

Bois de Sioux - Mustinka Comprehensive Watershed Management Plan

2021-2030

January 27, 2021



Effective Until January 31, 2031

Bois de Sioux – Mustinka

Comprehensive Watershed Management Plan

Acknowledgements

Planning Partners

Big Stone County and SWCD

Grant County and SWCD

Otter Tail County and West Otter Tail SWCD

Stevens County and SWCD

Traverse County and SWCD

Wilkin County and SWCD

Bios de Sioux Watershed District



Created in Collaboration With

Houston Engineering, Inc
7550 Meridian Circle North, Suite 120



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Bois de Sioux - Mustinka

Comprehensive Watershed Management Plan

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Executive Summary

The Bois de Sioux and Mustinka River Watersheds (or Bois de Sioux – Mustinka Watersheds) cover approximately 1,413 square miles of predominately agricultural land in west-central Minnesota. Stakeholders from these **two watersheds** partnered to develop this Comprehensive Watershed Management Plan (CWMP) under the Minnesota Board of Water and Soil Resources (BWSR) One Watershed, One Plan (1W1P) program.

The 1W1P program represents an effort to develop a single, concise, and coordinated approach to watershed management. This plan consolidates policies, programs and implementation strategies from existing data, studies, and plans, and incorporates input from multiple planning partners to provide a single plan for management of the watershed. Previously, numerous county and watershed district plans were developed for different areas of this watershed with little attention paid to coordination at the watershed scale. This plan is authorized by Minnesota State Statute 103B.801 and will substitute as the comprehensive local water management plan, soil and water conservation district comprehensive plan, and watershed district overall plan per 103C, 103B, and 103D. This plan builds on past efforts to better manage water resources in this watershed.

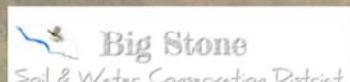
The purpose of this plan is to equip local governments tasked with managing natural and water resources with information necessary to identify issues specific to each watershed, set goals to address those issues, and take actions to fix (or make progress towards fixing) them. The plan also focuses on assisting landowners with getting conservation practices on the ground. The plan is not regulatory in nature. It is simply a tool to assist local governments and landowners with protecting and/or improving water management and securing project funds. Activities described in this plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation. This plan is a list of goals that the organizations may accomplish in the next 10 years. This plan in no way represents an agreement or contract between any or all the 13 independent local government units and the State of Minnesota or any of its departments or agents.

Plan Area and Planning Partners

In Minnesota, the Bois de Sioux – Mustinka Watersheds extend over portions of Big Stone, Grant, Otter Tail, Stevens, Traverse, and Wilkin counties. It includes the cities of Breckenridge, Campbell, Donnelly, Doran, Dumont, Elbow Lake, Graceville, Herman, Johnson, Nashua, Norcross, Tintah, Wendell, and Wheaton. The Bois de Sioux – Mustinka CWMP planning boundary also coincides with the jurisdictional boundary of the Bois de Sioux Watershed District (**Figure ES-1**).

The Bois de Sioux - Mustinka 1W1P Partnership was developed through a Memorandum of Agreement for purposes of drafting this plan. Partnership entities include:

- The counties of Big Stone, Grant, Otter Tail, Stevens, Traverse, and Wilkin,;
- The Big Stone, Grant, West Otter Tail, Stevens, Traverse, and Wilkin SWCDs; and
- The Bois de Sioux Watershed District.



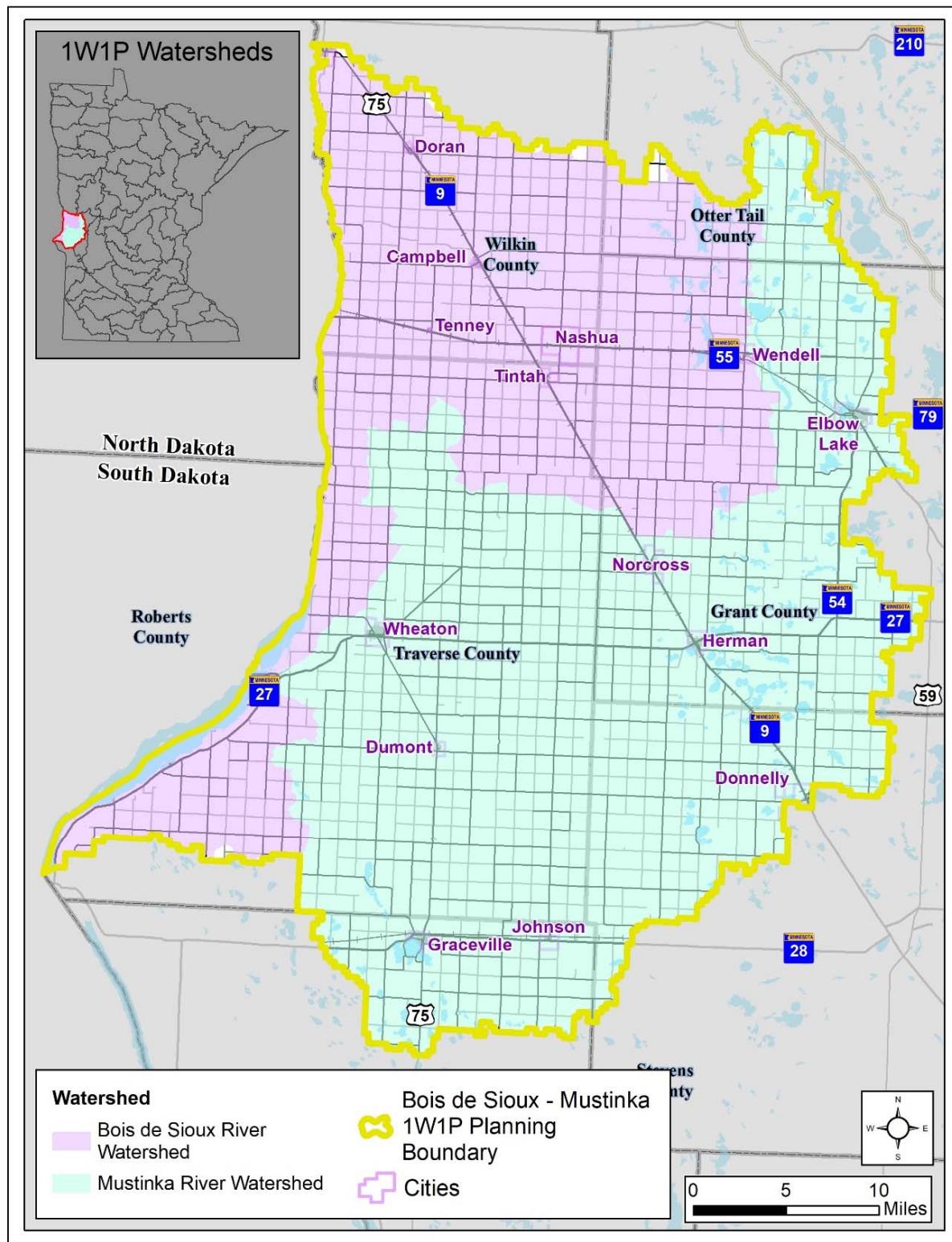


Figure ES-1: Bois de Sioux River and Mustinka River Watersheds within Bois de Sioux – Mustinka CWMP



Planning Regions

The Bois de Sioux – Mustinka Watersheds cover a large geographic area. To tailor planning and implementation to the issues that impact different areas of the watersheds, the Bois de Sioux – Mustinka Watersheds were subdivided into five, smaller planning regions (Figure ES-2). Planning region boundaries were created to follow hydrologic boundaries and topography changes. This plan is organized around these regions - they form the basis for prioritizing issues, setting goals to address those issues, and targeting actions to meet identified goals.

Figure ES-2: Bois de Sioux – Mustinka CWMP Planning Regions

Bois de Sioux River Watershed Planning Regions



Lake Traverse & Bois de Sioux River



Rabbit River

Mustinka River Watershed Planning Regions



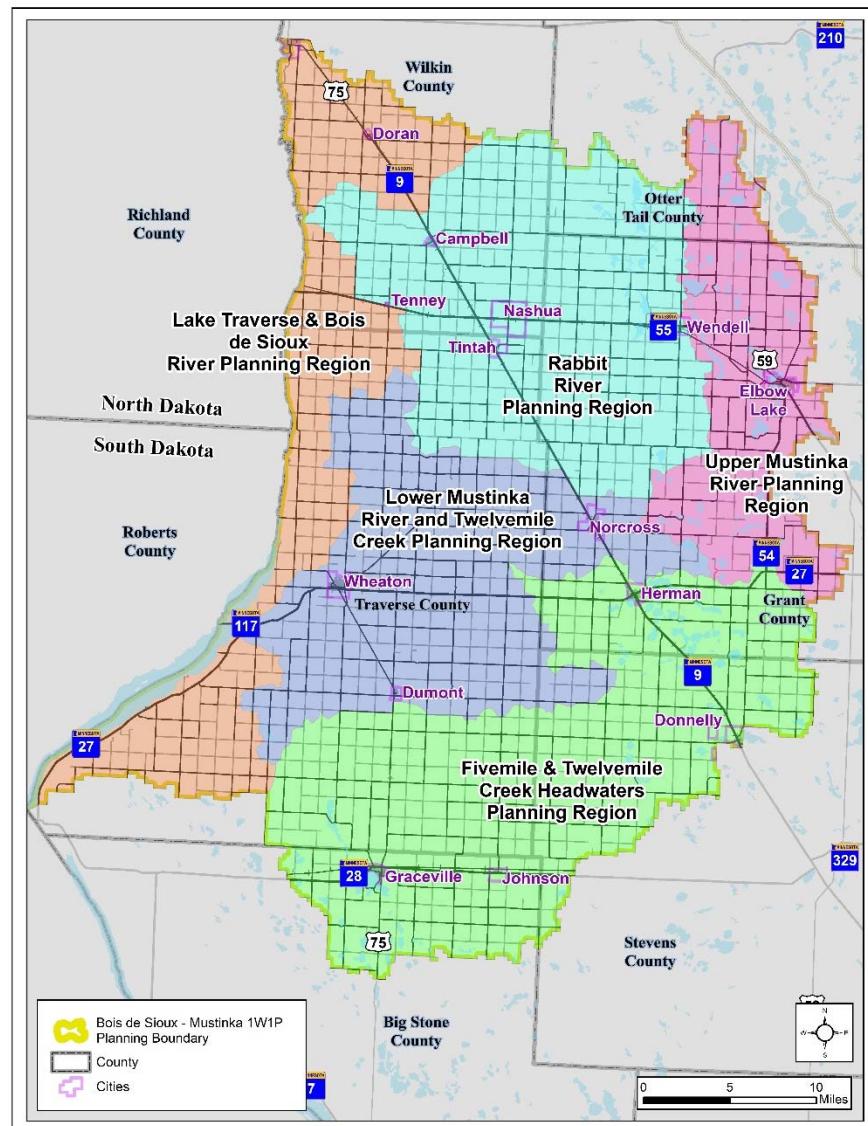
Upper Mustinka River



Lower Mustinka and Twelvemile Creek



Fivemile & Twelvemile Creek Headwaters



Issue Prioritization

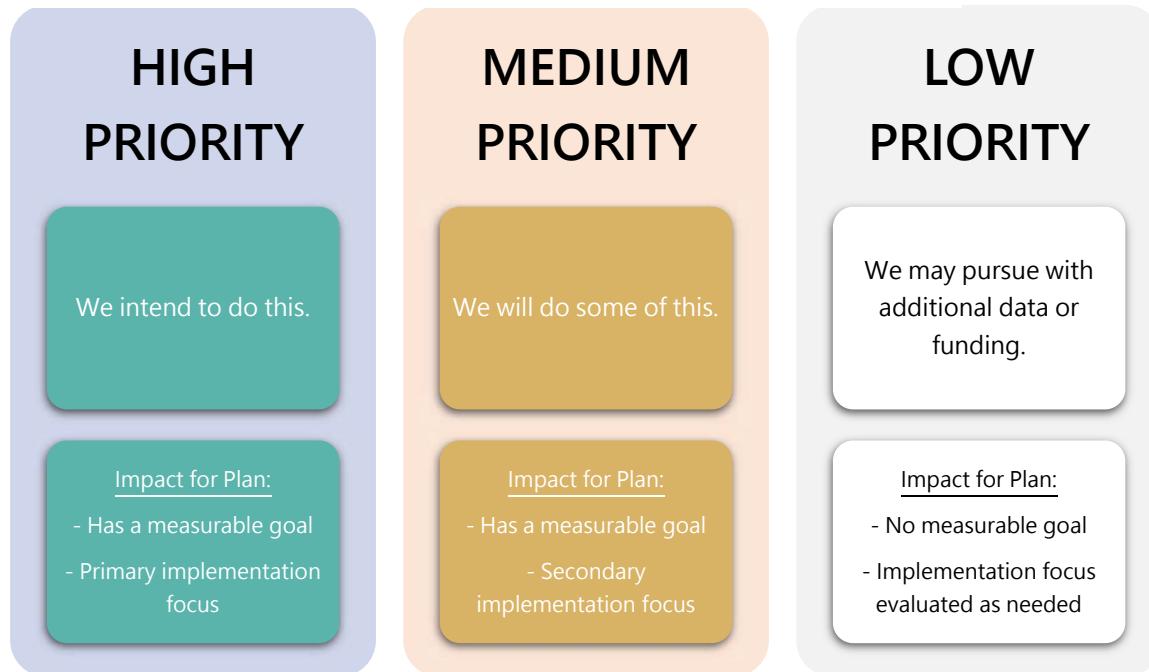
There is a wealth of information and data that summarizes natural resource and water management conditions within the Bois de Sioux – Mustinka Watersheds, including:

- Current county water plans and the watershed district plan;
- Total Maximum Daily Loads (TMDL) and Watershed Restoration and Protection Strategy Reports (WRAPS);
- Red River Basin Flood Damage Reduction Work Group Agreement; and
- Agency comment letters.

To begin the planning effort, issues summarized within these resources were aggregated to develop a list of natural resource and water management issues within the watersheds. In total, a list of 25 issues was generated. Due to realistic staff time and funding limitations, this plan prioritizes issues to focus on during a 10-year effort. Issues were prioritized by planning region based on input from two public meetings and feedback from stakeholder committee groups. The three priority levels are shown below.



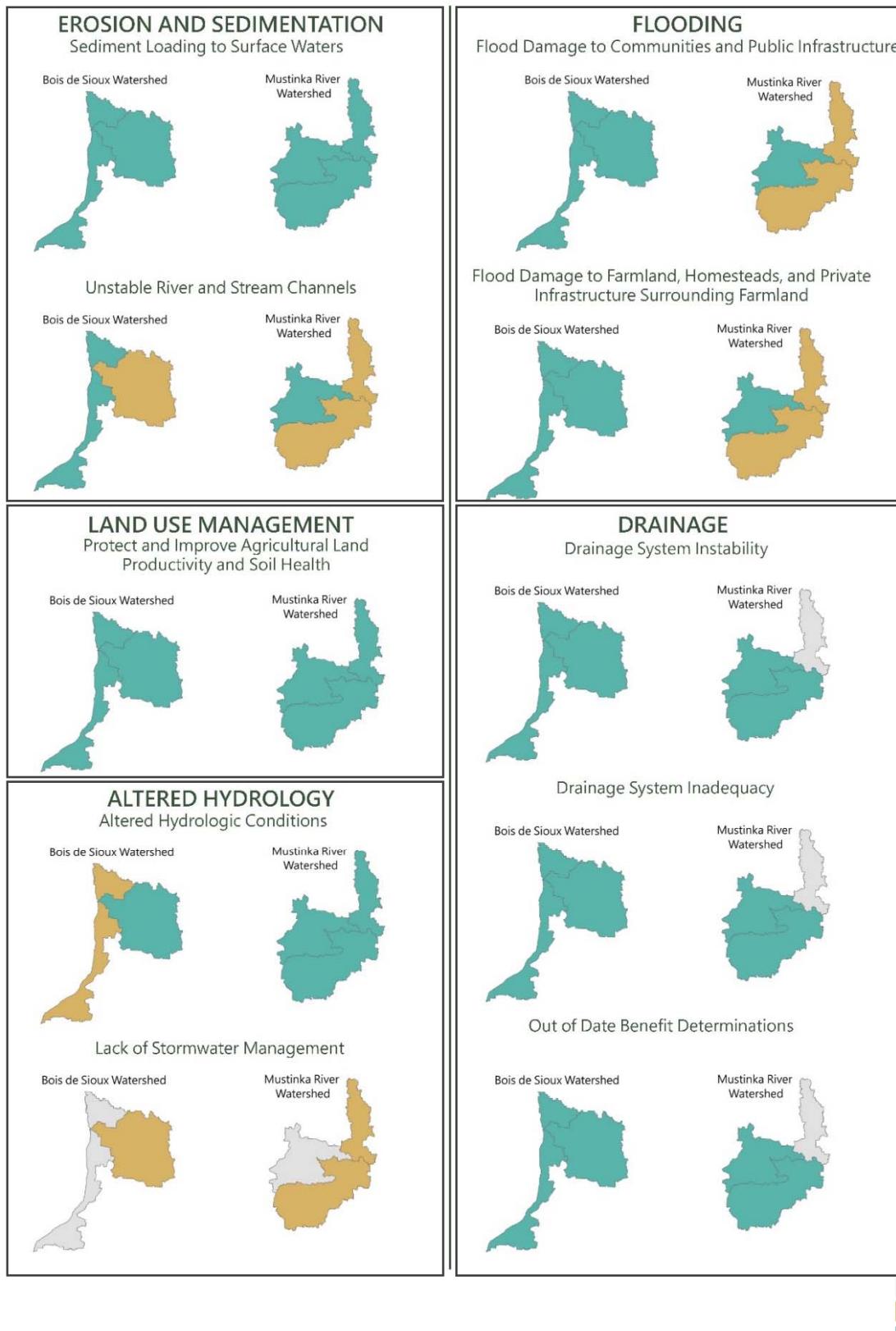
Figure ES-3 Priority level descriptions



Issues that received a “High” or “Medium” priority level for any of the five planning regions are considered “priority issues” in this plan. This plan identifies 20 priority issues, summarized in Figure ES-4.



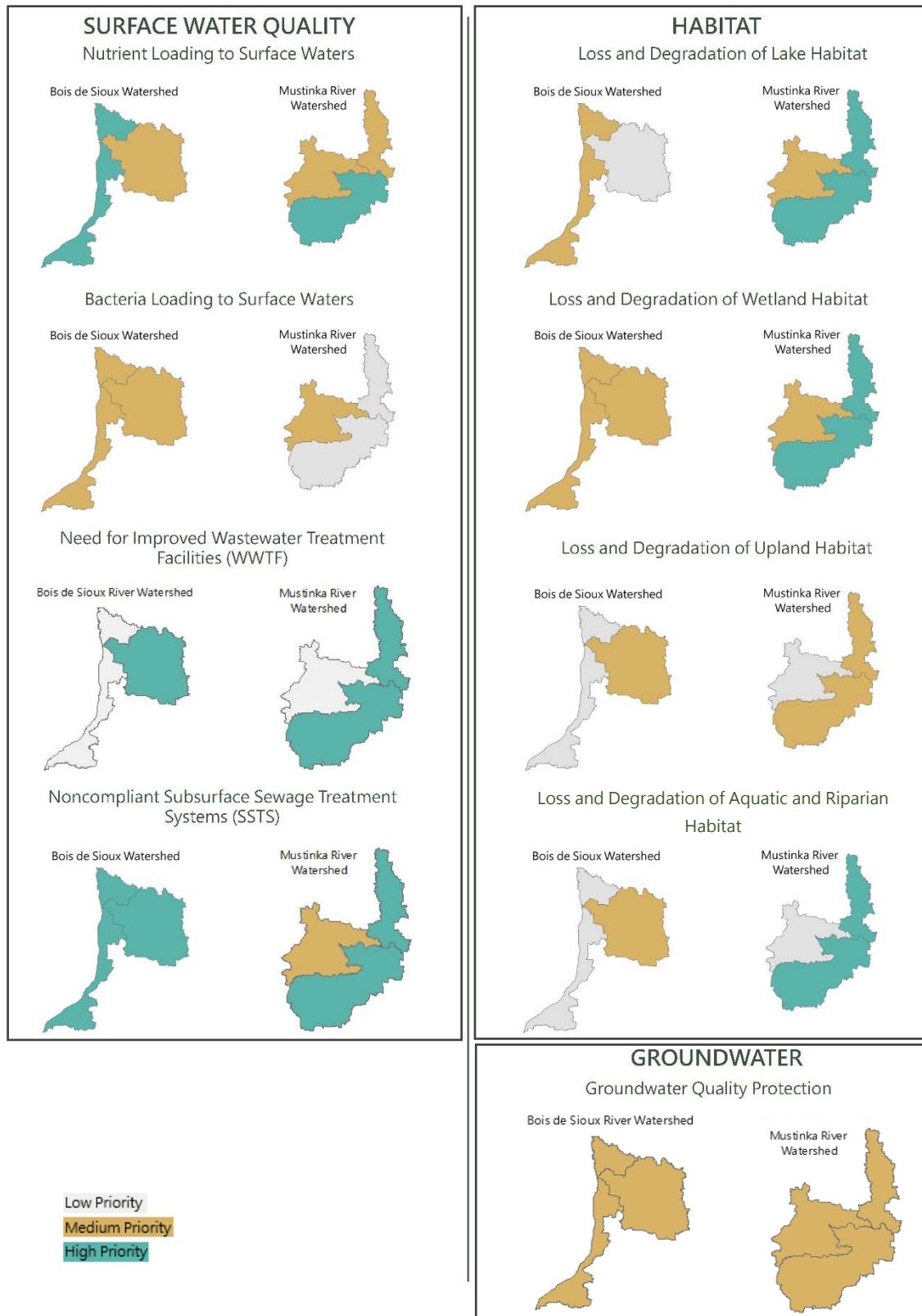
Figure ES-4: Priority issues for the Bois de Sioux-Mustinka CWMP



Low Priority
Medium Priority
High Priority



Figure ES-4 Cont.: Priority issues for the Bois de Sioux-Mustinka CWMP



Measurable Goals

This plan sets measurable goals for each priority issue. Measurable goals are statements of intended accomplishments, and are either short-term or long-term:

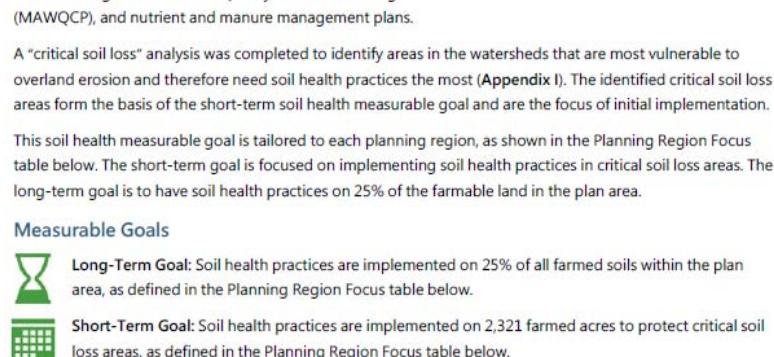
- Short-term measurable goals describe the interim conditions to accomplish during the 10-year timeframe of this plan
- Long-term measurable goals describe the desired future condition to accomplish, regardless of timeframe.

Twelve measurable goals were established to address the priority issues of this comprehensive plan. The measurable goals are presented as a series of factsheets, each summarizing:

- the priority issues the goal addresses,
- the planning region prioritization for each priority issue,
- background information supporting the goal,
- the short- and long-term goals, by planning region, and
- specific resources that are prioritized for the goal.

A measurable goal example is provided in **Figure ES-5**. For a full list of plan measurable goals, see **Section 3**.

Figure ES-5: Example measurable goal for the CWMP




Bois de Sioux – Mustinka Watershed

Planning Region	Area	Soil Health Practices Implemented (Acres)
Bois de Sioux Watershed	Lake Traverse & Bois de Sioux River	30,800 acres
Bois de Sioux Watershed	Rabbit River	45,800 acres
Mustinka Watershed	Upper Mustinka River	21,800 acres
Mustinka Watershed	Lower Mustinka and Twelvemile Creek	39,800 acres
Mustinka Watershed	Fivemile & Twelvemile Creek Headwaters	55,000 acres



Implementation

This plan identifies actions that may be implemented in the next 10 years to make progress towards the plan goals. Action Tables within the plan detail:

- information about each action,
- where and when it will occur,
- who will be responsible for implementation,
- how it will be measured, and
- how much it may cost.

This plan contains five different Action Tables that group similar actions together based on how they may be funded. A summary of these tables is shown in **Figure ES-6**.

Figure ES-6: Action tables in the Bois de Sioux-Mustinka CWMP

<p>Projects and Practices</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Structural conservation practices (filter strips, farm ponds, grade stabilization structures, etc.)• Management practices (cover crops, tillage methods, etc.)• Land contracting programs <p>Scale of Planning: Planning Region</p> <p>Funded by: Projects and Practices Implementation Program</p> <p>See Page 4-5</p>	<p>Capital Improvement Projects</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Large projects over \$250,000• Ditch Retrofits• Stream Stabilizations• Impoundments <p>Scale of Planning: Planning Region</p> <p>Funded by: Capital Improvements Implementation Program</p> <p>See Pages 4-5</p>	 <p>Types of Actions:</p> <ul style="list-style-type: none">• Monitoring• Studies to close data gaps <p>Scale of Planning: Watershedwide</p> <p>Funded by: Data Collection and Monitoring Implementation Program</p> <p>See Page 4-31</p>	<p>Data Collection</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Community events• Workshops and demonstrations• Educational material distribution <p>Scale of Planning: Watershedwide</p> <p>Funded by: Education and Outreach Implementation Program</p> <p>See Page 4-34</p>	<p>Education and Outreach</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Administration of feedlots, wetlands, septic systems, and land use <p>Scale of Planning: Watershedwide</p> <p>Funded by: Regulatory Implementation Program</p> <p>See Page 4-36</p>	<p>Regulatory</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Administration of feedlots, wetlands, septic systems, and land use <p>Scale of Planning: Watershedwide</p> <p>Funded by: Regulatory Implementation Program</p> <p>See Page 4-36</p>
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Making progress toward goals is largely dependent on funding and private landowner participation. With more funding and landowner cooperation, more actions can be implemented, and more progress toward goals made. This plan organizes actions into three funding levels, described in **Table ES-1**.

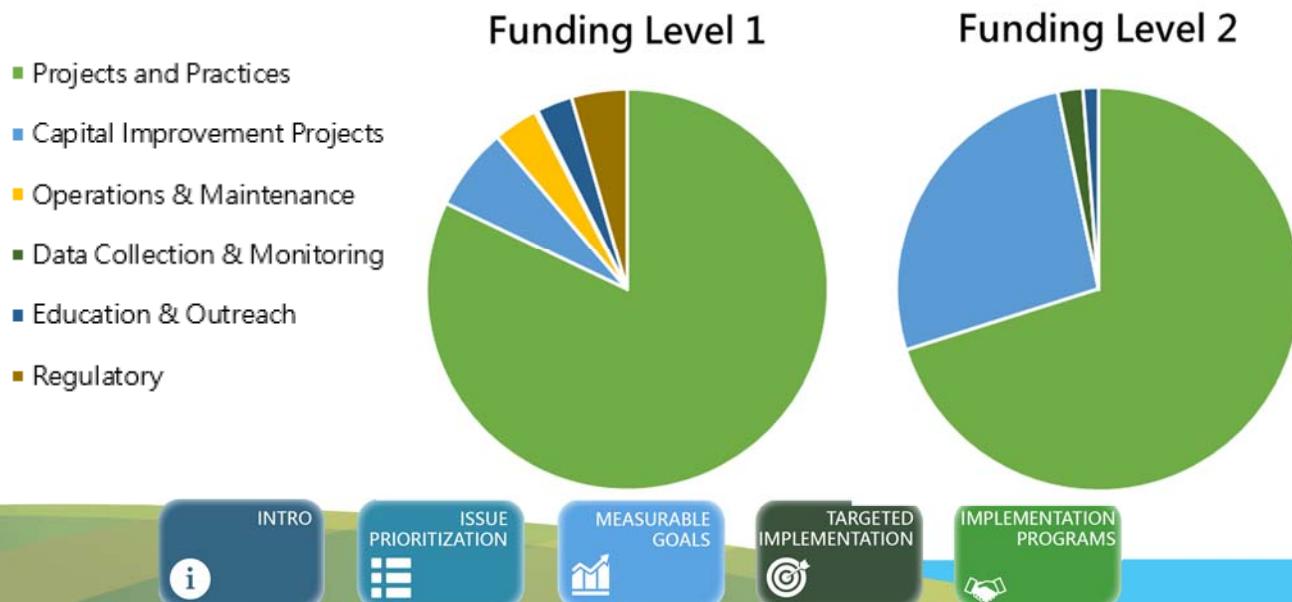
Table ES-1: Implementation funding levels for the Bois de Sioux-Mustinka CWMP

Funding Level	Description
1	Existing Dollars: These actions are the highest priority for implementation. Implementation of these actions assumes plan funding is similar in magnitude to existing funding focused on water issues within the plan area.
2	Additional Watershed-Based Implementation Funding (WBIF): These actions are the second-highest priority for implementation. This funding level assumes an additional \$1,000,000 per biennium (or \$500,000/year) from WBIF dollars.
3	Grant Funding: These actions are the third-highest priority for implementation, and will be pursued with additional, competitive grants.

Under Funding Level 1, implementation dollars are primarily used on actions relating to implementation of projects and practices, with a large portion of funding coming from federal sources to maintain lands in contracting programs such as Conservation Reserve Program (CRP) and Conservation Stewardship Program (CSP). This appropriation is shown in **Figure ES-7**.

With the addition of watershed-based implementation funding in Funding Level 2, most of the additional funding will still go towards implementing new projects and practices on the ground. However, a larger proportion of dollars will also go towards funding portions of capital improvement projects that align with plan priorities and make substantial progress toward measurable goals. These projects are detailed in the following section.

Figure ES-7: Funding appropriation by action type for Funding Level 1 and Funding Level 2



Prioritizing, Targeting, and Measuring Implementation Efforts

This plan focuses on putting the most effort and funding toward fixing priority issues that are impacting priority resources. When placed and designed correctly, implementation of large-scale Capital Improvement Practices and conservation projects and practices can be effective ways to fix (or begin fixing) priority issues that are impacting priority resources.

This plan identifies, prioritizes, and estimates the benefits of the most effective Capital Improvement Projects that will be the focus of implementation efforts with additional watershed-based implementation funding sources. This plan also uses Prioritize, Target, and Measure Application (PTMApp) data to target implementation of the most effective conservation projects and practices and estimate how much progress implementation can make toward plan goals. This information is summarized in a series of planning-region implementation summaries in **Section 4**.

By combining Funding Levels 1 & 2, this plan prioritizes and targets the following Capital Improvement Projects and conservation projects and practices within the watersheds (**Table ES-2**). These projects alone would meet plan measurable goals for sediment and nutrient (phosphorus) load reductions.

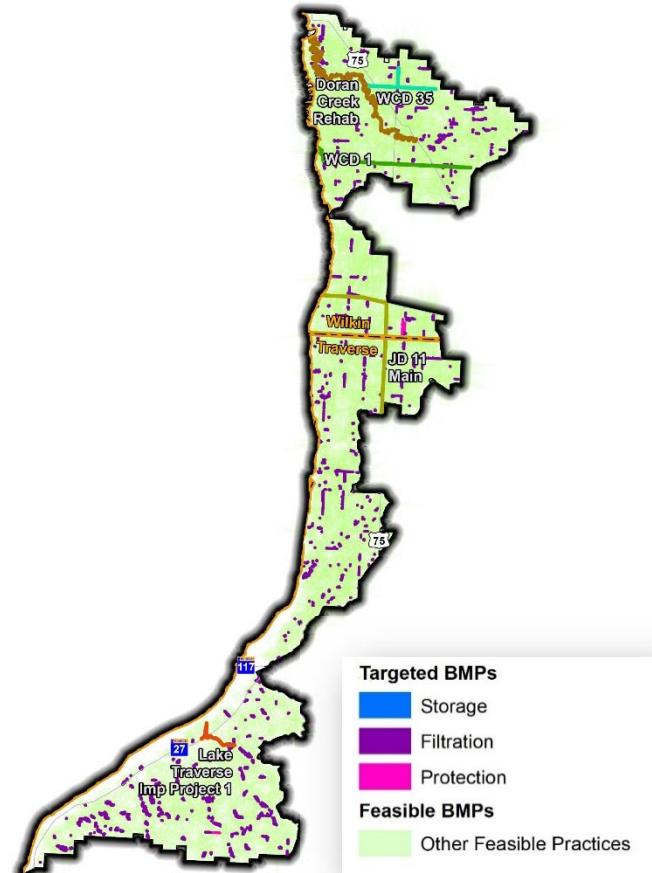


Table ES-2: Summary of Funding Levels 1 & 2 Capital Improvement and Projects and Practices costs and progress toward goals

Action	10-Year Estimated Cost	Estimated Sediment Reduction (tons/yr)	Estimated Phosphorus Reduction (lbs/yr)
Doran Creek Rehabilitation	\$7,500,000 (\$379,000 from WBIF)	890*	170*
Twelvemile Creek Rehabilitation	\$5,292,000 (\$521,500 from WBIF)	630*	120*
Fivemile Creek Rehabilitation	\$4,410,000 (\$436,000 from WBIF)	520*	100*



Action	10-Year Estimated Cost	Estimated Sediment Reduction (tons/yr)	Estimated Phosphorus Reduction (lbs/yr)
Filtration practices (e.g. filter strips, grass waterways)	\$8,717,800	1,031**	501**
Storage practices (e.g. WASCOBS and drainage water management)	\$1,957,300	388**	197**
Protection practices (e.g. grade stabilization, streambank protection, and side water inlets)	\$808,900	159**	46**
Soil health practices (e.g. residue management and cover crops)	\$1,438,000	156**	116**
	Total	3,774	1,250
		<i>Meets Short-Term Sediment Goal</i>	<i>Meets Short-Term Phosphorus Goal</i>

* Engineering estimate

** As estimated at the outlet of each planning region in PTMApp

Plan Administration and Coordination

At least two committees may administer this plan during implementation:

- **Steering Committee:** Comprised of local soil and water conservation district (SWCD), county, and watershed district staff (with their respective alternates), and a BWSR Board Conservationist (serving in a non-voting, ex-officio role); and
- **Policy Committee:** Comprised of elected and appointed board members (county commissioners, SWCD board supervisors, and watershed board managers).

Table ES-3 outlines the probable roles and functions of these committees during implementation. Expectations are that the roles of each committee will shift and change focus during implementation.

The Partnership previously entered into a formal agreement through a Memorandum of Agreement for purposes of developing this plan. It is anticipated that the parties will enter into a formal agreement for purposes of receiving watershed-based implementation funding. Individual local government units are individually responsible for their roles implementing this plan.



Table ES-3: Anticipated roles for Bois de Sioux - Mustinka CWMP implementation

Committee Name	Primary Implementation Roles/Functions
Policy Committee*	<ul style="list-style-type: none"> • Receive information regarding plan participant implementation funds • Approve the annual work plan • Approve annual fiscal reports • Annual review and confirmation of Steering Committee priority issue recommendations • Direction to Steering Committee on addressing emerging issues • Approve plan amendments for amendments not initiated and approved according to state statute • May approve joint grant applications, if needed • Accept annual assessment • Inform local boards on plan progress
Steering Committee	<ul style="list-style-type: none"> • Review the status of available implementation funds determined by individual plan participants • Recommend the use of watershed-based implementation fund to the Policy Committee • Research opportunities for collaborative grants • Review and recommend annual fiscal reports • Review and recommend annual reports submitted to BWSR • Annual review and confirmation of priority issues • Evaluate and recommend response to emerging issues • Prepare plan amendments as directed by the Policy Committee • Implement the Action Table • Develop annual work plan • Annually (or as needed) convene implementation meeting with plan review authorities • Compile annual results for annual assessment • Inform local boards on plan progress
Local Fiscal / Administrative Agent	<ul style="list-style-type: none"> • Convene committee meetings • Prepare and submit grant applications/funding requests

* The governing board of the Partnership's local fiscal agent may need to ratify Policy Committee actions



Section 1.0

Introduction



Section 1.0 Introduction

The One Watershed, One Plan (1W1P) program provides a framework for managing water on a watershed boundary, rather than jurisdictional boundaries. The aim is to bring together political entities that lie within a watershed (natural water boundary where all water falling on the landscape flows to one location) to create one unified water management plan. The resulting Comprehensive Watershed Management Plan (CWMP) improves coordination and collaboration across political boundaries, provides a more logical way to manage water resources, and helps local governments save resources by increasing efficiency and reducing the duplication of efforts where possible. As outlined in MN Statute 103B.801, CWMPs substitute any comprehensive plan, local water management plan, or watershed plan within the plan's jurisdictional area, according to chapters 103B, 103C, or 103D of Minnesota Statute.

Two major watersheds fall within this CWMP planning area in west-central Minnesota: the Bois de Sioux River Watershed and the Mustinka River Watershed (Figure 1-1). These watersheds, collectively called the Bois de Sioux – Mustinka Watersheds, cover approximately 1,413-square miles in Minnesota. The planning area extends over portions of Big Stone, Grant, Otter Tail, Stevens, Traverse, and Wilkin counties and coincides with the jurisdictional boundary of the Bois de Sioux Watershed District (Figure 1-1).

The Bois de Sioux – Mustinka Planning Partnership consists of a staff member and commissioner from each of the six participating counties, a staff member and supervisor from each of the six soil and water conservation districts, and a staff member and manager from the watershed district. The partnership chose to conduct one planning process for these combined watersheds to ease plan development, implementation, and management. Although these watersheds have many of the same characteristics—including a shared history of landscape development from the last ice age through today—they also have distinct resources and characteristics that make them unique. The following subsections briefly describe these shared and distinct qualities. For more background and information on the Bois de Sioux – Mustinka Watersheds' history and features, see the Land and Water Resources Inventory in Appendix A.

Because of the distinct qualities of the Bois de Sioux – Mustinka Watersheds, this document has content exclusive to each major watershed. Serving as a CWMP, this document will prepare local governments tasked with managing natural and water resources with the information necessary to identify issues, set goals to address those issues, and take actions to fix (or begin fixing) issues specific to each watershed. The plan also strives to assist landowners in each watershed with getting conservation on the ground. This plan will assist local governments and landowners with protecting and/or improving water management and securing funding to implement conservation in both watersheds.

Bois de Sioux - Mustinka Watersheds' Municipalities

Counties

Big Stone
Grant
Otter Tail
Stevens
Traverse
Wilkin

Cities

Breckenridge
Campbell
Donnelly
Doran
Dumont
Elbow Lake
Graceville
Herman
Johnson
Nashua
Norcross
Tintah
Wendell
Wheaton



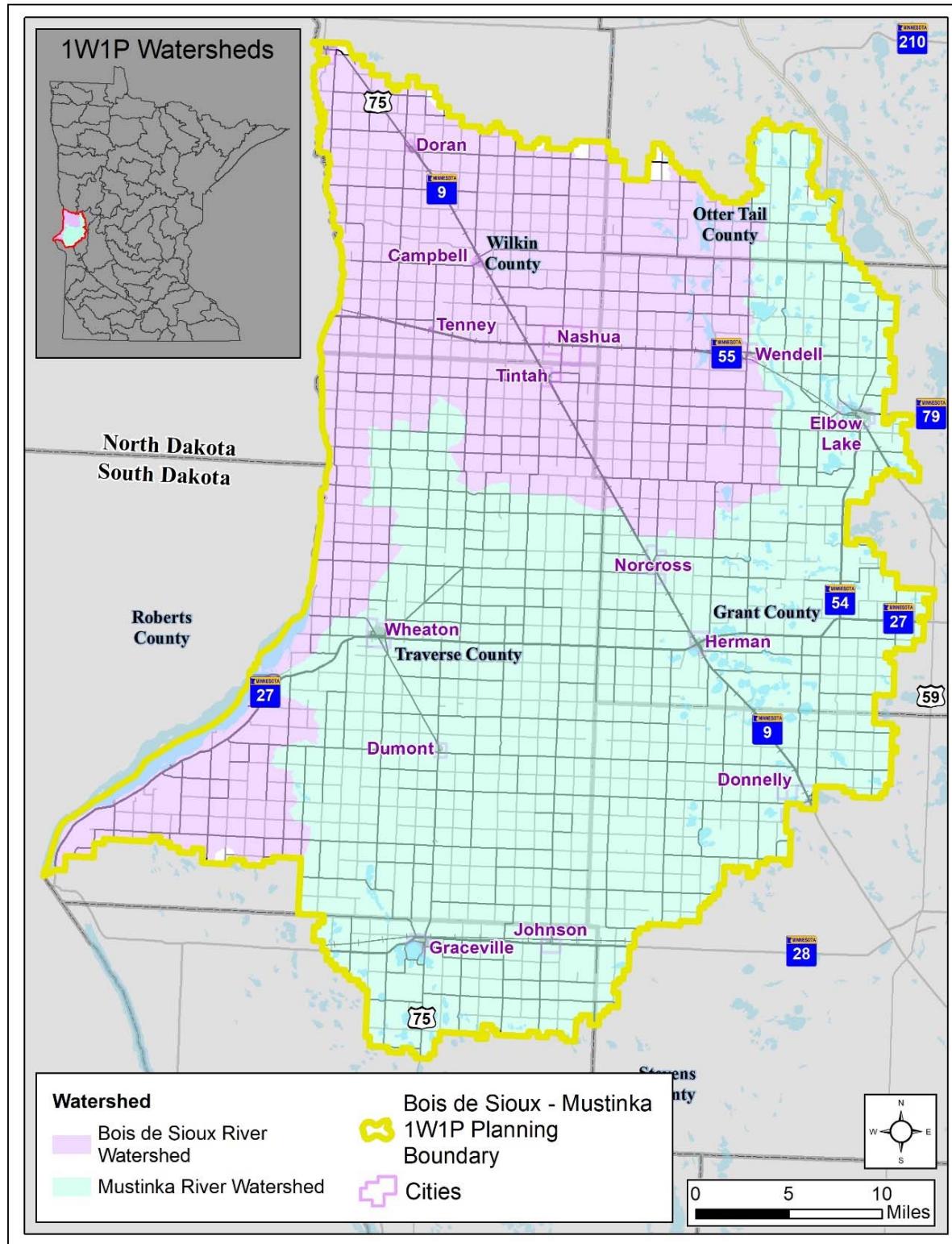


Figure 1-1: Bois de Sioux River and Mustinka River Watersheds within Bois de Sioux - Mustinka One Watershed, One Plan (1W1P) area



Mustinka River Watershed

Due to the large size of its contributing watershed, the Mustinka River forms its own major watershed (Figure 1-2; 8-digit hydrologic unit code (HUC-8) 09020102), collecting water from an area that eventually drains into Lake Traverse just upstream of the mouth of the Bois de Sioux River. The headwaters of the Mustinka River is in the rolling hills of southern Otter Tail County and northern Grant County. From there, the river flows south and west through wetlands, lakes, agricultural fields, and other land uses until it reaches the low, flat plains of the Red River Valley, eventually discharging into Lake Traverse east of the dam. The watershed spans Big Stone, Grant, Otter Tail, Stevens, and Traverse Counties and includes all or portions of the cities of Donnelly, Dumont, Elbow Lake, Graceville, Herman, Johnson, Norcross, Wendell, and Wheaton (Figure 1-2).

Overlying the bedrock throughout the watershed is a layer of glacially transported sediments that were deposited during and at the end of the last ice age. Major deposits of poorly sorted glacial sediment, referred to as glacial moraines, were deposited at the end of the glaciers as they began to recede. These moraines form the higher elevations located in the eastern and southern portions of the Mustinka River Watershed (Figure 1-3). Those same deposits trapped water from the melting glaciers and helped form the prehistoric Glacial Lake Agassiz. The bottom of this prehistoric lake is the flat terrain we see today in the Mustinka River Watershed, the Bois de Sioux River Watershed, and the Red River Valley to the north (Figure 1-3).

Fine sediments from Glacial Lake Agassiz make up the bulk of the soil in the low-lying areas on the Mustinka River Watershed. These soils have very low infiltration rates and often require improved drainage for agricultural activities and to manage flooding. Soils in the watershed vary from these very fine clay and silt soils of the valley, to fine loams within and along the morainal areas to the east, to a mix of occasional coarse sandy soils within the glacial beach ridges.

According to the Minnesota Department of Natural Resources Hydrography GIS dataset, the watershed has 205 lakes and 150 wetlands larger than 10 acres, most of which are located within the upland morainal portions of the watershed in central Otter Tail, Grant, and Stevens Counties as well as northern Big Stone County. Significant tributaries to the Mustinka River include Twelvemile Creek and Fivemile Creek.



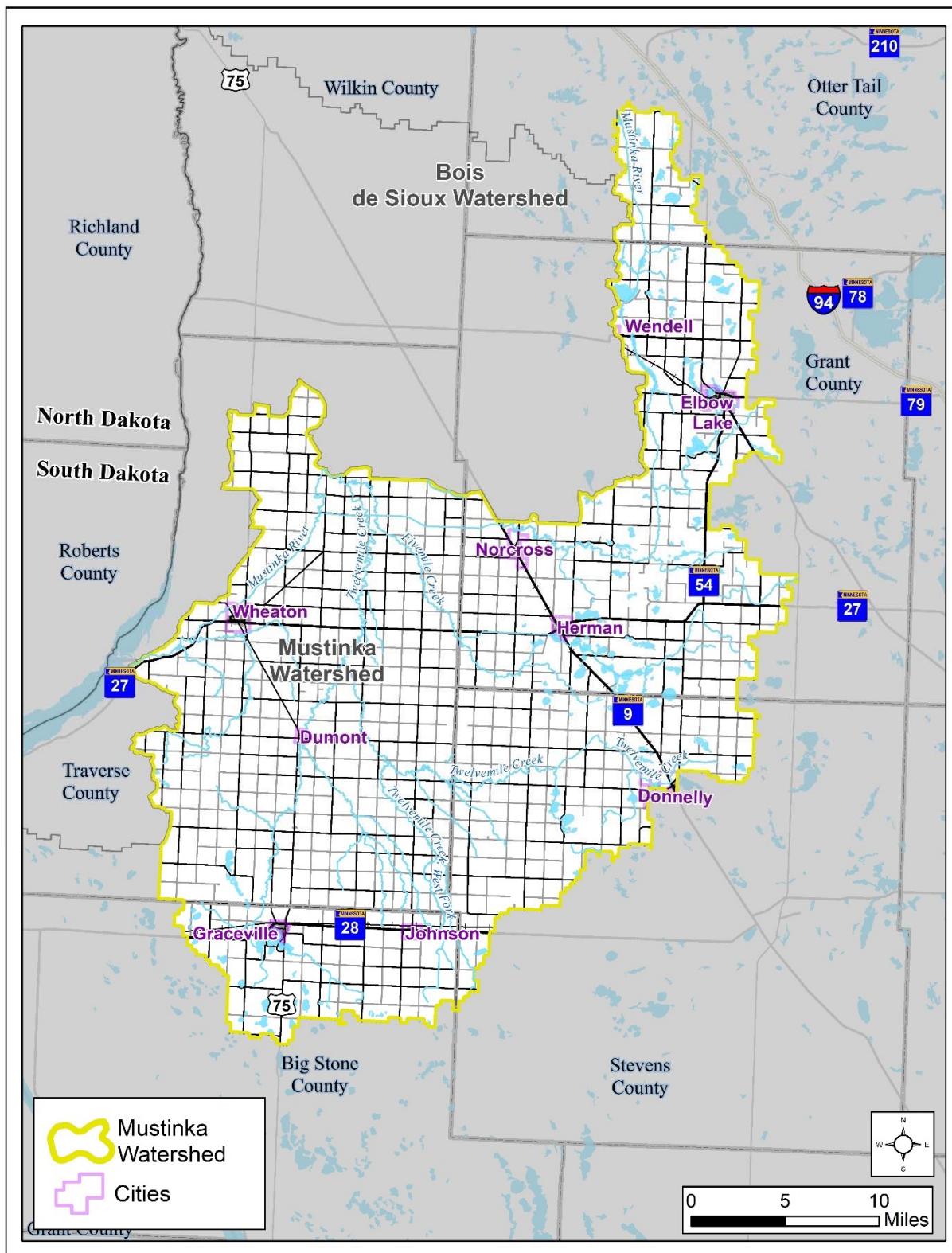


Figure 1-2: The Mustinka River Watershed

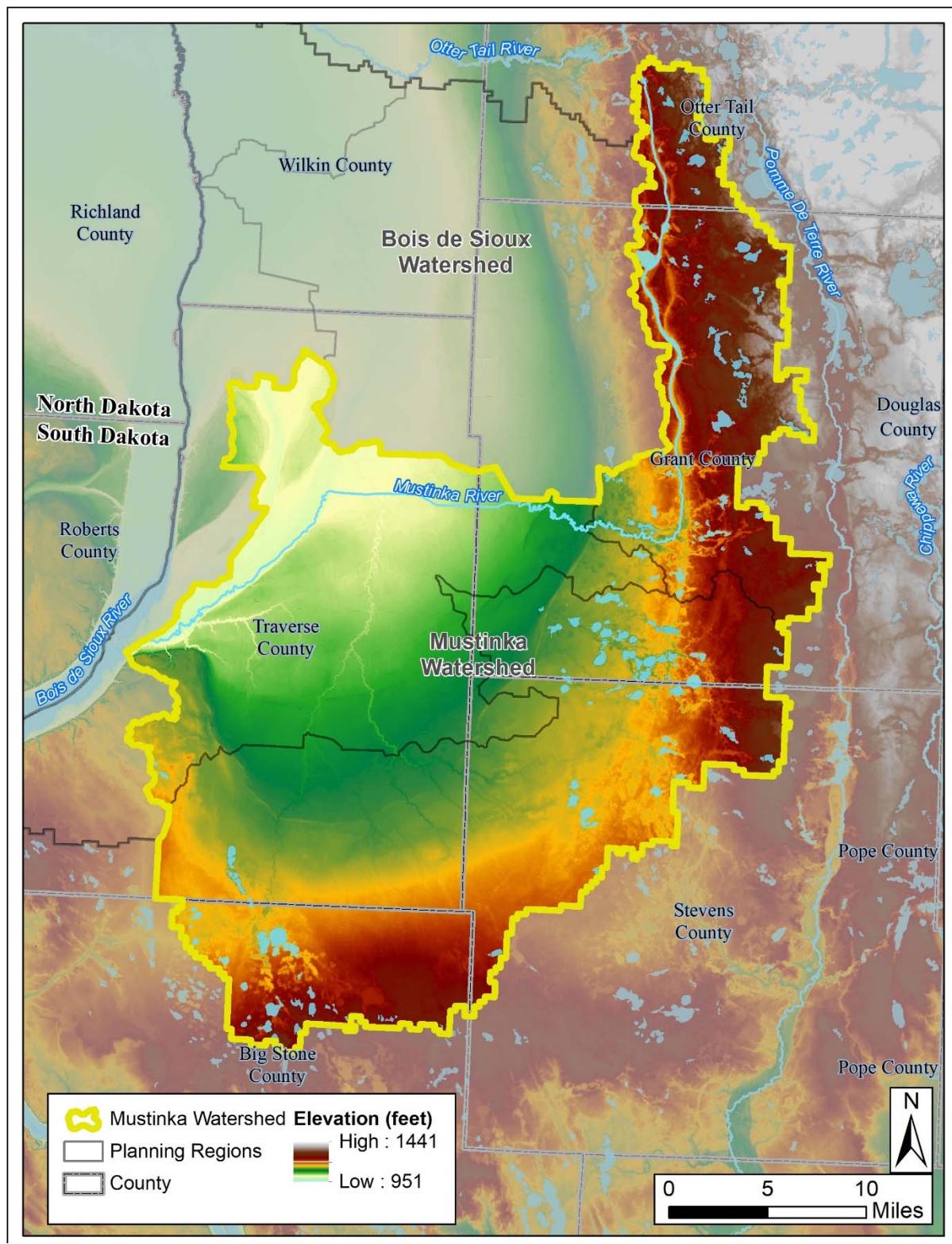


Figure 1-3: Elevation changes within the Mustinka River Watershed

Bois de Sioux River Watershed

For purposes of this planning effort, the Bois de Sioux River Watershed (Figure 1-4; HUC-8 09020101) refers to the areas within the State of Minnesota flowing to the Bois de Sioux River that do not enter the Mustinka River first. This watershed spans 564 square miles, and includes portions of Grant, Otter Tail, Traverse, and Wilkin Counties as well as all or portions of the cities of Breckenridge, Campbell, Doran, Nashua, Tenney, Tintah, and Wendell (Figure 1-4).

The southern segment of the watershed in Traverse County south and east of Lake Traverse all flows directly to the lake (Figure 1-4). The Mustinka River enters the Bois de Sioux River Watershed near the outlet of Lake Traverse just east of the dam. The Bois de Sioux River forms at the outlet of Lake Traverse and flows northeast through Mud Lake and north through agricultural landscapes into the flat plains of the southernmost reaches of the Red River Valley. Lake Traverse and the Bois de Sioux River—after it exits Lake Traverse—define the state boundary separating South Dakota from North Dakota. In Breckenridge, the Bois de Sioux River joins with the Otter Tail River to form the Red River of the North and defines the outlet of the planning area covered under this CWMP. Along its course, the Bois de Sioux River collects water from numerous major tributaries in Minnesota and South Dakota. Significant Minnesota tributaries flowing into the Bios de Sioux River include the Rabbit River, Mustinka River, and Twelvemile Creek. The watershed also has 62 lakes and 35 wetlands that are larger than 10 acres (Minnesota Department of Natural Resources Hydrography). Most of these waterbodies are in western Otter Tail and Grant Counties within the upland morainal portions of the watershed and in southwestern Traverse County east of Lake Traverse.

Topography and soils in this watershed formed under the same conditions as those in the Mustinka River Watershed. The two watersheds have similar features, evidenced by the watershed's elevation features (Figure 1-5). The Bois de Sioux Watershed also has morainal areas to the east, which are characterized by undulating hills, natural water resources, and generally fine loam soils. Similar conditions can also be found in areas draining directly to Lake Traverse. The central and northern portions of the watershed have the flat topography and clay/silt soils characteristic of the Glacial Lake Agassiz lakebed.



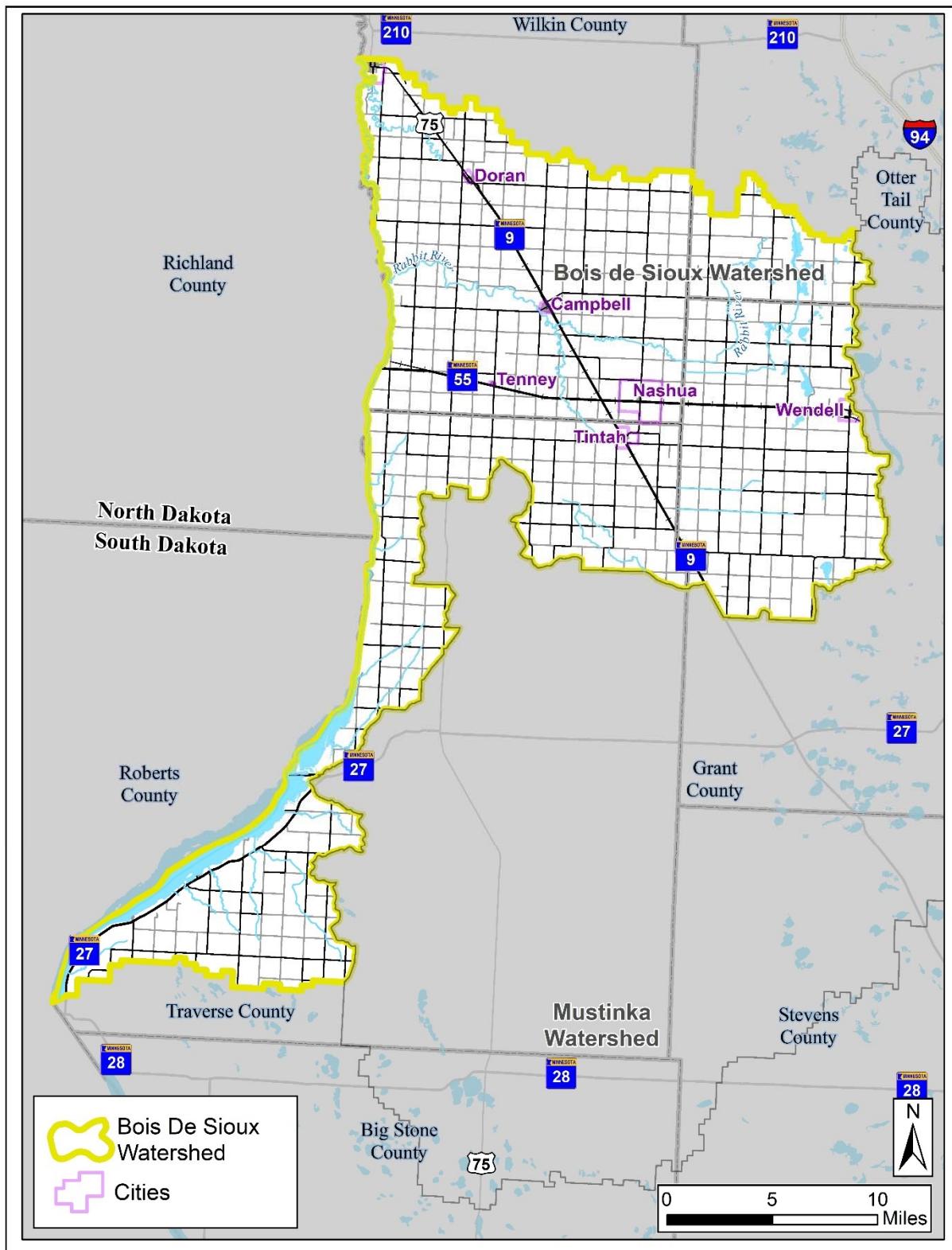


Figure 1-4: The Bois de Sioux River Watershed

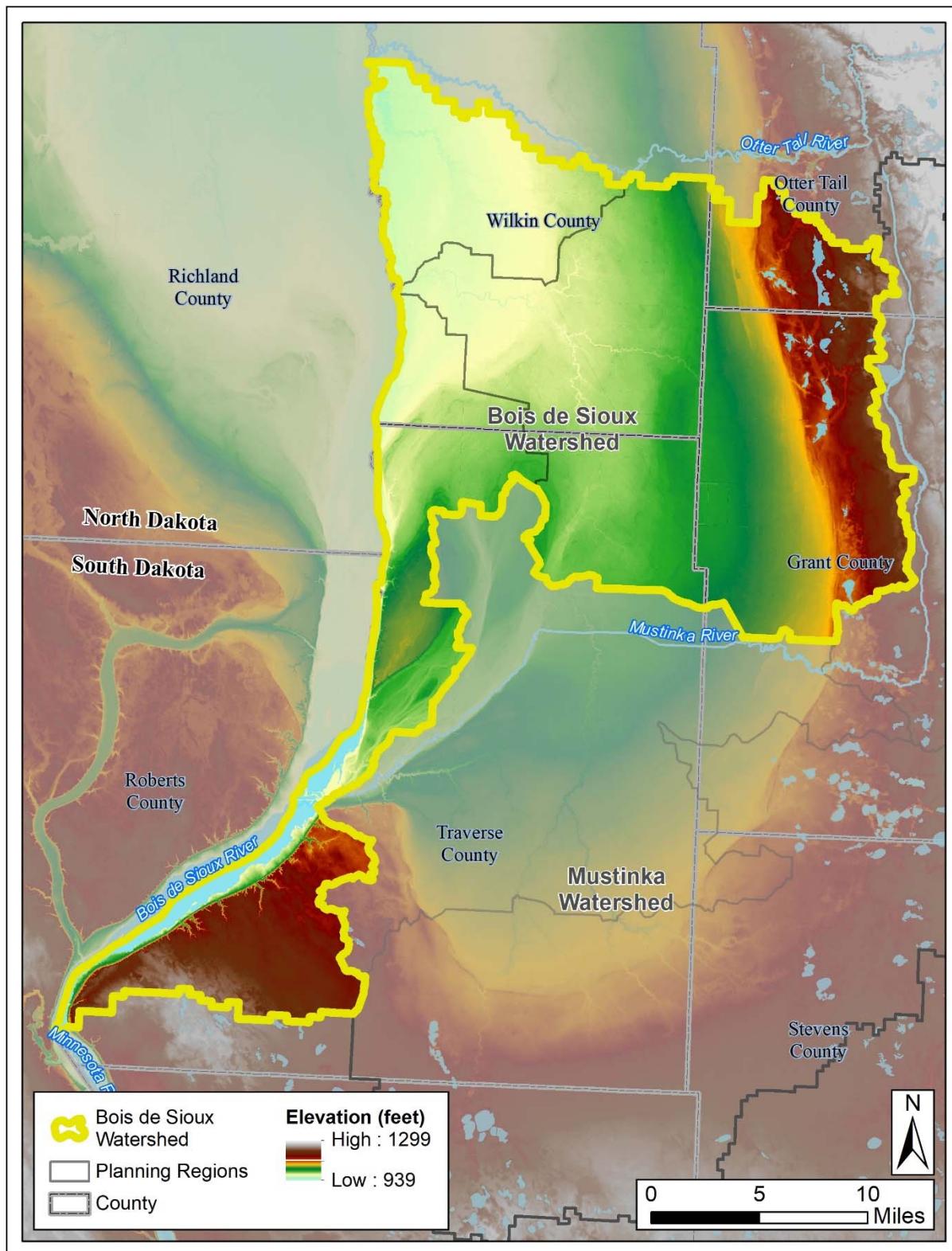


Figure 1-5: Elevation changes within the Bois de Sioux River Watershed.



Shared Qualities of the Watersheds

Historically, much of the Bois de Sioux River and Mustinka River Watersheds were covered in tall grass prairie and featured large areas of permanent and temporary wetlands. Encompassing three distinct ecoregions (i.e., areas of generally similar climate, soil, native vegetation, hydrology, and landforms): the Northern Central Glaciated Plains in the south, the Lake Agassiz Plain in the north, and the North Central Hardwoods in the far northeast; these lands fostered a wide variety of habitats and supported an abundance and tremendous diversity of wildlife and plant communities. Beginning before the turn of the 20th century, widespread drainage projects were undertaken to promote agricultural productivity by removing excess soil moisture. These projects modified many natural stream channels, drained most of the original wetlands, and eliminated or otherwise reduced riparian corridors.

Within the Bois de Sioux – Mustinka Watersheds, there are currently over 580 miles of legal drainage ditches, managed by multiple authorities, that are hydrologically stitching the landscape together. Field scale drainage projects remain common in the watersheds. This may not be surprising considering the general flat topography, soils with limited drainage qualities, and that approximately 90% of the land area in the watershed is productive agricultural land farmed as row crops.

Streams within the watersheds typically behave in two ways, depending on their location. In general, streams in the flat plain of former Glacial Lake Agassiz produce brief periods of high runoff and long periods with little or no flow in the stream. On the other hand, streams in the upland, morainal areas of both watersheds have more attenuated flow periods as a result of additional landscape water storage in the form of existing lakes, wetlands, and other impoundments that better trap and slowly release water. Excessive turbidity, elevated phosphorous concentrations, periods of low dissolved oxygen, and highly variable flow regimes within streams and ditches are common issues for waterbodies across the watersheds.

In the Bois de Sioux – Mustinka Watersheds, groundwater aquifers provide the primary source of drinking water. The Bois de Sioux River Watershed has four community and six non-community (e.g. churches, campgrounds, factories, dairy/livestock operations, etc.) public water suppliers that provide drinking water to residents and businesses. The Mustinka River Watershed has nine each community and non-community public water suppliers serving residents and businesses. The remainder of residents and businesses rely on private wells. The communities in the watersheds have deep aquifers that are well-protected and have a low vulnerability to groundwater contamination. The greatest risk to contamination is through unused and abandoned wells.

Despite significant aquatic and terrestrial habitat loss since the turn of the 20th century, areas within the watershed continue to provide critical habitat to migratory birds in the Central and Mississippi Migration Flyways. Public lands—including Waterfowl Production Areas and Wildlife Management Areas—provide fishing and hunting recreation for residents and visitors. Along with the agricultural economic base of the community, hunting, fishing, and other environmental-related tourism provide an influx to the local economies. These and many other natural resources will require conscious protection to maintain and improve their quality.



Economic concerns related to environmental pressures are also quite important in these watersheds. Flooding of agricultural and other lands resulting in damage to private and public property is common. Erosion can remove valuable soil and nutrients from agricultural fields and can be expensive to address. Loss of fish and wildlife habitat can have detrimental effects not only on the natural environment, but also economies that rely on healthy conditions for fish and wildlife (e.g. hunting, fishing, and tourism).

CWMP Planning Regions

The 1W1P planning process is intended to result in a more unified, effective, and science-based approach to address resources that are most important locally. The information contained within this document, collectively the CWMP for the Bois de Sioux – Mustinka Watersheds, comes from a compilation of existing local water management plans, studies, reports, models, scientific data, and state strategy documents. This CWMP addresses more than just surface water management. It also considers fish and wildlife habitat, groundwater management, local knowledge base, coordination, and funding.

To carry out planning and implementation, the Bois de Sioux – Mustinka Watersheds were subdivided into five planning regions (**Figure 1-6**). Planning regions were delineated primarily using hydrologic boundaries and topography.

Two of the planning regions lie within the Bois de Sioux River Watershed, the Rabbit River and Lake Traverse & Bois de Sioux River Planning Regions. These regions were largely defined based solely on hydrologic boundaries. The remaining three planning regions are within the Mustinka River Watershed (**Figure 1-6**). The Upper Mustinka River and Twelvemile Creek Headwaters Planning Regions were separated from the Lower Mustinka River & Twelvemile Creek Planning Region due mainly to the variation in topography, as the Lower Mustinka River & Twelvemile Creek Planning Region had generally flat topography and the Upper Mustinka River and Twelvemile Creek Headwaters Planning Regions had predominantly hilly topography.

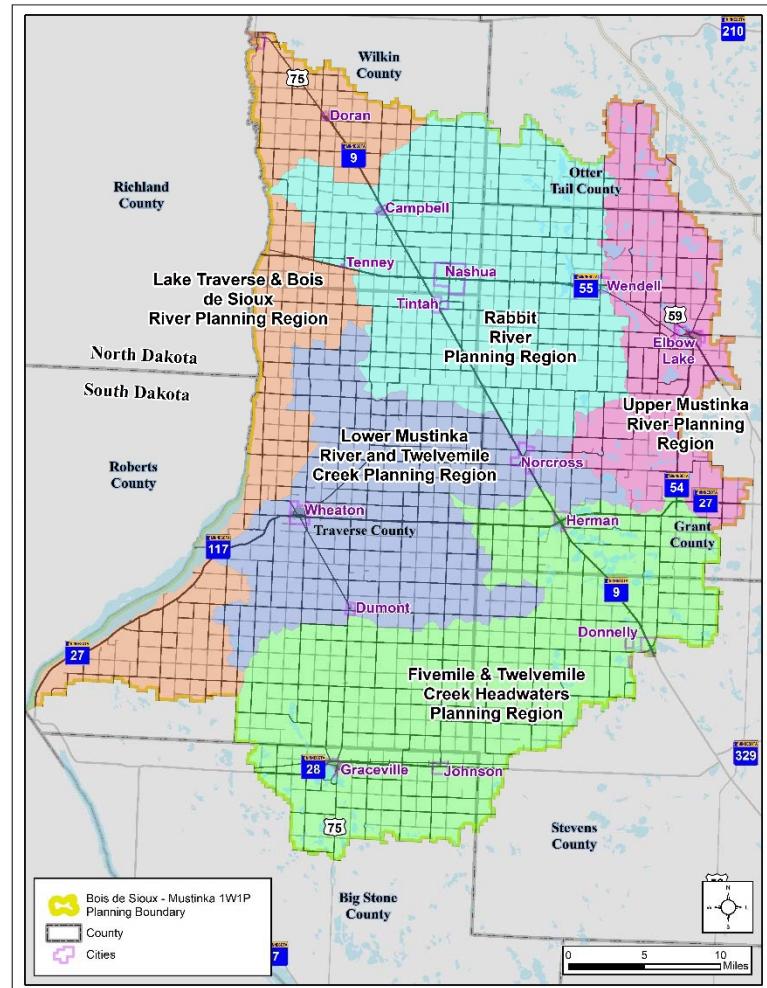


Figure 1-6: Planning regions within the Bois de Sioux – Mustinka CWMP.

Planning Partners and CWMP Development

The Bois de Sioux - Mustinka 1W1P Partnership includes all local planning partners primarily involved in developing the Bois de Sioux – Mustinka CWMP. The Partnership was developed under and through a Memorandum of Agreement (MOA) ([Appendix B](#)) adopted by the governing boards of the participating entities:

- The counties of Big Stone, Grant, Otter Tail, Stevens, Traverse, and Wilkin, by and through their respective County Boards of Commissioners;
- The SWCDs of Big Stone, Grant, West Otter Tail, Stevens, Traverse, and Wilkin, by and through their respective Boards of Supervisors; and
- The Bois de Sioux Watershed District, by and through its Board of Managers.

During plan development, the Partnership and associated individuals were subdivided into three local planning committees: The Steering Committee, the Advisory Committee, and the Policy Committee.



The Steering Committee was composed of local SWCD, county, and watershed district staff, along with their respective alternates. Consulting planning staff and regional Board of Water and Soil Resources (BWSR) staff also serve in non-voting roles. The Steering Committee was responsible for the logistical and day-to-day decision making in the planning process, providing information needed, reviewing and approving draft plan related information, and assisting in plan development.

The Advisory Committee served to make recommendations on plan content and the planning process, including processes for identifying and prioritizing issues, and defining and describing goals and action items. The Advisory Committee was composed of members of the Steering Committee along with required representatives from the State's main water and/or plan review agencies. Local subject matter experts and other members of the public also participated in relevant Advisory Committee meetings, providing pertinent information to develop and rank issues based on their local experience, to set reasonable goals to address the issues, and to develop a list of actions feasible with available (or attainable) resources. Members also promoted the plan to the community and assisted the Policy Committee in ensuring a credible process.

The Policy Committee was made up of one county commissioner and one SWCD board supervisor appointed from each of the participating counties in the watershed, plus a manager from the Bois de Sioux Watershed District. The Policy Committee made all final decisions about the content of the plan and its submittal to member local units of government, where individual board approval by each participating organization was required. Following this approval, the Policy Committee also submitted the plan to BWSR for their review and approval. The Policy Committee



retained ultimate responsibility for plan direction, decisions, and content. The Policy Committee contracted with Houston Engineering, Inc. to assist with meeting facilitation for all committees and plan writing.

Members of the Steering, Policy, and Advisory Committees as well as a more in-depth outline on committee roles and responsibilities, is detailed in The Bois de Sioux – Mustinka 1W1P Participation Plan ([Appendix C](#)).

Lastly, the public played an essential role during the development of the Bois de Sioux – Mustinka CWMP. The public were engaged during the plan development process primarily through initial public kickoff meetings, the final public hearing, and the planning website. Watershed district, county, and SWCD board meetings also included public updates about the planning process. Lastly, members of the public and additional local staff were used as technical, subject matter experts during key discussions on issue identification and prioritization, goal establishment, and targeted implementation schedule development through the planning process.

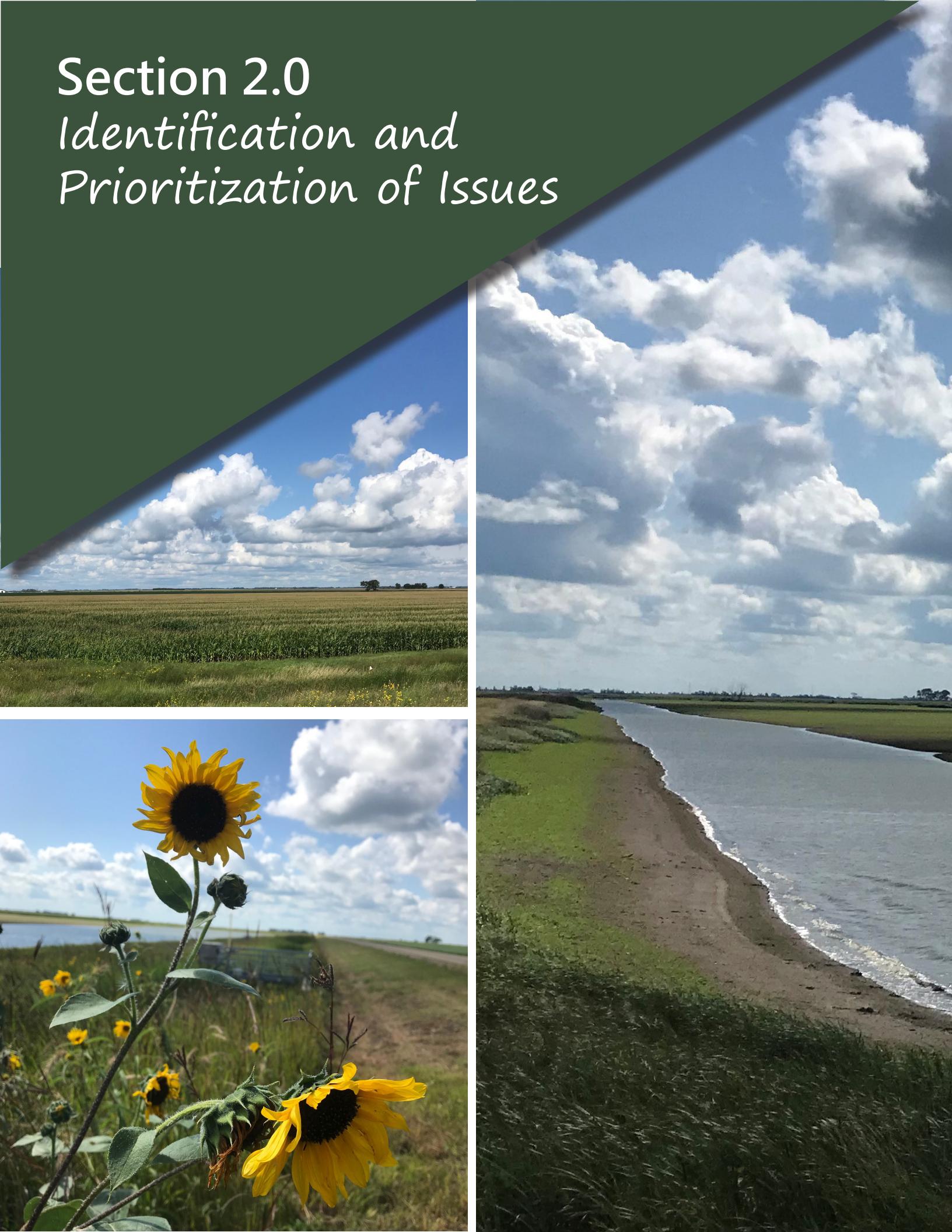
Incorporating Comments into the Plan

The Bois de Sioux – Mustinka 1W1P Participation Plan ([Appendix C](#)) was developed to create a clear process for soliciting input and obtaining comments during plan development. Throughout plan development, comments received from the public and local committees were documented and used to guide adjustments in plan content. See [Appendix D](#) for a list of comments received during public review processes and responses to those comments.



Section 2.0

Identification and Prioritization of Issues



Section 2.0 Identification and Prioritization of Issues

The resource and issue identification and prioritization section of this plan is intended to “*summarize the process that the planning partners used to reach agreement on the watershed resource issues that will be addressed within the lifespan of this plan. Prioritization is needed because not all identified issues can be addressed in the timeframe of a ten-year plan—some items will be addressed before others*” (BWSR, 2016).

In adherence to this guidance, this section identifies the following:

- The steps used to identify issues and issue themes;
- A list of the issues and issue themes considered for prioritization;
- A final list of agreed-upon priority issues; and
- The reasons for selecting those priority issues.

The outcome is a series of actions focused on achieving goals associated with the prioritized issues.

2.1 Identification and Summary of Issues

The process for identifying issues impacting resources in the watersheds included reviewing existing plans, studies, data, and information available at the time (Winter-Spring 2019) (Appendix E), including:

- Existing county water plans and the watershed district plan,
- Individual Bois de Sioux River and Mustinka River Watershed Restoration and Protection Strategies (WRAPS) reports,
- Individual Bois de Sioux Watershed and Mustinka Watershed Total Maximum Daily Load (TMDL) studies and supporting data (Stressor Identification Reports and Monitoring and Assessment Reports),
- The Red River Basin Flood Damage Reduction Work Group Agreement,
- Comment letters and supporting materials provided by state agencies (Appendix F), and
- The knowledge of local staff managing natural and water resources in the watersheds, including SWCD, county, and watershed district staff.



Using this information, the Steering Committee developed an issues table to summarize issues impacting resources within the watersheds. This table was reviewed and refined by members of the Steering Committee, Advisory Committee, and Policy Committee, with review and comment by local citizens in public meetings. The final issues table is shown in **Table 2-1**.

The issues table lists the issue theme, issue, and the issue impact. Issue impact describes why the issue is important, how it affects citizens and the environment, and what benefit(s) citizens within the Bois de Sioux River and Mustinka River Watersheds can expect from addressing the issue. This list is not meant to be all-inclusive, but simply reflects the strongest concerns of the public and committee members tasked with developing this plan.



Table 2-1 Issue themes and issues selected following committee deliberation and feedback in public meetings in the Bois de Sioux River – Mustinka River Watersheds. *Note: the numbering system does not represent prioritization - it serves to identify the issue themes by numerical reference.*

Issue Theme	Issue	Issue Impact
1. Groundwater: Water which is held underground within the pores of rocks and soils		
Groundwater	Groundwater quality protection	Drinking water is often pumped from groundwater aquifers. The susceptibility of groundwater to contamination is driven largely by how quickly and easily water and contaminants can be transported from the surface to the aquifer. It is important to protect areas on the surface that may contribute to groundwater contamination to reduce risks to human health and reduce the potential for significant cost to the local economy to treat contaminated water.
	Groundwater quantity protection	Groundwater supplies are important sources of drinking water, water supply (e.g. commercial and industrial purposes), and livestock watering. However, there is currently insufficient knowledge of groundwater resources. As a result, care must be taken to ensure groundwater withdrawals do not exceed estimated groundwater recharge.
2. Erosion and Sedimentation: Movement (removal – erosion, or deposition - sedimentation) of soil, rock, or dissolved material from one location to another		
Erosion and Sedimentation	Sediment loading to surface waters	Detached sediment from the landscape can be transported to nearby waterbodies by wind or water. Elevated concentrations of sediment in surface waters can be detrimental to aquatic life and aquatic recreation. Reducing sediment loading to rivers and lakes is important for protecting the ecological integrity of the waterbody, as well as maintaining navigation, recreation, and drinking water sources.



Issue Theme	Issue	Issue Impact
	Unstable river and stream channels	Unstable rivers and streams result in degraded water quality. Restoring healthy channel function by reducing the amount and rate of water and sediment that enters streams and rivers can slow the rate of erosion, protect water quality and aquatic habitat, and reduce property loss.
3. Flooding: The overflow of a body of water into areas of normally dry land		
Flooding	Flood damage to communities and public infrastructure	Widespread flooding is caused when incoming water enters a waterbody faster than outgoing water can drain downstream. The excess water inundates the surrounding landscape and damages property in normally dry areas. Retaining water in specific areas on the landscape can slow the movement of water to rivers and lakes and reduce the likelihood of flooding.
	Flood damage to farmland, homesteads, and private infrastructure surrounding farmland.	Localized or widespread flooding is a result of too much water on the landscape. Excess water fills depressions or inundates the landscape, causes intensified soil erosion, and can leave behind detrimental deposits of soil/debris. This can have the effect of killing crops and/or damaging property and infrastructure in normally dry areas. Draining water from certain areas on the landscape can reduce soil moisture and protect crop productivity. Retaining water on other parts of the landscape can slow the movement of water to rivers and lakes and reduce the likelihood of large-scale flooding.
4. Altered Hydrology: Change in the flow characteristics of a stream/river when compared to the past		
Altered Hydrology	Altered hydrologic conditions	Altered hydrology refers to a change in timing and intensity of water delivered to streams resulting in increased (or decreased) volume of runoff, peak discharges, and water levels as compared to historical averages. Cause(s) can vary but it typically results from an increased intensity of rainfall and/or changes to the landscape such as increases in the amount of impervious area, agricultural drainage, loss of wetlands, or other changes in land management practices. Unchecked altered hydrology can have wide ranging affects including decreased water quality, increased rates of in-stream erosion, and increased flood intensity.



Issue Theme	Issue	Issue Impact
	Lack of stormwater management	Stormwater management is an effort to reduce runoff and improve water quality by implementing practices to slow the movement of water from the landscape to surface water resources. Impervious surfaces and artificial drainage accelerate the movement of water off the landscape and can lead to increased flooding, streambank erosion, and aquatic habitat loss. Slowing the movement of water and allowing the excess water to infiltrate into the ground can reduce flooding, prevent damage to existing rivers, streams, and drainage systems, improve water quality, and improve aquatic habitat.
5. Drainage: The artificial removal of water from the landscape via surface ditches and subsurface pipes		
Drainage	Drainage system instability	Agricultural drainage systems quickly convey excess water off the landscape more rapidly than under normal conditions to improve crop productivity. Drainage systems not meeting hydrologic design standards or operating beyond capacity can lead to flooding, ditch bank erosion, and ditch system and cropland damages.
	Drainage system inadequacy	Drainage systems designed to convey a smaller volume of water than they are currently experiencing can be overwhelmed, resulting in increased stream or ditch erosion and sedimentation, decreased water quality, and increased annual maintenance costs to the drainage systems. Improvements to drainage systems can provide additional flood control, improve surface water quality, and reduce annual maintenance costs.
	Drainage system records modernization and standardization	Many drainage records have not been updated since ditch systems were established in the Bois de Sioux and Mustinka River Watersheds about a century ago. This can pose a challenge to managing these ditch systems as ditch authorities are obligated to ensure they are performing to their original design standard.



Issue Theme	Issue	Issue Impact
	Out of date benefit determinations	Determination of benefits (or damages) is important to the management and repair of existing drainage systems, and to the establishment and construction of other drainage projects. Benefits include any beneficial impact that a drainage system has on the landscape as it pertains to the market value of the drained property or the impact that the landscape has on the drainage system (increased drainage volume and sediment transport). Damages include productive land that is damaged/taken as a result of an addition or repair of a public drainage system. Unassessed lands, or lands historically outside of a drainage district, frequently drain into public drainage systems. Therefore, a redetermination of benefits may be necessary to ensure the accurate proportion of money is collected (or disbursed) from an affected property owner as a result of a drainage project.
	Inconsistent drainage authority administration	Lack of consistent, watershed-wide drainage enforcement to provide guidance; education and outreach; and to communicate information about agricultural incentives, conservation practices, and best management practices can pose a challenge for watershed managers as well as for producers.
6. Habitat: The natural environment in which an animal, plant, or organism lives		
Habitat	Aquatic invasive species in surface waters	Aquatic invasive species are non-native organisms that change the natural dynamics of an aquatic ecosystem and threaten the quality of native plant and animal communities. These species can be detrimental to commercial, agricultural, or recreation activities that depend on those ecosystems, negatively impacting ecological, economic, and human health.
	Improve connectivity in major rivers and streams to address aquatic species movement	The connectivity of natural watercourses is important for maintenance of a healthy aquatic habitat. The ability for aquatic species to move freely through aquatic systems and to have access to spawning grounds, feeding grounds, protective cover, and refuge during baseflow conditions is pivotal for maintaining populations of aquatic species throughout river and stream systems.



Issue Theme	Issue	Issue Impact
	Loss and degradation of lake habitat	Degradation of lake habitat is associated with the chemical or physical damage to shoreline or spawning areas. Increased sediment load, increased nutrient concentration, or decreased dissolved oxygen destroys habitat for certain aquatic species and reduces usable habitat for fish spawning. Protecting or improving lake habitat by managing shoreline areas can improve the overall integrity of aquatic life within lake systems.
	Loss and degradation of wetland habitat	Wetlands are areas of diverse habitat for avian, terrestrial, and aquatic species. Degradation of wetland habitat is often a result of draining wetlands to reduce excess water on the landscape. Wetlands are critical to the ecological, physical, and biological stability of the watershed as they may provide prime habitat for a wide range of organisms, help to regulate water levels throughout the watershed, improve water quality, and reduce destruction of downstream habitat. Protecting or improving wetland habitat by managing water levels and nutrient runoff can improve the overall integrity of aquatic life within and downstream of wetlands.
	Loss and degradation of upland habitat	Terrestrial habitat loss or fragmentation is a result of the conversion of the natural landscape to a land use that is less suitable for native organisms. Conversion of natural prairie grasslands and forests to urban or agricultural land uses displace native organisms and disrupts natural life cycles. Maintaining large tracts of contiguous upland habitat is important for the stability of terrestrial and avian populations. Protecting upstream habitat can have the added benefit of protecting downstream habitats by reducing erosion, reducing the effects of altered hydrology, and improving downstream water quality.



Issue Theme	Issue	Issue Impact
	Loss and degradation of aquatic and riparian habitat	Degradation of aquatic and riparian habitat is associated with the physical damage to stream banks and stream beds from higher and faster flows due to altered hydrology, or from chemical stressors such as reduced dissolved oxygen. Increased stream and river flows, increased sediment load, increased nutrient concentration, or decreased dissolved oxygen destroys habitat for certain aquatic species and reduces usable habitat for fish spawning. Protecting or improving riparian habitat by managing the upstream drainage area can improve the overall integrity of aquatic life within the stream systems.
7. Land Use Management: The process of managing the use and development of land		
Land Use Management	Protect and improve agricultural land productivity and soil health	Ensuring agricultural lands remain viable assets to the local economy through management that considers both the short-term and long-term value of the land. Manage the land using best management practices to improve soil health and agricultural productivity while simultaneously protecting water resources. Management and structural practices can be instituted to protect soil health while maintaining or improving crop yields, promote proper soil water drainage, reduce erosion, and retain nutrients within the soil.
8. Surface Water Quality: The physical, biological, and chemical condition of water in lakes and rivers		
Surface Water Quality	Nutrient loading to surface waters	Excess runoff of nutrients from the landscape into surrounding waterbodies can negatively affect surface water quality. Elevated concentrations of nutrients can impair water quality to the detriment of the aquatic ecosystem, drinking water resources, and aquatic recreation. Preventing excess nutrient runoff (i.e. keeping nutrients out of waterbodies) can be accomplished through reductions or modifications to land management activities, utilization of new technologies, or through the implementation of structural practices and/or best management practices targeted at nutrient reduction, water infiltration, or water storage.



Issue Theme	Issue	Issue Impact
	Bacteria loading to surface waters	Excess bacteria within streams, rivers, and lakes can negatively affect surface water quality. Elevated levels of bacteria can impair water quality to the detriment of drinking water resources and aquatic recreation. Common sources can include non-compliant and failing subsurface treatment systems, manure runoff, terrestrial wildlife, and waterfowl. Decreasing levels of bacteria in surface waters reduces the risk to human health and potential significant cost to the local economy to treat contaminated water.
	Low dissolved oxygen in surface waters	The concentration of dissolved oxygen in the aquatic ecosystem determines the type of organisms that can live in that ecosystem. Elevated levels of nutrients, or low water levels/stagnant water can cause decreases in dissolved oxygen concentration to levels that are low enough to negatively impact the diversity and quality of aquatic life. Maintaining sufficient water levels and preventing excess nutrients from entering streams and lakes can prevent dissolved oxygen concentrations from dropping below tolerable levels for sensitive aquatic organisms.
	Need for improved wastewater treatment facilities (WWTF)	Wastewater Treatment Facilities (WWTF) are regulated by the Minnesota Pollution Control Agency (MPCA). Effluent from WWTFs is controlled, and specific amounts of pollutants are permitted to enter nearby waterbodies. Downstream water quality can be diminished because of these permitted discharges. If permitted pollutant loads are causing excessive sediment, nutrient, or bacteria loading to surface waters, there can be impacts to local economy and public health. As a result, permit loads may need to be recalculated.
	Noncompliant subsurface sewage treatment systems (SSTS)	Improperly installed, inadequate, and non-compliant subsurface treatment systems (SSTS) can result in excess nutrients and bacteria in surface water and groundwater. This poses a direct health risk to drinking water resources and aquatic recreational users as well as aquatic life. Non-compliant systems will need to be properly maintained to ensure no groundwater or surface water contamination occurs.



2.2 Issue Prioritization

This plan is not expected to address all identified issues during its 10-year lifespan, nor does it reject any identified issues. Rather, this plan places all issues into priority levels. These priority levels are used to guide the creation of measurable goals and the timeline and aggressiveness of implementation efforts.

During plan development, participants analyzed and prioritized issues impacting resources by soliciting stakeholders' preferences on what issues were most important to them. This was done through committee and public meetings.

Meetings engaged multiple stakeholder groups within the Bois de Sioux – Mustinka Watersheds, including members of the:

- Policy Committee,
- Advisory Committee,
- Steering Committee, and
- Public.

Input from the public regarding issue prioritization was collected during the Mustinka River Watershed Public Kickoff Meeting held in Wheaton on April 2, 2019, and the Bois de Sioux River Watershed Public Kickoff Meeting held in Wendell on April 3, 2019. Both were well attended, with about 80 citizens attending between the two meetings. Participants were each given ten stickers and asked to use them to indicate which issue statements were the most important to them (Figures 2-1). Public priority issue selection results were tallied by the Steering Committee and is included in Appendix G.

Public priority issue selection results were generally consistent across the Bois de Sioux River and Mustinka River Watersheds. Issues related to drainage were by far most important (46% of votes in both watersheds). After drainage, issues within erosion and sedimentation, flooding, and land use management were the next highest priority. Overall, there were fewer selections for issues related to groundwater, habitat, and surface water quality.

The 10 issue statements that received the highest priority issue selection were:

- Drainage system inadequacy
- Sediment loading to surface waters
- Out of date benefit determinations
- Protect and improve agricultural land productivity
- Flood damage to farmland, homesteads, and public infrastructure surrounding farmland.
- Flood damage to communities and public infrastructure



Figure 2-1 Bois de Sioux - Mustinka, One Watershed One Plan public meeting



- Drainage system records modernization and standardization
- Drainage system instability
- Inadequate funding for conservation practices
- Unstable river and stream channels

The Steering Committee used priority issue selection results from the public meetings to assign priority level ranks to each issue by planning region. Priority level descriptions are presented in **Table 2-2**.

Table 2-2. Priority level descriptions for the Bois de Sioux-Mustinka CWMP



The Steering Committee made refinements to priority selection results from the public meetings based on:

- Information/data provided by local subject matter experts;
- Additional Advisory and Policy Committee input;
- Additional input provided during public meetings;
- Current options for measuring results from addressing each issue;
- Whether or not the issue is being addressed under current management and expenditures or whether addressing the issue would require additional funding; and
- The ability of local groups to address each issue.

Overall, the priority issue selection results from the public meetings were very consistent with the final prioritized list of issues defined by the Steering Committee. A general overview by issue theme is described below. The associated maps show the issue priority level by planning region. Issues receiving either 'High' or 'Medium' ranks are considered **priority issues** in this plan.



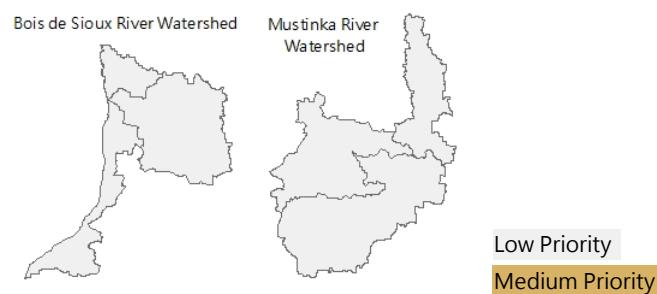
Groundwater

Each of the cities and urban areas in these watersheds, as well as private landowners in rural areas, rely on groundwater wells for drinking water. Due to the generally high quality of drinking water in the watersheds and the limited susceptibility to contamination, neither groundwater quality nor quantity protection was considered a high priority in either watershed. A medium priority was assigned for groundwater quality concerns across all planning regions, due to a desire to keep private wells as a priority resource. Groundwater quantity was designated as a low priority across all planning regions, but trend data will be considered by the local entities during implementation to inform management decisions.

Groundwater Quality Protection



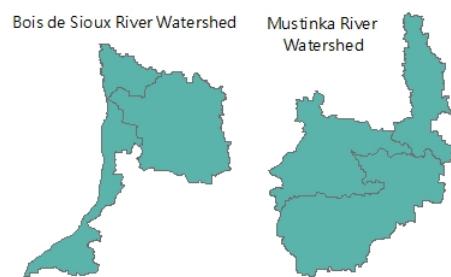
Groundwater Quantity Protection



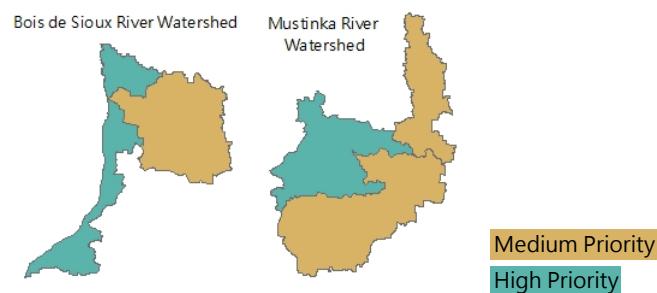
Erosion and Sediment

Two issues relating to erosion and sedimentation received a large number of votes during the public meetings and were referenced as stressors in several biological impairments in river and stream systems in both the Bois de Sioux and Mustinka Watersheds (MPCA 2016b, MPCA 2018b). As a result, the issues received primarily high rankings when prioritized within planning regions in both watersheds. High rankings were given to all five planning regions across both watersheds for sediment loading to surface waters as stream and river impairments related to sediment (notably: turbidity) were evident in each planning region (MPCA 2016b, MPCA 2018b). High rankings for the unstable river and stream channels issue was given for planning regions more prone to bank instability based on local knowledge. Other planning regions were given medium rankings as this issue was still prevalent but less critical in those areas.

Sediment Loading to Surface Water



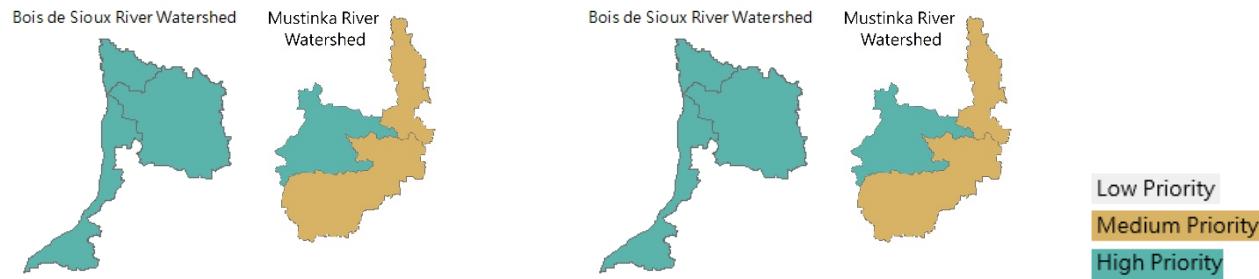
Unstable River and Stream Channels



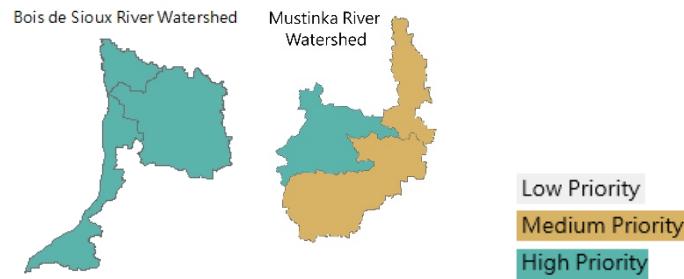
Flooding

Flooding was a major concern by many citizens attending public meetings in the Bois de Sioux River and Mustinka River Watersheds. The flooding issue theme was split between two issues, one related to threats and damages to public infrastructure and another related to threats and damages to private property and infrastructure. Both issues were viewed as a high priority across the watersheds, but the issues were moved to a medium priority in the Upper Mustinka River and Fivemile & Twelvemile Creek Headwaters planning regions because the flooding risk is lower within those planning regions.

Flood Damage to Communities and Public Infrastructure



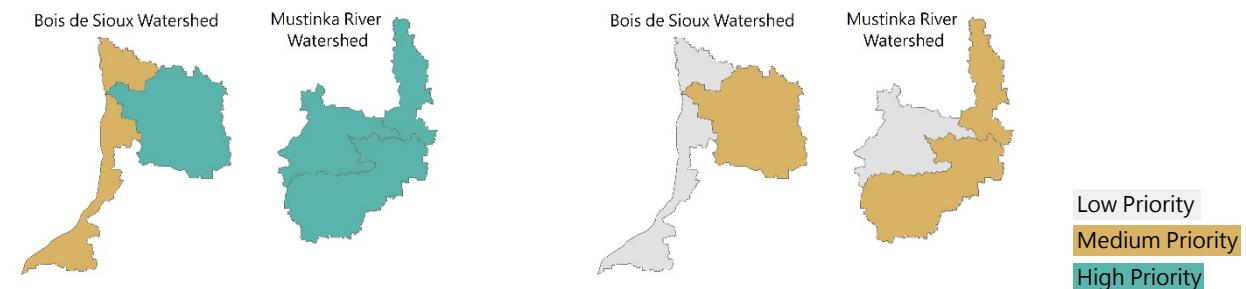
Flood Damage to Homesteads and Private Infrastructure Surrounding Farmlands



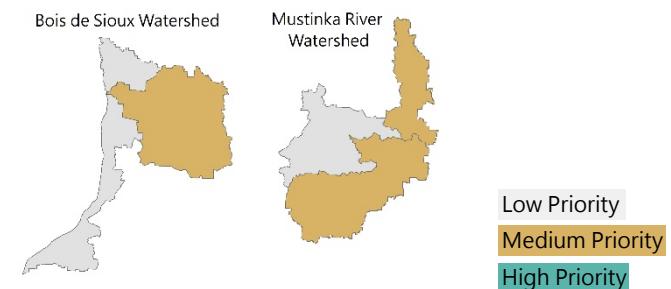
Altered Hydrology

There were very few public votes for prioritizing altered hydrology related issues. However, due to the wide-ranging negative effects that altered hydrology can cause, the Steering Committee decided to rank the altered hydrologic conditions issue as a high priority issue within all planning regions, but move the issue to a medium concern in the Lake Traverse & Bois de Sioux River planning region due to a smaller amount of ditches and current retrofit work. Lack of stormwater management was another issue within this issue theme but was de-emphasized as urban areas are disproportionately smaller than the predominately agricultural areas in both watersheds. That said, lack of stormwater management was considered a medium priority in the Rabbit River planning region of the Bois de Sioux Watershed as well as the Upper Mustinka River and Fivemile & Twelvemile Creek Headwaters planning regions in the Mustinka River Watershed due to concerns with untreated runoff leaving municipalities in those planning regions.

Altered Hydrologic Conditions



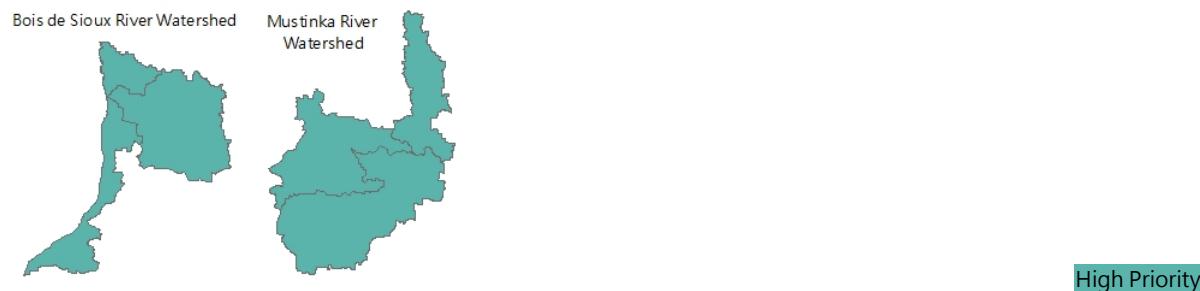
Lack of Stormwater Management



Land Use Management

As with drainage, land use management was commonly voted as a priority issue by the public during meetings in both watersheds. Many local citizens attending these meetings were producers, or those that work directly with producers, and were justifiably concerned that the needs of local producers be met within this plan. The Steering Committee agreed, and the issue related to soil health was given a high priority ranking in all planning regions.

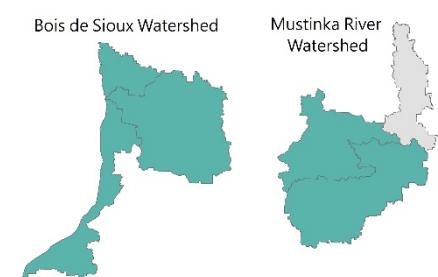
Protect and Improve Agricultural Land Productivity and Soil Health



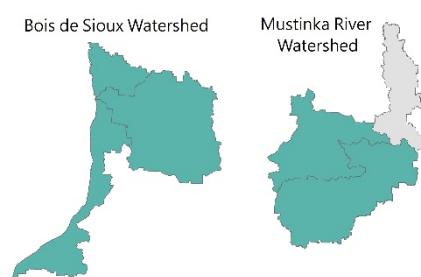
Drainage

Compared to other issue themes, drainage-related issues were most frequently voted for by the public, particularly as it pertained to drainage system inadequacy. Accordingly, the Steering Committee assigned a high priority rank to many drainage issues across both watersheds. Notably, drainage system inadequacy, drainage system instability, and out of date benefit determinations were considered high priorities for four of the five planning regions. The issues were moved to a low priority in the Upper Mustinka River planning region as it has minimal drainage systems. Drainage systems record modernization and standardization was considered a serious issue, but current efforts underway by the watershed district and other counties acting as drainage authorities were considered sufficient to address the issue. Therefore, it was not considered a priority for any planning region within this plan. Although there are multiple drainage authorities, neither the Steering Committee nor the public considered the inconsistent drainage system authority issue a priority. Thus, it was ranked as low across all planning regions.

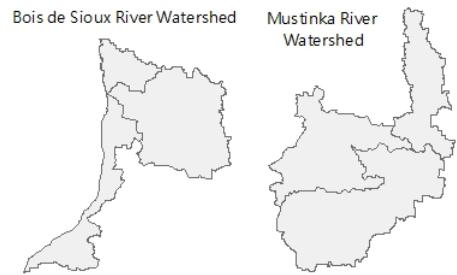
Drainage System Instability



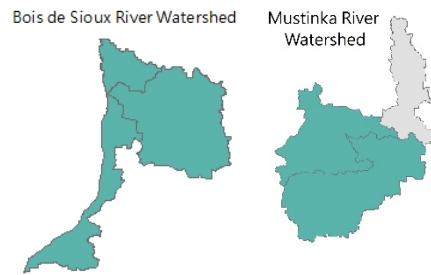
Drainage System Inadequacy



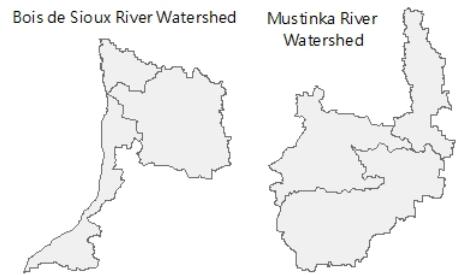
Drainage System Records Modernization
and Standardization



Out of Date Benefits Determination



Inconsistent Drainage Authority Administration

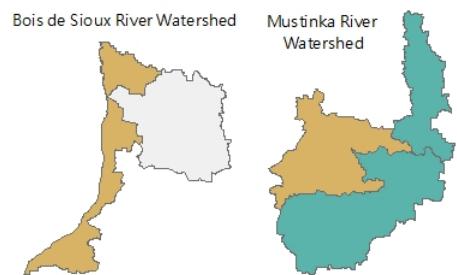


Low Priority
High Priority

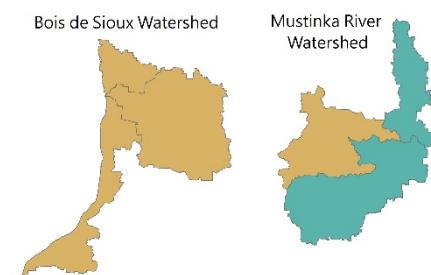
Habitat

Habitat-related issues received very few public votes. The Advisory Committee felt that, due to the importance of maintaining or improving natural habitat throughout the watersheds, the priority ranks within certain planning regions should be raised to medium or high as supported by the additional information described above. Notably, loss and degradation of lake, wetland, and aquatic and riparian habitat was considered a high priority in the Upper Mustinka River and Fivemile & Twelvemile Creek Headwaters planning regions of the Mustinka Watershed due to historic loss of these habitats. Also, wetland habitat loss has been prevalent across both watersheds since most of the prairie pothole wetlands were drained centuries ago. Therefore, the loss and degradation of wetland habitat issue was considered a medium or high priority for all planning regions. Other medium priorities included loss and degradation of lake habitat in planning regions where development around lakes has been increasing, as well as loss and degradation of both upland and aquatic / riparian habitat within the Rabbit River planning region. Aquatic invasive species and connectivity in major rivers and streams were ranked low priority.

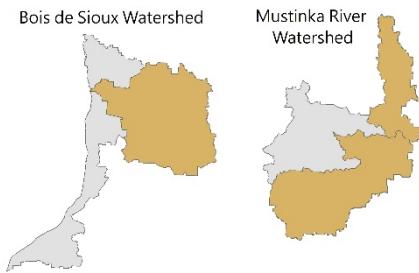
Loss and Degradation of Lake Habitat



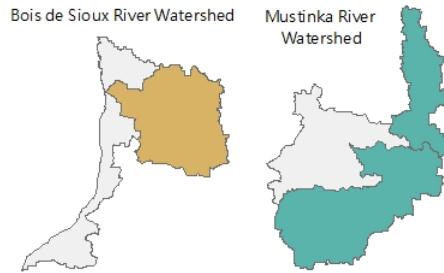
Loss and Degradation of Wetland Habitat



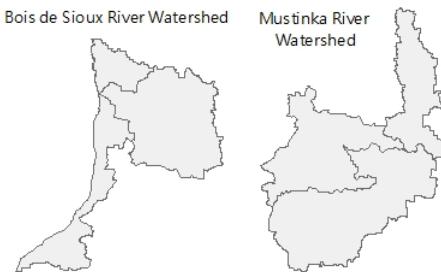
Loss and Degradation of Upland Habitat



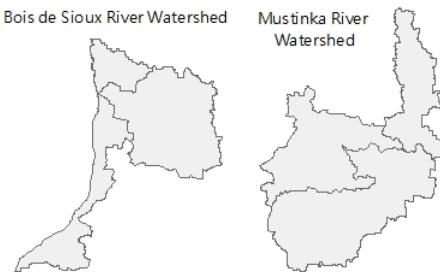
Loss and Degradation of Aquatic and Riparian Habitat



Aquatic Invasive Species in Surface Waters



Improve Connectivity in Major Rivers and Streams to Address Aquatic Species Movement

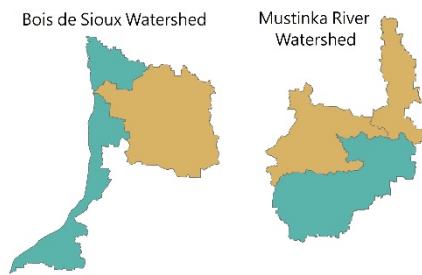


Low Priority
Medium Priority
High Priority

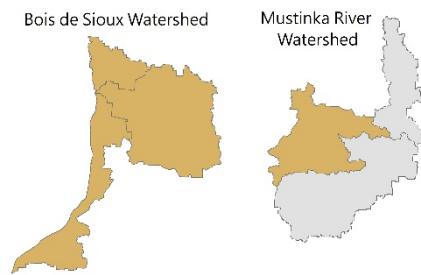
Surface Water Quality

Surface water quality issues received very few public votes. However, due to the detrimental impacts that poor surface water quality can have on aquatic life and aquatic recreation, the Steering Committee decided to increase priority ranks to specific planning regions within each watershed as supported by WRAPS and water quality monitoring. For issues related to nutrient and bacteria loading to surface waters, planning region ranks were based on local experience and surface water quality monitoring in streams, rivers, and lakes in each planning region (MPCA 2016a, MPCA 2016b, MPCA 2018a, MPCA 2018b). The low dissolved oxygen in surface waters issue was ranked as low for each of the five planning regions as this was primarily considered a symptom of other issues (notably increases in sediment and nutrient loading and water temperature) and will be addressed in this plan through other priority issues. Ranks for issues related to wastewater treatment facilities and subsurface sewage treatment systems were established based on guidance provided by Advisory Committee members and other local technical experts and reflects local needs within each planning region.

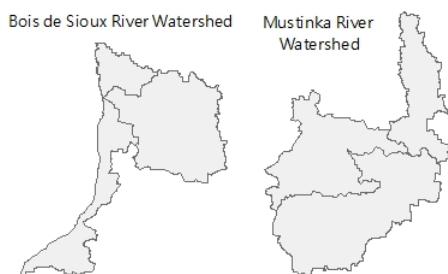
Nutrient Loading to Surface Waters



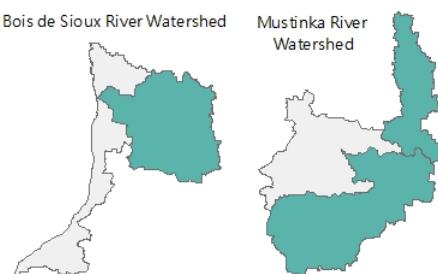
Bacteria Loading to Surface Waters



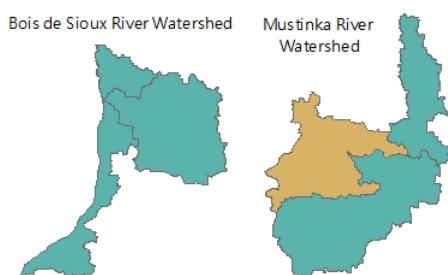
Low Dissolved Oxygen in Surface Waters



Need for Improved Wastewater Treatment Facilities (WWTF)



Non-compliant Subsurface Sewage Treatment Systems (SSTS)



Low Priority
Medium Priority
High Priority

2.3 Priority Issues

While all issues are important and worthy of local management efforts, limited resources for implementing solutions are available and not all issues can be addressed within the timeframe of a 10-year plan. Issues identified as high or medium priorities (herein “priority issues”) are the focus of this plan, with high priority issues having a greater focus than medium priority issues. In Section 3, measurable goals were developed for priority issues. The Policy Committee vetted and approved the priority issues.

Table 2-3. Final list of priority issues identified per planning region within the Bois de Sioux River and Mustinka River Watersheds.

Issue	Bois de Sioux River		Mustinka River		
	Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
Groundwater					
Groundwater quality protection	Medium	Medium	Medium	Medium	Medium
Erosion and Sediment					
Sediment loading to surface waters	High	High	High	High	High
Unstable river and stream channels	High	Medium	Medium	High	Medium
Flooding					
Flood damage to communities and public infrastructure	High	High	Medium	High	Medium
Flood damage to farmland, homesteads, and private infrastructure surrounding farmland.	High	High	Medium	High	Medium
Altered Hydrology					
Altered hydrologic conditions	Medium	High	High	High	High
Lack of stormwater management	-	Medium	Medium	-	Medium
Drainage					



Issue	Bois de Sioux River		Mustinka River		
	Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
Drainage system instability	High	High	-	High	High
Drainage system inadequacy	High	High	-	High	High
Out of date benefit determinations	High	High	-	High	High
Habitat					
Loss and degradation of lake habitat	Medium	-	High	Medium	High
Loss and degradation of wetland habitat	Medium	Medium	High	Medium	High
Loss and degradation of upland habitat	-	Medium	Medium	-	Medium
Loss and degradation of aquatic and riparian habitat	-	Medium	High	-	High
Land Use Management					
Protect and improve agricultural land productivity and soil health	High	High	High	High	High
Surface Water Quality					
Nutrient loading to surface waters	High	Medium	Medium	Medium	High
Bacteria loading to surface waters	Medium	Medium	-	Medium	-
Need for improved wastewater treatment facilities (WWTF)	-	High	High	-	High
Noncompliant subsurface sewage treatment systems (SSTS)	High	High	High	Medium	High

* Empty cells (-) represent low priority issues that will not be the focus of restoration or protection efforts in this plan.



2.4 Emerging Issues

An emerging issue is one that lacks detailed information within the watershed, is sometimes prominent in the media, or has the potential to affect resources within the Bois de Sioux River and Mustinka River Watersheds in the future. The assessment of emerging issues has been compiled through input from:

- Review of previous studies, reports, and scientific papers;
- Collective experience of staff and technical advisors;
- General understanding of resource management trends; or
- Specific requests from Steering Committee members.

Emerging issues will be periodically monitored by planning participants, concerning how they may affect plan implementation.

Extreme Weather Events and Infrastructure Resilience

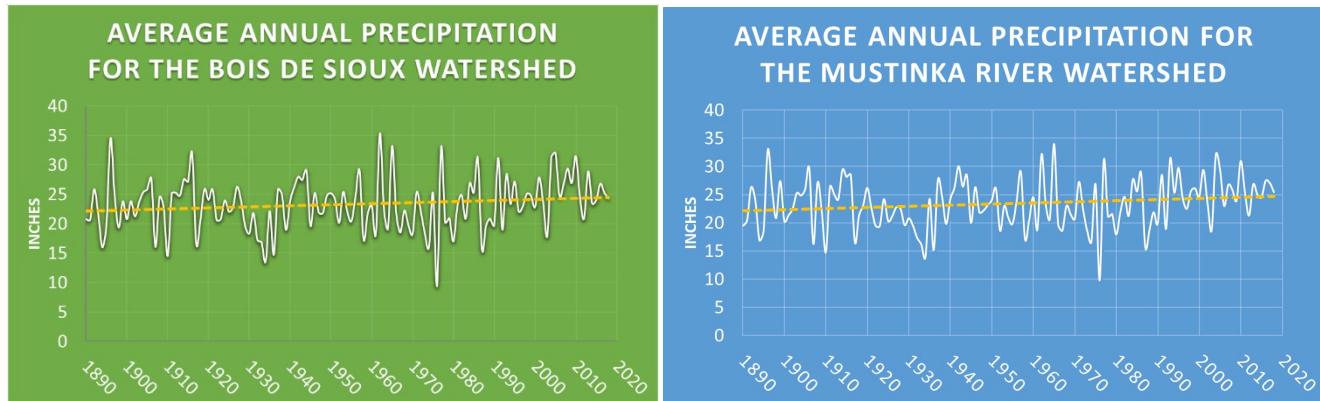
Minnesota's climate is changing; therefore, it should be considered in a long-term planning effort, as encouraged in the BWSR Climate Change Trends and Action Plan. According to the National Climatic Data Center, the average temperature in Minnesota has increased about one-tenth of a degree every decade, from 1895 to 1970. Since 1970, the rise has been more dramatic, about a half a degree every decade. Since the beginning of temperature data collection in the area, the 30-year running average of annual mean temperature has increased by approximately 2 degrees in the Bois de Sioux River and Mustinka River Watersheds (DNR, 2018).

Temperatures during the non-growing season have increased the most. Over the last 30 years, the average monthly temperatures between November and March have increased up to 3 degrees when compared to the long-term average from 1895-2018 (DNR, 2019a, DNR, 2019b).

Precipitation has been increasing across the state as well. In the Bois de Sioux River and Mustinka River Watersheds, trends have shown an increase in average annual precipitation (Figure 2-3). Minnesota has also seen an increase in the severity and frequency of storm events. The Minnesota Department of Natural Resources (DNR) defines “mega-rain” events as “events in which six inches of rain covers more than 1,000 square miles and the core of the event topped eight inches.” Minnesota has seen a sharp increase in these events since 2000 (MNDNR, 2017).



Figure 2-3. Average precipitation 20-year trends for the Bois de Sioux and Mustinka River Watersheds (DNR, 2020)



If the climate continues to warm, ice-cover of lakes and streams may melt earlier. Some lakes in Minnesota are showing that over the past century, the average ice-out is occurring about a week earlier. In turn, earlier snowmelt runoff would cause stream flows to peak sooner in the spring, leading to baseflow conditions earlier in the year.



It is important to understand these changes in regional climatic trends because they impact water resources and their management as well as shifts in habitat and economics. Increased storm intensities result in increased runoff and increased soil erosion. As a direct result of an increase in runoff, the MPCA warns that these more frequent, intense precipitation events may increase flooding (MPCA, 2013).

Agricultural water management practices can have the added benefits of improving soil health, carbon sequestration, improving food security, and strengthening local economies. Conservation practices in agricultural areas that promote soil health can enhance the ability of soils to capture and store rainfall, store carbon and decrease heat absorption. Conservation practices that minimize impacts from larger storms are highlighted in this section of the toolbox, including cover crops, field terraces, no-till farming, buffer strips, retention areas, and constructed wetlands. Conservation drainage and drainage water management practices are also key strategies to address water quality and quantity concerns. These practices can reduce runoff and nutrient loss, avoid runoff concentration, protect areas where runoff concentrates, reduce peak flows to reduce erosion, maintain agricultural productivity, improve water quality and habitat, and reduce flooding. Multipurpose drainage practices help make working lands as well as artificial and natural drainage systems more resilient to high intensity rainfall.

Contaminants of Emerging Concern

A contaminant can generally be defined as a substance in a location where it is undesirable. They can include pharmaceuticals, pesticides, industrial effluents, chloride and other salts, and personal care products that are washed down drains and processed by municipal wastewater treatment plants, and others (MDH, 2016). These contaminants are being found in waterbodies all around the state of Minnesota in part because of the



improvements in techniques for finding substances at lower levels, additional substances are being looked for, new substances are being used, and old substances are being used in new ways (MDH, 2016). There is a growing concern that even at low concentrations, these contaminants, or mixtures of them, may adversely affect fish, wildlife, ecosystems, and possibly human health.

Invasive Species

Invasive species are species (aquatic or terrestrial) that are not native to the ecosystem under consideration, and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health. These species are aggressive competitors, threatening the quality of high biodiversity areas and native communities. In Minnesota, present and actively managed aquatic invasive species include, but are not limited to Eurasian watermilfoil, purple loosestrife, zebra mussels, spiny water fleas, and invasive carp. Terrestrial invasive species in Minnesota include European Buckthorn, Gypsy Moth, and white nose syndrome of bats (caused by an invasive fungus).



While recreational lakes are primarily limited to the eastern portions of the Mustinka River Watershed, it is still very important to consider the potential impacts of the spread of aquatic invasive species (AIS) to all the surface water resources within each planning region. Minnesota has several state laws intended to minimize the introduction and spread of invasive species of wild animal and aquatic plants in the state. It is illegal to transport any prohibited invasive species, such as Eurasian Watermilfoil or Zebra Mussels, or to launch a boat or trailer with these species attached. The MNDNR is the main stakeholder statewide that addresses AIS issues, including educational and enforcement measures. In 2012, a statewide AIS Advisory Committee was created by MNDNR designed to involve local stakeholders across the state in guiding legislative policy initiatives. Within the Bois de Sioux River and Mustinka River Watersheds, the involvement of local stakeholders is needed for effective prevention and/or control efforts.

Thankfully, there is currently very little impact from invasive species within the terrestrial and aquatic ecosystems of the Bois de Sioux River and Mustinka River Watersheds. This plan recognizes the importance of managing and preventing any future threat to these systems and addresses this emerging concern through implementation programs that protect surface water resources and wildlife habitat.

Farm Law Legislation (National and International)

Changes to international and national legislation have large ramifications on the types, magnitude, and profitability of crops produced in Minnesota. For example, legislation promoting corn grown for ethanol production may impact the amount of corn and the rotation of crops in an agricultural area. Legislation incentivizing the production of alternative crops (i.e. switchgrass) for alternative fuels may also impact cropping practices. Types and productivity of crops may also be impacted by legislative changes to crop insurance support (i.e. the farm bill).



This plan recognizes the impact that national and international legislation has on local agricultural production and the economic stability of the producer. This plan addresses this emerging issue by supporting standard practices for all producers (i.e. managing for good soil health) and are addressed throughout this plan by programs that encourage this.

Renewable Energy Legislation (State and National)

State and national renewable energy policy has the potential to affect the economies and land-use patterns of counties with high capacity potential. A priority for the Bois de Sioux River and Mustinka River Watersheds will be ensuring that land-use changes resulting from renewable energy policy initiatives (whether solar, wind, or biofuel) balance the potential environmental risks of renewable energy production with the economic and environmental benefits the production of renewables could provide. Potential environmental risks include but are not limited to wetland impacts, fish and wildlife habitat fragmentation, aquifer depletion, and threats to avian species such as eagles and bats. This plan addresses the issue of concern through implementation programs that protect surface water resources and wildlife habitat.

Process for Addressing Emerging Issues and Data Gaps

Inevitably, issues emerge that lack sufficient data, research, or information. While a substantial effort was made to develop a comprehensive list of existing and emerging issues, it is possible that some issues were missed or that new issues emerge during the lifespan of this plan. Examples include the discovery of a new contaminant or AIS within the watersheds, or a change in the policies or administration of a member local government unit. Should an unanticipated issue emerge during the lifespan of this plan, the issue will be considered and addressed as necessary through annual evaluations and local work plan development (see **Section 5**). If the emerging issues are substantial enough, amendments to this plan will be considered based on procedures laid out in **Section 5**.

Gaps in technical knowledge continually need to be closed. Rather than delaying planning or implementation activities when these gaps arise, the Bois de Sioux River Watershed and Mustinka River Watershed planning partners will consider these gaps during self-assessments and develop action(s) to address them on an as-needed basis. These action(s) could be things such as specific implementation activities, support of additional research or data monitoring and collection, or increased education and outreach.



2.5 Issue Theme Maps

A series of maps were developed to illustrate watershed features and currently available data related to the priority issues. The intent of these maps is to present the current understanding of the watershed and what key features relate to, or are impacted by, the priority issues. These maps, when combined with the maps included in the Land and Water Resources Inventory (**Appendix A**), assist in the development of the plan's action tables.

Eight different watershed maps were created and are shown in **Figure 2-4** through **Figure 2-11**. A detailed description of each map and their relation to the priority issues described above is presented in **Table 2-4**.

Table 2-4 Descriptions for each issue theme map

Map Title	Description
Groundwater	These maps illustrate what is currently known about the watersheds, with respect to groundwater. They are based on data available at the inception of the plan. General data is presented regarding the locations of wellhead protection areas and drinking water supply management areas, susceptibility of groundwater to contamination, and current contaminant levels in monitored wells (nitrate and arsenic).
Erosion and Sedimentation	The extent and potential driving factors related to erosion and sedimentation within waterbodies of the Bois de Sioux River and Mustinka River Watersheds are shown. These maps provide MPCAs 2018 impaired waters (rivers, streams, and lakes) with impairments caused by sediment (i.e. turbidity/total suspended solids [TSS]). Some of these waterbodies are also biologically impaired with turbidity as a stressor. Additional water resources infrastructure (i.e. ditches) are included to illustrate the movement of water across the landscape, from specific areas to assessed and/or impaired waters. Note: streams that are not presented as impaired may have turbidity/TSS impairments but have not been fully assessed and are thus not classified as impaired.
Flooding	These maps show the FEMA delineated floodplain (2015), 100-yr and 500-yr Digital Flood Insurance Rate Map (DFIRM) floodplains (areas that have a 1% and 0.2% chance of flooding annually, respectively), and locations that have experienced flood damage within the watershed, presented along with the natural and anthropogenic water courses within the watershed.



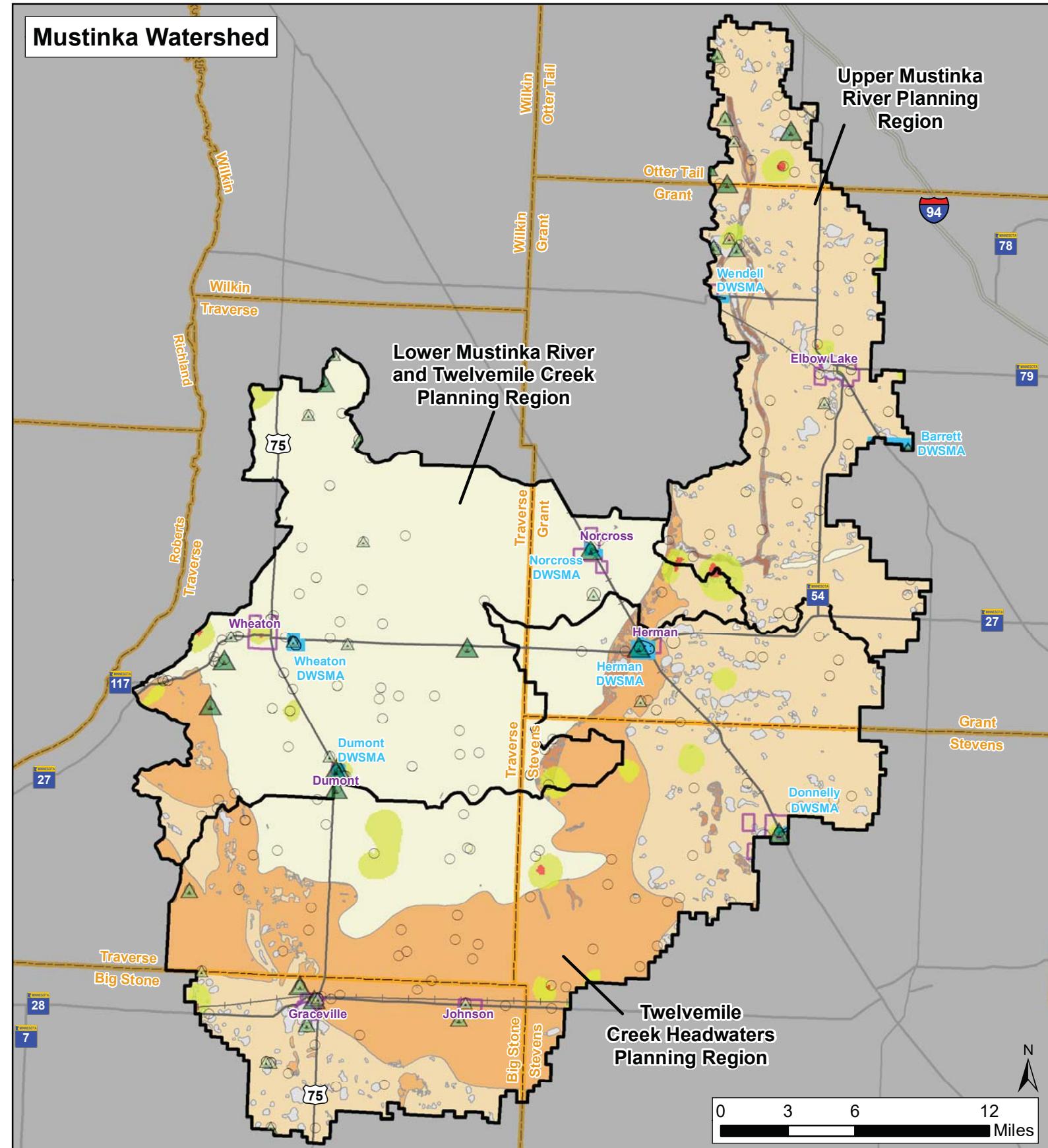
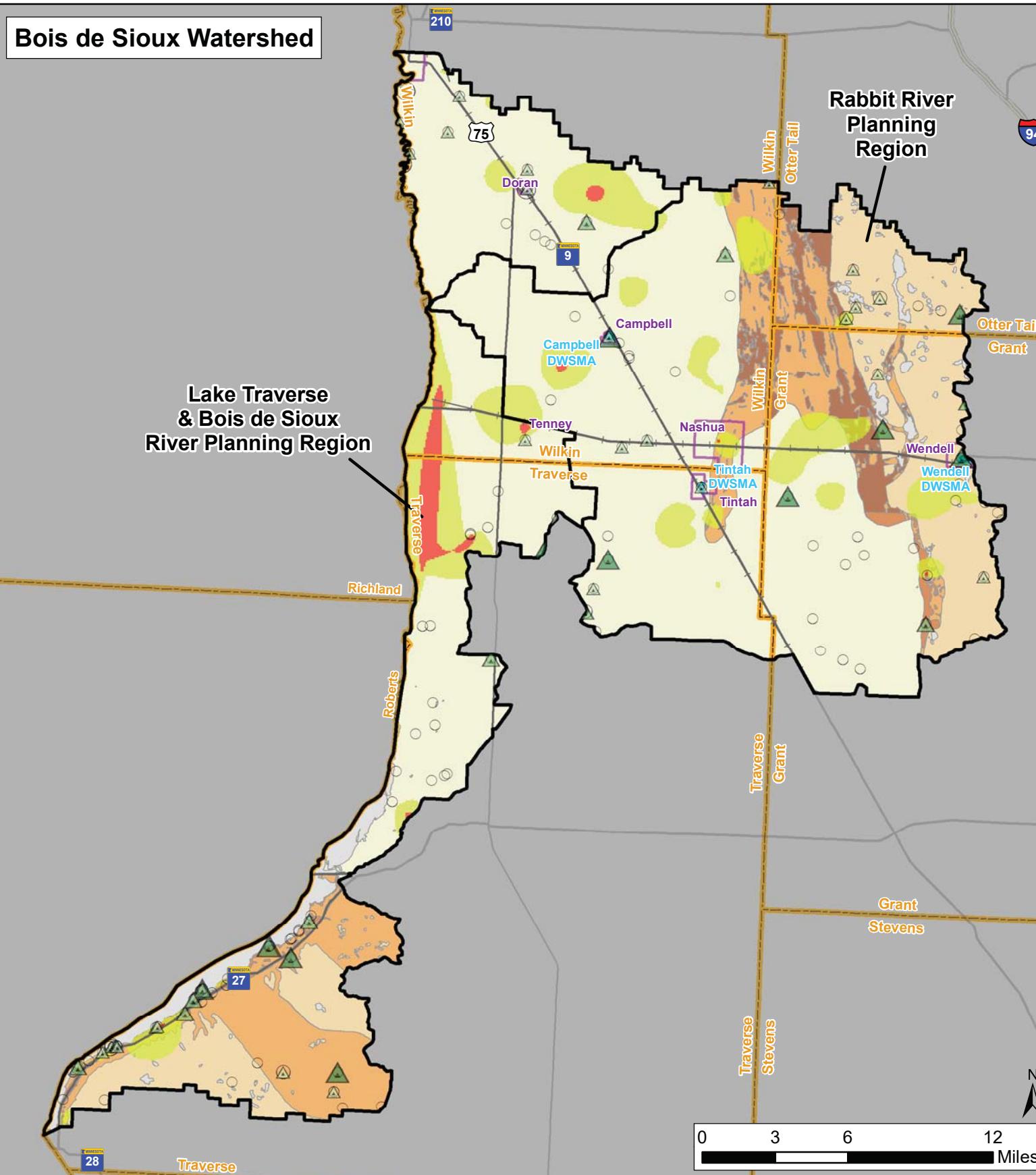
Map Title	Description
Altered Hydrology	These maps illustrate the interplay between watershed hydrology, water resources infrastructure (ditches), and impaired waters. The maps show streams from the MPCA 2018 impaired streams list that have biological impairments for which altered hydrology was considered a stressor. Also shown are non-impaired streams and public ditches, and areas of potential wetland restoration. These maps help identify the link between hydrology, altered drainage within the watershed, and water quantity/quality throughout the system. This map relates to many of the other issue themes, as altered hydrology can be a driver of many other impairments. Note: streams that are not presented as impaired may have biological impairments but have not been fully assessed and are thus not classified as impaired.
Drainage	These maps illustrate the extensive drainage networks throughout the Bois de Sioux River and Mustinka River Watersheds and highlights the potential interplay between natural and anthropogenic watercourses. The maps can be used to identify areas in the watershed that have been developed primarily for agriculture and can be used in conjunction with other maps (e.g. Erosion and Sedimentation and/or Altered Hydrology) to highlight areas of drainage system instability or inadequacy.
Habitat	These maps show public lands and special habitat areas (e.g. calcareous fens, scientific and natural areas, waterfowl production areas, prairies and wetlands, and wildlife management areas) throughout the watersheds. Note: streams that are not presented as impaired may have chemical or biological impairments but have not been fully assessed and are thus not classified as impaired.
Land Use Management	These maps display land use throughout the watersheds and highlight the potential interplay between land use and water resources infrastructure. The maps display National Land Cover Database information (2016) to identify areas in the watersheds that have been left undeveloped or have been developed primarily for urban or agricultural purposes. These maps relate to many of the other issue themes, as land use management can be a driver of many other issues.



Map Title	Description
Surface Water Quality Map	<p>These maps illustrate potential driving factors related to surface water quality issues. The maps present waterbodies (rivers, streams, and lakes) listed on the MPCA impaired waters list (2018) for bacteria as well as for biological impairments with excessive nutrients as a stressor. Some of the waterbodies with biological impairments caused by nutrients are also chemically impaired for nutrients. These waterbodies are shown against a backdrop of active feedlots and wastewater discharging sites and should be used in conjunction with the Land Use Management map. Additional water resources infrastructure (i.e. ditches) are included to illustrate the movement of water across the landscape, from specific areas to impaired waters. Note: streams that are not presented as impaired may have chemical or biological impairments but have not been fully assessed and are thus not classified as impaired.</p>



Figure 2-4: Groundwater Issue Theme



Pollution Sensitivity of Near-Surface Materials

- Ultra low
- Very low
- Low
- Moderate
- High

Pollution Sensitivity of Wells

- Moderate
- High
- Moderate
- High

Drinking Water Supply Management Area (DWSMA) Vulnerability

- Low
- High

County Well Index - Nitrate (mg/L)

- < 1.0
- 1.0 - 2.0
- 2.01 - 3.0

County Well Index - Arsenic (ug/L)

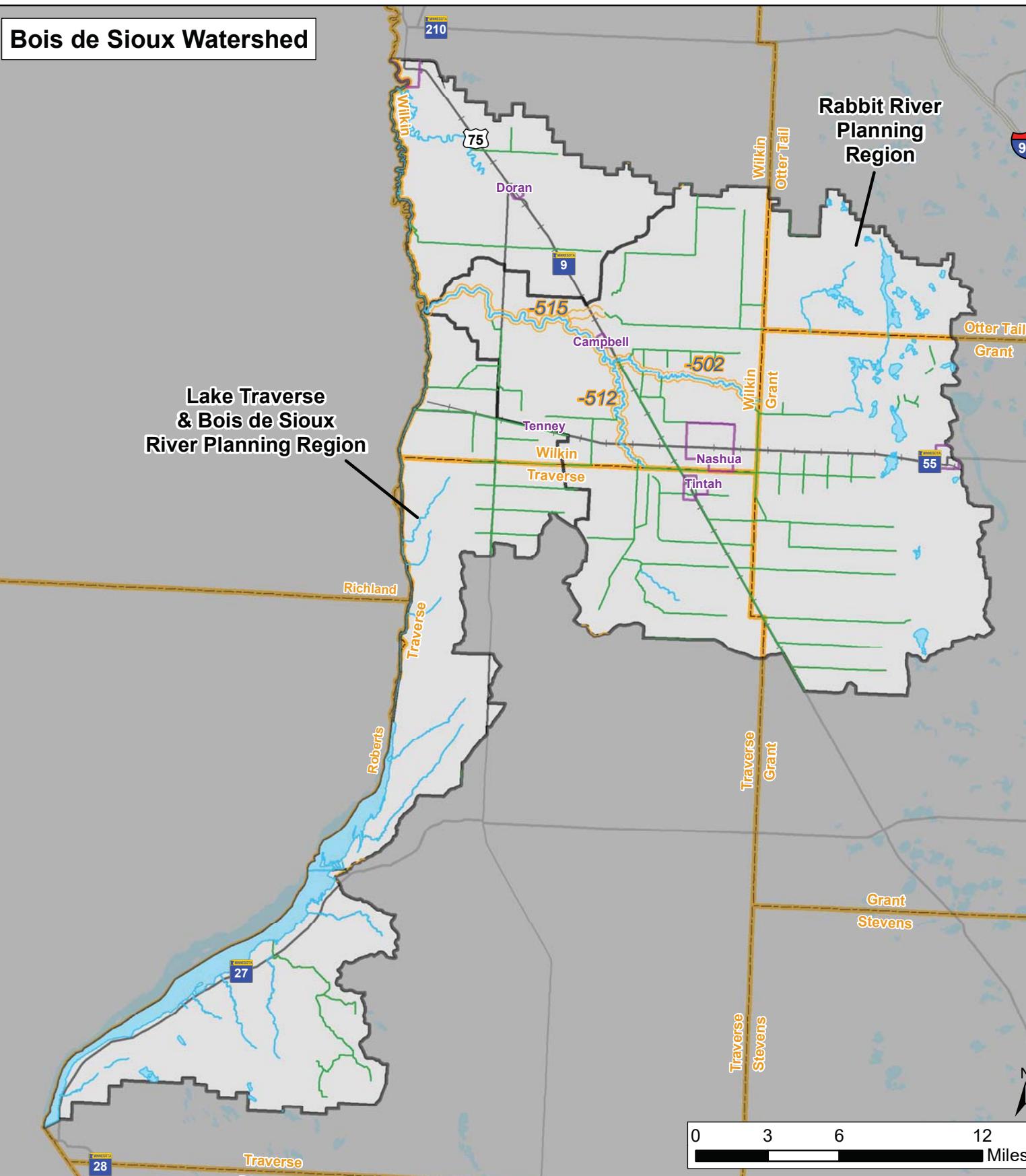
- < 5.0
- 5.0 - 10.0
- > 10.0

Legend

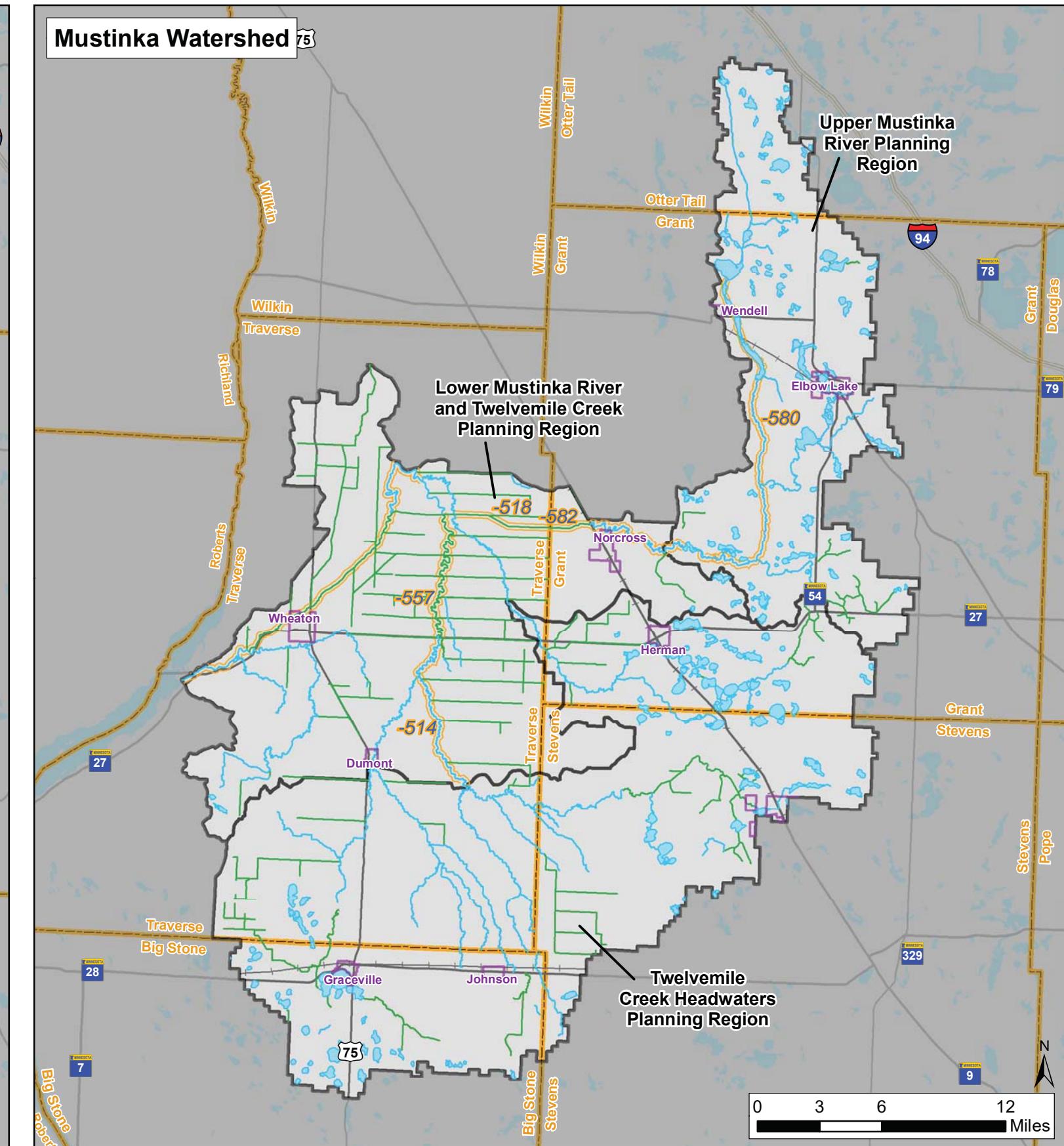
- Wellhead Protection Areas
- Major Roads
- Municipalities
- Planning Regions
- County Boundaries

Figure 2-5: Erosion and Sedimentation Issue Theme

Bois de Sioux Watershed



Mustinka Watershed



Public Watercourses
Public Ditches

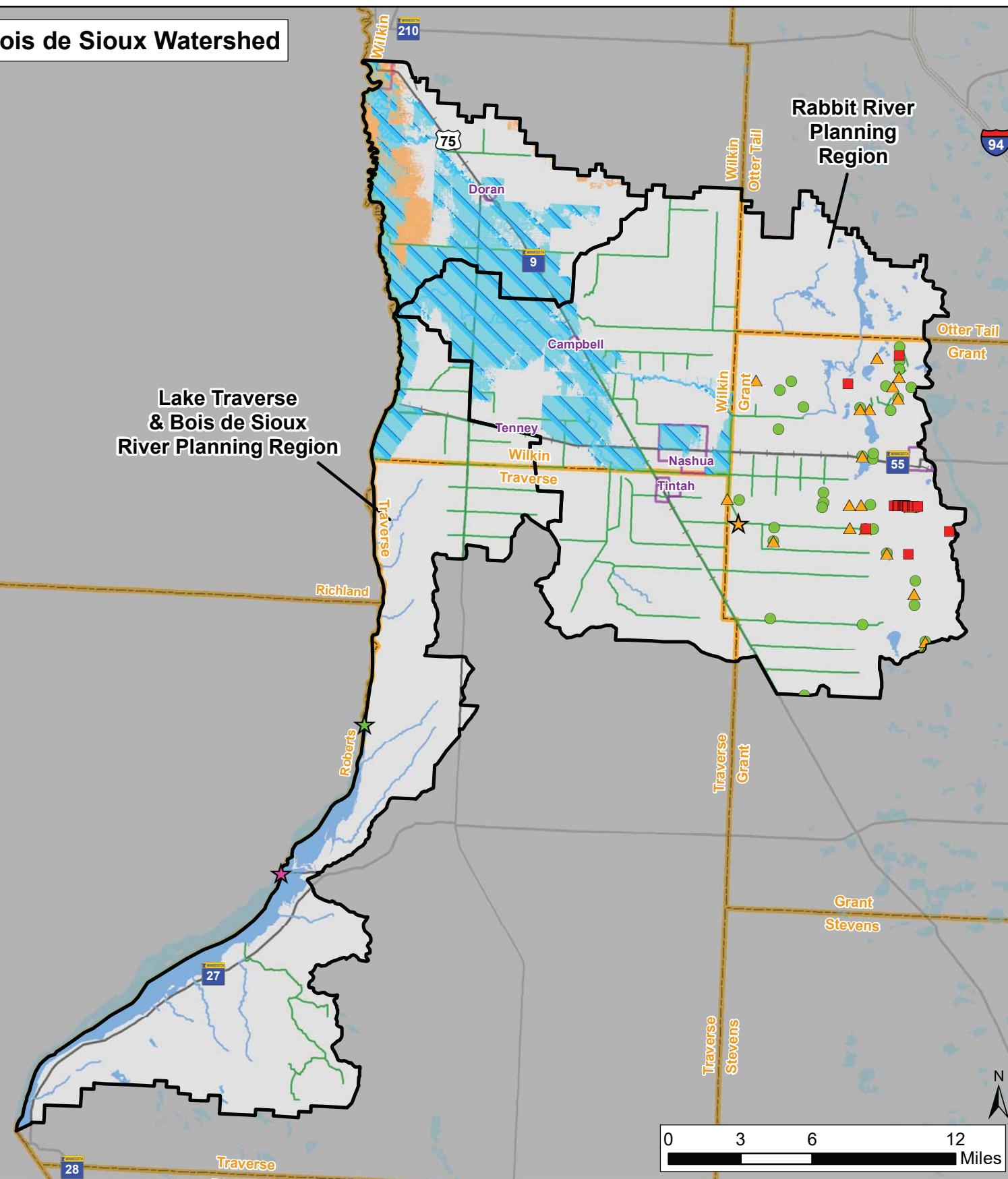
Impaired Streams
-Turbidity

Public Waters

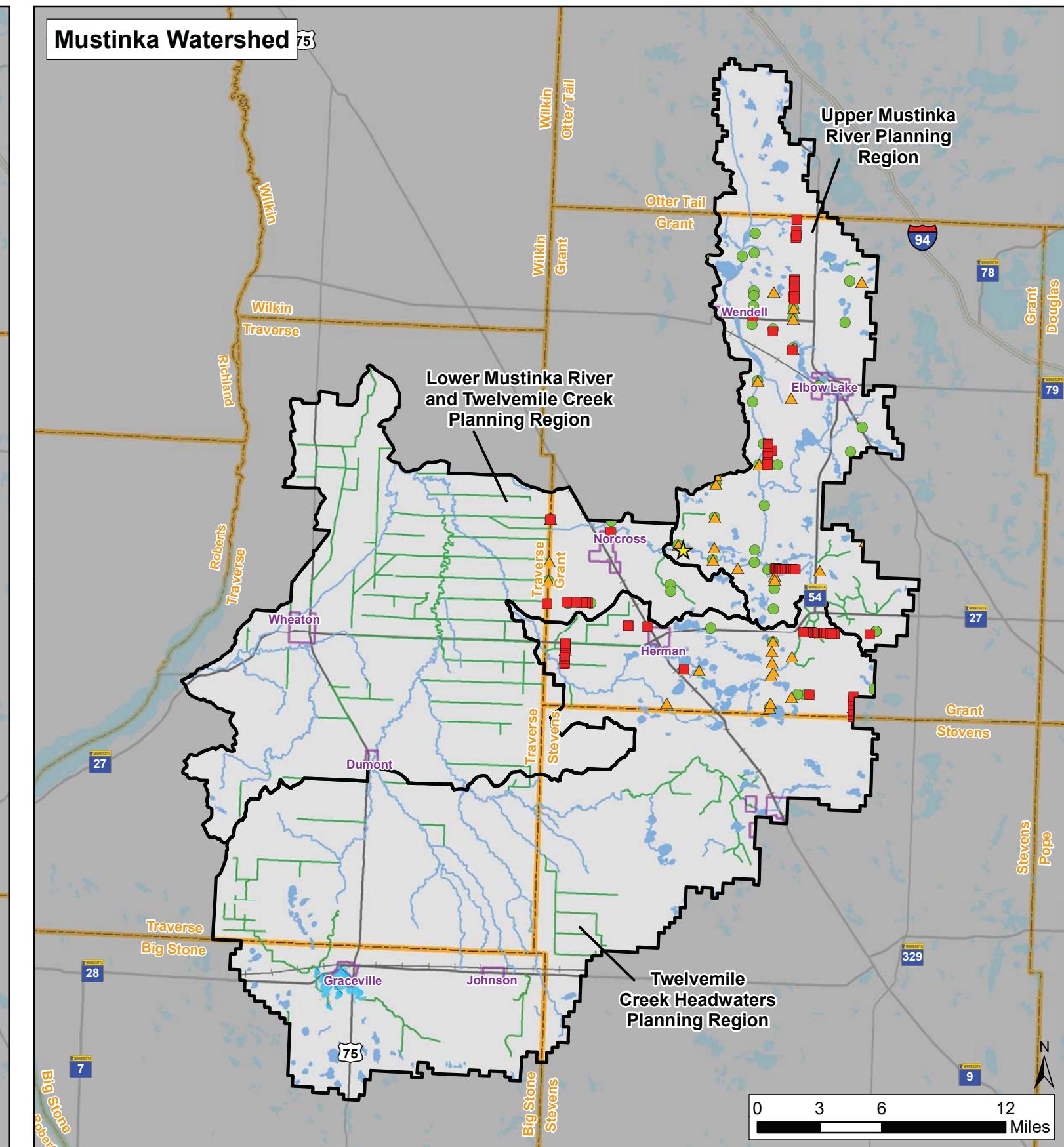
Planning Regions
Municipalities
Major Roads
County Boundaries

Figure 2-6: Flooding Issue Theme

Bois de Sioux Watershed



Mustinka Watershed



Impoundment

- ★ North Ottawa
- ★ White Rock Dam
- ★ Pine Ridge Park Dam

Reservation Dam

- Grant County
- 2019
- ▲ 2011
- 2009

Flood Damage Locations

- Floodplain (FEMA 2015)
- 100-yr Flood (DFIRM)
- 500-yr Flood (DFIRM)

Public Waters

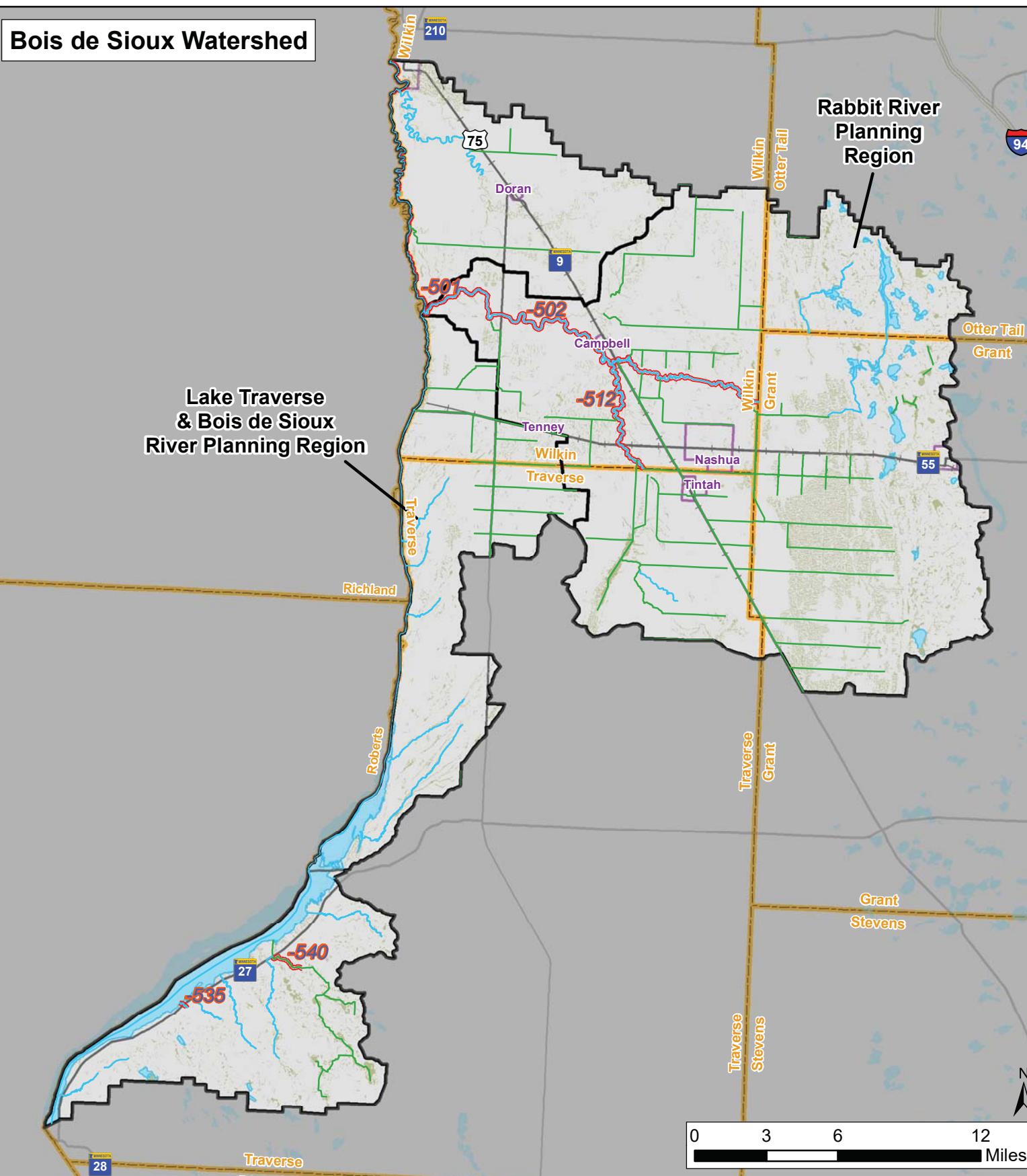
- Public Watercourses
- Public Ditches

Planning Regions

- Major Roads
- Municipalities
- County Boundaries

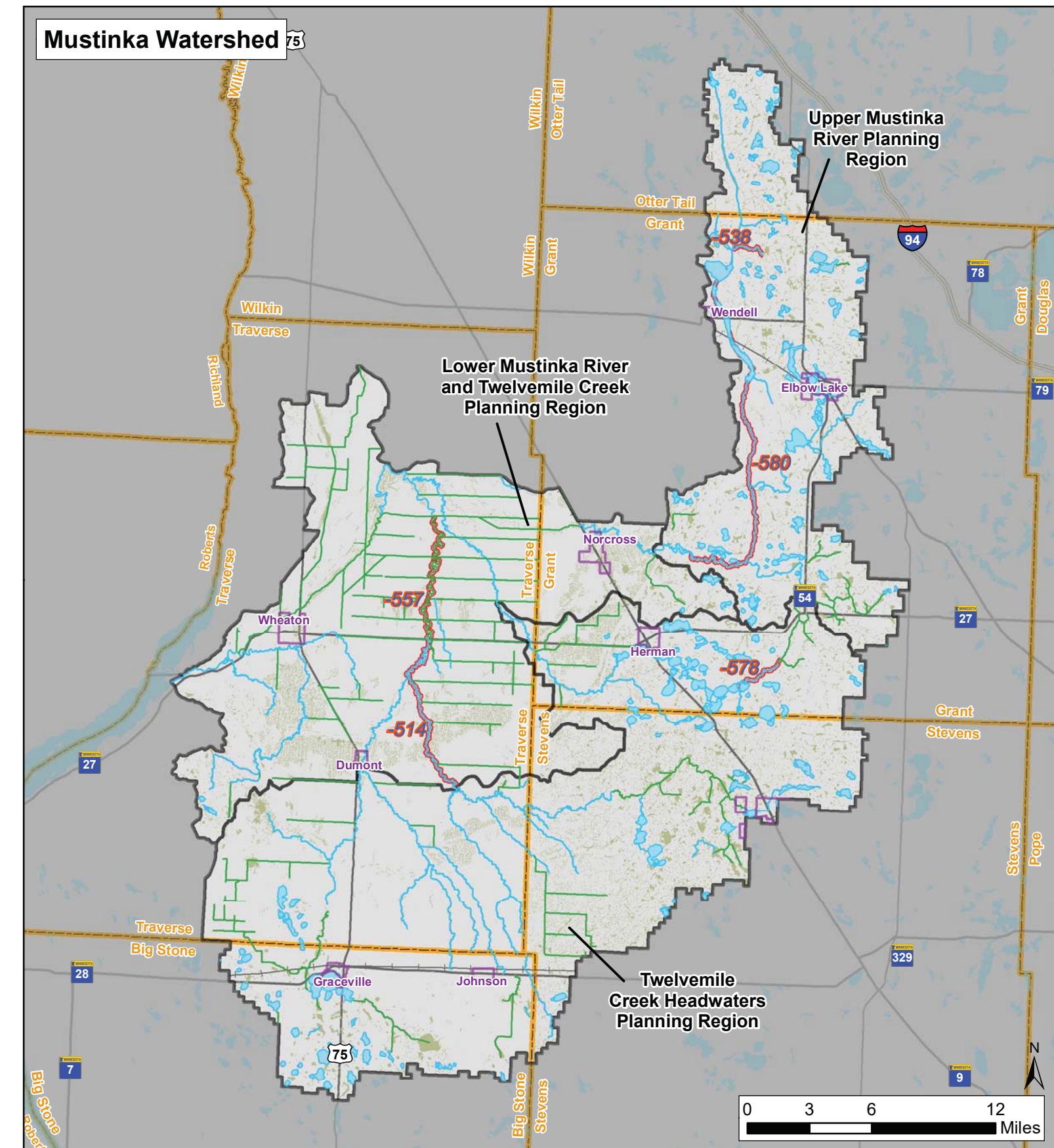
Figure 2-7: Altered Hydrology Issue Theme

Bois de Sioux Watershed



Lake Traverse
& Bois de Sioux
River Planning Region

Mustinka Watershed



Planning Regions — Major Roads
Municipalities County Boundaries

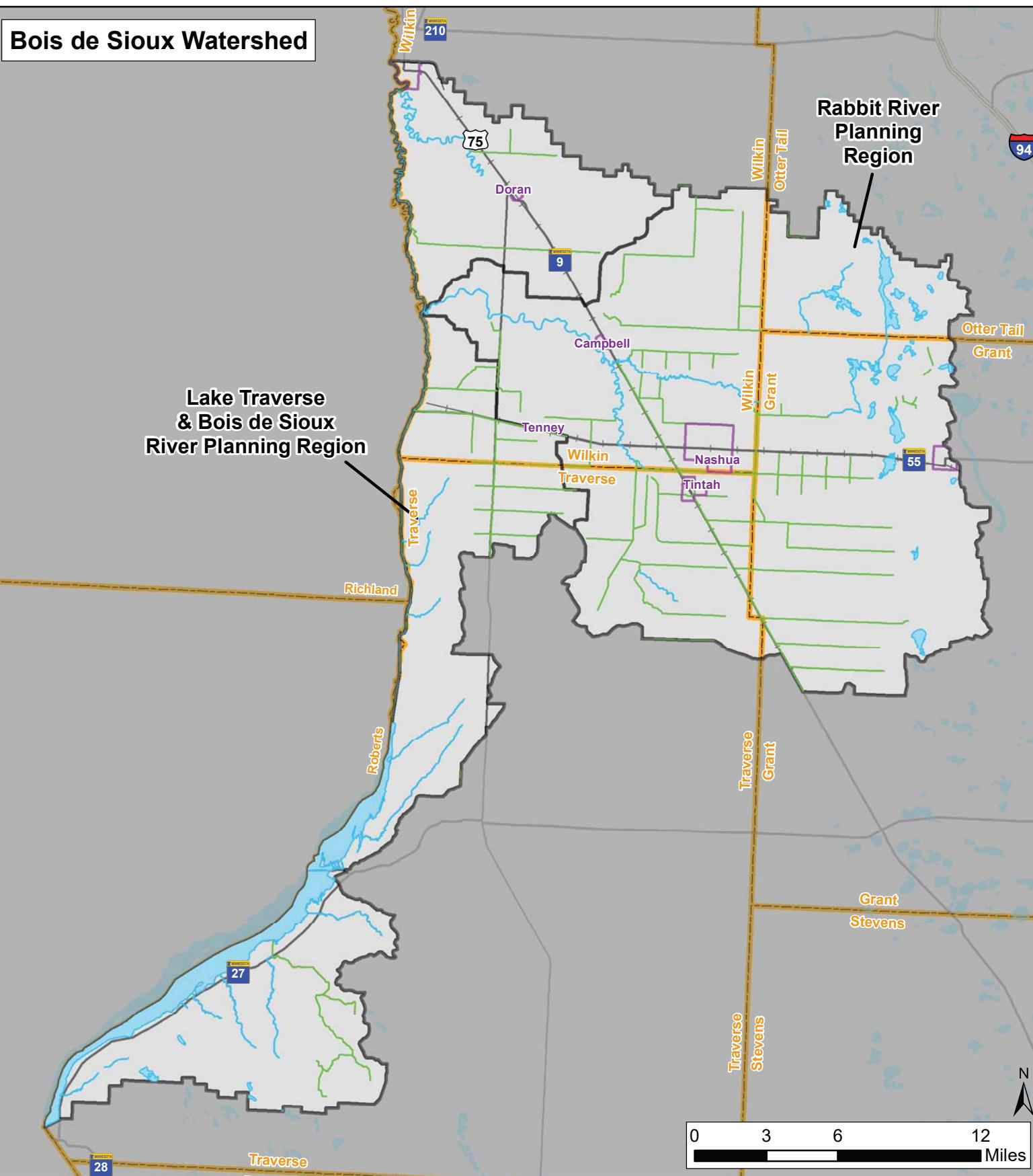
Public Watercourses
Public Ditches
Public Waters

Impaired Streams -
Biological Impairment,
Altered Hydrology
Stressor

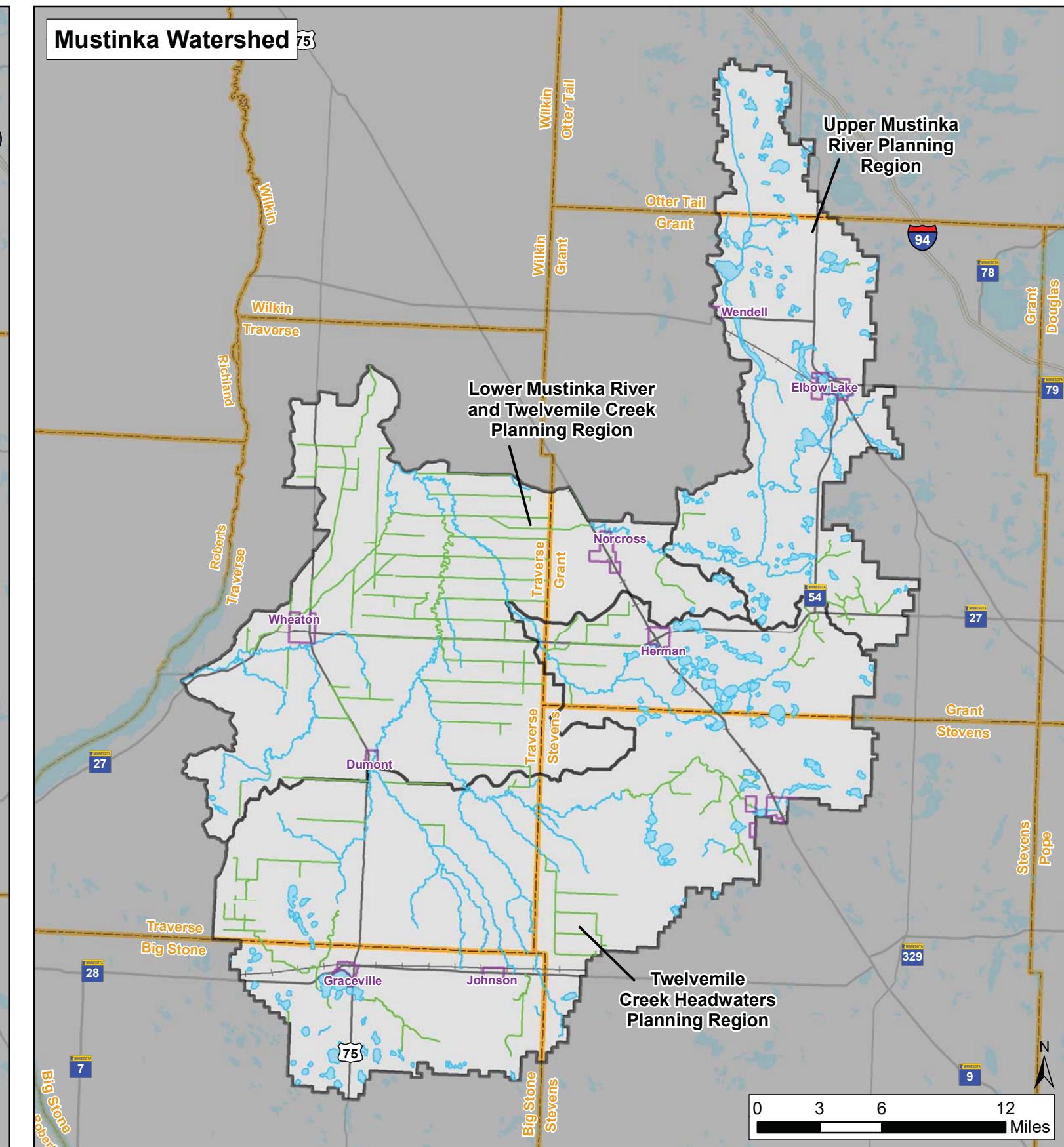
Restorable Wetlands
Inventory

Figure 2-8: Drainage Issue Theme

Bois de Sioux Watershed



Mustinka Watershed



~ Public Watercourses	□ Planning Regions	— Major Roads
~ Public Ditches	■ Municipalities	□ County Boundaries
~ Public Waters		

Figure 2-9: Habitat Issue Theme

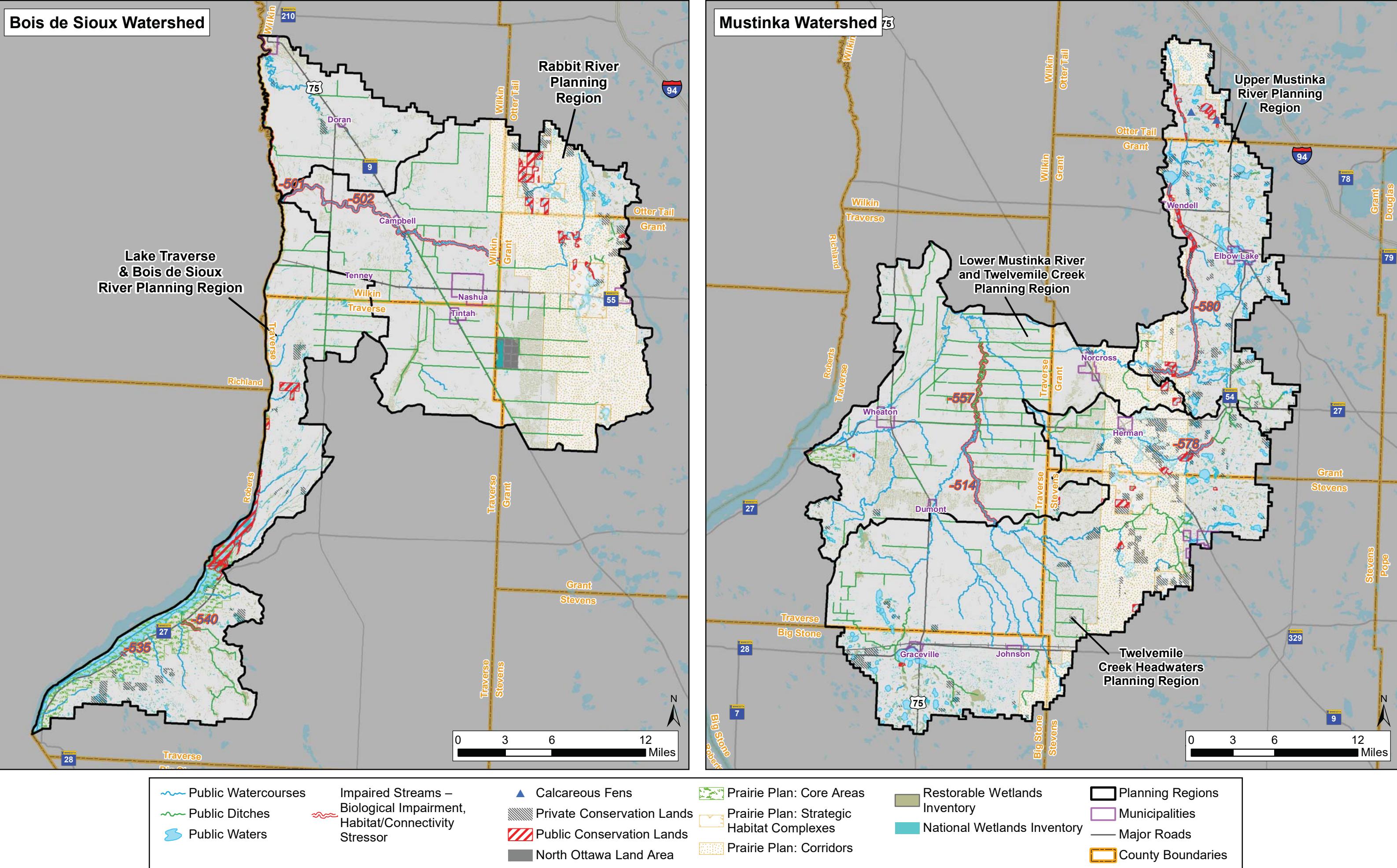
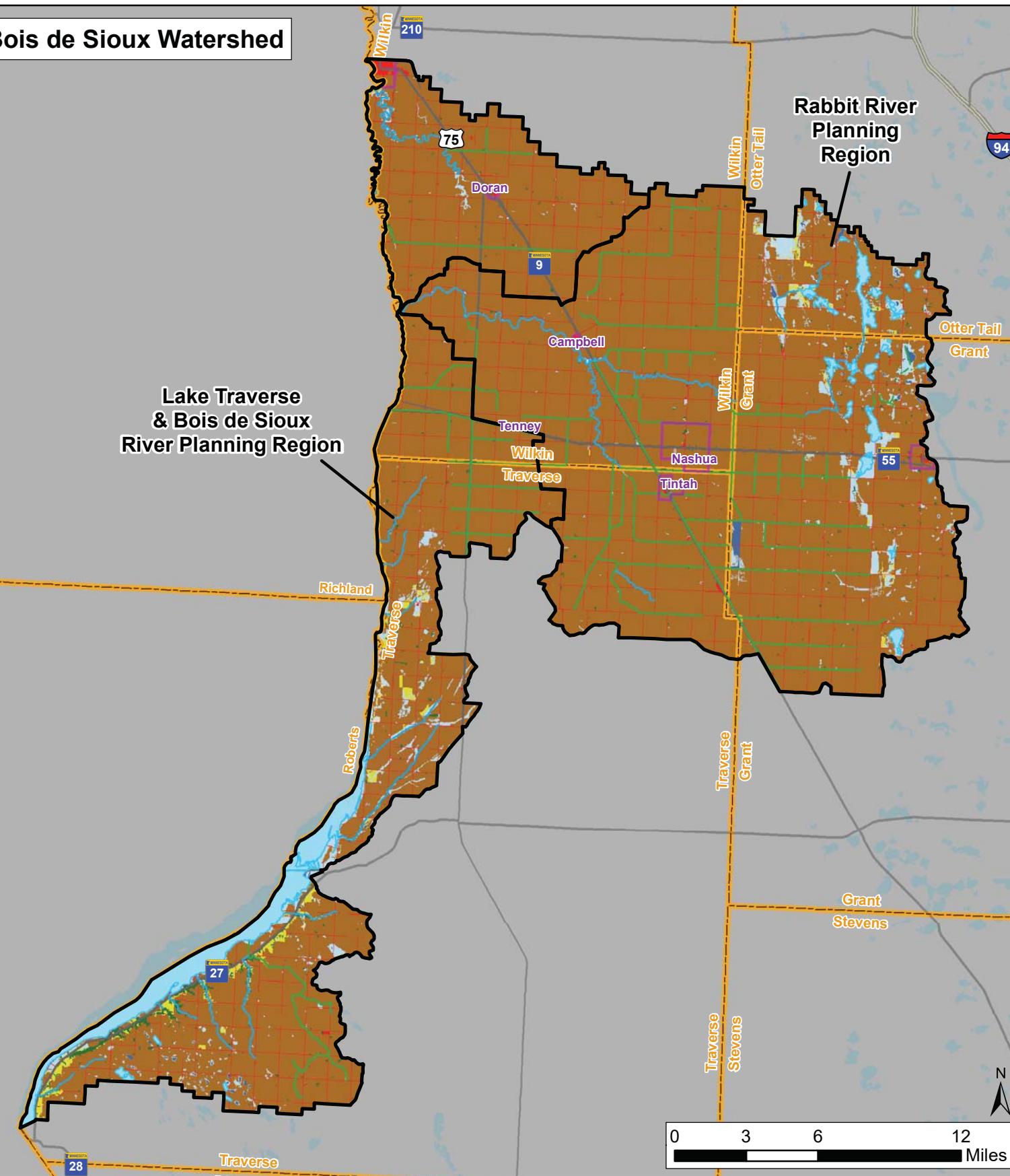
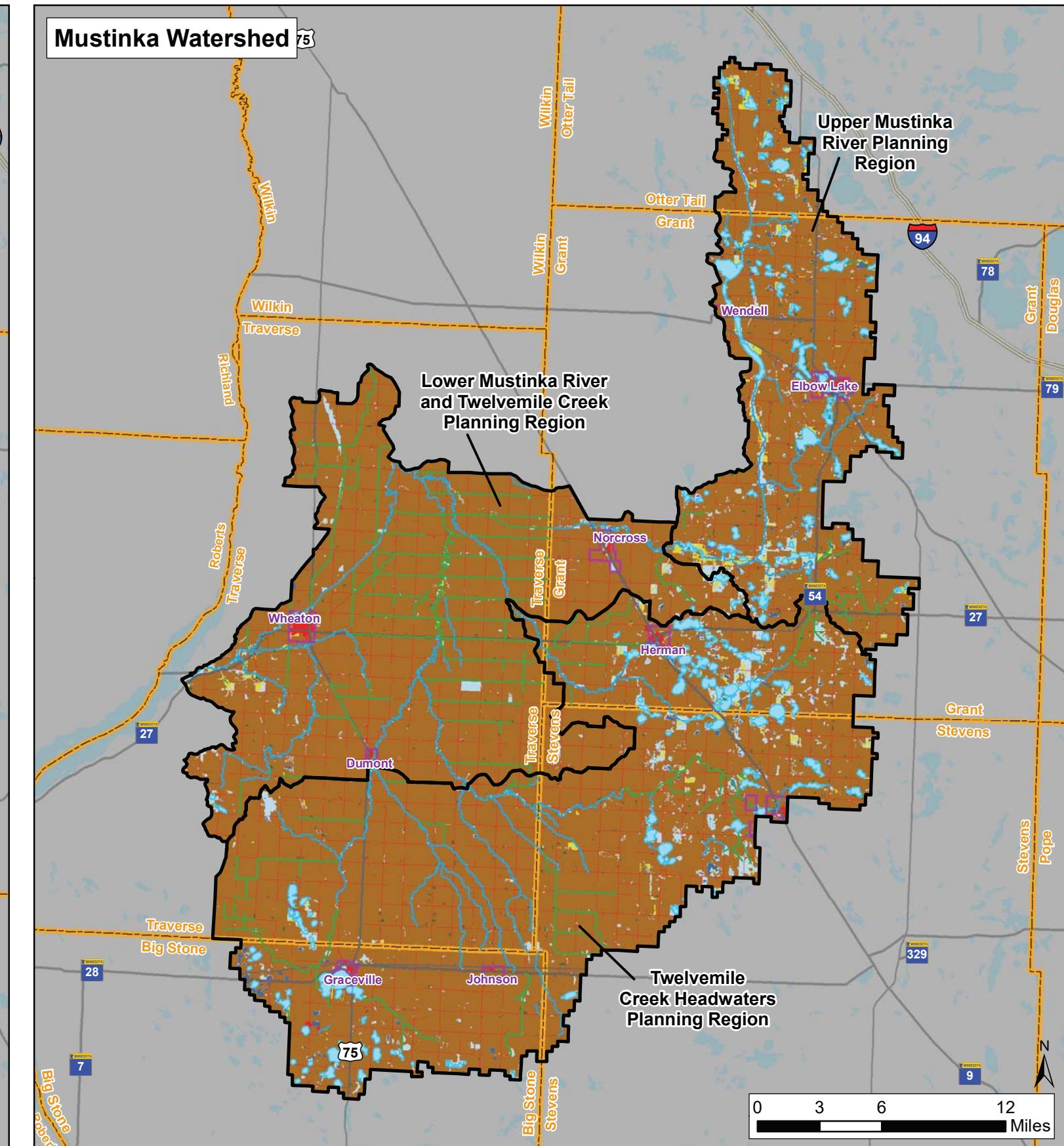


Figure 2-10: Land Use Issue Theme

Bois de Sioux Watershed



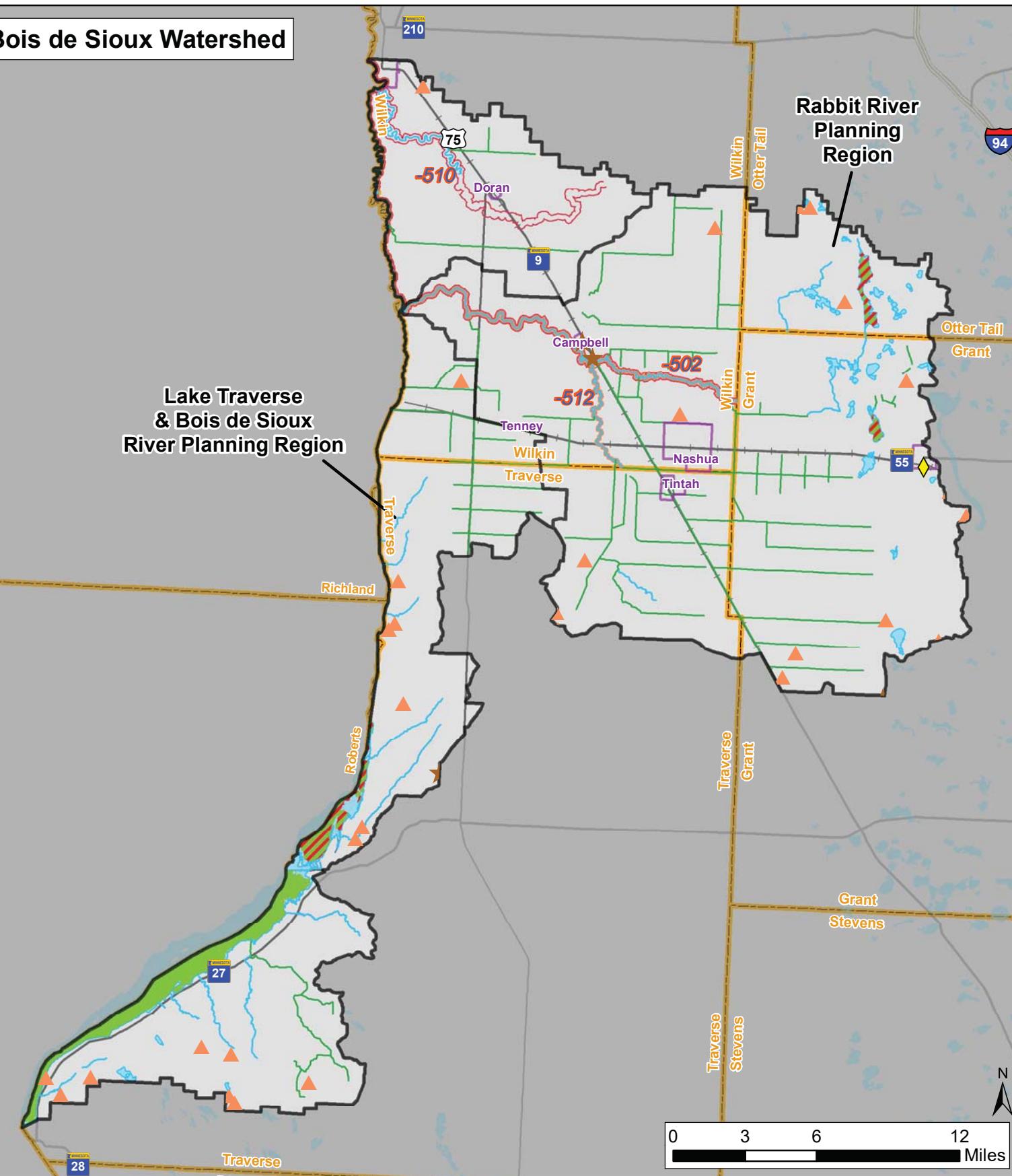
Mustinka Watershed



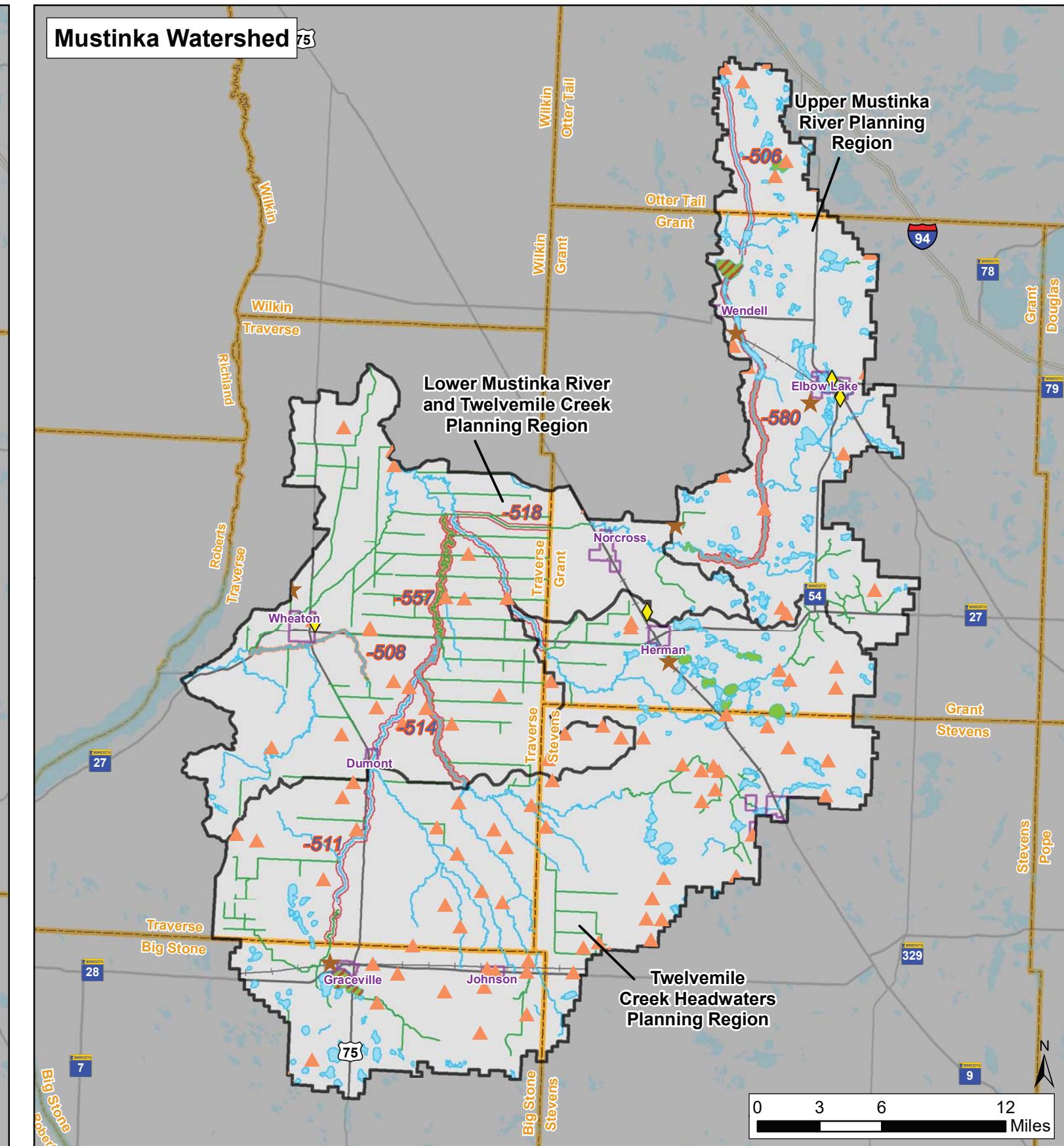
Land Cover	Hay/Pasture	Forest	Public Waters	Planning Regions
Open Water	Wetlands	Cultivated Crops	Public Watercourses	Municipalities
Shrub	Developed	Barren Land	Public Ditches	Major Roads
				County Boundaries

Figure 2-11: Surface Water Quality Issue Theme

Bois de Sioux Watershed



Mustinka Watershed



MPCA: What's in My Neighborhood

▲ Registered Feedlots

★ Wastewater Dischargers

Industrial NPDES Permittee

◆ Public Waters

◆ Lakes of Phosphorus Sensitivity Significance

◆ Impaired Lakes - Excessive Nutrients and Bacteria Stressors

◆ Public Watercourses

◆ Public Ditches

◆ Impaired Streams - Bacteria

◆ Impaired Streams - Biological Impairment, Nutrients Stressor

◆ Planning Regions

◆ Municipalities

◆ Major Roads

◆ County Boundaries

Section 3.0

Measurable Goals



Section 3.0 Measurable Goals

Definitions

The following definitions were developed to establish a common language for communicating information:

- **Priority Issue** - Issues receiving either 'High' or 'Medium' ranks for a planning region. Priority issues will be the focus of this comprehensive plan.
- **Measurable Goal** - A statement of intended accomplishment for each priority issue. Goals are meant to be quantitative or qualitative, simply stated and achievable, short- or long-term, and measurable through the implementation of actions.
- **Short-Term Goal(s)** - Interim conditions to accomplish or make progress towards during the 10-year lifespan of this plan;
- **Long-Term Goals(s)** - The desired future condition to accomplish, regardless of time frame.
- **Metric** - A feature, characteristic, or quantity that forms the unit by which progress towards attaining a measurable goal is measured.

3.1. Introduction

Measurable goals were established for each priority issue in the Bois de Sioux River and Mustinka River Watersheds. Information used to develop measurable goals included:

- Goals from existing management plans, studies, reports, data, and information, including the WRAPS, TMDLs, local water plans, state strategies, and similar documents (**Appendix E**);
- Results from the Prioritize, Target, and Measure Application (PTMApp); and
- Input from public kickoff meetings; Steering, Advisory, and Policy Committee members.

This section details the 12 measurable goals that address the 20 priority issues of the comprehensive plan. The measurable goals are presented as a series of factsheets, each summarizing:

- The priority issues the goal addresses;
- The planning region prioritization for each priority issue (example: Figure 3-1);
- Background information about the goal;
- The short- and long-term goals, by planning region; and
- Specific resources that are prioritized for the goal.

Specific resources were prioritized based on a review of scientific data and discussion amongst the Steering and Advisory Committees. Some resources are identified as needing "protection" or "restoration."



A resource is designated as **protection** when the condition of the resource is currently:

- Better than the minimum condition defined by state or federal environmental standards and criteria (e.g., numeric water quality standards); or
- A limited part of the landscape providing essential ecosystem functions and services at the landscape scale (e.g., habitat).

A resource is designated as **restoration** when the condition of the resource is currently:

- Below the minimum condition defined by local, state, or federal environmental standards and criteria (e.g., fails to meet numeric water quality standards); or
- Contributing to a downstream impairment or poor quality resource condition.

The Nonpoint Priority Funding Plan for Clean Water Funding Implementation prioritizes protection and restoration on water bodies that are nearly or barely impaired. To align implementation efforts with state-level funding priorities, protection and restoration categories and subcategories for streams, rivers, and lakes were mapped during the planning process ([Appendix H](#)). The Steering Committee used these maps to prioritize nearly or barely impaired surface water resources, therefore aligning with the Nonpoint Priority Funding Plan.

The measurable goals outlined in this plan build on the foundation of existing conservation efforts within the watersheds, including:

- Conservation Reserve Program (CRP) – a land retirement program that provides water quality and habitat benefits, and
- Conservation Stewardship Program (CSP) – a program for working lands that promotes stewardship.

This plan recognizes the importance of continuing these programs in the future, as without these programs resource conditions would likely change. Plan measurable goals are future-looking and are intended to build on these existing successes to improve resource conditions.

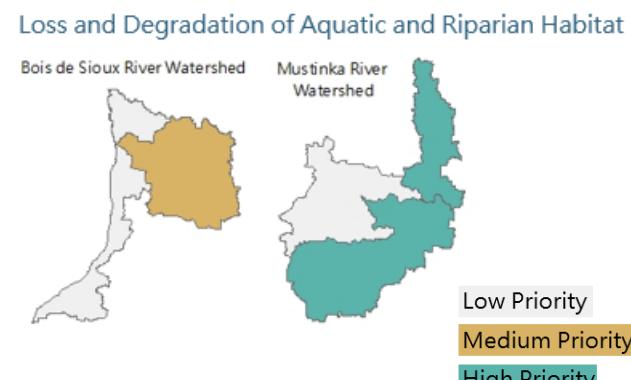


Figure 3-1 Example planning region prioritization map



Measurable Goal: Sediment

Priority Issues

- ✓ *Sediment*
- ✓ *Lake Habitat*
- ✓ *Aquatic and Riparian Habitat*

Background

Sediment loading from upland sources is one of two plan issues that is a priority across all planning regions. Much of this sediment likely comes from gully erosion during high flow events (MPCA, 2011). Sediment loss in upland areas degrades agricultural production and damages roads and bridges. Sediment delivery through and from private drainage ways and stream channels can also impact downstream stream and river systems.

As of 2018, there were 11 stream and river reaches listed as impaired for excess sediment in the watersheds. These reaches impact surface water drinking supplies, aquatic life such as fish and aquatic insects, aquatic habitat, and overall aesthetic appeal. The Bois de Sioux River and Mustinka River WRAPS and TMDL reports set sediment reduction goals for each of these resources to support their designated use.

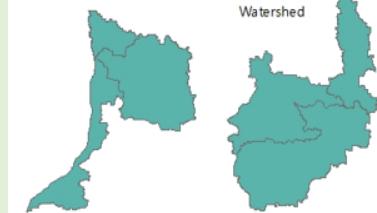
Issues addressed by this goal have been prioritized by planning region and implementation actions will focus on specific resource priorities. This is summarized in the box to the right.

The sediment reduction goal is planning region-based. As recommended by the MPCA, the planning region long-term sediment reduction goals are based on an average reduction of all excess sediment TMDLs within each planning region. A detailed breakdown of this is shown in the Resource Targets table on the next page.

Short-term goal reductions represent realistic, incremental progress toward the long-term goal.

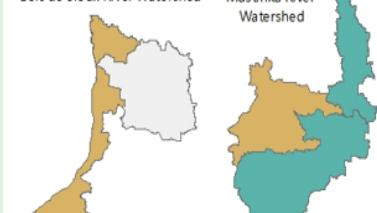
Sediment Loading to Surface Water

Bois de Sioux River Watershed Mustinka River Watershed



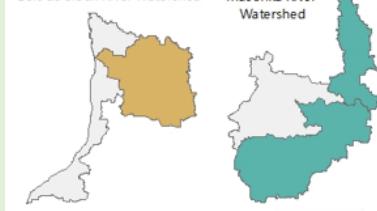
Loss and Degradation of Lake Habitat

Bois de Sioux River Watershed Mustinka River Watershed



Loss and Degradation of Aquatic and Riparian Habitat

Bois de Sioux River Watershed Mustinka River Watershed



Low Priority
Medium Priority
High Priority

Resource Priorities for Protection (Nearly Impaired for Excess Sediment):

- *Lake Traverse (78-0025-00)*

Measurable Goal: Sediment (continued)

Resource Targets

Planning Region	Reach	Percent Reduction*	Existing Load** (tons/year)	Target Reduction** (tons/year)
<i>Bois de Sioux River Watershed (HUC 09020101)</i>				
Lake Traverse & Bois de Sioux River	Bois de Sioux River (-501)	50%	53,623	26,811
Rabbit River	Rabbit River (-502)	34%	17,546	5,966
	Rabbit River, South Fork (-512)	N/A ***	7,190	N/A
	Unnamed Creek (-515)	N/A***	5,845	N/A
<i>Mustinka River Watershed (HUC 09020102)</i>				
Upper Mustinka River	Mustinka River (-580)	14%	33,825	4,736
Lower Mustinka and Twelvemile Creek	Mustinka River (-502)	37%	36,882	13,646
	Mustinka River (-503)	46%	48,991	22,536
	Twelvemile Creek (-514)	91%	14,825	13,491
	Mustinka River (-518)	80%	14,989	11,991
	Twelvemile Creek (-557)	0%	22,274	0
	Mustinka River (-582)	36%	19,000	6,840

* Percent reduction as calculated in the TMDL by the mid-range flow reduction, or next highest flow range

** As estimated at the Prioritize, Target, Measure Application (PTMApp) priority resource point

*** Insufficient monitoring data to calculate percent reduction goal

Measurable Goals



Long-Term Goal: Long-term goal sediment load reductions are met, as defined in the Planning Region Focus table below.



Short-Term Goal: Short-term load reduction goals are met, as defined in the Planning Region Focus table below.

Planning Region Focus

Bois de Sioux Watershed		Mustinka Watershed		
Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
Reduce by 50% or 26,800 tons/yr	Reduce by 34% or 6,000 tons/yr	Reduce by 14% or 4,400 tons/yr	Reduce by 58% or 28,400 tons/yr	Reduce by 10% or 4,300 tons/yr
Reduce by 1,125 tons/yr	Reduce by 225 tons/yr	Reduce by 345 tons/yr	Reduce by 1,175 tons/yr	Reduce by 900 tons/yr

Metric: % load reduction or mass load reduction at the end of 10-year plan. Load reduction estimates established at planning region outlets using PTMApp



Measurable Goal: Soil Health

Priority Issues

- ✓ Protect and Improve Agricultural Land Productivity and Soil Health

Background

Soil health is one of two plan issues that is a priority across all **planning regions**. Maintenance and protection of healthy soils are key to the success of the agricultural economy of the area. Healthy soils also provide a host of other benefits, including reducing runoff and downstream channel instability as well as retaining nutrients and sediment on the landscape. Soil health practices are commonly used in the plan area for maintaining and protecting healthy soils. These include residue management, rotations, cover crops, precision agriculture, Minnesota Agricultural Water Quality Certification Programs (MAWQCP), and nutrient and manure management plans.

A “critical soil loss” analysis was completed to identify areas in the watersheds that are most vulnerable to overland erosion and therefore need soil health practices the most ([Appendix I](#)). The identified critical soil loss areas form the basis of the short-term soil health measurable goal and are the focus of initial implementation.

This soil health measurable goal is tailored to each planning region, as shown in the Planning Region Focus table below. The short-term goal is focused on implementing soil health practices in critical soil loss areas. The long-term goal is to have soil health practices on 25% of the farmable land in the plan area.

Measurable Goals



Long-Term Goal: Soil health practices are implemented on 25% of all farmed soils within the plan area, as defined in the Planning Region Focus table below.



Short-Term Goal: Soil health practices are implemented on 2,321 farmed acres to protect critical soil loss areas, as defined in the Planning Region Focus table below.

Planning Region Focus



Bois de Sioux Watershed		Mustinka Watershed		
Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
30,800 acres	45,800 acres	21,800 acres	39,800 acres	55,000 acres
343 acres	698 acres	665 acres	238 acres	377 acres

Metric: Acres of soil health practices implemented



Measurable Goal: Altered Hydrology

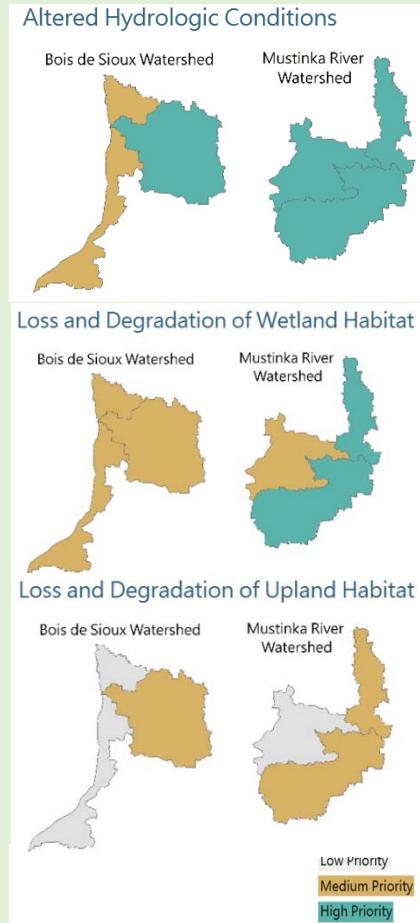
Priority Issues

- ✓ *Altered Hydrologic Conditions*
- ✓ *Loss and Degradation of Wetland Habitat*
- ✓ *Loss and Degradation of Upland Habitat*

Background

Altered hydrology is a change in hydrology and hydraulics compared to historic conditions. It is commonly characterized by increased peak discharge and runoff volumes and can create stream bank erosion and sedimentation, loss of aquatic habitat, and decrease in base flows. Storing water on the landscape is one way to mitigate the effects of altered hydrology. This can be done by installing large-scale water storage projects, such as regional distributed storage and impoundments. Often, projects that protect habitat, such as wetland restoration, also accrue water storage benefits. As a result, this altered hydrology goal also addresses the loss and degradation of wetland and upland habitat.

Issues addressed by the altered hydrology goal are prioritized by planning region, as shown in the box to the right. The planning region priority maps identify the focus for altered hydrology, wetland, and upland habitat restoration. This plan gives special consideration to areas in the Minnesota Prairie Plan for multiple benefit projects, including perennial vegetation and soil management practices.



The long-term goal is based on storage volumes identified in the BdSWD Updated Flow Reduction Strategy for each planning region. The short-term goal is a fraction of the long-term goal. Note: it may not be practical to split long-term, large scale impoundment goals across several small-scale, short-term goals.

Measurable Goals



Long-Term Goal: A total of **78,903 acre-feet** of additional water storage is achieved, broken out by planning region, as indicated in the Planning Region Focus table below.



Short-Term Goal: Achieve progress towards long-term goal through implementation of Redpath Controlled Flood Impoundment Project and small-scale storage to mitigate impacts of altered hydrology.

Planning Region Focus

Bois de Sioux Watershed		Mustinka Watershed		
Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
1,915 acre-feet	15,422 acre-feet	917 acre-feet*	24,367 acre-feet**	36,282 acre-feet
1,237 acre-feet*	2,545 acre-feet	917 acre-feet*	24,367 acre-feet**	5,442 acre-feet

Metric: Acre-feet of storage

Goal source: * 0.1 inches additional storage across planning region; ** Redpath Controlled Flood Impoundment Project

Measurable Goal: Public Flooding

Priority Issues

- ✓ *Flood Damage to Communities and Public Infrastructure*

Background

Public property flooding is an important issue throughout the plan area. Flooding causes significant damage to communities and public infrastructure, which brings a substantial financial burden. In agreement with existing management plans and stipulations of the Red River Watershed Management Board Red River Basin Flood Damage Reduction Framework, this plan goal is to reduce the risk of damage to communities and public infrastructure from flood events. This can be provided in part through large- and small-scale water storage projects and/or wetland restoration to promote water storage on the landscape. As such, water storage gained through the Altered Hydrology goal will also reduce public flooding risk.

The public flooding issue is prioritized by planning region. Implementation actions will focus on priority communities, shown in the box to the right. Flood risk reduction is defined as not being impacted by a given storm event. Rural public infrastructure includes roadways, culverts, etc.

Achieving this goal requires completing a flood risk assessment for unevaluated communities and ensuring all communities are protected. The short-term goal makes incremental progress toward the long-term goal.

Measurable Goals



Long-Term Goal: Flood risk reduction is provided against the Atlas 14 100-year, 24-hour event for all communities and against the Atlas 14 10-year, 24-hour event for all rural public infrastructure.



Short-Term Goal: The level of flood risk for unevaluated priority communities is defined and flood risk reduction against 100-year event is provided for 50% of those at-risk priority communities.

Metric: % communities, rural public infrastructure “protected” with flood risk reduction

Flood Damage to Communities and Public Infrastructure

Bois de Sioux River Watershed



Mustinka River Watershed



Low Priority
Medium Priority
High Priority

Priority Communities

At-risk:

- *Norcross*
- *Doran*
- *Graceville*

Unevaluated:

- *Herman*
- *Dumont*
- *Campbell*



Measurable Goal: Private Flooding

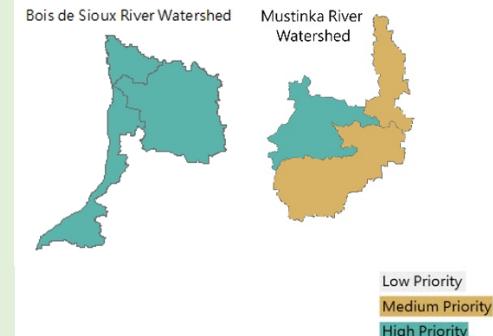
Priority Issues

- ✓ *Flood Damage to Homesteads and Private Infrastructure Surrounding Farmland*

Background

Private property flooding is a critical issue throughout the Red River Basin and the plan area. Flooding causes costly damage to rural homesteads and private infrastructure. This plan goal is to reduce the risk of damage to farmland from flood events. This will require changes in land management, installing large and small-scale water storage projects, and/or implementing flood risk reduction projects on the landscape (e.g., ring dikes). As such, water storage gained through the Altered Hydrology goal will also reduce private flooding risk.

Flood Damage to Homesteads and Private Infrastructure Surrounding Farmlands



The private flooding issue is prioritized by planning region, shown in the box above. Flood risk reduction is defined as not being impacted by a given storm event. Private infrastructure includes roadways, ditches, etc.

Achieving this goal requires prioritization of homesteads and private infrastructure for flood risk reduction, followed by implementation to achieve that flood risk reduction. The prioritization and applicable implementation are part of the short-term goal while continued implementation for more infrastructure and larger events will achieve the long-term goal.

Measurable Goals



Long-Term Goal: Flood risk reduction is provided against the Atlas 14 100-year, 24-hour event for all rural homesteads and against the Atlas 14 10-year, 24-hour event for other private infrastructure.



Short-Term Goal: Farmsteads and private infrastructure most at risk are identified and prioritized, with 50% protected with ring dikes as needed.

Metric: Percent of homesteads and farmlands, rural infrastructure “protected” with flood risk reduction

Measurable Goal: Public Ditch System Instability

Priority Issues

- ✓ *Drainage System Instability*

Background

The Bois de Sioux River and Mustinka River watersheds have 581 miles of designated public ditch systems (MS 103E). Ditches, if not properly maintained and protected, can become unstable or fail to fulfill its MS 103E statutory obligations and established functions. The result can increase maintenance and dredging costs. The cause of instability may vary by location. The instability may have an obvious local cause or may be caused by large-scale changes in hydrology or land use.

For purposes of this plan, a stable public ditch system is defined as a system that requires minimized annual maintenance and does not undergo major erosion, sedimentation, or channel migration during rain events for which it was designed.

Achieving this goal requires an assessment to classify stable and unstable portions of the system. Projects that work towards this goal are part of the 103E process and may include multipurpose drainage management projects to the ditch itself, upland landscape changes, or storage projects.

Public ditch system instability was prioritized by planning region. Implementation will initially focus on specific resource priorities as shown in the box above.

Measurable Goals



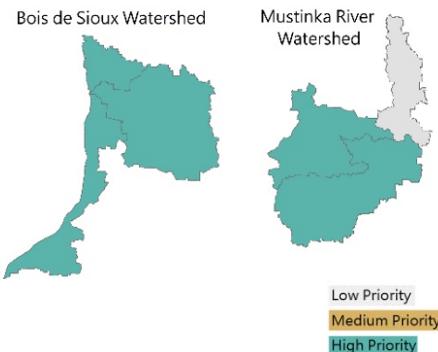
Long-Term Goal: All **581 miles** of public ditch systems are stable.



Short-Term Goal: **75 miles** of public, unstable ditches that are eroding and silting are stabilized.

Metric: Miles of ditch stabilized

Drainage System Instability



Resource Priorities

- *Grant County Ditch 8*
- *Stevens County Ditch 15*
- *Traverse County Ditch 52*
- *Traverse County Ditch 8*
- *Judicial Ditch 11*
- *Judicial Ditch 6*
- *Judicial Ditch 12*

Measurable Goal: Public Ditch System Inadequacy

Priority Issues

- ✓ *Drainage System Inadequacy*
- ✓ *Out-of-date Benefits Determination*

Background

The Bois de Sioux River – Mustinka River watersheds have a total of 581 miles of public (MS 103E) legal ditches. These ditches provide local relief from saturated soils and minor flooding problems. However, ditches that are inadequately sized can cause flooding, increased erosion and sedimentation, decreased water quality, and increased annual maintenance costs.

For purposes of this plan, an “adequate” public drainage system is defined as a system that can convey the Atlas 14 10-year, 24-hour storm event without overtopping and impacting the surrounding area.

To achieve this goal, an accurate benefit determination must be done to ensure the correct funds are collected from those benefitting from the drainage network. Achievement also requires an analysis to classify adequate and inadequate portions of the system. Projects that work towards this goal are part of the 103E process and may include multipurpose drainage management projects to the ditch itself, upland landscape changes, or storage projects.

Issues addressed by this goal are prioritized by planning region, with implementation initially focusing on specific resource priorities. This prioritization is shown in the box to the right.

Measurable Goals



Long-Term Goal: All **581 miles** of public drainage systems have the capacity to convey the Atlas 14 10-year, 24-hour storm event, providing opportunity to private landowners for improved drainage.



Short-Term Goal: **75 miles** of public ditch systems are repaired/improved to reach capacity to convey the Atlas 14 10-year, 24-hour event.

Metric: Miles of ditch repaired/improved to convey 10-year, 24-hour event

Drainage System Inadequacy

Bois de Sioux Watershed



Mustinka River Watershed



Out of Date Benefits Determination

Bois de Sioux River Watershed



Mustinka River Watershed



Low Priority
Medium Priority
High Priority

Resource Priorities

- *Grant County Ditch 8*
- *Stevens County Ditch 15*
- *Traverse County Ditch 52*
- *Traverse County Ditch 8*
- *Judicial Ditch 11*
- *Judicial Ditch 6*
- *Judicial Ditch 12*

Measurable Goal: Nutrient Loading

Priority Issues

- ✓ Nutrient Loading to Surface Waters

Background

Excess nutrient (phosphorus) loading to lakes is a significant concern in the plan area as well as a regional concern in the Red River Basin. Lake nutrient levels are directly tied to harmful algal blooms and impacts to aquatic life.

There are currently five lakes within the Bois de Sioux River – Mustinka River watersheds that have phosphorus TMDLs. Additionally, seven stream reaches have completed phosphorus TMDLs to address dissolved oxygen and aquatic life impairments.

The nutrient loading issue was prioritized by planning region. Implementation actions will focus on specific resource priorities, as shown in the box to the right. Per MPCA recommendations, the planning region long-term phosphorus reduction goals are based on an average reduction of all phosphorus TMDLs within each planning region. A detailed breakdown of this is shown in the Resource Targets table on the following page. Resource priorities include five lakes within the plan area. Short-term goal reductions represent realistic, incremental progress toward the long-term goal.

Measurable Goals



Long-Term Goal: Planning region long-term goal total phosphorus load reductions are met, as defined in the Planning Region Focus table below.

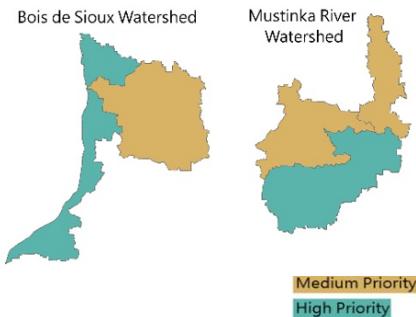


Short-Term Goal: Planning region short-term goal total phosphorus load reductions are met, as defined in the Planning Region Focus table below.

Bois de Sioux Watershed		Mustinka Watershed		
Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
Reduce by 64% or 91,900 lbs/yr	Reduce by 44% or 19,700 lbs/yr	Reduce by 57% or 10,800 lbs/yr	Reduce by 41% or 39,100 lbs/yr	Reduce by 72% or 38,400 lbs/yr
Reduce by 320 lbs/yr	Reduce by 190 lbs/yr	Reduce by 110 lbs/yr	Reduce by 375 lbs/yr	Reduce by 260 lbs/yr

Metric: Percent of load reduction/mass load reduction at the end of the 10-year plan. Load reduction estimates established at planning region outlets using PTMApp.

Nutrient Loading to Surface Waters



Resource Priorities (Impaired Lakes for Excess Nutrients):

- Lightning Lake
- Upper Lightning Lake
- Toqua Lake
- Lannon Lake
- Ash Lake



INTRO



ISSUE PRIORITIZATION



MEASURABLE GOALS



TARGETED IMPLEMENTATION



IMPLEMENTATION PROGRAMS



Measurable Goal: Nutrient Loading (continued)

Resource Targets

Planning Region	Reach or Lake	Percent Reduction*	Existing Load** (lbs/year)	Target Reduction** (lbs/year)
Bois de Sioux River Watershed (HUC 09020101)				
Lake Traverse & Bois de Sioux River	Bois de Sioux River (-501)	64%	143,554	91,874
Rabbit River	Rabbit River (-502)	57%	44,686	25,471
	Rabbit River, South Fork (-512)	0%	11,363	0
	Upper Lightning Lake (56-0957-00)	24%	228	55
	Ash Lake (26-0294-00)	51%	667	340
Mustinka River Watershed (HUC 09020102)				
Upper Mustinka River	Mustinka River (-580)	55%	18,251	10,038
	Lightning Lake (26-0282-00)	58%	4,954	2,873
Lower Mustinka and Twelvemile Creek	Eighteenmile Creek (-508)	51%	9,393	4,790
	Twelvemile Creek (-514)	44%	24,166	10,633
	West Branch Twelvemile Creek (-511)	27%	23,433	6,327
Twelvemile Creek Headwaters	West Branch Twelvemile Creek (-511)	27%	23,433	6,327
	East Toqua Lake (06-0138-00)	95%	1,537	1,460
	Lannon Lake (06-0139-00)	94%	2,692	2,531

* Percent reduction as calculated in the TMDL by the mid-range flow reduction, or next highest flow range

** As estimated by PTMAApp



Measurable Goal: Unstable Channels

Priority Issues

- ✓ *Unstable River and Stream Channels*

Background

River and stream systems are constantly changing in response to natural and human-caused factors within the watershed. Although some amount of channel instability is natural, human activities often exacerbate this condition. For example, land development commonly removes natural vegetation and storage, altering the natural hydrology of an area and increasing runoff. This increased runoff can impact channel stability and therefore water quality and aquatic health.

This measurable goal focuses on understanding the extent of unstable channels within the watersheds and stabilizing streams prone to erosion via stream stabilization practices. For purposes of this plan, a stable stream is defined as “a stream that can transport water and sediment while maintaining the channel’s width, depth, pattern, and longitudinal profile” (DNR, 2006).

The unstable river and stream channels issue is prioritized by planning region. Implementation actions will focus on specific priority river or stream channels, shown in the box above.

All river and stream channel banks must be stabilized within the plan area to achieve the long-term goal. The short-term goal makes incremental progress towards the long-term goal. The short-term goal also requires additional assessment to further determine the targeted priority river and stream banks.

Measurable Goals



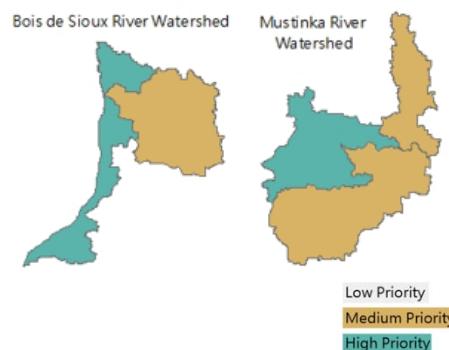
Long-Term Goal: All **465 miles** of rivers and streams channel banks within the plan area are assessed and stabilized.



Short-Term Goal: **23 miles** of priority river or stream channels are assessed and stabilized (where needed) through stream stabilization practices to decrease excessive erosion and channel sediment accumulation.

Metric: Miles of river or stream stabilized

Unstable River and Stream Channels



Priority River or Stream Channel

- *Mustinka River (downstream of Pine Ridge Park)*
- *Twelvemile Creek*
- *Doran Creek*
- *Fivemile Creek*



Measurable Goal: Bacteria Loading

Priority Issues

- ✓ *Bacteria Loading to Surface Waters*
- ✓ *Need for Improved Wastewater Treatment Facilities*
- ✓ *Noncompliant Subsurface Sewage Treatment Systems*

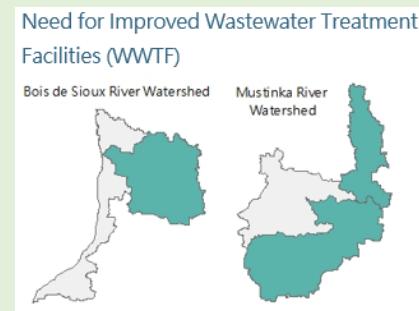
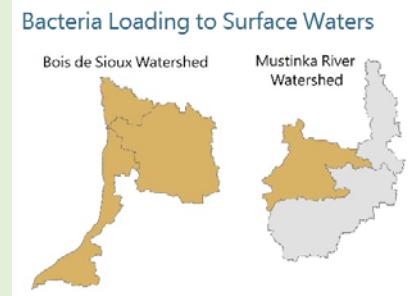
Background

Excessive levels of bacteria in surface waters can impact human health and the health of ecological systems. In humans, contact with contaminated water can lead to mild or severe illness.

Bacteria in surface waters can come from many natural and anthropogenic (man-made) sources. Natural sources typically include wildlife while anthropogenic sources include undersized WWTFs, non-compliant SSTSs, or improperly stored manure and improperly administered livestock operations. The anthropogenic sources can be targeted to reduce bacterial contamination in surface waters.

Issues addressed by the bacteria loading goal are prioritized by planning region, and implementation actions will focus on specific resource priorities. This prioritization is shown in the box to the right. The priority issue maps identify planning region focus for each type of anthropogenic source (i.e., WWTF and SSTS) as well as general bacterial loading priority.

The planning region long-term bacterial loading goal is to delist waterbodies currently listed as impaired for bacteria (i.e., *E. coli* or fecal coliform) and to protect those waterbodies that are not currently listed. The short-term goal makes incremental progress toward the long-term goal by implementing measurable projects specifically focused on reducing bacterial loading to impaired or unprotected water bodies.



Resource Priorities for Protection

- *Bois de Sioux River (09020101-503)*
- *Mustinka River (09020102-502)*

Resource Priorities for Restoration

- *Currently impaired stream reaches and lakes*



Measurable Goal: Bacteria Loading (continued)

Measurable Goals



Long-Term Goal: Planning region bacteria long-term goal is achieved, as defined in the Planning Region Focus table below.



Short-Term Goal: Implement projects, specifically focused on reducing bacterial loading to nearly or barely impaired priority resources, as defined in the Planning Region Focus table below.

Planning Region Focus

Bois de Sioux Watershed		Mustinka Watershed		
Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
Delist all (2)	Protection	Protection	Delist all (5)	Delist all (2)
3.4 miles fencing to restrict livestock access to riparian areas and shorelines	N/A	1,400-foot fencing to restrict livestock access to riparian areas and shorelines	N/A	N/A

Metric: Long-term: number of impaired reaches; Short-term: number of projects



Measurable Goal: Stormwater Management

Priority Issues

- ✓ *Lack of Municipal Stormwater Management*

Background

Although most of the land within the plan area is agricultural, there are several developed municipalities. Impervious surfaces and artificial drainage within developed areas increase runoff that can lead to increased flooding, streambank erosion, and loss of aquatic habitat. Runoff from these areas can also impact water quality. Use of Minimal Impact Design Standards (MIDS) or other municipal stormwater management can help mitigate these impacts.

The priority municipalities within the plan area associated with the short-term goal are listed in the box to the right.

Achieving the short- and long-term measurable goals for stormwater management within the plan area will require that municipalities create stormwater management plans, necessitating cooperation with municipalities. These plans can be developed through the financial assistance of a variety of grants.

Measurable Goals



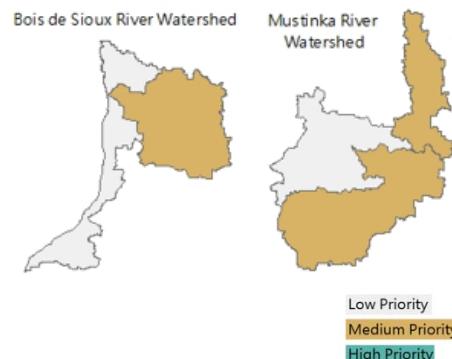
Long-Term Goal: All municipalities within the plan area have a stormwater management plan.



Short-Term Goal: Priority municipalities have a stormwater management plan.

Metric: Number of municipalities with stormwater management plan

Lack of Stormwater Management



Priority Municipalities

- *Wendell*
- *Elbow Lake*
- *Graceville*



Measurable Goal: Vulnerable Groundwater Protection

Priority Issues

- ✓ *Groundwater Quality Protection*

Background

Cities, municipalities, and rural landowners alike all rely on groundwater wells for drinking water. Groundwater quality in the plan area is relatively good. Drinking Water Supply Management Areas (DWSMAs) within the watershed all have a “low” vulnerability rating, and zero wells test above background levels for nitrate contamination (3 mg/L). Groundwater quantity is generally reliable within the plan area.

A primary concern for the protection of groundwater quality is the abandonment of unused wells. Sealing abandoned wells removes the potential for contamination to deep aquifers.

For purposes of this plan, “safe drinking water supplies” are defined as “maintaining the number of wells with nitrate-nitrogen below 3 mg/L and arsenic below 10 ug/L, as measured through the County Well Index (2018).” The number of wells within the plan area meeting these criteria are shown in the Safe Drinking Water Supplies table below. The long-term goal seeks to maintain this number of wells of safe drinking water supplies (or greater, provided additional wells are added). Achieving the short-term requires the sealing of abandoned wells as well as DNR and MDH groundwater level reporting to keep informed about changes in groundwater quantity.

Measurable Goals



Long-Term Goal: Safe drinking water supplies are maintained throughout the plan area.



Short-Term Goal: A total of **24 wells are sealed per year**. The Steering Committee acquires knowledge of groundwater levels through annual input from DNR and MDH to ensure groundwater/aquifer water levels are stable.

Safe Drinking Water Supplies by Planning Region

Bois de Sioux Watershed		Mustinka Watershed		
Lake Traverse & Bois de Sioux River	Rabbit River	Upper Mustinka River	Lower Mustinka and Twelvemile Creek	Fivemile & Twelvemile Creek Headwaters
Nitrate: 83 wells Arsenic: 26 wells	Nitrate: 56 wells Arsenic: 21 wells	Nitrate: 56 wells Arsenic: 8 wells	Nitrate: 89 wells Arsenic: 12 wells	Nitrate: 112 wells Arsenic: 19 wells



Section 4.0

Implementation



Section 4.0 Implementation

This section identifies targeted actions that will be implemented in the next 10 years to make progress toward measurable goals (see **Section 3**). This section summarizes information about each action, where and when it will occur, who will be responsible for implementation, how it will be measured, and how much it will cost. This information is included within **Action Tables**.

This plan contains five different Action Tables that group similar action types together:

- Projects and Practices;
- Capital Improvement Projects;
- Data Gaps;
- Education and Outreach; and
- Regulatory

Additional details about these Action Tables are shown in **Figure 4-1**. Some actions are implemented at a watershed-wide scale because they are applicable to the plan area as a whole. Other actions are targeted to a planning region scale to reflect changing issues and priorities from one planning region to the next.

Making progress toward goals is largely dependent on funding. With more funding, more actions can be implemented. This plan organizes actions into three funding levels (**Table 4-1**). These funding levels prioritize efforts within the Action Tables.

Table 4-1: Implementation funding levels for the Bois de Sioux-Mustinka CWMP

Funding Level	Description
1	Existing Dollars: These actions are the highest priority for implementation. Implementation of these actions assumes plan funding is similar in magnitude to existing funding focused on water issues within the plan area.
2	Additional Watershed-Based Implementation Funding (WBIF): These actions are the second-highest priority for implementation. This funding level assumes an additional \$1,000,000 per biennium (or \$500,000/year) from WBIF dollars.
3	Grant Funding: These actions are the third-highest priority for implementation, and will be pursued with additional, competitive grants.

The Action Tables identify who will complete each action, including plan partners, state agencies, federal agencies, and non-governmental organizations (NGOs). It is important to identify actions that other groups will complete, as it recognizes the work of others and clarifies roles. The Action Tables reflect the anticipated combined local, state, federal, and NGO fiscal and technical commitments. Execution of these types of actions may require considerable coordination and cooperation.



Figure 4-1: Action tables in the Bois de Sioux-Mustinka CWMP

<p>Projects and Practices</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Structural conservation practices (filter strips, farm ponds, grade stabilization structures, etc.)• Management practices (cover crops, tillage methods, etc.)• Land contracting programs <p>Scale of Planning: Planning Region</p> <p>Funded by: Projects and Practices Implementation Program</p> <p>See Page 4-5</p>	<p>Capital Improvement Projects</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Large projects over \$250,000• Ditch Retrofits• Stream Stabilizations• Impoundments <p>Scale of Planning: Planning Region</p> <p>Funded by: Capital Improvements Implementation Program</p> <p>See Pages 4-5</p>	 <p>Types of Actions:</p> <ul style="list-style-type: none">• Monitoring• Studies to close data gaps <p>Scale of Planning: Watershedwide</p> <p>Funded by: Data Collection and Monitoring Implementation Program</p> <p>See Page 4-31</p>	<p>Data Collection</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Community events• Workshops and demonstrations• Educational material distribution <p>Scale of Planning: Watershedwide</p> <p>Funded by: Education and Outreach Implementation Program</p> <p>See Page 4-34</p>	<p>Education and Outreach</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Administration of feedlots, wetlands, septic systems, and land use <p>Scale of Planning: Watershedwide</p> <p>Funded by: Regulatory Implementation Program</p> <p>See Page 4-36</p>	<p>Regulatory</p>  <p>Types of Actions:</p> <ul style="list-style-type: none">• Administration of feedlots, wetlands, septic systems, and land use <p>Scale of Planning: Watershedwide</p> <p>Funded by: Regulatory Implementation Program</p> <p>See Page 4-36</p>
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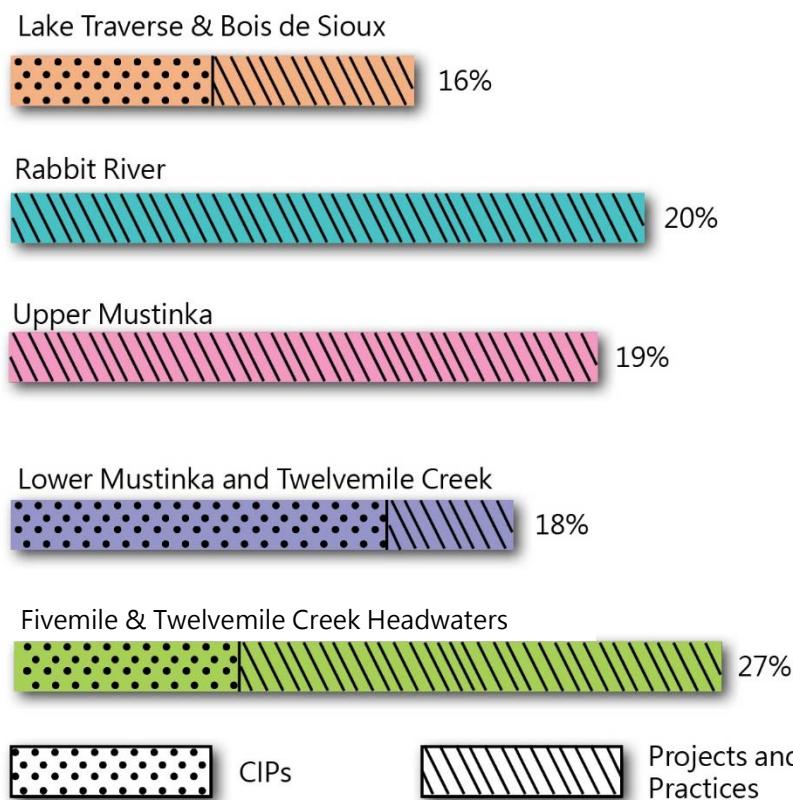
4.1. Prioritizing Planning Region Implementation Efforts

This plan aims to put the most effort and funding towards the areas that need it most. In prioritizing planning region scale actions (Projects and Practices; Capital Improvement Projects), the Steering Committee considered three criteria:

- Planning region land area;
- Planning region areas that contribute the highest loss of sediment to the edge of the field; and
- Planning region areas that contribute the highest loss of phosphorus to the edge of the field.

Below is a breakdown of how implementation dollars are distributed to planning regions by percentage. The group intends to split additional dollars from WBIF among each planning region following the same distribution. From there, some planning regions will also invest in Capital Improvements, while others will focus solely on Projects and Practices (Appendix J).

Figure 4-2: Proposed breakdown of implementation dollars for planning regions



4.2. Targeting Implementation

This plan leverages existing PTMApp data to identify where many new practices are feasible¹, and of these practices, how much each practice will cost², what the estimated water quality benefit is³, and how much progress implementation of a practice can make toward planning region goals⁴. Some practices in the Action Tables do not use PTMApp data for targeting practice location on the ground. Examples of these practices include wind breaks, cattle exclusions, continuous berms, and large-scale stream restorations. Priority resources can be used to inform decisions about where these types of practices should go. These priority resources are identified for each action, both in the Action Tables and the Priority Resources maps. Clean water practices within ditch retrofits are not recognized by PTMApp but are contained in the Action Tables. Information regarding these practices are based on engineering technical standards, calculations, and modeling. Stream restoration benefits are not recognized by PTMApp; location, cost, and water quality benefits are derived from in-depth engineering plan and design processes and are described in the Capital Improvement Projects Table.



PTMApp estimates existing pollutant loads and water quality benefit for a wide range of practices (**Appendix K**). The water quality benefit is expressed as annual load reductions of sediment, total phosphorus (TP), and total nitrogen (TN) that result from implementing the practice. Practices for this plan that are identified by PTMApp align with voluntary local implementation trends and have the highest load reduction benefits as measured at the edge of the field. Funding Level 1 of the Action Tables reflect the current annual project spending within each planning region. Funding Levels 2 show how implementation of the identified PTMApp practices scale up with WBIF. For more information about how PTMApp was used to inform implementation and benefits (sediment, TP, and TN) arising from PTMApp practices, see **Appendix L**.

The numbers, cost, and locations of practices in the Action Tables represent a best-case-scenario for planning. Due to voluntary participation, field verification, and funding availability, prioritized projects may not be feasible, in which case the next highest priority project will be targeted. In addition, projects may emerge that were not identified in the Action Tables and supporting maps. These projects will still be pursued if environmental and economic benefits are comparable to those identified in the Action Table.

Lastly, the Projects and Practices Action Tables include an action for maintaining existing acres of the watershed enrolled in the federal Conservation Reserve Program (CRP) and Conservation Stewardship Program (CSP). The action output is primarily focused on maintaining acres of expiring CRP land, estimated by prorating the acres of CRP expiring between 2020 – 2030 on the area of the county within each planning region. This plan recognizes the importance of these federally funded programs continuing in the future, as without these programs, resource conditions would likely change. However, as plan measurable goals are future-looking, implementation of these actions does not accrue additional progress towards plan goals.

¹ According to NRCS Field Office Technical Guide standards

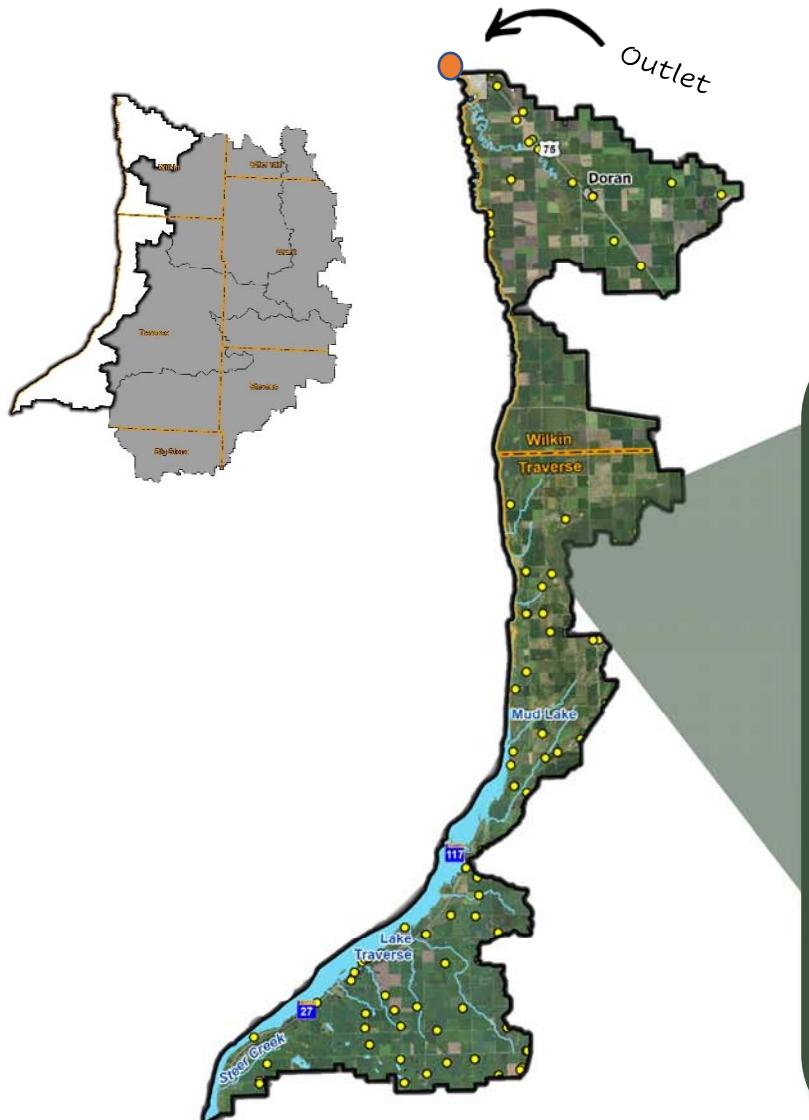
² Cost figures for actions described under Projects and Practices were calculated by doubling the 2016 EQIP rate, in order to include staff administrative, technical, and project development costs.

³ Theory and documentation at ptmapp.bwsr.state.mn.us

⁴ Based on cost, pollution reduction in PTMApp, and goals developed by the Steering Committee



Lake Traverse and Bois de Sioux River Planning Region



At A Glance

16%
of
plan area

89 existing
eLINK
practices

community
Doran

THE LAKE TRAVERSE AND BOIS DE SIOUX RIVER PLANNING REGION is in the Bois de Sioux River Watershed. The southern segment of the watershed flows directly to Lake Traverse. The Bois de Sioux River forms at the outlet of Lake Traverse and flows north through agricultural landscapes into the flat plains of the Red River Valley. In Breckenridge, the Bois de Sioux River joins with the Otter Tail River to form the Red River of the North and defines the outlet of the planning region and watershed (orange dot).

There are already conservation practices and land contracting programs on the landscape to protect and improve natural resources. Known locations of eLINK practices are shown by yellow dots on the map to the left.

Funding will be used to implement practices to:

- control upland erosion and runoff
- reduce nutrient delivery and shoreline erosion impacting Lake Traverse
- provide additional flood storage and protect at-risk communities such as Doran
- reduce human-based and livestock sources of bacterial loading to Bois de Sioux River
- seal abandoned wells
- maintain and expand lands under protection or contract



Lake Traverse & Bois de Sioux River Planning Region

Projects and Practices Action Table

The table below summarizes actions for implementing new structural (e.g., grassed waterways, controlled drainage) and management (e.g., cover crops, tillage management) practices. These actions will be funded by the New Projects Program (Section 5). This table also includes an action for maintaining existing land contracting programs, which is funded by the Land Contracting Program. Outputs and costs show what will be accomplished with existing dollars (Level 1) and what can be done with additional WBIF (Level 2), and what practices will be pursued with competitive dollars (Level 3- shown in grey).

Action*	Targeted Practices and Priority Resources	Responsibility (Lead = Bold)	Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	Timeline					Level 1		Level 2	
															2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Measurable Output	Total 10-Year Cost	Additional 10-Year Measurable Output	Additional Total 10-Year Cost
New Projects Program																							
1. Filtration practices (e.g., filter strips, grass waterways) to control erosion and sediment runoff on-field	Filtration Practices	SWCDs; NRCS; BdSWD; BWSR		●	○									●						518 practices	\$1,436,000	12 practices	\$37,000
2. Storage practices (e.g., WASCOBS and drainage water management) to reduce erosion and increase water storage capacity. When beneficial, use these actions in combination with multipurpose drainage management actions.	Storage Practices	SWCDs; NRCS; BdSWD; BWSR		○	○	●	●	●												1 practice	\$50,000	1 practice	\$58,000
3. Protection practices (e.g., grade stabilization, streambank protection, and side water inlets) to reduce ditch/stream scouring and reduce edge-of-field and in-channel sediment loss. When beneficial, use these actions in combination with multipurpose drainage management actions and streambank restoration capital improvement projects.	Protection Practices	SWCDs; BdSWD; BWSR; DNR		●	●			○	○	○				●						1 practice	\$31,000	1 practice	\$85,000
4. Soil health practices Improve soil structure, increase water retention, and reduce input needs. Examples may include residue management, rotations, cover crops, precision agriculture, MAWQCP, nutrient, and manure management plans.	Critical Soil Loss Areas	SWCDs; NRCS; MDA		○	○	○							●	○						228 acres	\$141,000	115 acres	\$71,000
5. Rental program for tillage equipment and/or hire custom tillage services Improve residue management and soil structure.	Critical Soil Loss Areas	SWCDs; NRCS; BdSWD; Dealer, equipment representative, or consultants		○									●	○						175 acres	\$2,000	-	-



Action*	Targeted Practices and Priority Resources	Responsibility (Lead = Bold)	Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	Timeline					Level 1		Level 2	
															2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Measurable Output	Total 10-Year Cost	Additional 10-Year Measurable Output	Additional Total 10-Year Cost
6. Shoreline BMPs <i>Reduce shoreline erosion and improve recreational and wildlife habitat.</i>	Lake Traverse	SWCDs; COLA; Lake Associations; BWSR; MDNR	○	●			○		○			○								600 sq. ft.	\$24,000	985 sq. ft.	\$39,000
7. Multipurpose drainage management practices to improve ditch system stability.	Planning Region Wide	SWCDs; BWSR, BdSWD	●			●	●	●	●			○								525 sq. ft.	\$21,000	1,970 sq. ft.	\$79,000
8. Seal abandoned wells	Planning Region Wide	SWCDs; MDH, PWS	●																	30 wells	\$15,000	16 wells	\$8,000
9. Fencing to restrict livestock access to identified unstable riparian areas and shorelines.	Bois de Sioux River	Counties; MPCA; NRCS; SWCD	○	○								●	○							2.2 miles	\$17,000	1.2 miles	\$10,000
10. Field windbreaks <i>May include farm shelterbelts and living snow fences</i>	Planning Region Wide	SWCDs; NRCS	○								○		○							6 acres	\$4,000	6 acres	\$4,000
11. Voluntary land restoration <i>Grassland or wetland and private RIM/conservation easements to increase water storage, provide filtration of sediment and pollutants, and increase wildlife habitat.</i>	Minnesota Prairie Plan Areas	SWCDs; DNR	○	○		●	○	○	○	○	○	○	○	○									
12. Urban stormwater practices (e.g., rain gardens, rain barrels, etc.) on urban and commercial parcels.	Doran	Cities; SWCDs	○		○	○	○	○	○	○				○									
															Total Level 1	\$1,741,000	Total Level 2	\$391,000					
Land Contracting Program																							
Maintain existing CRP and CSP land contracts to reduce sediment loss.	Planning Region Wide	SWCDs; NRCS	○	○	○	○	○	○	○	○	○	○	○	○						3,428 acres of expiring CRP	\$15,360,000	-	-
															Total Level 1	\$15,360,000	-	-					

○ Indirect progress; ● Direct progress

* Action description abbreviated for other planning regions.



Lake Traverse & Bois de Sioux River Planning Region

Capital Improvement Projects

As part of Funding Level 1, an estimated \$870,000 will be spent annually throughout the watersheds on the construction, repair, retrofit, or increased function of physical facilities, infrastructure, or environmental features. Several of these Capital Improvement Projects fall within the Lake Traverse & Bois de Sioux River Planning Region, as listed in the Action Table below and map on the following page. Because these projects are more expensive, they generally require external sources of funding to build, in addition to Level 1 and Level 2 funds. Within the Lake Traverse & Bois de Sioux River Planning Region, the Steering Committee has prioritized pursuing the Doran Creek Rehabilitation during implementation. As such, the group intends to use 49% of the planning region's Level 2 additional funding (\$379,000 over 10 years) to support implementation of the project.

Project	Description	Project Owner	Status	Measurable Goals												Est. Sediment Reduction (tons/yr)	Est. Phosphorus Reduction (lbs/yr)	Total Est. Project Cost	
				Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading				
Doran Creek Rehabilitation	Stream Rehabilitation	BdSWD	Modeling Completed		●	●	●								○	2020-2025	890	170	\$7,500,000
Judicial Ditch #11 Main	Retrofit/103E Repair	BdSWD	2020 Construction		●			●	●		●	●			○	2019 – 2021	420	117	\$2,289,000
Wilkin County Ditch Sub #1	Retrofit/103E Repair or Improvement	BdSWD	2022 Construction		●			●	●		●	●			○	2021-2023	450	90	\$1,448,000
Wilkin County Ditch #35	Retrofit/103E Repair or Improvement	BdSWD	Interest Increasing		●			●	●		●	●			○	2022-2024	260	50	\$852,000
Lake Traverse Water Quality Imp. Project Phase No. 1, 2, and 3	Channel Stabilization. Three Phases	BdSWD	2020-2022 Construction		●	●					●				○	2020 – 2023	2,250	Not calculated	\$3,500,000

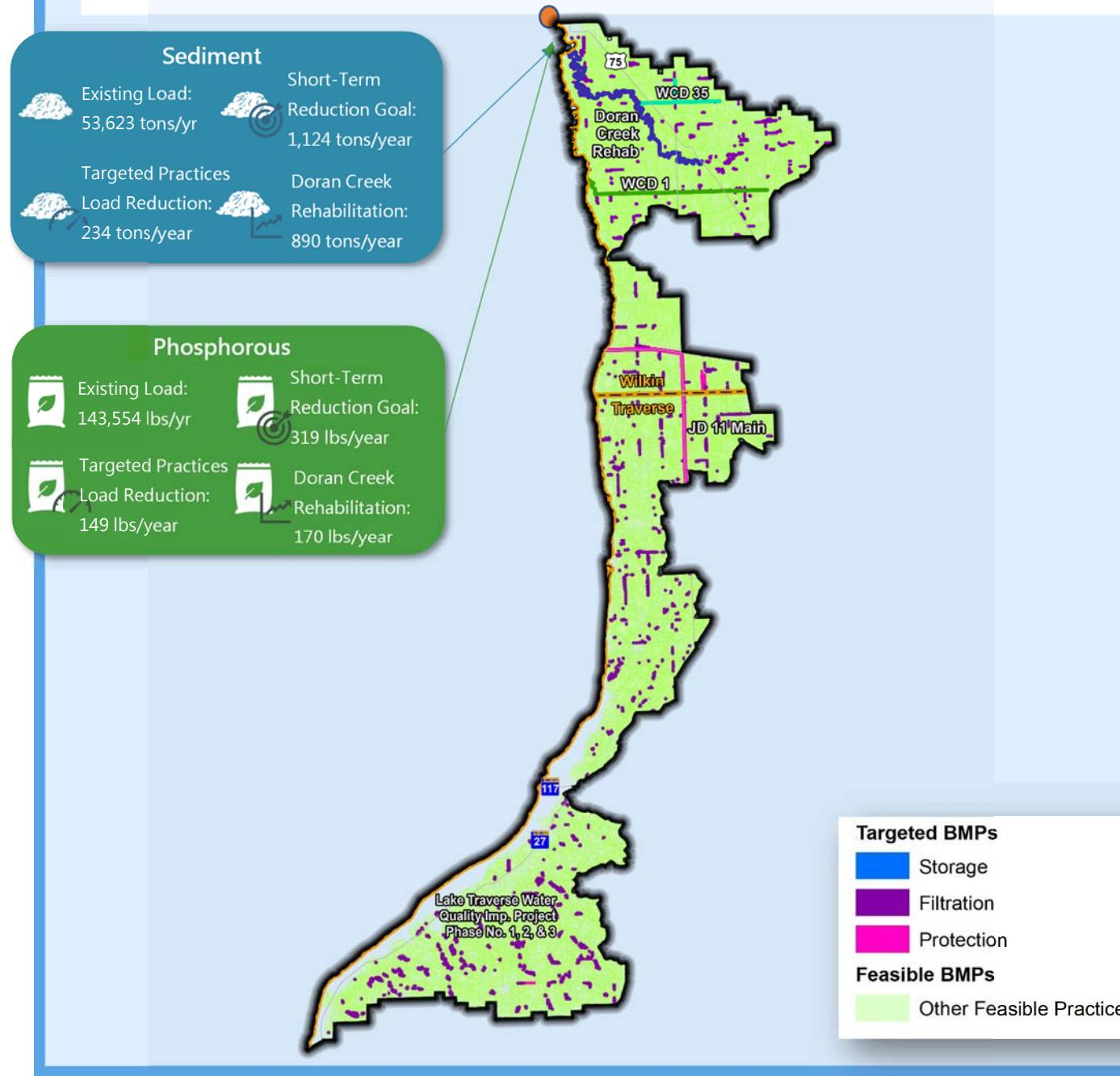
○ Indirect progress; ● Direct progress



Lake Traverse & Bois de Sioux River Planning Region

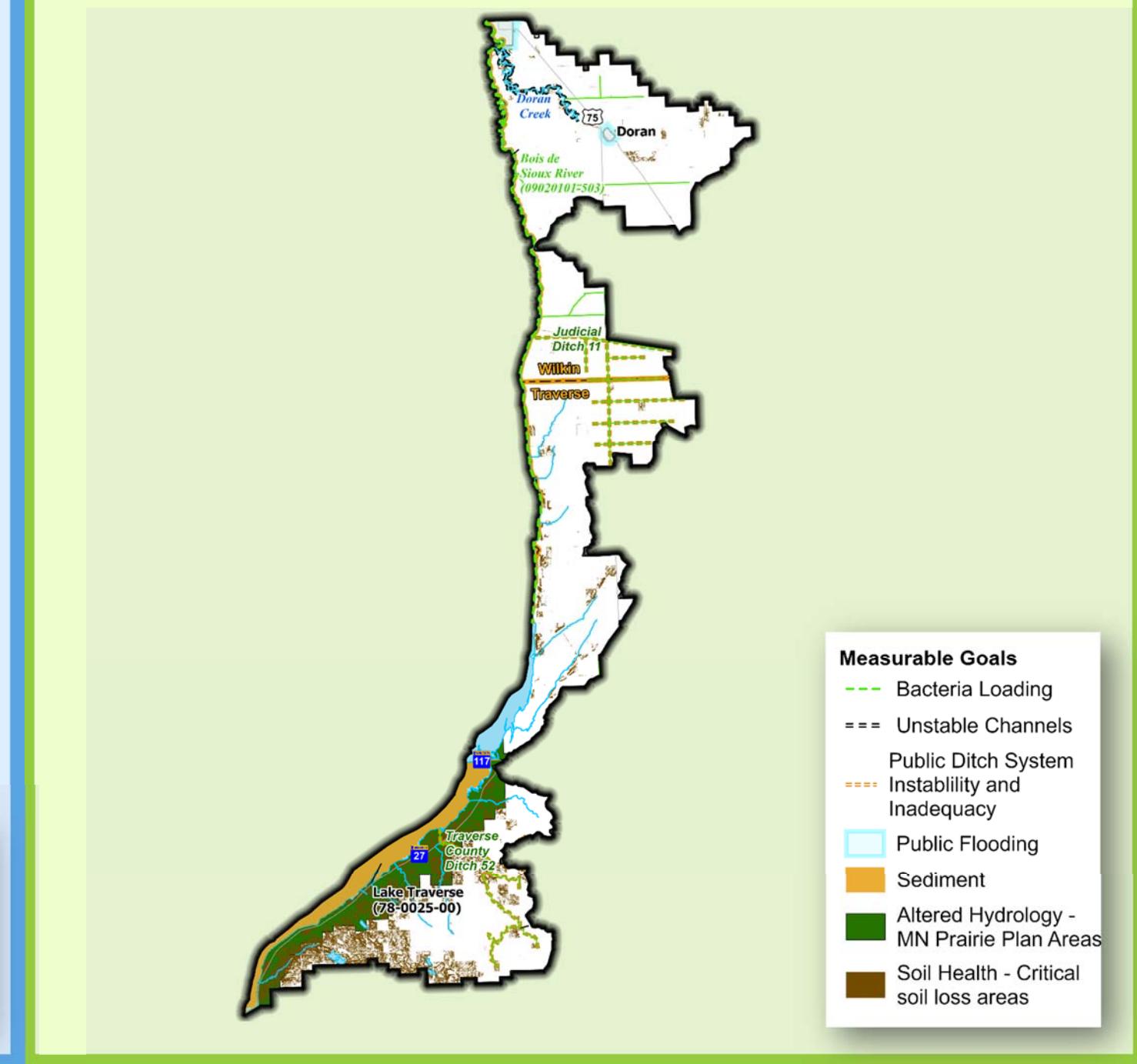
Targeted Practices and Capital Improvement Projects

This map shows PTMApp-identified practices and Capital Improvement Projects included within the Lake Traverse & Bois de Sioux River Planning Region Action Tables. Implementing the PTMApp-identified targeted practices would make considerable progress towards multiple planning region outlet goals, two of which are highlighted below. The benefit of the Doran Creek Rehabilitation Capital Improvement Project is also highlighted.

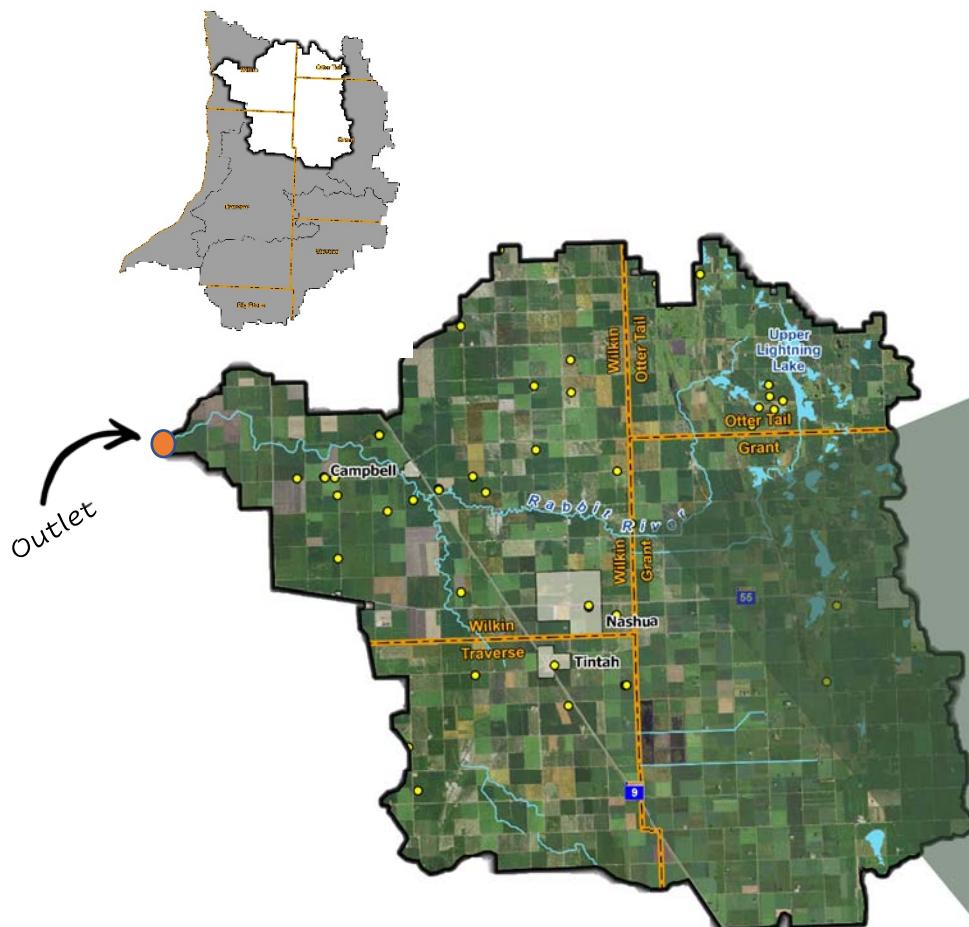


Priority Resources

Resources were prioritized by measurable goal in Section 3. Those resources that fall within the Lake Traverse & Bois de Sioux River Planning Region are summarized below.



Rabbit River Planning Region



At A Glance

23 %
of
plan area

44 existing
eLINK
practices

communities
Campbell
Nashua
Tintah

THE RABBIT RIVER PLANNING REGION contains multiple surface water resources, including Upper Lightning, Ash Lake, and the Rabbit River. The planning region outlets on the Rabbit River to the west where it joins with the Bois de Sioux River (orange dot).

There are already conservation practices and land contracting programs on the landscape to protect and improve natural resources. Known locations of eLINK practices are shown with yellow dots on the map to the left.

Funding will be used to implement practices to:

- control upland erosion and runoff
- reduce nutrient delivery and shoreline erosion impacting Upper Lightning and Ash Lake
- provide additional flood storage and protect at-risk communities
- seal abandoned wells
- maintain and expand lands under protection or contract



Rabbit River Planning Region

Projects and Practices Action Table

The table below summarizes actions for implementing new structural (e.g., grassed waterways, controlled drainage) and management (e.g., cover crops, tillage management) practices. These actions will be funded by the New Projects Program (Section 5). This table also includes an action for maintaining existing land contracting programs, which is funded by the Land Contracting Program. Outputs and costs show what will be accomplished with existing dollars (Level 1) and what can be done with additional WBIF (Level 2), and what practices will be pursued with competitive dollars.

Action	Targeted Practices and Priority Resources	Responsibility (Lead = Bold)	Groundwater Quality	Measurable Goals								Timeline					Level 1		Level 2									
				Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Measurable Output	Total 10-Year Cost	Additional 10-Year Measurable Output	Additional Total 10-Year Cost					
<i>New Projects Program</i>																												
1. Filtration practices	Filtration Practices	SWCDs; NRCS; BdSWD; BWSR		●	○									●						569 practices	\$1,534,000	40 practices	\$98,000					
2. Storage practices	Storage Practices	SWCDs; NRCS; BdSWD; BWSR		○	○	●	●	●												2 practices	\$251,000	2 practices	\$200,000					
3. Protection practices	Protection Practices	SWCDs; BdSWD; BWSR; DNR		●	●		○	○		○				●						-	-	3 practices	\$193,000					
4. Soil health practices	Critical Soil Loss Areas	SWCDs; NRCS; MDA		○	○	○						●	○							356 acres	\$221,000	342 acres	\$212,000					
5. Shoreline BMPs	Upper Lightning, Ash Lake	SWCDs; COLA; Lake Associations; BWSR; MDNR		○	●			○		○			○							550 sq. ft.	\$22,000	-	-					
6. Multipurpose drainage management practices	Planning Region Wide	SWCDs; BWSR, BdSWD		●			●	●		●	●		○							2,750 sq. ft.	\$110,000	6,400 sq. ft.	\$256,000					
7. Urban stormwater practices	Planning Region Wide	Cities; SWCDs		○		○	○	○	○				○							6 raingardens	\$12,000	12 raingardens	\$24,000					
8. Seal abandoned wells	Planning Region Wide	SWCDs; MDH, PWS	●																	22 wells	\$11,000	19 wells	\$10,000					
9. Field windbreaks	Planning Region Wide	SWCDs; NRCS		○								○	○							15 acres	\$9,000	16 acres	\$10,000					
10. Rental program for tillage equipment and/or hire custom tillage services	Critical Soil Loss Areas	SWCDs; NRCS; BdSWD; Dealer, equipment representative, or consultants		○								●	○															
11. Voluntary land restoration	Minnesota Prairie Plan Areas	SWCDs; DNR	○	○		●	○	○		○	○	○	○															
12. Fencing to restrict livestock access	Planning Region Wide	Counties; MPCA; NRCS; SWCD		○	○								●	○														
																							Total Level 1 \$2,170,000 Total Level 2 \$1,003,000					
<i>Land Contracting Program</i>																												
Maintain existing CRP and CSP land contracts to reduce sediment loss.	Planning Region Wide	SWCDs; NRCS	○	○	○	○	○	○	○	○	○	○	○	○						6,513 acres of expiring CRP	\$19,200,000	-	-					
○ Indirect progress ● Direct progress	Total Level 1 \$19,200,000 - -																											



Rabbit River Planning Region

Capital Improvement Projects

As part of Funding Level 1, an estimated \$870,000 will be spent annually throughout the watersheds on the construction, repair, retrofit, or increased function of physical facilities, infrastructure, or environmental features. Several of these Capital Improvement Projects fall within the Rabbit River Planning Region, as listed in the Action Table below and map on the following page. Because these projects are more expensive, they generally require external sources of funding to build, in addition to Level 1 and Level 2 funds.

Project	Description	Project Owner	Status	Measurable Goals												Years Start / End	Est. Sediment Reduction (tons/yr)	Est. Phosphorus Reduction (lbs/yr)	Total Est. Project Cost
				Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading				
Judicial Ditch #6	Retrofit/103E Repair	BdSWD	2021 Construction	•	•			•	•		•	•			○	2020 - 2022	370	70	\$1,193,000
Judicial Ditch #12 Main	Retrofit/103E Repair (Erosion)	BdSWD	Some Interest	•				•	•		•	•			○	2023- 2025	730	140	\$2,385,000
Judicial Ditch #12 Lat 1	New Ditch or Improvement	BdSWD	Some Interest	•				•	•		•	•			○	2023- 2025	160	30	\$511,000
Western 32	Controlled Flood Impoundment	BdSWD	Land acquired	•	○	•	•	•	•						○	2022 – 2030	Not calculated		\$5,000,000

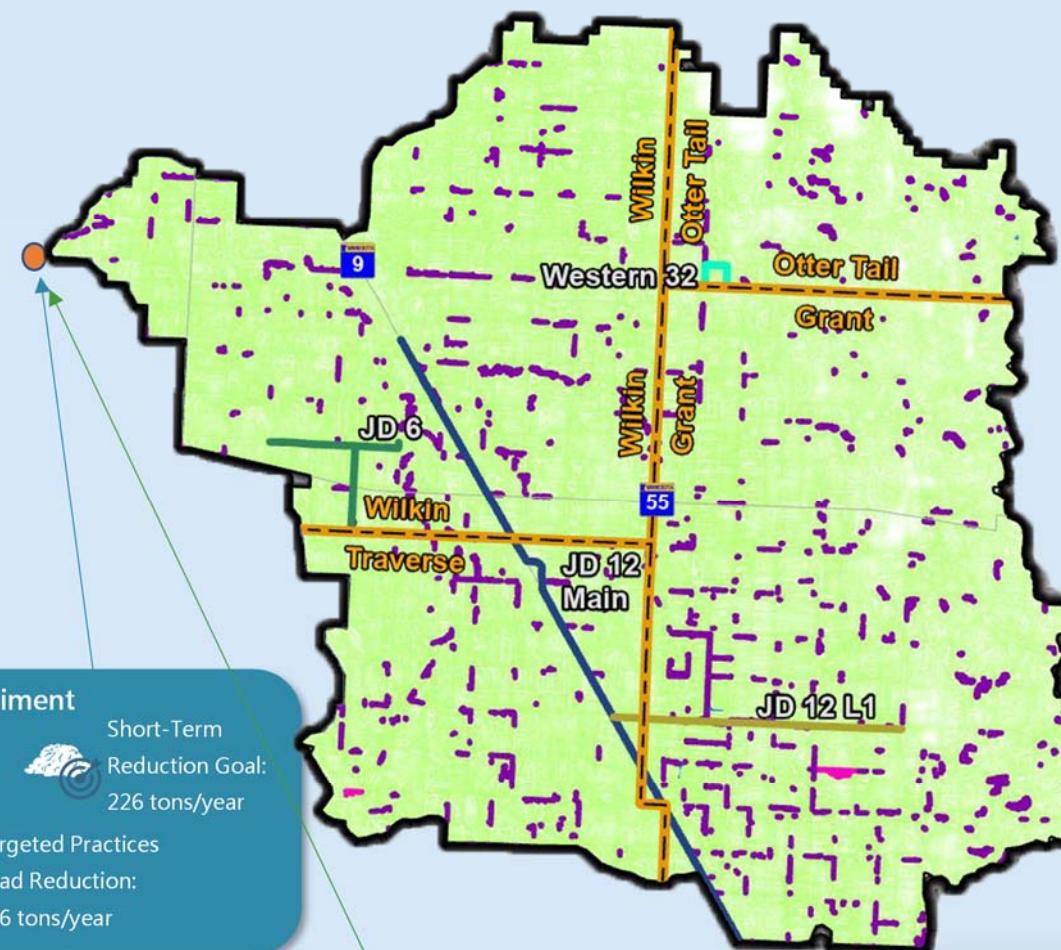
○ Indirect progress; ● Direct progress



Rabbit River Planning Region

Targeted Practices and Capital Improvement Projects

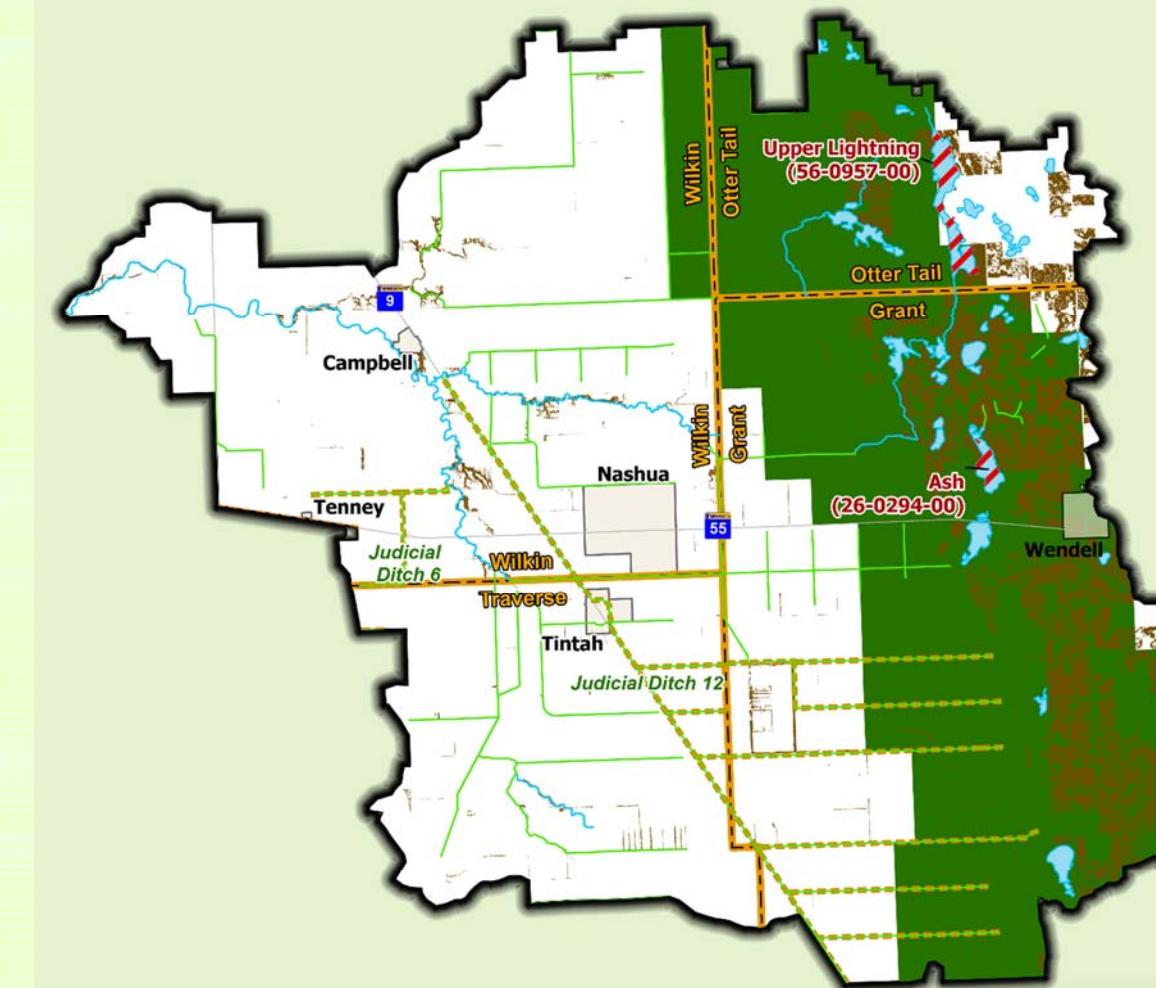
This map shows PTMApp-identified practices and Capital Improvement Projects included within the Rabbit River Planning Region Projects and Practices Action Tables. Implementing the PTMApp-identified targeted practices would make considerable progress towards multiple planning region outlet goals, two of which are highlighted below. Other feasible practices are shown in light, transparent color.



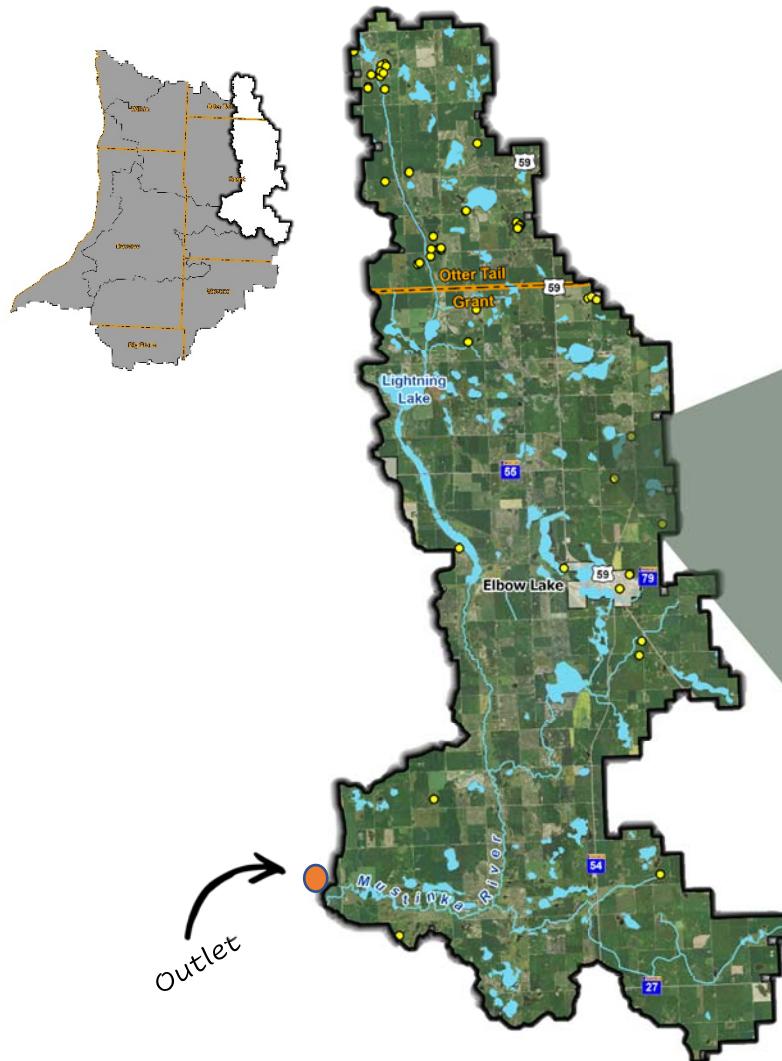
- Targeted BMPs**
- Storage
 - Filtration
 - Protection
- Feasible BMPs**
- Other Feasible Practices

Priority Resources

Individual resources were locally prioritized by measurable goal in Section 3. Those resources that fall within the Rabbit River Planning Region are summarized below.



Upper Mustinka River



At A Glance

20%
of
plan area

50 existing
eLINK
practices

community
**Elbow
Lake**

THE UPPER MUSTINKA RIVER PLANNING REGION is in the Mustinka River Watershed. The planning region outlets on the Mustinka, just downstream from where it makes a turn to flow west (orange dot).

There are existing conservation practices and land contracting programs on the landscape to protect and improve natural resources. Known locations of eLINK practices are shown by yellow dots on the map to the left.

Funding will be used to implement practices to:

- control upland erosion and runoff
- reduce nutrient delivery and shoreline erosion impacting Lightning Lake
- provide additional flood storage and protect at-risk communities
- seal abandoned wells
- maintain and expand lands under protection or contract



INTRO



ISSUE
PRIORITIZATION



MEASURABLE
GOALS



TARGETED
IMPLEMENTATION



IMPLEMENTATION
PROGRAMS

Upper Mustinka River Planning Region

Projects and Practices Action Table

The table below summarizes actions for implementing new structural (e.g., grassed waterways, controlled drainage) and management (e.g., cover crops, tillage management) practices. These actions will be funded by the New Projects Program (Section 5). This table also includes an action for maintaining existing land contracting programs, which is funded by the Land Contracting Program. Outputs and costs show what will be accomplished with existing dollars (Level 1) and what can be done with additional WBIF (Level 2), and what practices will be pursued with competitive dollars.

Action	Targeted Practices and Priority Resources	Responsibility (Lead = Bold)	Groundwater Quality	Measurable Goals										Timeline					Level 1 Existing Dollars		Level 2 Additional WBIF		
				Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Measurable Output	Total 10-Year Cost	Additional 10-Year Measurable Output	Additional Total 10-Year Cost
<i>New Projects Program</i>																							
1. Filtration practices	Filtration Practices	SWCDs; NRCS; BdSWD; BWSR		●	○									●						260 practices	\$1,143,000	24 practices	\$136,000
2. Storage practices	Storage Practices	SWCDs; NRCS; BdSWD; BWSR		○	○	●	●	●												4 practices	\$439,000	5 practices	\$265,000
3. Protection practices	Protection Practices	SWCDs; BdSWD; BWSR; DNR		●	●		○	○	○					●						-	-	3 practices	\$184,000
4. Soil health practices	Critical Soil Loss Areas	SWCDs; NRCS; MDA		○	○	○						●		○						361 acres	\$224,000	304 acres	\$188,000
5. Rental program for tillage equipment and/or hire custom tillage services	Critical Soil Loss Areas	SWCDs; NRCS; BdSWD; Dealer, equipment representative, or consultants		○								●		○						415 acres	\$4,000	-	-
6. Shoreline BMPs	Lightning Lake	SWCDs; COLA; Lake Associations; BWSR; MDNR		○	●			○	○	○				○						3,150 sq. ft.	\$126,000	2,250 sq. ft.	\$90,000
7. Multipurpose drainage management practices	Planning Region Wide	SWCDs; BWSR, BdSWD		●			●	●		●	●			○						2,100 sq. ft.	\$84,000	-	-
8. Urban stormwater practices	Planning Region Wide	Cities; SWCDs		○		○	○	○	○					○						2 raingardens	\$4,000	23 raingardens	\$46,000
9. Seal abandoned wells	Planning Region Wide	SWCDs; MDH, PWS	●																	46 wells	\$23,000	18 wells	\$9,000
10. Fencing to restrict livestock access	Planning Region Wide	Counties; MPCA; NRCS; SWCD		○	○								●	○						1,400 ft.	\$2,000	-	-
11. Field windbreaks	Planning Region Wide	SWCDs; NRCS		○									○	○	○	25 acres	\$15,000	15 acres	\$9,000				
12. Voluntary land restoration	Minnesota Prairie Plan Areas	SWCDs; DNR	○	○		●	○	○		○	○	○		○									
																				Total Level 1	\$2,064,000	Total Level 2	\$927,000
<i>Land Contracting Program</i>																							
Maintain existing CRP and CSP land contracts to reduce sediment loss.	Planning Region Wide	SWCDs; NRCS	○	○	○	○	○	○	○	○	○	○	○	○						4,993 acres of expiring CRP	\$18,240,000	-	-
			Total Level 1	\$18,240,000	-	-																	

○ Indirect progress; ● Direct progress



Upper Mustinka River Planning Region

Capital Improvement Projects

As part of Funding Level 1, an estimated \$870,000 will be spent annually throughout the watersheds on the construction, repair, retrofit, or increased function of physical facilities, infrastructure, or environmental features. Several of these Capital Improvement Projects fall within the Upper Mustinka River Planning Region and are listed in the Action Table below and map on the following page. Because these projects are more expensive, they generally require external sources of funding to build, in addition to Level 1 and Level 2 funds.

Project	Description	Project Owner	Status	Measurable Goals												Years Start / End	Est. Sediment Reduction (tons/yr)	Est. Phosphorus Reduction (lbs/yr)	Total Est. Project Cost	
				Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading					
Mustinka Corridor	Road Raises and Culvert Sizing	MNDOT & Grant County	In Progress					●	●							2019 – 2022	Not calculated		\$400,000	
Samantha & Elbow Lake Project	Outlet Improvements/Control/Storage	BdSWD	2020-2021 Construction				●	●	●							2006 – 2021	Not calculated		\$500,000	

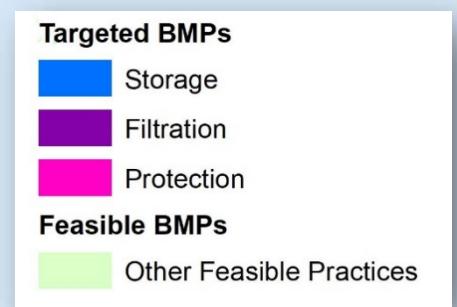
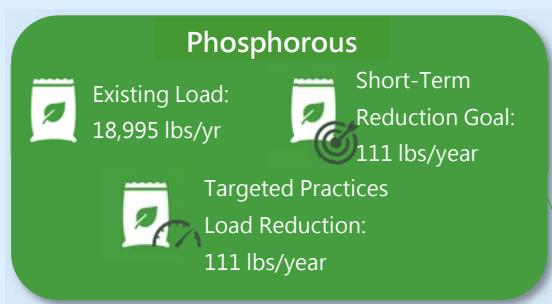
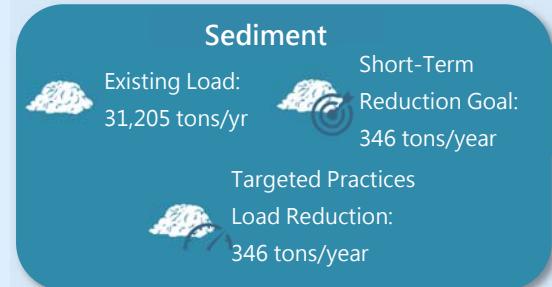
○ Indirect progress; ● Direct progress



Upper Mustinka River Planning Region

Targeted Practices and Capital Improvement Projects

This map shows PTMApp-identified practices and Capital Improvement Projects included within the Upper Mustinka River Planning Region Action Tables. Implementing the PTMApp-identified practices would make considerable progress towards multiple planning region outlet goals, two of which are highlighted below.

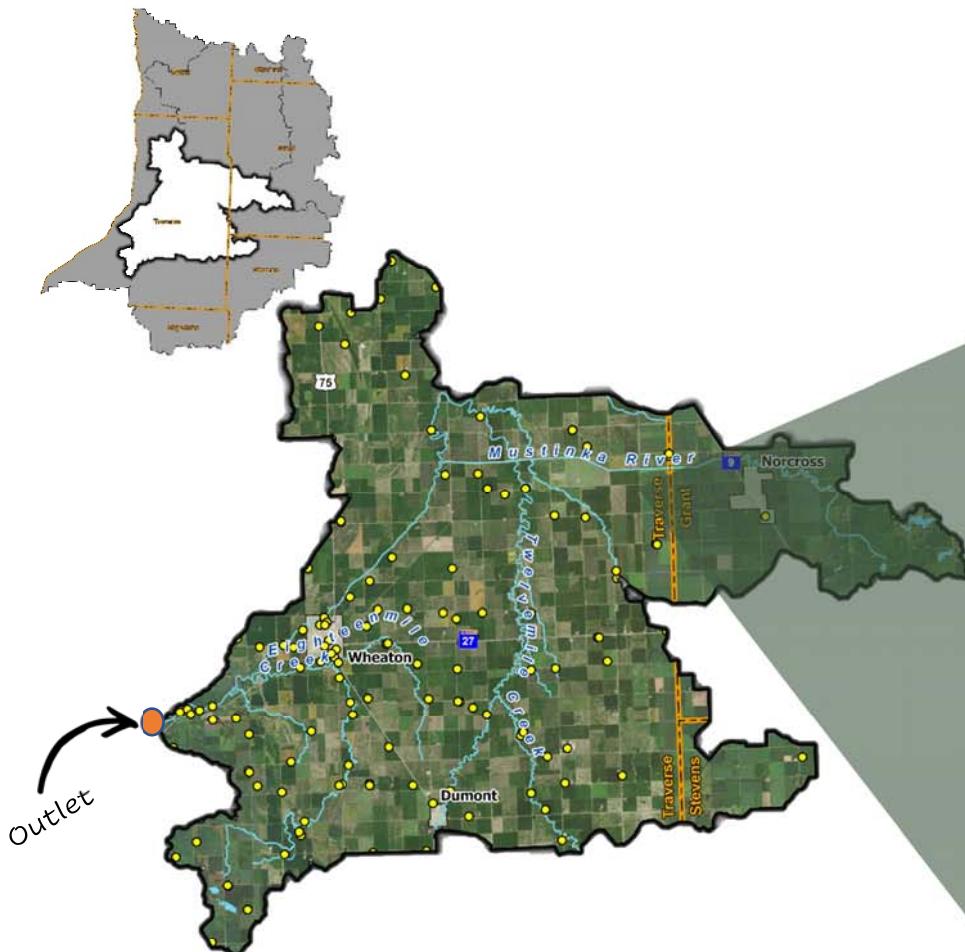


Priority Resources

Resources were prioritized by measurable goal in Section 3. Those resources that fall within the Upper Mustinka River Planning Region are summarized below.



Lower Mustinka and Twelvemile Creek



At A Glance

12%
of
plan area

129 existing
eLINK
practices

communities
Wheaton
Dumont
Norcross

THE LOWER MUSTINKA AND TWELVEMILE CREEK PLANNING REGION is in the Mustinka River Watershed. The planning region contains multiple surface water resources, including the Mustinka River, Twelvemile Creek, and Eighteenmile Creek. The planning region outlet is located where the Mustinka River flows into Lake Traverse (orange dot).

There are existing conservation practices and land contracting programs on the landscape to protect and improve natural resources. Known locations of eLINK practices are shown by yellow dots on the map to the left.

Funding will be used to implement practices to:

- control upland erosion and runoff
- provide additional flood storage and protect at-risk communities, including Norcross
- seal abandoned wells
- maintain and expand lands under protection or contract



Lower Mustinka and Twelvemile Creek Planning Region

Projects and Practices Action Table

The table below summarizes actions for implementing new structural (e.g., grassed waterways, controlled drainage) and management (e.g., cover crops, tillage management) practices. These actions will be funded by the New Projects Program (Section 5). This table also includes an action for maintaining existing land contracting programs, which is funded by the Land Contracting Program. Outputs and costs show what will be accomplished with existing dollars (Level 1) and what can be done with additional WBIF (Level 2), and what practices will be pursued with competitive dollars.

Action	Targeted Practices and Priority Resources	Responsibility (Lead = Bold)	Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	Timeline					Level 1		Level 2			
															2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	Existing Dollars	10-Year Measurable Output	Total 10-Year Cost	Additional 10-Year Measurable Output	Additional Total 10-Year Cost	
<i>New Projects Program</i>																									
1. Filtration practices	Filtration Practices	SWCDs; NRCS; BdSWD; BWSR		●	○										●						675 practices	\$1,579,000	17 practices	\$35,000	
2. Storage practices	Storage Practices	SWCDs; NRCS; BdSWD; BWSR		○	○	●	●	●													2 practices	\$197,000	1 practice	\$69,000	
3. Protection practices	Protection Practices	SWCDs; BdSWD; BWSR; DNR		●	●		○	○		○					●						1 practice	\$32,000	1 practice	\$92,000	
4. Soil health practices	Critical Soil Loss Areas	SWCDs; NRCS; MDA		○	○	○									●						124 acres	\$77,000	114 acres	\$71,000	
5. Shoreline BMPs	Planning Region Wide	SWCDs; COLA; Lake Associations; BWSR; MDNR		○	●			○		○					○						750 sq. ft.	\$30,000	-	-	
6. Multipurpose drainage management practices	Planning Region Wide	SWCDs; BWSR, BdSWD		●			●	●		●	●				○						750 sq. ft.	\$30,000	1,750 sq. ft.	\$70,000	
7. Urban stormwater practices	Planning Region Wide	Cities; SWCDs		○		○	○	○	○						○						1 raingarden	\$2,000	-	-	
8. Seal abandoned wells	Planning Region Wide	SWCDs; MDH, PWS	●																		24 wells	\$12,000	14 wells	\$7,000	
9. Field windbreaks	Planning Region Wide	SWCDs; NRCS		○											○	○						20 acres	\$12,000	6 acres	\$4,000
10. Rental program for tillage equipment and/or hire custom tillage services	Critical Soil Loss Areas	SWCDs; NRCS; BdSWD; Dealers, equipment, consultants		○											●	○									
11. Fencing to restrict livestock access	Planning Region Wide	Counties; MPCA; NRCS; SWCD		○	○										●	○									
12. Voluntary land restoration	Minnesota Prairie Plan Areas	SWCDs; DNR	○	○		●	○	○		○	○				○										
																		Total Level 1	\$1,971,000	Total Level 2	\$348,000				
<i>Land Contracting Program</i>																									
Maintain existing CRP and CSP land contracts to reduce sediment loss.	Planning Region Wide	SWCDs; NRCS	○	○	○	○	○	○	○	○	○	○	○	○	○						5,473 acres of expiring CRP	\$17,280,000	-	-	
																		Total Level 1	\$17,280,000	-	-				

○ Indirect progress; ● Direct progress



Lower Mustinka and Twelvemile Creek Planning Region

Capital Improvement Projects

As part of Funding Level 1, an estimated \$870,000 will be spent annually throughout the watersheds on the construction, repair, retrofit, or increased function of physical facilities, infrastructure, or environmental features. Several of these Capital Improvement Projects fall within the Lower Mustinka and Twelvemile Creek Planning Region and are listed in the Action Table below and map on the following page. Because these projects are more expensive, they generally require external sources of funding to build, in addition to Level 1 and Level 2 funds. Within the Lower Mustinka and Twelvemile Creek Planning Region, the Steering Committee has prioritized pursuing the Twelvemile Creek Rehabilitation during implementation. As such, the group intends to use 60% of the planning region's Level 2 funding (\$521,500 over 10 years) to support implementation of the project.

Project	Description	Project Owner	Status	Measurable Goals												Years Start / End	Est. Sediment Reduction (tons/yr)	Est. Phosphorus Reduction (lbs/yr)	Total Est. Project Cost
				Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Soil System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading				
Twelvemile Creek Rehabilitation	Stream Rehabilitation	BdSWD	Interest Increasing		●	●	●								○	2025-2030	630	120	\$5,292,000
Traverse County Ditch #37 Main	Retrofit/103E Repair or Improvement	BdSWD	Interest Increasing		●			●	●		●	●			○	2020 – 2024	290	60	\$937,000
Traverse County Ditch #8	Retrofit/103E Repair or Improvement	BdSWD	Interest Increasing		●			●	●		●	●			○	2020-2023	260	50	\$852,000
Redpath Project	Controlled Flood Impoundment	BdSWD	Shovel Ready		●	●	●	●	●		●	●			○	2007 – 2025	Not calculated		\$24,000,000
E. Branch Twelvemile Creek/Eldorado 7	Controlled Flood Impoundment	BdSWD	Interest Increasing		●	○	●	●	●						○	2005 – 2030	Not calculated		\$7,000,000

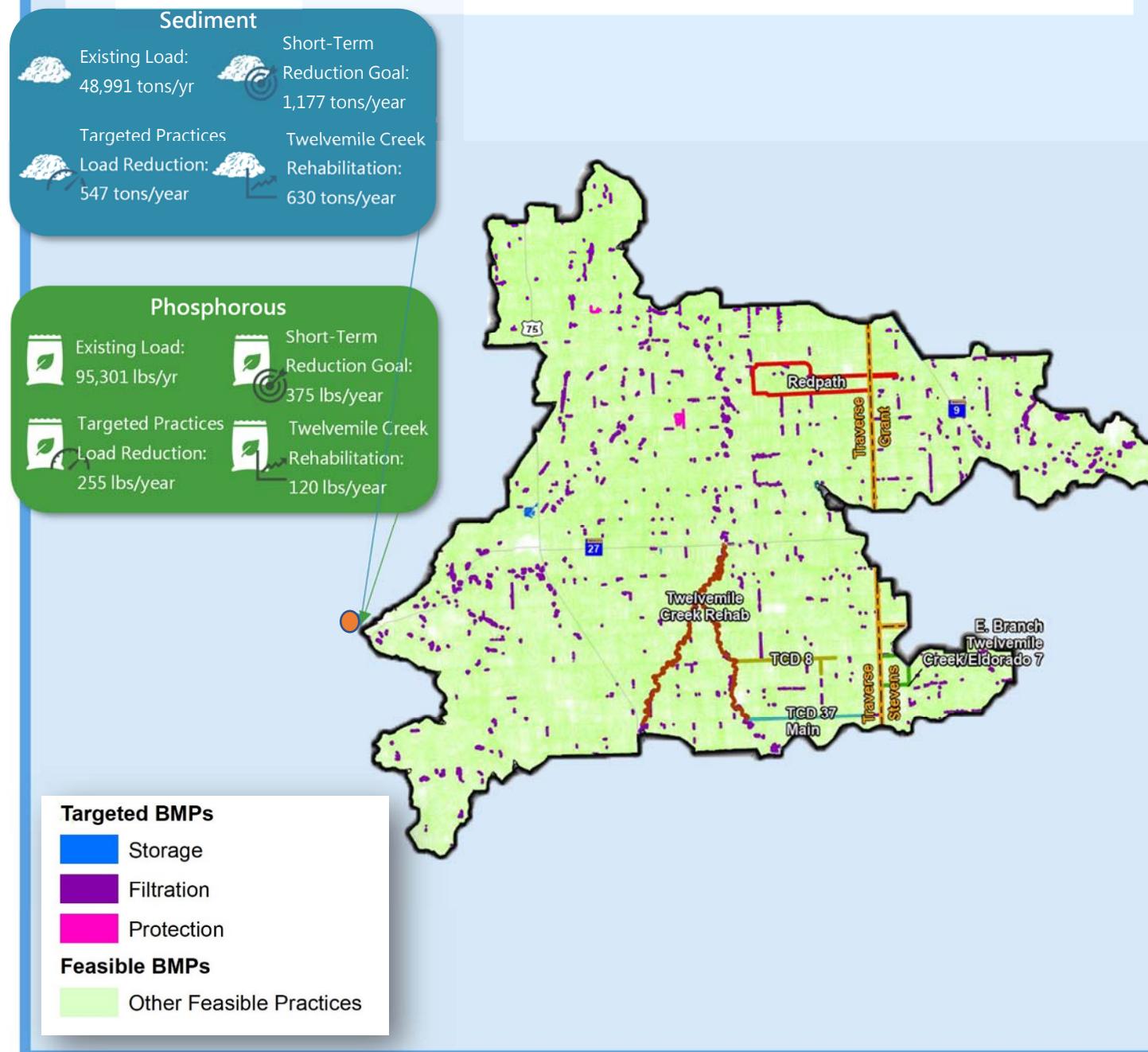
○ Indirect progress; ● Direct progress



Lower Mustinka and Twelvemile Creek Planning Region

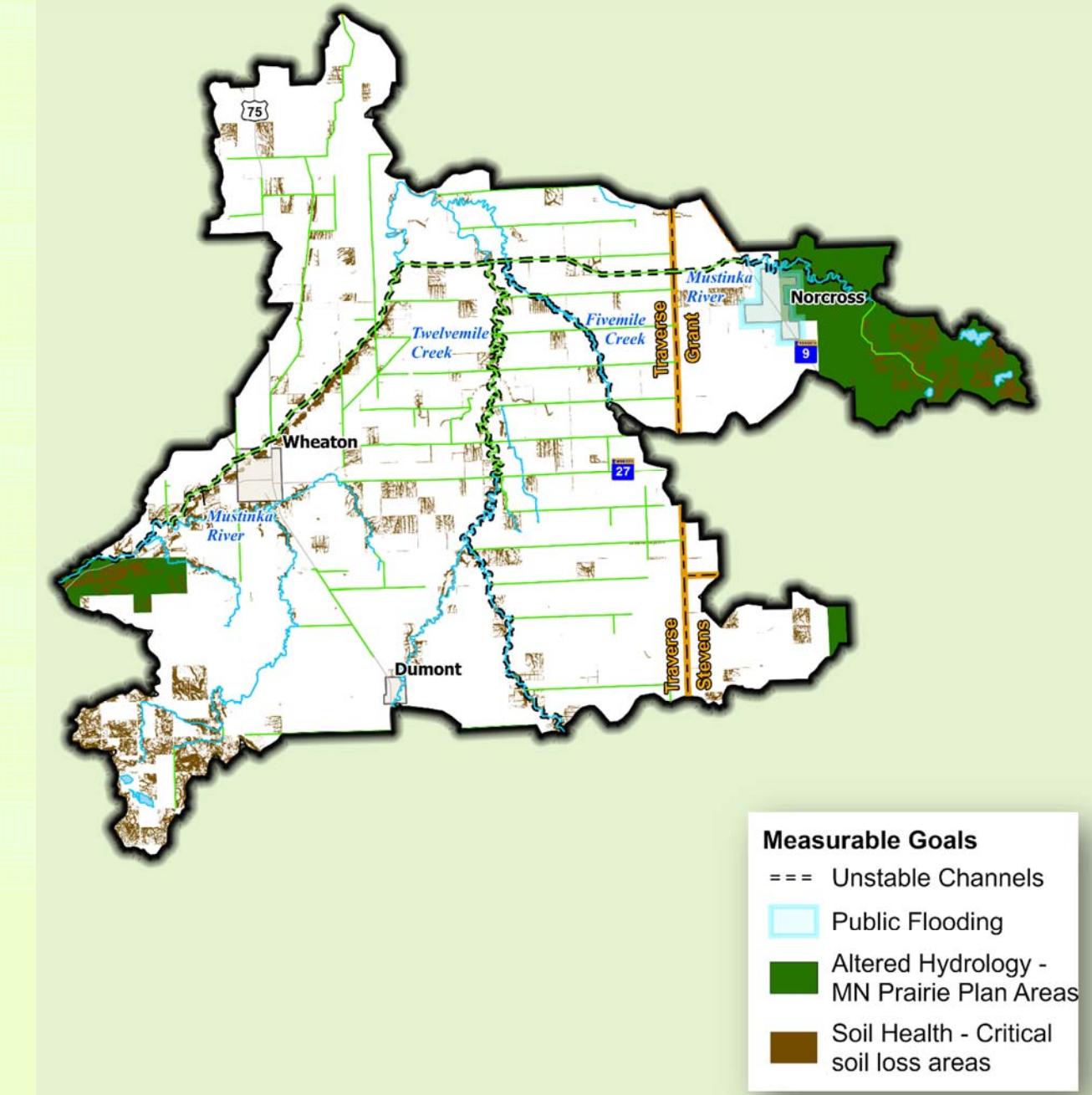
Targeted Practices and Capital Improvement Projects

This map shows PTMApp-identified practices and Capital Improvement Projects included within the Lower Mustinka and Twelvemile Creek Planning Region Action Tables. Implementing the PTMApp-identified practices would make considerable progress towards multiple planning region outlet goals, two of which are highlighted below. The benefit of the Twelvemile Creek Rehabilitation Capital Improvement Project is also shown.

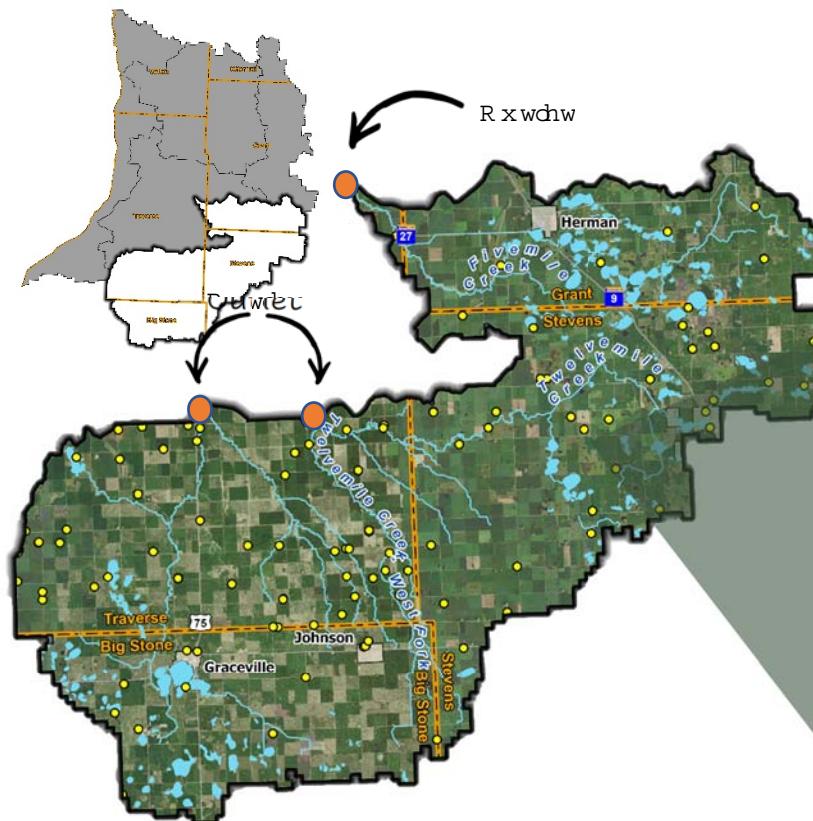


Priority Resources

Resources were prioritized by measurable goal in Section 3. Those resources that fall within the Lower Mustinka and Twelvemile Creek Planning Region are summarized below.



Fivemile & Twelvemile Creek Headwaters



At A Glance

29%
plan area

114 existing
eLINK
practices

communities
Herman,
Donnelly,
Graceville,
Johnson

THE FIVEMILE & TWELVEMILE CREEK HEADWATERS PLANNING REGION is in the Mustinka River Watershed. The lake-rich planning region contains multiple surface water resources, including Fivemile and Twelvemile Creek. The planning region outlets in three primary locations shown by orange dots.

There are already conservation practices and land contracting programs on the landscape to protect and improve natural resources. Known locations of eLINK practices are shown by yellow dots on the map to the left.

Funding will be used to implement practices to:

- control upland erosion and runoff
- reduce nutrient delivery and shoreline erosion impacting Toqua and Lannon Lake
- provide additional flood storage and protect at-risk communities, including Graceville
- seal abandoned wells
- maintain and expand lands under protection or contract



Fivemile & Twelvemile Creek Headwaters Planning Region

Projects and Practices Action Table

The table below summarizes actions for implementing new structural (e.g., grassed waterways, controlled drainage) and management (e.g., cover crops, tillage management) practices. These actions will be funded by the New Projects Program (Section 5). This table also includes an action for maintaining existing land contracting programs, which is funded by the Land Contracting Program. Outputs and costs show what will be accomplished with existing dollars (Level 1) and what can be done with additional WBIF (Level 2), and what practices will be pursued with competitive dollars.

Action	Targeted Practices and Priority Resources	Responsibility (Lead = Bold)	Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	Timeline					Level 1 Existing Dollars		Level 2 Additional WBIF	
															2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Measurable Output	Total 10-Year Cost	Additional 10-Year Measurable Output	Additional Total 10-Year Cost
<i>New Projects Program</i>																							
1. Filtration practices	Filtration Practices	SWCDs; NRCS; BdSWD; BWSR		●	○									●						780 practices	\$2,536,000	56 practices	\$183,000
2. Storage practices	Storage Practices	SWCDs; NRCS; BdSWD; BWSR		○	○	●	●	●												2 practices	\$237,000	2 practices	\$192,000
3. Protection practices	Protection Practices	SWCDs; BdSWD; BWSR; DNR		●	●		○	○		○				●						0 practices	\$0	3 practices	\$191,000
4. Soil health practices	Critical Soil Loss Areas	SWCDs; NRCS; MDA		○	○	○							●	○						94 acres	\$58,000	283 acres	\$175,000
5. Shoreline BMPs	Toqua, Lannon	SWCDs; COLA; Lake Associations; BWSR; MDNR		○	●			○		○				○						2,000 sq. ft.	\$80,000	2,250 sq. ft.	\$90,000
6. Multipurpose drainage management practices	Planning Region Wide	SWCDs; BWSR, BdSWD		●			●	●		●	●			○						225 sq. ft.	\$9,000	-	-
7. Urban stormwater practices	Planning Region Wide	Cities; SWCDs		○		○	○	○	○					○						2 raingardens	\$4,000	23 raingardens	\$46,000
8. Seal abandoned wells	Planning Region Wide	SWCDs; MDH, PWS	●																	30 wells	\$15,000	18 wells	\$9,000
9. Field windbreaks	Planning Region Wide	SWCDs; NRCS		○									○	○						5 acres	\$3,000	15 acres	\$9,000
10. Rental program for tillage equipment and/or hire custom tillage services	Critical Soil Loss Areas	SWCDs; NRCS; BdSWD; Dealer, equipment representative, or consultants		○									●	○									
11. Voluntary land restoration	Minnesota Prairie Plan Areas	SWCDs; DNR	○	○		●	○	○		○	○		○	○	○								
12. Fencing to restrict livestock access	Planning Region Wide	Counties; MPCA; NRCS; SWCD		○	○								●	○						Total Level 1	\$2,942,000	Total Level 2	\$895,000
<i>Land Contracting Program</i>																							
Maintain existing CRP and CSP land contracts to reduce sediment loss.	Planning Region Wide	SWCDs; NRCS	○	○	○	○	○	○		○	○		○	○	○					7,058 acres of expiring CRP	\$25,921,000	-	-
○ Indirect progress; ● Direct progress																							
																				Total Level 1	\$25,921,000	-	-



Fivemile & Twelvemile Creek Headwaters Planning Region

Capital Improvement Projects

As part of Funding Level 1, an estimated \$870,000 will be spent annually throughout the watersheds on the construction, repair, retrofit, or increased function of physical facilities, infrastructure, or environmental features. Several of these Capital Improvement Projects fall within the Fivemile & Twelvemile Creek Headwaters Planning Region and are listed in the Action Table below and map on the following page. Because these projects are more expensive, they generally require external sources of funding to build, in addition to Level 1 and Level 2 funds. Within the Fivemile & Twelvemile Creek Headwaters Planning Region, the Steering Committee has prioritized pursuing the Fivemile Creek Rehabilitation during implementation. As such, the group intends to use 33% of the planning region's Level 2 funding (\$436,000 over 10 years) to support implementation of the project.

Project	Description	Project Owner	Status	Measurable Goals												Years Start /End	Est. Sediment Reduction (tons/yr)	Est. Phosphorus Reduction (lbs/yr)	Total Est. Project Cost
				Groundwater Quality	Sediment	Unstable Channels	Altered Hydrology	Public Flooding	Private Flooding	Stormwater Management	Storm System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading				
Fivemile Creek Rehabilitation	Stream Rehabilitation	BdSWD	Interest Increasing		●	●	●								○	2020-2025	520	100	\$4,410,000
Big Lake Project	Outlet Improvements/Control/Storage	BdSWD	Permitting Proceeding				●	●	●							1999 – 2022	Not calculated		\$1,000,000
Moonshine Lakebed & 24/13	Controlled Flood Impoundment	BdSWD	Some land acquired		●	○	●	●	●						○	1999 – 2025	Not calculated		\$1,500,000
Miscellaneous 103E Ditches (Watersheds-wide)	Retrofits/103E Repairs or Improvements	BdSWD	Awareness		●			●	●		●	●			○	2024 – 2030	2,080	390	\$6,813,000

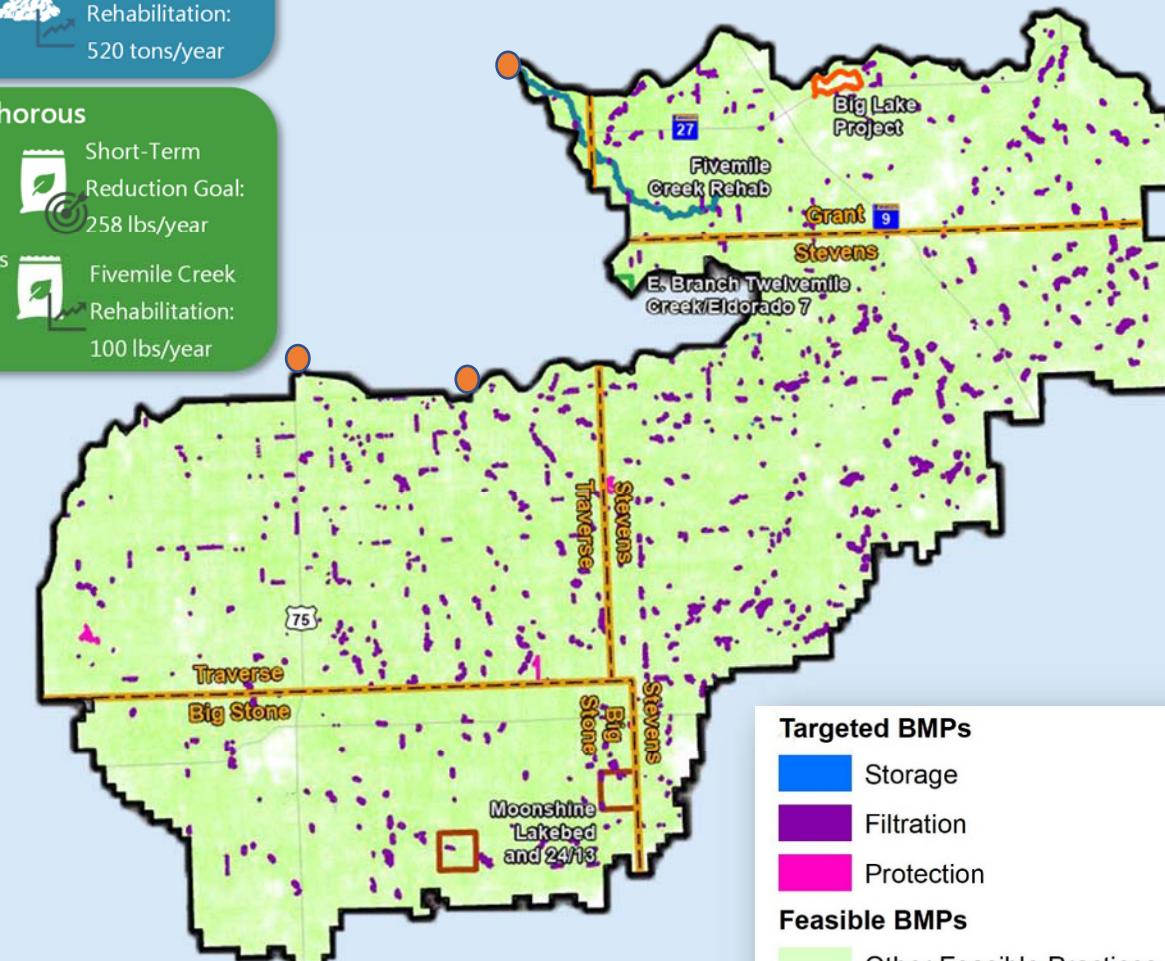
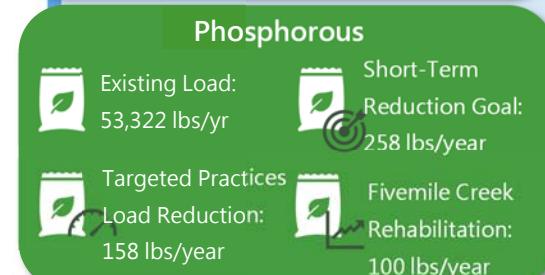
○ Indirect progress; ● Direct progress



Fivemile & Twelvemile Creek Headwaters Planning Region

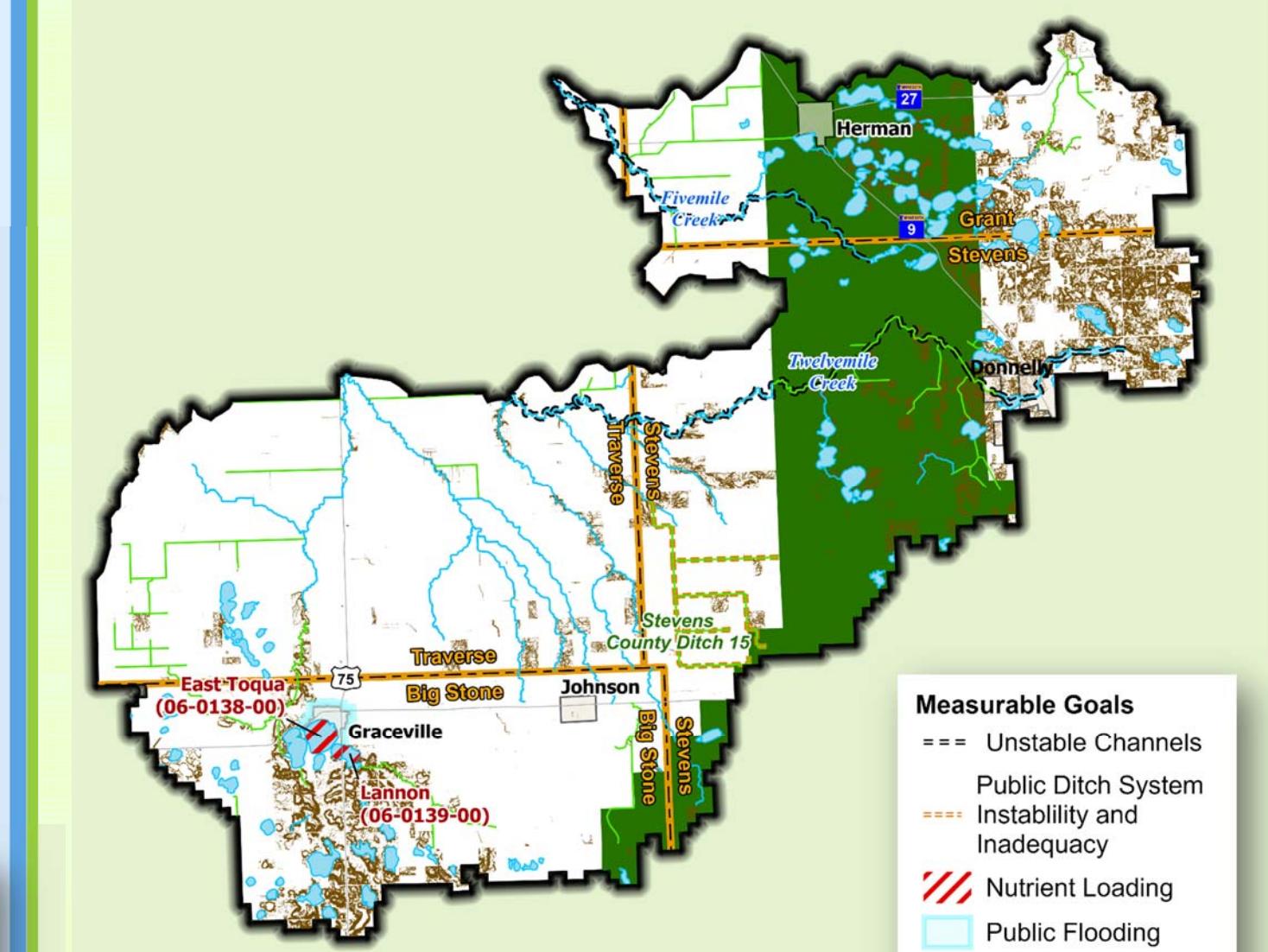
Targeted Practices and Capital Improvement Projects

This map shows PTMApp-identified practices and Capital Improvement Projects included within the Fivemile & Twelvemile Creek Headwaters Planning Region Action Tables. Implementing the PTMApp-identified targeted practices would make considerable progress towards multiple planning region outlet goals, two of which are highlighted below. The benefit of the Fivemile Creek Rehabilitation Capital Improvement Project is also shown. It should be noted- this planning region contains three outlets, shown by orange dots. Existing loads and load reduction benefits have been aggregated for all three to present one unified metric.



Priority Resources

Resources were prioritized by measurable goal in Section 3. Those resources that fall within the Fivemile & Twelvemile Creek Headwaters River Planning Region are summarized below.





4.3. Data Collection: Watershed-Wide Action Table

The Data Collection Action Table summarizes the following types of actions:

- Monitoring efforts; and
- Inventories, studies, and analyses to close identified data gaps.

Actions will be implemented watershed-wide to promote consistency and sharing of services. They will be funded by the Data Collection and Monitoring Implementation Program, described in **Section 5**.

Funding Level	Action	Priority Planning Regions	Priority Resources	10-Year Measurable Output	Lead	Partner	Groundwater Quality	Sediment	Unstable Channels	Public Flooding	Private Flooding	Altered Hydrology	Stormwater Mgmt	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Cost
1	1. Continue to inventory and assess river and stream channel banks within the plan area to further determine targeted channels for stabilization practices.	All	All	1 Watershed Inventory	BdSWD	SWCDs, Counties; DNR	○	●		○		○				○								\$35,000
1	2. Continue to inventory and classify unstable and inadequate portions of the public ditch system and prioritize ditch maintenance.	All	All	1 Watershed Inventory	BdSWD	SWCDs, Counties							●	●										\$40,000
1	3. Identify and prioritize communities, farmsteads, and private infrastructure within the plan area to determine existing levels of flood risk.	All	Herman, Dumont, Campbell	1 Watershed Inventory	BdSWD	SWCDs, Counties			●	●														\$25,000
1	4. Hold annual meeting with road authorities to define which roads are high priority based on risk of overtopping.	All	All	1 Annual Meeting	BdSWD, Counties	Road Authorities			●	●														\$5,000
1	5. Coordinate with FEMA to obtain and update floodplain maps for entirety of watersheds.	All	All	FEMA Flood Maps	FEMA	Counties			●	●														In-kind time
1	6. Establish a multipurpose drainage management plan to identify in-line opportunities and other large capital projects, their impact to drainage capacity, and their estimated hydrologic and environmental effects.	All	All	1 plan	BdSWD	SWCD	○		○	○	●		○	○		○								\$100,000
1	7. Develop a LGU coordination system for emergency situations such as flooding (during an event and debris cleanup coordination) and WWTF release (partial treatment, and bypasses) to public works managers within the watershed.	All	All	1 Management & Coordination System	Counties, EM Managers	Cities			○	○						○	○							\$10,000
1	8. Annually coordinate with MPCA staff in monitoring throughout the watershed and provide feedback regarding the implementation of WRAPS and 1W1P plans.	All	All	Annual coordination	MPCA	MDNR; SWCD; BdSWD	○									○	○							In-kind time
1	9. Support local water quality monitoring efforts through outreach events and recording all data in STORET.	All	All	Annual outreach event and STORET data	MPCA	DNR; BdSWD; COLA; SWCD	○	○								○	○							In-kind time



Funding Level	Action	Priority Planning Regions	Priority Resources	10-Year Measurable Output	Lead	Partner	Groundwater Quality	Sediment	Unstable Channels	Public Flooding	Private Flooding	Altered Hydrology	Stormwater Mgmt	Ditch System Instability	Soil Health	Bacteria	Nutrient Loading	2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Cost
1	10. Maintain up-to-date culvert inventory. Continue to update culvert inventory.	All	All	1 inventory	BdSWD	DNR; Counties; DOT			O		O												\$40,000
1	11. Maintain up-to-date drainage permits and projects records.	All	All	1 inventory	BdSWD; Counties	SWCD						O	O										\$50,000
2	12. Develop a stormwater management plan for municipalities in each priority planning region (Wendell, Elbow Lake, Graceville).	Rabbit, Upper Mustinka, Fivemile & Twelvemile Creek Headwaters	Wendell, Elbow Lake, Graceville	1 plan / municipality	Cities	Counties; Cities	O					●											In-kind time
2	13. Inventory, develop a database for, and maintain an ArcView GIS layer of conservation habitat (e.g., CRP, land retirement, easements)	All	All	Up-to-date Conservation Habitat Layer	SWCDs	Counties					O												\$50,000
2	14. Inventory, develop a database for, and maintain an ArcView GIS layer of conservation practices	All	All	Up-to-date Conservation Practices Layer	SWCDs	MDA	O				O	O	O	O	O	O							\$50,000
3	15. Develop a well inventory (inclusive of municipal, irrigation, and rural) for each watershed. Fill gaps in the groundwater level observation well network by installing additional, strategically located long-term groundwater observation wells.	All	All	Watershed / County Inventory; New obs wells	MDH, DNR	SWCD; DNR	O								O	O							In-kind time
3	16. Develop and implement a microbial source testing protocol for the watershed and make data available to public works managers and the public.	All	All	1 protocol	MPCA	MPCA							●										In-kind time
3	17. Request completion of a geologic atlas and publish applicable results in local newspapers.	All	All	1 Groundwater Atlas; 1 publication	Counties	SWCDs; MDH; MGS; DNR (if quantity)	O																\$5,000
3	18. Establish an annual process to receive dam operation information from United States Army Corps of Engineers and DNR controlled dams/ structures to improve flow regiment and better sustain aquatic communities.	All	All	Annual process	BdSWD	USACOE					O												\$10,000
3	19. Complete a tillage transect survey to record and show crop residue data to the public.	All	All	1 survey site created	SWCD; BWSR	NRCS	O							O									\$15,000

○ Indirect progress towards planning region goal

● Direct progress towards planning region goal





4.4. Education and Outreach: Watershed-Wide Action Table

The Education and Outreach Action Table summarizes the following types of actions:

- Community events;
- Workshops and demonstrations; and
- Educational material distribution.

These actions will be implemented watershed-wide to promote consistency and sharing of services. They will be funded by the Education and Outreach Implementation Program, described in [Section 5](#).

Funding Level	Action	Priority Planning Regions	Priority Resources	10-Year Measurable Output	Lead	Partner	Groundwater Quality	Sediment	Unstable Channels	Public Flooding	Private Flooding	Altered Hydrology	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Total Cost
1	1. Develop and formalize materials for implementing the Education and Outreach Implementation Program	All	All	Annual program implementation	SWCDs	BdSWD, Counties	O	O	O	O	O	O	O	O	O	O	O	O						\$10,000
1	2. Continue ongoing education and outreach efforts within jurisdictional areas.	All	All	Annual program implementation	SWCDs	BdSWD, Counties	O	O	O	O	O	O	O	O	O	O	O	O						\$3,655,000
1	3. Engage Co-ops and agricultural dealers via on-farm management demonstrations and field days	All	All	1 event / year	SWCDs	BdSWD; Co-ops; MDA	O	O								O	O	O						\$10,000
1	4. Conduct youth outreach (e.g., Envirothon, conservation days, lake management curriculum, ag-in-the-classroom, conservation camps, FFA, 4-H, etc.) to educate participants on land and water stewardship practices.	All	All	2 activities per year / County (or SWCD)	SWCDs	Counties	O	O	O	O	O	O	O	O	O	O	O	O						\$10,000
1	5. Continue utilizing the River Watch program.	Rabbit	All	Annual program implementation	BdSWD	SWCDs		O									O	O						\$50,000
1	6. Conduct outreach efforts to promote shoreline and streambank protection through vegetative management, stormwater construction practices, and BMPs.	All	Lake Traverse, Upper Lightning	Annual program implementation	SWCDs	COLA; SWCDs; DNR		O					O	O	O	O	O							\$10,000
1	7. Form partnership with realtors and property owners and hold annual meeting to work towards compliance of SSTS prior to property sales	All	All	1 meeting with realtor group / PR/year	Counties	SWCD; Cities; MPCA	O										O							\$5,000
2	8. Develop and hold field day and demonstration events that address farm management systems (soil loss, soil health, and nutrient management).	All	All	2 events / year	SWCDs	BdSWD; MDA	O	O									O	O	O					\$20,000
2	9. Conduct stormwater management outreach through newspaper articles, brochures, and workshops for the general public and public officials	Rabbit, Upper Mustinka, Fivemile & Twelvemile Creek Headwaters	Wendell, Elbow Lake, Graceville	1 workshop / PR / year; Outreach materials	Cities	SWCD					O		O											\$20,000



Funding Level	Action	Priority Planning Regions	Priority Resources	10-Year Measurable Output	Lead	Partner	Groundwater Quality	Sediment	Unstable Channels	Public Flooding	Private Flooding	Altered Hydrology	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	2021-2022	2023-2024	2025-2026	2027-2028	2029-2030	10-Year Total Cost
2	10. Publish articles so residents are informed about changes in infrastructure management (e.g., dams, culvert right sizing, bridge repairs, SSTS, groundwater conservation in homes, etc.)	All	All	1 article / year	BdSWD	Road authorities; Counties; SWCDs					O												\$2,500	
2	11. Educate well owners via mailing or testing workshop about the risk of well contamination by common pollutants such as nitrate, arsenic, and bacteria; promote the testing of private wells through education or cost share.	All	All	1 mailing or testing workshop / PR / year	SWCD; Counties	MDH; MDA	O										O	O					\$20,000	
3	12. Participate in wellhead protection plan meetings and teams.	All	All	Meetings as scheduled / requested	SWCD	MDH; MDA; SWCDs; Counties	O					O					O	O					\$500	
3	13. Conduct outreach to promote agricultural irrigation resources including weather data and the retrofit of systems (e.g., from high- to low- pressure) to conserve groundwater.	Rabbit, Upper Mustinka, Fivemile & Twelvemile Creek Headwaters	All	Annual program implementation	SWCD	MDA; NRCS; DNR	O																In-kind time	
3	14. Conduct outreach to promote conservation groups to improve public participation in the prioritization of wetland and shallow lake restoration to enhance wildlife habitat.	All	Minnesota Prairie Plan Areas	Annual program implementation	DNR	SWCDs		O									O	O					In-kind time	
3	15. Conduct outreach to promote education about stream dynamics to the general public (i.e., profile, pattern)	All	All	Annual program implementation	DNR	SWCDs			O														In-kind time	

○ Indirect progress towards planning region goal

● Direct progress towards planning region goal





4.5. Regulatory: Watershed-Wide Action Table

The Regulatory Action Table summarizes actions pertaining to the administration of statutory obligations and local ordinances. These actions will be implemented watershed-wide to promote consistency and sharing of services. They will be funded and guided by the Regulatory Implementation Program. A summary of the implementation program and how each local entity administers statutory obligations and local ordinances is provided in **Section 5**. Local government units may seek opportunities to align specific regulatory standards across county boundaries.

Funding Level	Action	Priority Planning Regions	Priority Resources	10-Year Measurable Output	Lead	Partner	Groundwater Quality	Sediment	Unstable Channels	Public Flooding	Private Flooding	Altered Hydrology	Stormwater Management	Ditch System Instability	Ditch System Inadequacy	Soil Health	Bacteria	Nutrient Loading	2021-2022	2023-2024	2025-2026	2027-2028	2029-2030
1	1. Administer shoreland ordinances and permitting programs.	All	N/A	Ongoing administration	Counties, BdSWD	N/A		O	O		O		O	O			O						
1	2. Administer storm water ordinances for subdivisions and shoreline protection.	All	N/A	Ongoing administration	City/county	BWSR; DNR		O			O					O	O						
1	3. Develop and administer floodplain ordinances and permitting regulations for 100-year floodplain.	All	N/A	Ongoing administration	Counties	DNR, FEMA				O	O	O											
1	4. Administer Subsurface Sewage Treatment Systems (SSTS) local ordinances, sanitation codes, and zoning requirements.	All	N/A	Ongoing administration	Counties, SWCD	N/A	O										O	O					
1	5. Implement a loan program for septic system upgrades through counties.	All	N/A	Program developed	Counties, SWCD	MDA, MPCA	O										O	O					
1	6. Administer solid waste management ordinances, zoning requirements, and solid waste comprehensive plans.	All	N/A	Ongoing administration	Counties	N/A	O										O	O					
1	7. Administer emergency hazard management ordinances and plans.	All	N/A	Ongoing administration	Counties	N/A				O	O												
1	8. Administer feedlots in accordance to local ordinances and MN Rules Chapter 7020.	All	N/A	Ongoing administration	Counties, SWCD, MPCA	N/A											O	O					
1	9. Administer stream and public water buffers as required by the state buffer law requirements.	All	N/A	Ongoing administration	Counties, SWCDs, BdSWD	BWSR		O	O		O		O				O						
1	10. Administer local land and resource management ordinances related to aggregate management.	All	N/A	Ongoing administration	Counties	N/A		O															
1	11. Administer the Minnesota Wetland Conservation Act.	All	N/A	Ongoing administration	Cities; counties/SWCD	BWSR	O			O	O	O											
1	12. Promote and administer comprehensive design and planning to minimal impact design standards as recommended by NPDES.	All	N/A	Ongoing administration	MPCA	Cities		O					O										
1	13. Administer wellhead protection plans and consider groundwater and drinking water resources in land use planning decisions.	All	N/A	Ongoing administration	Counties	MDH, cities	O																

○ Indirect progress towards planning region goal

● Direct progress towards planning region goal



4.6. Estimated Cost of Implementing the Plan

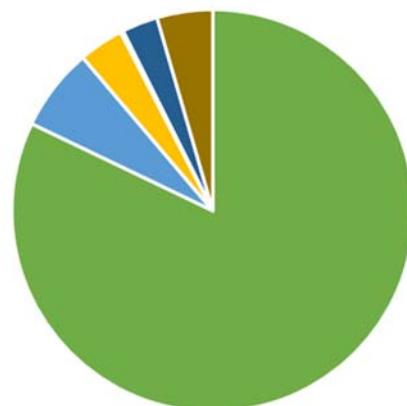
Below are the estimated costs for implementing actions in Funding Levels 1 and 2. This plan includes funding for an Operations and Maintenance Implementation Program, which funds the inspection and maintenance of public legal ditch systems and watershed district facilities. This plan includes administration in program costs (up to 10% of overall cost), and assumes local, state, and/or federal fiscal support of regulation remains unchanged.

Table 4-2: Estimated cost of implementing the Bois de Sioux- Mustinka CWMP under Funding Level 1 and Funding Level 2

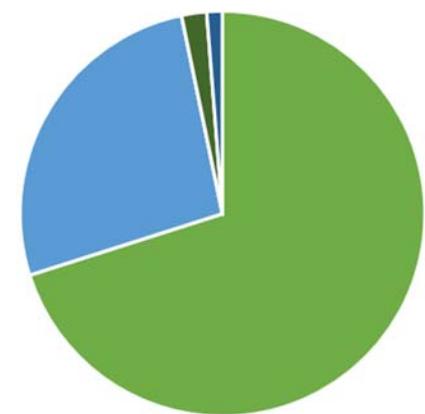
	\$ Funding Level 1 Existing Dollars		\$\$ Funding Level 2 Additional WBIF	
	Est. Annual Cost	Est. 10-Year Cost	Est. Annual Cost	Est. 10-Year Cost
Projects and Practices	\$10,688,900	\$106,889,000	\$356,400	\$3,564,000
Operations and Maintenance	\$470,000	\$4,700,000	\$0	\$0
Capital Improvement Projects	\$870,000	\$8,700,000	\$133,650	\$1,336,500
Data Collection	\$30,500	\$305,000	\$10,000	\$100,000
Education and Outreach	\$375,000	\$3,750,000	\$6,250	\$62,500
Regulatory	\$585,000	\$5,850,000	\$0	\$0
Total	\$13,019,400	\$130,194,000	\$500,000*	\$5,000,000

Funding Level 1

- Projects and Practices
- Capital Improvement Projects
- Operations & Maintenance
- Data Collection & Monitoring
- Education & Outreach
- Regulatory



Funding Level 2

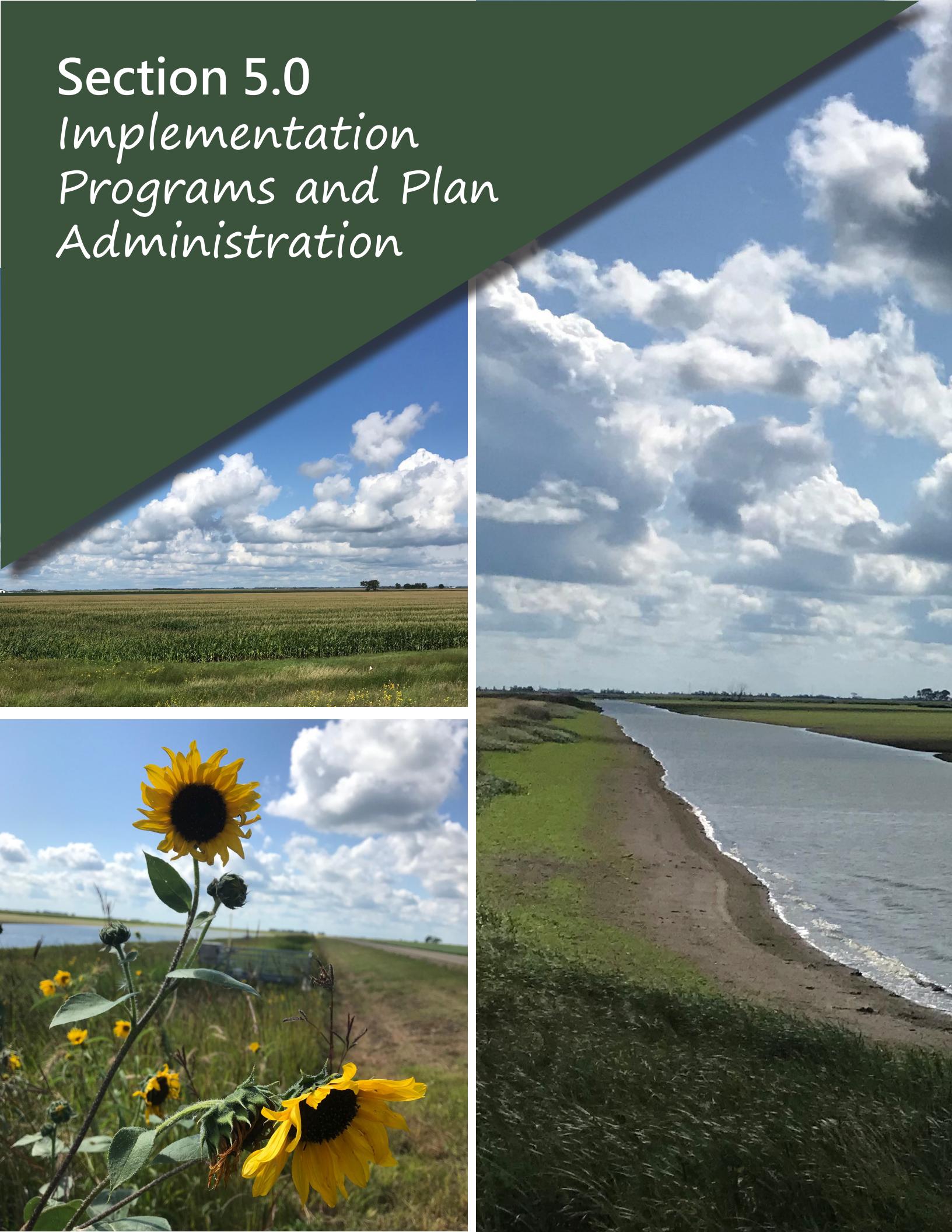


*Rounded to \$500,000 for planning purposes



Section 5.0

Implementation Programs and Plan Administration

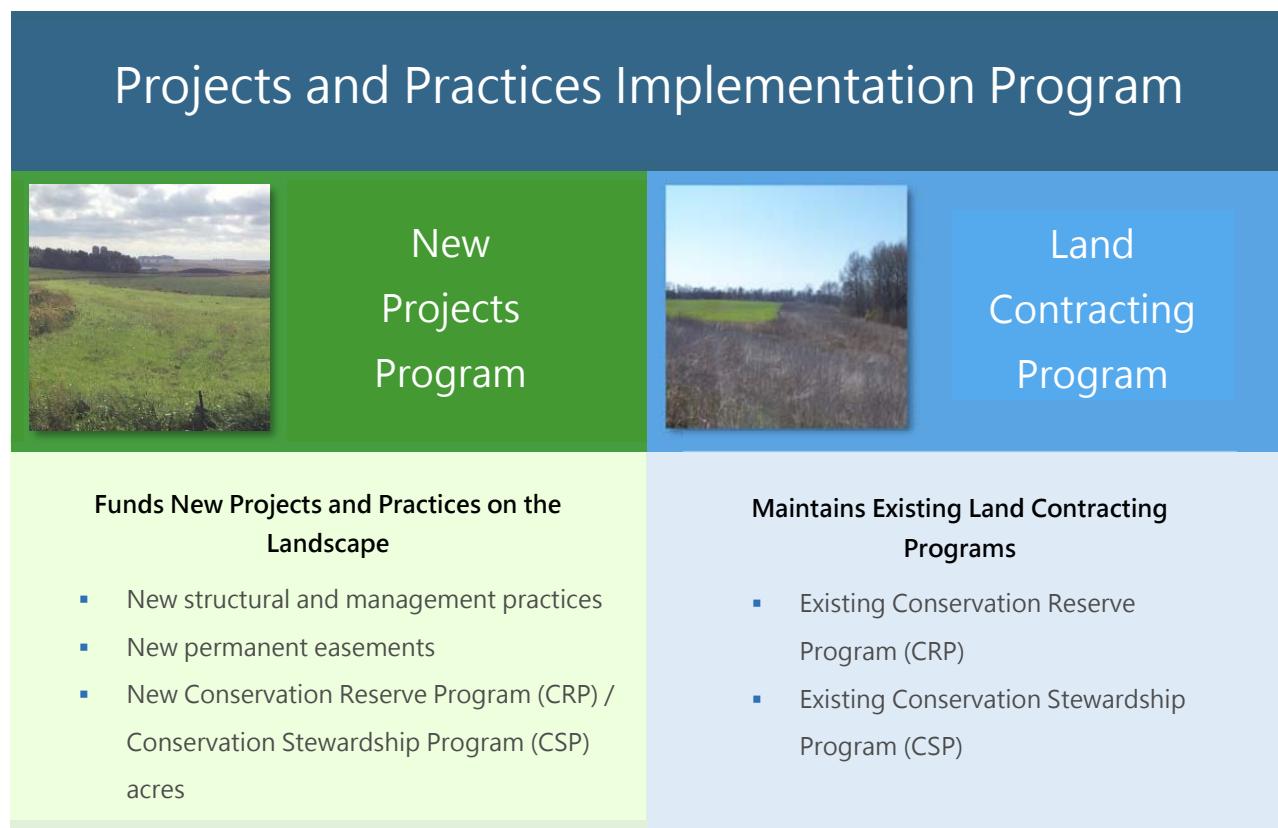


Section 5.0 Implementation Programs and Plan Administration

Implementation programs are the funding mechanism to implement the Action Tables. This plan establishes common implementation programs within the plan area and describes them conceptually in this section.

5.1. Projects and Practices Implementation Program

Dollars used to implement projects and practices on the landscape are funded by the Projects and Practices Implementation Program. This implementation is broken into two subprograms, as shown below.



New Projects Program

The New Projects Program funds actions pertaining to the planning, design, and implementation of new projects and practices to make progress toward plan goals. Projects can be structural (i.e., grassed waterways, controlled drainage) or nonstructural (i.e., nutrient management, conservation tillage, permanent protection, new lands enrolled in CRP/CSP). The program assists landowners in implementing voluntary actions through financial incentive, technical assistance, tax exemption, conservation easement, or land acquisition. This program is funded by local, state, and federal dollars.



Grant applications to fund the New Projects Program may be prepared jointly through the Bois de Sioux - Mustinka Watersheds CWMP Partnership when mutually beneficial to promote consistency in services and maximize efficiency in implementation across the plan area. During implementation, the Partnership may create decision-making processes for prioritizing what practices get funded, and how much watershed-based implementation funding practices will receive. Funding received by the Bois de Sioux - Mustinka Watersheds CWMP Partnership will be preferentially given to projects and practices identified with the Action Table and any subsequent amendments, consistent with the priority issues and goals established in this plan.

Land Contracting Program

The Land Contracting Program serves to maintain existing acres of the watershed enrolled in land conservation programs. While this plan recognizes that there are state funded and other perpetual easements of value in the plan area, this program focuses on federal programs such as the CRP and CSP.

CRP is a land conservation program administered by Farm Service Agency (FSA). In exchange for a yearly rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. Contracts for land enrolled in CRP are 10-15 years in length (USDA, 2020).

CSP is a financial assistance program for working lands. NRCS provides yearly payment to implement conservation activities such as grazing management, filter strips, cover crops, and range grasses. Contracts for working land enrolled in CSP are 5 years in length (NRCS, 2020).

Land enrolled in these programs produce numerous environmental benefits. For example, converting row-cropped lands with conventional tilling methods to perennial grasslands using programs such as CRP typically reduce about 50% of storm runoff (RRB, 2004). Implementing conservation tillage practices in programs such as CSP typically reduce 5% to 8% of runoff reduction (RRB, 2004).

	Conservation Reserve Program (CRP)	Conservation Stewardship Program (CSP)
Funding	✓ Federal	✓ Federal
Enrolled Land Type	✓ Grasses, trees	✓ Working land
Contract Length	✓ 10-15 years	✓ 5 years

5.2. Data Collection and Monitoring Implementation Program

The Data Collection and Monitoring Implementation Program funds actions that close data gaps to allow for tailored, science-based implementation strategies. The program also funds ongoing monitoring efforts aimed at the development and assembly of data and information.

Ongoing surface water monitoring programs are led by local and state entities. The MPCA administers three intensive watershed monitoring water chemistry stations in the Bois de Sioux Watershed and six in the





Mustinka River Watershed. MPCA's Watershed Pollutant Load Monitoring Network (WPLMN) provides continuous monitoring of water quality conditions with six WPLMN sites in the Bois de Sioux - Mustinka Watersheds (Rabbit River, Bois de Sioux River, Mustinka River, Twelvemile Creek). There are also 12 US COE stream gauge sites located within the plan area. Other existing surface water monitoring sites in the plan area are operated by the DNR and the USGS. Results from these networks and other ongoing tracking and monitoring

programs can be used to document measurable water quality and quantity changes resulting from implementation activities (**Table 5-1**).

Ongoing monitoring efforts also track groundwater supply quantity and quality trends. Current programs include Public Water Supplier Monitoring, MDA's township testing, MPCA's Ambient Groundwater Monitoring Program, DNR high capacity permitting program, and the DNR Observation Well Network. These programs have provided valuable information but are not yet extensive enough to fully assess the state of groundwater in the region.

Participating LGUs recognize that project funds are extremely limited, and that requests for information, tracking, evaluation, and assessment are activities that require staff time and office resources, decreasing the amount of funds available for high and medium priority projects. Outside of projects through watershed-based implementation funds, each LGU will be responsible for providing assessment, tracking, evaluation, and reporting data for their own organization's activities. Requests for additional information shall be filed in accordance with Minnesota Government Data Practices Act. Other requests will be considered optional, by each LGU, on a case-by-case basis, unless the request is required by a specific grant agreement or state statute.

During implementation, the Data Collection and Monitoring Implementation Program will build on the data and information processes already established by plan participants. The Data Collection and Monitoring Implementation Program will be collaborative (especially where efforts cross administrative boundaries), with Partnership entities sharing services wherever possible.

Table 5-1: Example means for tracking and documenting implementation progress

Level	Description	Example Application
Tracking	Counting number of practices, acres, miles of ditches or rivers, number of workshops, etc.	Outputs in Action Table (Section 4). Projects will be tracked and reported in eLINK and local database during implementation.
Estimating	Using lower resolution calculators and tools to estimate individual or collective impacts of projects.	Engineer estimates, existing PTMApp results
Modeling	Incorporating landscape factors and project information to predict future conditions.	PTMApp, HSPF in WRAPS Cycle 2
Measuring	Using field-collected information to assess the condition of the water.	Watershed Pollutant Load Monitoring Network, Cycle II Watershed Assessments



5.3 Education and Outreach Implementation Program

The Education and Outreach Implementation Program funds actions to increase engagement and understanding to make progress toward plan goals. The program is operated through sharing of services. Expectations are that a common set of template education and outreach materials will be developed to use across the watersheds but delivered by the staff within each county and/or planning region.



Youth Engagement

This program is dedicated to educating youth on the importance of natural landscape and the environmental issues that impact it:

- River Watch - provides high school students with watershed education and water quality monitoring experience
- Partner SWCD events:
 - Water Fest
 - Conservation Day
 - Family Fun Night at the Lake
 - Envirothons



Outreach Support

This program will also continue to support general public education and outreach through:

- Educational materials
- Newsletters
- Volunteer activities
- Public meetings to raise awareness and gain a better understanding of the consequences of individual decisions on water management.
- General media campaigns
- Citizen and LGU surveys
- Municipal training



Virtual Engagement

Many local government staff use virtual platforms to communicate important watershed information easily and effectively in a timely manner:

- Facebook
- Twitter
- YouTube
- E-mail
- Website updates
- Newsletters
- News articles



5.4 Regulatory Administration Implementation Program

Many plan issues can be addressed in part through the administration of statutory responsibilities and local ordinances. In many cases, local ordinances have been adopted to conform to (or exceed) the standards and requirements of the state statutes. The responsibility for implementing these programs will remain with the respective counties or appointed LGUs.

The BdSWD has rule making authority per MS 103D.341 and permitting authority per 103D.345; it retains its authority and ability to amend its rules, bylaws, inventories, permits, policies, procedures and restrictions. Current rules were adopted in 2009 and could periodically change during this plan. The 2009 BdSWD Rules are available by reference in **Appendix M**. To review current rules, please see the BdSWD website (www.bdswd.com).



Comprehensive Watershed Management Plan

Counties and the BdSWD will meet as needed to discuss changes to the following water-related ordinances and ordinance amendments. A full comparison of how local ordinances are used to administer statutory responsibilities is provided in **Appendix N**.

Shoreland Management

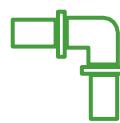
Minnesota Legislature delegated responsibility to LGUs to regulate the subdivision, use, and development of shorelands along public waters. This helps preserve and enhance the quality of surface waters and conserving the economic and natural environmental

values of shorelands. This statute is administered and enforced as a local zoning ordinance for all participating counties, and as a rule for the BdSWD. These local shoreland ordinances also manage the extraction of aggregate resources.



Subsurface Sewage Treatment Systems

The MPCA administers the Subsurface Sewage Treatment System (SSTS) Program to protect the public health and environment. SSTS Ordinances are adopted and enforced at the county level to meet state requirements. Big Stone, Stevens, Traverse, Otter Tail, and Wilkin counties administer Minnesota Rules Chapter 7080-7083 for SSTSs through local ordinances.



Hazard Management

Hazard mitigation may be defined as any action taken to eliminate or reduce the future risk to human life and property from natural- and human-caused hazards.

Extreme weather events and infrastructure resilience also play a part in hazard management. These requirements direct the state to administer cost-sharing. Emergency management departments are deployed in each of the contributing counties within the plan boundary to plan for hazard management.



Feedlots

Feedlot rules, regulations, and programs were established under MN Rules 7020 to govern the collection, transportation, storage, processing, and land application of animal manure and other livestock operation wastes. The program is administered through the MPCA, but local counties may accept

delegation of this authority. Big Stone, Stevens, and Traverse counties have accepted this delegation, whereas Grant, Otter Tail, and Wilkin have not.



Floodplain Management

Floodplain zoning regulations guide development in the floodplain to minimize loss of life and property, disruption of commerce and governmental services, extraordinary public expenditure for public protection and relief, and interruption of transportation and communication. The DNR and FEMA are in the process of updating floodplain maps on a county basis. Current flood maps can be found on the DNR website: https://www.dnr.state.mn.us/waters/watermgmt_section/floodplain/access-flood-maps.html.

Floodplain zoning regulations are enforced through local zoning ordinances by Big Stone, Grant, Stevens, Traverse, and Wilkin counties.



Solid Waste Management

Minnesota's Waste Management Act has been in place since 1980 and establishes criteria for the management of all types of solid waste, including mixed municipal solid waste, construction and demolition waste, and industrial waste. To receive annual grant funding to assist in implementing waste management programs, each county must have an MPCA-approved Solid Waste Management Plan. All counties in the plan area have approved plans. Counties can also adopt Solid Waste Ordinances to use as a supplement in enforcing MPCA Rules. Big Stone, Grant, Stevens, and Traverse counties have a solid waste ordinance that is administered by each respective county.



Public Drainage Systems

Drainage authority is granted to counties and watershed districts through MS 103E to establish, construct, and in perpetuity maintain public drainage systems. County boards serve as the drainage authorities for public drainage systems for four of the six counties in the plan area (Big Stone, Grant, Otter Tail, and Stevens). The Bois de Sioux Watershed District serves as the drainage authority for Traverse and Wilkins Counties as well as Judicial Ditch #2, Judicial Ditch #12, and Judicial Ditch #14, benefitting lands located in Grant and Traverse Counties.

The Bois de Sioux Watershed District has a system of rules and regulations for the management of water within the district, and a list of actions that require a permit to proceed with work in any public drainage system in the Bois de Sioux or Mustinka Watershed Districts.



Buffers

The Riparian Protection and Water Quality Practices statute (Minnesota Statute 103F.48, commonly referred to as the Buffer Law) requires a 50-foot average continuous buffer of perennial vegetation with a 30-foot minimum width along all public waters and a 16.5-foot minimum width continuous buffer of perennial vegetation all along public drainage systems.

All counties, SWCDs, and the watershed district implement and assess compliance with the Buffer Law through their local ordinances or rules. The local SWCDs are also responsible for landowner assistance with the Buffer Law. In most situations, landowners have the option of working with their SWCD to determine if other alternative practices aimed at protecting water quality can be used in lieu of—or in combination with—a buffer. Questions or requests for information about buffer or shoreland ordinances should be directed to the respective county soil and water conservation district.

Aquatic Invasive Species

Aquatic invasive species (AIS) can cause ecological and economic damage to water resources. The DNR has regulatory authority over aquatic plants and animals. Permits are required by the general public for transporting lake water and in species as well as for treating AIS. In Big Stone, Otter Tail, and Traverse, the county oversees aquatic invasive species programs, whereas in Wilkin and Stevens counties, the SWCDs fill that role.



Bluffland Protection

MN State Statute (Section 103F.201) requires that local municipalities and counties with shoreland within their juris—dictional boundaries manage development of shoreland areas using ordinances to reduce the negative impacts of development. Many counties specifically target bluffland areas due to their disproportionate impact on sediment erosion when the bluff becomes unstable. Big Stone, Grant, Otter Tail, Traverse, and Wilkin counties address bluffland protections as part of either or both of their shoreland or zoning ordinances.



Wetland Conservation

The Minnesota Legislature passed the Wetland Conservation Act (WCA) of 1991 (Minnesota Rules Chapter 8420) to achieve no net loss of, increase the quantity, quality, and biological diversity of, and avoid direct or indirect impacts to Minnesota's wetlands. LEGUs are responsible for administering, regulating, and educating landowners on WCA. The County serves as the WCA LGU for Big Stone, Grant, Otter Tail, and Traverse counties. In Stevens and Wilkin counties, the SWCD serves as the WCA LGU.



Construction Erosion Control

Temporary construction erosion control is the practice of preventing and/or reducing the movement of sediment from a site during construction. Projects disturbing one acre or more of land will require a National Pollutant Discharge Elimination System (NPDES) Permit from MPCA. Big Stone, Grant, Otter Tail, and Wilkin counties have regulations within their local zoning ordinances that address erosion control, with all but Wilkin enforcing through their shoreland ordinance. Traverse County Hometown Planning regulates construction erosion control through MN Rules Chapter 7090.



Wellhead Protection

The Minnesota Department of Health (MDH) administers the state wellhead protection rule, Minnesota Rules, Chapter 4720.5100 – 4720.5590, that sets standards for wellhead protection planning. Municipalities within the watersheds have completed, or will be completing, wellhead protection plans. The most recent listing of completed wellhead protection plans can be obtained from MDH.



Comprehensive or Land Use Plans

Counties and municipalities within the Bois de Sioux – Mustinka Watersheds are responsible for land use planning, which is administered through local zoning ordinances. From a regulatory perspective, management of lands and resources may overlap with the local government entities listed in Table 5-2. Therefore, meeting goals and strategies of local planning may also involve other governmental or non-governmental entities. Local government units within the Bois de Sioux – Mustinka Watersheds that have comprehensive and/or land use plans are provided in Table 5-2. Please note this is not intended to be all-inclusive.

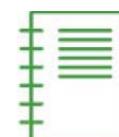


Table 5-2: Comprehensive and Land Use Plans adopted within the Bois de Sioux - Mustinka Watersheds

Local Governmental Unit (LGU)	Comprehensive or Land Use Management Plan (Year Adopted/Revised)
Big Stone County	Big Stone County Comprehensive Plan (2002)
Wilkin County	Wilkin County Minnesota Comprehensive Plan (2014)
Otter Tail County	Otter Tail County Long-Range Strategic Plan (in process)
Traverse County	Traverse County Comprehensive Plan (2011)
Stevens County	Stevens County Comprehensive Plan (2017)
Grant County	Grant County Comprehensive Plan (1998)

5.5 Capital Improvements

A capital improvement is defined as a major non-recurring expenditure for the construction, repair, retrofit, or increased utility or function of physical facilities, infrastructure, or environmental features. Some capital improvements are beyond the 'normal' financial means of the Partnership, often exceeding \$250,000, and are unlikely to get constructed without external funding.

Proposed capital improvements are shown by planning region in **Section 4** and are summarized for the watersheds in **Appendix O**. Members of the Policy Committee or the Partnership's individual and representative Boards may discuss the means and methods for funding new capital improvements with potential funding partners. Capital improvement projects completed through this plan will be operated and maintained by the owner of the CIP for its lifespan.



Capital improvements include watershed district projects (103D) and drainage projects (103E) primarily. As highlighted throughout this plan, public drainage systems are prevalent throughout much of the plan area. As such, the Partnership will engage drainage authorities about plan efforts and goals. Drainage authorities will be highly encouraged to coordinate and be involved during implementation of the Action Table to make progress towards measurable goals, including sediment delivery, private and public flood risk reduction, ditch stability, and multipurpose drainage. Based on this two-way engagement, drainage authorities could access implementation funds to adopt drainage actions in the Action Table (**Section 4**) during 103E processes and procedures when the opportunity arises within the planning area.

5.6 Operations and Maintenance Implementation Program

Entities within the plan area are engaged in the inspection, operation, and maintenance of CIPs, stormwater infrastructure, public works, facilities, natural and artificial watercourses, and legal drainage systems. Operation and maintenance of natural watercourses, legal ditches, impoundments, and small dams will continue under regular operations and maintenance plans of the entities with jurisdiction over these systems.





5.7 Implementation and Existing Authorities

The Partnership recognizes that its participating entities will continue to use financial incentives through their own programs to meet their own individualized needs within their jurisdictions. Similarly, planning participants retain all their individual authorities and statutory authorities. For example, watershed projects may be initiated by petition, with government aid, or as part of a plan, per Minnesota Statutes Chapter 103D; the Partnership recognizes that the Bois de Sioux Watershed District retain statutory obligations and responsibilities when it comes to development of watershed projects.

This plan does not implicitly grant a power or authority of one LGU to act on behalf of another. No LGU shall have any authority to act for or bind another party in any way, or to represent that it has such authority. Nothing in this plan shall be construed in and of itself as creating any agency or partnership or other form of joint enterprise between the LGUs, and no LGU may create any obligation or responsibility on behalf of the other LGUs. Implementation may be carried out individually or jointly, at the sole decision of each LGU's governing board. No clause in this plan shall create a rule or law where one previously does not exist.

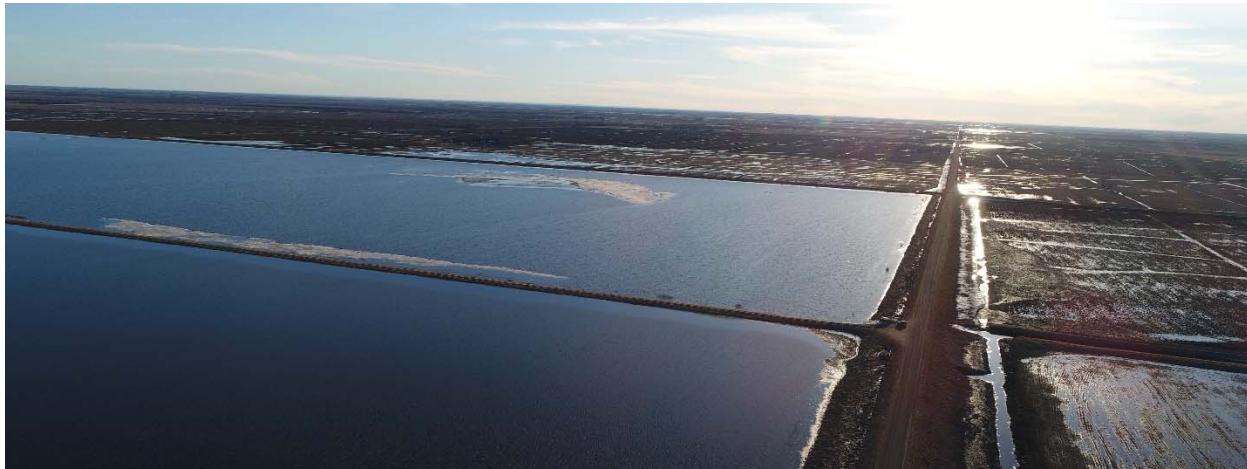
The Partnership also recognizes that drainage authorities retain statutory obligations and responsibilities when it comes to drainage systems per Minnesota Statutes Chapter 103E, and that it is at the drainage authorities sole discretion to develop, prioritize, and schedule projects based on local need, landowner acceptance, and budget considerations.

Water Management Districts

Watershed districts can establish water management districts (WMD) to fund projects under current law (103D). Effective in 2020, and subject to future changes, to use this funding method, MS 103D.729 requires that the WMD includes an identification of the area, the amount to be charged, the methods used to determine the charges, and the length of time the WMD is expected to remain in force.



As of the date this plan was written, there is one water management district enacted. See **Appendix M** for active water management districts. Because the existing authority of the watershed district is maintained, water management districts need only be approved by the corresponding watershed district to initiate a plan amendment, pursuant to the amendment process outlined under Minn. Stat. §§ 103D.729 and 103D.411. The watershed district shall notify the Policy Committee of the addition and the Policy Committee shall update plan documents as the state statute is followed.



5.8 Funding

This section of the plan describes how the plan will be funded. Existing dollars (Funding Level 1) was calculated by estimating the annual revenue and expenditures for all plan participants, scaled to the percentage of each county's land area in the Bois de Sioux – Mustinka River Watersheds. Funding Level 1 funding includes local, state, and federal funding, as explained in the following sections, and summarized in **Table 5-4**.



Local Funding

The amount of local funding needed to implement actions in Funding Level 1 is an estimated \$2,072,000 annually and \$20,725,000 for the ten-year plan. Local revenue is defined as money derived from either the local property tax base or in-kind services of any personnel funded from the local tax base (for local funding authorities, see **Appendix P**). Examples include local levy, match dollars, and county allocations.

These funds will be used for locally focused programs where opportunities for state and federal funding are lacking because of misalignment of a program's purpose with state or federal objectives. These funds will also be used for matching grants.



State Funding

The amount of state funding needed to implement actions in Funding Level 1 is an estimated \$805,000 annually and \$8,052,000 for the ten-year plan. State funding includes all funds derived from the State tax base. Examples of state funding includes legislative appropriations, direct allocations, Natural Resources Block Grants, Clean Water Funds, and SWCD Local Capacity Building Grants.

In collaboration with the fiscal agent, the Bois de Sioux - Mustinka Watersheds CWMP Partnership may apply for collaborative competitive or non-competitive grants. The assumption is that future base support for implementation will be provided to the Bois de Sioux - Mustinka Watersheds CWMP as one or more non-competitive watershed-based implementation funding grants (Level 2). Where the purpose of an implementation program aligns with the objectives of various state, local, non-profit, or private programs, these dollars will be used to help fund the implementation programs described by this plan.

Federal Funding

The amount of federal funding needed to implement actions in Funding Level 1 is an estimated \$10,142,000 annually and \$101,417,000 for the ten-year plan. Federal funding includes all funds derived from the Federal tax base. For example, this includes programs such as the Environmental Quality Incentives Program (EQIP), CRP, and CSP.

Partnerships with federal agencies are an important resource for ensuring implementation success. An opportunity may exist to leverage state dollars through some form of federal cost-share program. Where the purpose of an implementation program aligns with the objectives of various federal agencies, federal dollars will be used to help fund the implementation programs described by this plan.



Table 5-4. Summarized Funding Level 1 (existing dollars) for the Bois de Sioux - Mustinka Watersheds CWMP

	Local		State		Federal		All Sources	
	Implementation Programs	Annual	Total	Annual	Total	Annual	Total	Annual
Project and Practices- New Projects Program	\$249,948	\$2,499,482	\$297,219	\$2,972,190	\$521,723	\$5,217,228	\$1,068,890	\$10,688,900
Projects and Practices- Land Contracting Program	-	-	-	-	\$9,620,010	\$96,200,100	\$9,620,010	\$96,200,100
Operations and Maintenance	\$368,430	\$3,684,301	\$101,570	\$1,015,699	-	-	\$470,000	\$4,700,000
Capital Improvement Projects	\$870,000	\$8,700,000	-	-	-	-	\$870,000	\$8,700,000
Data Collection	\$26,633	\$266,332	\$3,867	\$38,668	-	-	\$30,500	\$305,000
Education and Outreach	\$158,103	\$1,581,033	\$216,897	\$2,168,967	-	-	\$375,000	\$3,750,000
Regulatory	\$399,356	\$3,993,564	\$185,644	\$1,856,436	-	-	\$585,000	\$5,850,000
Total	\$2,072,471	\$20,724,711	\$805,196	\$8,051,961	\$10,141,733	\$101,417,328	\$13,019,400	\$130,194,000



Additional Funding Sources

This plan includes actions assigned to Funding Level 3, meaning they will be pursued with additional grant dollars. Plan participants may pursue grant opportunities collaboratively or individually to fund these actions. **Table 5-5** shows the most-used state and federal grants for executing the actions described by this plan, cross-referenced to plan implementation programs, thereby showing potential sources of revenue for implementation.

Several non-governmental funding sources may also provide technical assistance and fiscal resources to implement the Action Table. This plan should be provided to all non-governmental organizations as a means of exploring opportunities to fund specific aspects of the Action Table.

Private sector companies, including those specifically engaged in agribusiness, are often overlooked as a potential source of funding for implementation. Some agribusiness companies are providing technical or financial implementation support because they are interested in agricultural sustainability. This plan could be used to explore whether the resource benefits arising from implementation have monetary value and, therefore, provide access to funding from the private sector.

Table 5-5: Implementation programs and related funding sources for the Bois de Sioux - Mustinka Watersheds. Note: List is not all-inclusive.

Program/Grant	Primary Assistance Type	Projects and Practices	Data Collection/ Monitoring	Education and Outreach
<i>Federal Programs/Grants</i>				
NRCS	Conservation Innovation Grant (CIG)	Financial	●	
	Conservation Stewardship Program (CSP)	Financial	●	
	Environmental Quality Incentives Program (EQIP)	Financial	●	
	Agricultural Conservation Easement Program (ACEP)	Easement	●	
FSA	Conservation Reserve Program (CRP)	Easement	●	
	Conservation Reserve Enhancement Program (CREP)	Easement	●	
	Farmable Wetlands Program (FWP)	Easement	●	
	Grasslands Reserve Program (GRP)	Easement	●	
FSA/ USDA/ NRWA	Source Water Protection Program (SWPP)	Technical		●



Program/Grant		Primary Assistance Type	Projects and Practices	Data Collection/ Monitoring	Education and Outreach
USFWS	Partners for Fish and Wildlife Program	Financial/ Technical	•		
FEMA	Hazard Mitigation Grant Program (HMGP)	Financial	•		
	Pre-Disaster Mitigation (PDM)	Financial	•		
	Flood Mitigation Assistance (FMA)	Financial	•		
	Risk Mapping, Assessment, and Planning	Technical	•		
EPA	Water Pollution Control Program Grants (Section 106)	Financial			•
	State Revolving Fund (SRF)	Loan	•		
	Drinking Water State Revolving Fund (DWSRF)	Loan	•		
	Section 319 Grant Program	Financial	•	•	
<i>State Programs / Grants</i>					
DNR	Aquatic Invasive Species Control Grant Program	Financial/ Technical	•		
	Conservation Partners Legacy Grant Program	Financial	•		
	Pheasant Habitat Improvement Program (PHIP)	Financial	•		
	Flood Hazard Mitigation Grant Assistance	Financial	•		•
	Forest Stewardship Program	Technical	•		
	Aquatic Management Area Program	Easement	•		
	Wetland Tax Exemption Program	Financial	•		
BWSR	Clean Water Fund Grants	Financial	•	•	
	Erosion Control and Management Program	Financial	•		
	SWCD Capacity Funding	Financial	•	•	•
	Natural Resources Block Grant (NRBG)	Financial	•		
	Reinvest in Minnesota (RIM)	Financial	•		
MPCA	Surface Water Assessment Grants (SWAG)	Financial		•	•
	Clean Water Partnership	Loan	•		



Program/Grant		Primary Assistance Type	Projects and Practices	Data Collection/ Monitoring	Education and Outreach
MDH	Source Water Protection Grant Program	Financial	●	●	●
	Public and Private Well Sealing Grant Program	Financial	●	●	
MDA	Agriculture Best Management Practices (BMP) Loan Program	Financial	●		
	Minnesota Agricultural Water Quality Certification Program	Financial	●		●



5.9 Decision-Making and Staffing

At least two committees may administer this plan during implementation:

- **Steering Committee:** Comprised of local soil and water conservation district (SWCD), county, and watershed district staff (with their respective alternates), and a BWSR Board Conservationist (serving in a non-voting, ex-officio role); and
- **Policy Committee:** Comprised of elected and appointed board members (county commissioners, SWCD board supervisors, and watershed board managers).

Table 5-6 outlines the probable roles and functions of these committees during implementation. Expectations are that the roles of each committee will shift and change focus during implementation. Fiscal and administrative duties may be assigned to a member LGU through a Policy Committee decision as outlined in the formal agreement. The Steering Committee will annually revisit the responsibilities for annual work planning and serving as the fiscal agent.

Table 5-6: Anticipated roles for Bois de Sioux - Mustinka Watersheds CWMP implementation

Committee Name	Primary Implementation Roles/Functions
Policy Committee*	<ul style="list-style-type: none">• Receive information regarding plan participant implementation funds• Approve the annual work plan• Approve annual fiscal reports• Annual review and confirmation of Steering Committee priority issue recommendations• Direction to Steering Committee on addressing emerging issues• Approve plan amendments for amendments not initiated and approved according to state statute• May approve joint grant applications, if needed• Accept annual assessment• Inform local boards on plan progress



Committee Name	Primary Implementation Roles/Functions
Steering Committee	<ul style="list-style-type: none"> Review the status of available implementation funds determined by individual plan participants Recommend the use of watershed-based implementation fund to the Policy Committee Research opportunities for collaborative grants Review and recommend annual fiscal reports Review and recommend annual reports submitted to BWSR Annual review and confirmation of priority issues Evaluate and recommend response to emerging issues Prepare plan amendments as directed by the Policy Committee Implement the Action Table Develop annual work plan Annually (or as needed) convene implementation meeting with plan review authorities Compile annual results for annual assessment Inform local boards on plan progress
Local Fiscal / Administrative Agent	<ul style="list-style-type: none"> Convene committee meetings Prepare and submit grant applications/funding requests

* The governing board of the Partnership's local fiscal agent may need to ratify Policy Committee actions

5.10 Collaboration

Collaboration Between Planning Partners

Although collaboration informally and formally is encouraged by this plan, mandatory participation in the Partnership is not required by this plan. Local government units who adopt this Comprehensive Watershed Management Plan can choose whether or not to approve and participate in future formal implementation agreements.

The benefits of successful collaboration between planning partners include consistent implementation of actions watershed-wide, increased likelihood of funding, and resource efficiencies gained. The Partnership will pursue opportunities for collaboration with fellow planning partners to gain administrative and program efficiencies, pursue collaborative grants, and provide technical assistance. The Partnership will also review similarities and differences in local regulatory administration to identify successes as well as future changes needed to make progress towards goals outlined in this plan.



However, there are costs associated with collaboration - for example, increased meeting and travel time; increased tracking, assessment, evaluation, and reporting requirements; a decrease of efficiency when actions must be coordinated in concert with 13 separately governed organizations, and possible increases to project completion timelines.

Collaboration with Other Units of Government



The Partnership will continue coordination and cooperation with other governmental units. This cooperation and coordination occur both at the local level and at the state/federal level. At the state/federal level, coordination between the Partnership and agencies such as BWSR, US Army Corps of Engineers, DNR, MDH, MDA, and the MPCA are mandated through legislative and permit requirements. Local coordination between the Partnership and comparable units of government, such as municipalities, city councils, township boards, county boards, and the

BdSWD Board, are a practical necessity to facilitate watershed-wide activities.

Intergovernmental coordination and communication is essential for the Partnership to perform its required functions. The Partnership will continue to foster an environment that enhances coordination and cooperation to the maximum extent possible throughout plan implementation.

Collaboration with Others

Plan partners expect to continue and build on existing collaboration with others, including non-governmental organizations, while implementing this plan. Many of these existing collaborations are aimed to increase habitat and recreational opportunities within the plan area, while providing education and outreach opportunities.

5.11 Work Planning

Local Work Plan

Annual work planning is envisioned to align the priority issues, availability of funds, and roles and responsibilities for implementation. An annual work plan will be developed by the Steering Committee based on the Action Table and any adjustments made through self-assessments. The annual work plan will then be presented to the Policy Committee, who will ultimately be responsible for approval. The intent of these annual work plans will be to maintain collaborative progress toward completing the Action Table.

State Funding Request

The Steering Committee will collaboratively develop, review, and submit a watershed-based implementation funding request from this plan to BWSR. This request will be submitted to and ultimately approved by the



Policy Committee before submitting it to BWSR. The request will be developed based on the Action Table and any adjustments made through self-assessments.

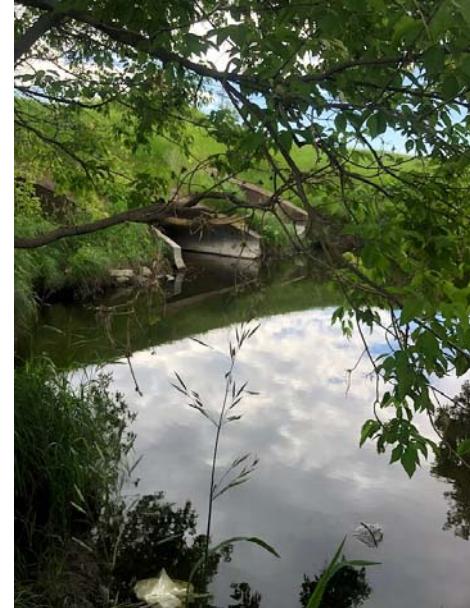
5.12 Assessment, Evaluation, and Reporting

Assessments

The Steering Committee will provide the Policy Committee with an annual update on the progress of the plan's implementation each year (see **Table 5-1**). During this annual review process, feedback will be solicited from the boards and Policy Committee. This feedback will be presented to the Policy Committee to set the coming year's priorities for achieving the plan's goals and to decide on the direction for collaborative grant submittals. In addition, this feedback will be documented and incorporated into annual and five-year evaluations.

Five-year Evaluation

This plan has a ten-year life cycle beginning in 2021. To meet statutory requirements, this plan will be updated and/or revised every 10 years. Over the course of the plan life cycle, progress towards reaching goals and completing the implementation schedule may vary. In addition, new issues may emerge and/or new monitoring data, models, or research may become available. As such, in 2025-26 and at every 5-year midpoint of a plan life cycle, an evaluation will be done to determine if the current course of actions is sufficient to reach the goals of the plan, or if a change in the course of actions is necessary.



Reporting

LGUs currently have a variety of reporting requirements related to their activities, programs, and grants or have those that are required by statute (e.g. watershed district annual report, buffer report). A number of these reporting requirements will remain the LGUs' responsibility. However, reporting related to grants and programs developed collaboratively and administered under this plan may be reported by the Steering Committee. In addition to annual reports, the Steering Committee may also develop a State of the Watershed Report. This report will document progress toward reaching goals and completing the Action Table. It will also describe any new emerging issues or priorities. The information needed to annually update the State of the Watershed Report will be developed through the annual evaluation process.

5.13 Plan Amendments

The Bois de Sioux – Mustinka Watersheds CWMP is effective through 2030. Activities described in this plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation. An amendment will not be required for addition or substitution of any of the actions and projects if those changes will still produce outcomes that are consistent with achieving the plan goals. This provision for flexibility includes changes to the activities except for those of capital improvement projects and water management districts which will follow different procedures.



Comprehensive Watershed Management Plan

Revision of this plan may be needed through an amendment prior to the plan update if significant changes emerge in the priorities, goals, policies, administrative procedures, or plan implementation programs. Revisions may also be needed if issues emerge that are not addressed in this plan.

Plan amendments may be proposed by any agency, person, city, county, soil and water conservation district, or the watershed district within the plan area to the Policy Committee, but only the Policy Committee can initiate and pursue the amendment process upon consideration of cost, location, and the proposal's relationship to the plan. All recommended plan amendments must be submitted to the Policy Committee along with a statement of the problem and need, the rationale for the amendment, and an estimate of the cost to complete the amendment. However, the existing authorities of each LGU is still maintained. The establishment of water management districts, by the watershed district, need not follow the amendment procedure outlined herein if the watershed district utilizes the procedure outlined under Minn. Stat. § 103D.729. Previously enacted and newly enacted water management districts are/will be featured in **Appendix M**.



Plan participants recognize the large work effort required to manage water-related issues. This plan provides the framework to implement this work by identifying priority issues, measurable goals, and action items. An amendment will not be required for the following situations:

- Any activity implemented through the "normal" statutory authorities of an LGU, unless the activity is deemed contrary to the intent and purpose of this plan; and
- The addition or deletion of action items, programs, initiatives, or projects, as long as they are generally consistent with the goals of this plan and will be proposed, discussed, and adopted as part of the bi-annual workplan budgeting process

If a plan amendment is needed, the plan amendment process will follow the process described in Minn. Stat. § 103D.411, which is as follows:

The Policy Committee may initiate an amendment of the plan or revised plan by submitting a petition with the proposed amendment to BWSR. BWSR must give notice and hold a hearing on the amendment in the same manner as a watershed management plan under Minn. Stat. § 103D.401. After the hearing, BWSR may, by order, approve or prescribe changes in the amendment. The amendment becomes part of the plan after approval by the Policy Committee. BWSR must send the order and approved amendment to the entities that receive an approved watershed management plan under Minn. Stat. § 103D.401, subd. 5.



5.14 Formal Agreements

The Bois de Sioux - Mustinka Watersheds CWMP Partnership is a coalition of counties, SWCDs, and a watershed district in west-central Minnesota. The Partnership previously entered into a formal agreement through a Memorandum of Agreement for planning the CWMP for the Bois de Sioux - Mustinka Watersheds. The parties anticipate entering into a formal agreement for purposes of receiving watershed-based implementation funding. Individual local government units, governed separately by their respective boards, are individually responsible for their roles implementing this plan.

