft							●	
Drone					●	●		

5.2 CAPITAL IMPROVEMENT PROJECTS

For the purposes of this Plan, capital improvement projects (CIPs) are large-scale projects, more expensive, and have a longer effective life than the projects typically funded through traditional incentive and cost-share programs. The types of projects eligible to be considered as capital improvement typically provide significant, regional benefits and may require feasibility studies before design and construction. These projects require operation and maintenance (O&M) plans for the life of the project, which includes an inspection schedule to ensure the project's effectiveness. An easement and/or land acquisition are both potential components of CIPs. These projects are often completed in coordination with multiple entities and are strong candidates for state or federal grant funding. Costs of CIPs may vary, but usually exceed $500,000.

CIP examples for the JPE include, but are not limited to, Multipurpose Drainage Management (MDM) plans, habitat protection and restoration, stream restoration, ravine stabilization, increasing water storage, water quality protection, and urban stormwater.

Opportunities to implement CIPs in tandem with drainage projects to obtain desired water quantity and water quality improvements will be considered based on the results of multi-purpose drainage management plans that will be developed. All three of the county offices within the Planning Area serve as the drainage authority for the public drainage systems within their boundaries. As such, the county representatives in the partner meetings will regularly communicate with their drainage staff to ensure that drainage projects are consistent with the goals of the Plan, and to identify opportunities for partnership based on the work of the drainage authority and the work of the SWCD partners. Where possible, the Partnership will assist drainage authorities in integrating water storage, water quality, and habitat improvements into drainage projects by securing grant and low interest loan funds, as well as providing technical expertise. The Partnership may also coordinate meetings with other key partners in multi-purpose drainage projects, such as the DNR, road authorities, and the USACE. Within the Planning Area, opportunities to implement large scale projects will generally depend on the ability to secure the necessary funding through grants and loans. Funding options to complete these projects will be explored by the partnership during the development of each biennium's workplan. Though a specific CIP implementation table has not been developed for the Plan document, the partners intend to develop CIPs as appropriate to achieve the goals of the Plan in a more cost-effective manner than the traditional BMPs currently incorporated in the implementation table.

In addition to the CIPs taken on by the JPE, Prior Lake - Spring Lake Watershed District, Lower Minnesota River Watershed District, and the Scott Watershed Management Organization each have a CIP program that they will continue to implement.

SCOTT WATERSHED MANAGEMENT ORGANIZATION COMPREHENSIVE WATER RESOURCES MANAGEMENT PLAN

bit.ly/Scott-WMO

LOWER MINNESOTA RIVER WATERSHED DISTRICT WATERSHED MANAGEMENT PLAN

bit.ly/Lower-MN

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT WATER RESOURCES MANAGEMENTPLAN

bit.ly/PL_SL

5.3 OPERATION AND MAINTENANCE PLANS

After BMP and CIPs have been completed, regular inspections and maintenance are important to keep the project functioning at its design capacity and life expectancy. The parties responsible for operations and maintenance (O&M) inspection procedures and enforcement will vary based on the type of project, funding entity, and contractual requirements. O&M plans must be prepared before construction. The O&M plan should include expected maintenance activities, timing of activities, and an inspection schedule. Information should also be developed on the procedure to be followed if the inspection determines maintenance is required or if required maintenance has not been performed, including potential penalties or enforcement actions. Minnesota State Rules 8400.1700 and 8400.1750 outline program requirements for projects funded through state cost-share programs.

Inspections should be conducted on a regular basis and after significant weather events throughout the life of the practice to confirm that the O&M plan is being followed and that the practice is still performing as designed. Staff conducting inspections should be trained and have the appropriate signing approvals in place. Staff may also choose to hire an outside firm to complete inspections if additional expertise is needed. Site inspections should include a written record, photographs, a report regarding the status of the practice, and an outline of repairs or maintenance required. Inspection records should be kept throughout the life of the practice to verify maintenance activities. Ultimately, local staff will determine the appropriate level of rigor required in an O&M plan for a given project, provided that all funding requirements are met within the O&M. BWSR's recommended time frames for inspections are as follows:

- Conservation practice with a minimum effective life of 10 years: during years 1, 3, and 9 following the certified completion.
- CIPs having a minimum effective life of 25 years: during years 1, 8, 17, and 24 following certified completion is a recommended minimum.
- Some CIPs may warrant more frequent inspections to ensure project effectiveness.
- Relevant inspection schedules may be developed by the local partners as deemed necessary.

If easement encroachments or maintenance requirements are not corrected within the designated time frame, the authorities vested in local government units, as well as state and funding agencies, will be used to compel compliance.

Learn more about Minnesota State Rules 8400.1700!

Scan the QR code or click here:
revisor.mn.gov/rules/8400.1700/

Learn more about Minnesota State Rules 8400.1750!

Scan the QR code or click here:
revisor.mn.gov/rules/8400.1750/

TABLE 5.3: EXISTING OPERATION & MAINTENANCE PROGRAMS								
Programs	Le Sueur		Rice		Scott		Scott WMO	Lower MN River WD
	County	SWCD	County	SWCD	County	SWCD		
Ditch Inspection		●		●		●		
Illicit Discharge Enforcement					●			
Stormwater facility maintenance					●			
Flood Control Structure maintenance					●			
Stormwater BMPs maintenance					●			

5.4 OUTREACH AND EDUCATION PROGRAM FRAMEWORK

Education and outreach are essential components of plan implementation as the success of this plan relies on individuals changing their behavior and adopting practices that reduce their impact on natural resources within the Planning Area. This section of the Plan outlines the framework for the education and outreach program, and the necessary components of the program that will be utilized during the implementation period. Due to the importance of this program, the Lower Minnesota River East Watershed Joint Powers Board (LMREWJPB) may decide to hire additional staff to carry out the implementation work on behalf of the Partners. Additionally, the Partners may consider hiring and or working closely with a soil health specialist or conservation agronomist, who is trusted and supported by local landowners, to achieve the implementation actions identified within the Plan.

The partners started discussions on education and outreach based on their existing programs, as shown in Table 5.4.

The Partners developed an education and outreach program consisting of two primary components. The first component of the education and outreach program features a menu style approach. Much like selecting desired options from the various menu sections at a restaurant to craft an ideal meal, the Partners will utilize the education and outreach menu during work planning to identify the appropriate campaign topic and desired message to relay, along with corresponding priority level and plan goals, then defining the appropriate audience and partners, and finally selecting the best implementation strategies to successfully execute the campaign. Menu categories have been populated and included in the following pages for reference during implementation, however, they are by no means intended to restrict the education and outreach activities the Partners may utilize in the development of various campaigns. Rather, the menu content provided is intended to outline the process and several possible options that may be utilized.

The second component is a traditional implementation table that provides an overview of anticipated costs for education and outreach campaigns.

TABLE 5.4: EXISTING EDUCATION AND OUTREACH PROGRAMS

Programs	Le Sueur		Rice		Scott		Scott WMO	Lower MN River WD
	County	SWCD	County	SWCD	County	SWCD		
Aquatic Invasive Species Program	●				●			
Awards Program		●		●		●		
Farmer Forum						●		
K-12 Education	●	●		●		●		
Household Hazardous Wastes Program	●				●			
Outdoor Education Days				●		●		
Social Media		●		●	●	●		
Newsletters	●	●		●	●	●	●	
Tours and Demonstrations		●		●		●	●	
Shoreland Program	●				●	●		
Septic Program	●				●			
Educator Mini Grant								●
Clean water Education Program						●	●	●
Water Testing Clinics	●					●		

Menu Approach

The first step in the menu approach is to identify the desired campaign topic, its corresponding priority level in the Plan, and the Plan goal(s) being addressed. Table 5.5 includes campaign topics that were discussed during the planning process as a starting point. Additional campaign topics may be developed throughout plan implementation.

TABLE 5.5: EDUCATION AND OUTREACH CAMPAIGN TOPICS

Campaign Topic	Priority Level	Associated Goal
Smart Salting/Chloride Awareness	High	Surface Water Quality – Chloride
Upland Water Storage	High	Surface Water Hydrology – Altered Hydrology and Storage
Soil Health	High	Surface Water Quality – Sediment/Erosion
Riparian Landowner Education	High	Surface Water Quality – Sediment/Erosion
Habitat and Streambank Restorations	High	Habitat – Riparian Restoration Surface Water Quality - Sediment/Erosion
Groundwater Quality Testing, Well Testing – Groundwater Contamination	High	Groundwater Quality – Groundwater Protection - Source Contamination
Building Collaborations (Farmer Led Council, Peer Groups, Non-Governmental Organization (NGO) partnership, etc.)	High	All
Infiltration BMPs	Medium	Groundwater Quality – Groundwater Protection Surface Water Quality
Point Sources, SSTS, and Manure Management	Medium	Groundwater Quality – Groundwater Protection, Surface Water Quality – E. coli
Easements/Protected Lands	Medium	Habitat – Protection and Preservation
One Watershed One Plan Updates and Notifications	Medium	All

The order in which the type of audience, messages, and education/outreach strategies that are formulated depends on the campaign topic. If multiple target audiences are identified, it will be important to determine whether the audiences require different information or if the goal of the efforts are different. If so, separate campaigns should be developed for each respective audience, though some materials developed may overlap.

The Advisory Committee participated in an activity that prioritized categories of outreach and education efforts. The categorization consisted of high and medium priority efforts. High priority education and outreach efforts were deemed necessary to meeting high priority goals of the Plan and medium priority education and outreach efforts were categorized as opportunities based on availability of funding and capacity to address lower priority goals of the Plan. Priority levels may change over time based on the needs to support the planning efforts.

DID YOU KNOW?

Cooperatives, commonly called Co-ops, are a farm, business, or other organization which is owned and run jointly by its members, who share the profits or benefits.

Farmer-owned co-ops help producer-members market and process their crops and livestock, as well as secure needed production supplies and services.

TABLE 5.6: TARGET AUDIENCE
Policy Makers
Agricultural Landowners
Urban Residents, Businesses, and Municipalities
Shoreline Residents, Businesses, and Municipalities
Schools/Students
Community Groups
Private Well Owners
Other - Define

Once the campaign topic has been selected, the message has been defined, and the target audience has been identified, the partners need to understand why the targeted audience should care about their message. This step will be essential for successfully engaging the targeted audience (Table 5.6).

The partners will work to help their audience understand how their actions can impact water quality and quality of life in the watershed. The partners will strive to understand the needs and interests of their target audience, providing relevant information to address concerns, appeal to their values, and build trust. A well-crafted outreach program will strengthen relationships and build local capacity for conservation within the Planning Area for years to come.

Next partners for the campaign should be identified. The list provided in Table 5.7 is by no means a comprehensive list, but merely a starting point for consideration.

TABLE 5.7: SUPPORT AND PARTNERS
Minnesota Well Owners Organization (MNWOO)
University of Minnesota Extension
Farmer Led Conservation Council (to be developed)
State Agencies

TABLE 5.7: SUPPORT AND PARTNERS
Peer Groups (to be developed)
Cooperatives
NGOs (e.g., Pheasants Forever, The Nature Conservancy, etc.)
Southern Minnesota Sportsman's Club

Finally, strategies should be selected to deliver the desired education and outreach information. Table 5.8 provides strategies for consideration.

TABLE 5.8: EXAMPLE STRATEGIES

Strategies	Examples	Estimated Cost Per Item
Workshop or Field Day	Groundwater testing clinic, well testing clinic, and SSTS training for professionals and homeowners	$2,500
Youth Education	School visit, outdoor activity, and Waterfest	Varies
Newspaper/Newsletter Articles	Groundwater pollutants and prevention, and One Watershed One Plan progress updates	$200
Social Media Posts	Project success stories, and upcoming opportunities for implementation	$60
Educational Site Visits	Peer site visits to show project success, and on-farm demonstration and research	$1,000
Meetings	Educating policy makers on a specific topic such as groundwater	$200
Direct Mailing, Phone Calls, Emails, or Home Visits	Outreach regarding nitrogen application restrictions	Varies
Trainings and Classes	Educational webinar on specific BMPs, smart salting training	$500

Estimated costs provided in Table 5.8 Example Strategies are the costs estimated for a single occurrence of each item or event along with the necessary preparation for the item or event.

Several necessary education and outreach campaigns were identified during the planning process and will need to be developed during plan implementation. The initial framework for those campaigns is included below. The program includes both outreach and public engagement activities. Outreach activities are typically prepared and delivered to various targeted audiences. These activities are structured, and communication is typically one-way with the goal of informing the targeted audience. In comparison, public engagement activities are structured to generate active participation with the targeted audience. This active participation is beneficial to work with the audience and build trust and address questions or concerns.

CAMPAIGN 1: SMART SALTING/ CHLORIDE AWARENESS

Develop a chloride campaign for Rice and Le Sueur counties. Scott County will continue using their existing chloride plan and will share materials and insight with Rice and Le Sueur counties.

Audiences: decision makers/policy makers, municipalities, county staff, private applicators/ contractors, property managers, homeowners

Focus Point: Smart Salting/Smart Applicator trainings to take place 1-2 times per year

CAMPAIGN 2: HABITAT AND STREAM RESTORATIONS

This is a focus specifically for Le Sueur County

Audience: landowners, policy makers

Focus Points: building relationships and teaching about stream restorations

CAMPAIGN 3: GROUNDWATER QUALITY TESTING, WELL TESTING - GROUNDWATER CONTAMINATION

Improve Groundwater Knowledge by Supporting County Activities

Audience: staff and general public - need to develop one campaign for each audience

Focus Point: Local partners (County, SWCD, and other LGU staff) attend Private Well Forum

CAMPAIGN 4: POINT SOURCES, SSTS, AND MANURE MANAGEMENT

Voluntary Manure Management Plans

Audience: hobby and small farmers that are not required to have a plan

Focus Point: how would having a plan help them and why should they care?

LAND USE MANAGEMENT

Planning for growth and land use changes in a way that is suitable for the resource is important to protect natural resources within the Planning Area from anthropogenic activities. Federal, state, and local land use management control programs provide the regulatory mechanisms that support land use planning activities by outlining compliance criteria for associated land use actions. All JPE partners have some level of regulatory authority. This commonality will allow for conversations on regulatory consistency, identification of gaps, and planning to address gaps within the context of regular partner meetings. This section outlines both land use management planning and land use management control programs within the Planning Area.

Land Use Management Plans

County and municipal comprehensive or land use management plans are important tools that guide future land management activities to prevent harmful impacts to environmental and economic components of the Planning Area. These plans indicate where orderly growth will occur and must include goals for protecting open space and the environment. The goals and objectives contained in comprehensive plans are reflected in the zoning ordinances, permit standards, and conditional use criteria that the county or municipality employs to ensure the comprehensive land use management plan goals are obtained. The date of the most recent comprehensive land use management plans for each county is listed in Table 5.9.

TABLE 5.9: COMPREHENSIVE LAND USE PLANS AND ADOPTION DATES

Local Governmental Unit	Adoption Date
Le Sueur County	July 2007
Rice County	October 2021
Scott County	June 2019

Land Use Management + Existing Regulatory Controls

LGUs, including counties, cities, townships, and watershed districts, are responsible for regulating land-use controls and implementing various state programs and legislation, such as the DNR Shoreland Management Program and Minnesota's Wetland Conservation Act. In addition to local controls, federal and state laws, regulations, and rules are in place that relate to watershed and natural resource management. In addition to the County and SWCD partners, the Planning Area has two watershed districts that also have regulatory authorities. Regulatory controls most related to watershed management are presented in the Existing Regulatory Controls section below and Table 5.10.

Recommendations

A key aspect of a successful land use management program is the consistent application of standards and criteria in planning, zoning, and permitting as well as enforcement of land use management controls. Opportunities exist for land use authorities to achieve consistency and manage planning for the long-term protection of watershed resources in a way that balances economic growth with ecological and environmental needs. The following land use management planning and control recommendations are included in the implementation tables:

- Implementation of restored wetlands in targeted areas.
- Restoring and protecting native habitat in riparian areas.
- Updating existing septic systems that are non-compliant.

Influencing State Policy

The Partnership members are eligible to participate in their respective statewide associations, including but not limited to the Minnesota Association of Soil and Water Conservation Districts (MASWCD), Association of Minnesota Counties (AMC), League of Minnesota Cities (LMC), and Minnesota Watersheds. Each association has a resolution and policy process and platform. The JPE will review issues of significant importance and brainstorm potential policies to improve regulatory support on an annual basis. Additionally, the JPE will seek opportunities to improve watershed management programs through various channels including local, regional, and statewide organizations.

TABLE 5.10: EXISTING REGULATORY PROGRAMS

An LGU may choose not to have an ordinance for every area that it has legal regulatory authority over.

Programs	Le Sueur		Rice		Scott		Scott WMO	Lower MN River WD
	County	SWCD	County	SWCD	County	SWCD		
Buffer	●	●		●	●	●		
Erosion Control & Stormwater Management	●			●	●			
Feedlot Ordinance	●				●			
Shoreland Ordinance	●				●			
Septic Ordinance	●				●			
Soil Loss Ordinance								
Zoning Ordinance	●				●			
Well Ordinance	●							
Wetland Conservation Act Authority		●		●		●		
Subsurface Sewage Treatment System Program	●				●			
Well Program	●							
Wild & Scenic Rivers Regulations								
Solid Waste Program	●				●			
Steep Slope Rule								●
High Value Resource Rule								●
Floodplain & Drainage Alteration Rule					●		●	●
Aquatic Invasive Species Program	●				●			

Wetland Management

There are regulatory controls that govern the discharge of dredged or fill materials into waters of the United States, including wetlands. The USACE and EPA share responsibilities for implementing Section 404 of the Clean Water Act. Section 401 of the Clean Water Act requires certification of water quality compliance measures. This certification is a requirement of various federal permit programs and is implemented at the state level by the MPCA. USDA implements the Federal Farm Bill policies regarding draining or filling wetlands for farm program participation. Minnesota also has the Wetland Conservation Act (WCA) that is intended to result in "no-net loss" of wetlands through various mitigation, replacement, and permitting activities. BWSR administers the program however, the program is implemented through local governments. The WCA entities within the Planning Area are Le Sueur SWCD, Rice SWCD, and Scott SWCD.

REGULATIONS: MN Statute portions of 103B, MN Statute portions of 103G, MN State Rules Chapter 8420

Floodplain Management

The Federal Emergency Management Agency (FEMA) administers federal floodplain management, mapping, insurance, and flood-assistance programs. The DNR oversees the state program and administers the National Flood Insurance Program for the state. Local zoning regulations identify permitted land use in the floodway, flood fringe, and floodplain.

Shoreland Management

Minnesota has shoreland management standards that are identified in rules and are overseen by the DNR. Local governments are required to adopt land-use controls that protect shorelands along rivers and lakes. Ordinances may be more restrictive depending on the local government units. Within the Planning Area, Le Sueur and Rice counties have shoreland management ordinances.

REGULATIONS: MN Statute 103F, MN State Rules 6120.2500–3900

Buffer Management

Buffers are required on public waters and public drainage ditches. According to legislation enacted in 2015, buffers of perennial vegetation are required to be an average of 50 feet with a minimum of 30 feet on public waters and 16.5 feet on public drainage ditches. Flexibility is provided if other practices are implemented and provide the same water quality benefit as a buffer. Exceptions are allowed for areas that are covered by roads, buildings, or other structures; areas that are enrolled in the Environmental Quality Incentives Program (EQIP); public-water accesses; and municipalities that follow federal and state stormwater requirements. BWSR is the regulatory authority of this program, which is operated at the county level. Three of the six local government units within the Planning Area (Le Sueur County, Rice County, Rice SWCD) have buffer management ordinances.

REGULATIONS: Minnesota Statute 103B, Minnesota Statute 103F.48, Subd. 4

Point Source Pollution Regulations

Mandates regulating point sources of pollution were a major component of the Clean Water Act which was passed in 1972. The U.S. Environmental Protection Agency is responsible for regulating point sources through the National Pollutant Discharge Elimination System (NPDES). The Minnesota Pollution Control Agency (MPCA) implements this program, which includes municipal sewage treatment plants, industrial discharges, stormwater, and concentrated animal feeding operations (CAFOs) at the state level. Minnesota has general permits that govern activities such as confined animal feedlots and the standards are outlined in state rule.

REGULATIONS: MN Statute 115, as amended, MN Statute 116, as amended, MN Rules Chapter 7001, MN Rules Chapter 7050, MN Rules Chapter 7052, MN Rules Chapter 7060, MN Rules Chapter 7090

Municipal Separate Storm Sewer Systems (MS4)

Discharges from certain municipal separate storm sewer systems (MS4s) are regulated under the NPDES which was developed as a result of the federal Clean Water Act. There is a total of twelve MS4 systems wholly or partially within the Planning Area: City of Prior Lake, City of Savage, City of Shakopee, Credit River Township, Shakopee Mdewakanton Sioux Community, Jackson Township, Louisville Township, Spring Lake Township, Scott County, Prior Lake - Spring Lake Watershed District, MNDOT Metro District, and portions of City of Elko New Market. Compliance with MS4 regulations is managed on the state level through the MPCA.

Minnesota Well Code

Minnesota well code regulates activities such as well abandonment and sealing, as well as the installation of new wells and borings. It is administered and enforced by the Minnesota Department of Health through its Well Management Program.

REGULATIONS: MN Rules 4725 and MN Statute 103

Wellhead Protection

Protection of public drinking water sources is accomplished by preventing human-caused contaminants from entering wells used by public water supply systems through the development and implementation of a Wellhead Protection Plan. The Minnesota Department of Health administers the state's Wellhead Protection Rule and assists public water systems with their Wellhead Protection Plans. Plans include the delineation of a wellhead protection area, an inventory of potential contaminant sources in the wellhead protection area, and other information to assist the public water system in managing their water supply. A wellhead protection area is the surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field within a specified timeframe (typically 10 years). The wellhead protection area is then translated into a boundary of roads or property lines to aid in management, which results in the drinking water supply management area (DWSMA). There are a handful of DWSMAs within the Planning Area, including those for 11 municipal water systems.

REGULATIONS: MN Rule 4720, MN Statute 103

Subsurface Sewage Treatment Systems

The goal of the Subsurface Sewage Treatment Systems (SSTS) program is to protect the public health and the environment by adequately dispersing and treating domestic sewage from dwellings or other establishments that generate volumes less than 10,000 gallons per day. SSTS requirements are adopted and enforced locally. Counties and SWCDs in the Planning Area may have grants and or low interest loans available for SSTS upgrades for individuals that meet limited income qualifications.

REGULATIONS: MN Statute 115.55, MN Statute 115.56, MN Rules Chapter 7080, MN Rules Chapter 7081, MN Rules Chapter 7082, MN Rules Chapter 7083

Waste Management

Waste management permitting and regulatory programs are implemented by the MPCA. These programs include hazardous waste, storage tanks, and solid waste. Local land-use and zoning controls may regulate whether waste storage and handling facilities are a compatible use. Le Sueur County and Rice County have solid waste ordinances.

REGULATIONS: MN Statute 115.55, MN Rules Chapter 7001, MN Rules Chapter 7035, MN Rules Chapter 7045, MN Rules Chapter 7150, MN Rules Chapter 7151, MN Rules Chapter 9215, MN Rules Chapter 9220

Groundwater/Surface Water Use (Siting Wells)

A water use (appropriation) permit from DNR Division of Ecological Water Resources is required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year. DNR is required to manage water resources to ensure an adequate supply to meet long-range seasonal requirements for domestic, agricultural, fish and wildlife, recreational, power, navigation, and quality control purposes. SWCDs and planning and zoning offices are offered the opportunity to comment on these permit applications.

REGULATIONS: MN Statute 103G, for appropriation, MN Statute 103H, 1989 Groundwater Act

Invasive Species

DNR has regulatory authority over aquatic plants and animals, and terrestrial vertebrates. The Minnesota Department of Agriculture (MDA) has regulatory authority over terrestrial plants (noxious weeds) and plant pests. Each county has an agriculture inspector whose responsibility is to ensure that all laws and rules related to noxious weeds are carried out. There is no counterpart for aquatic plants and animals or terrestrial vertebrates, however, Le Sueur and Rice counties have aquatic invasive species regulatory programs.

Feedlots

The MPCA administers the feedlot regulations in Minnesota. Additionally, counties in the state may be delegated by the MPCA to administer the program for feedlots that are not required to have a state or federal permit. Le Sueur County and Rice County are delegated counties and as such manage their own programs. Each program must include permitting, inspection, and registration. Each county will maintain delegated authority during the Plan implementation.

REGULATIONS: MN Rules Chapter 7020

Public Waters

The DNR administers the Public Waters Work Permit Program which regulates activities below the Ordinary High Water Level (OHWL) in public waters and wetlands. There are many activities that require a Public Waters Work Permit, and permits must be received prior to work beginning. Activities that may require this permit include excavation, dredging, filling, putting in structures, and shoreland protection measures.

REGULATIONS: MN Statute 103G.245

Extraction/Extractive Use

Counties are responsible for administering land use controls for extraction.

EXTRACTIVE USE means the use of land for the removal of surface or subsurface sand, gravel, rock, industrial minerals, a nonmetallic mineral, or peat not regulated by Minn. Stat. §§ 93.44—93.51 and amendments thereto.

Extractive Use mining may include construction sand and gravel used in:

- Concrete
- Aggregates
- Concrete products
- Asphalt
- Road base
- Fill
- Snow and ice control
- Other miscellaneous uses

EXTRACTIVE USE
the use of land for the removal of surface or subsurface sand, gravel, rock, industrial minerals, a nonmetallic mineral, or peat not regulated by Minn. Stat. §§ 93.44—93.51 and amendments thereto.

ARABLE
land used or suitable for growing crops

Public Drainage Systems

Artificial drainage (subsurface drainage tile and open ditches) was used historically to increase the amount of ARABLE land. Over the past several decades, more extensive tiling (pattern tiling) has been used to optimize crop production by ensuring soil moisture does not prevent planting at the optimal time or create undesired crop stress due to excess soil/surface moisture.

Public drainage systems are publicly managed drainage systems that provide outlets for private tile and ditches. Management of public drainage systems by drainage authorities (typically counties or watershed districts) is governed by Minn. Stat. §§ 103E. Drainage authorities work with landowners to ensure adequate drainage and enforcement of relevant regulations (e.g., buffer requirements). Le Sueur County and Rice County serve as the drainage authority for public drainage systems within their boundaries.

Cultural Resources

The National Historic Preservation Act (NHPA) of 1966 governs the protection of cultural resources. The NHPA requires federal agencies to consider the effect of their activities on historic properties; in practice this is achieved in partnership with State/Tribal Historic Preservation Offices. Minn. Stat. §§ 138 designates the Commissioner of the Department of Administration as the Historic Preservation Officer and assigns responsibility for the program with the State Historic Preservation Office (SHPO).

The Minnesota Field Archaeology Act mandates licensing for archaeological work on non-federal public land and requires state agencies to coordinate with the State Archaeologist, SHPO, and the Minnesota Indian Affairs Council for review when working in areas of known or suspected archaeological sites. The Minnesota Historic Sites Act establishes the State Historic Sites Network and the State Register of Historic Places and requires state agencies to consult with the SHPO before undertaking or licensing projects that may affect listed properties.

Other pertinent regulations come from The Minnesota Private Cemeteries Act, which protects all human remains on public or private land in Minnesota; the Minnesota Environmental Rights Act; and MN Environmental Quality Board rules regarding Environmental Assessment Worksheets and Environmental Impact Statements.

Endangered and Threatened Species

Minn. Stat. §§ 88 .0895 governs protection of threatened and endangered species and defines species with special protection as follows: endangered species are those threatened with extinction throughout all or a significant portion of its range; threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of its range; and species of special concern are those that are not endangered or threatened, but are extremely uncommon in Minnesota or have unique or highly specific habitat requirements and deserve careful monitoring.

DNR is required to adopt rules designating species as endangered, threatened, or species of special concern. Species are also protected at the federal level and their protection status is determined by the US Fish and Wildlife Service (USFWS). Species with state or federal protection status are shown in Chapter 1. With respect to the Northern long-eared bat (NLEB), USFWS may regulate tree removal or other activities if they are conducted:

- Within 1/4 mile of an entrance to a known NLEB hibernaculum
  (a cave, mine, or other feature in which NLEBs have been documented to overwinter)
- Within 150 feet of a known NLEB maternity roost tree
  (a tree in which a female NLEB has been documented to roost)

MONITORING PROGRAM

An important component of watershed management is understanding watershed conditions and trends. It is also important to gain knowledge about our lesser understood resources. Data obtained through research and monitoring programs provides the information that allows implementation actions to be adapted and tailored to meet changing conditions. This section of the Plan presents information about current monitoring and data gathering efforts (Tables 5.11 and 5.12), identifies potential future data gathering and research efforts, and provides information about the organizations and programs that are involved in monitoring and research efforts.

Data collected through locally led efforts will use industry standard methods and protocols and will be integrated in locally led modeling and resource management projects. Data acquired through local efforts may be submitted to the appropriate state agency. State agencies are responsible for updating state sponsored modeling and resource assessment efforts, such as the Hydrological Simulation Program – Fortran (HSPF) and WRAPS programs, with the data acquired through local efforts. Within the Planning Area, much of the monitoring is conducted by state agencies and local volunteers, as well as the Met Council, Scott WMO, Prior Lake - Spring Lake Watershed District, and the Lower Minnesota River Watershed District.

TABLE 5.11: CURRENT MONITORING

Surface Water	
Streams	The MPCA's Watershed Pollutant Load Monitoring Network (WPLMN) measures and compares data on pollutant loads from Minnesota's rivers and streams and tracks water quality trends. Data are collected along major river main stems, at major watershed (i.e., HUC-8) outlets to major rivers, and in several subwatersheds. The main monitoring gauge within the Planning Area is located in the Minnesota River near Jordan which is managed by USGS and tracks stream flow and volume. An additional gauge was located near the outlet of the Minnesota River at Fort Snelling. The gauge was operational from 2004 until 2019 when it was destroyed from flooding. The Fort Snelling gauge was an important gauge for evaluating pollutant loading.
	The MPCA conducts biological and stream monitoring roughly every 10 years as a part of the Intensive Watershed Approach. The first round of monitoring in the Planning Area began in 2015 and the second round is scheduled to begin in 2025.
	The MPCA's Volunteer Water Monitoring Program provides records of water body transparency. This program relies on a network of volunteers who measure transparency approximately monthly.
	Discharges from permitted municipal and industrial wastewater sources are reported through discharge monitoring records; these records are used to evaluate compliance with NPDES/SDS permits. Summaries of discharge monitoring records are available through the MPCA's Wastewater Data Browser.
	Tracking of implementation activities is conducted by both BWSR (i.e., eLINK) and the United States Department of Agriculture. Both agencies track the locations of BMP installations. Tillage transects and crop residue data are collected periodically and reported through the Minnesota Tillage Transect Survey Data Center. BMP tracking information is readily available through the MPCA's "Healthier Watersheds" webpage.
	Stream water monitoring data includes analysis of a variety of potential pollutants such as Phosphorus, Ortho-phosphorus, Total Suspended Solids, Nitrate and Nitrite, Dissolved Oxygen, and Temperature.
	MPCA's Environmental Data Access (EDA) system features data from surface water monitoring sites located around Minnesota. Where available, you can also view the conditions of lakes, rivers or streams that have been assessed.
	Scott WMO has a water quality monitoring program to track long-term water quality trends; provide a scientific basis to identify, target and design programs and projects to meet goals; and to evaluate project and program effectiveness and progress towards water quality goals. The WMO also works closely with the Metropolitan Council and DNR to coordinate and collaborate with monitoring efforts. Detailed monitoring areas and sampling parameters are included in the Scott WMO Comprehensive Water Resources Management Plan.
	The Metropolitan Council Environmental Services monitors water quality and flow on some of the major streams in the seven-county Metropolitan Area, including Sand Creek and Credit River. These streams are monitored near their outlets to the major rivers to attempt to assess nonpoint source pollution.

TABLE 5.11: CURRENT MONITORING	
Lakes	Lake water monitoring data includes analysis of a variety of potential pollutants with a focus on Phosphorus, Water Clarity, Dissolved Oxygen, Chlorophyll a, and Temperature.
	The MPCA conducts lake monitoring roughly every 10 years as a part of the Intensive Watershed Approach. The first round of monitoring in the Planning Area began in 2015 and the second round is scheduled to begin in 2025.
	The MPCA's Volunteer Monitoring Program provides useful information on lake water clarity which is used to calculate long-term water clarity trends.
	Sponsor organizations such as counties, cities, watershed districts, and other local governments utilize the Citizen-Assisted Monitoring Program (CAMP) through the Metropolitan Council for lake monitoring. CAMP is a partnership to collect and analyze scientifically valid water-quality data from lakes in the seven-county Twin Cities area. Under CAMP, sponsor organizations recruit volunteers to track water quality in local lakes. Each volunteer monitors a specific site on a lake on a regular basis from mid-April through mid-October (every two weeks is most common). Volunteers collect a surface water sample, measure water temperature and clarity, and report weather and lake conditions.
Groundwater	
Numerous organizations are involved in monitoring groundwater quality and quality. Figure 5.1 - Schematic of Agencies Involved in Groundwater Monitoring (Courtesy of BWSR) provides an overview of the state agencies involved in monitoring groundwater.	
The MPCA monitors water quality conditions in two ambient groundwater monitoring wells within the Planning Area.	
The DNR monitors groundwater levels in two wells within the Planning Area. One well has been monitored since 1980 and the other well has been monitored since 2000.	
The MDA administers the Township Testing Program (TTP) which focuses on townships considered vulnerable to groundwater contamination and have significant row crop production.	
The MDH requires all new wells (since 2008) be tested for arsenic when they are drilled.	
Scott County provides well water test kits to the public and reports results of the test kits as public information. Parameters tested for include: coliform bacteria, nitrate+nitrite, fluoride, manganese, arsenic, and lead.	
Climate	
Periodic summaries of recent and long-term weather-reporting station data may be helpful in modifying monitoring activities and interpreting data to reflect weather variability. A climate summary is available from the Department of Natural Resources: http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/climate_summary_major_33.pdf	
Data from weather networks such as NWS and CoCoRaHS may also be helpful when analyzing monitoring data. Data from these programs includes precipitation and temperature data.	

TABLE 5.12: EXISTING DATA COLLECTION AND MONITORING PROGRAMS

Programs	Le Sueur		Rice		Scott		Scott WMO	Lower MN River WD
	County	SWCD	County	SWCD	County	SWCD		
Precipitation Monitoring		●		●		●		
Lake Water Monitoring						●	●	
Stream Water Monitoring						●	●	
Ambient Well Monitoring						●		
River/Stream Gauges						●		
Well Water Testing	●				●	●		
GIS Inventory of Wells					●			
GIS Inventory of Septics					●			
GIS Inventory of Stormwater/Urban BMPs						●		
GIS Inventory of Ag BMPs						●		

QUALITY

- Pesticides
- Fertilizer

- Public water supply
- Well construction
- Health risk assessment

- Chemical release
- Industrial pollutants

QUANTITY

- Water supply/availability
- Natural resource/ecosystem functions

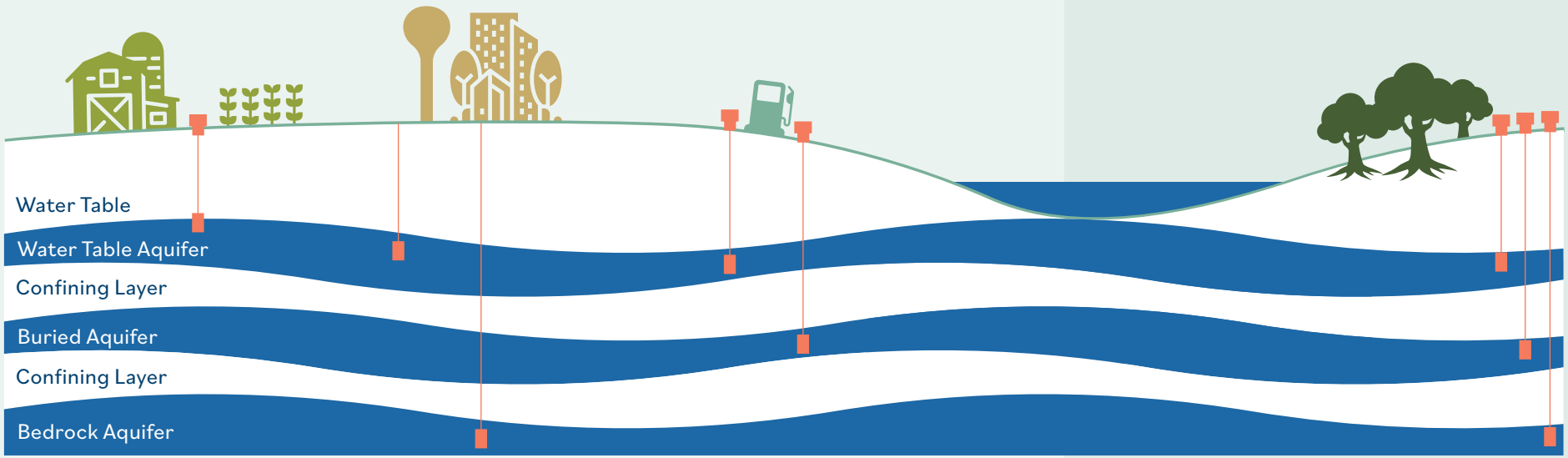

Figure 5.1: Minnesota State Agency Roles in Groundwater

Future Monitoring Considerations, Resources, and Goals

While the partnership has been proactive in collecting data and understanding resource issue concerns throughout the watershed, the partners feel additional data is needed to address monitoring and assessment gaps. Gaps in the Planning Area that have been identified by the partnership include: nitrate and arsenic trends, peak flows and volumes to the Minnesota River, near/in channel erosion issues in priority streams and along the Minnesota River, groundwater and geology connections, understanding and awareness of resource concerns within the watershed. A summary of monitoring, data acquisition, and studies anticipated over the 10-year plan period are captured in Table 4.2. Additional details for these monitoring activities are provided in the implementation schedule located in Chapter 4.

During the 10-year lifetime of this Plan, the MPCA plans to complete the second round of monitoring and update the Lower Minnesota River Watershed Restoration and Protection Strategies (WRAPS) report. The MDH also plans to complete the Groundwater Restoration and Protection Strategies (GRAPS) report within the next 10 years. Additional monitoring, community engagement, and modeling completed for the state-led initiatives may further inform this Plan. The partners will consider updating their Plan based on new monitoring data during the 5 year plan assessment period.

TABLE 5.9: FUTURE MONITORING AND DATA COLLECTION EFFORTS

Area	Effort
Waterbodies	Water quality monitoring
	Increase volunteer lake monitoring program participation
	Feasibility studies for streambank stabilization, restoration, or remeanders
	Complete in-lake management feasibility studies
Upland	Complete a high value resource ID study
	Complete and use Multi-purpose Drainage Management plans to partner with drainage authorities
	Complete and use subwatershed analyses
	Update LiDAR, aerial imagery, culvert inventories, and hydrologically conditioned DEM
	Tillage surveys
Groundwater	Septic system inventory
	Private well monitoring
	Well inventory
	Complete County Geologic Atlas for entire Planning Area

Chapter 6:
Plan Administration and Coordination

Chapter 6: **Plan Administration and Coordination**

A Memorandum of Agreement (MOA) was established by the planning partners for development of the Plan. Throughout the planning process, numerous discussions occurred regarding the type of administration the Partners would like to utilize to implement the Plan. The PC recommended the establishment of a Joint Powers Entity (JPE) named the Lower Minnesota River East Watershed Partnership (LoMRE) with the powers and authorities outlined in the Joint Powers Agreement (JPA). The JPA for the plan implementation establishes a new entity with a governing board that operates autonomously from the members. The JPA, once finalized, is legally binding and must meet the requirements of Minnesota Statue 471.59.

Committees

The committees that were created for the development of this Plan will continue in largely the same fashion with slight changes as needed to effectively implement the Plan. The parties agree to continue using the Steering Team, which will become the Implementation Team and be comprised of LGU staff; the Advisory Committee (AC) comprised of LGU, state agency, and interested conservation organization representatives.

JOINT POWERS BOARD

The Joint Powers Board (LMREWJPB) will be made up of one appointed representative of each participating entity. The JPA details the governing structure and defines the LMREWJPB powers, terms, vacancies, officers, openings, operations, budgeting, fiscal agent, committees, and compliance with open meeting laws. The draft JPA states that the LMREWJPB will meet twice per year or more often as deemed necessary. The LMREWJPB is responsible for approving the budget, workplan, plan amendments, cost-share policies, bylaws, as well as establishing committees as necessary to implement the Plan. The Board does not have the authority to directly hire staff but may contract for coordinating or other services. Furthermore, the Board may set local dues to assist with legal fees, audits, project implementation efforts, or administration costs. The process in how dues will be set up for the partnership are explained in the JPA.

STEERING TEAM/IMPLEMENTATION TEAM

The Steering Team (ST) will be made up of local technical staff from the participating entities and BWSR staff. The ST will continue with monthly meetings to assist with developing priorities for plan implementation efforts, implementing projects and practices, and developing draft budgets and work plans.

ADVISORY COMMITTEE

Members of the AC will be appointed by the Board and may include political representatives and technical staff from outside organizations such as BWSR, MN DNR, Met Council, MDH, MPCA, and NRCS, as well as local government units such as municipalities, tribal communities, WDs, and WMOs that are located within the planning boundary that do not serve on the JPB. The AC will meet at least once or more often if needed. The AC will assist with technical expertise when developing work plans and budgets, provide any insight on upcoming events, workshops, grants, or other opportunities that could help further plan efforts for the Partnership, and partner with projects.

Staffing

The Partnership will utilize existing staff, may hire additional staff, and may contract out services to fulfill roles that are needed in order to implement the plan. Roles that are necessary for plan implementation include a fiscal agent/grant administrator, plan coordinator (day to day), and legal counsel. Additional roles that may be needed to help implement the plan include, but are not limited to: project tracking, education and outreach, agronomist, modeling/monitoring/assessments. The partnership may utilize a variety of funds such as WBIF and other local/state/federal funds to assist with administration and technical assistance costs to implement the Plan.

Decision Making Process

The ST and AC will meet biennially to develop a draft workplan and budget. The ST will make recommendations to the JPB for workplan, budget, and project approval (projects over the set dollar threshold). The JPB will make the final decisions for work plans and budget approvals. The JPB and ST discussed setting a dollar threshold for whether a project requires JPB approval. Projects that fall under certain dollar threshold could be approved by staff and would not require JPB approval. If a project falls within the classification of only requiring staff approval and not full JPB, it will be up to each local board if they would also like the project to have local board approval. Projects can be approved and funded as long as they have been identified in the plan, have sufficient funds to cover project costs, fall within priority areas identified within the plan, and follow ranking/scoring process.

Coordination of Shared Services

The LGUs located within this planning area have had a history of shared services to help implement projects and practices within the planning boundary. The Partnership recognizes the benefit of obtaining efficiencies through shared service delivery. Throughout the implementation of the Plan, and particularly at the biennial planning and five-year evaluation benchmarks, the committees will assess appropriate use of shared services to ensure goals are achieved. Potential opportunities for shared services include but are not bound or restricted to:

- A partnership focused education and outreach staff member
- Partnership website and other web-based tools
- The use of job approval authority sign-offs across political boundaries within the watershed
- Smart Salting Campaign
- RIM Easements
- Equipment
- Tools/Models

Collaboration with Other Units of Government

The LMREWJPB and staff will actively seek opportunities for early coordination and collaboration with other units of government including:

- Cities
- Townships
- Special purpose joint powers boards
- Federal agencies
- Shakopee Mdwekatonan Sioux Community
- Prior Lake-Spring Lake Watershed District
- Scott Watershed Management Organization

Governmental units, including municipalities, watershed districts, and water management organizations, which are not part of the JPE, will be invited to participate in implementation activities that are relevant to their respective goals or implementation measures. Collaboration with state agencies such as BWSR, MPCA, MDH, MDA, and DNR are critical for executing the programs and goals of the Plan. Federal government partners, including the USFWS, USACE, USGS, NRCS, and FSA, are not required participants, but their programs and staff expertise are necessary components to fulfill plan goals. The Implementation Team will utilize opportunities to collaborate with federal partners as they arise, specifically in terms of fulfilling federal Farm Bill requirements, such as convening the Local Working Groups.

Collaboration with Others

To a large degree, the success in achieving the Plan goals will depend on the local support that drives its implementation. The Partnership is committed to working with non-governmental entities including:

- Civic groups
- Nonprofit entities
- Private businesses
- Volunteers
- Individuals
- Foundations
- University of Minnesota (UMN)
- Co-ops
- Pheasants Forever
- Lake Associations

DID YOU KNOW?

Many of the nongovernmental entities noted above are already involved in protecting and improving resources in the Watershed.

6.2 WORK PLAN DEVELOPMENT

Work plan development the first biennium will be based off of what local partners believe they can achieve with existing knowledge and efforts. As time goes on, work plan development with start with a review of recent implement efforts completed by the JPE. The goal of this review will be to achieve meaningful results while considering existing conditions and circumstances. Following this review, the Partnership will develop a draft biennial plan and budget based on the timing of actions identified in the implementation section of this Plan in addition to the amount of available funding. The Partnership will present the draft work plan and budget to the LMREWJPB for recommendation of approval. The LMREWJPB will provide initial feedback and recommended changes, which will be incorporated before soliciting feedback from the governing boards of the joint powers agreement.

The ST will update the biennial work plan with the feedback received as well as their own recommendations. Once updated, the LMREWJPB will conduct a second review and update accordingly prior to taking action to approve the biennial work plan. The approved work plans will be referenced when the LMREWJPB submits a funding request to BWSR for Watershed Based Implementation Funding biennially.

DID YOU KNOW?

The activities described in this Plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation.

The amendment process for the Plan will follow current BWSR amendment process policies. This Plan is in effect for 10 years after obtaining state approval and local adoption. Once the Plan is in effect, new data will be generated that will provide a better understanding of watershed issues and solutions. Administrative authorities, state policies, and resource concerns may also change. Changes, additions, or clarifications to the Plan may be necessary to address new information. An amendment will be required when a requested change includes revising a goal or the deletion or addition of a priority area. This does not include adding Prioritize, Target, Measure (PTM) information to an already identified priority area. The activities described in this Plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation.

In recognizing the need to maintain flexibility during implementation, a Plan amendment is generally not required for the following situations (unless requested by the Partners):

- Formatting of the plan (ex: grammatical errors).
- Clarification of existing plan goals or policies.
- Revision of a procedure meant to streamline plan administration.
- Revising the estimated cost for an individual project or program.
- Altering the timeline for planned activities within the implementation schedule.
- Inclusion of additional data not requiring interpretation.
- New or updated monitoring data, model results, or other technical information.
- Expansion of public process.

Requests for Plan amendments may be proposed by any agency, person, or local government, including the ST and AC. The ST will consider potential changes that warrant a plan amendment and recommendations will be brought forward to the JPB only by ST members. Potential changes and a call for additional recommendations to be considered will be discussed as part of biennial work planning.

All recommended Plan amendments must be submitted to the JPB along with an explanation of why the Plan amendment is needed. Draft Plan amendments presented to the JPB for consideration shall be prepared and formatted as described herein. Amendments must be provided (printed or digitally) in the form of replacement pages for the plan, each page of which must:

- Show deleted text as stricken and new text as underlined.
- Be renumbered as appropriate (unless the entire Plan is reproduced).
- Include the effective date of the amendment (unless the entire Plan is reproduced).

The amendment must be voted on and approved by the JPB. If the JPB, in coordination with BWSR, determines that a Plan amendment is needed, the ST will complete the amendment according to BWSR policy and related statutes. After approval the amended Plan will be distributed to all parties; ST, AC, and LMREJPB.

The Partnership will use the biennial work plan and budget as a tracking sheet for implementation actions and costs throughout the planning period. The tracking sheet will align anticipated outcomes contained in the biennial work plan to measure progress towards plan implementation goals. An annual review of Plan progress will be made at the end of each calendar year. Additionally, an annual board update of Plan progress will be made at the very beginning of each calendar year. Assessment and evaluation of plan progress towards achieving goals will be made every two years to align with the biennial work plan. The partnership will adjust as needed based on identified implementation barriers and opportunities, changes in capacity, and the adoption and success of practices and projects. Progress towards overall measurable goal achievement will include:

- Tracking numerical goals
- Models and tools
- Estimating pollution reductions
- Verifying outcomes using evidence-based data collection
- Education and Outreach widgets

The partnership would like hold themselves accountable with reduction numbers, number of BMPs, timelines, priorities, etc. Appendix E will be utilized as a way to see if the partnership is meeting annual milestones (pollutant reductions, number of practices, securing enough funds to implement projects and practices) during plan implementation.

Every five years, the JPE will conduct an evaluation of overall progress towards the 10-year goals and desired future conditions. The evaluation will begin with an assessment of new data, information, updated models, studies, and trends. This information will be used to evaluate whether the Plan's established measurable goals and priority issues still align with the outcomes of the updated information. The Partnership will also reach out to state agency partners to determine whether they have gathered new information or studies that would be beneficial to include in the evaluation process.

In addition to reviewing updated data, an assessment will be made as to whether the 10-year goals will be met with the current pace of progress. The conclusions of these reviews will determine if additional resources are needed, or if the delivery of services should be adjusted to strengthen implementation efforts. If these changes are deemed necessary, the LMREWJPB will initiate a plan amendment process. Additionally, full plan amendments may occur prior to or after the 5-year evaluation mark; however, at the 5 year evaluation mark, the partnership will plan to expect for a full plan amendment process.

Lastly, the partners will reevaluate issues that were not selected as a priority for the 10-year Plan to ensure consistency with on going issues within the Planning Area. Topics to evaluate include but are not limited to emerging concerns and groundwater quantity issues.

The partnership will regularly assess their performance in implementing the programs and activities in the Plan and achieving goals throughout the life of the Plan in informal and formal ways. Informally, the Partnership will adjust as needed to leverage the partnership's collective and individual strengths as funding and collaborative opportunities arise. Formally, the Partnership and the LMREWJPB will assess the degree to which goals were achieved and how to best organize and align efforts to fulfill Plan goals on a biennial basis. Any revisions to the roles and responsibilities amongst the JPE will be reflected in the workplan and within the bylaws.

As part of the partnership assessment, new and existing tools, models, data, studies, and reports will be considered when prioritizing efforts and tracking progress towards plan goals. The partnership has decided that HSPF-SAM is the desired tool for tracking plan progress during the first five years of the plan. However, HSPF-SAM is limited on its ability to provide goals for every project and practice that the partnership will be implementing. Other tools may be better suited and will be considered when tracking plan progress, including, but not limited to: Septic System Improvement Estimator (SSIE), BWSR Water Erosion Pollution Reduction Estimator RUSLE 2, PTMApp, LiDAR, and GIS. Furthermore, additional surface and groundwater monitoring data, a Groundwater Restoration and Protection Strategies (GRAPS) report, an updated Watershed Restoration and Protection Strategies (WRAPS) report, and Le Sueur County Geologic Atlas are expected to be completed within the 10-year timeframe of the Plan.

Reporting

The fiscal agent is responsible for submitting all required grant reports. The plan coordinator and the other JPE members will assist in the development of the required reports and will continue to file their own reports as required. An update will be provided to stakeholders and partners on an annual basis. Format of the report may vary from year to year, but may include PowerPoint presentations, story maps, email updates, or other formats.

6.5 FUNDING

The following sections discuss current local funding, funding needs, and potential funding sources. The extent to which the Plan activities can be accomplished is dependent on the level of funding that is available, as well as the capacity of the staff.

Current local funding, the estimated annual cost to implement the Plan, and estimated total plan cost are outlined in Table 6.1. Also included in the funding amounts are the expected watershed-based implementation funding (WBIF) and secured grant funds. It is expected that the current level of investment by each LGU will remain the same during the Plan implementation. Annual funding that is available through state and federal programs are accounted for in Table 6.1 and considered as additional funding sources to help implement the Plan. The partners utilized historic local, state, and federal contributions to watershed improvements to anticipate future contributions that may be used to help implement the Plan.

The estimated cost to implement the 10 year comprehensive Plan is $22,678,272. The cost to implement the plan is allocated in different components which include agriculture and urban best management practices, education and outreach, technical assistance, data, studies, and monitoring, policy and regulation, administration costs. (Table 6.2) .

TABLE 6.1: SUMMARY OF CURRENT LOCAL FUNDING AND TOTAL COST TO FUND THE 10-YEAR PLAN.

Anticipated Funding Sources for Plan Implementation	
State	$6,656,441
Local	$1,491,630
WBIF	$2,691,980
Other	$11,838,221
Total	**$22,678,272**

TABLE 6.2: PLAN COSTS	
Costs for Plan Implementation	
Best Management Practices	$15,356,825
Education and Outreach	$1,744,482
Technical Assistance	$3,488,965
Data, Studies, and Monitoring	$1,883,000
Policy and Regulation	$205,000
Total	**$22,678,272**

Local Funding

Local funds may include general funds, landowner contributions, or are those which are derived from the local tax base, including in-kind contribution of personnel whose position is funded through locally derived funds. Local funds will be used to fund local priorities and programs as well as to provide required or additional match for grants. Different funding sources will be explored in addition to WBIF funds when implementing projects and practices within the plan. Table 6.3 shows applicable local funding sources as identified in the BWSR One Watershed, One Plan Guidebook.

TABLE 6.3: LOCAL FUNDING		
Citation	**Applies To**	**Summary**
§103B.251	Counties	May certify for payment by the county all or any part of the cost of a capital improvement contained in the capital improvement program of plans developed in accordance with §103B.231. Counties may issue general obligation bonds to pay all or part of the cost of projects. The county may pay the principal and interest on the bonds by levying a tax on all property located in the watershed or subwatershed in which the bonds are issued. Loans from counties to watershed districts for the purposes of implementing this section are not subject to the loan limit set forth in §103D.335
§103E.601	Drainage Authorities	Drainage System Costs: Funding of all costs related to construction, maintenance, and improvement of drainage systems is apportioned to property owners within the drainage system based on the benefits received from the improved drainage.
§103E.011 Subd. 5		External Sources of Funding: A drainage authority can accept and use funds from sources other than assessments from benefited landowners for the purposes of flood control, wetland restoration, or water quality improvements. Additionally, 103E.015, Subd.1a requires drainage authorities to investigate potential use of external funding for the purposes identified in 103E.011, Subd. 5.
§103B.331 Subdivisions 3 & 4	Counties	(3) May charge users for services provided by the county necessary to implement the local water management plan. (4) May establish one or more special taxing districts within the county and issue bonds to finance capital improvements under the Comprehensive Local Water Management Act. After adoption of the resolution, a county may annually levy a tax on all taxable property in the district.
§103B.555 Subdivisions 1 & 3		(1) May establish a Lake Improvement District (LID) and impose service charges on the users of LID services within the district. May levy an ad valorem tax solely on property within the lake improvement district for projects of special benefit to the district; may impose or issue any combination of service charges, special assessments, obligations, and taxes. (3) A tax under Subd. 1 may be in addition to amounts levied on all taxable property in the county for the same/similar purposes.
§103B.355		Water Planning Authority for Special Projects: Counties have authority to levy funds for priority projects and to assist SWCDs with program implementation.
§103C.331 Subdivision 16	County boards on behalf of soil and water conservation districts	May levy an annual tax on all taxable real property in the district for the amount that the board determines is necessary to meet the requirements of the district.
§462.358 Subdivision 2b(c)	Municipalities	May accept a cash fee for lots created in a subdivision or redevelopment that will be served by municipal sanitary sewer and water service or community septic and private wells. May charge dedication fees for the acquisition and development or improvement of wetlands and open space based on an approved parks and open space plan.
§444.075		Stormwater Utility Fee: Municipalities are authorized to collect stormwater utility fees to build, repair, operate, and maintain stormwater management systems. Stormwater utility fees must be set using reasonable calculations based on runoff volume or pollution quantities, property classification, or an equitable basis.

State Funding

The state of Minnesota has the responsibility to fund watershed management programs through various capacities, programs, and agencies. The Nonpoint Priority Funding Plan outlines a criteria-based process to prioritize Clean Water Fund investments. These high-level state priority criteria include:

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

Funding for capital improvement projects may be obtained through legislative appropriations directly or through state agency programs that have bond funds available, such as RIM. Grants are another funding option and are available from BWSR, MPCA, DNR, MDH, and MDA to fund programs, practices, and projects. Grants are also available through legislative commissions, such as the Lessard-Sams Outdoor Heritage Council which funds habitat projects, and the Legislative and Citizens Commission on Minnesota Resources Environmental Trust Fund, which funds research and innovation projects. State revolving fund loans can be obtained from the MPCA and MDA. These funding sources will be pursued during implementation of this plan to provide supplemental funding for projects as deemed appropriate or necessary.

Federal Funding

Federal agencies expected to partner, and from which funds will be sought, include:

- USFS
- USFWS
- USACE
- USGS
- NRCS
- FSA
- EPA

Dam improvement programs that address habitat and connectivity concerns may involve partnering with USACE. USGS will likely provide support for data acquisition and monitoring programs while USFWS may provide land retirement program funds. Other types of projects and practices that may be funded through federal funds include, but are not limited to:

- Water quality projects
- Public health and groundwater
- Agricultural
- Habitat projects

NONREGULATORY ECOSYSTEM SERVICE PROGRAMS

Credit trading programs that allow developers to meet permit requirements off-site from the location of the permit.

Specific programs, such as AgBMP, rural loans, and FEMA funds may also be utilized.

Nonregulatory Ecosystem Service Programs

Most ecosystem service trading programs are facilitated through regulatory permits and programs, such as wetland banking. However, demand is increasing to provide ecosystem service grants that are not regulatory in scope. Funding initiatives that may be available could focus on increasing or protecting habitat for a particular species, such as endangered or threatened species, or for increasing or protecting habitat for a particular ecosystem, such as increasing habitat for pollinators. Funding for these programs could come from:

- Federal
- State
- Nonprofits
- Foundations

Other Funding Sources

Foundations, nonprofit organizations, and private contributions, including landowners and corporate entities, will be sought for funding of plan implementation activities. Local foundations may fund education, civic engagement, and other local priority efforts. Several conservation organizations have robust programs and conservation efforts in Minnesota, such as:

- The Nature Conservancy
- Audubon Society
- Minnesota Deer Hunters Association

These organizations acquire funding of their own and may have project dollars and technical assistance that can be leveraged. Other major cooperators and funding sources are private landowners who often contribute funds, services, equipment, or land donation for projects and programs. Additional funding sources that may be considered include road authority funds and water tax dollars.

The water tax would be funded through levy dollars allocated for a specific purpose, such as water storage projects. Using this funding mechanism would provide the funding needed to pull complex water quality and quantity projects over the finish-line in situations where funding may otherwise be a limiting factor. Funds generated through a water tax levy would need to follow statutory requirements and processes.

Collaborative Grants

The Partnership will develop grant applications and seek funding from various governmental and nongovernmental agencies based on the work plan. Individual entities will continue to submit grant applications for their existing programs and activities. Potential funding sources for implementing the Plan and the types of activities supported by each source are outlined in Table 6.4.

TABLE 6.4: POTENTIAL GRANT FUNDING SOURCES

Organization	Program and Fund Name	Type of Assistance	Form of Assistance	Programs			
				Conservation	Land Use Management	Monitoring, Data, Acquisition, and Studies	Education and Outreach
State Funding							
BWSR	Clean Water Fund	Financial	Grant	●		●	●
BWSR	Reinvest in Minnesota (RIM)	Financial	Easement	●			
BWSR	Natural Resources Block Grant (NRBG)	Financial	Grant		●	●	●
BWSR	SWCD Local Capacity Service Grants	Financial	Grant	●	●	●	●
BWSR	Conservation Contracts	Financial	Grant	●			
DNR	Conservation Partners Legacy	Financial	Grant	●			
DNR	Aquatic Invasive Species Control	Financial and Technical	Grant		●	●	
DNR	Forest Stewardship Program	Technical	Cost Share	●			
DNR	Aquatic Management Area, Wildlife Management Area, Scientific and Natural Area	Financial	Fee Title Acquisition	●			
DNR/Revenue	Sustainable Forest Incentive Act	Financial	Tax Incentive	●			
MPCA	Clean Water Partnership	Financial	Grant	●			
MPCA	State Revolving Fund	Financial	Loan	●			
MPCA	Surface Water Assessment Grant (SWAG)	Financial	Grant			●	
MDH	Source Water Protection Grant	Financial	Grant	●			
MDH	Nitrate Testing	Technical	Monitoring			●	
MDA	Ag BMP Loan Program	Financial	Loan	●			
LSOHC	Outdoor Heritage Funds	Financial	Grant	●			

TABLE 6.4: POTENTIAL GRANT FUNDING SOURCES

Organization	Program and Fund Name	Type of Assistance	Form of Assistance	Programs			
				Conservation	Land Use Management	Monitoring, Data, Acquisition, and Studies	Education and Outreach
LCCMR	Environmental Trust Fund	Financial	Grant	●		●	●
Legislature	Bonding	Financial	Bond	●			
Federal Funding							
FSA	Conservation Reserve Enhancement Program (CREP)	Financial	Cost Share	●			
FSA	Conservation Reserve Program (CRP)	Financial	Cost Share	●			
FSA	Grassland Reserve Program	Financial	Cost Share	●			
NRCS	Conservation Innovation Grant	Financial	Grant	●		●	●
NRCS	EQIP	Financial	Cost Share	●			
USGS	Stream Gaging Network	Technical	Monitoring			●	
USACE	Planning Assistance	Technical	Planning			●	
EPA	State Revolving Fund	Financial	Loan	●			
Other Funding							
Ducks Unlimited		Financial and Technical	Easement and Cost Share	●			
Trout Unlimited		Financial and Technical	Easement and Cost Share	●			
The Nature Conservancy		Financial	Easement	●			
Minnesota Land Trust		Financial	Easement	●			

Chapter 7:
References

Chapter 7: **References**

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Appendix A:
Committee Members

Appendix A: **Committee Members**

POLICY COMMITTEE MEMBERS	
LGU	**Authorized Representative**
Le Sueur County	Danny O'Keefe
Le Sueur SWCD	Greg Entinger
Rice County	Jeff Docken
Rice SWCD	Richard Cook
Scott County + WMO	Rita Weaver
	Virgil Pint
Scott SWCD	Doug Schoenecker
Lower Minnesota River WD	Laura Amundson

STEERING TEAM MEMBERS	
LGU	**Authorized Representative**
Le Sueur County	Holly Bushman
Le Sueur SWCD	Mike Schultz
Rice County	Brad Behrens
Rice SWCD	Steve Pahs
Scott County + WMO	Melissa Bokman Ermer
	Vanessa Strong
Scott SWCD	Meghan Darley
	Troy Kupahl
Lower Minnesota River WD	Linda Loomis
BWSR	Barb Peichel
	Anne Sawyer

ADVISORY COMMITTEE MEMBERS	
Affiliation	**Name**
Metropolitan Council	Joe Mulcahy
Minnesota Board of Water and Soil Resources (BWSR)	Barb Peichel
	Anne Sawyer
Minnesota Department of Agriculture (MDA)	Travis Hirman
Minnesota Department of Health (MDH)	John Frietag
	Abby Shea
Minnesota Department of Natural Resources (DNR)	David De Paz
Minnesota Pollution Control Agency (MPCA)	Brittany Faust
Prior Lake Spring Lake Watershed District	Joni Giese

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Appendix B:
Official Comment Letters

Appendix B: **Official Comment Letters**

DEPARTMENT OF NATURAL RESOURCES

Office of the Regional Director
DNR Central Region Headquarters
1200 Warner Road
St. Paul, MN 55106

July 6, 2022

Holly Kalbus, Environmental Resources Specialist
Le Sueur County
88 South Park Avenue
Le Center, MN 56057

Subject: Lower Minnesota River East One Watershed One Plan

Dear Holly:

Thank you for inviting the Minnesota Department of Natural Resources (DNR) to provide input as you and other local partners begin developing a Comprehensive Watershed Management Plan for the Lower Minnesota River East Watershed. I am writing on behalf of DNR Commissioner Sarah Strommen to share our priorities and express our support.

Attached are priorities we encourage you to address in your plan—keys to protecting and improving the health of the watershed. A plan centered on these priorities will help sustain water resources in ways that enhance the quality of life for all who live, work, and enjoy the outdoors in this watershed.

The DNR can supply scientific data and information related to the attached priorities. We also offer tools and services that can help inform stakeholders on conditions within the watershed and explore how those conditions intersect with their water resource values.

Our lead staff person for this One Watershed One Plan (1W1P) project is David De Paz, Watershed Specialist based in St. Paul. Please contact David by phone (651-259-5775) or email (david.depaz@state.mn.us) if you have questions or want more information about the attached priorities or the types of technical support we can provide.

Also, feel free to contact me directly if needed. As the DNR's Regional Director, I am committed to ensuring that DNR staff in the region are organized to support 1W1P planning efforts and the resulting plans. We greatly value the opportunity to contribute to the process and hope the information we provide is helpful.

Sincerely,

Grant Wilson, DNR Central Region Director

cc: David De Paz (DNR), Dan Lais (DNR), Barbara Weisman (DNR), Melissa King (BWSR), Travis Hirman (MDA), John Freitag (MDH), Brittany Faust (MPCA), Joe Mulcahy (Met Council) Scott Roemhildt (DNR)

DNR Priorities for the Lower Minnesota River - East Watershed

The priority concerns and opportunities below were identified in consultation with an interdisciplinary team of DNR natural resource management specialists from multiple DNR Divisions whose work areas include this watershed. The priorities are grouped under several high-level issues that are commonly taken into consideration in Comprehensive Watershed Management Planning. The priorities are similar to many issues, concerns and opportunities identified in existing plans. Acting on these priorities would benefit multiple high-level issues and make real progress towards a healthier watershed.

High-Level Issue: Water Quality

Concern: Surface Water Quality

Many of the watershed's streams and lakes are impaired for nutrients. Reducing excess nutrients (phosphorus) is a priority for the DNR as it reduces water quality and impacts fish and wildlife habitat. High nutrient levels also put the waters at risk of algae blooms, including harmful blue-green algae, which can significantly reduce the aesthetic quality of lakes and streams and limit recreational use. Perennial vegetation along lake and stream shorelines filters runoff, reduces erosion, aids in sediment storage, and slows floodwaters. Preventing nutrients from entering lakes is an important strategy to maintain high quality game fish populations and recreational uses. Another important strategy is managing common carp populations and preventing the spread of invasive carp. Common carp is one of the most damaging aquatic invasive species due to its wide distribution and severe impact on shallow lakes and wetlands. Common carp release phosphorus into the water when feeding, which increases algae growth and turbidity. The following lakes are priorities for the DNR, based mainly on their popularity and the quality of game fish populations:

Priority lakes: Upper and Lower Prior Lake, Spring Lake, O'Dowd Lake, Thole Lake, Cedar Lake, Mahon Lake, Fish Lake, Greenleaf Lake, and Clear (Lexington) Lake

Strategies to consider

- Implement shoreline habitat restoration and stream buffers using native vegetation
  - Promote natural shoreline management (emergent aquatic vegetation, native vegetated banks, and bank protection techniques utilizing natural materials, rather than hard-armored)
  - Encourage land use best management practices along densely populated shorelines and urban areas. Also see DNR's Innovative Shoreland Standards Showcase
- Promote use of phosphorus-free fertilizer
- Continue to promote key conservation practices on agricultural land, such as cover crops to hold nutrients and reduce spring and fall erosion, no-till farming, grassed waterways where applicable, and best management practices to reduce and treat nutrient runoff before it reaches waterways
- Reach out to experts at DNR Fisheries and the Minnesota Aquatic Invasive Species Research Center at the University of Minnesota to see if carp management is feasible for a particular waterbody and to obtain assistance in developing a management plan

Concern: Stream Erosion and Sedimentation

Tributaries to the Minnesota River, especially along the Minnesota River Valley "bluff line", are in a state of imbalance due to in part to historic glacial process changes. Although a natural post-glaciation process, human influences from agriculture, drainage, land conversion and development have greatly accelerated the process, causing excess erosion, decreased water quality and poor aquatic habitat. The two large stream systems within

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the 1W1P planning area (Sand Creek and Le Sueur Creek) are impaired for suspended sediment. Reducing the sediment load would not only improve aquatic habitat and stability of streams, it would also reduce the overall sediment load to the Minnesota River.

Strategies to consider

- Work with the DNR and others who have expertise to implement stream channel and aquatic habitat restorations using natural channel design principles to improve hydrologic function, sediment transport, and aquatic habitat
  - Incorporate DNR field survey data to help target solutions or guide restoration efforts (see DNR's Minnesota River, Shakopee Watershed Characterization Report)
- Increase perennial vegetation at the tops of bluffs to reduce gully and bluff failures, preventing sediment from reaching waterbodies
- Increase floodplain connectivity of streams to enhance water storage and remove nutrients from runoff
- Explore other water storage solutions throughout the watershed to help reduce the severity of peak flows that contribute to channel instability

High-Level Issue: Water Storage and Retention

Concern: Peak Flows and Flooding

High stream flows can have significant impacts on infrastructure, stream stability, water quality, and ecological function. The DNR has completed an evaluation of hydrologic change for the Lower Minnesota River Watershed upstream of Jordan, but tributaries in the Lower Minnesota River East 1W1P planning area likely have similar conditions. The analysis shows that annual precipitation has increased by 3.6 inches in the time period from 1991 to present, compared to the time period of 1935 (as far back as we have sufficient records) to 1991. It also indicates that the annual peak flow has increased by 80% and prolonged high flows have increased dramatically, when comparing the same time periods. Reducing the power and frequency of these flows can help maintain system stability and protect habitat for vulnerable species. Many nutrient reduction and water quality strategies also improve water retention.

Strategies to consider

- Invite DNR to share relevant information about hydrologic change in the watershed to help stakeholders understand the types, amounts and impacts of these changes, and related solutions
- Target projects that reduce peak flows, peak velocities of discharge, and annual discharge
  - Include mitigation in drainage improvement projects to ensure they do not increase peak flows or peak velocities of discharge
- Restore historical depressional wetlands and wet marshes that can provide short and long-term water retention and metering of flows
  - Target areas with multiple benefits, for example, wetlands with upland wildlife habitat
  - One high-value natural resource to consider restoring is Schmidt Slough, a partially drained public water wetland in the upper Le Sueur Creek watershed at Cordova Wildlife Management Area
- Enhance flood water retention using 2-stage channels in drainage systems to allow for drainage while providing flood storage on small floodplains, as well as providing habitat
- Promote increased water retention upstream and protect and increase existing water storage to minimize nutrient transport

  - Install rain gardens, stormwater retention ponds, and stormwater re-use projects to protect against the impacts of future development
  - Adopt stormwater management ordinances that follow Minimal Impacts Design Standards (MIDS), especially in areas outside of MS4 regulation
- Increase soil organic matter, which can increase storage capacity
- Increase floodplain connectivity of streams to enhance water storage

Concern: Groundwater Quantity

Working to protect groundwater sources and recharge areas is essential for a sustainable water supply for today and future generations. Groundwater protection may also increase the resilience of trout in Eagle Creek, an important cold water stream in the watershed.

Strategies to consider

- Counties can encourage high-volume water users (farms, gravel mines, manufacturing plants and others) to obtain DNR Water Appropriation Permits
  - Appropriation Permits help us understand water use in the watershed
- Cities can promote and encourage water conservation methods that reduce peak water use demand
  - Cities can also adopt water use restriction ordinances, such as odd-even watering days, or implement watering bans or restrict non-essential uses during periods of drought
- Counties and other organizations can consider constructing a water level observation well network
  - Observation wells provide data on the health of aquifers, and, when applicable, can help explain changes in water levels in lakes, wetlands and streams
- Communities can investigate aquifers and other potential sources of alternate water supply for citizens
  - Educate stakeholders on the recent law change (FAQs for Water Appropriation Wells Constructed in the Mount Simon-Hinckley Aquifer) that restricts construction of new wells in the Mount Simon aquifer to "potable" use only. The new law applies to the entire aquifer whereas it previously applied only to the seven-county metro area

High-Level Issue: Habitat

Concern: Upstream-Downstream Connectivity and Dams

Loss of upstream-downstream connectivity by dams, perched culverts and other structures prevents fish and other aquatic organisms from migrating to more desirable habitat during periods of low flow, temperature stress and spawning. Improving upstream-downstream connectivity is important for the health of fish populations and other aquatic species. The DNR can provide guidance and support in maintaining and increasing this type of connectivity. When replacing structures, follow DNR's best practices manual for designing hydraulic and fish passage function.

Strategies to consider

- Remove constructed barriers, such as dams and crossings that limit upstream-downstream connectivity. Assess the following specific barriers and their significant impacts:
  - Low head dam on Le Sueur Creek between Fox Hollow Road and Lexington Road
  - Weir on Forest Prairie Creek, at the crossing with 320th Street
  - Low head dam on Forest Prairie Creek, immediately downstream of Tyrone Road

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Concern: Existing Natural Areas

Healthy, intact natural areas are essential for a functioning and resilient ecosystem. They mitigate weather events, sequester carbon and other nutrients, provide water treatment, control erosion, and enhance soil quality. For example, floodplain forests along the Minnesota River form a natural wildlife corridor with diverse animal habitats while also providing considerable flood water storage. Maintaining and improving existing natural areas and locating other areas of high-value native communities for further protection would promote resilience and overall watershed health.

Strategies to consider

- Promote the DNR Forest Stewardship program for floodplain and upland forest landowners (Forest Stewardship)
- Encourage enrollment of agricultural land within the Minnesota River floodplain to native vegetation through conservation easement programs such as Reinvest in Minnesota and the Conservation Reserve Program
- Protect native plant communities and increase habitat connectivity through easements, acquisition, and coordinating management with private landowners
  - Where native plant communities are mapped, implement management approaches that will enhance their biodiversity and improve resilience
- Survey intact habitats for listed species and, if detected, manage for their preservation
- Manage invasive species
  - Local units of government and lake associations may be eligible for DNR technical and financial assistance to help control the spread of invasive species
  - Have an early detection response plan along with a plan to prevent the spread of invasive species during roadside mowing

Concern: Calcareous Fens

Calcareous fens are rare, distinctive wetlands that depend on a constant supply of groundwater rich in calcium and other minerals. They are one of the rarest natural communities and are threatened, which is why they are protected by law in Minnesota and regulated by the DNR. Changes in groundwater supply and changes in development pose a risk to these rare features. Savage Fen in the Minnesota River Valley is one of these. There are likely others in the 1W1P planning area to be located and protected from impact. Another form of groundwater-to-surface discharge is in the form of springs. Springs are important water resources for cold water streams, cool and warm water streams, and lakes and ponds. Protecting calcareous fens and springs promotes watershed health and ecosystem resilience.

Strategies to consider

- Explore and map additional calcareous fens as well as other groundwater-surface interactions of fens and springs
- Protect calcareous fens through zoning rules and groundwater appropriation monitoring
- Avoid adverse impacts to groundwater
- Collaborate with the DNR if there is potential for existing or proposed water supply sources to impact a calcareous fen

High-Level Issue: Outdoor Recreation

Concern: Minnesota Valley State Recreation Area

The Minnesota Valley State Recreation Area and State Trail is a high-value multiple-use resource. Recent increases in rainfall, increased runoff/stormwater from urban development, and dramatically increased discharge from the greater Minnesota River Watershed make the trail vulnerable to extended flooding and water quality and erosion issues. Protection of these flood impacted trail areas and related infrastructure is critical to maintaining the habitat, recreational opportunities and ecological functions provided by the state trail and recreation area.

Strategies to consider

- Wetland and riparian protection adjacent to the trail, to lessen erosional impacts
- Expansion of public areas neighboring the wetland complex sections of the recreation area, to reduce future impacts
- Consider water crossings that can accommodate flood flows, to increase flow capacity and promote stability at trail junctions
- Improved stormwater management practices along urban portions of the trail, such as near the cities of Chaska and Shakopee, to limit stormwater discharge to the Minnesota River during periods of peak flow

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BOARD OF WATER AND SOIL RESOURCES

Barbara Peichel
Board of Water and Soil Resources
520 Lafayette Rd N
Saint Paul, MN 55155

July 8, 2022
Lower Minnesota River East Watershed Partnership
Holly Kalbus, Environmental Resources Specialist
Le Sueur County
88 S. Park Ave
Le Center, MN 56057

Dear Holly,

Thank you for the opportunity to provide priority issues and plan expectations for the development of the Lower Minnesota East (LME) Comprehensive Watershed Management Plan (Plan) that will be developed under Minnesota Statutes 2021, section 103B.801. The Board of Water and Soil Resources (BWSR) has the following expectations for the Plan.

The planning process must follow all of the requirements outlined in the *One Watershed, One Plan Operating Procedures, Version 2.1 (March 24, 2021)* document. In particular, BWSR would like to see the Partnership involve a broad range of stakeholders that includes tribal governments, municipalities, watershed organizations, and other entities that could partner on future implementation efforts. This may include communication and outreach that is beyond traditional methods. It is important that the Partnership spends time during the planning process to determine the organizational structure that will work best for implementing the Plan. The Partnership should also spend time towards the end of the planning effort developing a work plan and funding request.

The Plan must meet all of the requirements outlined in the *One Watershed, One Plan – Plan Content Requirements version 2.1 (August 29, 2019)* document. More specifically, the Plan must include an implementation schedule that identifies priority waterbodies and geographic areas for implementation activities, measurable goals that can demonstrate a pace of progress, and targeted practices. The Partnership should discuss and include in the Plan a thorough description of the programs required to implement the actions.

The *Plan Content Requirements* also include a list of issues that must be addressed in the Plan, but below are items that BWSR wants to particularly highlight.

- **Lake and Stream/River Water Quality Restoration and Protection** - the Partnership should use existing data, draft priorities, modeling results, and strategies from existing studies such as the multiple Watershed Restoration and Protection Strategies (WRAPS) Reports that include the Lower Minnesota River East waterbodies (e.g. lakes, streams, and the Minnesota River) to start discussions for 10-year Plan priorities. Due to the magnitude of the impaired streams and lakes in the LME Watershed, BWSR would like to see a thorough discussions on how you will set priorities and demonstrate success in this timeframe. The Partnership may want to engage drainage authorities in strategy development because of the number of altered watercourses in the Watershed. The Plan should also identify high value water resources (e.g. trout streams) that are most at risk for impairment using information such as the *Lake Phosphorus Sensitivity Significance* analysis (MN DNR/MPCA). Water quality data from multiple sources such as the MPCA and Met Council should be reviewed and considered for all pollutants.

- **Groundwater and Drinking Water Quality -** the Plan should address drinking water quality issues present in the watershed as protection of drinking water is critical to ensure the long-term health of people. The Partnership should consider strategies in priority areas such as vulnerable groundwater areas and Drinking Water Supply Management Areas. Using existing data and reports and also working with drinking water/groundwater experts are methods that could be used to assist local governments in developing drinking water implementation strategies. Although a *Groundwater and Restoration Strategies Report (GRAPS)* will not be developed for this watershed at this time, MDH has committed to providing access to relevant state agency data which should be reviewed and considered by the Partnership.

- **Water Quantity** - the Partnership should use existing models and data to address water quantity issues in the Plan. In particular, we recommend use of the data such as Hydrologic Simulation Program–FORTRAN (HSPF) estimates of annual average runoff and precipitation to prioritize subwatersheds for water storage activities. HSPF can also be used for estimating pollutant loads from subwatersheds for prioritization. In addition, the Partnership should use information from relevant hydrologic reports such as the *Evaluation of Hydrologic Change (EHC)* developed by the MNDNR and hydrologic models developed for floodplain modeling (e.g. Scott County) and other studies. Note that data such as flow, discharge, runoff, etc. that can be used for the report can come from multiple entities such as DNR, MPCA, Met Council, watershed organizations, counties, and the U.S. Geological Survey.

- **Wetlands -** Wetlands are an important part of healthy watersheds and can serve as storage to mitigate heavy rainfall events and provide habitat. The Partnership should consider including wetland protection (particularly for fens) and restoration efforts in priority areas of the Plan particularly where there have been high rates of loss.

- **Landscape Resiliency and Climate Adaption** - BWSR strongly encourages your Partnership to discuss climate change during Plan development. The Partnership should address how more extreme weather events would have implications for the implementation of restoration and protection

strategies. One potential source of information for use in the planning process is the BWSR Climate Resiliency Toolbox.

In addition to the priorities listed above, BWSR currently has programs that support strategies focused on surface water and groundwater quality protection and restoration, multi-purpose drainage management, water storage, soil health, pollinator habitat, wetlands, and conservation easements. Our website at https://bwsr.state.mn.us/ has more information.

I look forward to working with you as your Partnership develops the Plan. If you have any questions, please feel free to contact me at 651-296-6068 or barbara.peichel@state.mn.us.

Sincerely,

Barb Peichel

Barb Peichel
Clean Water Specialist

cc: Lower MN East 1W1P Steering Committee
Marcey Westrick, Regional Supervisor, BWSR
Julie Westerlund, 1W1P Coordinator, BWSR
David DePaz, MN Department of Natural Resources (DNR)
Travis Hirman, MN Department of Agriculture (MDA)
John Freitag, MN Department of Health (MDH)
Brittany Faust, MN Pollution Control Agency (MPCA)
Joe Mulcahy, Metropolitan Council

July 7, 2022

Holly Kalbus
Environmental Resources Specialist
Le Sueur County
88 S Park Ave
Le Center, MN 56057

RE: Priority Concerns for the Lower Minnesota River East One Watershed, One Plan

Dear Ms. Kalbus:

Thank you for the opportunity to submit our priority concerns for inclusion in the Lower Minnesota River East One Watershed, One Plan (1W1P), as well as Council expectations for the 1W1P outcomes. I have also included a list of Council resources that may be of use in the 1W1P preparation, including data, load calculations, and assessment reports.

The Lower Minnesota River East 1W1P will be an inter-jurisdictional, comprehensive management plan that will guide water management activities in the watershed by Le Sueur, Rice, and Scott counties, their soil & water conservation districts, the Scott WMO, and the Prior Lake-Spring Lake Watershed District over 10-years. Scott County is within the Council's official seven-county metropolitan area jurisdiction. Council concerns, comments, and suggestions should be viewed with the most weight in the Scott County portion of the watershed.

Council Expectations and Priorities for 1W1P Preparation and Review

Council staff will review the plan, especially for that portion of the watershed within the metropolitan area, through the lens of the Council's *Thrive MSP 2040* Regional Development Framework and the *2040 Water Resources Policy Plan*, both of which can be found on the Council's web page (*www.metrocouncil.org*).

In particular, the *2040 Water Resources Policy Plan* (Policy Plan) includes policies and strategies to achieve the following goal:

> *To protect, conserve, and utilize the region's groundwater and surface water in ways that protect public health, support economic growth and development, maintain habitat and ecosystem health, and provide for recreational opportunities, which are essential to our region's quality of life.*

The Policy Plan takes an integrated approach to water supply, water quality, and wastewater issues. This approach moves beyond managing wastewater and stormwater only to meet regulatory requirements by viewing wastewater and stormwater as resources, with the goal of protecting the quantity and quality of water our region's needs now and for future generations.

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The Policy Plan includes policies and strategies to:

- Maximize regional benefits from regional investments in the areas of wastewater, water supply and surface water management and protection.
- Pursue reuse of wastewater and stormwater to offset demands on groundwater supplies.
- Promote greater collaboration, financial support, and technical support in working with partners to address wastewater, water quality, water quantity and water supply issues.
- Promote the concept of sustainable water resources through collaboration and cooperation, with the region taking steps to manage its water resources in a sustainable way with goals of:
    - Providing an adequate water supply for the region
    - Promoting and implementing best management practices aimed at protecting the quality and quantity of our resources
    - Providing efficient and cost effective wastewater services to the region
    - Efficiently addressing nonpoint and point sources pollution issues and solutions, and,
    - Assessment and monitoring of lakes, rivers, and streams to direct adequate management, protection, and restoration of the region's valued water resources.

In addition to being consistent with the Council's new policy plans, Council staff will be looking for the plan to address the issues and problems in the watershed and to include projects or actions and funding to address them. Minnesota Statutes, Section 103B.801, subdivision 4 should be used as a guide. At a minimum, the 1W1P should address:

1. Any problems with lake and stream water quality and quantity including information on impaired waters and the watershed's role in addressing the impairments.
2. Flooding issues in the watershed.
3. Impacts of water management on the recreation opportunities.
4. Impact of soil erosion problems on water quantity and quality.
5. The general impact of land use practices on water quantity and quality.
6. Policies and strategies related to monitoring of area water resources.
7. Policies and strategies related to use of best management practices.
8. Issues concerning the interaction of surface water and groundwater in the watershed
9. An implementation plan with itemized list of actions, estimated costs, and timeline.
10. Specifics on long-term maintenance of projects and practices, including identification of entities responsible for funding and conducting maintenance, as well as how long-term maintenance will be documented.

Specific Priority Issues for the Lower Minnesota River East watershed

The Metropolitan Council has water quality monitoring data for the main stem of the Minnesota River at Jordan and Fort Snelling as well as data for Sand Creek, Credit River, and Eagle Creek, collected near their confluences with the Minnesota River.

The Minnesota River data was used in the Council's 2018 report, *Regional Assessment of River Water Quality in the Twin Cities Metropolitan Area: 1976-2015,* (available at https://eims.metc.state.mn.us/Documents)

Data for Sand Creek, Credit River, and Eagle Creek were assessed in the Council's 2014 report *Comprehensive Water Quality Assessment of Select Metropolitan Area Streams* (available at www.metrocouncil.org/streams/).

Based on the results of these studies and Council policies, the following issues are specific to the Lower Minnesota River East and are viewed as priorities by the Council for inclusion in the 1W1P:

- Any water quality and quantity problems or issues identified in the Lower Minnesota River TMDL and the Lower Minnesota River Watershed Restoration and Protection Strategy (WRAPS).
- Impacts and mitigation of row crop agriculture and agricultural drainage on water quality and quantity. Phosphorus source control would reduce eutrophication issues in watershed lakes, and nitrate source control would protect human health and reduce potential for drinking water well contamination.
- Sources of chloride loading in the watershed and possible measures to mitigate them.
- WWTP (wastewater treatment plant) upgrades: Council trend analysis suggests that WWTP upgrades and installation of phosphorus-removal technologies has resulted in measurable reductions in total phosphorus in the Lower Minnesota River. While it may be beyond the scope of the 1W1P, identification of WWTPs needing upgrades may help with reductions in phosphorus, nitrogen, chloride, and bacteria.
- Downstream impacts from the Lower Minnesota River East watershed: The majority of the 1W1P will be focused on waterbodies and practices within the watershed. However, the Lower Minnesota River East watershed is a major contributor of sediment and nutrients to the Mississippi River and has downstream impacts on water supplies, Lake Pepin, and ultimately the Gulf of Mexico. The 1W1P should explicitly address the context of the Lower Minnesota River East within the greater Mississippi River watershed.
- Regional parks: The Lower Minnesota River East watershed includes four regional parks in Scott County: Cedar Lake Farm Regional Park, Cleary Lake Regional Park, Murphy-Hanrehan Regional Park Reserve, Spring Lake Regional Park, and the Scott County West Regional Trail, all of which the Council has made a substantial investment in through its park implementing powers. In addition, portions of the Minnesota Valley National Wildlife Refuge, Minnesota Valley State Recreation Area, and the Minnesota Valley State Trail are also located in the Scott County portion of the watershed.

Improvement of water quality in the watershed would likely have a positive impact on the parks, whether by improving fisheries and wildlife, by reducing risks to public health, and by improving river aesthetics.

Available Council Resources

The Council has collected monitoring data for the following sites in the Lower Minnesota River East watershed:

River/Stream	Site ID	River Mile	Years Monitored
Credit River	CR0009	0.9	2013-2022
Eagle Creek	EA0008	0.8	2013-2022
Minnesota River	MI0143	14.3	2013-2022
Minnesota River	MI0251	25.1	2013-2020
Sand Creek	SA0082	8.2	2013-2022

Lake Name	DNR ID	Site No	Years Monitored
Buck Lake	70006500	1	2014-2021
Cates Lake	70001800	1	2013, 2017-2021
Cedar Lake	70009100	1	2013-2021
Cedar Lake	70009100	2	2013-2018
Crystal Lake	70006100	1	2020-2021
Fish Lake	70006900	1	2013, 2020-2021
Haas Lake	70007800	1	2013-2021
Little Prior Lake	70016900	1	2020-2021
Lower Prior Lake	70002600	1	2013
Lower Prior Lake	70002600	2	2013-2021
McMahon Lake	70005000	1	2013-2021

O'Dowd Lake	70009500	1	2013-2021
Pleasant Lake	70009800	1	2017, 2019
Spring Lake	70005400	1	2013
Sutton Lake	70009400	1	2020-2021
Thole Lake	70012001	1	2015-2021
Upper Prior Lake	70007200	1	2013

River and lake data can be downloaded by visiting the Council's EIMS website: *https://eims.metc.state.mn.us/*.

Please feel free to me call at 651-602-1104 with questions about my comments or for any assistance during the plan preparation.

Sincerely,

Joe Mulcahy
Environmental analyst
Metropolitan Council – Environmental Services
651-602-1104
joe.mulcahy@metc.state.mn.us

DEPARTMENT OF AGRICULTURE

July 11, 2022

Holly Kalbus, Environmental Resources Specialist
Le Sueur County
88 South Park Ave
Le Center, MN 56057

Subject: Lower Minnesota River East One Watershed One Plan

Dear Holly,

Thank you for the opportunity to provide priority issues for consideration in the development of the Lower Minnesota East One Watershed One Plan (1W1P). The Minnesota Department of Agriculture (MDA) looks forward to working with local government units, stakeholders, and other agency partners in the planning process, as well as to help provide technical information to appropriate landowners and agricultural organizations in the watershed.

One of the MDA's roles, related to the 1W1P process, is technical assistance. The MDA maintains a variety of water quality programs including research, on-farm demonstrations, and groundwater and surface water monitoring. Our goal is to provide you with data from the programs to help understand the resource concerns and further engage the agricultural community in local problem solving, and to identify potential areas of collaboration as you discuss priority areas in the plan.

MDA Priority Concerns

Nitrate and pesticides in surface and groundwater are the priority resource concerns for the MDA statewide. Priority concerns specific to the Lower Minnesota watershed relate to nitrate and pesticides in surface water.

The MDA is interested in working with local and state partners to engage the agricultural community, support on-farm demonstrations, promote the Minnesota Ag Water Quality Certification Program, and use the most recent and relevant research and tools to share information about conservation practices.

Pesticide Water Quality Monitoring

Annual Report: http://www.mda.state.mn.us/monitoring
MDA's ambient surface and groundwater water quality data is available at the National Water Quality Monitoring Council: https://www.waterqualitydata.us/

The MDA has been conducting pesticide monitoring in groundwater since 1985, and in surface waters since 1991. Annually, the MDA completes approximately 250 sample collection events from groundwater and 800 sample collection events from rivers, streams, and lakes across the state. In general, the MDA collects water samples from agricultural and urban areas of Minnesota and analyzes water for up to approximately 150 different pesticide compounds that are widely used and/or pose the greatest risk to water resources. Groundwater monitoring is conducted by the MDA and MPCA staff. Surface water monitoring is conducted by the MDA and local organizations. All monitoring is completed following annual work plans and standard operating procedures (SOPs) developed by the MDA.

The purpose of the MDA's pesticide monitoring program is to determine the presence and concentration of pesticides in Minnesota waters, and present long-term trend analysis. Trend analysis requires a long-term investment in monitoring within the MDA's established networks. The monitoring information is used to inform the management of pesticides in Minnesota. The MDA will continue to conduct statewide pesticide monitoring and will provide additional information related to the occurrence of pesticides in Minnesota waters.

Nitrogen Fertilizer Management Plan (NFMP)

http://www.mda.state.mn.us/nfmp

The NFMP is the state's blueprint for preventing or minimizing the impacts of nitrogen fertilizer on groundwater. The original plan was developed in 1990 and updated in March 2015. One activity stemming from the 2015 NFMP is implementation of the Groundwater Protection Rule, which (among other things) identifies vulnerable area where fall nitrogen fertilizer application is restricted. There is limited area in the watershed where fall restrictions apply.
See: Vulnerable Groundwater Area Map
The Groundwater Protection Rule also responds to DWSMAs with high nitrate levels in the public supply wells. In this watershed, the Shakopee DWSMA is impacted by the rule, however, due to the low amount of agricultural land in the high vulnerability area of the DWSMA, MDA has decided not to implement the rule in this DWMSA.

Township Testing Program-Private Well Nitrate Testing

www.mda.state.mn.us/townshiptesting

The MDA has identified townships throughout the state that are vulnerable to groundwater contamination and have significant row crop production. Scott, Le Sueur, and Rice counties participated in the TTP. Each selected township was offered testing in two steps, the 'initial' sampling, and the 'follow-up' sampling. In the initial sampling, all township homeowners using private wells received a nitrate test kit. If the initial sample detected nitrate at any level, the homeowner was offered follow-up tests for nitrate and pesticides and a well site visit. Trained MDA staff visited willing homeowners to resample the well and then conducted a site assessment. The site assessment identified possible non-fertilizer sources of nitrate and

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assessed the condition of the well. A well with construction problems may be more susceptible to contamination.

Two datasets, 'Initial' and 'Final', are used to evaluate nitrate in the private wells in this program. The initial dataset represents private wells drinking water regardless of the potential source of nitrate. The final dataset was informed through an assessment process to evaluate each well. In the assessment, wells that had nitrate results over 5 mg/L were removed from the final dataset if a potential non-fertilizer source or well problem was identified, there was insufficient information on the construction or condition of the well, or for other reasons which are outlined in the full report. The final dataset represents wells with nitrate attributed to the use of commercial fertilizer. Scott, Le Sueur, and Rice counties have been through both initial testing and follow-up testing. Within the DWSMA, 5 townships were involved in the TTP: Jackson, Louisville, Sand Creek, and St. Lawrence in Scott County; and Ottawa Township in Le Sueur County. Among these townships, none were identified as high nitrate areas (greater than 10% of wells above 10 mg/l) Ottawa township did exceed 10%, however it was not deemed a high nitrate area due to the low number of wells in the final sample.

Private Well Pesticide Sampling (PWPS)

https://www.mda.state.mn.us/pesticide-fertilizer/private-well-pesticide-sampling-project

The MDA began evaluating pesticide presence and magnitude in private residential drinking water wells as part of the Private Well Pesticide Sampling (PWPS) Project in 2014. This is a companion program to the MDA Township Testing Program (TTP). The townships included in the PWPS depend on the voluntary participation of well owners and may not reflect all townships sampled in the TTP. The same townships sampled in the Township Testing Program were also included in the PWPS within the Lower Minnesota East Watershed. An analysis of the results can be found at the link above.

Additional Resources and Opportunities for BMP Funding and Cost Share

Since there is a significant portion of the watershed in agricultural production, we would like to bring to your attention a few programs and resources that we encourage you to reference during the planning process.

Minnesota Agricultural Water Quality Certification Program (MAWQCP)

www.mda.state.mn.us/awqcp.

The MAWQCP is a voluntary opportunity for farmers and agricultural landowners to take the lead in implementing conservation practices that protect water quality. Participants that implement and maintain approved farm management practices will be certified and in turn obtain regulatory certainty for a period of ten years. This planning program should be included

in the 1W1P because it is an opportunity for agricultural producers to evaluate nutrient and field management practices within the watershed.

Nitrogen and Pesticide Use Surveys

The MDA surveys farmers through the National Agricultural Statistics Service (NASS). A summary of the survey data is attached. The most recent nitrogen use survey was for the 2014 crop year, specifically the Irrigated and Non-Irrigated sandy soils, Northwestern, Southwestern and West Central BMP regions. The most recent pesticide use survey was from the 2015/2016 crop years. MDA can provide more detail on this if requested.

For reference, the University of Minnesota fertilizer recommendations are found here: https://extension.umn.edu/nutrient-management/crop-specific-needs

Ag BMP Handbook

The Agricultural BMP Handbook for Minnesota is a comprehensive inventory of agricultural best management practices that address water quality impairments. The handbook is available on-line and hard copies are available upon request. State agencies and local government partners have found this a useful resource in the WRAPS and 1W1P processes.

Webpage:
http://www.mda.state.mn.us/protecting/cleanwaterfund/research/handbookupdate
• Download at: https://wrl.mnpals.net/islandora/object/WRLrepository:2955

Nutrient Management Initiative (NMI)

www.mda.state.mn.us/nmi

The NMI assists crop advisers and farmers in evaluating nutrient management practices on their own fields using on-farm trials. This is a great opportunity to promote new strategies that are available that could improve fertilizer use efficiency and help open the door to include local cooperators in the water quality discussion. In addition, advanced trials working with University of Minnesota researchers help to guide current nitrogen rate recommendations. Crop advisers worked directly with their farmers to evaluate nitrogen rate, nitrogen rate after manure, application timing, and stabilizer products by setting up trials on their own fields. New ideas in other watersheds included on-farm cover crop, placement, tillage, as well as precision agriculture and technology-based trials.

The AgBMP Loan Program

www.mda.state.mn.us/agbmploans

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The AgBMP Loan Program is a water quality program that provides low interest loans to farmers, rural landowners, and agriculture supply businesses. The purpose is to encourage agricultural best management practices that prevent or reduce runoff from feedlots, farm fields, and other pollution problems identified by the county in local water plans.

Agricultural Land Preservation Program

The MDA assists local government in protection of farmland through its Agricultural Land Preservation Program. This includes online tools and programmatic support. More information is available at https://www.mda.state.mn.us/environment-sustainability/farmland-protection

Agricultural Growth, Research, and Innovation (AGRI) Program

The AGRI program has funding that may be helpful in water quality protection. Specifically:

- The AGRI Livestock Investment Grant encourages long-term industry development for Minnesota livestock farmers and ranchers by helping them improve, update, and modernize their livestock operation infrastructure and equipment. More information is available at www.mda.state.mn.us/livestockinvestment.

- The AGRI Sustainable Agriculture Demonstration Grant supports innovative on-farm research and demonstrations. It funds projects that explore sustainable agriculture practices and systems that could make farming more profitable, resource efficient, and personally satisfying. Findings are published in the MDA's annual Greenbook. More information is available at www.mda.state.mn.us/sustagdemogrant.

Thank you again for the opportunity to provide background and relevant information as we look forward to being involved in the 1W1P process.

Sincerely,

Travis Hirman
Soil Scientist
Minnesota Department of Agriculture
651-201-6566
Travis.Hirman@state.mn.us

Cc: Carrie Raber, MDH Source Water Protection Unit
Barb Peichel, BWSR Clean Water Specialist
David DePaz, DNR Natural Resource Specialist
Brittany Faust, MPCA Watershed Project Manager
Joe Mulcahy, Met Council Environmental Analyst
John Freitag, MDH Principal Planner
Margaret Wagner, MDA Non Point Section Manager

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

July 8, 2022

Holly Kalbus
Environmental Resources Specialist
Le Sueur County
88 S Park Ave
Le Center, MN 56057
RE: Priority Concerns for the Lower Minnesota River East One Watershed One Plan

Dear Ms. Kalbus:

Thank you for the opportunity to submit comments regarding water management issues for consideration in the One Watershed One Plan (1W1P) planning process for the Lower Minnesota River East. Our agency looks forward to working closely with the local government units, stakeholders, and other agency partners on this watershed planning initiative.

The Minnesota Department of Health's (MDH) mission is to protect, maintain, and improve the health of all Minnesotans. An important aspect to protecting citizens health is the protection of drinking water sources. MDH is the agency responsible for implementing programs under the federal Safe Drinking Water Act (SDWA).

Source Water Protection (SWP) is the framework MDH uses to protect drinking water sources. The broad goal of SWP in Minnesota is to protect and prevent contamination of public and private sources of groundwater and surface water sources of drinking water using best management practices and local planning. Core MDH programs relevant to watershed planning are the State Well Code (MR 4725), Wellhead Protection (MR 4720) and surface water / intake protection planning resulting in a strong focus in groundwater management and protecting drinking water sources.

One of the three high level state priorities in Minnesota's Nonpoint Priority Funding Plan is to "Restore and protect water resources for public use and public health, including drinking water" which aligns with our agency's mission and recommendations to your planning process.

MDH Priority Concerns:

Prioritize Drinking Water Supply Management Areas (DWSMA) in the Lower Minnesota River East 1W1P.

DWSMA boundaries establish a protection area through an extensive evaluation that determines the contribution area of a public water supply well, aquifer vulnerability and provide an opportunity to prioritize specific geographic areas for drinking water protection purposes. DWSMA boundaries that extend beyond city jurisdictional limits or are established in Wellhead Protection (WHP) Action Plans for nonmunicipal public water supplies, like mobile home parks, can be a special focus for local partners prioritizing drinking water protection activities.

Aquifer vulnerability determines the level of management required to protect a drinking water supply and provides an opportunity to target implementation practices in accordance with the level of risk different land uses pose. The attached Public Water Supply Summary Spreadsheet highlights the primary drinking water protection activities for many DWSMAs in the watershed.

Prioritize Sealing Abandoned Wells

Unused, unsealed wells can provide a conduit for contaminants from the land surface to reach the sources of drinking water. This activity is particularly important for abandoned wells that penetrate a confining layer above a source aquifer.

Sealing wells is a central practice in protecting groundwater quality, however when resource dollars are limited it is important to evaluate private well density to identify the populations most at risk from a contaminated aquifer.

Prioritize Protection of Private Wells

Many residents of Lower Minnesota River East rely on a private well for the water they drink. However, no public entity is responsible for water testing or management of a private well after drilling is completed. Local governments are best equipped to assist private landowners through land use management and ordinance development, which can have the greatest impact on protecting private wells. Other suggested activities to protect private wells include: hosting well testing or screening clinics, providing water testing kits, working with landowners to better manage nutrient loss, promoting household hazardous waste collection, managing storm water runoff, managing septic systems, and providing best practices information to private well owners.

Targeting Groundwater & Drinking Water Activities in the 1W1P Planning Process

Limitation of Existing Tools –

Watershed models used for prioritizing and targeting implementation scenarios in the 1W1P, whether PTMapp, HSPF-Scenario Application Manager (SAM) or others, leverage GIS information and/or digital terrain analysis to determine where concentrated flow reaches surface water features. While this is an effective approach for targeting surface water contaminates, it does not transfer to groundwater concerns because it only accounts for the movement of water on the land's surface. Unfortunately, targeting tools are not currently available to model the impact on groundwater resources. The Minnesota Department of Health suggests using methodologies applied by the agency to prioritize and target implementation activities in the Source Water Protection program.

Using Wellhead Protection Plans –

- Identify Drinking Water Supply Management Areas (DWSMA) located in the watershed.
- Examine the vulnerability of the aquifer to contamination risk to determine the level of management required to protect groundwater quality. For example, a highly vulnerable setting requires many different types of land uses to be managed, whereas a low vulnerability setting focuses on a few land uses due to the long recharge time and protective geologic layer.
- Use the Management Strategies Table in a Wellhead Protection Plan to identify and prioritize action items for each DWSMA

Using Guidance Documents to Manage Specific Potential Contaminant Sources –

The MDH has developed several guidance documents to manage impacts to drinking water from specific potential contaminant sources. Topics include mining, stormwater, septic systems, feedlots, nitrates, and chemical and fuel storage tanks. This information is available at

https://www.health.state.mn.us/communities/environment/water/swp/resources.html

MDH Data and information:

A Groundwater Restoration and Protection Strategies (GRAPS) report will not be produced for this 1W1P. MDH can assist with Drinking water quality information upon request.

- Drinking Water Statistics – Where do people get their drinking water in the Lower Minnesota River East? All obtain their drinking water from groundwater. This information can help you understand where people are obtaining their drinking water and develop implementation strategies to protect the sources of drinking water in the watershed.

- Shape files of the Drinking Water Supply Management Areas (DWSMA) in the watershed are located at: https://www.health.state.mn.us/communities/environment/water/swp/maps/index.htm. This information can help you prioritize and target implementation activities that protect drinking water sources for public water supplies.

Thank you for the opportunity to be involved in your watershed planning process. If you have any questions, please feel free to contact me at (651) 201-4669 or john.freitag@state.mn.us.

Sincerely,

John Freitag, Principal Planner
Minnesota Department of Health
Source Water Protection Unit
625 North Robert Street
St. Paul, MN 55164

CC: Mark Wettlaufer, MDH Source Water Protection Unit
Bob Tipping, MDH Source Water Protection Unit
Carrie Raber, MDH Source Water Protection Unit
Derek Richter, MDH Source Water Protection Unit
Teresa Purrington, MDH Well Management Section
Vacant, BWSR Board Conservationist
Barb Peichel, BWSR Clean Water Specialist
David DePaz, DNR Natural Resource Specialist
Brittany Faust, MPCA Watershed Project Manager
Travis Hirman, MDA Soil Scientist
Joe Mulcahy, Met Council Environmental Analyst

MINNESOTA POLLUTION CONTROL AGENCY

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July 11, 2022

Holly Kalbus
Environmental Resources Specialist
Le Sueur County
88 S Park Ave
Le Center, MN 56057
hkalbus@co.le-sueur.mn.us

RE: Response to Request for Priority Issues and Concerns to be addressed in the Lower Minnesota River-East One Watershed, One Plan

Dear Holly Kalbus:

The Minnesota Pollution Control Agency (MPCA) appreciates the opportunity to provide priority resource concerns and issues for consideration in the Lower Minnesota River-East One Watershed, One Plan (1W1P). Our priority resource concerns and issues focus primarily on information available through the Watershed Approach process for the Lower Minnesota River Basin that began in 2014. A list of the available reports, studies, technical information, data, and other relevant supporting documents from this process and prior watershed work is included below.

The MPCA and other state agencies coordinated with local partners to gather, analyze, and summarize information to develop the Watershed Restoration and Protection Strategies (WRAPS) report for the entire Lower Minnesota River Watershed (LMRW). The MPCA recognizes the 1W1P will not cover this entire area. The following pages provide a summary of available information from the watershed process that includes the Lower Minnesota River-East planning area. The MPCA requests you consider this information during development of the 1W1P.

MPCA Water Management Priorities in the Lower Minnesota River-East 1W1P Area

The MPCA recommends focusing on the following priorities in the Lower Minnesota River-East planning process. The priorities were identified based on the existence of these issues watershed wide as identified by monitoring and assessment, stressor identification (SID), and the WRAPS.

Biota (Aquatic Life)

Address the stressors to aquatic life in the 1W1P. Aquatic life use impairments within the watershed are complex. Biotic impairments are a result of nonpoint source pollution and localized stress linked to poor habitat condition and altered hydrology. High nitrogen and phosphorus levels are likely impacting fish and macroinvertebrate communities in the southern part of the watershed. Stabilizing hydrology, increasing riparian buffer width, and stabilizing stream banks would greatly help the in-stream habitat.

Altered Hydrology

Seek changes to the landscape that reduce the volume, rates, and timing of runoff and increase the base flows needed to prevent continued and further impairments. A primary stressor of the biotic impairments in the watershed is altered hydrology. Other pollutants (turbidity, nutrients, bacteria, etc.) are delivered because of altered hydrology. Managing the hydrology to provide a consistent base flow is imperative for the survival of the biological communities in the watershed. Increasing rainfall infiltration and water retention, and improving riparian conditions are activities that are needed to stabilize hydrology and reduce impairments.

Turbidity and Total Suspended Solids (Aquatic Life)

Reduce and control sediment entering the water bodies of the watershed. Total suspended solids (TSS), and turbidity (measure of water clarity affected by sediment, algae, and organic matter), are common impairments and stressors to aquatic life in the watershed. Reducing TSS will also likely reduce how other pollutants are conveyed (phosphorus and bacteria).

Nutrients (Aquatic life/Eutrophication)

Reduce nutrient delivery to the watershed. High levels of nutrients (phosphorus) are driving nuisance algae blooms in the watershed's impaired lakes and threatening other lakes that are on the verge of becoming impaired. Algae blooms can deprive lakes of their oxygen as the algae die off and decay, causing fish kills. High levels of algae cause increased levels of turbidity, degrading aquatic recreation and aquatic life. Blue-green algae can also cause serious health issues for humans and pets.

The MPCA anticipates more lakes and stream reaches will be listed as impaired following the intensive monitoring phase of the second watershed cycle (beginning 2025). Past stream monitoring has documented high concentrations of total phosphorus. With the implementation of the new River Eutrophication Standards, the MPCA suspects that new stream impairments are likely to emerge.

Management plans that appropriately value the nutrient worth of manure and previous crops and focus on the timing and intensity of the fertilizers and manure applications will help reduce the amount of phosphorus and nitrogen reaching the river. These reductions would also aid in the low dissolved oxygen problems present in some parts of the watershed.

- Point Source Phosphorus Mapping Tool: Provides summaries of annual phosphorus loads and flow volumes discharged from NPDES/SDS permitted facilities since 2005
- Minnesota Nutrient Reduction Strategy

Bacteria (Aquatic Recreation)

Control pathways delivering human and livestock feces to the LMRW. High levels of bacteria are widespread across the western portion of the watershed. The abundance of feedlots, feedlot runoff, improper manure management, and over-grazed pastures in the watershed may correlate with this finding. High bacteria levels are also attributed to noncompliant septic systems.

Chloride Reduction

Six reaches in the Lower Minnesota River-East area are on the 2022 impaired waters list for chloride. The major sources of chloride around the state include application of chloride-based salts for winter maintenance activities, residential and commercial water softening, and agricultural inputs.

Chloride reduction at the source is key to protecting water quality, as there are currently no know economically feasible remediation strategies to remove chloride once it enters the environment.

The MPCA maintains resources (technical, educational, and financial) that may be of use to local partners in designing ways to reduce chloride:

- Statewide Chloride Resources
- Smart Salting Assessment Tool

Climate Change Resiliency and Adaptation

Planning should incorporate implementation of practices that address changing weather patterns to help our communities be prepared for extreme weather events.

- https://www.pca.state.mn.us/air/climate-resilient-communities
- Climate-vulnerable populations and strategies to reduce risk | Minnesota Pollution Control Agency (state.mn.us)

Environmental Justice

Environmental justice means the right of communities of color, Indigenous communities, and low-income communities, to the enjoyment of a healthy environment and to fair treatment and meaningful involvement with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. As part of the 2025 WRAPS update process, the MPCA is planning on making environmental justice concerns a priority. As part of this 1W1P, please consider integrating environmental justice values into the plan.

The MPCA has resources to assist in identifying areas with environmental justice concerns:

- Understanding environmental justice in Minnesota (arcgis.com)
- MPCA and environmental justice | Minnesota Pollution Control Agency (state.mn.us)

Lakes, Streams, and Groundwater Protection

There is a growing focus on maintaining the high-quality water that we still have. The same practices that protect water quality will also benefit wildlife, groundwater, air quality, soils, and numerous other aspects of our Minnesota environment.

With this understanding in mind, the MPCA collaborated with the Minnesota Department of Natural Resources and the Board of Water and Soil Resources to develop guidance for incorporating protection strategies into WRAPS, local water plans, and/or 1W1P documents. Link to resource: Protection and prioritization tools

Areas of protection pertinent to the LMRW that were mentioned by the WRAPS work group. These areas included specifically the bluffs of the Minnesota River Valley that give rise to many springs, including Boiling Springs in Savage, a sacred site to the Mdewakanton Sioux Tribe as well as Eagle Creek, which is a coldwater system that is a designated trout stream. In addition, calcareous fens, including Savage Fen, are unique features within the bluffs of the lower Minnesota River Valley. Calcareous fens are one of the rarest natural wetland communities and are protected under Minn. Stat. 103G.223. They are very dependent on a constant supply of groundwater, highly susceptible to disturbance, and support numerous rare plant species. A priority to protect drinking and groundwater sources especially in Ottawa, Sharon and Tyrone townships in Le Sueur County were also mentioned by the work group.

Additional MPCA resources:

- Minnesota Stormwater Manual
- MPCA funding options: Financial assistance for water projects | Minnesota Pollution Control Agency (state.mn.us)

Background Information

The State of Minnesota employs a watershed approach to restore and protect Minnesota's rivers, lakes, and wetlands. The watershed approach includes the following processes that can be used to inform water planning:

1. Watershed monitoring and assessment
2. SID of biological impairments

3. Total Maximum Daily Loads (TMDLs)
4. WRAPS

The following pages provide a brief description of these processes and internet links for the reports associated with these efforts in the LMRW.

Monitoring and Assessment

In 2014, a comprehensive approach was taken to monitor and assess surface water bodies in the LMRW for aquatic life, recreation, and fish consumption use support. For details on the data collected, refer to the Lower Minnesota River Watershed Monitoring and Assessment Report (wq-ws3-07020012b). For more information about the LMRW and links to reports visit: https://www.pca.state.mn.us/water/watersheds/lower-minnesota-river.

Monitoring data are used to determine if water quality is supporting a water body's designated use. During the assessment process, data on the waterbody are compared to relevant standards. When pollutants/parameters in a waterbody do not meet the water quality standard, the waterbody is considered impaired. When pollutants/parameters in a waterbody meet the standard (e.g. when the monitored water quality is cleaner than the water quality standard), the waterbody is considered supporting. Data from three water quality monitoring programs inform water quality assessment and create a long-term data set to track progress toward water quality goals. These programs will continue to collect and analyze data in the LMRW as part of Minnesota's Water Quality Monitoring Strategy. Intensive Watershed Monitoring (IWM), the Watershed Pollutant Load Monitoring Network (WPLMN) and Citizen Stream and Lake Monitoring Program (CSMP and CLMP) data provide a periodic but intensive "snapshot" of water quality conditions throughout the watershed.

Within the Lower Minnesota River-East area, there are 107 impairment listings. Table 1 summarizes the listings by impairment type. See the 2022 Impaired Waters List for details.

Table 1. Summary of water quality impairments for the Lower Minnesota River-East area.

Impairment Type	Number of Listings	Beneficial Use
Turbidity; Total Suspended Solids	7	Aquatic Life
Fecal Coliform; *E. coli*	16	Aquatic Recreation
Aquatic Macro-invertebrate bio assessment	19	Aquatic Life
Fish bio assessment	28	Aquatic Life
Lake; Nutrient/eutrophication	17	Aquatic Recreation
River Eutrophication	3	Aquatic Life
Chloride	6	Aquatic Life
Mercury in fish tissue	11	Aquatic Consumption

Stressor Identification

SID is performed on biological impairments to determine what pollutant and nonpollutant stressors are causing impairments to the aquatic biological community. The process is described in more detail and documented in the Lower Minnesota River Streams Stressor Identification Report (wq-ws5-07020012c) for the reaches listed for aquatic life impairments (fish, aquatic macro-invertebrate impairments). SID was completed on 82 waterbodies for biota (fish and/or macroinvertebrates) impairments in the entire LMRW. In the East area, 23 reaches were assessed within the city of Belle Plain – Minnesota River, Sand

Creek, and Le Sueur Creek subwatersheds within Scott, Le Sueur, and Rice counties. A summary of the primary stressors to the biological community by impaired reach can be found in Table 660 on Page 669 in the report referenced above. A table of stressors for each stream reach is also available in the respective stream reach sections of the report. In the study, primary stressors are identified as summarized in Table 2.

Table 2. Stressor identification summary for the aquatic life impaired streams in the Lower Minnesota River-East area.

Stressor	Number of Reaches
Altered hydrology/connectivity	8
Poor Habitat	18
Low Dissolved Oxygen	8
Eutrophication	12
High turbidity/TSS	7
High Nitrates	9
Chloride	1

Total Maximum Daily Loads

The Clean Water Act requires that TMDLs be developed for waters that do not support their designated uses. A TMDL essentially provides the allowable pollutant loading, as well as needed reductions, to attain and maintain water quality standards in waters that are not currently meeting standards. Following assessment of the LMRW, TMDL studies were completed for 98 impairments on waterbodies for the entire LMRW.

The TMDL report containing impaired waterbodies and pollutant reductions located in the eastern part of the watershed is found here:

Lower Minnesota River Watershed TMDL Report Part I – Southern and Western Watersheds

TMDL reductions and loads for individual waterbodies are presented in Section 4 of the report.

Basin-wide:

Minnesota River and Greater Blue Earth River Basin TMDL for TSS

Minnesota River bacteria TMDL and strategies report

Lower Minnesota River TMDL - Low Dissolved Oxygen

TCMA Chloride TMDL

Scott County:

Cedar Lake and McMahon (Carl's) Lake Excess Nutrients TMDL report

Spring Lake-Upper Prior Lake Nutrient TMDL (state.mn.us)

WRAPS

In each cycle of the watershed approach, rivers, lakes, and wetlands across the watershed are monitored and assessed, waterbody restoration and protection strategies and local plans are developed, and conservation practices are implemented. Much of the information presented in the WRAPS report

was synthesized from the Monitoring and Assessment, SID, and TMDL reports. However, the WRAPS report presents additional data and analyses including watershed-scale models and tools, detailed analyses and output from these work products, and a set of potential strategies for point and nonpoint source pollution that will cumulatively achieve, or otherwise make significant progress toward, water quality targets. The LMRW WRAPS report can be found here: Lower Minnesota River Watershed WRAPS Report. The restoration and protection strategy table can be found beginning on Page 80 of the report.

Civic engagement and public participation were a major focus during the LMRW Approach occurring from 2013 through 2018. The MPCA worked with county and SWCD staff in the watershed, consultants, citizens, and other state agency staff to work on two projects to promote civic engagement collaboratively in the area. Projects were tailored to local partner interest and capacity. See Page 244 of Lower Minnesota River Watershed Approach Civic Engagement Project for more information and review of these activities.

To ensure the WRAPS strategies and other analyses appropriately represent the LMRW, local county, SWCD staff, and state natural resource and conservation professionals (referred to as the WRAPS Feedback Group) were convened to inform the report and advise technical analyses. Two key products of this WRAPS report are the strategies table and the priorities section, each developed with the WRAPS Feedback Group. The strategies table outlines high level strategies necessary to restore and protect water bodies in the Watershed, including social strategies that are key to achieving the physical strategies. The priorities section presents criteria to identify priority areas for water quality improvement, including examples of water bodies and areas that meet the prioritizing criteria.

The primary audience for the WRAPS report is local planners, decision makers, and conservation practice implementers; watershed residents, neighboring downstream states, agricultural business, governmental agencies, and other stakeholders are the secondary audience.

Watershed Goals

Among the required elements of WRAPS are timelines for achieving water quality targets and interim milestones within 10 years of strategy adoption. It is the intent of the implementing organizations in this watershed to make steady progress in terms of pollutant reduction. However, needed pollutant load reductions are generally high and will require significant adoption of conservation practices. Accordingly, as a very general guideline or goal, it is assumed that 1% to 2% of the overall needed reduction will occur per year on average. This means that a 10% reduction goal is expected to be achieved in 5 to 10 years and 50% reduction goal will take 25 to 50 years.

Again, this is a general guideline and approximation. Factors that may mean slower progress include limits in funding or landowner acceptance, challenging fixes (e.g., unstable bluffs and ravines, invasive species) and unfavorable climatic factors. Conversely, there may be faster progress for some impaired waters, especially where high-impact fixes are slated to occur or where the watershed is subject to focused efforts.

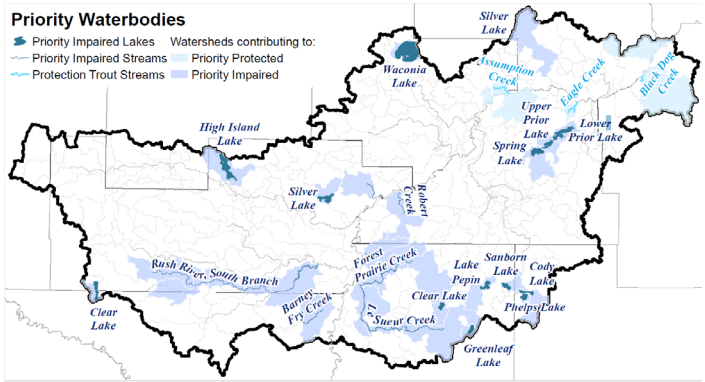
Prioritizing and Targeting

Section 3 of the LMR WRAPS Report discusses several existing methods to identify priority areas for planning consideration through development of the goals maps, the HSPF model maps, and the GIS estimated altered hydrology maps. The WRAPS report describes the priority areas identified by the WRAPS Local Work Group which are summarized below and should be considered for 1W1P planning efforts. Priority areas as shown in Figure 1 include impaired lakes (Upper Prior Lake, Lower Prior Lake, Spring Lake, Clear Lake, Lake Pepin, Sanborn Lake, Cody Lake, Greenleaf Lake, and Phelps Lake), impaired streams (Robert Creek, Forest Prairie Creek, and Le Sueur Creek), and protection trout streams

(Eagle Creek). These waterbodies provide both ecological and recreational value to residents and are of high social importance. Areas with rare and natural plant and animal communities should also be protected and enhanced. Rebuilding habitat utilized by rare and threatened species will help restore their populations while also improving watershed health and stream stability.

Other priorities identified in the WRAPS include "high impact/mitigating" areas with the potential to mitigate pollutants and stressors when ideally managed or areas with a disproportionately high negative impact when poorly managed. This would include reducing ditch cleanouts of stable channels with connection to a floodplain. Access to floodplains reduces sediment loading from bed and bank erosion, creates aquatic habitat, increases water and sediment storage, and increases nutrient uptake.

Figure 1. Locally identified priority waterbodies in the Lower Minnesota River WRAPS Report.



Restoring healthy channels and riparian areas of streams and ditches throughout the watershed offers critical habitat, improves water quality, and has the potential to buffer impacts of other stressors. Previously channelized streams in prioritized headwater reaches can be remaindered to restore stable conditions, increase stream length, create floodplain accessibility, improve habitat, and decrease sediment. Reconnecting incised streams to their floodplains improves ecological and hydrological functions, including increased resiliency in the system and reduced downstream flooding impacts. Collaborative assessment, targeting, and planning is necessary on a subwatershed scale to strategically plan before engaging in stream restoration. Streambank stabilization practices should only be used in appropriate locations (for example threatened infrastructure) due to the natural hydrologic regime being so heavily altered in the LMRW resulting in unstable incised channels.

Protection Plans and Strategies

There is a growing focus on maintaining the high-quality water that we still have. The same practices that protect water quality will also benefit wildlife, groundwater, air quality, soils, and numerous other aspects of our Minnesota environment.

Stream Protection Prioritization

In 2002, the Credit River was listed as impaired for aquatic life based on turbidity and was slated for a TMDL study. During the data collection process for the study, it became clear that the river did not exceed the turbidity standard and the end product was changed to a Protection Plan: Credit River protection plan.

Four streams in the Lower Minnesota River-East 1W1P area are considered high priority for protection: Eagle Creek (07020012-519), Unnamed Creek (07020012-684), County Ditch 3 (07020012-738), and County Ditch 8/53 (07020012-766).

Rankings for stream protection are based on water quality assessments, the level of risk posed from near shore areas, the level of risk posed from the contributing watershed, as well as the level of protection already in place in the watershed. These tools are considered a starting point, and local knowledge of surface water resources is key to utilizing any prioritization tool. For streams, the data is split into thirds; the top third are high (A) priority, the next third medium (B) priority, and the final third are low (C) priority.

Lake Protection Prioritization

Table 3 lists 10 lakes to be considered for protection strategies. Rankings for lake protection are based on water quality assessment results, the amount of clarity lost if phosphorus is added, the amount of land use disturbance, lake size, as well as what is known about current trends in water quality. These tools are considered a starting point, and local knowledge of surface water resources is key to utilizing any prioritization tool. For lakes, the top 25th percentile is the high (A) priority, the 50 to 75th percentile is medium (B) priority, and the bottom half of the lakes are the lower (C) priority.

Table 3. LMRW – East 1W1P area protection priority list.

Water body name	Lake ID	Depth Class	Lakes of Phosphorus Sensitivity Significance Protection Priorities
Lower Prior	70-0026-00	deep	A (High priority)
McMahon	70-0050-00	shallow	A (High priority)
O'Dowd	70-0095-00	deep	A (High priority)
Unnamed (Hass)	70-0078-00	shallow	B (Medium priority)
Rice	40-0016-00	shallow	C (Lower priority)
Metogga	66-0064-00	shallow	C (Lower priority)
Murphy	70-0010-00	deep	C (Lower priority)
Unnamed (South Portion)	70-0011-02	deep	C (Lower priority)
Hanrahan	70-0019-00	shallow	C (Lower priority)
Crystal	70-0061-00	deep	C (Lower priority)

Again, thank you for the opportunity to comment. The MPCA recognizes all the hard work and cooperation from the local partners within the Lower Minnesota River-East Watershed and offers our continued support in local water planning. If we may be of further assistance, please contact Brittany Faust at brittany.faust@state.mn.us at the MPCA's St. Paul office or Bryan Spindler at bryan.spindler@state.mn.us at the MPCA's Mankato office.

Sincerely,

Brittany Faust

This document has been electronically signed.

Brittany Faust
Environmental Specialist
Watershed Division

BF:jdf

Scan the QR code or click here:

bit.ly/LowerMN_AppendixC

Appendix C:
Data Aggregation Summary

Appendix C: **Data Aggregation Summary**

INTRODUCTION

Issues, resources, and priorities gathered from documents, reports, comment letters, water plans, and the kickoff meeting were categorized into resource categories and subcategories. Categories included emerging concerns, groundwater, leadership, natural resources, quality of life, and surface water. Subcategories for each concern are summarized in this appendix.

RESOURCE CATEGORIES	COUNT
Emerging Concerns	40
Groundwater	70
Outreach and Education	26
Habitat and Natural Resources	77
Quality of Life	26
Surface Water	303
Policy and Regulation	25
Data Studies Monitoring	30

Emerging Concerns	COUNT
Chlorides	13
Climate Change and Resilience	5
Contaminants of Emerging Concern	7
Land Development & Changes	13
Reduce Pesticide & Fertilizer Impacts	2
Other	9

Groundwater Subcategories	COUNT
Drinking Water Supply	15
Groundwater Quality	43
Groundwater Quantity	5
Infiltration & Recharge	1
Protect Groundwater Resources	5
Other	9

Outreach and Education Subcatego	COUNT
Stakeholder Involvement	0
Relationship Building	0
Landowner Engagement	9
Public Outreach	12
Engagement Opportunities	4
Other	9

Habitat & Natural Resource Subcate	COUNT
Manage, Enhance, and Restore Habitat	3
Aquatic Habitat	31
Wetland Habitat	15
Upland Habitat	0
Invasive Species	17
Preserve Prime Farmland	0
Preserve Sites of High Ecological Value	7
Protect Soil Health	2
Chlorides	
Invasive Species	17

Quality of Life	COUNT
Aquatic Consumption	6
Aquatic Recreation	16
Public Safety	3
Other	9
Other	

Surface Water Subcategories	COUNT
Altered Hydrology	7
Drainage System Management	12
Erosion & Sediment Control	65
Flooding & Floodplain	15
Protect Surface Water Resources	14
Stormwater Management	18
Surface Water Quality	140
Water Rate & Quantity	8
Waste & Feedlot	23
Other	2
Other	9

Policy & Regulation	Count
Administrative Priorities	15
Collaboration	6
Land Use Management	3
Political Support	0
Other	9

Data, Studies, & Monitoring	Count
Data Gaps	0
Feasibility Studies	0
Modeling	3
Data Collection	9
Monitoring Needs	16
Other	9

Scan the QR code or click here:

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Appendix D:
Kickoff Meeting Summary

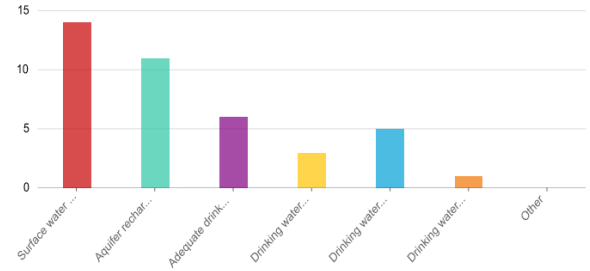
Appendix D: **Kickoff Meeting Summary**

Kickoff Meeting Summary:

Kickoff meeting was held on Tuesday, July 26, 2022, from 6:00 - 8:00pm at the Cedar Lake Farm Regional Park Pavilion; 25875 Juniper Ave, New Prague, Minnesota. There were 54 attendees present throughout the open house. Attendees included local staff, agency staff, commissioners, SWCD board members, city residents, lake residents, landowners, agricultural landowners, and watershed district members. The kickoff meeting was open house style with number of display boards that corresponded with various concerns throughout the watershed. Attendees were encouraged to participate in a virtual survey at each board during the meeting at their own pace. Below Is a summary of the ranking surveys and other activities.

Groundwater Concerns:

Select your top two groundwater concerns:



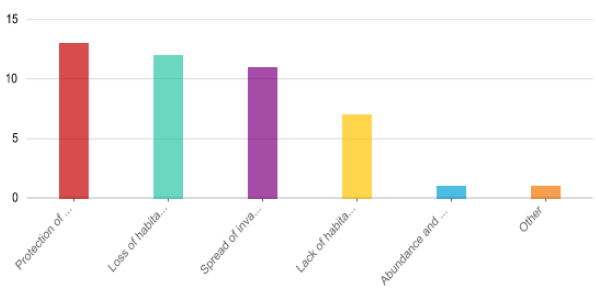
Answers	Count	Percentage
Surface water to groundwater connections	14	70%
Aquifer recharge rates	11	55%
Adequate drinking water supply	6	30%
Drinking water safety - high arsenic	3	15%
Drinking water safety - high nitrates	5	25%
Drinking water safety - bacteria	1	5%
Other	0	0%

Answered: 20 Skipped: 0

Lower Minnesota East Watershed Comprehensive Watershed Management Plan

Habitat Concerns:

Select your top two habitat concerns:



Answers	Count	Percentage
Protection of existing habitat (pollinator, trout, riparian, high quality, wetlands)	13	56.52%
Loss of habitat (pollinator, trout, riparian, high quality, wetlands, upland, perennial vegetation)	12	52.17%
Spread of invasive species (aquatic and terrestrial)	11	47.83%
Lack of habitat connectivity	7	30.43%
Abundance and diversity of wildlife	1	4.35%
Other	1	4.35%

Answered: 23 Skipped: 0

Other:

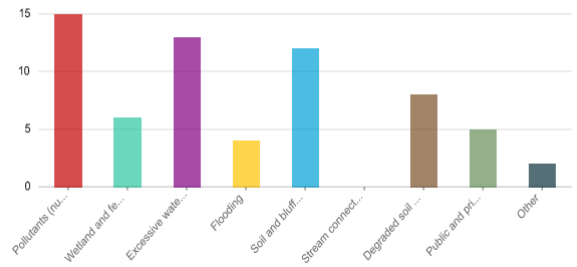
- What about aquatic habitat?

Tell Us More:

- There is missing natural areas that contain a large portion of natural cover and biodiversity in Le Sueur county. There is also a lot of privately owned land that supports native land cover.
- Need more habitat for wildlife....More easement opportunities

Surface Water Concerns:

Select your top three surface water concerns:



Answers	Count	Percentage
Pollutants (nutrients, bacteria contamination, chloride, toxics, metals)	15	68.18%
Wetland and fen management	6	27.27%
Excessive water runoff from the landscape	13	59.09%
Flooding	4	18.18%
Soil and bluff erosion	12	54.55%
Stream connectivity	0	0%
Degraded soil health	8	36.36%
Public and private drainage	5	22.73%
Other	2	9.09%

Answered: 22 Skipped: 0

Other:

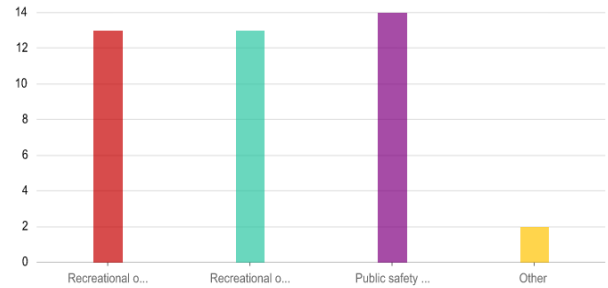
- Sediment water clarity.
- Run off into lakes - need more rain garden and natural shorelines

Tell us More:

- Too much road salt getting into boiling springs - Prior Lake
- I live on Cedar Lake and very concerned about algae blooms and water quality.

Quality of Life Concerns:

Select your top two quality of life concerns:



Answers	Count	Percentage
Recreational opportunities adversely impacted due to water and natural resources issues (fishing, boating, hunting, hiking, etc.)	13	54.17%
Recreational opportunities are deemed not safe due to water and natural resource issues (bacteria in waters causing illness, etc.)	13	54.17%
Public safety concerns due to contaminant in drinking water (arsenic, nitrates, bacteria)	14	58.33%
Other	2	8.33%

Answered: 22 Skipped: 2

Other:

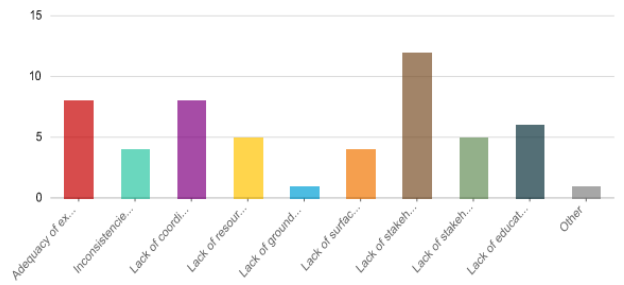
- Eliminate wake boarding
- Flooding and river flashiness

Tell us more:

- Very concerned about the effect of wake boats on the shoreline
- recreational activities negatively impacting water and habitat (wake boats)
- Poor water quality, wakes from fast boats affecting shore and shallot w alters/ plants

Research, Coordination, Policy, and Outreach:

Select your top three research, coordination, policy and outreach concerns:



Answers	Count	Percentage
Adequacy of existing regulations and ordinances to address adverse impacts on groundwater, surface water, and natural resources	8	40%
Inconsistencies in ordinances between partnering LGU's	4	20%
Lack of coordination with other local, state, federal, and non-profit organizations	8	40%
Lack of resources to track enforcement	5	25%
Lack of groundwater inventory or monitoring data	1	5%
Lack of surface waters inventory or monitoring data to determine impairments for their designated use	4	20%
Lack of stakeholder understanding of connections between land use activities and water quality	12	60%

Lack of stakeholder understanding of groundwater issues	5	25%
Lack of educational opportunities for the public (workshops, trainings, hands-on events)	6	30%
Other	1	5%

Answered: 20 Skipped: 0

Other:

- SWCD has excellent environmental programs for residents like planting native plants, etc

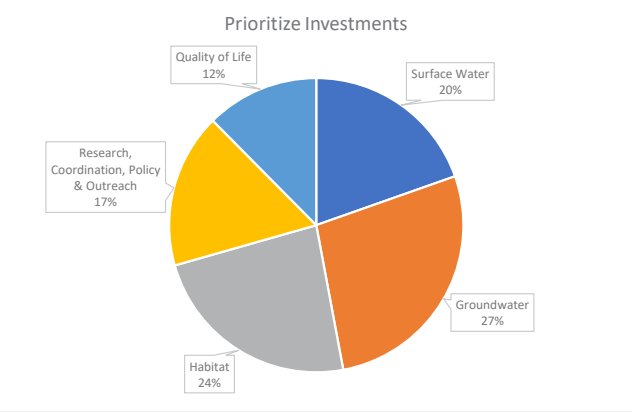
Tell us more:

- Education and outreach opportunities for the general public to visualize and understand direct impacts that citizens can have on the natural resources and watershed, positivity and negatively.
- I live on Cedar Lake

Prioritize Investments in your Watershed

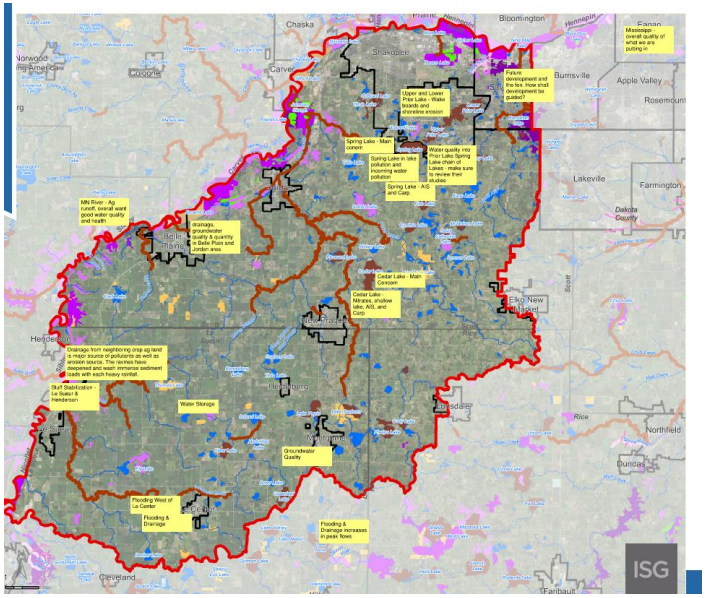
Where do you think the Lower Minnesota River East Partnership should prioritize investments? You have $5, where would you allocate funds? You can use more than $1 per topic.

Resource Concern Category	$ Invested	% of Total
Surface Water	$30	20%
Groundwater	$42	27%
Habitat	$36	24%
Research, Coordination, Policy & Outreach	$26	17%
Quality of Life	$19	12%
Total	$153	



Locations of Concern:

Select location(s) of concern to you on the map and provide a brief description of the concern and why its important to you.



Response Summary:

- Future development and the fen. How shall development be guided.
- Water Storage
- Flooding and drainage
- Flooding and drainage increases in peak flows
- Flooding west of Le Center
- Controlled tiling
- Drainage from neighboring crop ag land is a major source of pollutants as well as erosion sources. The Ravines have deepened and wash immense sediment loads with each heavy rainfall.
- Le Sueur / Henderson – Bluff Stabilization
- Spring Lake - Main concerns are invasive aquatic vegetation and carp.
- Spring lake
- Spring Lake – in lake pollution and incoming water pollution
- Water quality into Prior Lake – Spring Lake chain of lakes – make sure we revisit their studies

- Upper and Lower Prior Lake – wake boards and waterfront shoreline erosion
- Cedar Lake – nitrates, shallow lake, AIS, and carp
- Minnesota River – ag runoff, overall want good water quality / health
- Mississippi – overall quality of what we are putting in
- Groundwater quality
- Drainage, groundwater quality and quantity in Belle Plain and Jordan area

Scan the QR code or click here:

bit.ly/LowerMN_AppendixE

Appendix E:
Detailed Implementation Tables

Appendix E: **Detailed Implementation Tables**

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Soil Health Practices										
Nutrient Management	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 400 acres that result in a reduction of: 1,845 lbs of TN/yr 35 lb of TP/yr	80	80	80	80	80	$ 8,000	**SWCDs,** PLSLWD, LMRWD, MDA
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 250 acres that result in a reduction of: 1,680 lbs of TN/yr 25 lb of TP/yr	50	50	50	50	50	$ 5,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 210 acres that result in a reduction of: 1,275 lbs of TN/yr 25 lb of TP/yr	42	42	42	42	42	$ 4,200	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek	Implement 200 acres that result in a reduction of: 1,465 lbs of TN/yr 30 lb of TP/yr	40	40	40	40	40	$ 4,000	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Cover Crops (newly implemented, yearly for 3 years from first implementation)	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear Groundwater Priority Areas	Implement 6,500 acres that result in a reduction of: 115 tons TSS/yr 33,865 lbs TN/yr 950 lbs TP/yr	650	650	1300	1950	1950	$ 260,000	**SWCDs,** PLSLWD, LMRWD, MDA
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay Groundwater Priority Areas	Implement 3500 acres that result in a reduction of: 185 tons TSS/yr 26,925 lbs TN/yr 610 lbs TP/yr	500	500	750	750	1000	$ 140,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761) Groundwater Priority Areas	Implement 1,400 acres that result in a reduction of: 25 tons TSS/yr 9,455 lbs TN/yr 305 lbs TP/yr	140	140	280	420	420	$ 56,000	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek Groundwater Priority Areas	Implement 275 acres that result in a reduction of: 30 tons TSS/yr 2,340 lbs TN/yr 80 lbs TP/yr	25	25	50	75	100	$ 11,000	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon Groundwater Priority Areas	Implement 50 acres that result in a reduction of: 1 tons TSS/yr 260 lbs TN/yr 5 lbs TP/yr	0	0	0	0	50	$ 2,000	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Perennial Cover, Perennial Crops, Conservation Cover, Critical Area Planting, Prairie Restoration, Contour Buffer Strips, buffer expansions, buffer installation (where not required), and other natural cover practices	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear Groundwater Priority Areas	Implement 500 acres that result in a reduction of: 10 tons TSS/yr 10,055 lbs TN/yr 235 lbs TP/yr	10 ac	10 ac	10 ac	10 ac	10 ac	$ 1,250,000	**SWCDs,** PLSLWD, LMRWD
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay Groundwater Priority Areas	Implement 350 acres that result in a reduction of: 25 tons TSS/yr 8,760 lbs TN/yr 175 lbs TP/yr	70 ac	70 ac	70 ac	70 ac	70 ac	$ 875,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761) Groundwater Priority Areas	Implement 5 acres that result in a reduction of: 0.1 tons TSS/yr 115 lbs TN/yr 5 lbs TP/yr			5 ac			$ 12,500	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek Groundwater Priority Areas	Implement 10 acres that result in a reduction of: 1 tons TSS/yr 245 lbs TN/yr 10 lbs TP/yr		5 ac		5 ac		$ 25,000	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon Groundwater Priority Areas	Implement 25 acres that result in a reduction of: 1 tons TSS/yr 560 lbs TN/yr 10 lbs TP/yr			25 ac			$ 62,500	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Conservation Tillage (No till or strip till w/ high residue) (newly implemented, Yearly for 3 years from first year of implementation)	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear Groundwater Priority Areas	Implement 1,760 acres that result in a reduction of: 30 tons TSS/yr 4,595 lbs TN/yr 530 lbs TP/yr	176	352	352	440	440	$ 52,800	**SWCDs,** PLSLWD, LMRWD
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay Groundwater Priority Areas	Implement 2,500 acres that result in a reduction of: 135 tons TSS/yr 9,980 lbs TN/yr 895 lbs TP/yr	500	500	500	500	500	$ 75,000	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek Groundwater Priority Areas	Implement 35 acres that result in a reduction of: 5 tons TSS/yr 135 lbs TN/yr 20 lbs TP/yr	0	0	0	0	35	$ 1,050	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Ag BMPs										
Grassed Waterways (Assume one grass waterway if 50-feet wide and 300-feet long and treats 24-acres)	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 5 grass waterways that result in reduction of: 1 ton of TSS/yr 75 lbs of TN/yr 15 lbs of TP/yr	1 grass waterway	1 grass waterway	1 grass waterway	1 grass waterway	1 grass waterway	$ 495	**SWCDs,** PLSLWD, LMRWD
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 6 grass waterways that result in reduction of: 5 ton of TSS/yr 160 lbs of TN/yr 20 lbs of TP/yr	1 grass waterways	1 grass waterways	1 grass waterways	2 grass waterways	1 grass waterways	$ 585	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 5 grass waterways that result in reduction of: 1 ton of TSS/yr 100 lbs of TN/yr 20 lbs of TP/yr	1 grass waterway	1 grass waterway	1 grass waterway	1 grass waterway	1 grass waterway	$ 495	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek	Implement 2 grass waterways that result in reduction of: 1 ton of TSS/yr 45 lbs of TN/yr 10 lbs of TP/yr				1 grass waterways	1 grass waterways	$ 180	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon	Implement 2 grass waterways that result in reduction of: 0.5 ton of TSS/yr 30 lbs of TN/yr 5 lbs of TP/yr				1 grass waterways	1 grass waterways	$ 180	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
WASCOBs (10 acres treated per WASCOB)	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 30 WASCOBs that result in reduction of: 5 tons of TSS/yr 1,410 lb of TN/yr 140 lb of TP/yr	6 WASCOBs	6 WASCOBs	6 WASCOBs	6 WASCOBs	6 WASCOBs	$ 330,000	**SWCDs,** PLSLWD, LMRWD
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 8 WASCOBs that result in reduction of: 5 tons of TSS/yr 675 lbs of TN/yr 45 lbs of TP/yr	1 WASCOBs	1 WASCOBs	2 WASCOBs	2 WASCOBs	2 WASCOBs	$ 88,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 8 WASCOBs that result in reduction of: 2 tons of TSS/yr 480 lbs of TN/yr 55 lbs of TP/yr	2 WASCOB	1 WASCOB	2 WASCOB	1 WASCOB	2 WASCOB	$ 88,000	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek	Implement 4 WASCOBs that result in reduction of: 5 tons of TSS/yr 295 lbs of TN/yr 45 lbs of TP/yr		1 WASCOBs	1 WASCOBs	1 WASCOBs	1 WASCOBs	$ 44,000	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon	Implement 1 WASCOBs that result in reduction of: 0.5 tons of TSS/yr 55 lbs of TN/yr 5 lbs of TP/yr					1 WASCOB	$ 11,000	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Alternative Side Inlets (44 acres treated per ASI)	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 25 ASIs that result in a reduction of: 25 tons of TSS/yr 1,755 lbs of TN/yr 355 lbs of TP/yr	10 ASIs		10 ASIs		5 ASIs	$ 112,500	**SWCDs, Le Sueur & Rice Counties,** PLSLWD, LMRWD
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 6 ASIs that result in a reduction of: 20 tons of TSS/yr 730 lbs of TN/yr 105 lbs of TP/yr			2 ASIs	2 ASIs	2 ASIs	$ 27,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 5 ASIs that result in a reduction of: 5 tons of TSS/yr 430 lbs of TN/yr 105 lbs of TP/yr		5 ASIs				$ 22,500	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon	Implement 1 ASIs that result in a reduction of: 2 tons of TSS/yr 115 lbs of TN/yr 15 lbs of TP/yr				1 ASIs		$ 4,500	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Grade Stabilization	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 10 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	$ 150,000	**SWCDs,** PLSLWD, LMRWD, municipalities
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 6 grade stabilization projects		1 grade stabilization projects	2 grade stabilization projects	1 grade stabilization projects	2 grade stabilization projects	$ 90,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 10 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	2 grade stabilization projects	$ 150,000	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek	Implement 1 grade stabilization projects				1 grade stabilization projects		$ 15,000	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon	Implement 1 grade stabilization project			1 grade stabilization projects			$ 15,000	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Storage										
Wetland restoration, enhancements, banks, and constructed wetlands (Assumes 50-acres of existing cropland treated by 4.6 ac of wetland - 1ac pool to 3.6 ac of buffer; area notes includes pool and buffer)	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear Groundwater Priority Areas	Implement 50 acres that result in a reduction of: 15 tons/yr of TSS 5,375 lbs/yr of TN 135 lbs/yr of TP		25 acres		25 acres		$ 762,500	**SWCDs,** PLSLWD, LMRWD, municipalities
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay Groundwater Priority Areas	Implement 40 arcs that result in a reductions of: 30 tons/yr of TSS 5,435 lbs/yr of TN 105 lbs/yr of TP			20 acres		20 acres	$ 610,000	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon Groundwater Priority Areas	Implement 5 acres that result in a reduction of: 1 tons/yr of TSS 610 lbs/yr of TN 10 lbs/yr of TP				5 acres		$ 76,250	
Impoundments	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	10 ac-feet			1 Impoundment Project			$ 80,000	**Le Sueur County**

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Stream and Lakeshores										
Riparian Native Plantings along Lakes and Streams	Watershed-Wide	Streams - Le Sueur Creek, Forest Prairie Creek, Middle Sand Creek, Upper Sand Creek, Raven Stream, Unnamed Creek (761), Roberts Creek, Unnamed Creek (604) Lakes - Clear, Cedar, Cody, Phelps, LeMay, Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon Riparian Habitat Priority Areas	Implement 10,000 ft^2 of Riparian Native Plantings	500 ft^2	500 ft^2	500 ft^2	500 ft^2	500 ft^2	$ 6,000	**SWCDs, PLSLWD, LMRWD,** Le Sueur & Rice Counties, Municipalities

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Stream Restorations	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Riparian Habitat Priority Areas	Implement 2 stream restoration projects (approx 1,000 LF)			1 Project		1 Project	$ 150,000	**SWCDs, PLSLWD, LMRWD,** Municipalities, DNR
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Riparian Habitat Priority Areas	Implement 5 stream restoration project (approx 1,375 linear feet)	1 Project	1 Project	1 Project	1 Project	1 Project	$ 206,250	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761) Riparian Habitat Priority Areas	Implement 2 stream restoration project (approx 200 linear feet)		1 Project		1 Project		$ 30,000	
	City of Belle Plain - Minnesota River	Streams - Roberts Creek Riparian Habitat Priority Areas	Implement 0 stream restoration project				1 Project		$ -	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Riparian Habitat Priority Areas	Implement 1 stream restoration projects (approx 600 linear feet)			1 Project			$ 90,000	
Streambank Stabilization	Watershed-Wide	Streams - Le Sueur Creek, Forest Prairie Creek, Middle Sand Creek, Upper Sand Creek, Raven Stream, Unnamed Creek (761), Roberts Creek, Unnamed Creek (604)	Implement 5 Stream Stabilization Project (approx 3,000 linear feet)	1 Project	1 Project	1 Project	1Project	1 Project	$ 300,000	**SWCDs** **WD** Municipalities DNR

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
In-Lake Practices										
Lake Alum Treatments	Le Sueur Creek	Lakes - Clear	Complete 1 alum treatment					1 Project	$ 200,000	**Le Sueur County & SWCD**
	Minnesota River Outlet	Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon	Complete 1 alum treatment					1 Project	$ 200,000	**PLSLWD**
Urban BMPs										
Stormwater filtration basins	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 1 filtration basin / trench that results in a reduction of: 0.1 tons/yr of TSS 5 lbs/yr of TN 0.6 lb/yr of TP				1 filtration basin/ trench		$ 10,000	**PLSLWD, LMRWD Municipalities**, SWCDs
Stormwater Retention Basins	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 1 retention basin that results in a reduction of: 0.1 tons/yr of TSS 5 lbs/yr of TN 0.5 lb/yr of TP				1 retention basin		$ 15,000	**Watershed Districts, Municipalities**, SWCDs
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 1 retention basin that results in a reduction of: 0.2 tons/yr of TSS 5 lbs/yr of TN 0.6 lb/yr of TP			1 retention basin			$ 15,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 1 retention basin that results in a reduction of: 0.1 tons/yr of TSS 5 lbs/yr of TN 0.6 lb/yr of TP		1 retention basin				$ 15,000	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon	Implement 1 retention basin that results in a reduction of: 0.2 tons/yr of TSS 15 lbs/yr of TN 1 lb/yr of TP			1 retention basin			$ 15,000	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Bioretention Basins	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 2 bioretention basins that results in a reduction of: 0.2 tons/yr of TSS 15 lbs/yr of TN 1 lb/yr of TP			1 bioretention basin		1 bioretention basin	$ 1,000	**Watershed Districts, Municipalities**, SWCDs
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 30 bioretention basins that results in a reduction of: 5 tons/yr of TSS 300 lbs/yr of TN 20 lb/yr of TP	6 bioretention basins	6 bioretention basins	6 bioretention basins	6 bioretention basins	6 bioretention basins	$ 15,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 5 bioretention basins that results in a reduction of: 0.4 tons/yr of TSS 25 lbs/yr of TN 5 lb/yr of TP	1 bioretention basins	1 bioretention basins	1 bioretention basins	1 bioretention basins	1 bioretention basins	$ 2,500	
	Minnesota River Outlet	Streams - Unnamed Creek (604) Lakes - Spring, Upper Prior, Lower Prior, O'Dowd, Thole, McMahon	Implement 20 bioretention basins that results in a reduction of: 10 tons/yr of TSS 385 lbs/yr of TN 30 lb/yr of TP	4 bioretention basins	4 bioretention basins	4 bioretention basins	4 bioretention basins	4 bioretention basins	$ 10,000	
Groundwater / Wells										
Seal Unused Wells	Watershed-Wide	Implementation is opportunity/interest based. Outreach and Education targeted to priority groundwater areas	Complete 40 Well Sealings	8	8	8	8	8	$ 80,000	**Le Sueur & Rice Counties, SWCDs, PLSLWD, LMRWD** Municipalities
SSTS / E.coli										

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
SSTS repair/replacements	Watershed-Wide	Implementation is need or requirement based.	Complete 10 SSTS improvements, repairs, or replacements	2	2	2	2	2	$ 280,000	**Le Sueur & Rice Counties** MPCA
Ravines										
Ravine Stabilization	Le Sueur Creek	Streams - Le Sueur Creek, Forest Prairie Creek Lakes - Clear	Implement 2 ravine stabilizations			1 Project		1 Project	$ 130,000	**SWCDs, PLSLWD, LMRWD,** Municipalities
	Sand Creek	Streams - Middle Sand Creek, Upper Sand Creek, Raven Stream Lakes - Cedar, Cody, Phelps, LeMay	Implement 2 ravine stabilizations		1 Project		1 Project		$ 130,000	
	City of Le Sueur - Minnesota River	Streams - Unnamed Creek (761)	Implement 2 ravine stabilizations		1 Project		1 Project		$ 130,000	

Implementation Action	Location (HUC10 Subwatershed)	Priority Areas	Measurable output for this activity	Timeframe					Estimated Cost (*Outside funding not needed)	Lead & Supporting Entities
				Years 1 & 2	Years 3 & 4	Years 5 & 6	Years 7 & 8	Years 9 & 10		
Habitat/Easement										
Riparian Buffers	Le Sueur Creek	Riparian restoration priority areas	Implement 125 acres of riparian buffers	25	25	25	25	25	$ 312,500	
	Sand Creek	Riparian restoration priority areas	Implement 50 acres of riparian buffers	10	10	10	10	10	$ 125,000	
	City of Le Sueur - Minnesota River	Riparian restoration priority areas	Implement 75 acres of riparian buffers	15	15	15	15	15	$ 187,500	
	City of Belle Plain - Minnesota River	Riparian restoration priority areas	Implement 25 acres of riparian buffers	5	5	5	5	5	$ 62,500	
	Minnesota River Outlet	Riparian restoration priority areas	Implement 25 acres of riparian buffers	5	5	5	5	5	$ 62,500	**SWCDs**, WD, Drainage Authorities
Easements	Le Sueur Creek	Habitat Protection Priority Areas	Enroll 400 acres into conservation easements	80	80	80	80	80	$ 3,400,000	
	Sand Creek	Habitat Protection Priority Areas	Enroll 200 acres into conservation easements	40	40	40	40	40	$ 1,700,000	
	City of Le Sueur - Minnesota River	Habitat Protection Priority Areas	Enroll 100 acres into conservation easements	20	20	20	20	20	$ 850,000	**SWCDs,** WD, Le Sueur & Rice Counties, BWSR, USFWS, DNR
	City of Belle Plain - Minnesota River	Habitat Protection Priority Areas	Enroll 25 acres into conservation easements					25	$ 212,500	
	Minnesota River Outlet	Habitat Protection Priority Areas	Enroll 75 acres into conservation Easements		50		25		$ 637,500	

Appendix F:
Modeling

Appendix F: **Modeling**

Memorandum

Lower Minnesota River East - Advisory Committee

The following memo provides a summary of the water quality modeling completed for the Lower Minnesota East Comprehensive Watershed Management Plan. The measurable goals presented in the Plan have been developed with quantifiable metrics for the issue framework based on the quantities, efforts, and modeled outcomes as a reflection of the implementation actions included in the Plan.

MODELING OVERVIEW

The values presented in the implementation tables were developed using the updated HSPF watershed model with BMPs added to create scenarios using the Scenario Application Model (SAM) software. The HSPF model simulates pollutant loading from the landscape and within the stream reaches for the watershed. Pollutant values are calibrated to observed water quality data. Scenarios were developed by applying BMPs in the targeted subwatersheds. Pollutant reductions showcase reduction on pollutant delivery to the Minnesota River. The area treated and associated costs were entered into SAM to simulate pollutant reductions and assess the cost effectiveness of the BMPs. The cost assumptions used for the implementation tables are included in the attachments. Costs assume total cost for implementation but are not inclusive of outreach, planning, technical assistance, or engineering that may be needed.

The model utilized Version 2.13 of HSPF Scenario Application Manager. The MPCA contracted with RESPEC to update the most up to date files to utilize the functionality of SAM Version 2 in this planning effort. The files were provided via email on March 17, 2023.

The model utilized two separate data files due to the setup of the models utilized for the WRAPS and other state led planning efforts. The models are divided into the Lower Minnesota model which includes Le Sueur Creek, City of Le Sueur – Minnesota River, and portions of the City of Belle Plaine Minnesota River subwatershed, and the Minnesota River (Metro) model which includes remaining portions of the City of Belle Plaine – Minnesota River, the Minnesota River Outlet, and Sand Creek subwatershed. There are portions of both model that extend into areas that are not within the Lower Minnesota East Planning Area. These areas where not included in the analysis of scenarios for implementing BMPs. SAM is limited in the number of unique land uses it can utilize in each data file, therefore the models were most likely separated into more agricultural dominated landscape model (Lower Minnesota) and urban dominated landscape model (Lower Minnesota – Metro).

6465 Wayzata Boulevard + Suite 970 + St. Louis Park, MN 55426
952.426.0699 + ISGInc.com
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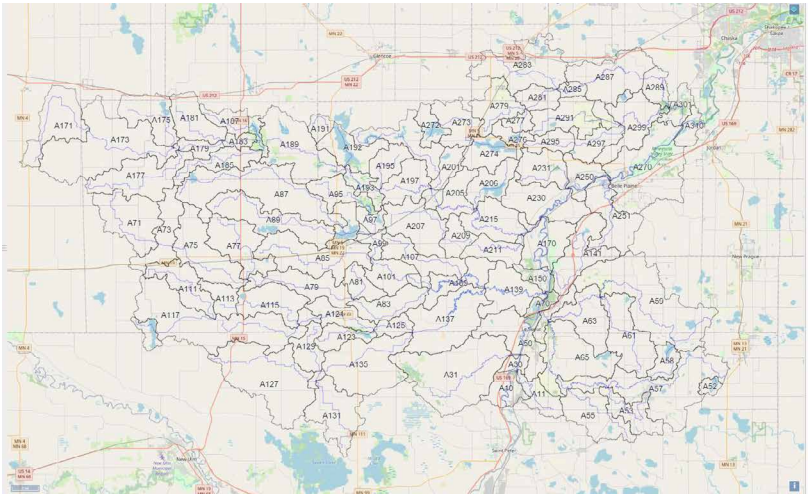

Figure 1: Lower Minnesota SAM Model Area

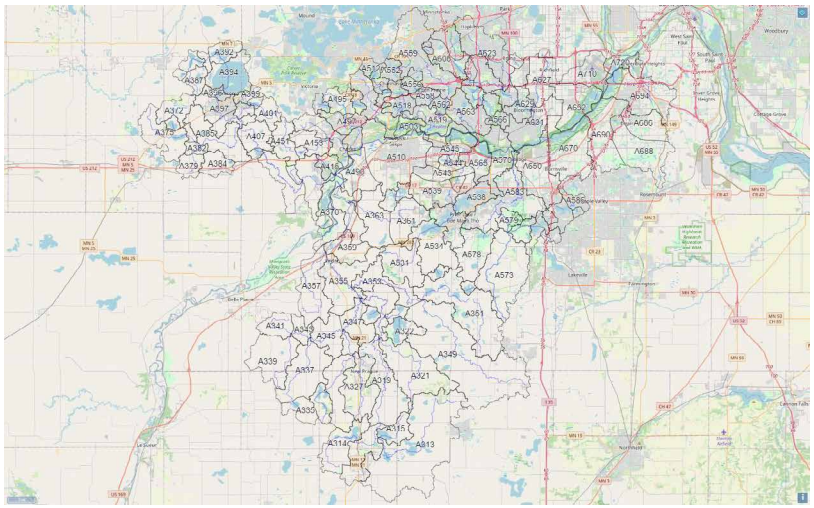

Figure 2: Lower Minnesota Metro Model Area

The HSPF model simulates pollutant loading from the landscape and in-stream processes for the Planning Area with simulated pollutant values being calibrated to observed water quality data at key monitoring locations throughout the Planning Area and within the Minnesota River. Detailed calibration reports for each model can be referenced below:

2015 Minnesota River Basin HSPF Model Hydrology Recalibration: https://www.pca.state.mn.us/sites/default/files/wq-iw7-47o.pdf

2016 Minnesota River Basin HSPF Model Sediment Recalibration: https://www.pca.state.mn.us/sites/default/files/wq-iw7-47o.pdf

MODELING ASSUMPTIONS

With all models there are a number of assumptions that are made to best represent the conditions that may be anticipated in the future conditions. The following section outlines the assumptions made while modeling the Lower Minnesota East watershed planning efforts.

BMP Placement

BMPs were placed in subwatersheds that overlap with priority areas for each practice. The BMPs were placed into each subwatershed equally based on the suitable acres within each subwatershed. Further refinement on priority placement of BMPs

at field scale will be completed during work planning and can utilize other tools to further prioritization such as PTMApp, ACPF, and HSPF-SAM subwatershed loading rates.

Cost Assumptions and Treated Acres

Cost assumptions and number of acres treated for each BMP are outlined in the BMP treatment and cost assumption spreadsheet. The spreadsheet was initially created by ISG and reviewed by the Steering Team to provide edits and feedback for the final version that is included in this memo as an attachment.

Pollution Reductions

Default pollution reductions were used for surface, interflow, and base flow for each practice. Default pollution reductions were compiled by MPCA utilizing literature review relevant to Minnesota. See Figure 3 below for summary of the default pollution reductions for each practice from the Documentation of Best Management Practices Database Available in the Scenario Application Manager (RESPEC, 2017) (https://www.respec.com/sam-file-sharing/).

Constituent	TN	TN	TN	TP	TP	TP	TSS
Flow Pathway	Surface	Interflow	Base Flow	Surface	Interflow	Base Flow	Surface
Nutrient Management	12	12	5	4	4	2	0
Nutrient Management + Manure Incorporation	10	14	5	13	13	5	0
Restore Tiled Wetlands (cropland)	52	52	20	43	43	16	75
Tile Line Bioreactors	0	22	6	0	0	0	0
Controlled Tile Drainage	0	43	11	0	43	11	0
Riparian Buffers, 16 ft wide (replacing row crops)	43	27	12	50	31	14	74
Riparian Buffers, 50 ft wide (replacing row crops)	66	42	19	67	42	19	84
Riparian Buffers, 100 ft wide (replacing row crops)	79	50	22	80	51	23	90
Filter Strips, 50 ft wide (cropland field edge)	66	42	19	67	42	19	84
Conservation Crop Rotation	42	26	12	30	19	9	50
Conservation Cover Perennials	91	58	26	84	53	24	96
Corn & Soybeans with Cover Crop	28	17	8	29	18	8	74
Short Season Crops with Cover Crop	43	27	12	29	18	8	74
Reduced Tillage (30%+ residue cover)	33	21	9	33	21	9	50
Reduced Tillage (no-till)	79	50	22	68	43	19	80
Alternative Tile Intakes	0	66	17	0	66	17	90
Riparian Buffers, 50 ft wide (pasture)	44	33	14	45	34	14	50
Corn & Soybeans to Rotational Grazing	75	47	21	59	37	17	75
Water and Sediment Control Basin (cropland)	82	52	23	85	54	24	90
Constructed Stormwater Pond	24	18	8	40	30	13	67
Constructed Wetland	24	18	8	30	22	9	58
Infiltration Basin	80	60	25	80	60	25	80
Bioretention/Biofiltration	60	45	19	61	45	19	74

TN = total nitrogen.
TP = total phosphorus.
TSS = total suspended solids.

Figure 3: Default Pollution Reductions for SAM (RESPEC, 2017)

Limitations

HSPF – SAM does not model near channel erosion (ravine, bank, or bluff). The BWSR Water Erosion Pollution Reduction Estimator was used to quantify reduction numbers for near channel and in-channel projects such as ravine stabilization and stream restoration.

HSPF – SAM is limited in its capabilities to model internal loading particularly in-lake processes. The model and measurable goals focus on external loading and watershed contributions. The model does not include in-lake treatment BMPs.

Memorandum
Lower Minnesota River East - Advisory Committee

More Information

More information about HSPF modeling assumptions and parameters can be found here in the SAM User Manual and BMP Reference: https://www.respec.com/sam-file-sharing/

BMP PRACTICE MODEL

The table below outlines the tools utilized to determine pollution reductions for each BMP in the implementation table. The main tools utilized to determine pollution reductions were HSPF-SAM and the BWSR Water Erosion Pollution Reduction Estimator. Some practices will measure success in measurements of widget (ex. well sealings) and were not modeled for pollutant reductions.

BMP Practice	HSPF – SAM	BWSR Water Erosion Pollution Reduction Estimator	Widget
Nutrient Management	X		
Cover Crops	X		
Perennial Cover	X		
Conservation tillage	X		
Grassed waterways	X		
WASCOBs	X		
Alternative Side Inlets	X		
Grade Stabilizations		X	
Wetland Restorations	X		
Impoundments	X		
Shoreline Restorations		X	
Stream Restorations		X	
Streambank Stabilization		X	
Lake Alum Treatments			X
Stormwater Retention Basin	X		

Bioretention	X		
Well Sealing			X
SSTS repairs / replacements			X
Ravine stabilization		X	
Riparian buffers	X		
Easements	X		

Practice	Units Implemented	Cost per Unit Implemented	Not to Exceed Total	Cost period	Acres Treated per Unit Implemented	Notes about Treatment Ratio
Cover crops (EQIP 340)	acres	$40.00		Yearly for 3 years from First year of Implementation	1	Treated acres are equal to Implemented acres
Conservation Tillage - Includes both no till (EQIP 329) and strip till with high residue (EQIP 345)	acres	$30.00	$45,000 / yr	Yearly for 3 years from First year of Implementation	1	Treated acres are equal to Implemented acres
Grassed Waterway	linear feet	$9.00		one time	0.08	Assume a grassed waterway is 50ft wide and 300ft long (15,000ft^2) that treats an area of 1,045,000ft^2 (24 acres). Therefore one linear
Water and sediment control basins (WASCOBs) and Terraces	project	$11,000.00		one time	10.8	Assume 10 acres of cropland treated per WASCOB
Ponds, impoundments, and other engineered water storage practices - Structures solely focused on providing water storage	acre-feet of water storage	$8,000.00		one time	NA	Assume one project achieves 5 acre-ft of storage
Wetland Restoration (EQIP 657)	acres	$15,250		one time	10.8	Assume 50 acres of existing cropland can be treated by 4.6 ac of wetland (1 ac pool + 3.6 acres of buffer)
Perennial Cover - Establishing perennial cover in priority areas identified in the plan.	acres	$2,500.00		one time	1	Treated acres are equal to Implemented acres
Alternate Side Inlets	project	$4,500.00		one time	44	Assume one project treats 44 acres
Grade Stabilization (riparian) - Grade stabilization structures adjacent to streams in the riparian corridor to stabilize gully's.	project	$15,000.00		one time	NA	Count of projects implemented
Nutrient Management	acres	$20.00	$10,000 - $15,000 / yr	Yearly for 3 years from First year of Implementation	1	Treated acres are equal to implemented acres
Nutrient Management Plan - Establishment of a Nutrient Management Plan that meets all requirements of EQIP 104.	plan	$3,500.00		one time	NA	Count of plans established
Stream Restorations - Applying nature-based engineering solutions to stabilize stream channels, reconnect incised channels to the floodplain, and increase habitat . Specific location and scope of practice will be determined following the completion of the feasibility studies.	linear feet	$150.00		one time	NA	Count of projects implemented; One Project is 200 LF
Stream Stabilization - Definition of streambank stabilization is used to stop active erosion (riprap, biorolls, etc	linear feet	$300.00				One project is 100 LF
Grade Stabilization (ravine) - Stabilization structures for ravines in the Minnesota River valley	project	$65,000.00		one time	NA	Count of projects implemented
Lakeshore Restorations - Restoring lakeshore areas with nature-based engineering approaches and establishment of native vegetation and buffers. Specific location and scope of practice will be determined following the completion of the feasibility studies.	linear feet	$100.00		one time	NA	Count of linear feet implemented
Lake Alum Treatments - Reduces internal phosphorus loading. Will only be persued if feasibility studies identify as an effective approach.	project	$10,000.00		one time	NA	Count of projects implemented
Lake Vegetation Management - Treatment or removal of invasive and nuisance aquatic vegetaton. Will only be perued if feasibility studies identify as an effective approach.	project	$1,000.00		one time	NA	Count of projects implemented

Practice	Units Implemented	Cost per Unit Implemented	Not to Exceed Total	Cost period	Acres Treated per Unit Implemented	Notes about Treatment Ratio
Permeable Pavers - Stormwater management to reduce impermeable surfaces.	acres	$440,000.00		one time	2	Assume 2 acres treated per 1 acre of implemented area
Stormwater filtration Basins	Project	$10,000.00		one-time	24	Assume a typical implementation area of 0.2 acres and treats 5 acres
Stormwater retention basins	project	$15,000.00		one-time	24	Assume a typical implementation area of 0.2 acres and treats 5 acres
Bioretention (Rain Gardens)	acres	$2,500.00		one time	24	Assume a typical rain garden has an implementation area of 0.2 acres and treats 5 acres
Well sealing	wells	$2,000.00		one time	NA	Count of private wells sealed
Septic system upgrades	septic systems	$28,000.00		one time	NA	Count of septic systems updraded

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