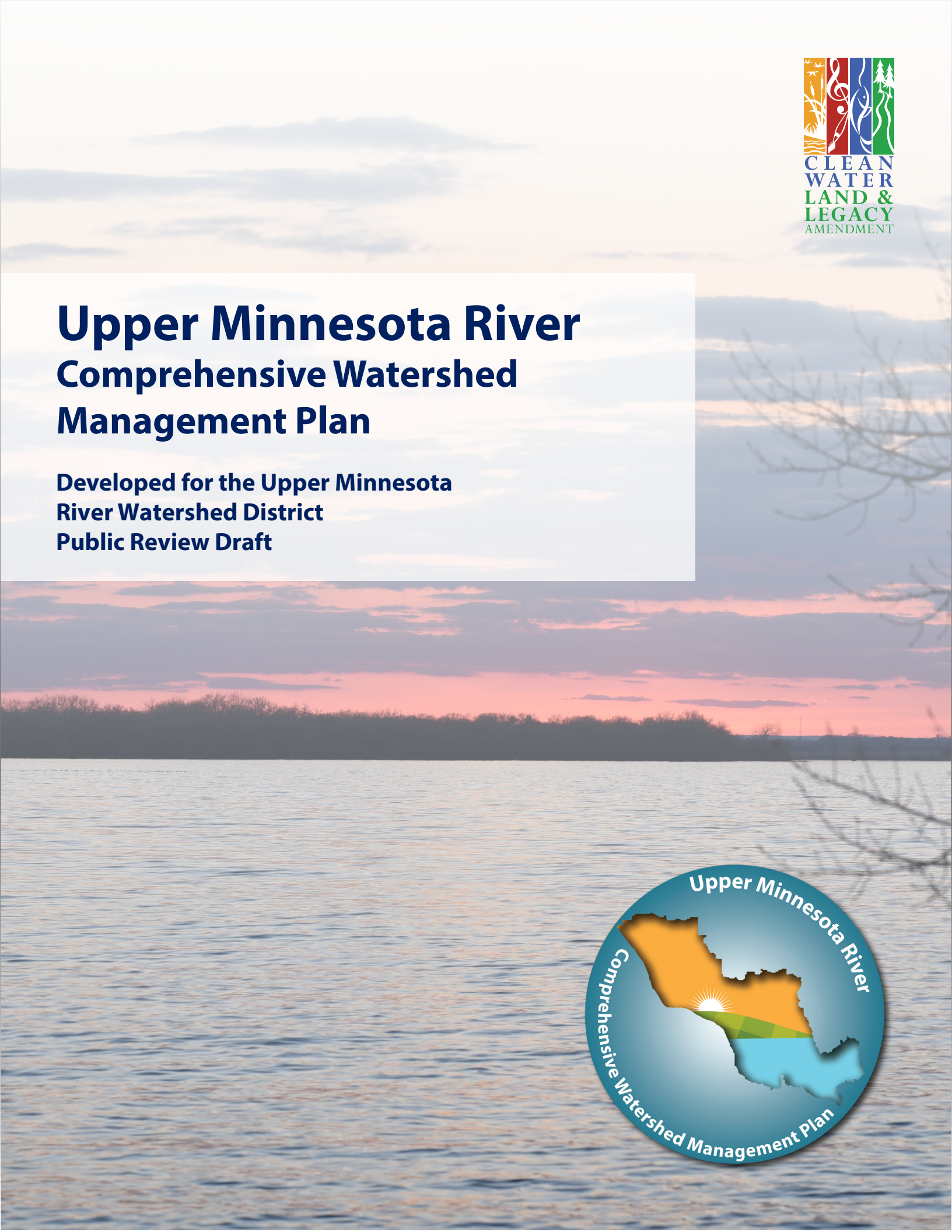

CLEAN WATER LAND & LEGACY AMENDMENT

Upper Minnesota River
Comprehensive Watershed Management Plan

Developed for the Upper Minnesota River Watershed District
Public Review Draft

Upper Minnesota River Comprehensive Watershed Management Plan

List of Abbreviations

One Watershed, One Plan	1W1P
Agricultural Conservation Easement Program	ACEP
Aquatic Invasive Species	AIS
Best Management Practices	BMP
Board of Water and Soil Resources	BWSR
Contaminants of Emerging Concern	CECs
Conservation Innovation Grant	CIG
Capital Improvement Project	CIP
Conservation Reserve Enhancement Program	CREP
Conservation Reserve Program	CRP
Conservation Stewardship Program	CSP
Comprehensive Watershed Management Plan	CWMP
Minnesota Department of Natural Resources	DNR
Drinking Water Supply Management Area	DWSMA
Drinking Water State Revolving Fund	DWSRF
Environmental Quality Incentives Program	EQIP
Flood Mitigation Assistance	FMA
Farm Service Agency	FSA
Farmable Wetlands Program	FWP
Grasslands Reserve Program	GRP
Hazard Mitigation Grant Program	HMGP
Hydrologic Simulation Program - Fortran	HSPF
Intensive Watershed Monitoring	IWM
Local Government Unit	LGU
Lessard-Sams Outdoor Heritage Fund	LSOHF
Minnesota Department of Agriculture	MDA
Minnesota Department of Health	MDH
Memorandum of Agreement	MOA
Minnesota Department of Revenue	MNDOR
Minnesota Pollution Control Agency	MPCA
National Land Cover Dataset	NLCD
Nutrient Management Initiative	NMI
National Pollutant Discharge Elimination System	NPDES
Natural Resources Block Grant	NRBG
National Resource Conservation Service	NRCS
National Wildlife Refuge	NWR
Pre-Disaster Mitigation	PDM
Pheasant Habitat Improvement Program	PHIP
Prioritize, Target, and Measure Application	PTMApp

Reinvest in Minnesota	RIM
Sustainable Forest Incentive Act	SFIA
Species of Greatest Concern	SGCN
State-Revolving Fund	SRF
Subsurface Sewage Treatment System	SSTS
Surface Water Assessment Grants	SWAG
Soil and Water Conservation District	SWCD
Source-Water Protection Program	SWPP
Total Maximum Daily Load	TMDL
Upper Minnesota River Watershed	UMRW
US Fish and Wildlife Service	USFWS
Water and Sediment Control Basin	WASCOB
Watershed-Based Implementation Funding	WBIF
Wetland Conservation Act	WCA
Watershed District	WD
Well Head Protection Area	WHPA
Wildlife Management Area	WMA
Watershed Pollutant Load Monitoring Network	WPLMN
Watershed Restoration and Protection Strategy	WRAPS
Wetland Reserve Program	WRP

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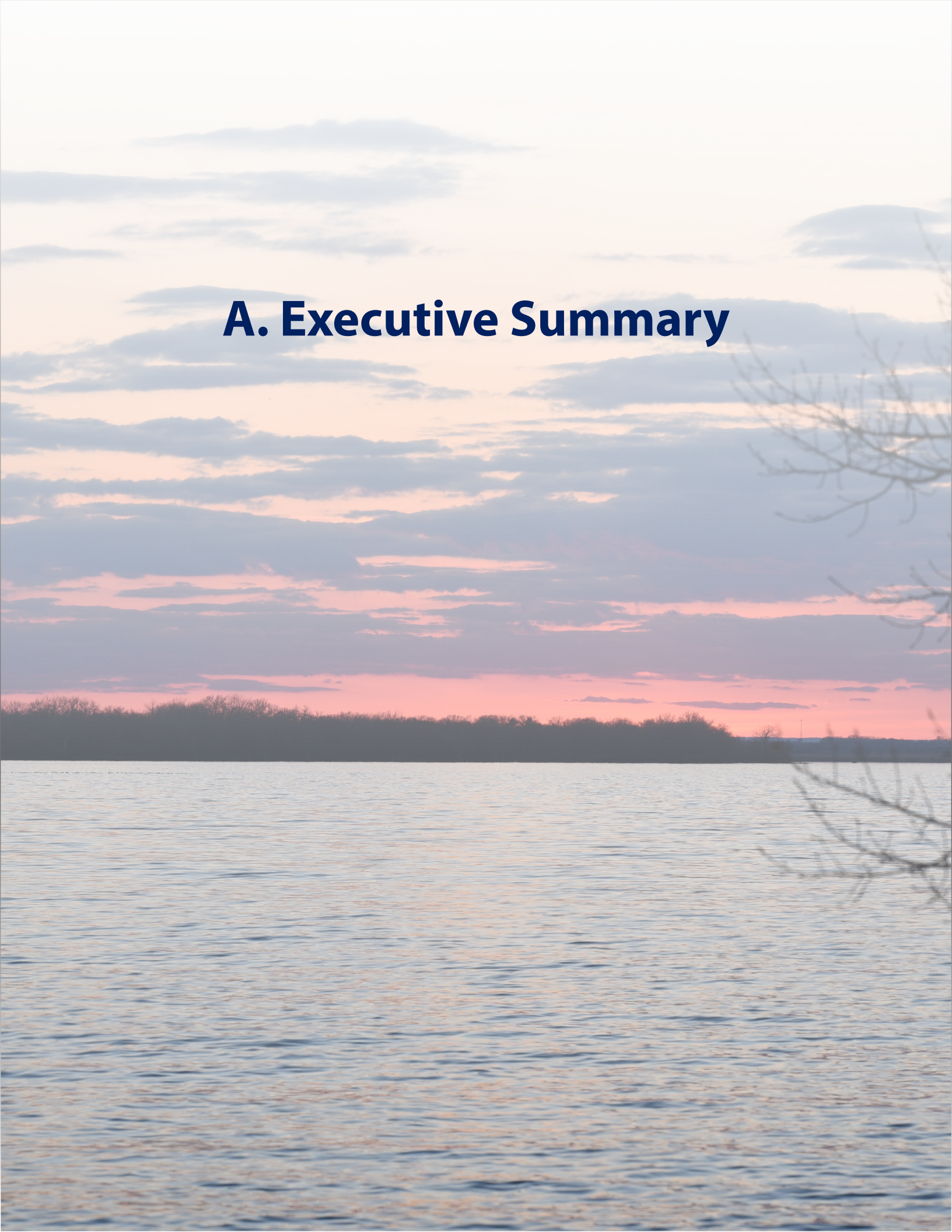


A. Executive Summary

Section A. Executive Summary

The Upper Minnesota River Watershed (UMRW) is in southwest Minnesota within a region of predominately agricultural-based uses, with rich and productive farms. The watershed, originating primarily in South Dakota, forms the headwaters of the Minnesota River and covers approximately 2,132 square miles, with approximately 784 square miles within Minnesota. The Minnesota portion of the UMRW is the focus of this planning effort.

The planning area includes several major tributaries of the headwaters of the Minnesota River, including Fish Creek, Five Mile Creek, Meadowbrook Creek, Salmonson Creek, and Stony Run Creek. The planning area is also fed by the Little Minnesota River, Yellow Bank River, and Whetstone River, which all originate in South Dakota. These waters do not follow traditional political boundaries, creating a need to plan water management at a watershed scale rather than at political scales. The UMRW Comprehensive Water Management Plan (CWMP) planning area was created to accommodate planning at a watershed scale.

The UMRW CWMP planning area contains portions of five counties (Big Stone, Traverse, Stevens, Swift, and Lac qui Parle counties). The three most populated towns within the planning area are Ortonville, Browns Valley, and Clinton. These counties and communities are in approximately 501,700 acres of the CWMP's planning area.

The UMRW CWMP was developed between 2022-2023 through the One Watershed, One Plan (1W1P) program administered by the Minnesota Board of Water and Soil Resources (BWSR; Minnesota Statutes §103B.801). The CWMP will guide watershed partners, including local counties, soil and water conservation districts (SWCDs), the Upper Minnesota River Watershed District (WD), and other local stakeholders through the implementation processes to restore, protect, and ensure the Watershed's water management and sustainability moving forward.

Administration and Coordination

CWMP planning began with a Memorandum of Agreement (MOA; Appendix A) between cooperating local governmental agencies and organizations, including:

- Big Stone, Swift, and Traverse counties
- Big Stone, Swift, and Traverse SWCDs, with a letter of support from Lac qui Parle SWCD
- Upper Minnesota River Watershed District (WD)

Throughout the planning process, guiding committees have developed and detailed the CWMP for implementation. These committees include:

- **Policy Committee** that is comprised of board members from counties, SWCDs, Upper Minnesota River WD, and other local groups. The policy committee represented their respective organizations as well as guided general decision-making regarding the CWMP.
- **Advisory and Steering Teams** that are composed of members from SWCDs; Upper Minnesota River WD; counties; landowners; city and township officials; and other stakeholders, including state agencies such as BWSR, Minnesota Department of Natural Resources (DNR), Minnesota Department of Agriculture (MDA), Minnesota Department of Health (MDH), Minnesota Pollution Control Agency (MPCA).

For plan implementation, these groups continue much of their responsibilities (full responsibilities outlined in **Section F**). The Policy Committee continues to guide decision making and works closely with BWSR for implementation. The Advisory and Steering Teams will provide reports and develop working plans.

Planning Regions

Due to the varied topography and unique surface water features within the planning area, planning regions were developed to help identify distinct regions for focused prioritization and implementation of activities. The four planning regions developed for this CWMP are shown in **Figure A1**. These planning regions will be used to guide the implementation of this plan. They are meant to represent distinct areas of the watershed that will aid in focusing efforts on the priority issues of this CWMP.

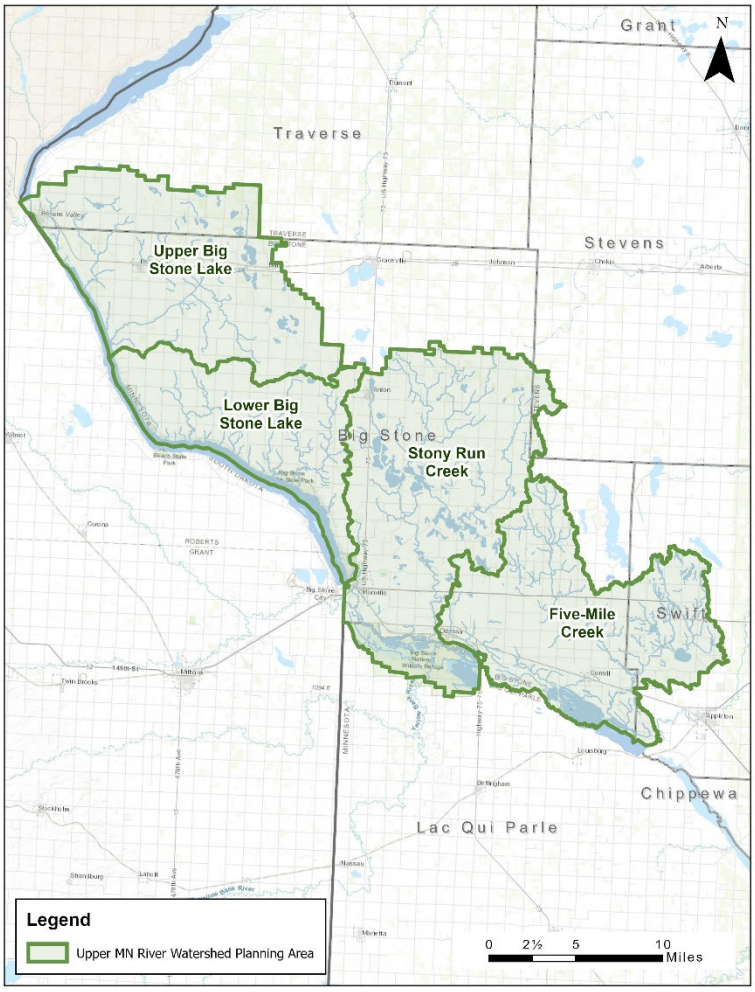


Figure A1. Planning region map.

Issue Prioritization

Existing reports, state agency feedback, and input for the Steering Team and Advisory Committee were used to establish a list of 20 distinct issues within the planning area. These 20 issues were then initially ranked based on feedback at a public kick-off meeting. How frequently the issue was addressed was decided based on information in existing studies and feedback from state agencies. The Steering Team, with input from the Advisory Committee, then adjusted the initial rankings based on local expertise within the planning area to establish a final prioritization of the 20 issues.

Figure A2 shows the ranking structure for issue prioritization, how many issues were within each rank, and what those ranks mean for implementing this CWMP. Each issue was then further divided into either a watershed-wide issue or a planning region specific issue by the Steering Team and Advisory Committee. The Policy Committee made the final approval of the issue prioritization process. The High (**Table A1**) and Medium-High (**Table A2**) issues, along with their watershed-wide or planning region rankings, are shown on the following pages.

High — Three issues

- These issues are of the highest priority to address. The main focus of effect and initial Watershed-Based Implementation Funding (WBIF) funding will be put towards acheiving goals that improve these issues.

Medium High — Five issues

- These are a high priority to address but behind the highest category. These issues will have early effort and WBIF funding aimed at reducing them.

Medium — Five issues

- These issues significanly impact the watershed but are a smaller problem or have less of an impact on resources. These will have goals developed and will be addressed as effort and funding allow.

Low — Five issues

- These issues still impact the watershed but either have a smallest impact or are unfeasible to address. These will not have goals developed to address them, and effort to address these priorities will only occur if additional state funding becomes available.

Figure A3. Structure of the issue prioritization process ranks and the number of issues within each rank.

Each issue is placed into a resource category, shown in icons in the issue tables. Resource categories include groundwater, habitat, land stewardship, and surface water. Refer to **Section C** for further details of each category.

Priority Issues

High Priority Issues

Planning Region Prioritization Key: = high priority = medium priority = low priority

Table A1. High priority issues within the planning area along with planning region rankings. All high priority (dark blue) indicates a watershed-wide issue.

Resource Category	Resource	Issue	Issue Description	Planning Region Prioritization
	Agricultural Lands	Soil health	Healthy soils provide increased agricultural productivity and benefits for water quality and water quantity. In addition, healthy soils provide opportunities to increase climate resiliency. Maintaining or improving soil health within the watershed can produce multiple benefits. This includes promoting a healthy soil structure that allows for better infiltration, reducing ponding and surface flow along with reducing nutrient loading into streams.	
	Agricultural Lands	Erosion and sediment	Upland surface erosion (inclusive of ravine, gully, and wind erosion) causing detachment and transport of valuable soils and sediment to surface water, impacting aquatic life, and recreation.	
	Streams and Drainage Systems	Agricultural surface flow and drainage	Water moves quickly across agricultural fields causing concentrated flow paths which result in gully formation. In turn, high sediment and nutrient yields may occur, impacting drainageways and stream and lake health. Numerous forms of drainage such as public and private ditches, culverts, and tile drainage have been constructed in the watershed to move water out of agricultural fields. Drainage can cause downstream impacts, such as flooding and decreased water quality.	

Medium-High Priority Issues

Planning Region Prioritization Key: = high priority = medium priority = low priority

Table A2. Medium-high priority issues within the planning area along with planning region rankings. All high priority (dark blue) indicates a watershed-wide issue.

Resource Category	Resource	Issue	Issue Description	Planning Region Prioritization
	Wetlands	Decline in wetland quality and quantity	In the last century, land use and land management decisions have resulted in a loss of wetlands or decline in the quality of wetlands. These changes have impacts on habitat as well as issues connected to surface water such as decreased storage.	
	Streams and Drainage Systems	Streambank erosion	Eroding banks along streams and ditches have resulted in issues that impact drainage, infrastructure, aquatic life, aquatic recreation, and water quality.	
	Streams and Drainage Systems	Loss of water storage	Lost storage can impact chronic bank-full flooding, increase crop damage, drive cross-watershed flood events, and increase flashiness of ditch systems. Insufficient storage of water in lakes due to increased inflows and lack of structural release of water downstream is increasing water levels in waterbodies. The sizing of infrastructure impacts flow and storage, such as culverts, can also be connected to this issue.	

Resource Category	Resource	Issue	Issue Description	Planning Region Prioritization
	Aquifer	Groundwater quantity protection	Water quantity in Well Head Protection Areas (WHPAs) and Drinking Water Supply Management Areas (DWSMAs) can be impacted if recharge is not balanced against withdrawals. These public water supplies may need to be protected against depletion.	
	Drinking Water	Groundwater quality/protection of private wells and public water supplies	Groundwater is threatened due to unsealed abandoned wells and Subsurface Sewage Treatment Systems (SSTS) that are failing or are an immediate threat to public health. Due to the significant reliance on groundwater for personal consumption, private well owners should be educated about potential contamination from naturally occurring (e.g., arsenic and manganese) and human made sources (e.g., pesticides and nitrates). Additionally, WHPAs and DWSMAs may need protection to safeguard drinking water quality.	

Measurable Goals

To successfully implement the CWMP and make progress towards improving priority issues, setting and tracking measurable goals are essential. Demonstrating progress towards goals over the plan's 10-year timeframe will ensure its success. To do this, specific, measurable outcomes were set to track progress. These goals were set either on a watershed-wide basis or a planning region basis consistent with the manner in which an issue was prioritized (**Table A1** and **Table A2**).

The Prioritize, Target, and Measure Application (PTMApp; https://ptmapp.bwsr.state.mn.us/) was used in this plan to develop goals and identify the locations of structural and non-structural practices that would be both cost effective and help make progress towards the plan's goals. The Total Maximum Daily Load (TMDL) and Watershed Restoration and Protection Strategy (WRAPS) were used with PTMApp projections and helped define measurable goals for the CWMP. In addition, existing state studies, along with Steering Team and Advisory Committee input, was used to craft measurable goals that could be accomplished within the plan's lifespan and make progress towards improving the priority issues. **Table A3** provides an outline of the measurable goals that are described in detail in **Section D**.

*Table A3. Measurable goals outline described in **Section D**. Short-term goals are set for 10 years and long-term goals are the desired future condition.*

Measurable Goal	Short-Term Goal(s)	Long-Term Goal(s)	Goal Focus
Soil Health	▪ Implement soil health practices on at least 5,000 acres per year.	▪ Have healthy and productive soils on all working lands within the watershed.	Watershed-wide
Erosion and Sediment	▪ Reduce sediment by a total of 8,600 tons per year from the two planning regions prioritizing this goal.	▪ Reduce sediment by a total of 31,200 tons per year from the two planning regions prioritizing this goal.	Upper Big Stone Lake, Stony Run Creek
Water Storage (Agricultural Surface Flow and Drainage and Loss of Water Storage)	▪ Add 6,210 acre-feet of storage across the watershed (1,580 acre feet in Upper Big Stone Lake and Stony Run Creek, 3,500 acre-feet watershed-wide).	▪ Add 33,848 acre-feet of storage across the watershed (17,380 acre feet in Upper Big Stone Lake and Stony Run Creek).	Watershed-wide (Agricultural Surface Flow); Upper Big Stone Lake, Stony Run Creek (Loss of Water Storage)
Decline in Wetland Quality and Quantity	▪ Create, restore, protect, or enhance 800 acres of wetland and 14,000 acres of adjacent uplands cumulatively in the two high priority planning regions.	▪ Establish and maintain healthy and resilient wetlands across the watershed.	Stony Run Creek, Five Mile Creek
Streambank Erosion	▪ Implement eight projects that aid in stabilizing streambanks in planning regions that are a high priority for this goal.	▪ Create stable and healthy streams and drainage systems throughout the watershed.	Upper Big Stone Lake, Stony Run Creek

Measurable Goal	Short-Term Goal(s)	Long-Term Goal(s)	Goal Focus
Groundwater Quantity Protection	▪ Add a cumulative total of 1,500 acres per year of groundcover that will support groundwater quantity protection within the two planning regions that are prioritizing this goal.	▪ Create a resilient groundwater supply.	Upper Big Stone Lake
Groundwater Quality/Protection of Private Wells and Public Water Supplies	▪ Add a total of 1,500 acres per year of practices protect groundwater quality within the two priority planning regions.	▪ Meet Minnesota nitrogen reduction goal for drinking water and groundwater protection. Goal is based on the Minnesota Groundwater Protection Act of 1989.	Upper Big Stone Lake

Targeted Implementation

To successfully implement the CWMP, a series of action tables were developed that outline actions that can be taken to address specific issues in the watershed at the planning region scale. These action tables outline where and when the actions should be targeted, how they will be measured, and the costs of implementation. These tables can be found in **Section E** of the CWMP. There are seven implementation programs, as outlined in **Figure A3**.

The resources available (both staff time and funding) over the 10-year implementation period will drive the progress made in implementing the programs of this CWMP. There are three funding levels for this CWMP, shown in **Table A4**. This plan is expected to be implemented at Funding Level 2 with the intent of pursuing resources to achieve several actions budgeted for Funding Level 3. **Table A5** shows the anticipated funding Level 2 allocation for each of the plan programs.

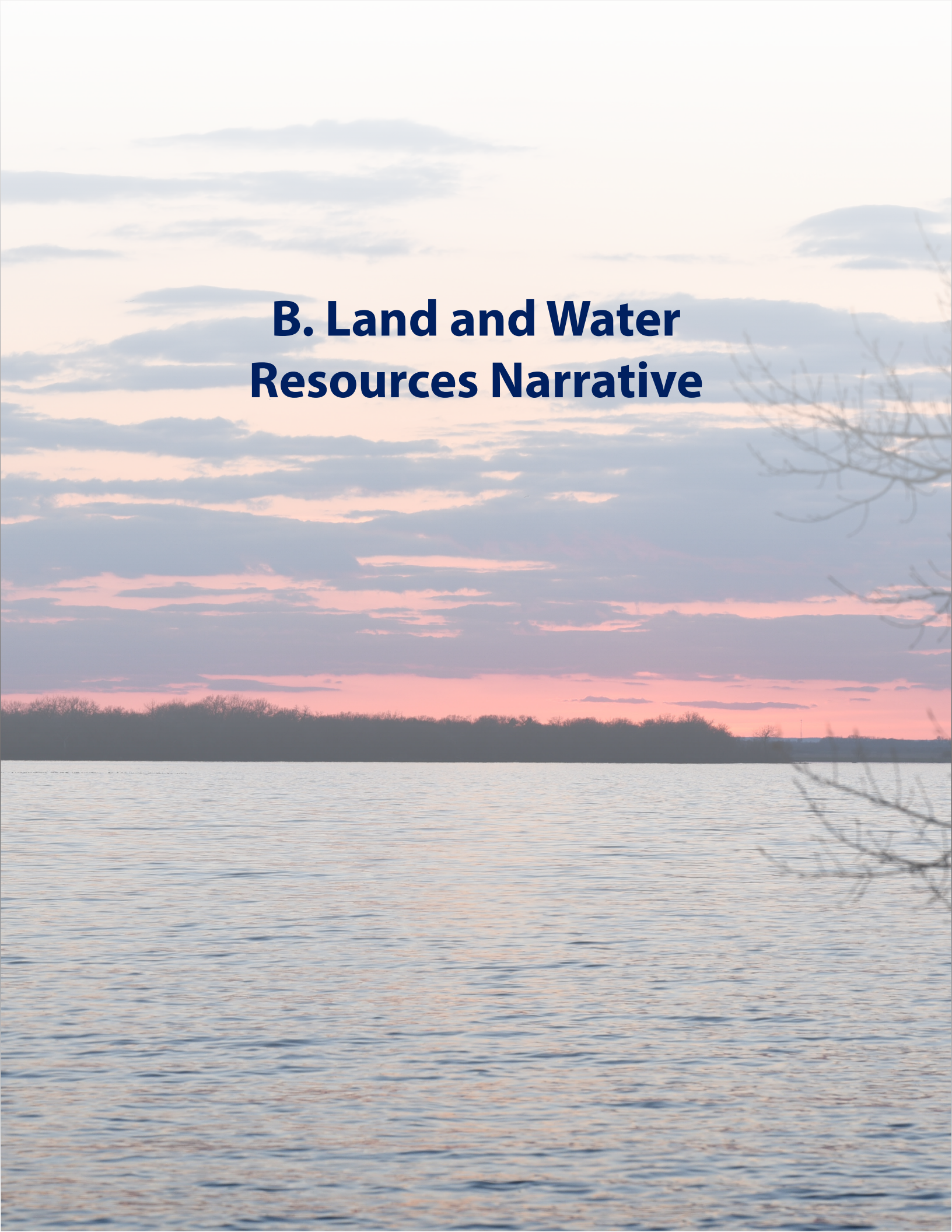
Table A4. Funding levels and descriptions

Funding Level	Funding type	Description
1	Current Funding	This is baseline funding for current programs and projects.
2	Current Funding + WBIF	Level 2 funding assumes current funding will remain available and WBIF funding will add an additional $250,000/year
3	External Funding	This includes additional sources of funding, including partners such as National Resource Conservation Service (NRCS), United States Fish and Wildlife Service (USFWS), Sustainable Forest Incentive Act (SFIA), Conservation Reserve Program (CRP), and Lessard-Sams.

*Figure A4. Implementation Programs described in **Section F.***

Table A5. Estimated cost of implementing the CWMP under funding Level 2 (Current + WBIF)

	Funding Level 2 (Current + WBIF)	
Implementation Program	Est. Annual Cost	10-year Cost
Project & Practices	$390,520	$3,905,200
Research and Monitoring	$36,000	$360,000
Education & Outreach	$45,600	$456,000
Regulatory	$24,103	$241,030
Capital Projects + Maintenance	$405,296	$4,052,964
Administration and Technical Assistance	$108,250	$1,082,500
Total	$1,009,770	$10,097,694



B. Land and Water Resources Narrative

B. Land and Water Resources Narrative

Introduction

The UMRW is in southwest Minnesota and is predominately an agricultural region. The Minnesota River flows along the southern border of the watershed and several of its major tributaries originate within the watershed, including Fish Creek, Five Mile Creek, Meadowbrook Creek, Salmonson Creek, and Stony Run. Additionally, the Little Minnesota River, Yellow Bank River, and Whetstone River are Minnesota River tributaries that originate in South Dakota.

The UMRW planning area incorporates the Minnesota portion of one major (HUC 08) watershed, Upper Minnesota **(Figure B1**). It also incorporates six sub-watersheds (HUC 10): Big Stone Lake, Lower Little Minnesota River, Marsh Lake, South Fork Whetstone River, South Fork Yellow Bank River, and Stony Run. The Upper Minnesota Watershed encompasses portions of Minnesota, South Dakota, and North Dakota. The Minnesota portion comprises approximately 37% of the total watershed area (approximately 2,132 square miles; 1,364,500 acres). The portion of the watershed in South Dakota encompasses approximately 63% of the watershed, while the small portion in North Dakota encompasses approximately 2.5 square miles (1,600 acres). The North and South Dakota portion of the watershed contributes water to the Minnesota River independently of the Minnesota portion of the watershed. The total area of the sub-watersheds (HUC 10) is approximately 1,195 square miles (764,800 acres), of which, approximately 658 square miles (421,350 acres) occur in Minnesota and 536 square miles (343, 475 acres) occur in South Dakota.

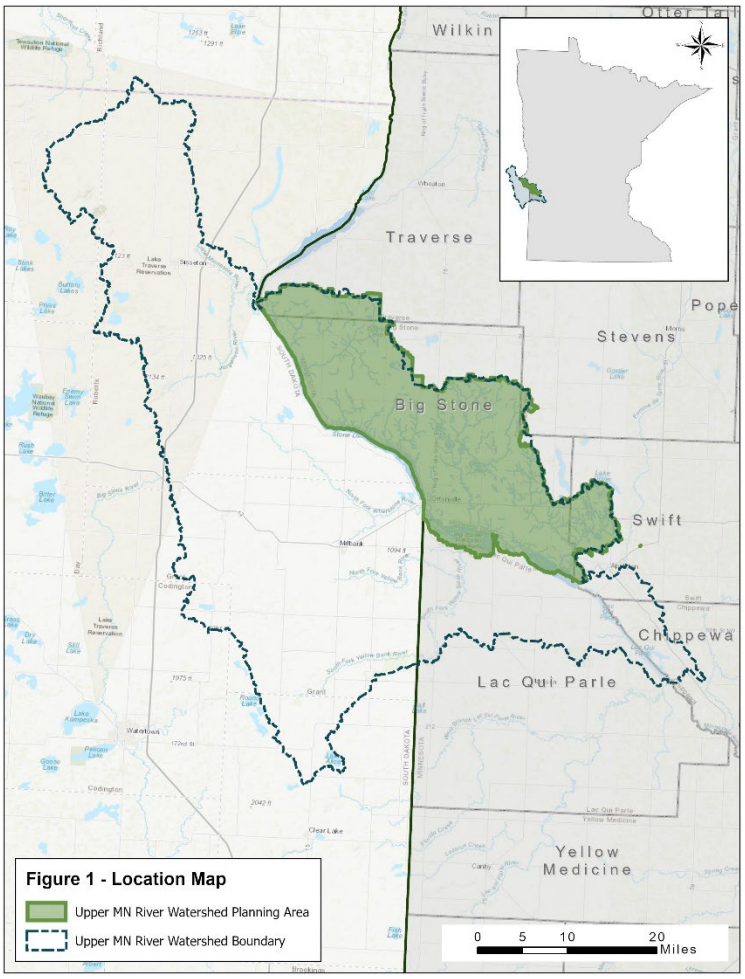


Figure B1. UMRW Location Map.

The Upper Minnesota Major Watershed was split into three areas for planning purposes. The southern portions of the watershed were adopted for the Chippewa and Lac Qui Parle 1W1P. The UMRW planning area is in Big Stone, Lac Qui Parle, Stevens, Swift, and Traverse counties. The most populated city in the Upper Minnesota River planning area is Ortonville with an estimated population of 1,808, followed by Browns Valley (557 people) and Clinton (417 people) (US Census Bureau 2020).

History

The pre-settlement vegetation was predominately made up of tallgrass prairie, wet prairie, open water lakes, river bottom forest, and oak opening and barrens (DNR, 2021b). Lakes and wetlands were created from receding glacial sheets and are scattered across the region. Lowlands and floodplain forests are scattered throughout the Minnesota River Valley. The tall grass prairie has since been converted into agricultural production where small grain and row crop production and pastureland dominate the landscape. In recent years, the land use trends have seen an increase in row crop production and a decrease in small grain production. The predominate crops within the UMRW are soybeans and corn (DNR, 2019a; MPCA). Cattle is the predominant livestock on pastures.

Native Tallgrass Prairie. Photo Credit: Explore Minnesota.

The Minnesota River Valley and surrounding landscape were once populated by the Yankton and Yanktonai Dakota (Sioux, Očhéthi Šakówiŋ). As settlers moved in, the Dakota people were forced to settle along the Minnesota River. Tensions began to rise over land, lack of food, and failed treaty, which eventually resulted in the Dakota War of 1862. The war sent the Dakota fleeing the region to avoid the battle. Today, some of the Dakota people remain along the Minnesota River on designated reservations.

Topography, Soils, and General Geology

The geologic features within the UMRW were formed by the advancement and receding of glaciers during the latest Wisconsin Glaciation period (DNR, 2019a). The receding and melting of the glaciers from this period developed Glacial Lake Agassiz, which covered parts of Minnesota, North Dakota, and South Dakota. The glacial advancements and receding influenced the development of till plains, outwash plains, and supraglacial drift complexes that dominate the watershed's surficial geology. The Minnesota River Valley and present-day Minnesota River were developed from the draining of Glacial Lake Agassiz as it overtopped a moraine dam. The outlet from Glacial Lake Agassiz was named the Glacial River Warren, which cut out the Minnesota River Valley as it flowed generally east to southeast (DNR, 2019a). The Minnesota River Valley borders the southern portions of the UMRW planning area.

Minnesota River Valley. Photo Credit: MPR News, Jefferey Thompson.

The UMRW is in the Northern Glaciated Plains (Ecoregion Level III) and the Tewaukon/Big Stone Stagnation Moraine (Ecoregion Level IV) (USEPA, 2020). The Northern Glaciated Plains ecoregion consists of flat to gently rolling hills that are

broken up by a high density of wetlands. This ecoregion has highly fertile soils, so settlers converted the prairie land into row crops and small grains over much of the landscape. The Tewaukon/Big Stone Stagnation Moraine ecoregion is the transition zone between the Red River Valley and the Minnesota River Valley. The topography in this ecoregion is gently undulating with a high density of lakes. The Minnesota River Valley is characterized by steep slopes, with elevation changes between 100 and 200 feet.

The fertile soils within the UMRW are predominately loam, sandy loam, clay loam, silty loam, and silty clay textured soils (USDA-NRCS, 2022). The soils are categorized as well- to moderately well-drained broken up by large tracts of somewhat poorly drained soils. The most commonly found soils are the Hamerly-Parnell complex, Esmond-Heimdal loams, Hattie silty clays, Hamerly-Lindaas complex, and Fram-Vallers-Parnell complex (USDA-NRCS, 2022).

Existing Land Uses and Anticipated Land Use Changes

Much of the watershed's pre-settlement landscape makeup included tallgrass prairie on well-drained fertile soils and wet prairie on poorly drained soils (DNR, 2019a; USEPA, 2020). As the UMRW was settled, the fertile soils were ideal for growing small grains such as wheat, barley, rye, oats, and row crops such as corn and soybeans. As agricultural practices evolved, drainage tiles were placed in poorly drained soils and put into small grain or row crop production. Agricultural trends over the years have shown an increase in row crop production and an equivalent decrease in small grain production (DNR, 2019a). The land uses within the watershed are expected to stay consistent in coming years. Drainage and land use practices have impacted the groundwater quality and quantity in this watershed and management plans and strategies are targeting these issues.

Based on the National Land Cover Database (2019), the UMRW is dominated by cultivated crops, which makes up approximately 68% of the land use (total 222,500 acres), followed by 12% wetlands (39, 500 acres), 8.8% open water (28,800 acres), and 4.7% hay/pasture lands (15,400 acres) (**Figure B2** and **Figure B3**). Currently, most of the watershed's agricultural production is made up of soybeans (31.3%; 102,370 acres) and corn (27.1%; 88,615 acres). Spring wheat, alfalfa, and fallow make up a combined 4.6% (15,250 acres) (NASS 2015).

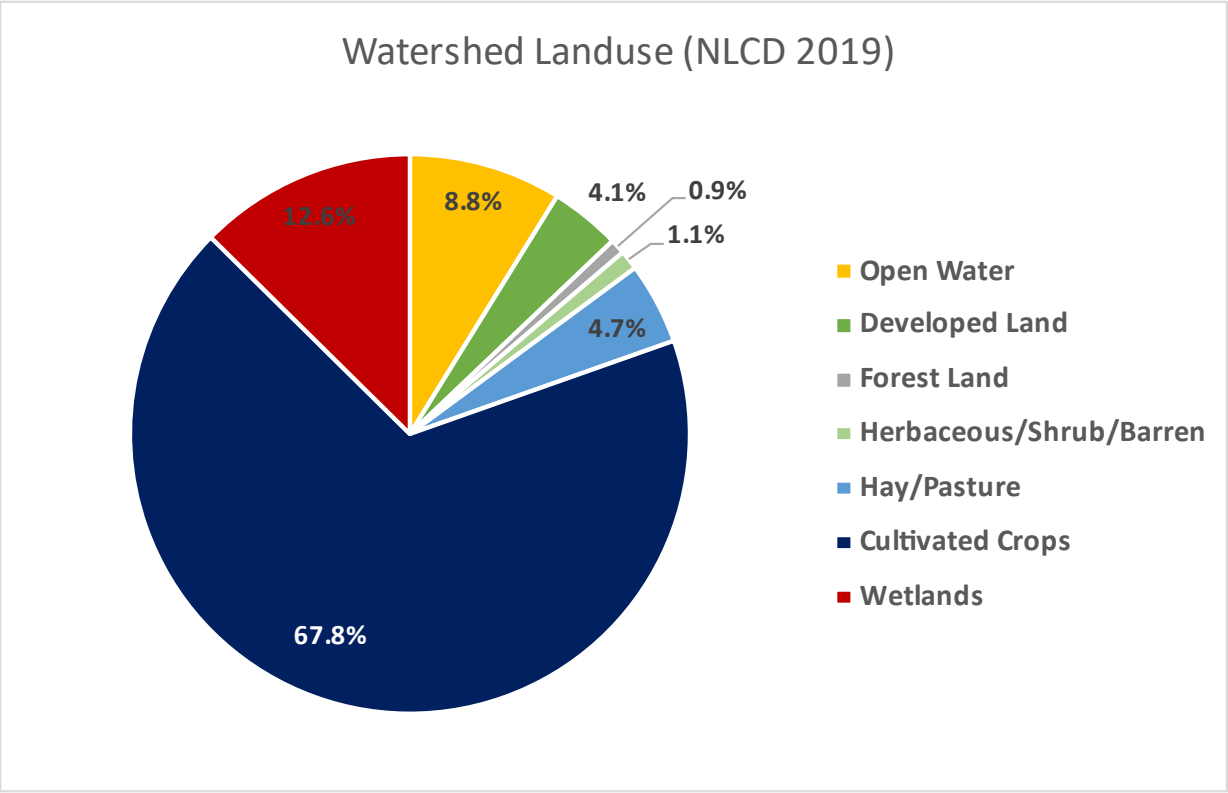


Figure B2. Land Use Upper Minnesota River Watershed (NLCD, 2019).

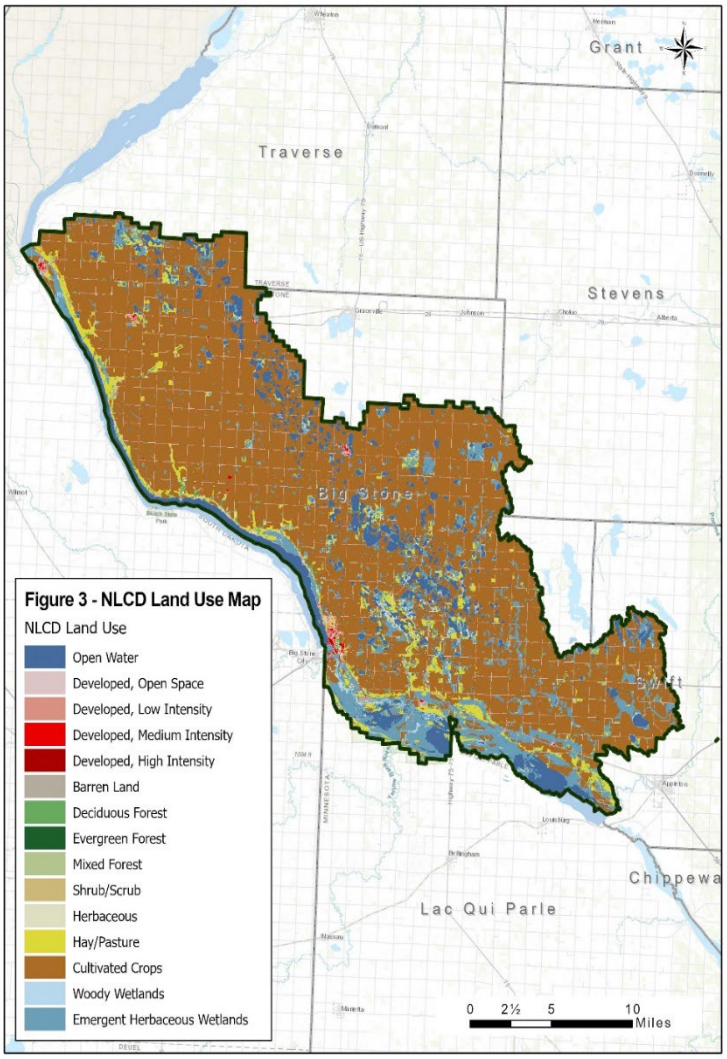


Figure B3. Upper Minnesota River Watershed Land Use Map (NLCD 2019).

Relevant Socio-Economic Information

In 2010, there were 10.61 people per square mile in the UMRW, while the 2020 census found that the watershed population decreased to 10.39 people per square mile (US Census Bureau, 2020). The cities within the UMRW—Barry, Beardsley, Browns Valley, Clinton, Correll, Odessa, and Ortonville—have an estimated combined population of 3,320 people.

The five counties that encompass the UMRW planning area have similar trends in education level. Based on the 2020 census, the percentages of each county's population that has a high school degree or higher are as follows:

- 92% of Big Stone County,
- 94% of Traverse County,
- 95% of Stevens County,
- 91% of Swift County, and
- 93% of Lac qui Parle County.

The percentages with a bachelor's degree or higher includes:

- 18% of Big Stone County,
- 16% of Traverse County,
- 30% of Stevens County,
- 21% of Swift County, and
- 19% of Lac qui Parle County (US Census Bureau, 2020).

The professional breakdown of the counties that make up the UMRW are as follows:

- 28.4% of the population works in educational services, health care, and social assistance;
- 13.1% in agriculture, forestry, fishing and hunting, and mining;
- 12.4% in manufacturing; and
- 9.7% in retail trade.

The MPCA developed a map of environmental justice areas of concern, which is used to understand what areas in the state may have marginalized communities adversely affected by environmental issues. All but a small portion of the watershed in Stevens County has been identified as an area of concern due to a large percent of the population living in poverty. The MCPA defines an area of concern for poverty as having over 35% of the population below 200% of the federal poverty threshold.

Climate and Precipitation

The climate of the UMRW includes cold winters with an average minimum temperature of 8° Fahrenheit (1895-2021) and mild summers with an average maximum temperature of 77° Fahrenheit (1895-2021) (DNR, 2019b; DNR, 2022c). The growing season is generally five months long (May-September), in which the temperature averages 64.8° Fahrenheit. The average annual temperature in the UMRW has been increasing by 0.22° Fahrenheit per decade since 1895. The average annual rainfall in the UMRW is approximately 23 inches, with most of the rainfall occurring in the month of June. Annual precipitation has been trending upward with an increase of approximately 0.21 inches of rain per decade since 1895 (DNR, 2019b; DNR, 2022c). According to data from 1991-2020, the average number of frost-free days in the UMRW is approximately 140 days with the average first fall frost occurring October 1st (NOAA, 2020).

Surface Water

Streams

The Minnesota River borders the southern portion of the watershed planning area and is the main waterbody where most of the streams drain (DNR, 2019a). The Minnesota River is a tributary of the Mississippi River and originates from Big Stone Lake along the Minnesota-South Dakota border. From the outlet of the Big Stone Lake, the Minnesota River meanders 332 miles southeast to the City of Mankato, then meanders to the northeast until it merges with the Mississippi River just south of Minneapolis-St. Paul. The major tributaries of the Minnesota River include the Little Minnesota River, Yellow Bank River, Whetstone River, Fish Creek, Five Mile Creek, Meadowbrook Creek, Salmonson Creek, and Stony Run (DNR, 2019a). The Little Minnesota River is approximately 71 miles long, flows generally northwest to southeast, and drains into the Minnesota River at its headwaters (DNR, 2022a). The Yellow Bank River (12 miles long) and the Whetstone River (12.7 miles long) are both tributaries of the Minnesota River that originate in South Dakota and flow generally from southwest to northwest. Fish Creek (9.9 miles), Five Mile Creek (10 miles), Meadowbrook Creek (7.8 miles), Salmonson Creek (6.2

miles), and Stony Run (14.5 miles) all originate within the watershed planning area, flow generally from north to south, and merge with the Minnesota River (DNR, 2022a).

Lakes

The UMRW planning area has a high density of lakes, many of which provide important ecosystem services such as water supply and recreation. There is a total of 171 Public Waters Basins, of which 30 are named lakes (DNR, 2022a). Of the 113 lakes with DNR Shoreland Classifications, three lakes are identified as General Development: Lake Traverse, Big Stone Lake, and Eli Lake (DNR, 2020b). These lakes provide important economic benefits to the UMRW planning area through recreational tourism. The remaining classified shoreland lakes are identified as Natural Environment. These lakes provide valuable habitat for an abundance of fish and wildlife species (DNR).

Big Stone Lake State Park. Photo Credit: Explore Minnesota

There are 14 lakes that have been identified as having various degrees of biological significance. Traverse, Big Stone, Marsh, Barry, and Swenson lakes are among those that have "Outstanding" biological significance to fish and wildlife; Marsh Lake has biological significance for goose management as well as pelican nesting and is home to the largest breeding population of American pelicans in North America, and Big Stone Lake produces healthy populations of walleye and perch (DNR). The largest lakes within the UMRW are Big Stone Lake (11,983 acres), Traverse Lake (10,848 acres), and Marsh Lake (4,461 acres). Both Big Stone Lake and Lake Traverse are border lakes between Minnesota and South Dakota. Big Stone Lake stretches 27 miles of the Minnesota-South Dakota border, while Lake Traverse stretches 16 miles. Only the southern tip of Lake Traverse is located within the watershed planning area.

Stormwater Systems, Drainage Systems, and Control Structures

City and town development has changed the way that water moves along the landscape. Impervious surfaces cause stormwater runoff, which increases the speed and volume of urban contaminants that reach a nearby waterbody through subsurface storm sewers. The UMRW's developed and urban areas make up 4% total watershed area (USGS 2019).

The streams within the UMRW have been heavily altered or impounded to maintain agricultural operations and provide flood control/protections. This has caused several runoff-related issues, including nutrient overloads from agricultural lands, unstable shorelines, gully erosion and concentrated flows, and loss of fish and wildlife habitats. Based on MPCA data, approximately 33% of the streams are altered, 32% are natural, and 3% are impounded (MPCA 2018). Most of the altered watercourses occur along the upstream stretches of watershed streams. The streams become more natural along the lower stretches before draining into the Minnesota River. Most of the impoundments occur along the Minnesota River (DNR, 2015).

Dams, roadway culverts, and water control structures are constructed to provide flood retention and storage. These are important in protecting residents and maintaining the integrity of infrastructure. There are 11 dams located within the UMRW with Big Stone Lake Dam and Browns Valley Dike being the two major dams within the watershed (DNR 2022b).

Flooding within the UMRW is driven by land use changes, precipitation events, and spring snowmelt, which has resulted in increased runoff within the watershed. This has resulted in flood events, erosion issues, and decreased water quality of streams.

Surface Water Quality

In 2022, the MPCA published the WRAPS report for the Minnesota River Headwaters Watershed, which this planning area is a portion of. The monitoring efforts assess surface waters to see if they can provide fishable and swimmable beneficial uses. The identified impairments are paired with restoration opportunities that local governments can pursue to improve the water quality within the watershed.

The MPCA assessed 15 streams within the planning area portion of the watershed and found that 12 streams were impaired (**Figure B4)**. Ten streams had impaired aquatic life while nine had impaired aquatic recreation (MPCA, 2022). The main concerns for these streams include bacteria (*E. coli*), fish biotic integrity, and macroinvertebrate biotic integrity. The MPCA also assessed 16 lakes; five were identified as having aquatic recreation impairments and one was impaired for aquatic life (un-ionized ammonia). The impairments to these lakes include nutrient levels within the water column and mercury levels in fish tissues. The lake and stream impairments are predominately due to nonpoint source pollutants (approximately 99% of pollution). The main sources of pollutants were fertilizer and manure runoff from agriculture fields, failing septic systems, wildlife, bank erosion, and excessive peak flows. Best management practices (BMPs) such as grassed waterways, reducing tillage, cover crops, improving fertilizer and manure management, increasing crop diversity,

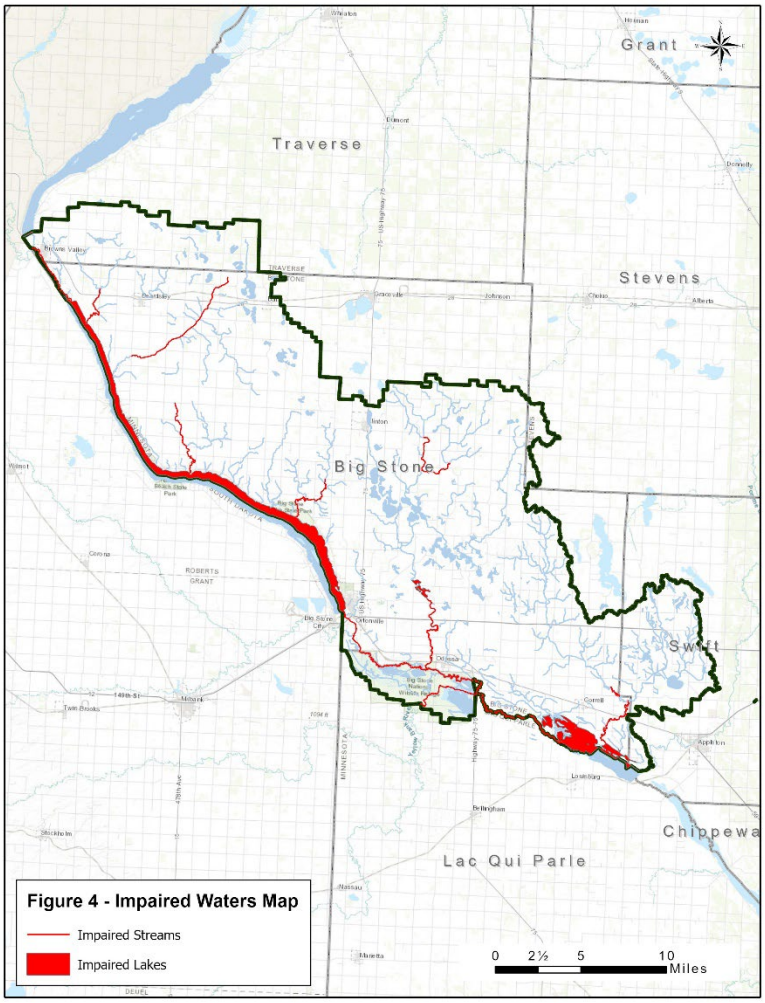


Figure B4. Impaired Waters of the UMRW (MPCA 2022).

implementing buffers, and improving pasture management are all suggestions to improve the water quality of the streams and lakes within the UMRW (MPCA, 2022).

Water-Based Recreation Areas

There are several water-based recreational areas in the UMRW. Big Stone Lake, Marsh Lake, Long Tom Lake, and Botker's Slough provide public trailer launches for boating, fishing, and swimming (**Table B1**; DNR, 2020a). Barry Lake, Shible Lake, Marsh Lake, and the Minnesota River each have public carry-in launching areas that provide canoeing, kayaking, and fishing opportunities.

There are 24 Wildlife Management Areas (WMAs), two National Wildlife Refuges (NWRs), and one State Park within the UMRW that provide bird and wildlife watching. Although much of the Lac qui Parle WMA is outside of the watershed, its northern portions cover much of the southern tip of the UMRW planning area. Approximately 11,586 acres of the Big Stone National Wildlife Refuge resides within the UMRW and a glimpse at several wildlife species include bobolinks, black terns, and white pelicans (USFWS). Big Stone State Park is located along the north shore of Big Stone Lake, just north of Ortonville (DNR). This park provides public access to swimming beaches, campgrounds, bird watching, and exceptional walleye and perch fishing. In addition, the Minnesota River is designated as a Minnesota State Water Trail for kayak and canoeing utilization.

Table B1. Recreational Opportunities in the UMRW.

Water-Based Recreation Areas		
Waterbody	**Type**	**Recreation Opportunities**
Big Stone Lake	Lake	State Park - camping, fishing, bird watching, swimming, waterfowl hunting, hiking
Marsh Lake	Lake	Bird watching, waterfowl hunting, fishing
Long Tom Lake	Lake	Fishing, boating, canoeing, kayaking
Barry Lake	Lake	Fishing, canoeing, kayaking
Shible Lake	Lake	Fishing, canoeing, kayaking
Minnesota River	River	State Water Trail – canoeing, kayaking, swimming, fishing, bird watching

Winter recreation opportunities include ice fishing and snowmobiling on state designated trails. Two snowmobiling trails, the Big Stone Lake Sno-Rider trail (Trail No. 10) and Ridge Runner Trail (Trail No. 71), have approximately 100 miles of trail within the UMRW.

Groundwater Resources

Three Minnesota Groundwater Provinces intersect the UMRW with varying degrees of groundwater availability. Most of the watershed is in the Western Province and the Central Province (DNR, 2021a, 2022d). The Western Province is made up of fine silts and clays that limit aquifers, other than the exception of localized surficial sands that provide moderate aquifers. The Central Province is made up primarily of sands and a good source of buried and surficial sand aquifers. The Minnesota River at the southern tip of the watershed is in the Arrowhead/Shallow Bedrock Province. This province has exposed or shallow bedrock with limited aquifer resources (DNR, 2022d).

The primary supply of drinking water is through private wells, community wells, or other public water suppliers. Per Minnesota Well Index Data, the UMRW planning area has a total of 569 drinking water wells (MDH, 2021). There are seven Wellhead Protection Areas, each correlating to a city or town, including Odessa, Browns Valley, Lismore Colony, Ortonville, Beardsley, and Bellingham (DNR, 2021b). These are also identified as DWSMAs and the majority have a moderate to high vulnerability to groundwater contamination (**Figure B5**). The main concern at a watershed level is nitrate

contamination brought on by agricultural practices, poor well construction, and screening wells located near the top of aquifers (Big Stone County, 2013).

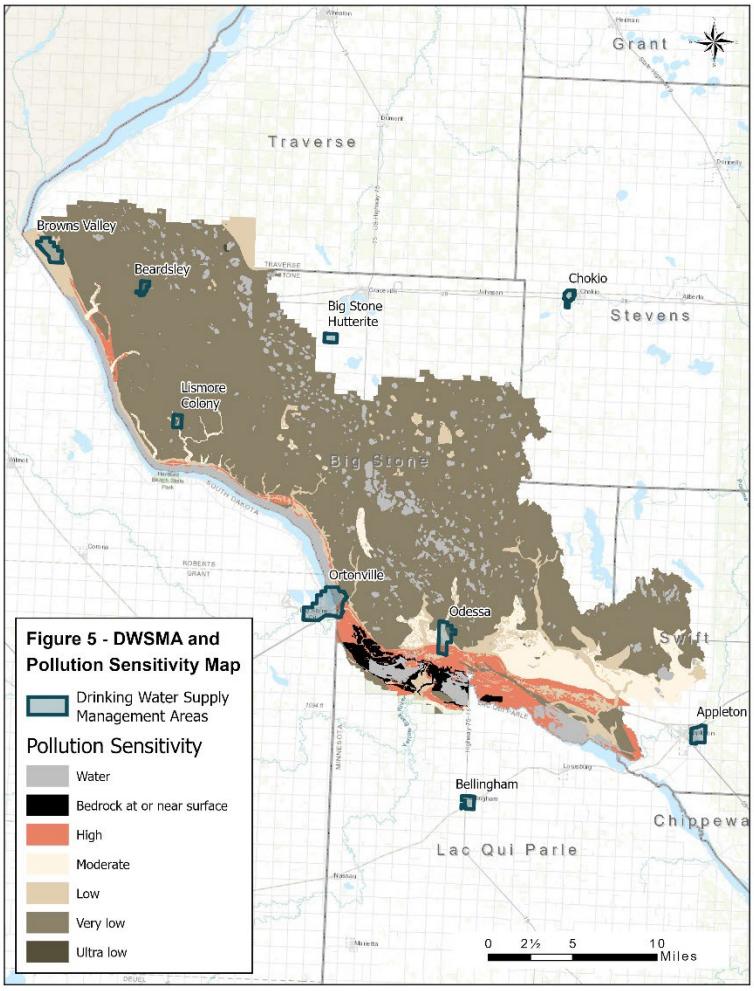


Figure B5. DWSMAs and Pollution Sensitivity of Near-Surface Materials.

Additionally, the watershed's groundwater sensitivity to pollution is characterized by its rivers and stream valleys. The Minnesota River Valley is highly sensitive to groundwater pollution while the smaller stream valleys range between low and moderate sensitivity to groundwater pollution (**Figure B5**) (DNR, 2022d). The landscape outside of these valleys have a very low sensitivity to groundwater pollution.

Fish and Wildlife Habitat and Rare and Endangered Species

The UMRW is located within the Prairie Parkland Province, the North Central Glaciated Plains section, and the Minnesota River Prairie subsection (Minnesota Ecological Classification System). The watershed's pre-settlement vegetation was predominately tallgrass prairie broken up by wet prairies. Currently, the watershed has been extensively converted into agricultural production (DNR, 2019a). The watershed has numerous native plant communities, rare plants and animals, and other rare features identified by Minnesota Biological Surveys, including one calcareous fen located along the Stony Run River north of Odessa.

There are 116 Species of Greatest Concern (SGCN) and 52 federally or state-listed threatened or endangered species that live or potentially live in the Minnesota River Prairie subsection (DNR, 2006). Of these species, 56% are bird species, 10% are mollusks, 9% are insect, and 8% are mammal species. The remaining 17% of SGCN within the subsection are split between amphibians, reptiles, spiders, and fish.

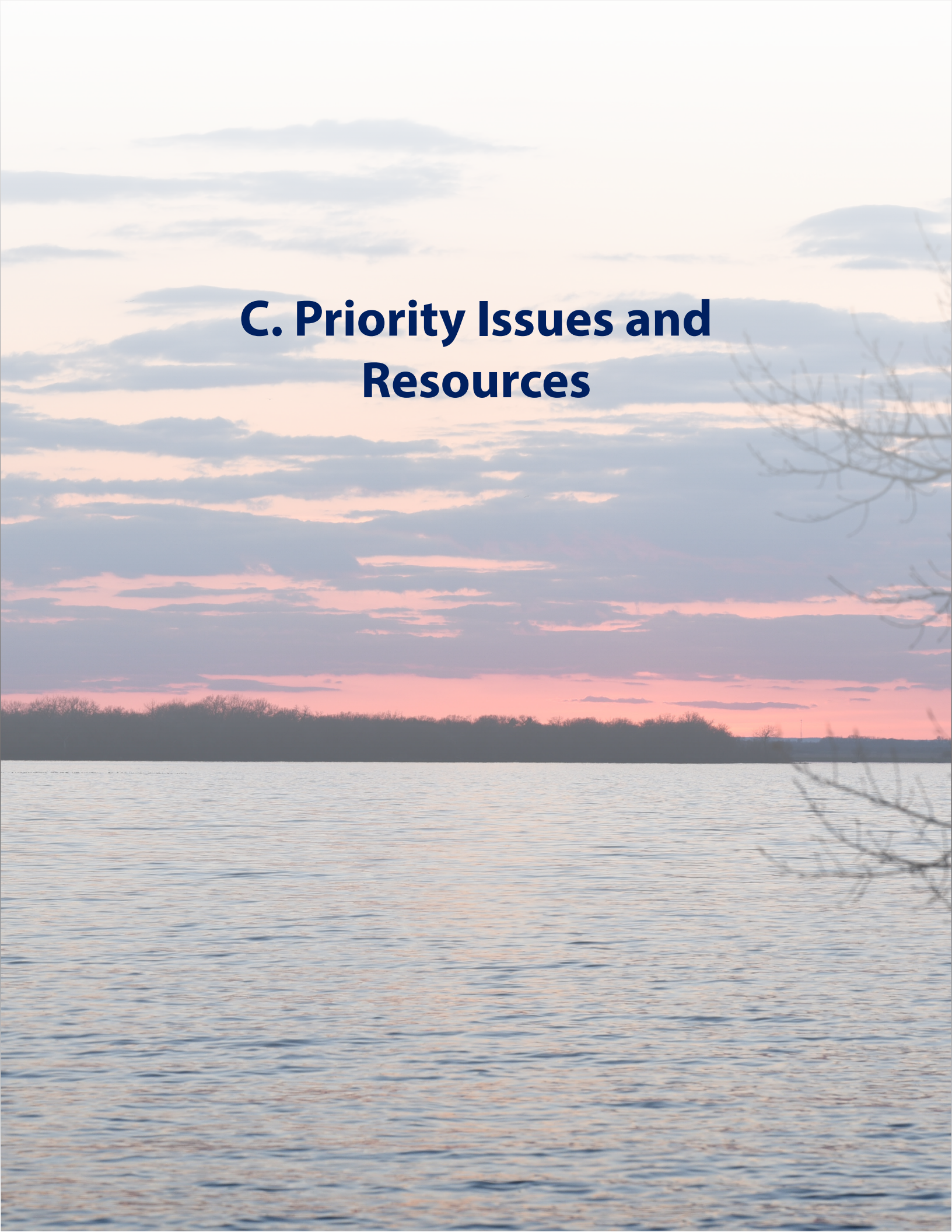
The threats that lead to the listing of a particular species are linked to habitat loss, destruction from human interventions, and land use changes. As habitats become degraded, there is an increased risk of invasive species colonization that out compete important native communities. Several terrestrial invasive species live in the Upper Minnesota Watershed, including Queen Ann's Lace, wild parsnip, leafy spurge, tansy, and crown vetch. The curly leafy pondweed is the only confirmed aquatic invasive species (AIS) within the watershed. Targeting practices that manage and prevent the spread of

invasive species is a key component to protecting and improving federal and state threatened and endangered species. Federally listed species identified within the UMRW are included in **Table B2** (USFWS, 2021). There are no critical habitats located within the watershed.

Table B2. Threatened and Endangered Species in the UMRW.

Threatened and Endangered Species			
Species Name	**Common Name**	**Type**	**Status**
Myotis septentrionalis	Northern long-eared bat	Mammal	Threatened
Calidris canutus rufa	Red knot	Bird	Threatened
Hesperia dacotae	Dakota skipper	Insect	Threatened
Danaus plexippus	Monarch butterfly	Insect	Candidate
Oarisma poweshiek	Poweshiek skipperling	Insect	Endangered
Platanthera praeclara	Western prairie fringed orchid	Flower	Threatened

The Minnesota Biological Surveys of the UMRW indicate that there are 202 rare features occurrences, which include 15 vertebrate species, 13 invertebrate species, 28 vascular plant species, one fungus species, colonial nesting sites, and mussel sampling sites. There are 394 identified native plant communities (total 11,524.25 acres) with various degrees of biodiversity significance. These communities are important to the conservation and recovery of rare species and threatened and endangered species.



C. Priority Issues and Resources

Section C. Priority Issues

This section lays out the issues that this watershed plan seeks to address. **Issues** are problems the watershed is facing (i.e., erosion leading to sediment in streams, farming practices delivering nutrients to surface water) that affect a resource. **Resources** are natural features in the watershed that can be grouped for management activities. Issues are grouped by the resource they affect for management purposes. After issues are determined and the impacted resources are identified, issues can be prioritized according to how significant the impacts are and how available funding/resources are to address them over the next 10 years. The following section describes how issues were selected and prioritized with input from the public and planning committees.

Issue Compilation

Existing reports

The first step in determining which issues should be included in this plan was to gather existing information on the watershed. This includes the following:

- County water plans:
  - Big Stone, Lac qui Parle, Traverse, Stevens, and Swift counties
- Upper Minnesota River Watershed District 10 Year Plan
- State reports, which were reviewed to pull out common issues affecting the watershed:
  - WRAPS
  - Watershed Monitoring and Assessment Report
  - Watershed Stressor Identification Report
  - DNR Watershed Characterization Report

Comment Letters

In addition to gathering issues in existing reports, state agencies were requested to submit letters on what issues each agency felt was a priority to address in the plan. Letters were received from the DNR, BWSR, MDH, MPCA, MDA, and Big Stone National Wildlife Refuge (part of the USFWS).

Issues from both existing reports and state letters were compiled. Issues were tallied based on if they were referenced within the reviewed sources. Issues with multiple mentions were considered primary issues affecting the watershed. Issues were discussed and approved by the Steering Committee.

Resource Categories

Groundwater

Drinking water

Aquifers

Habitat

Aquatic

Terrestrial

Wetland

Land Stewardship

Agricultural lands

Rural and Urban Communities

Surface Water

Streams and drainage systems

Lakes

Resource categories were defined by the Steering Team:

- Groundwater,
- Habitat,
- Land Stewardship, and
- Surface Water.

Each of these contain multiple specific resources, for example, the habitat category is further separated into aquatic, terrestrial, or wetland habitats. Issues are put into resource categories based on which resource they most affect as many issues overlap and impact more than one resource.

Issue Prioritization

After the final list of issues was compiled with input from existing reports, state agencies, and planning committees, the issues were ranked and prioritized to identify the issues to focus on during implementation.

A two-step process was used to establish the final rank and priority of issues:

1. **Initial Ranking** - Input from a public kick-off meeting, past plans, existing studies (e.g., WRAPS), and 60-day comment letters were combined to create an initial ranking and priority of each issue.
2. **Committee Ranking** - These ranks were then adjusted by the steering team, with input from the advisory committee to establish final priorities based on local knowledge of the watershed and expert opinion. The policy committee approved the final issue prioritization.

Initial Ranking of Issues

Public Kick-off

Public input was an important part of ranking the priority levels considered during the planning process. A public kick-off meeting was held on July 28th, 2022, in Clinton, MN. There, the 1W1P purpose was explained to members of the public, who were invited to provide input on the

importance of issues by placing sticky dots next to them on tables adjacent to maps representing the location of the issues. The sticky note count was summed for each issue. The count was ordered highest to lowest, divided into three groups, and categorized as high, medium, or low. The high, medium, or low categorization by the public was used during the issue prioritization process described in the following section.

Scoring

Issues were first prioritized according to their presence in watershed plans, reports, and state letters by receiving a point for each item they were mentioned in. Each point was summed to get a ranking based on the sources, so issues were assigned a score 0-6 for local plans (county and watershed district plan), 0-4 for existing study, and 0-6 for comment letters. Each was then ordered high to low and divided into three groups that were then assigned high, medium, or low classifications.

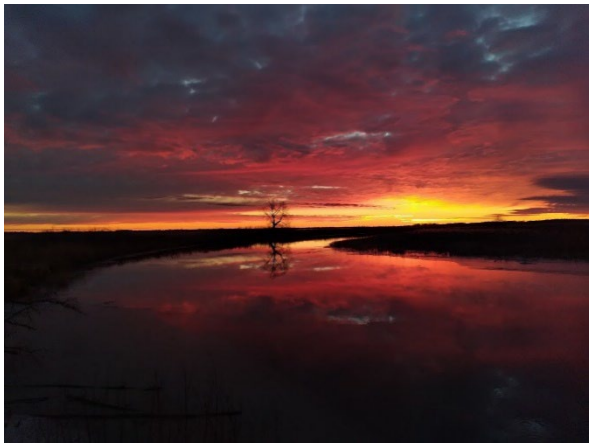


Photo Credit: Isaac Johnson (former SWCD staff).

The result is the equally weighted issue prioritization from high to low for local water plans, existing studies, comment letters, and public input. High was a 3, medium a 2, and low a 1. The sum of the rankings for each of the four sources was then summed with the highest priority issues at a 12 and the lowest at a 4. Rankings 4-12 were divided into three groups, with the largest numbers considered to be high priorities, middle numbers assigned medium priority, and smallest numbers a low priority. This resulted in six high priority issues, eight medium, and six low. Scoring was adjusted in the Policy Committee meeting when a fourth category was added. This is discussed in the following **Committee Ranking** section.

Committee Ranking

The Steering Team reviewed these issue ranks and used local expertise, with input from the advisory committee, to establish the final ranking of issues. The Steering Team created an additional ranking category, medium high, to focus implementation efforts on high and medium high issues. Committee rankings are included in the issues table in the local and written columns.

Final prioritization was decided at the September 14th, 2022, meeting and sent to the Policy Committee for final approval. See **Appendix C** for the full ranking table.

High — Three issues

- These issues are of the highest priority to address. The main focus of effect and initial Watershed-Based Implementation Funding (WBIF) funding will be put towards acheiving goals that improve these issues.

Medium High — Five issues

- These are a high priority to address but behind the highest category. These issues will have early effort and WBIF funding aimed at reducing them.

Medium — Five issues

- These issues significanly impact the watershed but are a smaller problem or have less of an impact on resources. These will have goals developed and will be addressed as effort and funding allow.

Low — Five issues

- These issues still impact the watershed but either have a smallest impact, or are unfeasible to address. These will not have goals developed to address them, and effort to address these priorities will only occur if additional state funding becomes available.

Planning Regions

Figure C1. Planning region map.

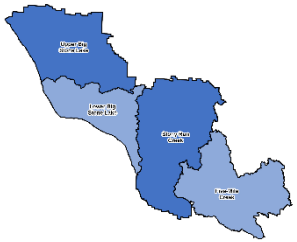
The UMRW has been divided into four planning regions to better target issues and activities to meet water quality goals. The planning boundary covers 511 square miles. With this large of an area, water quality problems can vary greatly by region. Planning region boundaries were created following HUC 10 lines, with the Big Stone Lake region separated into upper and lower by a HUC 12 boundary.

The planning regions in the UMRW include Upper Big Stone Lake, Lower Big Stone Lake, Stony Run Creek, and Five-Mile Creek. Issue prioritization in the table on the following pages is further divided into priority by planning region. One issue can have a low, medium, and high priority if the severity of the issue varied across planning regions.

Issue Tables

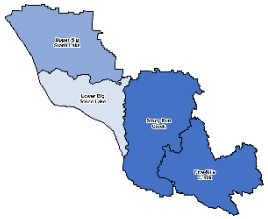
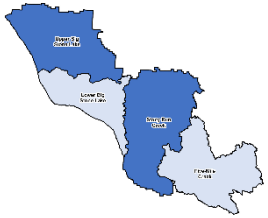
High Priority Issues

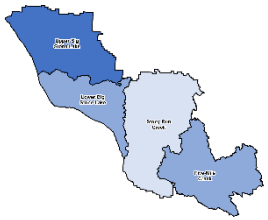
Planning Region Prioritization Key: = high priority = medium priority = low priority

Resource Category	Resource	Issue	Issue Description	Planning Region Prioritization
	Agricultural Lands	Soil health	Healthy soils provide increased agricultural productivity and benefits for water quality and water quantity. In addition, healthy soils provide opportunities to increase climate resiliency. Maintaining or improving soil health within the watershed can produce multiple benefits. This includes promoting a healthy soil structure that allows for better infiltration, reducing ponding and surface flow along with reducing nutrient loading into streams.	
	Agricultural Lands	Erosion and sediment	Upland surface erosion (inclusive of ravine, gully, and wind erosion) causing detachment and transport of valuable soils and sediment to surface water, impacting aquatic life and recreation.	
	Streams and Drainage Systems	Agricultural surface flow and drainage	Water moves quickly across agricultural fields causing concentrated flow paths, which result in gully formation. In turn, high sediment and nutrient yields may occur, impacting drainageways and stream and lake health. Numerous forms of drainage such as public and private ditches, culverts, and tile drainage have been constructed in the watershed to move water out of agricultural fields. Drainage can cause downstream impacts, such as flooding and decreased water quality.	

Medium-High Priority Issues

Planning Region Prioritization Key: = high priority = medium priority = low priority

Resource Category	Resource	Issue	Issue Description	Planning Region Prioritization
	Wetlands	Decline in wetland quality and quantity	In the last century, land use and land management decisions have resulted in a loss of wetlands or decline in the quality of wetlands. These changes have impacts on habitat as well as issues connected to surface water such as decreased storage.	
	Streams and Drainage Systems	Streambank erosion	Eroding banks along streams and ditches have resulted in issues that impact drainage, infrastructure, aquatic life, aquatic recreation, and water quality.	
	Streams and Drainage Systems	Loss of water storage	Lost storage can impact chronic bank-full flooding, increase crop damage, drive cross-watershed flood events, and increase flashiness of ditch systems. Insufficient storage of water in lakes due to increased inflows and lack of structural release of water downstream is increasing water levels in waterbodies. The sizing of infrastructure impacts flow and storage, such as culverts, can also be connected to this issue.	

Resource Category	Resource	Issue	Issue Description	Planning Region Prioritization
	Aquifer	Groundwater quantity protection	Water quantity in WHPAs and DWSMAs can be impacted if recharge is not balanced against withdrawals. These public water supplies may need to be protected against depletion.	
	Drinking Water	Groundwater quality/protection of private wells and public water supplies	Groundwater is threatened due to unsealed abandoned wells and Subsurface Sewage Treatment Systems (SSTS) that are failing or are an immediate threat to public health. Due to the significant reliance on groundwater for personal consumption, private well owners should be educated about potential contamination from naturally occurring (e.g., arsenic and manganese) and human made sources (e.g., pesticides and nitrates). Additionally, WHPAs and DWSMAs may need protection to safeguard drinking water quality.	

Medium Priority Issues

Medium priority issues are not prioritized but may receive attention if time and funding allow. These issues may also be addressed through partner groups.

Resource Category	Resource	Issue	Issue Description
Habitat	Aquatic	Changes in flow	Altered hydrology is creating flow regimes that are either too high or too low, impacting aquatic life.
Habitat	Terrestrial	Loss of habitat and organisms	Current land uses and land management can decrease the quantity and quality of terrestrial habitat, thereby impacting populations of terrestrial organisms like wildlife, plants, and insects.
Land Stewardship	Agricultural Lands	Grazing and livestock management	Over grazing or grazing in sensitive areas of the landscape like riparian areas can have impacts on water quality and quantity. Similarly, improperly managed livestock feeding operations can have impacts on surface waters.
Surface Water	Streams and Drainage Systems	Climate resiliency and changing precipitation	Increased precipitation frequencies, quantities, and annual timing is degrading water quality watershed-wide by worsening erosion and nutrient movement.
Surface Water	Lakes	Aquatic life and recreation	Surface waters can become impaired from a range of water constituents (e.g., dissolved oxygen, nutrients, pesticides, sediment, *E. coli*, mercury) that impact their use for recreation and aquatic life. There are several surface waters in the watershed impaired for aquatic life and recreation.

Low Priority Issues

It is not anticipated that low priority issues will be addressed within the 10-year timeframe of this plan by planning partners, but the issues may be moved up in priority as needed in future plan updates.

Both medium and low priority issues will not have goals that directly address them, these issues will be addressed through secondary benefits of goals designed for high and medium high issues. For example, projects and practices implemented to address high priority issues of soil health and erosion will hold soil on the landscape and reduce nutrient loading, helping to improve the low priorities of aquatic life and recreation as well as point source of pollution.

Resource Category	Resource	Issue	Issue Description
Habitat	Aquatic	Loss of Connectivity	Aquatic habitat can become disconnected in many ways. This includes latitudinal (e.g., floodplain connectivity) and longitudinal (e.g., obstructions in rivers that block fish passage, like a dam). These connectivity impacts decrease the quality of aquatic habitat.
Land Stewardship	Rural and Urban Communities	Sewage and wastewater treatment	Private SSTS and small communities that need improved wastewater treatment can have impacts on the water quality of downstream receiving waters.
Land Stewardship	Rural and Urban Communities	Stormwater and Development	As upgrades are made and development pressure intensifies, sustainable development will be necessary to help reduce environmental impacts. This includes issues that can arise associated with stormwater in developed areas.
Surface Water	Streams and Drainage Systems	Aquatic life and recreation	Surface waters can become impaired from a range of water constituents (e.g., dissolved oxygen, nutrients, pesticides, sediment, *E. coli*, mercury) that impact their use for recreation and aquatic life. There are several surface waters in the watershed impaired for aquatic life and recreation.
Surface Water	Streams and Drainage Systems	Point sources of pollution	Permitted municipal, agricultural, and industrial point sources of pollution impacting water quality conditions.

Inter-State Governance

Many of the areas in the planning boundary receive water from South Dakota (**Figure C1**). The issues identified and prioritized for this plan were developed specific to Minnesota. However, to fully address these issues, there will be times when inter-state collaboration with South Dakota is required. The planning partners have an established history of collaborating with South Dakota, such as collaboration with East Dakota Water Development District, and intend to continue to work as partners.

Emerging Issues

The issues table lists present issues affecting the UMRW where there is enough information to set measurable goals that will result in improvements to the issues. This is not a comprehensive list of issues affecting the watershed, other issues may be present but lack sufficient information to be listed as an issue considered for this plan. This section highlights some of these issues that may, over the lifespan of this plan or in future plans, become an issue that is the focus of implementation efforts.

Chloride

Road salt is applied on roads to reduce the risk of traffic accidents in the winter months. However, this salt, made up of sodium chloride, is not degradable and therefore builds up in the environment. Chloride concentrations are increasing in freshwater across the country since the 1950s, and the trend is expected to continue unless chloride application is drastically reduced. Minnesota has 50 waterbodies impaired for chloride, and while no waterbodies in the UMRW are impaired yet, chloride is increasing in the water (MPCA, 2022).

Road salt is not the only source of chloride (others include water softeners, fertilizer, and industrial discharge), but it is the largest source. The salinization of freshwater is a serious threat that not only harms lakes and rivers but also threatens drinking water as chloride infiltrates through soil and into shallow aquifers. High chloride in the environment impairs water quality and has also been shown to induce toxicity to roadside vegetation, corrode infrastructure, and degrade soil quality.

These serious impacts of chloride on the environment have led to a push to reduce chloride application wherever possible. The best way to reduce chloride is to put down less road salt. Road salt is often over applied and applied in weather where it is not effective. Training applicators can help to reduce chloride applications. Using alternative deicers besides chlorides are an option, although they are more expensive and come with their own set of environmental problems. More information about how chloride impacts Minnesota specifically can be found in the Statewide Chloride Management Plan: https://www.pca.state.mn.us/sites/default/files/wq-s1-94.pdf

Climate Change

As mentioned in **Section B**, temperatures and precipitation are increasing in the UMRW. Each decade, the annual average temperature increases by 0.22°F and precipitation increases by 0.21 inches (DNR, 2022c). Temperatures are warming the most at night and in the winter, impacting agriculture and recreation. Much of the increase in precipitation has been characterized by more intense weather events. In other words, getting more rain from one storm. Climate variability is expected to cause major issues during the next century, with increased flooding, drought, changing ecosystems, and agricultural challenges. Building a resilient watershed is vital for the people who live in the UMRW.

While climate change and climate resiliency (the ability to prepare for and respond to climate change) were not identified as priority issues for this planning effort, the planning partners acknowledge that this is an emerging issue that may need to be addressed during the lifespan of this plan. Where possible, the planning group will align actions with the State of Minnesota's Climate Action Framework (https://climate.state.mn.us/minnesotas-climate-action-framework). In general, when an action from this plan can also provide progress towards goals of the Climate Action Framework, this planning partnership will seek to align with the Climate Action Framework.

Contaminants of Emerging Concern

Contaminants of emerging concern (CECs) are a class of compounds, including pharmaceuticals, industrial chemicals, detergents, insecticides, flame retardants, and more that have been found in the environment. They enter our lakes, streams, and soils from industrial discharge, wastewater treatment plants (which do not treat CECs), and stormwater runoff. Many of these compounds were not studied for toxicity and their effects on the environment or human health is not known. Endocrine-disrupting compounds are of specific concern, as they mimic hormones in organisms.

Microplastics are a type of CEC, which is a plastic less than 5mm long. They are found in waters around the world and are either produced (usually as microbeads) or come from fragments of broken plastics. We are still learning about the presence of microplastics in the environment and research is investigating the potential health impacts of microplastics. Information on Minnesota's CEC initiative can be found here: https://www.health.state.mn.us/cec.

Aquatic Invasive Species

AIS have been spreading across the country (and Minnesota), prompting public information campaigns and laws prohibiting practices that could transport invasive species. These include moving a boat from an infested waterbody into another without draining water or cleaning off visible invasive plants.

AIS are introduced to a new environment and because they did not coevolve with the native species, they can take over and outcompete native species. Outside of the watershed, grass carp, bighead carp, and zebra mussels have been reported in the Minnesota River. The presence of these and other AIS is managed by the DNR.

Aging Infrastructure

Many CIPs and general infrastructure were installed decades ago and are nearing or past their estimated lifetime. Unexpected and unbudgeted costs like failures or expensive maintenance costs for culverts, dams, drainage systems, or bridges may arise over the course of this 10-year plan. This type of failure can shift local priorities and create a need to reallocate funds towards maintenance rather than planned water quality improvements.

Irrigation

Groundwater recharge is not a concern in the UMRW. However, changing precipitation patterns and an increase in the withdrawal of groundwater for irrigation make groundwater quantity a resource to keep an eye on in the coming decades. In this watershed, the recharge rate is an average of 2.8 inches per year, lower than the average across Minnesota of 4 inches per year (MPCA, 2018).

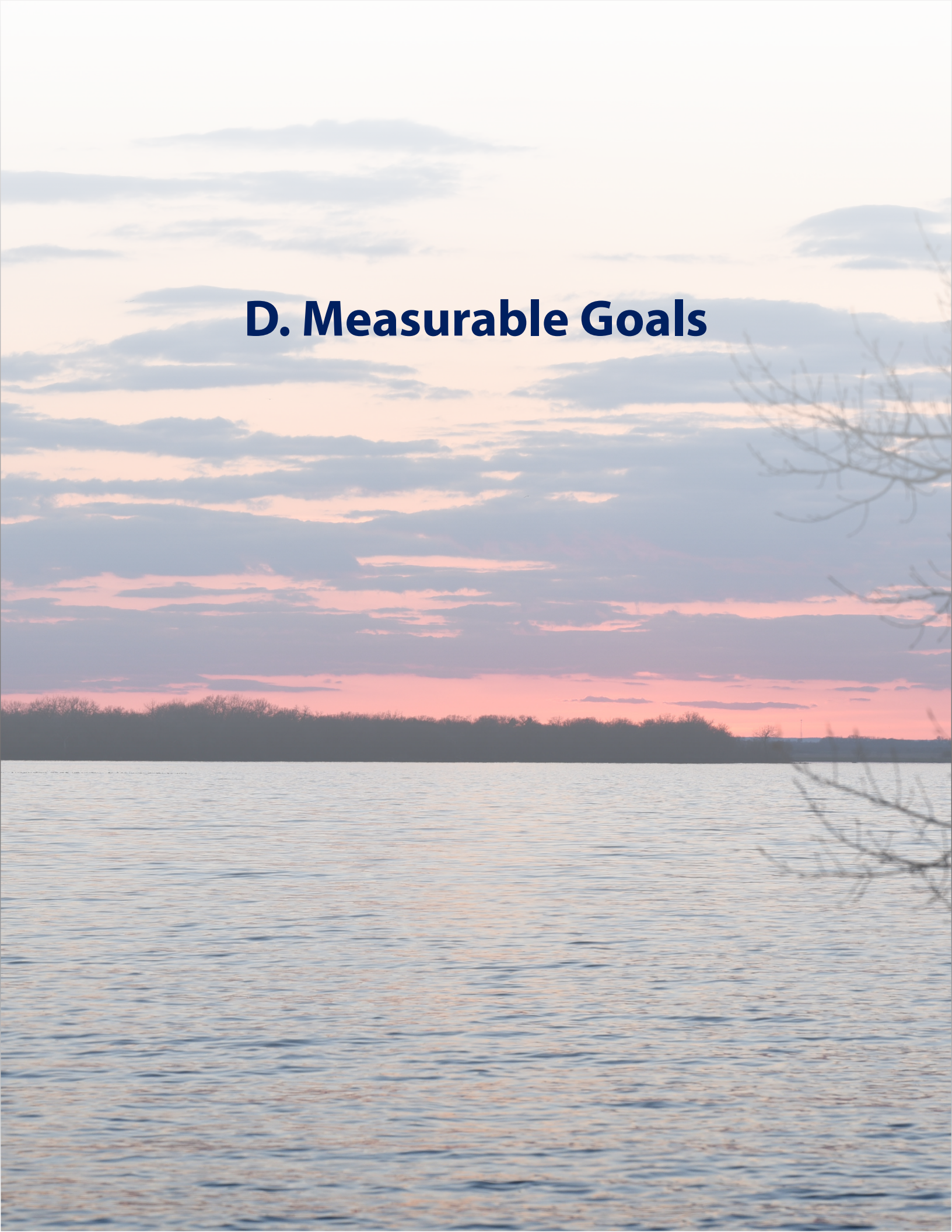
The DNR issues permits for groundwater withdrawal. As of 2019, the DNR has granted 100 active permits for 146 installations in the UMRW. Of the 100 permits, 82 are for agricultural irrigation, 10 for

water supply, two for water maintenance and industrial processing, one for non-crop irrigation, and three are not specified (DNR, 2019a). An installation is a pump or well that withdraws groundwater. It is possible for a permittee to install more than one pump or well per permit to reach their water use allocation. 70% of the withdrawals in the UMRW are for agricultural irrigation (MPCA, 2018). The DNR maintains data on permitted groundwater use 1988-2021. In the UMRW, the amount of water withdrawn for irrigation has decreased since the late 1980s but reached a 30-year high in 2021 (DNR, 2022e).

Renewable Energy

Minnesota has the ambitious goal to reach 25% renewable energy by the year 2025 through the state's Energy Action Plan. While this is not looking likely given that as of 2018, Minnesota only had 16% of its energy derived from renewable resources, the state is on track to meet its goal of having 25% of its electricity come from renewable sources.

3% of the electricity in Minnesota was solar powered in 2020. Solar is expected to grow significantly in the 2020s, with a solar electricity standard mandating that 10% of electricity in Minnesota must be generated from solar energy by 2030 (MN DOC, 2020). This growth decreases our dependence on fossil fuels and supports 4,000 jobs in Minnesota (MN DOC, 2022). The predicted growth in solar energy sources may lead to an increase in land used for solar farms and new utilities in the watershed. Watershed planning partners should be made aware of the likelihood of increasing solar installations throughout the state and can look for collaborative opportunities.



D. Measurable Goals

Section D. Measurable Goals

This plan section outlines the implementation options that can be taken to address the priority concerns within the watershed that were outlined in **Section C**. This section provides goals that can be used to measure the outcomes of the implemented projects throughout the plan's 10-year lifetime.

This section has short-term goals—those that will be addressed during the plan's lifetime—and long-term goals—those that provide the desired future conditions of the resource. The plan is also broken up by goal scale. Goals are set either for the watershed or by planning region. The goal scales were assigned by the Steering and Advisory Teams and the Citizen Committee. This section focuses primarily on watershed-wide goals. Planning region goals are discussed in **Section E**, with aggregated information on planning region goals provided in this section.

In most cases, making progress towards the goals described in this plan section will provide benefits towards multiple priority issues. For example, improving soil health should also provide water quality, water quantity, agricultural surface flow, and drainage benefits. **Section E** shows the connection between planned implementation activities and progress towards multiple goals.

Geographic Prioritization of Priority Issue Goals

There are a total of eight priority issue goals in this plan. The Steering Team decided each issue and its respective goal scale with input from the Advisory Team and Citizen Committee. Of the eight priority issues, two are watershed-wide goals and six have goals set by planning region priority.

For the six goals that are planning region-specific, only planning regions where that issue is ranked as "high priority" are given measurable goals. **Table D1** defines the watershed, four planning regions, resource category, resource, resource issue, and goal scale. When the goal scale is set by planning region, goals are only set for the planning regions that are in dark blue, or "high priority." Planning region prioritization was completed using a two-step geographic prioritization process:

- **Step 1** – GIS data from existing studies (e.g., PTMApp, WRAPS, DNR WHAF) were used to do an initial high, medium, and low ranking of where the issue was the most prevalent within the watershed.
- **Step 2** – The results from Step 1 were shown to the Steering and Advisory Teams and the Citizen Committees. They adjusted the ranking based on their discussion and local knowledge through a series of workshops.

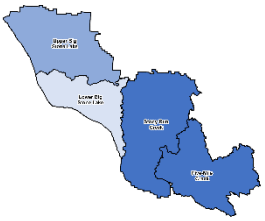
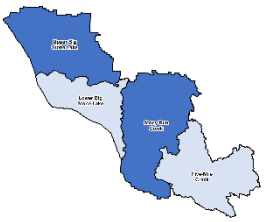
The two-step process resulted in four priority ranking classifications, "low," "moderate," "moderately high," and "high." The "moderately high" and "high" classifications were combined to set goals and are the only two classifications that received goals. **Figure D1** outlines the prioritization ranking within the planning regions:

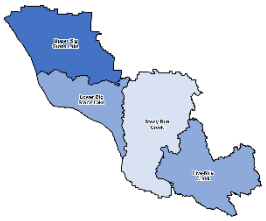
- **Dark Blue** represents the "high" and "moderately high" planning regions. These regions will be the focus of implementation over the plan's lifetime.
- **Blue** represents the "moderate" ranked planning regions. These planning regions will be focused on when the "high" and "moderately high" planning regions have been addressed.

Figure D1: Prioritization classifications.

- **Light Blue** represents the "low" ranked planning regions. These planning regions were ranked the lowest for focused implementation efforts for this plan. Plan implementation activities/efforts may occur within these planning regions but will not be the focus of this plan.

Table D1. High priority issues and their respective goal scales.

Resource Category	Resource	Issue	Planning Region Prioritization	Goal Scale
	Agricultural Lands	Soil health		Watershed-wide
	Streams and Drainage Systems	Agricultural surface flow and drainage		Watershed-wide
	Agricultural Lands	Erosion and sediment		Planning region (see **Section E** for goals)
	Wetlands	Decline in wetland quality and quantity		Planning region (see **Section E** for goals)
	Streams and Drainage Systems	Streambank erosion		Planning region (see **Section E** for goals)

Resource Category	Resource	Issue	Planning Region Prioritization	Goal Scale
	Streams and Drainage Systems	Loss of water storage		Planning region (see **Section E** for goals)
	Aquifer	Groundwater quantity protection		Planning region (see **Section E** for goals)
	Drinking water	Groundwater quality/protection of private wells and public water supplies		Planning region (see **Section E** for goals)

Soil Health

Description

Healthy soil provides a multitude of benefits for farmers as well as downstream watercourses and lakes. One definition of soil health is the capacity of soil to function as a living ecosystem that sustains plants, animals, and humans. Healthy soils regulate water, filter and buffer pollutants, cycle nutrients, and stabilize plant roots. Soil erosion becomes more likely to occur as soil degrades and loses nutrients, microorganisms, and water holding capacity. Soil erosion and resulting sedimentation has negative downstream impacts on water quality and aquatic habitat.

Photo Credit: Isaac Johnson.

The map on the next page (**Figure D2.**) shows land uses where soil health practices might be applied.

The image to the left shows an example of a soil health practice, residue management.

Goals Statements

Long-Term Goal(s):

- Have healthy and productive soils on all working lands within the watershed.

Short-Term Goal(s):

- Implement soil health practices on at least 5,000 acres per year.

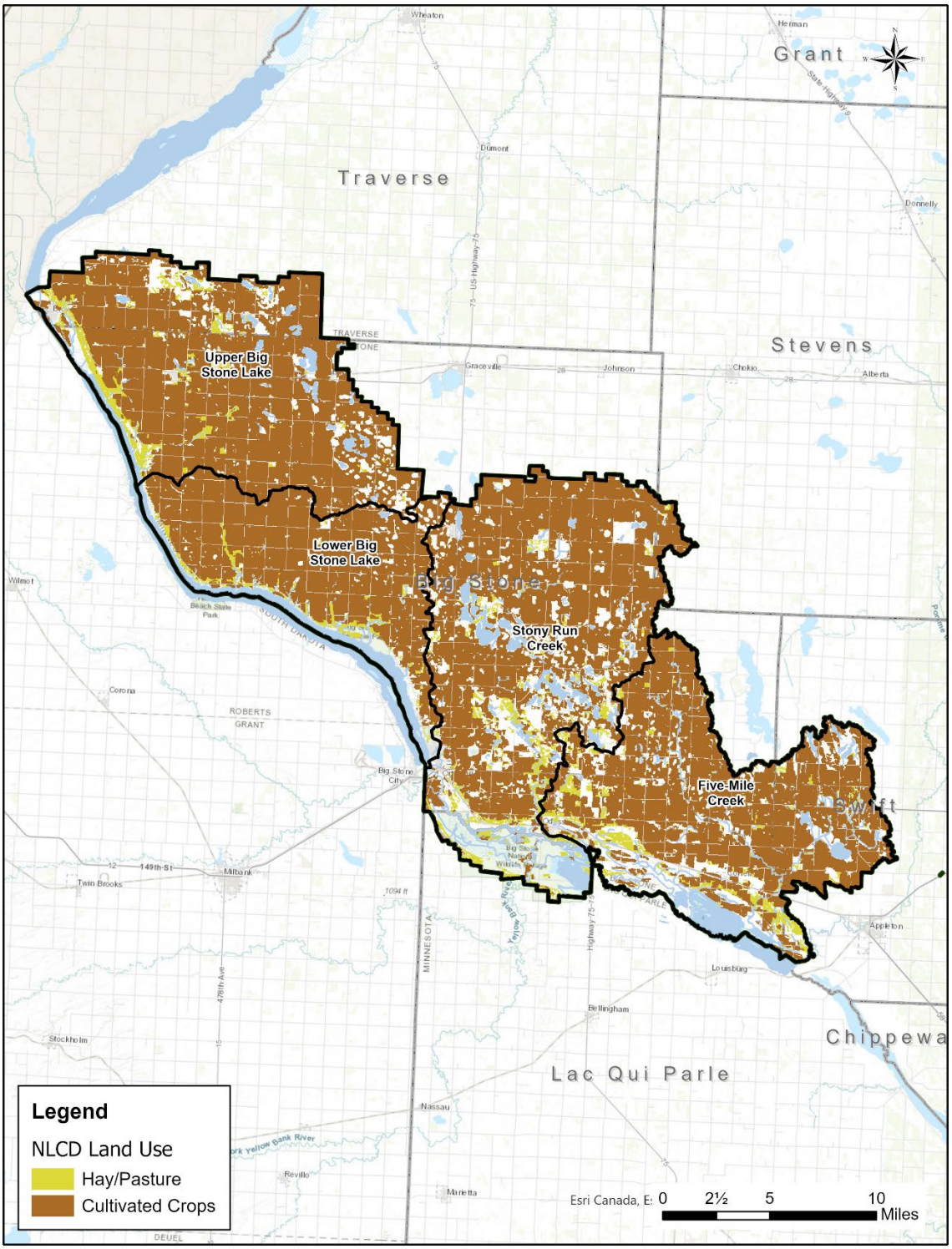


Figure D2. Potential soil health practices.

Water Storage: Agricultural Surface Flow and Drainage and Loss of Water Storage

Description

This goal addresses Agricultural Surface Flow and Drainage on a watershed-wide basis and Loss of Water Storage within prioritized planning regions. Water runoff from agricultural fields and drainage can happen via overland flow (water moving across the surface of the soil) or subsurface tile drainage systems. When water moves across agricultural surfaces, it can create concentrated flow paths that result in gully formations and can contribute to erosion and nutrient losses. When water moves through the topsoil and is intercepted by perforated tile lines, the tile lines carry water and dissolved nutrients such as nitrate to the tile outlet. Tile generally outlets to the edge of a field, a ditch, or a stream. Water moves downstream to other waterbodies. Water moving across agricultural fields can also move through surface inlets directly to tile lines. Surface inlets can move topsoil into the tile lines and into downstream waterbodies as well. More effective hydrologic management is generally thought of—both in terms of agricultural productivity and environmental outcomes—when discussing agricultural surface flow and drainage.

Water storage is storage that is on the landscape that can hold water for a period of time. Examples of water storage are lakes, streams, wetlands, depressions, and healthy soils. Water storage has changed significantly over time due to human activities that have drained wetlands and straightened ditches and streams.

Decreased water storage can impact the speed and volume at which water is discharged from the local environment and enters streams and rivers, creating flashier systems and increasing erosive potential within the stream/river channels. Increasing water storage on the landscape can help reduce the speed at which water moves across the landscape and decrease erosion and sediment/nutrient transport to downstream receiving waters.

Photo Credit: Isaac Johnson.

The map on the next page (**Figure D3**) shows National Land Cover Dataset (NLCD) categories as well as public drainage systems (ditches) in the planning area.

The image to the left shows an example of a drainage system or ditch within the planning area.

Goals Statement

Long-Term Goal(s):

- Add 33,848 acre-feet of storage across the watershed (17,380 acre feet in Upper Big Stone Lake and Stony Run Creek).

Short-Term Goal(s):

- Add 6,210 acre-feet of storage across the watershed (1,580 acre feet in Upper Big Stone Lake and Stony Run Creek, 3,500 acre-feet watershed-wide).

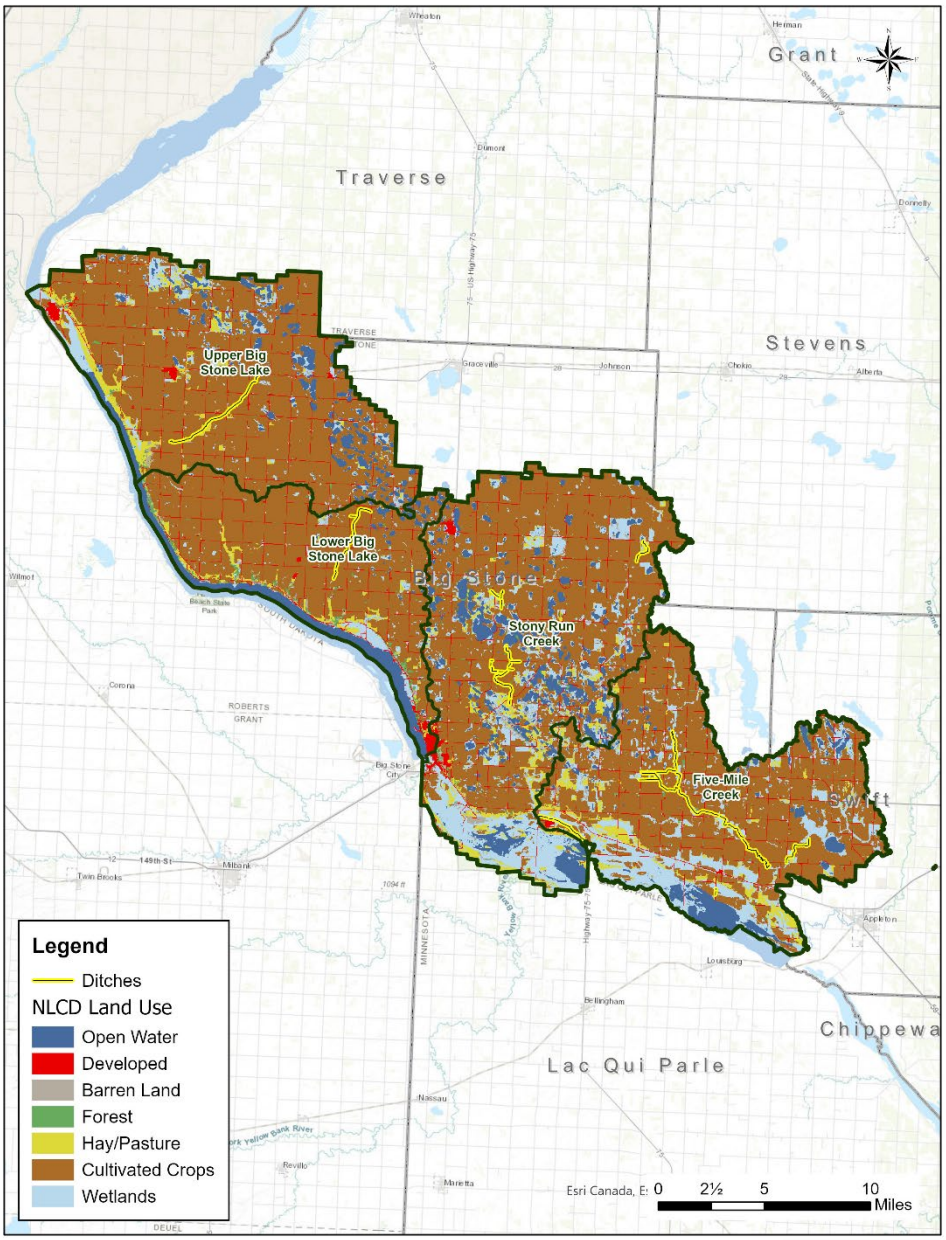


Figure D3. NLCD land use layer with public drainage network.

Erosion and Sediment

Description

Sedimentation occurs when wind and water erosion move soil off the land and deposit it in a different place. Overland erosion is caused when exposed soils encounter heavy rains, rushing water, or strong winds. Human activities can increase erosion when vegetation is removed from the land for agriculture, development, construction, or logging. When sediment is deposited on the land, it can inhibit crop productivity and damage roads and bridges. Sediment in streams can decrease the quality of aquatic habitat and harm aquatic life.

Photo Credit: Isaac Johnson.

A reduction in sediment often reduces nutrients as well, as both sediment and nutrients leave agricultural fields through water erosion and phosphorus binds to sediment. While not its own goal in this plan, the WRAPS has 10-year nutrient and phosphorus goals (a 20% reduction in TP and TN for Big Stone Lake) that can be worked towards alongside the sediment goal.

Goals Statement

Long-Term Goal(s):

- Reduce sediment by a total of 31,200 tons per year from the two planning regions prioritizing this goal (Upper Big Stone Lake and Stony Run Creek).

Short-Term Goal(s):

- Reduce sediment by a total of 8,600 tons per year from the two planning regions prioritizing this goal (Upper Big Stone Lake and Stony Run Creek).

Decline in Wetland Quality and Quantity

Description

In the last century, land use and land management decisions have resulted in a loss of wetlands or decline in the quality of wetlands. These changes have impacts on habitat as well as issues connected to surface water, such as decreased storage and decreased opportunity for water to slow and deposit sediment out of the water and into the wetland. Progress towards this goal will include new acres and improve existing acres of wetlands.

Photo Credit: Isaac Johnson.

Goals Statement

Long-Term Goal(s):

- Establish and maintain healthy and resilient wetlands across the watershed.

Short-Term Goal(s):

- Create, restore, protect, or enhance 3,500 acres of wetland and 14,000 acres of adjacent uplands cumulatively in the two high priority planning regions (Stony Run Creek and Five Mile Creek).

Streambank Erosion

Description

Streambank erosion can be caused by many factors. Streambanks naturally change and erode. When a streambank is unconfined, it can self-correct, create sandbars, and manage sediment loads. In a constructed system with altered hydrology (i.e., installed dams, culverts, and levees that restrict access to floodplains), streams are not able to self-regulate. Flow speeds change and sediment is not as available within the streams. As a result, streambank erosion and sediment transport become more likely.

Photo Credit: Houston Engineering, Inc.

Goals Statement

Long-Term Goal(s):

- Create stable and healthy streams and drainage systems throughout the watershed.

Short-Term Goal(s):

- Implement fifteen projects that aide in stabilizing streambanks in planning regions that are a high priority for this issue (Upper Big Stone Lake and Stony Run Creek).

Groundwater Quantity Protection

Description

Groundwater quantity is something that needs to be understood and managed because much of the drinking water supply for residents and businesses within the watershed comes from groundwater supplies. Ensuring that wells do not run dry is an important goal. Aquifers take time to replenish and can become at risk for contamination or running out if not properly protected. Protection practices include cover crops, irrigation management, conservation easements, and wetland restoration.

Photo Credit: Alexandra Anderson

Goals Statement

Long-Term Goal(s):

- Create a resilient groundwater supply.

Short-Term Goal(s):

- Add a cumulative total of 1,500 acres per year of groundcover that will support groundwater quantity protection within the planning region prioritizing this goal (Upper Big Stone Lake).

Groundwater Quality/Protection of Private Wells and Public Water Supplies

Description

Groundwater quality is an important aspect of groundwater management. As mentioned in the Groundwater Quantity Protection goal, most residents and businesses within the watershed rely on groundwater for their drinking water. Protecting the quality of groundwater reduces the amount of treatment that is needed to ensure that the water is safe to drink. Protection practices include well sealing, nutrient management plans, and perennial cover.

Areas within the watershed are more susceptible to groundwater contamination compared to other areas. This could be due to shallower well depths, potential connections between surface waters and aquifers, or from unsealed or abandoned private wells. If wells are not properly sealed, they can become a direct conduit to groundwater and provide direct access for potentially contaminated surface waters to enter groundwater.

Goals Statement

Long-Term Goal(s):

- Meet Minnesota nitrogen reduction goal for drinking water and groundwater protection. Goal based on Minnesota Groundwater Protection Act of 1989.

Short-Term Goal(s):

- Add a total of 1,500 acres per year of practices that protect groundwater quality within the priority planning region (Upper Big Stone Lake).

E. Targeted Implementation Schedule

Section E. Targeted Implementation Schedule

This section pulls together each part of the planning process, from determining issues to setting goals to determine the most-effective use of funds to address priority issues. This section groups plan actions by planning region, with each planning region having the following:

- High, medium, and low priority issues in the planning region.
- A targeted map showing where high priority issues are on the landscape.
- A goal table that gives short- and long-term goals for each issue.
- An action table that lays out project, practice, and program implementation to make progress towards goals.

The targeted implementation schedule identifies actions that will be taken to reach goals and includes action tables for each planning region. This includes the planned practices and capital improvements, how actions will be measured, the 10-year progress they should make, which goals they address, who will lead efforts, and a timeline and budget.

The overall priority of each planning region was determined by assigning issues as a 1 (low), 2 (medium), or 3 (high) and summing all issue rankings. Upper Big Stone Lake and Stony Run Creek had the highest total and were determined to be high priority planning regions. Five-Mile Creek is a medium priority region, and Lower Big Stone Lake is a low priority planning region.

Work will focus on high priority planning regions initially, with medium and low priority regions being addressed as opportunities arise. Actions will still be done in medium and low priority planning regions through watershed-wide actions. Progress towards addressing goals depends on available funding. There are three levels of funding available for watershed funding (**Table E1)**. BWSR awards non-competitive watershed-based implementation funding (WBIF) to 1W1Ps to implement plan actions. This plan assumes Level 2 (existing or current funding sources + WBIF) funding but recognizes that additional funds will be available through external funding sources (Level 3). Funding Level 2 is used to set budget expectations for the plan, while Level 3 is not quantified for all actions and activities.

Table E1. Funding levels and descriptions

Funding Level	Funding type	Description
1	Current Funding	This is baseline funding for current programs and projects
2	Current Funding + WBIF	Level 2 funding assumes current funding will remain available and WBIF funding will add an additional $375,000/year
3	External Funding	This includes additional sources of funding, including partners such as NRCS, USFWS, SFIA, CRP, and Lessard-Sams

Implementation Programs

Actions are implemented through one of six programs. For example, implementing agricultural BMPs would be in the Projects & Practices program, while a stream restoration project would likely be a Capital Improvement Project (CIP). **Figure E1** shows the implementation programs and gives a description on what that category entails. For more detail on implementation programs, see **Section F.**

Figure E1. Implementation Programs.

Targeting Plan Actions

The Advisory Committee determined targeted conservation actions and CIPs within each planning region. PTMApp was used to determine where on the landscape conservation practices and BMPs can go to gain measurable improvements in water quality. The group set the following criteria to select BMPs from PTMApp:

- Budget to achieve goals in high priority planning regions first
    - Remaining budget directed at watershed-wide goals
- Select BMPs based on sediment reduction ability
- Conduct reasonable cost-effectiveness screening based on sediment
    - Then select BMPs based on the largest sediment load reduction at edge-of-field

Reductions in sediment, nitrogen, and phosphorus will be recorded at planning region outlets for goal tracking. Load reductions calculated in PTMApp from implementing BMPs (i.e., tons/year of sediment reduction) are not meant to be exact, but rather an expected range of water quality benefits from implementing actions. Accordingly, the planning group is not likely to implement the exact number of practices or acres suggested for specific practices in PTMApp but will adjust practices as the plan is implemented. Various factors can influence where and if conservation actions are implemented, including:

- Voluntary participation by landowners
- Existing conservation efforts
- New data and emerging practices
- Effectiveness of outreach and education initiatives
- Field verification of practice

Groundwater quantity protection is a priority issue for this plan. It is important to note that this plan focuses on practices that can help to promote the protection of groundwater quality. However, permitting for groundwater use is outside the control of the local government units (LGUs) responsible for implementing this plan. The LGUs responsible for this plan will make efforts to coordinate with agencies that have permitting authority for groundwater use.

Several actions within this section call for the maintenance and expansion of land covers that make progress towards measurable goals associated with priority issues. Where perennials are identified as a targeted action, the plan partners responsible for implementation intend to utilize easements, in addition to traditional cost-share and technical assistance programs, to make progress towards implementing these actions.

Comparison of Water Quality Estimates

The average yields (lbs/ac/yr) from the MPCA Watershed Pollutant Load Monitoring Network (WPLMN) and Hydrologic Simulation Program – Fortran (HSPF) data were used for comparison against PTMApp data from the watershed. Monitored and modeled yield were multiplied by the area within the highlighted PTMApp priority resource catchment (PR) in **Figure E2** (PR 93 outlined in blue, 63799 ac) to obtain estimated loads (lbs/yr) for that area based on WPLMN and HSPF data.

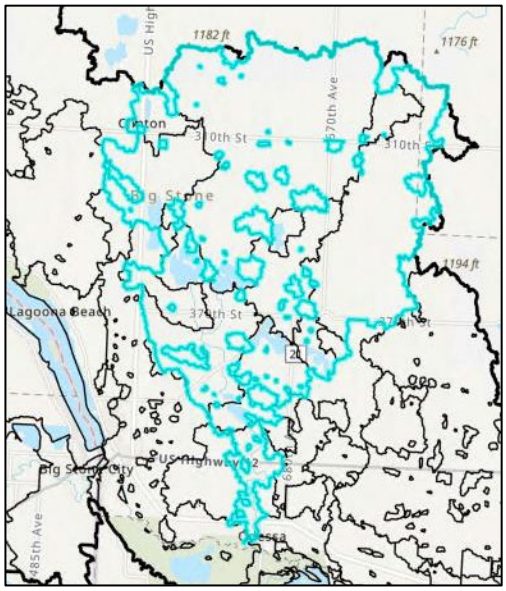


Figure E2. PTMApp Catchment.

This PTMApp priority resource catchment was chosen as a relatively large area that was hydroconditioned to exclude non-contributing areas of the watershed from contributing loading downstream. This level of hydroconditioning was not performed for areas of the watershed located west of the Minnesota state border and is the reason that a comparison site further downstream was not chosen. A drawback to this location, however, is that PR 93 is upstream of any of the major lakes within the watershed. Large waterbodies can have a major influence on eventual loading to a downstream point and are a part of the WPLMN and HSPF results.

PTMApp-estimated loads, particularly sediment, are expected to be slightly higher when compared to the WPLMN and HSPF estimated loads due in part to the load reduction that occurs within the large lakes that are incorporated into the WPLMN and HSPF watershed yield estimates. As a result, it was determined that the default PTMApp loading values were a reasonable approximation of the "typical" annual loading from the watershed.

Table E2. PTMApp loading comparisons to MPCA WPLMN and HSPF.

	Sediment (tons/year)	TP (lbs/year)	TN (lbs/year)
PTMApp PR catchment # 93 (63,799 acres)	6,478	17,955	353,016
MPCA-WPLMN Minnesota River near Lac Qui Parle (E22007001) - Mean	1,522	19,714	262,852
HSPF – Mean	1,429	20,334	182,686

Planning Region Implementation Schedule

High Priority:
Upper Big Stone Lake Planning Region

The Upper Big Stone Lake Planning Region is in the northernmost part of the watershed, and Big Stone Lake borders it on the West. This is a high priority planning region, meaning plan funds and actions will be directed into this region first. Top issues in this region include areas of high risk for nitrogen infiltration and groundwater recharge, high sediment loss and streambank erosion, and water storage loss. Soil health and agricultural surface flow and drainage are watershed-wide high priority issues. The issue rating specific to this planning region is shown in **Table E3**, which also shows targeted locations of the issues that are a high priority for this planning region. **Table E4** and show the measurable goals and targeted actions for this planning regions, respectively.

Table E3. Issues in Upper Big Stone Lake Planning Region

Resource Category	Issue	Region Priority
Groundwater	**Groundwater Quantity Protection**	**High**
	Groundwater Quality/Protection of Private Wells and Public Water Supplies	**High**
Habitat	Decline in Wetland Quality and Quantity	Medium
Land Stewardship	Soil Health	High
	Erosion and Sediment	**High**
Surface Water	Agricultural Surface Flow and Drainage	High
	Streambank Erosion	**High**
	Loss of Water Storage	**High**

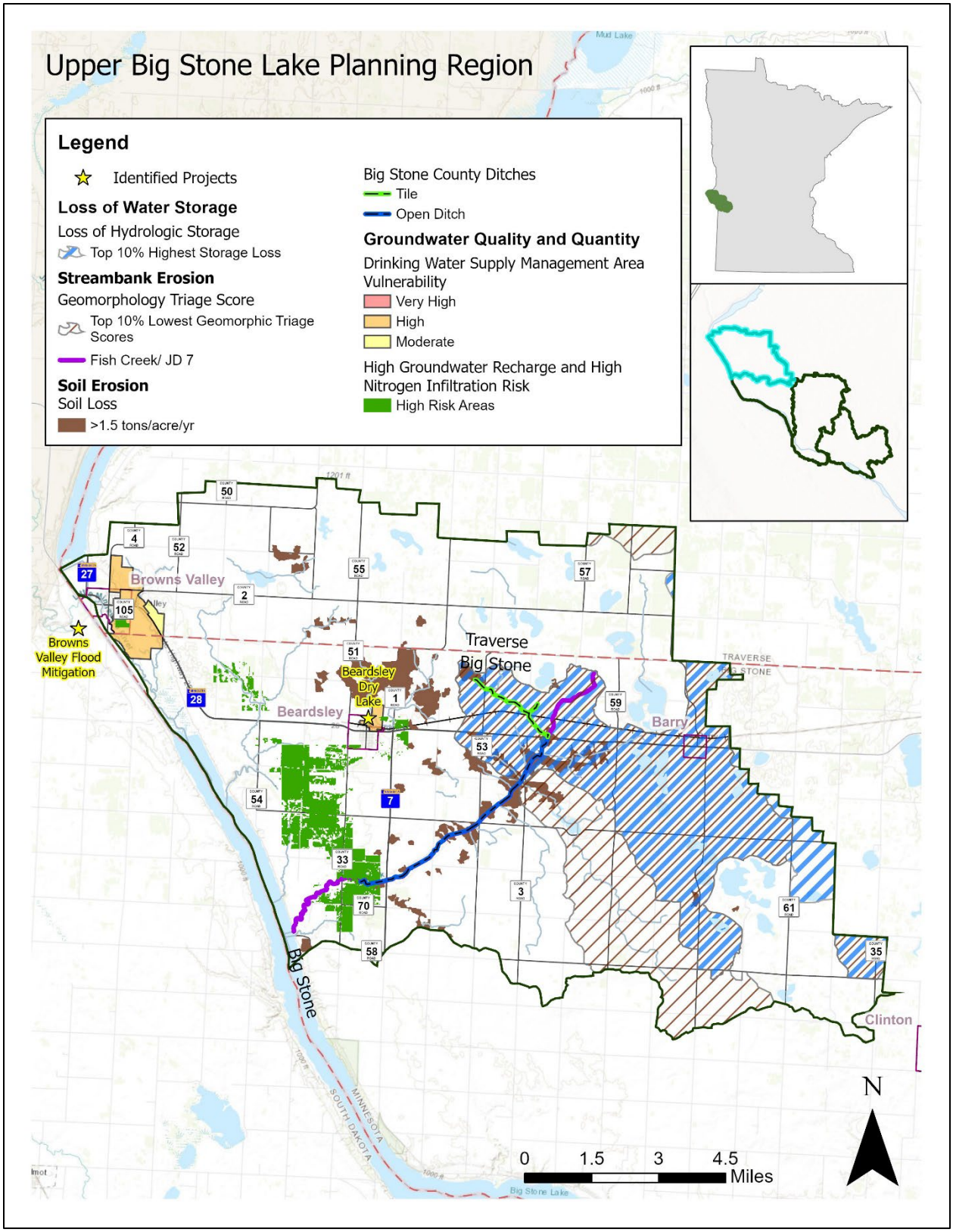


Figure E3. Targeted map of high priority issues in Upper Big Stone Lake.

Table E4. Upper Big Stone Lake Measurable Goal Table.

Issue	Planning Region Goal (Reporting Milestone)	Resource-specific Target	Indicator (see 'Progress towards goal' column in Table E5)
Groundwater Quantity Protection	**Short-Term:** ▪ 1,500 acres/year of practices, on average, present through efforts of plan partners. **Long-Term:** ▪ Create a resilient quantity of groundwater supply.		Acres of practices implemented.
Groundwater Quality Protection of Public Supplies	**Short-Term:** ▪ Treat 1,500 acres/year with practices (e.g., easements, perennial cover) that support groundwater quality protection. **Long-Term:** ▪ Meet Minnesota Nitrogen Reduction Goal for drinking water and groundwater protection.	This acreage target will include all practices that have science-based standards for reducing the delivery of pollutants to groundwater. For example, practices that provide perennial cover, precision application of nutrients (i.e., 4Rs), or cover crops are all practices that can support protecting groundwater quality.	Annual tracking of acres of practices implemented. 5-year and 10-year coordination with State agencies to evaluate change in groundwater concentration.
Erosion and Sediment	**Short-Term:** ▪ Reduce sediment tonnage at Planning Region outlet by 10%, or 3,500 tons/year. **Long-Term:** ▪ Reduce sediment load by 28%, or 9,600 tons/year.	Excess phosphorus bound in sediment delivered to Big Stone Lake (06-0152-00) will be reduced.	PTMApp used to estimate lbs of nutrients and tons of sediment based on acres treated to track pact of progress towards goals.
Streambank Erosion	**Short-Term:** ▪ Five projects that aide in stabilizing streambank erosion. **Long-Term:** ▪ Stabilize stream erosion throughout the planning region.	Will support progress towards improving sediment and phosphorus driven issues.	Number of stream restoration or stabilization projects.
Loss of Water Storage	**Short-Term:** ▪ Increase storage by 700 acre-feet. **Long-Term:** ▪ Increase storage by 3,900 acre-feet.	Will support progress towards improving water storage in stream reaches with an altered hydrology stressor (such as Fish Creek, AUID-571, and unnamed creek AUID-541) contributing to impairment.	Acre-feet of projects, calculated as live storage. Live storage is the volume of water in a storage project designed for holding stormwater for a set period of time.

Table E5: Upper Big Stone Lake Targeted Action Table.

	Action	ID	Targeting Approach	Short-Term Goal	Progress Towards Goal (see 'Indicator' column in Table E4)	Groundwater Quality	Groundwater Quantity	Wetland Quality & Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Responsibility (Bold = Lead)	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Annual Cost	Total Budget
Projects and Practices	**Structural Practices** ▪ Sediment Basins/WASCOBs ▪ Alternative Tile Inlets ▪ Grassed Waterways ▪ Saturated Buffer ▪ Wetland Restoration/Creation ▪ Two Stage Ditch ▪ Grade Stabilization	UB-1	PTMApp Data	Treat at least 1,000 acres	Tons/year sediment lbs/year phosphorus lbs/year nitrogen Acre-feet storage	★	★	★		★	O	O	★	**SWCD,** NRCS, BWSR, MDA, UMRWD	★	★	★	★		$116,500	$1,164,900
	Non-structural Practices ▪ Cover Crops ▪ Reduced Tillage ▪ Nutrient Management Planning ▪ Prescribed Grazing ▪ Crop Rotation ▪ Perennial Cover	UB-2	PTMApp Data	Treat at least 1,500 acres	Tons/year sediment lbs/year phosphorus lbs/year nitrogen Acre-feet storage	★	★	O	★	★	O	O	O	**SWCD,** NRCS, BWSR, MDA, UMRWD	★	★	★	★		$16,400	$164,200

★ = goal directly addressed by action; **O** = goal indirectly addressed by action

High Priority:
Stony Run Creek Planning Region

This planning region is bordered by Lower Big Stone Lake on the west and Five-Mile Creek planning region on the east. Stony Run Creek planning region contains 44% of the lakes in the watershed. High priority issues in the watershed include a decline in wetland quality and quantity, high erosion, and a loss in water storage. The issue rating specific to this planning region is shown in **Table E6**, which also shows targeted locations of the issues that are a high priority for this planning region. **Table E7** and **Table E8** show the measurable goals and targeted actions for this planning regions, respectively.

Table E6. Issues in Stony Run Creek Planning Region.

Resource Category	Issue	Region Priority
Groundwater	Groundwater Quantity Protection	Low
	Groundwater Quality/Protection of Private Wells and Public Water Supplies	Low
Habitat	**Decline in Wetland Quality and Quantity**	**High**
Land Stewardship	Soil Health	High
	Erosion and Sediment	**High**
Surface Water	Agricultural Surface Flow and Drainage	High
	Streambank Erosion	**High**
	Loss of Water Storage	**High**

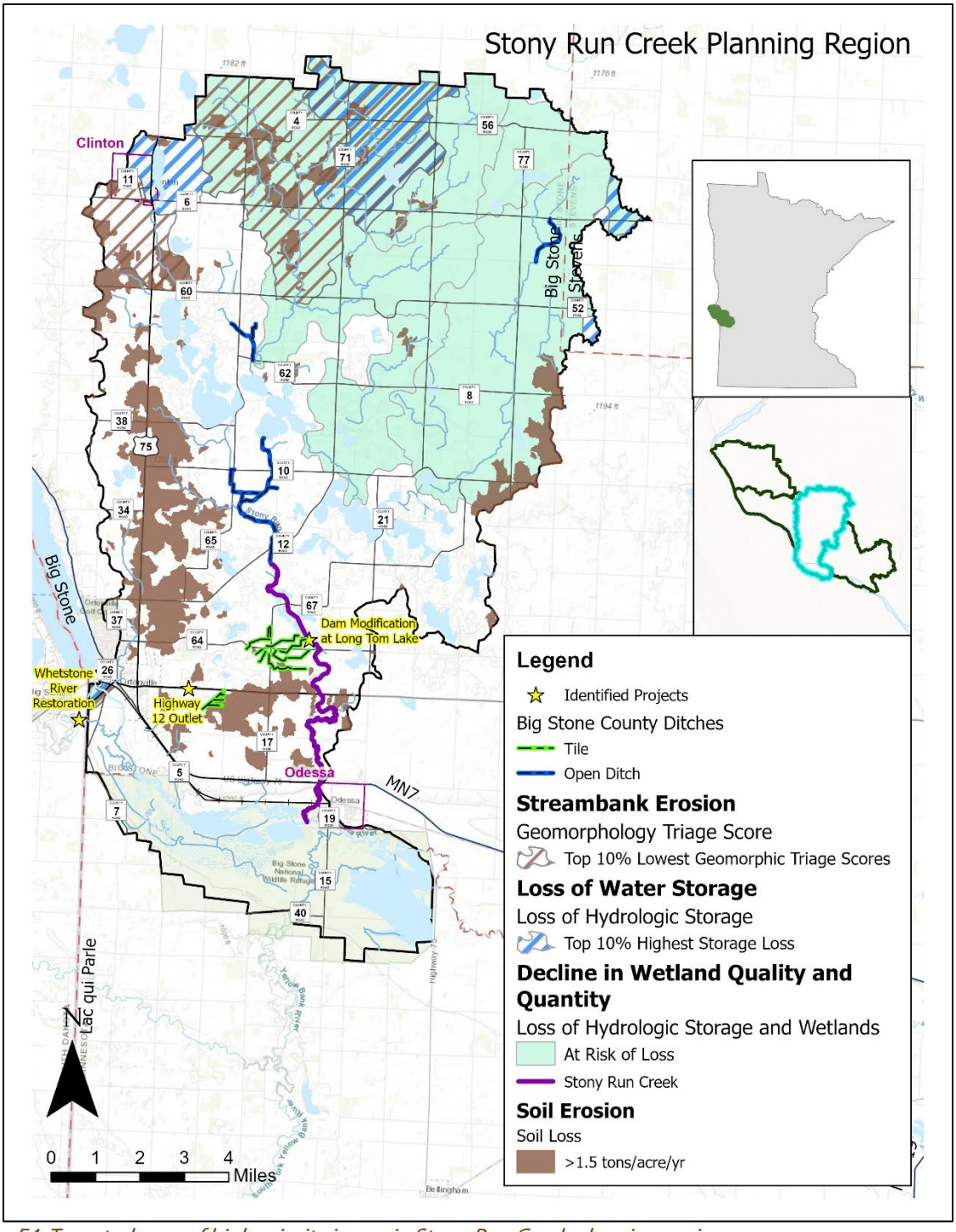


Figure E4. Targeted map of high priority issues in Stony Run Creek planning region.

Table E7. Stony Run Measurable Goal Table.

Issue	Planning Region Goal	Resource-specific Target	Indicator (see 'Progress towards goal' column in Table E8)
Decline in Wetland Quality and Quantity	**Short-Term:** ▪ Protect, restore, create, or enhance 500 acres of wetlands. ▪ Protect, restore, create, or enhance of 2,000 acres adjacent uplands. **Long-Term:** ▪ Establish and maintain healthy and resilient wetlands.		Acres of wetlands protected, restored, or enhanced.
Erosion and Sediment	**Short-Term:** ▪ Reduce sediment tonnage at planning by 10%, or 5,100 tons/year. **Long-Term:** ▪ Reduce sediment load by 42%, or 21,600 tons/year.	AUID-531-Stony Run Creek Reduction in stream concentration 10-Year Reduction: 10% Long Term Reduction 27.7% AUID-525 – Yellow Bank River Reduction in stream concentration 10-Year Reduction: 10% Long Term Reduction: 64%	PTMApp used to estimate lbs of nutrients and tons of sediment based on acres treated to track pact of progress towards goals.
Streambank Erosion	**Short-Term:** ▪ 10 projects that aide in stabilizing streambank erosion. **Long-Term:** ▪ Create stable and healthy streams and drainage systems.		Number of stream restoration or stabilization projects.
Loss of Water Storage	**Short-Term:** ▪ Increase storage by 880 acre-feet. **Long-Term:** ▪ Increase storage by 4790 acre-feet.	AUID-531, 559, and 560: increase flow in dry conditions and decrease flow during wet conditions.	Acre-feet of projects, calculated as live storage.

Table E8. Stony Run Creek Targeted Action Table.

	Action	ID	Targeting Approach	Short-Term Goal	Progress Towards Goal (see 'Indicator' column in Table E7)	Groundwater Quality	Groundwater Quantity	Wetland Quality & Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Responsibility (Bold = Lead)	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Annual Cost	Total Budget
Projects and Practices	**Structural Practices** ▪ Sediment Basins/WASCOBs ▪ Alternative Tile Inlets ▪ Saturated Buffer ▪ Wetland Restoration ▪ Two Stage Ditch ▪ Filter strips ▪ Grade Stabilization	SR-1	PTMApp Data	Treat at least 1,000 acres	Tons/year sediment lbs/year phosphorus lbs/year nitrogen Acre-feet storage	★	★	★		★	O	O	★	**SWCD,** NRCS, BWSR, MDA, UMRWD	★	★	★	★	★	$118,200	$1,182,400
	Non-structural Practices ▪ Cover Crops ▪ Reduced Tillage ▪ Nutrient Management Planning ▪ Prescribed Grazing ▪ Crop Rotation ▪ Perennial Cover	SR-2	PTMApp Data	Treat at least 4,000 acres	Tons/year sediment lbs/year phosphorus lbs/year nitrogen Acre-feet storage	★	★	O	★	★	O	O	O	**SWCD,** NRCS, BWSR, MDA, UMRWD	★	★	★	★	★	$77,200	$771,700

★ = goal directly addressed by action; O = goal indirectly addressed by action

Medium Priority:
Five-Mile Creek Planning Region

Five-Mile Creek planning region is the most eastern portion of the watershed. A decline in wetland quality and quantity is a high priority within the region, but overall, the planning region is a medium priority. Issues will not be targeted here on a planning region basis until high priority planning region needs are met. The issue rating specific to this planning region is showing in **Table E9**. **Figure E5** shows targeted locations of the issues that are a high priority for this planning region. **Table E10** and **Table E11** show the measurable goals and targeted actions for this planning regions, respectively.

Initially, progress may be made to the goals of this planning region through watershed-wide actions. However, the specific goals and actions identified below for this planning region will not be an initial focus of implementing this plan.

Table E9. Issues focus for Five-Mile Creek Planning Region.

Resource Category	Issue	Region Focus
Groundwater	Groundwater Quantity Protection	Medium
	Groundwater Quality/Protection of Private Wells and Public Water Supplies	Medium
Habitat	**Decline in Wetland Quality and Quantity**	**High**
Land Stewardship	**Soil Health**	**High**
	Erosion and Sediment	Medium
Surface water	**Agricultural Surface Flow and Drainage**	**High**
	Streambank Erosion	Low
	Loss of Water Storage	Low

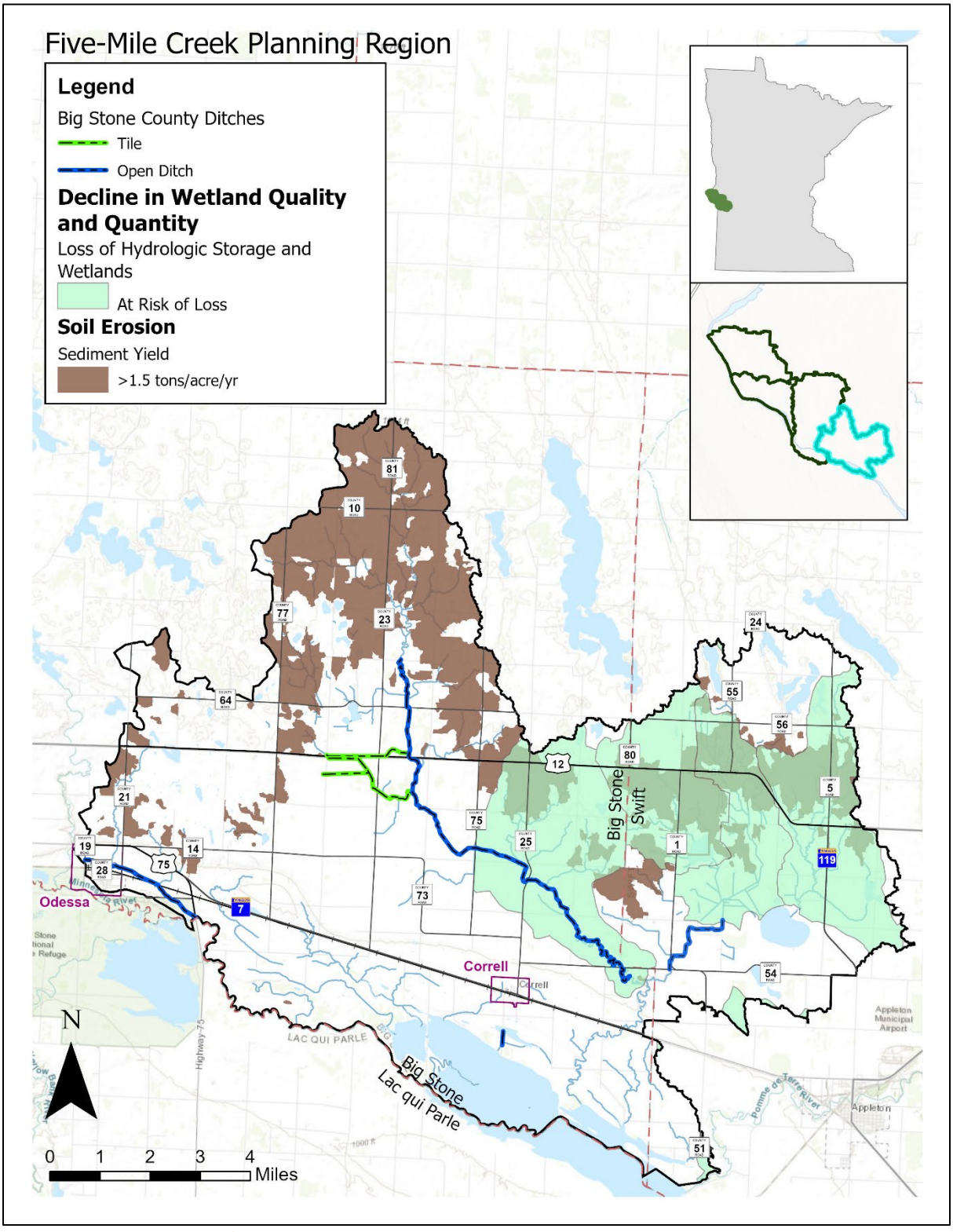


Figure E5. Targeted map of high priority issues in Five-Mile Creek planning region.

Table E10. Five-Mile Creek Measurable Goal Table.

Issue	Planning Region Goal	Resource-specific Target	Indicator (see 'Progress towards goal' column in Table E11)
Decline in Wetland Quality and Quantity	**Short-Term:** ▪ Protect, restore, create, or enhance 3,000 acres of wetlands. ▪ Protect, restore, create, or enhance of 12,000 acres adjacent uplands. **Long-Term:** ▪ Establish and maintain healthy and resilient wetlands.		Acres of wetlands protected, restored, or enhanced.

Table E11. Five-Mile Creek Targeted Action Table.

★ = goal directly addressed by action; O = goal indirectly addressed by action

	Action	ID	Targeting Approach	Short-Term Goal	Progress Towards Goal (see 'Indicator' column in Table E10)	Groundwater Quality	Groundwater Quantity	Wetland Quality & Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Responsibility (Bold = Lead)	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Annual Cost	Total Budget
Projects and Practices	**Structural Practices** ▪ Wetland Restoration and conservation practices at wetland edge	FM-1	PTMApp Data	Treat at least 3,000 acres	Tons/year sediment lbs/year phosphorus lbs/year nitrogen Acre-feet storage	★	★	★		★	O	O	★	**SWCD,** NRCS, BWSR, MDA, UMRWD	★	★	★	★	★	$24,000	$240,000
	Easements for Wetlands	FM-2	PTMApp Data	Protect at least 300 acres	Acres protected	O		★	★	★	O		O	**SWCD,** NRCS, BWSR, MDA	★	★	★	★	★	$9,300	$93,000

Low Priority:
Lower Big Stone Lake Planning Region

Lower Big Stone Lake Planning region is bordered by Upper Big Stone Lake to the north, Stony Run Creek to the east, and South Dakota to the southwest. This planning region does not have any high priority issues, but erosion, agricultural surface flow, soil health, and groundwater issues are medium priorities. Overall, Lower Big Stone Creek planning region is a low priority, meaning issues will not be targeted here on a planning region basis until high priority planning region needs are met. There are important resources and issues in this planning region, even though it was set a low priority. Issues in this region will still be addressed during implementation through watershed-wide actions, but this implementation will begin with a focus on the Upper Big Stone Lake planning lake as a focus and the Lower Big Stone Lake will be a future focus. The issue rating specific to this planning region is showing in **Table E12**. Like other planning regions, a focused map of the Lower Big Stone Lake Planning Region is provided in **Figure E6**. However, as there were not any issues rated as high within this planning region, **Figure E6** is only meant to provide a general picture of the landscape within the planning region.

Issues will be addressed within this planning region through watershed-wide actions. Therefore, there are not specific goals or actions identified for this planning region at this time.

Table E12. Lower Big Stone Lake Issues.

Resource Category	Issue	Region Focus
Groundwater	Groundwater Quantity Protection	Medium
	Groundwater Quality/Protection of Private Wells and Public Water Supplies	Medium
Habitat	Decline in Wetland Quality and Quantity	Low
Land Stewardship	**Soil Health**	**High**
	Erosion and Sediment	Medium
Surface Water	**Agricultural Surface Flow**	**High**
	Streambank Erosion	Low
	Loss of Water Storage	Low

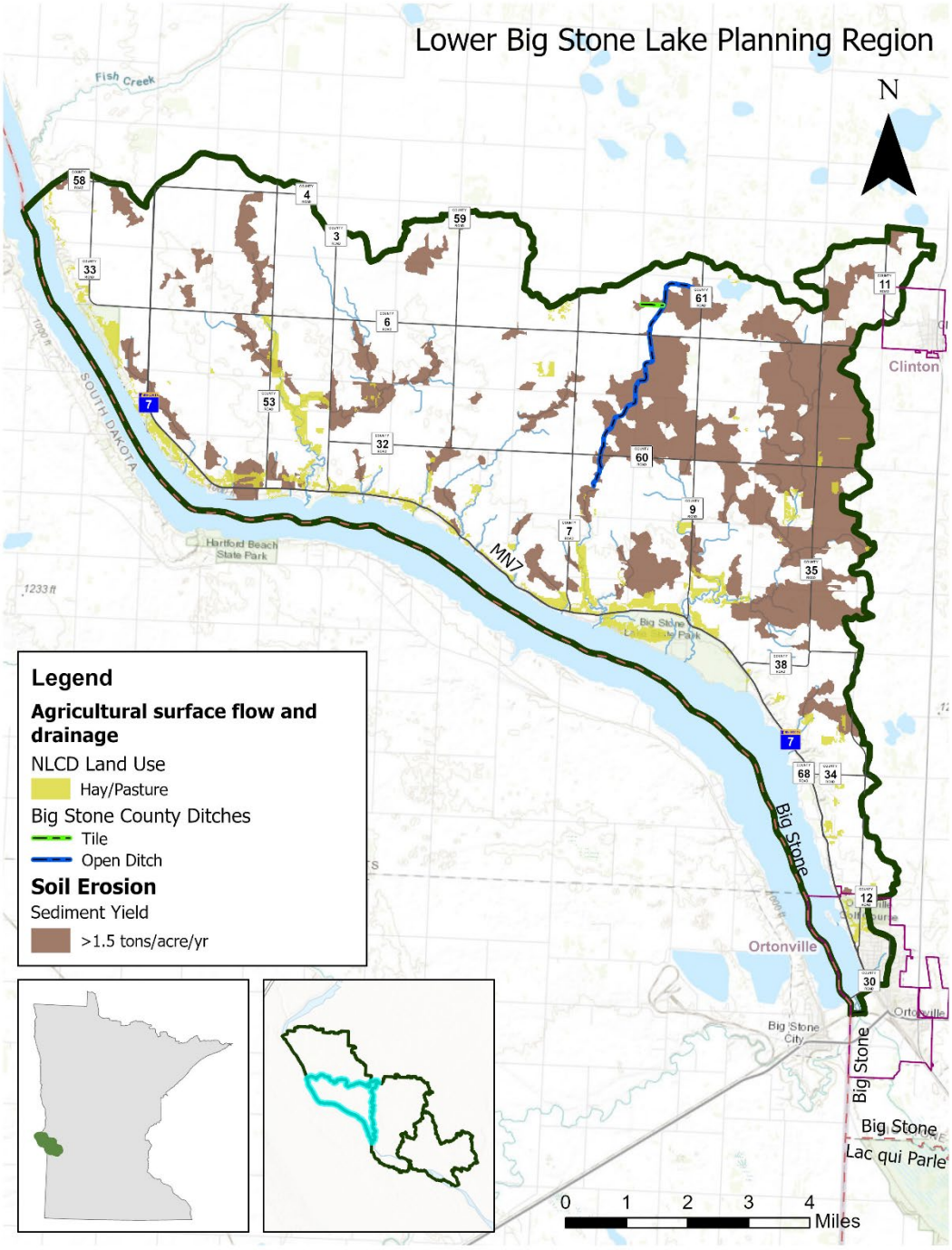


Figure E6. Focused map of the Lower Big Stone Lake Planning Region.

Projects and Practices: Watershed-Wide Goals and Actions

In addition to actions that were prioritized within specific planning regions, this plan also establishes two priority issues that will be addressed at a watershed-wide level. The watershed-wide priority issues and associated measurable goals are shown in **Table E13**. These watershed-wide measurable goals are described in detail in **Section D.** They are summarized here for convenience. The targeted actions through the projects and practices program that will be implemented to achieve these goals are show in **Table E13**. In addition to practices identified in **Table E13,** practices implemented through the CIP Program will also make progress towards achieving these watershed-wide goals, particularly storage goals. Watershed-wide actions will be implemented as high priority actions along with planning region specific actions implemented in Upper Big Stone Lake and Stony Run Creek.

The research around conservation practices that provide the broadest benefits through improving soil health is ongoing. This plan will seek to implement soil health practices that have established science-based standards or innovative approaches to improving soil health that have approval by professionals.

Table E13. Measurable Goals Table for issues that will be addressed on a watershed-wide basis. It is important to note that storage might be added to the watershed that is outside of the control of the partners responsible for implementing this plan.

Issue	Planning Region Goal	Resource-specific Target	Indicator (see 'Progress towards goal' column in Table E14)
Soil Health	**Short-Term:** ▪ Treat 5,000 acres/year of soil health practices. **Long-Term:** ▪ Have healthy and productive soils on all working lands within the watershed.		Acres of soil health practices implemented.
Ag. Surface Flow and Drainage	**Short-Term:** ▪ Add 3,050 acre-ft of storage across the watershed. **Long-Term:** ▪ Add 16,500 acre-ft of storage across the watershed.	AUID-521, 531, 541, 559, 560, 568, 571, and 574 have altered hydrology as a stressor. Increasing storage will have the secondary benefit of addressing altered hydrology stressors to these streams.	Acres treated.

Table E14. Watershed-wide Targeted Action Table.

	Action	ID	Targeting Approach	Short-Term Goal	Progress Towards Goal (see 'Indicator' column in Table E13)	Groundwater Quality	Groundwater Quantity	Wetland Quality & Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Responsibility (Bold = Lead)	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Annual Cost	Total Budget
Projects and Practices	**Structural Practices** ▪ Sediment Basins ▪ Alternative Tile Inlets ▪ Saturated Buffer ▪ Wetland Restoration ▪ Two Stage Ditch ▪ Grassed Waterway ▪ Grade Stabilization	WT-1	PTMApp Data	Treat at least 5,000 acres	Tons/year sediment lbs/year phosphorus lbs/year nitrogen Acre-feet storage	★	★	★		★	O	O	★	**SWCD,** NRCS, BWSR, MDA, UMRWD	★	★	★	★	★	$258,730	$2,587,300*
	Non-structural Practices ▪ Cover Crops ▪ Reduced Tillage ▪ Nutrient Management Planning ▪ Prescribed Grazing ▪ Crop Rotation (3 year plus) ▪ Perennial Cover	WT-2	PTMApp Data	Treat at least 5,000 acres/year	Tons/year sediment lbs/year phosphorus lbs/year nitrogen Acre-feet storage	★	★	O	★	★	O	O	O	**SWCD,** NRCS, BWSR, MDA, UMRWD	★	★	★	★	★	$112,490	$1,124,900**
	Seal abandoned wells	WT-3	Local Data	10 wells/year	Number of wells sealed	★								**SWCD,** MDH	★	★	★	★	★	$10,000	$100,000

★ = goal directly addressed by action; O = goal indirectly addressed by action

*Structural cost is the sum of each planning region ($1,164,900 in Upper Big Stone Lake, $1,182,400 in Stony Run Creek, and $240,000 in Five-Mile Creek)

** Non-structural cost is the sum of each planning region ($164,200 in Upper Big Stone Lake, $771,700 in Stony Run Creek, $0 in Five-Mile Creek, and $189,000 in Lower Big Stone [no action table within the plan for this low priority region])

Capital Improvements (Watershed-Wide)

The Capital Improvement Projects Action Table summarizes the actions pertaining to the construction, repair, retrofit, or increased utility or function of physical facilities, infrastructure, or environmental features. CIPs require external funding. These actions will be implemented watershed-wide, as project footprints and benefits span planning region boundaries. They will be implemented through the CIP Program, described further in **Section F**. The benefits of these projects and progress towards the goals of this plan will be determined on a case-by-case basis. For retention projects on channels, the partners will collaborate to maintain or improve longitudinal connectivity, while also maximizing storage benefits.

The estimated cost of action CP-10 will use the entire Level 1 budget for CIPs. An additional $120,206/year is available for CIPs but has not been allocated to a specific project.

The actions for this program are broken into two categories:

1. **General** – these are general areas of capital improvements that may come up over the course of the lifespan of this plan but did not have a defined project established during the development of this CWMP.
2. **Specific** – these are identified projects that may be implemented during this lifespan of this CWMP resources, permitting, and local buy in are secured over the next 10-years.

Table E15. Watershed-wide general CIPs.

Project	ID	Description	Lead Entity	Planning Region	Year (Start and End)	Status	Estimated Cost	Storage (acre-ft)
General								
Dam and Obstruction Removals	CP-1	This action will implement projects that remove dams or other obstructions from surface waters. Where possible, projects will seek to address multiple benefits towards priority issues.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Multipurpose Drainage Management Enhancements	CP-2	This action will seek to implement multipurpose drainage management plans and enhancements. These projects will be pursued when there are opportunities to broaden benefits, such as storage and water quality benefits, of actions on public drainage systems.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Wetland and Water Storage treatment projects	CP-3	This action will seek to implement projects on the landscape that enhance, maintain, or restore wetlands, or provide water storage and treatment.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Enhancements to recreational facilities	CP-4	This action will seek to support the establishment, maintenance, or improvement of recreational facilities that increase or maintain community access to resources (as defined in this CWMP) in the planning area.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Shoreline stabilization	CP-5	This action will seek to implement shoreline stabilization practices that improve water quality, protect infrastructure, or improve aquatic habitat.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Stream restoration and stabilization	CP-6	This action will seek to restore or stabilize streams or other surface water conveyance areas where progress towards the measurable goals of this plan can be achieved.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Culvert replacement or modification	CP-7	Culvert replacement/repairs for both storage and aquatic life.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Water level management projects	CP-8	Plan and assess solutions to high water levels. Include consensus building through stakeholder groups.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Perennial Easements	CP-9	Through this action, easements will be implemented that increase or maintain the acreage of perennial vegetation in the watershed.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	TBD (Level 3)	TBD
Repair, maintain, or improve legal drainage systems.	CP-10	Through this action legal public drainage systems will be repaired, maintained or improved. ***Note that the resources for this action will come from local Level 1 funding generated from the benefited area subject to the action.***	UMRWD or County	Watershed-wide	TBD	Ongoing	$254,090/year (only Level 1 funding)	TBD
Project Development	CP-11	At times, resources are needed to investigate and build stakeholder buy in for capital projects. When implemented this action will seek to get projects ready for implementation through this program. Each effort aimed at developing projects will include a process for identifying how constructable projects make progress towards the measurable goals for this plan.	UMRWD, County or SWCD	Watershed-wide	TBD	Ongoing	$31,000/year	N/A

Table E16. Specific CIPs.

Project	ID	Description	Lead Entity	Planning Region	Year (Start and End)	Status	Estimated Cost	Storage (acre-ft)
Specific								
Big Stone Lake dredge/Alum	CP-12	Near mouth on south side of lake	UMRWD	Lower Big Stone Lake	TBD	In Development	TBD (Level 3)	N/A
Dam modification	CP-14	On Minnesota River	UMRWD	Stony Creek	TBD	In Development	TBD (Level 3)	N/A
Dam modification	CP-15	On Long Tom Lake	UMRWD			In Development	TBD (Level 3)	N/A
Stream restoration	CP-17	Headwaters stretch of Minnesota River	UMRWD	Stony Creek/ Five Mile Creek	TBD	In Development	TBD (Level 3)	N/A
Barrier culverts	CP-18	Implemented in Hoss Creek and Fish Creek				In Development	TBD (Level 3)	N/A
Highway 12 outlet	CP-19	Approx. 1 mile east of Ortonville	UMRWD	Stony Creek	TBD	In Development	TBD (Level 3)	N/A
Whetstone	CP-20	Restoration of historic Whetstone channel	UMRWD	Stony Creek	2023	Seeking Funding	$8,000,000 (Level 3)	N/A
Browns Valley flood control	CP-21		UMRWD	**Upper Big Stone Lake**		In Development	TBD (Level 3)	N/A
Browns Valley Toelle Coulee	CP-22	Flood mitigation along Toelle Coulee near Browns Valley	UMRWD	**Upper Big Stone Lake**	TBD	Seeking Funding	TBD (Level 3)	N/A
Browns Valley Fish passage improvements	CP-23	Monitor and improve fish passage through diversion and flood mitigation project embankment culvert.	UMRWD	Upper Big Stone Lake	TBD	Seeking Funding	$1,000,000 (Level 3)	N/A
Dry Lake Enhancement	CP-24	Provide stable outlet to dry lake to prevent flooding in Beardsley, MN	UMRWD	**Upper Big Stone Lake**	TBD	Seeking Funding	$2.500.000 (Level 3)	N/A

Research and Monitoring

The Research and Monitoring Action Table summarizes actions related to closing known data gaps, feasibility studies to better support implementation, and general monitoring efforts. These actions will be implemented watershed-wide to promote consistency and sharing of services. They will be funded by the Research and Monitoring Implementation Program, described in **Section F.**

Table E17. Watershed-wide research and monitoring actions.

Action	ID	Prioritized Resources	Metric	Groundwater Quality	Groundwater Quantity	Wetland Quality & Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Implementation Lead (in bold) and Partners	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Annual Cost	Total Budget
Starting the hydrologic atlas to support knowledge around groundwater impacts on high-water levels.	RM-1	Watershed-Wide	Hydrologic atlas started		★							**County**, DNR	★	★				$3,000	$30,000
Identify culverts in need of adjustments to support aquatic life. Make use of existing culvert inventories as part of effort and fill information gaps where needed.	RM-2	Watershed-Wide	Number of culverts identified						★			**SWCD**, UMRWD, DNR	★	★	★	★	★	$1,000	$10,000
Monitor groundwater through the Observation Well Monitoring Program.	RM-3	Watershed-Wide	Ongoing	★	★							**SWCD,** DNR	★	★	★	★	★	$5,000	$50,000
Cities develop stormwater management plans.	RM-4	Urban areas	Number plans developed									**Cities**, **SWCD**, MPCA		★	★	★	★	$15,000	$150,000
Identify data gaps in watershed conditions, identify feasibility studies that may lead to capital improvement projects.	RM-5	Watershed-Wide	Gaps or overlaps identified	o	o	o	o	o	o	o	o	**UMRWD,** SWCD, County	★	★	★	★	★	$2,000	$20,000
Microbial source tracking to identify sources of bacteria	RM-6	Watershed-wide	One Report Completed	★		★						**MPCA,** SWCD, UMRWD		★	★			$50,000	$100,000

★ = goal directly addressed by action; O = goal indirectly addressed by action

Regulatory

The Regulatory Action Table summarizes actions pertaining to the administration of statutory obligations and local ordinances. These actions are implemented watershed-wide to promote consistency and sharing of services. The actions in this table 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 F**. LGUs may seek opportunities to align specific regulatory standards across county boundaries.

Table E18. Regulatory and administrative actions.

Action	ID	Prioritized Resources	Metric	Groundwater Quality	Groundwater Quantity	Wetland Quality/Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Implementation Lead (in bold) and Partners	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032
Administer shoreland ordinances and permitting programs.	RG-1	Watershed-wide	Ongoing					★		★		**County, SWCD**	★	★	★	★	★
Administer floodplain ordinances and permitting programs.	RG-2	Watershed-wide	Ongoing			o		★			o	**County, SWCD**	★	★	★	★	★
Administer SSTS local ordinances, sanitation codes, and zoning requirements.	RG-3	Watershed-wide	Ongoing	o								**County, SWCD**	★	★	★	★	★
Administer solid waste management ordinances, zoning requirements, and solid waste comprehensive plans.	RG-4	Watershed-wide	Ongoing	o								**County, SWCD**	★	★	★	★	★
Administer emergency hazard management ordinances and plans.	RG-5	Watershed-wide	Ongoing								o	**County, SWCD**	★	★	★	★	★
Administer feedlots in accordance with local ordinances and MN Rules Chapter 7020.	RG-6	Watershed-wide	Ongoing	o		o						**County, SWCD**	★	★	★	★	★
Administer stream and public water buffers as required by the state buffer law requirements.	RG-7	Watershed-wide	Ongoing					o		★		**County, SWCD**	★	★	★	★	★
Administer MN Statute Chapter 103E for the management and maintenance of public drainage systems.	RG-8	Watershed-wide	Ongoing					o	★	o		**County, SWCD**	★	★	★	★	★
Administer local land and resource management ordinances related to aggregate management.	RG-9	Watershed-wide	Ongoing									**County, SWCD**	★	★	★	★	★
Administer the Minnesota WCA.	RG-10	Watershed-wide	Ongoing			★	o				o	**County, SWCD**	★	★	★	★	★
Administer wellhead protection plans and consider groundwater and drinking water resources in land use planning decisions.	RG-11	Watershed-wide	Ongoing	★	★							**County, SWCD**	★	★	★	★	★
Manage stormwater and construction erosion control in accordance with the National Pollutant Discharge Elimination System (NPDES).	RG-12	Watershed-wide	Ongoing			o		★				**County, SWCD**	★	★	★	★	★

★ = goal directly addressed by action; O = goal indirectly addressed by action

Education and Outreach

The Outreach Action Table summarizes actions related to landowner engagement, removing conservation barriers, and informing the public about natural resource issues. These actions will be implemented watershed-wide to promote consistency and sharing of services. They will be funded by the Outreach Implementation Program, described in **Section F**. Shaded circles are primary benefits and closed circles are secondary benefits.

Table E19. Education and Outreach action to be implemented within the planning area.

Action	ID	Prioritized Resources	Metric	Groundwater Quality	Groundwater Quantity	Wetland Quality/Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Implementation Lead (in bold) and Partners	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Annual Cost	Total Budget
Soil Health																			
Soil health demonstration sites.	EO-1	Watershed-wide	Two sites				★				o	**SWCD, NRCS, MDA**	★	★	★	★	★	$3,000	$30,000
Hold workshops on structural BMPs, nutrient management, and soil health conservation programs.	EO-2	Watershed-wide	One workshop per year				★	o			o	**SWCD, BWSR**, UMN Extension, UMRWD	★	★	★	★	★	$4,000	$40,000
Meet with co-ops, crop consultants, agronomists.	EO-3	Watershed-wide	One meeting/ call per year				★					**SWCD**	★	★	★	★	★	$1,000	$10,000
Soil health testing for nonstructural cost share participants.	EO-4	Watershed-wide	10 tests				★					**SWCD, NRCS**	★	★	★	★	★	$10,000	$100,000
Increase enrollment in MN Ag Water Quality Certification program.	EO-5	Watershed-wide	15 farms	o			★	o			o	**MDA,** SWCD, NRCS	★	★	★	★	★	$2,000	$20,000
Outreach																			
Landowner survey to determine landowner concerns, needs, and knowledge.	EO-6	Watershed-wide	One survey				★	o	o			**SWCD,** DNR		★				$4,000	$4,000
Hold youth outreach events (envirothon, conservation days, FFA, 4-H) to education youth on conservation practices.	EO-7	Watershed-wide	One per year			o	o	o	o			**SWCD,** UMRWD	★	★	★	★	★	$8,000	$80,000
Make information available to private well users about local drinking water quality and well testing. Host a well testing clinic or provide resources to well users to have their water tested: ▪ **Every year for coliform bacteria** ▪ **Every other year for nitrate** ▪ **At least once for arsenic, lead, and manganese**	EO-8	Watershed-wide	One per year	★								**SWCD,** MDH, County	★	★	★	★	★	$500	$5,000
UMRCWMP policy committee field trip to see innovative conservation actions on drainage, water storage, or soil health.	EO-9	Watershed-wide	One field trip				o	o	o	o	o	**Policy Committee**				★		$2,000	$2,000
Education																			
Build partnerships with realtors/property owners and hold meetings to work towards SSTS compliance on lake properties.	EO-10	Watershed-wide	One meeting per year	o								**SWCD, WD,** MPCA	★	★	★	★	★	$3,000	$30,000
Educational events at Bonanza Education Center (related to drinking water conservation, need for well sealing, water use conservation, and irrigation management).	EO-11	Watershed-wide	One event per year	★	★	o			o			**SWCD, UMRWD,** MDH	★	★	★	★	★	$5,000	$50,000

Hold workshops to educate residents on AIS, stormwater BMPs, and feedlots.	EO-12	Watershed-wide	One workshop per year	o				★				**SWCD, County**, DNR, MPCA	★	★	★	★	★	$3,000	$30,000
Smart salting training for road salt applicators.	EO-13	Watershed-wide	Five trainings	o								**County, Cities, MPCA**	★	★	★	★	★	Level 3	Level 3
Build environmental education into K-12 curriculum, hold ag-in-the-classroom events.	EO-14	Watershed-wide	One event per year	o	o	o	o	o	o	o	o	**SWCD,** County	★	★	★	★	★	$5,000	$50,000
Educate elected officials on natural resource protection.	EO-15	Watershed-wide	10 officials contacted	o	o	o	o	o	o	o	o	**SWCD, UMRWD**	★	★	★	★	★	$500	$5,000

★ = goal directly addressed by action; O = goal indirectly addressed by action.

Administration and Technical Assistance

The Administration and Technical Assistance Table summarizes actions that are associated with local staff involvement in supporting the implementation of this watershed plan. A summary of the program is provided in **Section F**.

Table E20. Watershed-wide administration and technical assistance actions.

Action	ID	Targeting Approach	Groundwater Quality	Groundwater Quantity	Wetland Quality & Quantity	Soil Health	Erosion and Sediment	Ag Surf. Flow and Drainage	Streambank Erosion	Loss of Water Storage	Responsibility (Bold = Lead)	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Annual Cost	Total Budget
Local staff time to support plan implementation.	AT-1	Watershed-Wide	★	★	★	★	★	★	★	★	Steering Team	★	★	★	★	★	$40,250	$402,500
Technical assistance for implementing actions.	AT-2	Watershed-Wide	★	★	★	★	★	★	★	★	Steering Team	★	★	★	★	★	$68,000	$680,000

★ = goal directly addressed by action

Estimated Cost of Implementing the Plan

Table E21 shows the estimated cost based upon Level 2 funding for implementing the actions associated with this plan. Completing the actions of this plan and making progress towards goals established in **Section D.** assumes that Level 2 funding will be available starting in 2023.

It is important to note that this plan identifies multiple actions that will require additional funding beyond the levels identified in **Table E21**. To complete the implementation of the actions outlined in this plan section, the planning partners will also need to pursue outside funding such as state and federal grants as well as private and foundational sources of funding. The tables within this section define those actions as requiring Level 3 funding. It is worth noting that 19% of Level 2 funding comes from existing current/local funding contributions.

Table E21. Estimated cost of implementing the comprehensive watershed management plan under funding Level 2 (Current + WBIF).

	Funding Level 2 (Current + WBIF)	
Implementation Program	**Est. Annual Cost**	**10-year Cost**
Project & Practices	$390,520	$3,905,200
Research and Monitoring	$36,000*	$360,000
Education & Outreach	$45,600*	$456,000
Regulatory	$24,103	$241,030
Capital Projects + Maintenance	$405,296	$4,052,964
Administration and Technical Assistance	$108,250	$1,082,500
Total	$1,009,770	$10,097,694

*These costs are different than the sum of all the annual actions in Tables E18 and E20 because some annual costs were only allocated to one or two years. The estimated annual costs in Table E22 are 1/10th of the 10-year cost.

F. Plan Implementation Programs

Section F. Implementation Programs

This plan implements actions through five implementation programs (shown in **Figure F1)** and further described in this section. Implementation programs are the funding mechanism for actions in **Section E**.

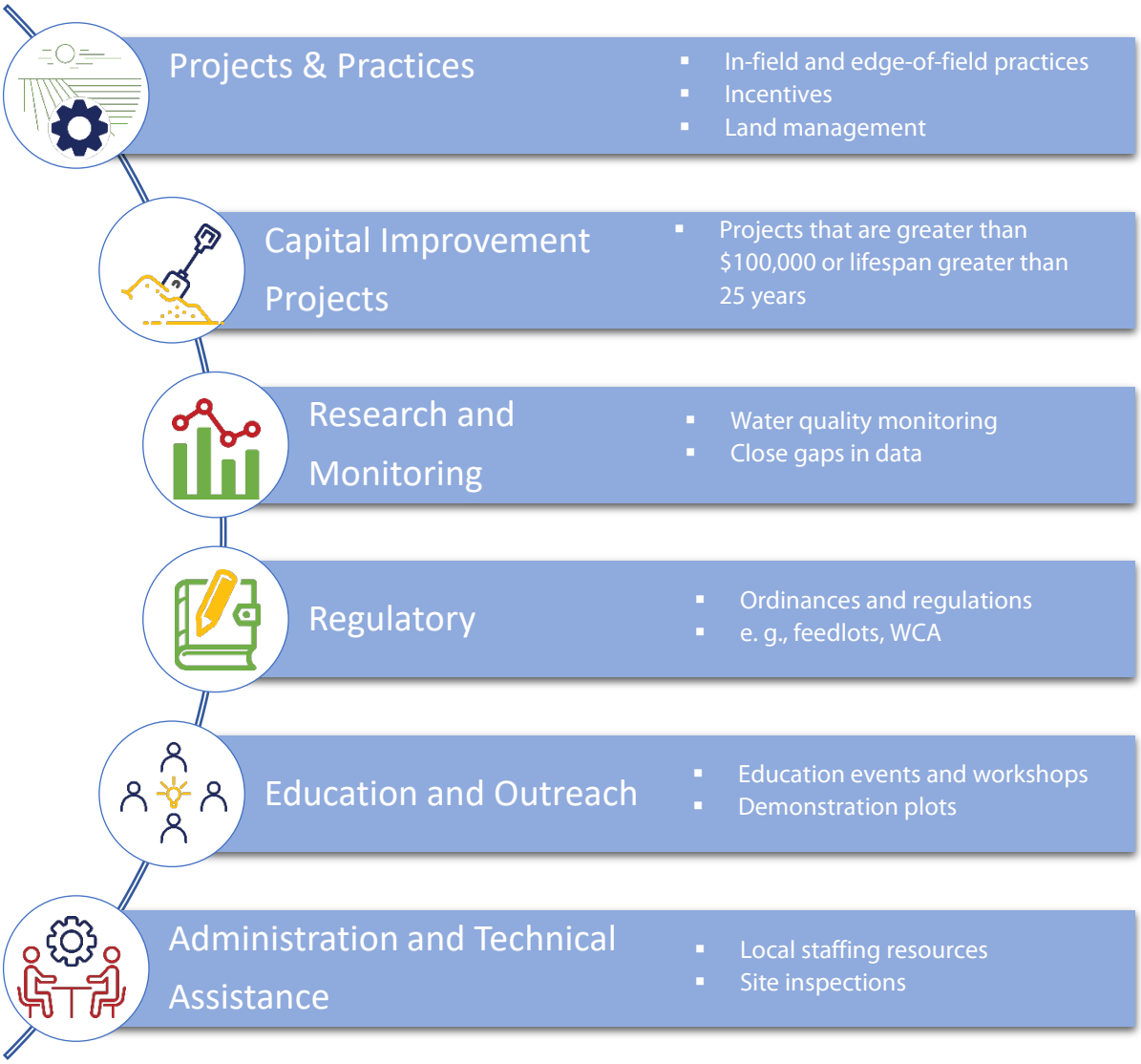


Figure F1. Implementation programs in the UMRW.

Projects & Practices

The Incentive Program funds projects and practices related to implementing conservation practices on the landscape. This can include planning and design in additional to implementation. It also funds or incentivizes land protection. This program seeks to assist landowners in implementing conservation actions, and does this through financial incentives, technical assistance, tax exemption, conservation easement, or land acquisition.

As there are many actions that fall into this program in **Section E**, local planning partners will create a scoring system to prioritize funding and allocate funds to each project. An Incentive Program policy document will be followed to clarify funding categories and how much funding a practice can receive. Funding is sourced from both local, state, and federal dollars. Preferential funding will be given to projects in a high priority planning region that provide multiple benefits towards achieving goals.

Cost-share Programs

Cost-share programs financially assist landowners with the cost of implementing a project or practice that results in natural resource benefits. Conservation practices can be structural—such as grassed waterways or WASCOBS—or nonstructural—such as nutrient management plans or cover crops. Multiple cost-share programs are available at the local, state, and federal level to aid landowners in paying for conservation practices.

Practices installed through this program have inspections and regular maintenance to ensure their success. Inspections are typically at the 1-, 3-, and 9-year mark according to the BWSR Grants Administration Manual. Notes and photos from inspections and any resulting maintenance activity should be recorded and stored with the Operations and Maintenance Plan for that project. Most practices have a lifespan of 10-15 years, and the landowner is required to maintain the practice during the life of the contract.

Land Protection Programs

Land protection programs maintain existing land enrolled in temporary set-aside programs or land rental. They work with partners to obtain additional perpetual easements. There are many state, federal, and partner-funded land protection programs in the UMRW. Examples of these include the Reinvest in Minnesota (RIM) Reserve Program, Conservation Reserve Enhancement Program (CREP), and the Farm Service Agency (FSA) CRP.

CRP is a land conservation program administered by the FSA. Farmers enroll in this program and agree to remove environmentally important land from production in return for an annual rental payment. Species that improve habitat and water quality are planted on the land. Contracts for CRP land are 10-15 years long.

Capital Improvement Projects Program

A CIP is a one-time project that generally costs more than $100,000 and lasts more 25 years. These projects are larger, more expensive, and longer lasting then projects implemented in the Incentives Program. These projects can include a repair, retrofit, or increased function of a facility, infrastructure, or environmental feature. CIPs are typically funded with Level 3 funding (partner assistance). CIPs typically require design, permitting, and construction. Post-installation regular inspections and maintenance are expected.

Planned CIPs are shown on **Table E15** in **Section E**. There is a potential for multipurpose drainage projects to be planned for the implementation of this plan that would result in reduced erosion, sedimentation, and stream peak flows. Additional CIPs may be installed during the 10-year lifespan of this plan if they provide progress towards measurable goals.

CIPs will need ongoing maintenance and operation. Entities responsible for CIPs, such as stormwater infrastructure, public works, facilities, and artificial watercourses, are responsible for maintenance though the project lifetime. Operation over the flow of water including natural watercourses, legal

drainage systems, impoundments, and small dams will continue under the regular operation and maintenance plans of these systems.

Research and Monitoring Program

This program funds actions that close knowledge gaps to allow for more effective and evidence-based implementation. This also funds monitoring that tracks resource conditions and the impacts of conservation action.

Currently, multiple monitoring programs (shown in **Table F1**) are run by local and state organizations. The data these programs produced helped to determine resource conditions, priority issues, and measurable goals of this plan. The monitoring efforts in the UMRW will continue during plan administration, without financial assistance from WBIF funds due to BWSR limitations on use.

Table F1. Summary of ongoing water quality and quantity monitoring programs. RS = rivers and streams, L = lakes, W = wetlands, and GW = groundwater (Source: BWSR).

Parameters	MPCA	DNR	MDH	MDA	County, SWCD, and WD
Nutrients	RS, L, W	RS, L		RS, GW	RS, GW, L
Suspended Solids	RS, L, W	RS			RS
Productivity	RS, L	RS			L
Pesticides				RS, L, W, GW	
Bacteria	RS, L		GW		RS
Biology	RS, L, W	RS, L			
Water level/Flow	RS, L	RS, L		GW, RS	RS
Algal Toxins	L				
Invasive Species		RS, L			L, RS, W
Fish Contaminants	RS, L	L	RS, L		
Chlorides	RS, L, W	RS	RS, L, GW	GW, RS	
Sulfates	RS, L, W	RS, L	RS, L, GW		

As summarized in **Table F1,** there are ongoing water quality monitoring programs in the UMRW led by state and local entities. The MPCA has 20 Intensive Watershed Monitoring (IWM) sites in the UMRW, two WPLMN sites that include drainage outside of or entering the plan boundary, and ongoing citizen monitoring through the Volunteer Monitoring Program. The MPCA will begin intensive monitoring of WPLMN sites and select IWM sites again in 2026 for the next WRAPS cycle. Other agencies including DNR, United States Geological Survey (USGS), and MDA are responsible for stream gaging. Data from monitoring sites will be useful to document measurable changes in water quality throughout implementation of this plan (**Table F2**).

Table F2. Summary of how information will be used to track resource condition improvements from implementation.

Level	Description	UMRW CWMP Application
Tracking	Practices, acres treated.	Outputs in Action Table (**Section E**). Projects will be tracked with a system and reported in eLINK during implementation.
Estimating	Using lower resolution calculators and tools to give a sense of the collective impacts of projects.	Engineers estimates and PTMApp results.
Modeling	Incorporating landscape factors and project information to predict future conditions.	PTMApp and Engineers estimates .
Measuring	Using field-collected information to assess the condition of the water.	Partner monitoring, with data gaps filled by lake monitoring, pollutant load monitoring, and network stream monitoring.

In addition to surface water, the DNR, MDA, and MPCA also monitor groundwater. Monitoring programs include the MDA Township Testing, DNR Observation Well Program, MPCA and MDA Ambient Groundwater Monitoring Programs, and Public Water Supplier Monitoring.

Local Government Units (LGUs) engaged with watershed issues understand that project funds are limited, and requests for tracking, evaluation, and assessment require staff time and resources, decreasing the funding available for projects. Outside of projects funded with WBIF, each LGU will be responsible for assessing, tracking, evaluating, and reporting data for their own organizations' activities. The Data Collection and Monitoring Program will be collaborative when efforts cross administrative boundaries, and entities in the partnership will share services where possible.

Regulatory Program

Many plan issues can be addressed through administration and enforcement of local ordinances and programs. Some Minnesota statutes are administered at the county level, as described in the following section. Counties, SWCDs, and WDs share regulatory and enforcement responsibility as shown in **Appendix E**. These LGUs will meet when applicable to discuss ordinances and update with any changes. These entities will review overlaps and differences in local regulatory administration to identify successes and any changes that could make progress towards plan goals. It is important to note that the WD also has their own rules that they enforce as shown in **Appendix F**.

Shoreland Management

The Minnesota Legislature has delegated responsibility to LGUs to regulate the subdivision, use, and development of shorelands along public waters to preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shorelands, and provide for the wise use of waters and related land resources. This statute is administered and enforced through ordinances in all counties.

Regulations: Minnesota Statute 103F and Minnesota Rules, Chapter 6120.2500-3900

Floodplain Management

Floodplain zoning regulations aim 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. To do this, these regulations are intended to guide development in the floodplain in a way that is consistent with the magnitude of these threats. 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 at https://www.dnr.state.mn.us/waters/watermgmt_section/floodplain/access-flood-maps.html. Floodplain zoning regulations are enforced through floodplain ordinances for all counties.

Regulations: Minnesota Statutes 103F, 104, 394

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 up until a feedlot becomes a confined animal feedlot operation at which point the MPCA becomes the regulatory agent. Swift, Traverse, and Big Stone counties have accepted this delegation and administer the rule through their feedlot ordinance and zoning ordinances.

Regulations: Minnesota Rules, Chapter 7020

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 along all public drainage systems. While SWCDs are responsible for determining compliance and assisting with implementation of the Buffer Law, the enforcement of the law is the responsibility of the counties.

Regulations: Minnesota Statutes 103B and 103F.48, Subd. 4

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 public for transporting and treating invasive species. Big Stone and Swift counties have AIS programs, while Traverse County enforces AIS transport laws through the Sheriff's Department.

Wetland Conservation Act

The Minnesota Legislature passed the WCA of 1991 to achieve no net loss of; increase the quantity, quality, and biological diversity of; and avoid direct or indirect impacts to Minnesota's wetlands. LGUs are responsible for administering, regulating, and educating landowners on WCA. Swift County administers the WCA while Swift SWCD assists. Big Stone and Traverse counties enforce the WCA and Traverse SWCD assists with administration.

Regulations: Minnesota Rules, Chapter 8420

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 NPDES Permit from the MPCA. All counties in the watershed have regulations within their local ordinances that address construction erosion control.

Regulations: Minnesota Rules, Chapter 7090

Comprehensive or Land Use Plans

Counties and municipalities within the UMRW are responsible for land use planning, which is administered through local zoning ordinances. Comprehensive or land use plans have been adopted by the LGUs within the watershed. From a regulatory perspective, land and resource management may overlap with the local government entities listed below. Therefore, meeting goals and strategies of local planning may also involve other governmental or non-governmental entities. The implementation of this plan will include coordination with the organizations showing in **Table F3**.

Table F3. Existing comprehensive or land use management plans that will be considered for overlaps and collaboration during the implmentation of this plan.

Local Government Unit	Comprehensive or Land Use Management Plan
Big Stone County	Big Stone County Comprehensive Plan (2002): https://www.bigstonecounty.gov/government/environmental/planning___zoning/index.php
Swift County	Swift County Comprehensive Plan, not available online
Traverse County	Traverse County Comprehensive Plan: https://www.co.traverse.mn.us/wp-content/uploads/2014/08/Traverse-County-Comprehensive-Plan-SIGNED.pdf

Wellhead Protection

The MDH administers the state wellhead protection rule that sets standards for safe drinking water. Municipalities within the planning area have completed or will be completing wellhead protection plans. The most recent listing of completed wellhead protection plans can be obtained from MDH.

Regulations: Minnesota Rules, Chapter 4720.5100 – 4720.5590; Minnesota Rules, Chapter 4725

Subsurface Sewage Treatment Systems

The SSTS Program is administered by the MPCA to protect public health and the environment. SSTS Ordinances are adopted and enforced at the county level to meet state requirements. Traverse County contracts the SSTS program out to Traverse SWCD, while Big Stone County and Swift County enforce ordinances on SSTS.

Regulations: Minnesota Rules, Chapters 7080 through 7083

Solid Waste Management

Minnesota's Waste Management Act has been in place since 1980 and establishes criteria for managing 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 have adopted Solid Waste Ordinances to use as a supplement in enforcing MPCA Rules.

Regulations: Minnesota Statutes 115A, 400

Public Drainage Systems

Drainage authority is delegated to counties and watershed districts through MN Statute Chapter 103E to establish, construct, and maintain public drainage systems. Swift and Big Stone counties have drainage programs for inspection and maintenance. Traverse County has delegated most of its authority to Bois de Sioux Watershed District. The Upper Minnesota River Watershed District coordinates on drainage systems with Big Stone County.

Regulations: Minnesota Statutes 103E

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 play a part in hazard management. These requirements direct the State to administer cost-sharing. All counties have Hazard Management Plans. Big Stone County has a draft of their plan available on their website that was open for public comment in February 2023.

Regulations: Minnesota Statute 12

Education and Outreach Program

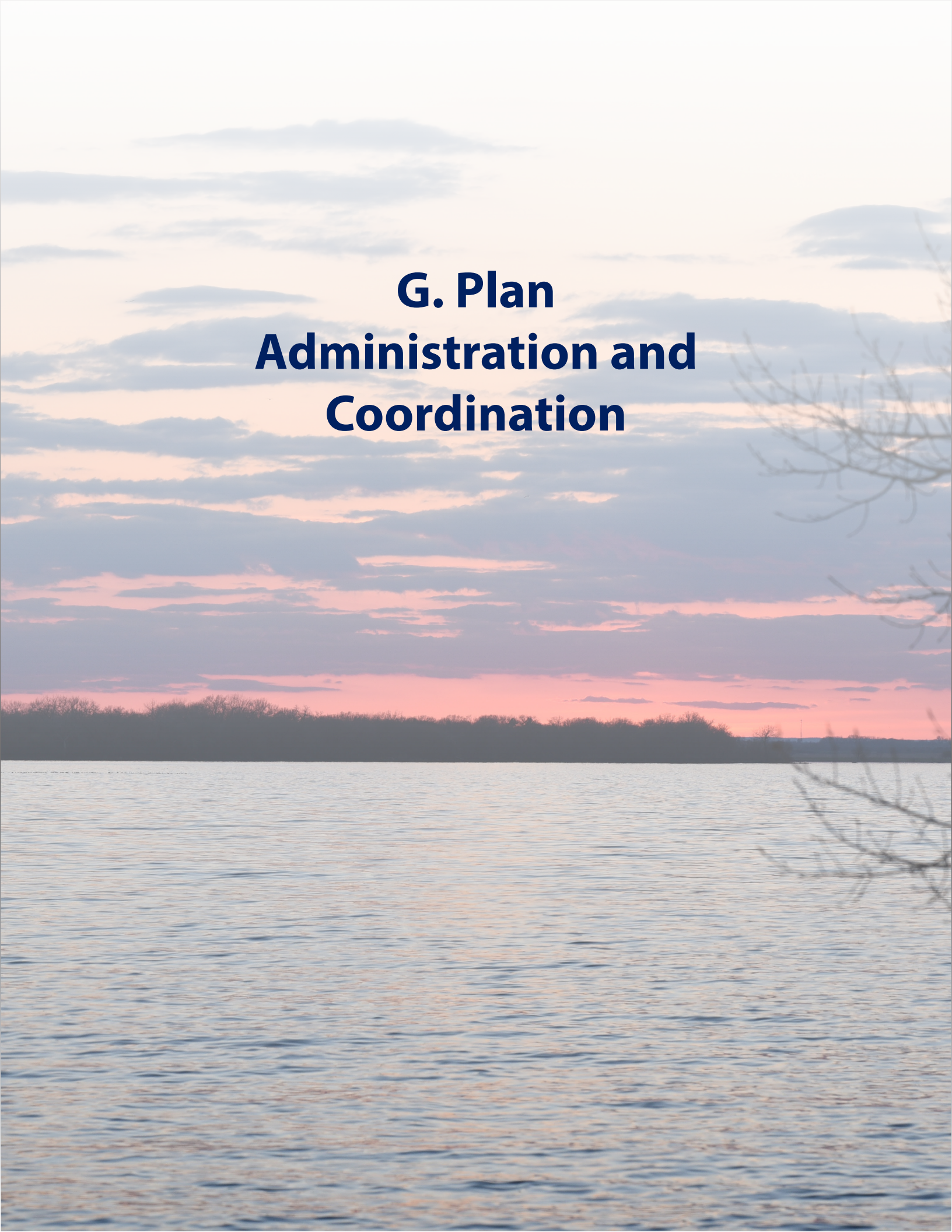
Implementation actions in this plan are largely voluntary and depend on landowner and stakeholder participation. Given this, education and outreach activities are an essential part of successful implementation. The Public Participation and Engagement Program funds actions that increase resident understanding of watershed issues, encourage local engagement, and address barriers to conservation action. There is already education and outreach efforts occurring in the watershed, and new actions will build on ones already implemented.

Example engagement/education events include:

- Field days
- Demonstration plots
- Workshops
- Social media engagement

Administration and Technical Assistance Program

This program is designed to capture local county contributions, state aid programs, SWCD technical support and conservation delivery (i.e., staffing resources), site inspections, and local levies. In other words, resources that are made available to staff at local units of government related to carrying out activities associated with this plan.



G. Plan Administration and Coordination

Section G. Plan Administration and Coordination

The UMRW CWMP will be implemented through a Joint Powers Agreement between the following entities:

- Big Stone, Swift, and Traverse counties
- Big Stone, Swift, and Traverse SWCD
- Upper Minnesota Watershed District

These entities are referred to as the Upper Minnesota River Watershed Partnership (Partnership). Each LGU is individually responsible for their roles in plan implementation.

Decision-Making and Staffing

Plan implementation will require increased funding, staff capacity, and local coordination. Successful implementation will depend on continuing and building on partnerships in the watershed between landowners, planning partners, agencies, and local organizations.

Two committees will serve the plan during implementation: the Policy Committee and the Steering Team.

Policy Committee

- Comprised of elected and appointed board members
- UMRWD Managers, one County Comissioner, and SWCD Board Supervisor for each of the three participating counties

Steering Team

- Comprised of local SWCD, county, watershed district, and state agency staff
- Listens to regular input from state agencies and local stakeholders

In addition to these regularly engaged committees, the Steering Team will engage an Advisory Committee during the development of biannual workplans for feedback on priority actions. The Advisory Committee will maintain a membership like the organizational makeup of the Advisory Committee that convened during plan development. **Table G1** lists the various roles and functions of committees during implementation. It is expected that roles may shift during implementation. Fiscal and administrative duties may be designated to a member LGU by the Policy Committee as described in the formal agreement. The Steering Team will approve the fiscal agent and determine local responsibilities for annual work planning.

Table G1. Roles and functions of committees during implementation.

Committee Name	Primary Implementation Roles
Policy Committee	▪ Recommend annual work plan ▪ Review and confirm priority issue recommendations ▪ Recommend plan amendments ▪ Recommend assessments as needed ▪ The Policy Committee will appoint one of its Partners to act as Fiscal that will oversee agreements and contracts on behalf of the Partnership ▪ Inform local boards of plan progress ▪ Approve implementation funding requests to BWSR
Steering Team	▪ Review the status of available implementation funds from plan participants ▪ Review opportunities for collaborative grants ▪ Review work plan and adjust as needed ▪ Review reports submitted to BWSR as required ▪ Biennial review and confirmation of priority issues ▪ Prepare plan amendments ▪ Implement the Action Tables
Local Fiscal and Administrative Agent	▪ Convene committee meetings ▪ Prepare and submit grant applications/funding requests ▪ Present annual audits of grant funds and usage ▪ Maintain financial records and accounting ▪ Prepare work plan ▪ Compile results for annual assessment

Collaboration

Collaboration Between Planning Partners

Collaboration between planning partners, both formally and informally, is encouraged but not mandated by this plan. LGUs that adopt this plan can choose whether to approve and participate in future implementation agreements. Meaningful collaboration between partners increases the likelihood of funding, consistent implementation of actions watershed-wide, gaining resource efficiencies. Ultimately, collaboration can result in water quality benefits. The Partnership will seek out opportunities for collaboration to gain administration and program efficiencies, pursue collaborative grants, and provide technical assistance.

The Partnership will also review local regulatory administration in order to identify successes and gaps and recommend any changes that will make progress towards plan goals.

Collaboration with other Units of Government

Members within the Partnership have been involved in coordination and cooperation with all units of government and will continue to build these partnerships throughout plan implementation. At the state/federal level, coordination between the Partnership and agencies such as BWSR, USGS, USACE, DNR, MDH, MDA, and MPCA are mandated as legislative or permit requirements. Local coordination

between the Partnership and municipalities, city councils, township boards, and county boards facilitate watershed-wide activities. The Partnership will continue to create an environment that encourages intergovernmental cooperation and communication.

Collaboration with Others

Collaborations with other organizations outside of government, such as non-governmental organizations (NGOs), will be expanded through plan implementation. Many existing NGO partnerships are focused on expanding habitat and recreation in the watershed, while providing education and outreach opportunities. As the UMRW is on the western border of Minnesota, cooperation with South Dakota water managers such as East Dakota Water Development District has been and will continue to be a key partnership. In addition, a citizens advisory group will be formed and engaged regularly for input on plan implementation.

Funding

Funding watershed actions consists of funding from current sources (Level 1), current and WBIF funding upon approval of this plan (Level 2), and partner funding (Level 3). The estimated funds available for implementation are shown below in **Table G2**. The Partnership plans to have Level 2 funding for implementation.

Table G2. Estimated funding available for implementation.

	Funding Level		
	Level 1	Level 2 (includes Level 1)	Level 3
Estimated Annual	$634,804	$1,009,769	Dependent on partner and grant funding availability
Estimated 10-year	$6,348,040	$10,097,694	

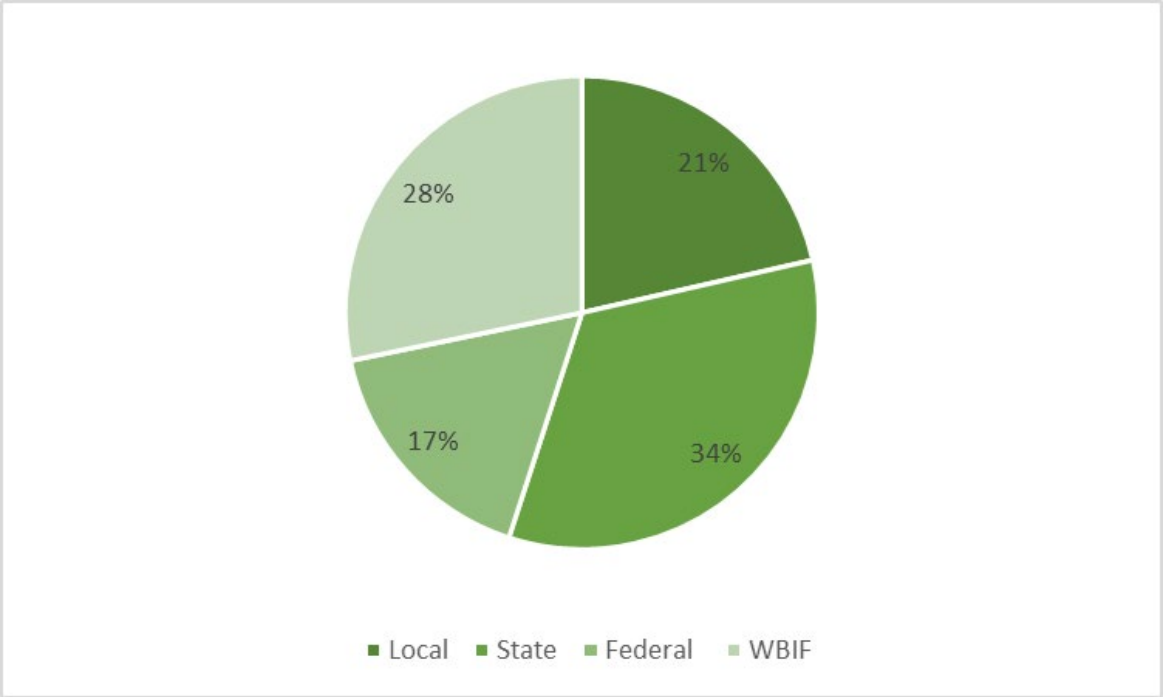


Figure G1. Allocation of funding for implementation programs.

Local Funding

Local funding is money derived from the local property tax base or in-kind services of personnel funded from the local tax base. Examples of this includes local levy, county allocations, and local match dollars. Local funds will be used for locally focused projects where state and federal funding is not available, or for matching grants. The estimated available local funds are $190,000/year.

State Funding

State funding is money that comes from the state tax base, including conservation delivery, state cost share, Natural Resources Block Grants, Clean Water Funds, and SWCD aid. The fiscal agent will apply on behalf of the Partnership for collaborative grants from state funds. WBIF funds are non-competitive state funding that are expected to be available for implementation upon plan approval. Many actions planned for implementation have outcomes that align with state programs. These actions can access state funding to help fund implementation.

Federal Funding

Federal funding is funds derived from the federal tax base. Just as with state funding, if goals of federal programs align with actions, partnerships with federal agencies for grants that address both the Partnership and agency goals will be an asset for implementation. Programs such as Environmental Quality Incentives Program (EQIP) will be available through the NRCS, and the FSA supports land retirement programs such as CRP. We estimated that $3,600,000/year of federal funding is available within the planning area to support implementation activities. It is important to note that this funding is considered Level 3 funding as it is not directly in the control of the plan partnership and is typically allocated through federal programs. However, it is a great opportunity for leveraging Level 3 funding to make progress towards the goals of this plan.

Additional Funding

Current local, state, and federal funding is not sufficient to fund plan actions. Implementation will be carried out at Level 2 funding, which includes WBIF funds. Level 3 funding will be leveraged when possible, especially for expensive CIPs.

NGO funding sources are also available to provide technical and financial assistance. This plan should be distributed to local NGOs to explore opportunities for collaboration. The private sector, especially in agribusiness, is an overlooked area that could provide funding for implementation.

Plan partners may pursue grant opportunities individually or collaboratively to fund action tables. **Table G3** shows a list of available grant opportunities (not all-inclusive).

Table G3. Implementation programs and related funding sources for the UMRW watershed. Note: List is not all-inclusive.

Program / Grant		Primary Assistance Type	Projects & Support	Capital Improvement Projects	Monitoring & Studies	Education and Public Involvement
Federal Programs / Grants						
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)	Financial	•			
	Farmable Wetlands Program (FWP)	Financial	•			
	Grasslands Reserve Program (GRP)	Financial	•			
	Wetland Reserve Program (WRP)	Easement	•	•		
FSA/ USDA/ NRWA	Source Water Protection Program (SWPP)	Technical				•
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	•		•	•
NACD	Technical Assistance Grants	Financial/ Technical	•	•	•	•

Table continued on next page

Program / Grant		Primary Assistance Type	Projects & Support	Capital Improvement Projects	Monitoring & Studies	Education and Public Involvement
State Programs / Grants						
LSOHF	Lessard-Sams Outdoor Heritage Fund (LSOHF)	Financial	•	•	•	•
DNR	Aquatic Invasive Species Control Grant Program	Financial/ Technical	•		•	•
	Conservation Partners Legacy Grant Program	Financial	•	•		
	Flood Hazard Mitigation Grant Assistance	Financial	•	•	•	•
	Forest Stewardship Program	Technical	•			•
	Groundwater Atlas Program	Technical			•	
	Aquatic Management Area Program	Acquisitions	•			
	Wetland Tax Exemption Program	Financial	•			
BWSR	Clean Water Fund Grants	Financial	•	•		•
	Erosion Control and Water Management Program	Financial	•			
	Natural Resources Block Grant (NRBG)	Financial	•			•
	RIM	Financial	•	•		•
MPCA	Surface Water Assessment Grants (SWAG)	Financial			•	•
	Clean Water Partnership	Loan	•			
	WRAPS Clean Water Fund	Financial			•	•
MDH	Source Water Protection Grant Program	Financial	•	•	•	•
	Accelerated Implementation Grant	Financial			•	
	Public and Private Well Sealing Grant Program	Financial	•		•	
MDA	Agriculture BMP Loan Program	Financial	•			
	Nutrient Management Initiative (NMI)	Technical/ Financial	•		•	•
	Minnesota Agricultural Water Quality Certification Program	Financial	•			•
	Soil Health Financial Assistance Program Grant	Financial	•			
MNDOR	SWCD and County aid	Financial	•		•	•
Other Funding Sources						
Pheasants Forever		Financial/ Technical	•	•	•	•
Ducks Unlimited		Financial/ Technical	•	•	•	•
The Nature Conservancy		Financial	•	•	•	•
Minnesota Land Trust		Financial	•	•	•	•

Water Management Districts

Watershed districts may establish water management districts (WMD) to fund projects under current law (103D). The Upper Minnesota River Watershed District may establish a WMD to help with plan implementation.

Process to Create Water Management Districts

BWSR has provided guidance as to the process of creating a WMD (see guidance online at: https://bwsr.state.mn.us/water-management-districts). Creation of WMDs through this CWMP will follow this guidance.

Duration for Existence of Water Management Districts

The PC anticipates that the WMDs will provide funding to assist with the implementing a variety of stormwater-related (runoff and/or water quality) projects. The WMDs will remain in existence for a time consistent with the implementation schedule of this plan or as determined by the UMRWD Board. An annual charges assessment could vary from no charges to the maximum WMD revenue limit of the planning region.

Use of Funds

The primary use of the funds collected from charges within WMDs will support stormwater runoff and water quality projects that help achieve the goals of the planning regions, which benefits residents within a WMD.

Description of WMDs and Annual Charge Amount

The WMD funding option can only be used to collect charges to pay costs for projects initiated under MS 103D.601, 103D.605, 103D.611, or 103D.730. To use this funding method, Minnesota law (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. This plan establishes the four UMRW planning regions (See **Section 1**) as WMDs. The UMRWD may create different WMDs under future plan amendments. However, any plan amendment initiated solely by the UMRWD can only be done to establish WMDs. All other forms of plan amendments will be initiated by the Policy Committee per the Plan Amendment section on page 87 of this CWMP. The maximum WMD revenue limit within each WMD is based on 0.10% of the taxable market value within each planning region. This value will change each year as property values increase or decrease over time.

Method to Determine Charges

The methods proposed to establish the charges will be based on:

Option 1: the proportion of the total annual runoff volume and contributed by a parcel,

Option 2: the proportion of the solids load contributed by a parcel, or

Option 3: combination of **Options 1 and 2**

Option 4: may be based on the drainage area of the parcel within an WMD.

Option 1: The runoff volume method will:

- Use soils and land use data to determine the existing curve number for each parcel within a WMD,
- Use the curve number for each parcel and the annual average precipitation depth to compute the annual runoff volume for each parcel,
- Sum the annual average runoff volumes for all parcels within a WMD to determine the total annual runoff volume, and
- Compute the percentage of the annual runoff volume from each parcel as the ratio of the annual average runoff volume from the parcel and the total annual average runoff volume for the WMD (i.e., the "runoff ratio").

Option 2: The solids load contribution method will:

- Use the Revised Universal Soil Loss Equation (or equivalent) and a sediment delivery ratio representing the portion of the solids and sediment reaching a watercourse to compute the annual average sediment and solids load for each parcel,
- Sum the annual average solids and sediment loads for all parcels within a WMD to determine the total annual average sediment and solids load, and
- Compute the percentage of the annual average sediment and soils load from each parcel as the ratio of the annual average sediment and solids load from the parcel and the total annual average sediment and soils load for the WMD (i.e., the "sediment ratio").

Option 3: The combination runoff volume and solids load method is used to consider both runoff volume and solids load contribution and would follow the methodologies listed in **Options 1 and 2** for both solids contribution and runoff volume.

Calculation of charges for **Options 1-3** would be determined as follows:

- Add the runoff ratio and/or the sediment ratio to determine the charge ratio for each parcel within the WMD. The amount charged to a specific parcel is the sum of the runoff and sediment ratios for the parcel divided by the sum of the runoff and sediment ratios for all parcels within the WMD.
- Apply the charge ratio to the total amount of revenue needed for the WMD to carry out the stormwater related projects, programs, and activities described by the plan to achieve the stormwater-related goals within that WMD.

Option 4: The drainage area method will determine the drainage area of each parcel of land within the planning region.

Calculation of charges for **Option 4** would be determined as follows:

- The amount charged to a specific parcel is determined by the charge ratio. The charge ratio is determined by taking the drainage area of that parcel within the planning region divided by the total area of the planning region.
- Apply the charge ratio to the total amount of revenue needed for the WMD to carry out the stormwater-related projects and programs described by the plan to achieve the stormwater-related goals within that WMD.

Selection of the appropriate process of determining charges will be established and further refined in Step 4 of the process described in **Process to Be Used to Create Water Management Districts**. In recognition of geospatial data limitations, (while not a complete list) common adjustments involve

correction of land use geospatial data and developing composite runoff and sediment delivery from common land use classifications, and field verification of project drainage area boundaries.

Local Appeal

The following local appeal procedure is established when WMDs are established under this plan:

1. Upon receipt of the order of BWSR approving the establishment of a WMD, the Watershed District shall publish notice of its resolution adopting the WMD in a newspaper in general circulation in the 1W1P area.
2. Any landowner affected by the WMD may, within 30 days of first publication of notice of the resolution, appeal the establishment of the WMD to the Watershed District by filing a letter stating the basis for the appeal.
3. Within 30 days of receiving a letter of appeal, the Watershed District shall hold a hearing on the appeal, giving the appellant an opportunity to be heard and to present evidence why the WMD should not be established. The hearing shall be noticed as required for a special meeting under statutes chapter 103D.
4. The hearing shall be recorded to preserve a record for further review. The record of the appeal shall include the recording, any documentary evidence provided by the appellant, and all records related to the establishment of the WMD.
5. Within 30 days of the hearing, the Watershed District shall adopt and mail findings and an order on the appeal to the appellant and the BWSR.
6. Further appeal, if any, shall be as provided in Statutes Chapter 103D and existing authorities and procedures of the BWSR Board.

Work Planning

Local Work Plan

Work planning is developed by the fiscal/administrative agent for the purposes of aligning plan issues, available funding, and role and responsibilities during implementation. The work plan will be reviewed by the Steering Team annually and adjusted if necessary to respond to grant requests and any changes identified through assessments. The work plan will then be presented to the Policy Committee, which will approve the work plan. Work planning is intended to keep partners collaborating throughout implementation.

State Funding Request

A biennial WBIF request will be developed by the Steering Team based on the work plan. The Policy Committee will review and approve it before submitting it to BWSR. Biennial funding requests will be derived from plan actions and any changes made from self-assessments.

Assessment, Evaluation, and Reporting

Assessments

Annual progress towards reaching plan goals will be documented through a tracking system used by the Steering Team. Each year, the Steering Team will provide the Policy Committee with an update on the progress of the plan's implementation through a partnership assessment. During this update, feedback will be solicited from local boards and the Policy Committee. This feedback will be presented

by the Local Fiscal/Administrative Agent to the Policy Committee in order to set the coming year's priorities for achieving the plan's goals and to decide on the direction for collaborative grant submittals.

Five-Year Evaluation

This plan has a 10-year life cycle beginning in 2023. 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 2027-28 and at every 5-year midpoint of a plan life cycle, an evaluation will be done to determine if the current course of action is sufficient to reach the goals of the plan or if a change is necessary. Feedback from local boards and the policy committee during the annual progress update will be documented and incorporated into 5-year evaluations.

Reporting

LGUs currently have a variety of reporting requirements related to their activities, programs, and grants. Other reporting requirements are required by state statute, such as watershed district annual reporting and buffer reports. 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 (including WBIF) may be reported by the Local Fiscal/Administrative Agent appointed to represent the partnership. In addition to annual reports, the Local Fiscal/Administrative Agent may also develop a State of the Watershed Report. This brief report will document progress toward reaching goals and action tables. 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 evaluation process.

Plan Amendments

The UMRW CWMP is effective through 2033. Activities described in this plan are voluntary 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 plan goals. This provision for flexibility includes changes to the activities except for CIPs.

While this plan is in effect, it is likely that new data giving a better understanding of watershed issues and solutions will be generated. Administrative authorities, state policies, and resource concerns may also change. New information; significant changes to the projects, programs, or funding in the plan; or the potential impact of emerging concerns and issues may require activities to be added to the plan. While plan amendments may be proposed by any agency, person, or local government, the plan amendment process shall be initiated only by the Policy Committee (aside from the creation of WMDs, see 'Description of WMDs and Annual Charge Amount' section on page 83) and will proceed according to the procedure described in State statute.

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Appendices

Appendix A

MEMORANDUM OF AGREEMENT

Upper Minnesota River Partnership

This agreement (Agreement) is made and entered into by and between:

The Counties of Traverse, Big Stone and Swift by and through their respective County Board of Commissioners, and

The Traverse, Big Stone and Swift Soil and Water Conservation Districts, by and through their respective Soil and Water Conservation District Board of Supervisors, and

The Upper Minnesota River Watershed District, by and through their respective Board of Managers,

Collectively referred to as the "Parties."

WHEREAS, the Counties of this Agreement are political subdivisions of the State of Minnesota, with authority to carry out environmental programs and land use controls, pursuant to Minnesota Statutes Chapter 375 and as otherwise provided by law; and

WHEREAS, the Soil and Water Conservation Districts (SWCDs) of this Agreement are political subdivisions of the State of Minnesota, with statutory authority to carry out erosion control and other soil and water conservation programs, pursuant to Minnesota Statutes Chapter 103C and as otherwise provided by law; and

WHEREAS, the Upper Minnesota River Watershed District is a political subdivision of the State of Minnesota, with statutory authority to carry out conservation of the natural resources of the state by land use controls, flood control, and other conservation projects for the protection of the public health and welfare and the provident use of the natural resources, pursuant to Minnesota Statutes Chapters 103B, 103D and as otherwise provided by law; and

WHEREAS, the parties to this Agreement have a common interest and statutory authority to prepare, adopt, and assure implementation of a comprehensive watershed management plan in the Upper Minnesota River Watershed to conserve soil and water resources through the implementation of practices, programs, and regulatory controls that effectively control or prevent erosion, sedimentation, siltation and related pollution in order to preserve natural resources, ensure continued soil productivity, protect water quality, reduce damages caused by floods, preserve wildlife, protect the tax base, and protect public lands and waters; and

WHEREAS, with matters that relate to coordination of water management authorities pursuant to Minnesota Statutes Chapters 103B, 103C, and 103D with public drainage systems pursuant to Minnesota Statutes Chapter 103E, this Agreement does not change the rights or obligations of the public drainage system authorities.

WHEREAS, the Parties have formed this Agreement for the specific goal of developing a plan pursuant to Minnesota Statutes § 103B.801, Comprehensive Watershed Management Planning, also known as *One Watershed, One Plan*.

NOW, THEREFORE, the Parties hereto agree as follows:

1. **Purpose:** The Parties to this Agreement recognize the importance of partnerships to plan and implement protection and restoration efforts for the Upper Minnesota River Watershed. The purpose of this Agreement is to collectively develop and adopt, as local government units, a coordinated watershed management plan for implementation per the provisions of the Plan. Parties signing this agreement will be collectively referred to as Upper Minnesota River Partnership.

2. **Term:** This Agreement is effective upon signature of all Parties in consideration of the Board of Water and Soil Resources (BWSR) Operating Procedures for One Watershed, One Plan; and will remain in effect until adoption of the plan by all parties, unless canceled according to the provisions of this Agreement or earlier terminated by law.

3. **Adding Additional Parties:** A qualifying party desiring to become a member of this Agreement shall indicate its intent by adoption of a board resolution prior to *December 31, 2021.* The party agrees to abide by the terms and conditions of the Agreement; including but not limited to the bylaws, policies and procedures adopted by the Policy Committee. If a qualifying party desires to join after the date above, they should notify the grant Administrator and present their intent to become a member to the Policy Committee for their consideration at their next meeting.

4. **Withdrawal of Parties:** A party desiring to leave the membership of this Agreement shall indicate its intent in writing to the Policy Committee in the form of an official board resolution. Notice must be made at least 30 days in advance of leaving the Agreement.

5. **General Provisions:**

    a. **Compliance with Laws/Standards:** The Parties agree to abide by all federal, state, and local laws; statutes, ordinances, rules and regulations now in effect or hereafter adopted pertaining to this Agreement or to the facilities, programs, and staff for which the Agreement is responsible.

    b. **Indemnification:** Each party to this Agreement shall be liable for the acts of its officers, employees or agents and the results thereof to the extent authorized or limited by law and shall not be responsible for the acts of any other party, its officers, employees or agents. The provisions of the Municipal Tort Claims Act, Minnesota Statute Chapter 466 and other applicable laws govern liability of the Parties. To the full extent permitted by law, actions by the Parties, their respective officers, employees, and agents pursuant to this Agreement are intended to be and shall be construed as a "cooperative activity." It is the intent of the Parties that they shall be deemed a "single governmental unit" for the purpose of liability, as set forth in Minnesota Statutes § 471.59, subd. 1a(a). For purposes of Minnesota Statutes § 471.59, subd. 1a(a) it is the intent of each party that this Agreement does not create any liability or exposure of one party for the acts or omissions of any other party.

    c. **Records Retention and Data Practices:** The Parties agree that records created pursuant to the terms of this Agreement will be retained in a manner that meets their respective entity's records retention schedules that have been reviewed and approved by the State in accordance with

Minnesota Statutes § 138.17. The Parties further agree that records prepared or maintained in furtherance of the agreement shall be subject to the Minnesota Government Data Practices Act. At the time this agreement expires, all records will be turned over to the Upper Minnesota River Watershed District for continued retention.

d. **Timeliness:** The Parties agree to perform obligations under this Agreement in a timely manner and keep each other informed about any delays that may occur.

e. **Extension:** The Parties may extend the termination date of this Agreement upon agreement by all Parties.

6. **Administration:**

a. **Establishment of Committees for Development of the Plan.** The Parties agree to designate one representative, who must be an elected or appointed member of the governing board, to a Policy Committee for development of the watershed-based plan and may appoint of one or more technical representatives to a Steering Team for development of the plan in consideration of the BWSR Operating Procedures for One Watershed, One Plan. An Advisory Committee made up of local stakeholders and state employees/officials will be convened to provide additional support and recommendations.

i. The Policy Committee will meet as needed to decide on the content of the plan, serve as a liaison to their respective boards, and act on behalf of their Board. Each representative shall have one vote.

ii. Each governing board may choose one alternate to serve on the Policy Committee as needed in the absence of the designated member.

iii. The Policy Committee will establish bylaws by March 1, 2022 to describe the functions and operations of the committee(s).

iv. The Advisory Committee will meet as needed to assist and provide support and make recommendations to the Policy Committee on the development and content of the plan. Members of the Advisory Committee may not be a current board member of any of the Parties.

v. The Steering Team will consult with the Advisory Committee as needed to provide public comments and recommendations. This will occur no less than once per year until the plan is approved.

b. **Submittal of the Plan.** The Policy Committee will recommend the plan to the Parties of this agreement. The Policy Committee will be responsible for initiating a formal review process for the watershed-based plan conforming to Minnesota Statutes Chapters 103B and 103D, including public hearings. Upon completion of local review and comment, and approval of the plan for submittal by each party, the Policy Committee will submit the watershed-based plan jointly to BWSR for review and approval.

c. **Adoption of the Plan.** The Parties agree to adopt and begin implementation of the plan within 120 days of receiving notice of state approval and provide notice of plan adoption pursuant to Minnesota Statutes Chapters 103B and 103D.

7. **Grant Administration:** The Upper Minnesota River Watershed District will act as the grant administrator for the purposes of this Agreement and agrees to provide the following services:

   a. Accept all responsibilities associated with the implementation of the BWSR grant agreement for developing a watershed-based plan, including being the primary BWSR contact for the *One Watershed, One Plan* Grant Agreement and being responsible for BWSR reporting requirements associated with the grant agreement.

   b. Provide the Policy Committee with the records necessary to describe the planning condition of the BWSR grant agreement.

   c. Perform financial transactions as part of grant agreement and contract implementation.

   d. Annually provide a full and complete audit report.

   e. Provide the Policy Committee with the records necessary to describe the financial condition of the BWSR grant agreement.

   f. Retain fiscal records consistent with the agent's records retention schedule until termination of the agreement (at that time, records will be turned over to the Upper Minnesota River Watershed District).

8. **Authorized Representatives:** The following persons will be the primary contacts for all matters concerning this Agreement:

Traverse County
Sara Gronfeld or successor
County Water Planner
304 4th St N
Wheaton, MN 56296
Telephone: (320) 563-8218

Traverse SWCD
Sara Gronfeld or successor
District Manager
304 4th St N
Wheaton, MN 56296
Telephone: (320) 563-8218

Big Stone County
Darren Wilke or successor
Environmental Director
20 Second St SE
Ortonville, MN 56278
Telephone: (320) 839-6376

Big Stone SWCD
Tammy Nuebauer or successor
District Manager
990 US Highway 12
Ortonville, MN 56278
Telephone: (320) 839-6149

Swift County
Scott Collins or successor
Environmental Services Director
301 14th Street N
Benson, MN 56215
Telephone: (320) 843-2356

Swift SWCD
Andy Albertsen or successor
District Manager
1430 Utah Ave
Benson, MN 56215
Telephone: (320) 842-7201 x3

Upper Minnesota River Watershed District
Amber Doschadis or successor
District Administrator
211 2nd Street SE
Ortonville, MN 56278
Telephone: (320) 839-3411

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **Traverse County**

APPROVED:

BY: _____ 4/6/21
Board Chair Date

BY: Sara Gronfield 4/6/2021
County Water Planner Date

APPROVED AS TO FORM *(use if necessary)*

BY: _____ April 6, 2021
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **Traverse SWCD**

APPROVED:

BY: _____ 4/8/21
Board Chair Date

BY: Sara Gronfield 4/8/2021
District Manager Date

APPROVED AS TO FORM *(use if necessary)*

BY: _____ April 6, 2021
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **Big Stone County**

APPROVED:

BY: _____ 4/6/2021
Board Chair Date

BY: _____ 4-6-21
Environmental Serv. Director Date

APPROVED AS TO FORM *(use if necessary)*

BY: _____
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **Big Stone SWCD**

APPROVED:

BY: Dan Marvel 4-6-21
Board Chair Date

BY: 4/6/21
District Manager Date

APPROVED AS TO FORM *(use if necessary)*

BY: _____
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **Swift County**

APPROVED:

BY: _____ 4-6-2021
Board Chair Date

BY: _____ 4-7-2021
Environmental Serv. Director Date

APPROVED AS TO FORM *(use if necessary)*

BY: _____ 4/7/2021
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **Swift SWCD**

APPROVED:

BY: _____ 4-8-21
Board Chair Date

BY: _____ 4-8-21
District Manager Date

APPROVED AS TO FORM *(use if necessary)*

BY: _____
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **Upper Minnesota River Watershed District**

APPROVED:

BY: _____ 5/4/2021
Board Chair Date

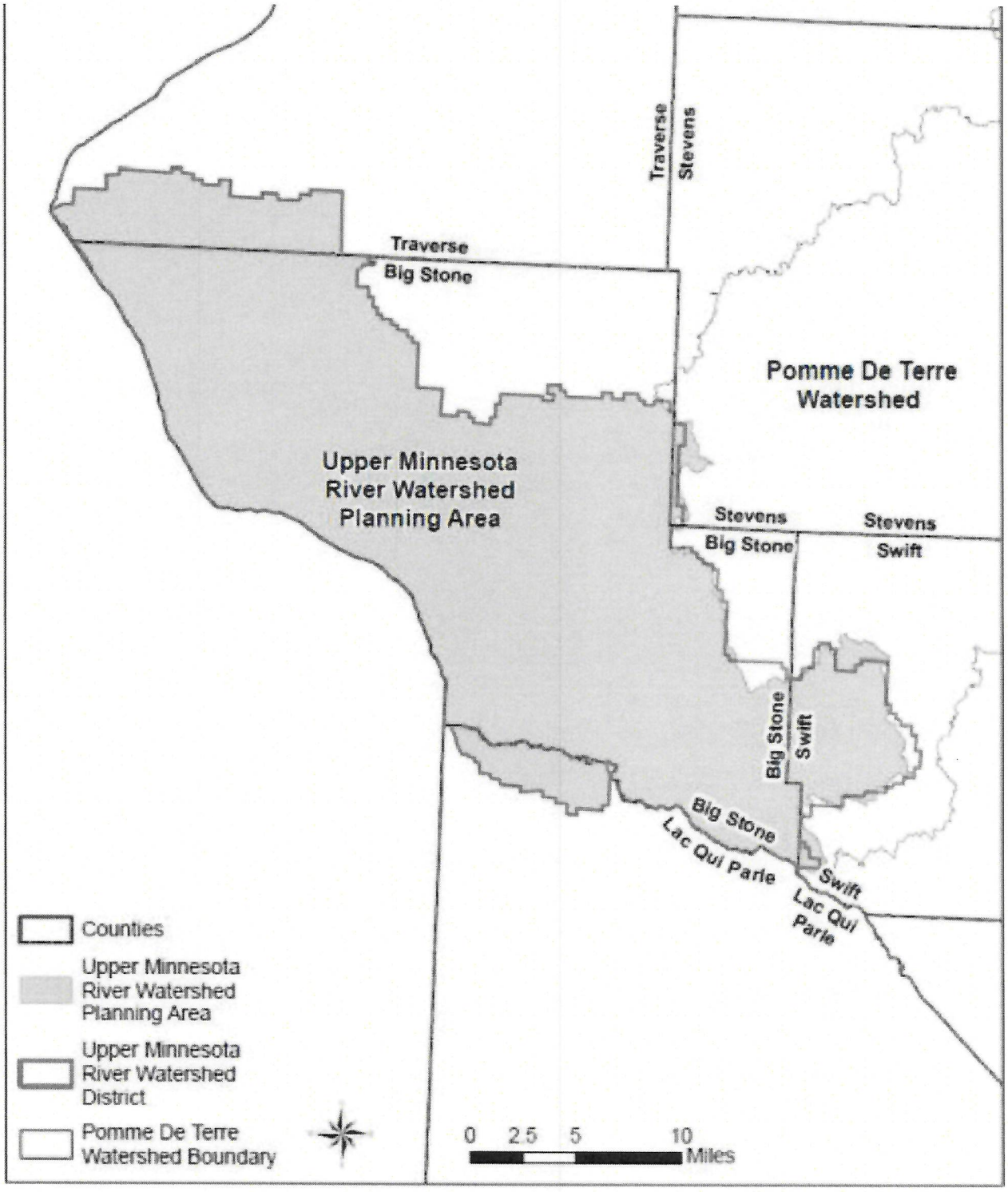
BY: _____ 5/4/2021
District Administrator Date

APPROVED AS TO FORM *(use if necessary)*

BY: N/A
County Attorney Date

Attachment A

Upper Minnesota River Watershed Planning Boundary



Attachment B

Scope of Services Provided by the

Upper Minnesota River Watershed District

As Grant Administrator, The Upper Minnesota River Watershed District will have the following duties:

1. Coordination of Policy Committee meetings, including:
    a. Provide advance notice of meetings;
    b. Prepare and distribute the Agenda and related materials;
    c. Prepare and distribute Policy Committee Minutes;
    d. Maintain all records and documentation of the Policy Committee;
    e. Provide public notices to the counties and watershed district for publication; and
    f. Gather public comments from public hearing and prepare for submittal.

2. Coordination of Advisory Committee meetings, including the technical and citizen subcommittees, including:
    a. Provide advance notice of meetings;
    b. Prepare and Distribute the Agenda and related materials;
    c. Prepare and Distribute Minutes; and
    d. Maintain all records and documentation of the committees.

3. Administration of the grant with BWSR for the purposes of developing a watershed-based plan, including:
    a. Submit this Agreement, work plan, and other documents as required;
    b. Execute the grant agreement;
    c. Account for grant funds and prompt payment of bills incurred;
    d. Complete annual eLINK reporting;
    e. Present an annual audit of grant funds and their usage; and
    f. Maintain all financial records and accounting.

4. Contracting for Services with the chosen consultant for plan preparation and writing of the watershed-based plan, including:
    a. Execute the Contract for Services agreement;
    b. Oversee expenditures incurred by the consultant;
    c. Provide prompt payment for services rendered; and
    d. Serve as primary contact person with the consultant.

Lac qui Parle Soil and Water Conservation District

122 8th Ave South, Madison, MN 56256
Phone: (320) 598-7321 Ext 3.
Website: www.lacquiparleswcd.org

March 12, 2021

Upper Minnesota River Partnership
211 2nd Street SE
Ortonville, MN 56278

Dear Ms. Doschadis:

I am writing in support of the Upper Minnesota River Partnership's One Watershed, One Plan planning effort. Lac qui Parle SWCD believes in the One Watershed, One Plan mission and efforts. However, the Lac qui Parle SWCD Board will not be participating in the planning effort. The Upper Minnesota River Watershed covers less than five percent of Lac qui Parle County and most of the land in that area is already in a permanent protection program. Please note that the Lac qui Parle SWCD will adopt the final plan after approval by the Minnesota Board of Water and Soil Resources.

The Lac qui Parle SWCD wishes the Partnership success in their planning efforts.

Sincerely,

Chessa Frahm

Chessa Frahm
Lac qui Parle SWCD District Manager

Appendix B

BOARD OF WATER AND SOIL RESOURCES

Thursday, April 27, 2023

Upper Minnesota River Partnership One Watershed, One Plan Planning Partners
c/o Amber Doschadis, Upper Minnesota River Watershed District
211 2nd Street SE
Ortonville, MN 56278

RE: Invitation to Submit Priority Concerns for the Upper Minnesota River Partnership One Watershed, One Plan (1W1P)

Dear Mrs. Doschadis,

Thank you for the opportunity to provide priority issues and plan expectations for the development of the Upper Minnesota River Comprehensive Watershed Management Plan (One Watershed, One Plan) under Minnesota Statutes section 103B.801. We appreciate the partner's willingness to participate in development of a watershed-based plan.

The Board of Water and Soil Resources (BWSR) has the following overarching expectations for the plan:

Process

- The planning process must follow the requirements outlined in the One Watershed, One Plan – Operating Procedures 2.1 document, adopted by the BWSR Board on March 24, 2021 and available on the BWSR website: https://bwsr.state.mn.us/sites/default/files/2021-04/2.1%20Operating%20Procedures_Final_4_7.pdf. More specifically, the planning process must:
    - Involve a broad range of stakeholders to ensure an integrated approach to watershed management.
    - Reassess the agreement established for planning purposes when finalizing the implementation schedule and programs in the plan, in consultation with the Minnesota Counties Intergovernmental Trust and/or legal counsel of the participating organizations, to ensure implementation can occur efficiently and with minimized risk. This step is critical if the plan proposes to share services and/or submit joint grant applications.
    - Follow the revised and agreed upon planning boundary as described in the resolution and submitted application as part of the 2021 Clean Water Fund One Watershed, One Plan Planning Grant Request for Proposals. The revised planning boundary, which removed the subwatershed area that drains into Lac qui Parle Lake and the Yellow Bank River subwatershed received concurrence from planning boundary #16, #18 and #20 Counties, SWCDs, and Watershed Districts.

Plan Content

- The plan must meet the requirements outlined in the One Watershed, One Plan – Plan Content Requirements 2.1 document, adopted by the BWSR Board on August 29, 2019 and available on the BWSR website: https://bwsr.state.mn.us/sites/default/files/2019-12/1w1p_plan_content_requirements_2.1_0.pdf. More specifically, the plan must have:
    - A thorough analysis of issues, using available science and data, in the selection of priority resource concerns.
    - Sufficient measurable goals to indicate an intended pace of progress for addressing the priority issues.
    - A targeted and comprehensive implementation schedule, sufficient for meeting the identified goals.
    - A thorough description of the programs and activities required to administer, coordinate, and implement the actions in the schedule: including work planning (i.e. shared services, collaborative grant-making, decision making as a watershed group and not separate entities) and evaluation.
    - The following issues must be addressed in the plan
        - Surface water and ground water quality protection, restoration, and improvement, including prevention of erosion and soil transport into surface water systems
        - Restoration, protection, and preservation of drinking water sources and natural surface water and groundwater storage and retention systems
        - Promotion of groundwater recharge
        - Minimization of public capital expenditures needed to correct flooding and water quality problems
        - Wetland enhancement, restoration, and establishment
        - Identification of priority areas for riparian zone management and buffers
        - Protection and enhancement of fish and wildlife habitat and water recreational facilities
        - Identified issues that were NOT addressed in the plan and why

BWSR has the following specific priority issues:

Surface Water

- Surface water resource issues that BWSR believes are relevant and important to consider in the Upper Minnesota River watershed, and should be examined, include:
    - **Streams-Surface Water Quality**: Degraded surface water quality and issues with water quantity are a problem in the watershed. Many rivers and streams are impaired due to nutrients, sediment, and/or bacteria. Surface waters in the Upper Minnesota River watershed have also experienced damaging high flow and/or flood events. There are several causes for these issues including, but not limited to: altered hydrology, increased peak flows, runoff, and streambank/riparian erosion and sedimentation. BWSR believes it is important that the watershed plan examine the causes of these surface water concerns and identify specific areas where implementation of specific BMPs could help decrease these issues. BWSR believes that accelerated soil erosion, leading to turbidity and other water quality issues, is a significant issue in the watershed. We also would like

to see the concept of soil health as a key component in addressing accelerated soil erosion on cropland and pastureland in the watershed. Improved soil health can provide a number of benefits, from increased water infiltration/reduced runoff to nitrate scavenging, and reduced soil erosion.

- **Lakes-Surface Water Quality:** Lakes are very important to the local quality of life and local economies and are sensitive to nutrient enrichment and runoff from both shoreland and watershed sources. Several of the lakes within the watershed are listed as impaired. The watershed plan should consider prioritizing practices that meet the Lake Restoration and Protection Strategies listed in the Watershed Restoration and Protection Strategies (WRAPS) and the high-level state priorities in the 2018 Nonpoint Priority Funding Plan (NPFP).

Groundwater

- **Groundwater Coordination and Prioritization:** Work with BWSR staff and agency partners (MDH, DNR, MDA, and MPCA) to outline any groundwater – related priority issues for the planning area. Consider identified Drinking Water Supply Management Areas, Wellhead Protection Areas, areas with direct connection to the water table, and other areas of groundwater concern. Address specific concerns about groundwater contamination and overuse identified and documented. Groundwater and surface water interactions in Drinking Water Supply Management Areas (DWSMAs) should be considered, as this can be a pathway for pollutants to reach groundwater.
- **Groundwater References:** The Upper Minnesota River Watershed has a number of references and data available. Be sure to make use of existing groundwater data and publications. These include maps, data layers, and publications available from the Minnesota Geological Survey, MN DNR, MN Dept. of Health, US Geological Survey, Groundwater Restoration and Protection Strategies Report (when available) and other sources.

Drainage Management (103E):

- **Involve Drainage Authorities:** The Chapter 103E drainage authorities within the watershed should be included as stakeholders in the plan development process. This inclusion should ensure that the Chapter 103E processes and proceedings as well as the extent and the limitations of drainage authority responsibility are adequately included in the final plan. Use Section 103E.015 *CONSIDERATIONS BEFORE DRAINAGE WORK IS DONE* and other provisions of drainage law to capture both the extent and the limitations of drainage authority responsibility and authority for participating in the planning and implementation of conservation practices involving public drainage systems and their associated drainage areas.
- **Multipurpose Drainage Management (MDM):** Include multipurpose drainage management in the approach for targeting best management practices (BMPs) within the drainage area of Chapter 103E drainage systems.
- **Remember PTM Concepts:** Always remember Prioritized, Targeted, and Measurable.
    - Prioritization of the watershed should include identification of Chapter 103E drainage systems and their drainage areas.

- Measurable outcomes for erosion and sediment reduction, nutrient reduction, improved instream biology, and detention storage to assist those outcomes, should include correlation to Chapter 103E drainage systems.

- **Coordinate Implementation:** Lay out a coordinated approach for how implementation of multipurpose drainage management practices identified in the plan can be coordinated with, and/or integrated early into Chapter 103E processes and proceedings. When projecting funding needs for BMP implementation along, or within the drainage area of, public drainage systems, incorporate use of the following Sections of Chapter 103E: 103E.011, Subdivision 5. *Use of external sources of funding.*, 103E.015, Subdivision 1a. *Investigating potential use of external sources of funding and technical assistance.* These provisions enable public-private funding partnerships involving 103E drainage systems.

Altered Hydrology/Flooding/Water Quantity

- The hydrologic conditions of this planning area have changed over time. In recent decades more artificial drainage, more precipitation, more runoff, and more runoff per unit of precipitation has been observed as well as more frequent periods of extremely low flow in some watercourses. These hydrologic changes as well as others have contributed to instability of natural and artificial watercourses, degradation of wetland habitats, loss of agricultural productivity, and increased the risk of flood damages. BWSR believes the watershed plan should examine these hydraulic conditions and identify specific areas within the watershed where implementation of BMPs could help contribute to the reduction of peak flows, frequency of flooding events, streambank/riparian erosion and sedimentation.

Wastewater and Subsurface Septic Treatment System (SSTS) Management

- Proper wastewater and SSTS management and disposal are important to surface and groundwater quality and drinking water supplies. It is recommended that the plan evaluate the current and future effectiveness of management efforts within the watershed and conduct a comparative review of local ordinances.

Conservation Easements

- The State's Re-Invest in Minnesota (RIM) Reserve Easement Program considers several site specific and landscape scale factors when funding applications. Though it is dependent on specific program terms, the State does consider local prioritization of areas for easement enrollment. The plan should consider areas with a higher risk of contributing to surface and subsurface water degradation such as highly erosive lands and wellhead protection areas for waters sensitive to pollution degradation that would be relieved through permanent vegetation cover.

Wildlife/Habitat

- The planning partners are encouraged to identify opportunities to benefit wildlife populations and habitat. Wildlife of concern should include, but not be limited to, Blanding turtles, fisheries, fowl, and pollinators. The partnership is encouraged to work with a wide variety of partners and utilize a wide variety of plans, studies, and information to increase habitat acres and/or quality.

Examples include: The Minnesota Prairie Conservation Plan, the BWSR Pollinator Initiative, and Minnesota's Wildlife Action Plan 2015-2025.

Wetlands

- **Wetland Management:** Protection and restoration of wetlands provides benefits for water quality, flood damage reduction, habitat and wildlife. The plan should support the continued implementation of the Wetland Conservation Act and look for opportunities to improve coordination across jurisdictional boundaries. The plan should also identify high priority areas for wetland restoration and strategically target restoration projects to those areas. The Restorable Wetland Prioritization Tool is one resource that can be used to help identify areas for wetland restoration.

General Comments

- The State's Nonpoint Priority Funding Plan (NPFP) outlines a criteria-based process to prioritize Clean Water Fund investments. If planning partners are intending to pursue Clean Water Fund as a future source of funding, partners are strongly encouraged to consider the high-level state priorities, keys to implementation, and criteria for evaluating proposed activities in the NPFP.
- BWSR suggests a comparative review, rather than a simple listing, of local ordinances and regulations across the watershed with the purpose of identifying commonalities, significant differences as well as opportunities for coordination. Gaps or inconsistencies in the partnership's local ordinances, policies, or regulations could affect the success of your plan's implementation. Examples that should be explored during plan development include, but are not limited to: redetermination of ditches, SSTS compliance inspection requirements (property transfer, variance, etc.), level III feedlot inventories and shore land regulations.
- Throughout the planning process, consider ways to incorporate the comprehensive watershed management plan components and approaches into the county comprehensive land use plans. Ensure the plans do not conflict with each other. After all, land use drives water quality.
- The Minnesota River-Headwaters Watershed Restoration and Protection Strategy (WRAPS) is in DRAFT form but will be finalized in 2022; this information should be reviewed and incorporated into your planning efforts. The WRAPS outlines reduction goals for excess sediment, phosphorus, nitrogen, habitat, altered hydrology and bacteria, as well as identifying areas where protection considerations need to be made for lakes, streams, and groundwater/drinking water.
- As part of the plan, devise methods that the planning group can follow to ensure adherence to the planned activities and reassess the plan as implementation occurs in the future. Data collection and monitoring activities necessary to support the targeted implementation schedule and reasonably assess and evaluate plan progress are required and should be coordinated with other data collection and monitoring efforts.
- BWSR strongly encourages your planning partnership to consider the potential for more extreme weather events and their implications for the water and land resources of the planning area in the analysis and prioritization of issues. The weather record for the planning area shows increased frequency and severity of extreme weather events, which has a direct effect on the resources and local water management. In response to climate change, the state of MN as

developed the Climate Action Framework. The framework provides actions that should be taken to achieve long-term goals of a carbon-neutral, resilient and equitable future for Minnesota. Special consideration should be given to Goal 2: Climate-smart natural and working lands. Adjustments involving conservation and fieldwork planning and implementation should be explored; for instance, the use of an updated precipitation frequency chart such as the NOAA Atlas 14 when designing conservation projects. An additional source of information for use in the planning process is the BWSR Landscape Resiliency Toolbox. Finally, a white paper from the Minnesota Interagency Climate Adaptation Team titled "Building Resiliency to Extreme Precipitation in Minnesota" also provides resiliency strategies related to this topic.

We commend the partners for their participation in the planning effort. We look forward to working with you through the rest of the plan development process. If you have any questions, please feel free to contact me by phone (507) 829-8204

Sincerely,

Jason Beckler
Board Conservationist

cc: Ryan Bjerke, MDNR (via email)
Ryan Lemickson, MDA (via email)
Amanda Strommer, MDH (via email)
Katherine Pekarek-Scott, PCA (via email)
Ed Lenz, BWSR (via email)
Mark Hiles, BWSR (via email)

DEPARTMENT OF NATURAL RESOURCES

4/11/2022

Amber Doschadis, Upper MN River Watershed District Administrator
211 2nd Street SE
Ortonville, MN 56278

Dear Amber,

Thank you for inviting the Minnesota Department of Natural Resources (DNR) to provide input in the development of your Comprehensive Watershed Management Plan. I am writing on behalf of DNR Commissioner Sarah Strommen to share our priorities and convey that we are committed to supporting the plan development process.

This is a real opportunity to influence change in the watershed. The stresses put on our ditch and stream banks, farmland, bridges and culverts can only be reduced with an honest look at the watershed and a plan including targeted actions.

The DNR can supply scientific data and information related to the attached priorities. We also offer tools and services that can help stakeholders get to know the watershed and explore water resource values.

Our lead staff person for this One Watershed One Plan (1W1P) project is Ryan Bjerke, Area Hydrologist, (320) 839-3823, ryan.bjerke@state.mn.us. Ryan reports from the DNR office in Ortonville and can be contacted if you have questions, or want more information about the attached priorities or types of technical support we can provide.

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

Sincerely,

Scott W. Roemhildt
South Region Director
Minnesota Department of Natural Resources

cc: Ryan Bjerke, Korey Woodley, Jim Sehl, Barbara Weisman, Jason Beckler, Katherine Pekarek-Scott, Ryan Lemickson, Amanda Strommer, Jay Gilbertson

DNR Priorities for the Upper Minnesota Watershed

The priorities below were identified in consultation with an interdisciplinary team of DNR natural resource management specialists from multiple DNR Divisions whose work areas include this watershed. The priorities are grouped around three high-level issues: Hydrological Conditions & Clean Water, Habitat & Unique Natural Resources, and Outdoor Recreation.

High-Level Issue	Priority Resource Concerns & Opportunities
Hydrological Conditions & Clean Water	• **The Water Quantity & Quality Connection:** In the Upper Minnesota River (Upper MN) Planning Area there are opportunities, such as working land initiatives and targeted conservation practices, to reduce excessive flows and improve water quality. Often the underlying driver of declining water quality—99% of which is attributable to non-point source pollution in the watershed—is changing hydrological conditions or "altered hydrology." The MPCA has identified altered hydrology as a stressor for every biologically-impaired stream reach in the planning area and asserts in its Minnesota River Headwaters Watershed Restoration and Protection (WRAPS) report that "…the sources of altered hydrology are common across the watershed. Therefore, altered hydrology is likely negatively impacting water quality watershed-wide…" Runoff events of increasing magnitude and frequency in agricultural watersheds are impacting water quality, leading to poor or unsafe conditions for aquatic recreation and aquatic life. Significant land use changes have occurred—principally the conversion of a mixed-use agricultural landscape to one dominated by a corn and soybean crop rotation and the accompanying intensification of agricultural drainage. These changes, in conjunction with an increasing precipitation trend over the last 30 years, have amplified the runoff response. Changing land use and altered hydrology has led to the delivery of substantially more runoff per unit of precipitation to riverine and wetland systems. These changes also lead to increased stress on biological communities and are causing stream channels to deliver higher rates of sediment as they adjust to new conditions. Building a common understanding of the science and conditions in the watershed is important to develop and implement a watershed plan. The DNR uses a suite of metrics and analyses to tell the story of the significant impact that changing water quantity trends have on watershed health conditions. DNR staff are prepared to present this information to the public and agency partners at appropriate points in the 1W1P process. Meanwhile, see the Minnesota River Headwaters Watershed Characterization Report. • **Vegetation & Water Interaction:** As the area's native prairies were converted to pasture, hay, and cropland, the latter category initially encompassed a fairly diverse mixture of small grains, alfalfa and corn. All except the corn had seasonal water consumption rates that aligned with seasonal precipitation cycles, most notably in spring and early summer when rain is abundant. In contrast, most water use by corn and soy occurs after full canopy cover (late June). Hence, the planning area's large-scale conversion to these two crops has resulted in rain falling on exposed soils early in the growing season when these

crops are in the early stage of development. The lack of rainfall uptake during the spring and decrease in cover has increased runoff from the watershed.

With this history in mind, we want to highlight four major factors in the watershed that have conspired to speed up runoff and increase the magnitude and frequency of flooding for almost all storm events: approximately 52 percent of growing season precipitation in the watershed falls between April 1 and June 30; peak water demand from row crops occurs in July/August, which is substantially different than small grains and native vegetation; more row crops and less perennial vegetation leads to less infiltration and soil water storage; and lower soil organic matter reduces the soil's water-holding capacity.

To address this combination of factors we recommend that 1W1P partners focus on integrating soil health practices such as continuous living cover (cover crops) and conservation or no-till practices into row crop rotations. Promoting working lands and regenerative agriculture initiatives that integrate pasture, hayland, alfalfa, and small grains in conjunction with best practices for grass-based livestock operations could also be a value-added mechanism to realign seasonal vegetative water use and precipitation. Protecting and restoring perennial vegetation—especially native, deep-rooted species that also benefit wildlife and pollinators—is another high priority recommendation for both conservation lands and higher slope areas within cropland. Maps in the state's Prairie Plan and Wildlife Action Plan outline areas to protect and enhance.

- **"Re-plumbing" the Watershed:** The use of surface ditches and drainage tile systems, both public and private, to drain water from agricultural lands in the planning area has been ongoing for over a century. And the rate of agricultural drainage has accelerated in recent decades with technological advancements in manufacturing and installation of drainage tile. As modern cropping practices have advanced, this "re-plumbing" of the watershed's hydrological system has changed the hydrology of downstream receiving wetlands and watercourses. Public drainage system repair and improvement projects can negatively affect water quantity and quality by increasing flow capacity at the outlet of the system. This also often leads to installation of additional private drainage infrastructure, increasing total runoff and accelerating downstream impacts.

  Measurable action by drainage authorities in the watershed is needed to fully mitigate flow increases from public and private drainage projects. This should include a suite of best practices for storing water and attenuating flow—natural wetland restoration, grassed waterways, water and sediment control basins, multiple stage channels with floodplain connection, removal of surface tile intakes or replacement with "blind" tile intakes, etc.—within a comprehensive multipurpose drainage management plan. A major advantage would be reduced system maintenance costs. Other benefits would include reductions in runoff volume, peak flows, erosion, sedimentation, and nutrient transport, as well as increased infiltration, evapotranspiration, and wildlife habitat. We encourage drainage authorities to investigate and apply for grants to implement multipurpose drainage management plans and best practices. We also strongly recommend early and ongoing coordination with DNR staff and other agency partners as drainage projects and multipurpose plans are being developed.

	• **Changing Hydrology of Landlocked Basins:** The planning area has an abundance of landlocked basins, a legacy of the last ice age. A combination of factors—predominately increased precipitation, large scale land cover conversion to corn and soy monocultures, and rapidly expanding agricultural drainage—have led to changing wetland hydrology. These landlocked basins have increased in size and volume, affecting riparian land and infrastructure such as roads and buildings, and in many cases altering biological productivity and benefits to wildlife and aquatic organisms. In recent decades numerous private landowners and public entities have installed artificial outlets in these basins, mostly to mitigate the effects of rising water on agricultural land and roadway infrastructure—sometimes with unintended impacts in the basins and downstream. DNR staff with expertise in hydrology, wetland biology, wildlife, and fisheries are willing partners to collaborate with private and public stakeholders to investigate hydrologic and hydraulic modeling opportunities and implement multiple-benefit projects. We advocate for thorough research to account for contributing watershed and wetland characteristics; engagement between riparian and downstream interests to identify shared objectives; and ongoing monitoring to assess and enhance project effectiveness. Water level control structures that facilitate temporary drawdowns to mimic natural wet and dry cycles can mitigate in-basin and downstream flooding by increasing water storage potential, rejuvenating biological productivity and aquatic and riparian habitat, and improving water quality. We also encourage riparian and shoreland landowners to enroll in conservation programs to install buffers of native perennial vegetation that allow unimpeded fluctuation of water levels within their natural range. • **Watercourse Floodplain Connectivity:** The increasing frequency and duration of high flows in the watershed—especially flows that exceed the 1.5 to 2-year bankfull or channel forming flow—is affecting the size and shape of stream and river channels. This occurs primarily through the downcutting and widening of the channel to accommodate higher flows. Non-natural modifications, mostly in the form of channelization (straightening, deepening, widening), can disconnect the stream or river from its floodplain, confining high-velocity flows that exacerbate in-channel erosion and sedimentation. Intensified channel erosion in mid and lower reaches of larger watercourses in the watershed has damaged adjacent private and public infrastructure such as buildings, roads, bridges, and culverts, as well as riparian land. Storing more water on the landscape is a key strategy to stabilize channel integrity and maintain the connection between a stream or river and its floodplain, which provides temporary storage of flood flows and traps sediments and nutrients. Floodplain reconnection is also integral to promote healthy, resilient channels that can adapt to increasing streamflow—a main objective of the Whetstone River Restoration project. Continued collaboration to bring this project to fruition will restore flow and the vital floodplain connection to 9,000 linear feet of the lower river, in addition to providing myriad other hydrological and ecological benefits.

Habitat & Unique Natural Resources	• **Reconnecting & Preserving Aquatic Habitat:** In the face of changing hydrological conditions and numerous water quality and biological impairments in the watershed, it is imperative to maintain and reconnect access to ecologically important aquatic habitat for fish and other aquatic organisms. Improperly designed road crossings—e.g., undersized and perched culverts—act as velocity and elevation barriers that partially or wholly disconnect vital aquatic ecosystems. Dams and other water retention structures, such as Long Tom Dam, that block access to spawning areas in the headwaters of perennial and intermittent riverine systems are barriers to fish and aquatic organism movement. DNR staff are ready to work directly with project and road authorities at all levels to evaluate dams and structures at road-stream crossings for potential removal or replacement, incorporating the principles outlined in the DNR's Geomorphic Approach to Infrastructure Design at Road-Watercourse Intersections and MNDOT's Minnesota Guide for Stream Connectivity and Aquatic Organism Passage Through Culverts. • **Exceptional Natural Resources:** Interspersed throughout the planning area are numerous natural resources of distinction. Not only are they valued for their outstanding biological and ecological characteristics, but some are also well-known eco-tourism destinations that likely generate substantial local economic benefits. We recommend giving special consideration to the care and protection of these outstanding resources, especially the following: ○ Big Stone Lake ○ Big Stone National Wildlife Refuge (NWR) ○ Lac qui Parle Wildlife Management Area (WMA) ○ Minnesota River valley granite bedrock outcrops and resident native species, such as the state-endangered ball cactus ○ Audubon-designated Lac qui Parle-Big Stone Important Bird Area ○ 2 designated calcareous fens ○ Native plant communities ○ Rare plant and animal species listed as threatened, endangered, or special concern • **Protecting & Restoring Habitat:** The Upper MN Planning Area contains a multitude of high-quality habitats, primarily a matrix of public lands and easements and private lands in conservation programs that provide myriad ecosystem benefits and outstanding opportunities for outdoor recreation. This impressive mix of native prairie, restored grassland, and forested riparian corridors with floodplain wetlands is home to many different native plant communities; rare plant and animal species listed as endangered, threatened, or special concern; Species in Greatest Conservation Need (SGCN) identified in Minnesota's Wildlife Action Plan; and rare or sensitive natural features, including those vulnerable to a single catastrophic event, as detailed in the Natural Heritage Information System. (Datasets and shapefiles may be downloaded from Minnesota Geospatial Commons.) Minnesota's Wildlife Action Plan aims to ensure the long-term health and

	viability of the state's wildlife, with emphasis on species that are rare, declining, or vulnerable to decline. The plan focuses on conserving designated SGCN and other wildlife within a mapped Wildlife Action Network (WAN). Large core areas—including Prairie Plan core areas and corridors within the watershed, such as Big Stone Lake, Lac qui Parle, and Big Stone Moraine—help facilitate species movement that supports the biological diversity already present in the network. Targeting conservation within the WAN will increase the effectiveness and efficiency of actions to reduce the primary causes of wildlife population declines. In order to maintain the many high-quality natural resources in the watershed, the DNR recommends **protection strategies** that focus on (1) remnant native habitats within or adjacent to the WAN that are not already in some form of protected conservation land status (state, federal, non-governmental, or private lands in conservation easement); (2) riparian zones along streams, wetlands, and shallow lakes; and (3) implementing applicable legal protections for rare species and natural communities, and calcareous fens. Additionally, **restoration goals** to repair and improve degraded and marginal natural resources should specifically target creation of larger habitat networks and incorporate best management practices such as soil health systems into the agricultural landscape. Early coordination and collaboration with the DNR and other partners is strongly encouraged to better pursue opportunities for multiple benefits and leverage expertise and funding resources.
Outdoor Recreation	• **Big Stone Lake:** Situated at the headwaters of the Minnesota River, Big Stone Lake is the premier regional destination for outdoor recreationists. A large portion of the lake's shoreline in Minnesota and South Dakota has been developed for permanent and seasonal residences, numerous resorts and restaurants, and state parks. Long a popular fishing destination, populations of panfish have recently exploded, a silver lining to the recent introduction of invasive curly leaf pondweed. But the quality of this engine that powers a sustainable, lucrative outdoor recreation economy is imperiled—illustrated by an aquatic recreation impairment due to eutrophication, as identified in the recently released Minnesota River Headwaters WRAPS report. To reduce the load of nutrients, like phosphorus and nitrogen, that drive algae blooms—including toxic blue-green algae that have led to summer fish kills—water storage in the lake's watershed should be increased via soil health practices, wetland restorations, perennial vegetation reestablishment, reconnecting streams to their floodplains, and fully mitigating flow increases from agricultural drainage projects. • **Public Lands:** Upper MN Planning Area public lands are highly utilized for a variety of outdoor recreation activities, but are especially prized for hunting and fishing. This suite of conservation lands encompasses U.S. Fish & Wildlife Service Waterfowl Production Areas (WPAs) and a national wildlife refuge; and DNR-administered properties such as Wildlife Management Areas (WMAs), Aquatic Management Areas (AMAs), Scientific and Natural Areas (SNAs), and a state park. Prime examples include: Big Stone NWR, Big Stone State Park, Lac qui Parle WMA, the Mosquito Ranch and Robin Hood WPA complex, and

	Bonanza Prairie and Clinton Prairie SNAs. Meandering through the Big Stone NWR and Lac qui Parle WMA, the upper reach of the Minnesota River State Water Trail provides miles of scenic paddling for canoers and kayakers. Development of a trail within the Minnesota River corridor, potentially from Big Stone State Park to Lac qui Parle State Park, would be a boon to hikers, bicyclists, and the economies of small towns along the route. DNR staff welcome constructive dialogue and relationship building opportunities with 1W1P partners about management and uses of existing public lands—and ensuring future opportunities in a transparent and equitable process that fully accounts for the myriad benefits they provide. • **Increasing Public Recreation Opportunities:** Abundant recreational opportunities exist on public lands in the planning area, especially where healthy basin and wetland complexes are interspersed among tracts of grassland, providing fantastic waterfowl and upland game hunting, open water and ice fishing, and bird watching, among other activities. Recently, a group of local government representatives and agency stakeholders met to discuss opportunities to expand public recreational access to basins where it currently doesn't exist, such as Otrey Lake and Swenson Lake in central Big Stone County. Spearheaded by locals and informed by science, the overall objective is to selectively enhance fish and/or wildlife potential in and around wetlands to provide an additional draw for recreationists and bolster development of a sustainable, outdoor recreation-based economy. Unsurprisingly, many of the wetlands under consideration have experienced prolonged high water levels, so ample chances exist to collaborate on projects that address impacts to riparian land and infrastructure, while reaping benefits for fish, wildlife, water quality—and local economies. We strongly encourage continued discussion and action by project partners regarding these potential "win-win" opportunities.

DEPARTMENT OF AGRICULTURE

April 7, 2022

Amber Doschadis
Upper Minnesota River Watershed
211 2nd Street SE
Ortonville, MN 56278
amber@umrwd.org

RE: Invitation to Submit Priority Concerns for the Upper Minnesota River Partnership One Watershed, One Plan (1W1P)

Dear Mrs. Doschadis,

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

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

The MDA's research and on-farm demonstration projects help ensure that current scientific information is made available to help address water quality concerns and to support farmer-led discussion. Engaging farmers and crop advisers in a trusted relationship is essential for making on–farm decisions.

MDA Priority Concerns

Nitrate and pesticides in groundwater are the priority resource concerns for the MDA in the watershed. The MDA is interested in working with local and state partners to engage the agricultural community, support on-farm demonstrations, promote the Minnesota Ag Water Quality Certification Program, and use relevant research and tools to share information about conservation practices that can benefit agriculture and the 1W1P process.

Nitrogen Fertilizer Management Plan (NFMP)
http://www.mda.state.mn.us/nfmp
Contact: **luke.stuewe@state.mn.us**

The NFMP is the state's blueprint for preventing or minimizing the impacts of nitrogen fertilizer on groundwater. The primary goal of the NFMP is to involve local farmers and agronomists in problem-solving to address elevated levels of nitrate in groundwater. As part of the NFMP, the MDA designed the Township Testing Program (TTP) to determine current nitrate-nitrogen concentrations in private wells within areas that are vulnerable to groundwater contamination.

Groundwater Protection Rule (GPR)
https://www.mda.state.mn.us/nfr

The GPR minimizes potential sources of nitrate pollution to the state's groundwater and protects our drinking water. The rule restricts the application of commercial nitrogen fertilizer in the fall and on frozen soils in areas vulnerable to contamination (part 1), and it outlines steps to reduce the severity of the problem in areas where nitrate in public water supply wells is already elevated (part 2).

The part 1 Fall nitrogen use restrictions exist in areas with vulnerable groundwater and within in protection areas around municipal public wells with high nitrate. Vulnerable groundwater areas are determined by coarse textured soils, shallow bedrock, or karst geology and are designated by quarter sections or government lot. An entire quarter section or government lot is included if 50% or more of the area is considered vulnerable.

These restrictions begin September 1st of each year. An interactive map to review where these restrictions are in place is available at www.mda.state.mn.us/vulnerableareamap. Each year updates to this fall restrictions map are posted in January.

Part 2 of the rule is structured using a sliding scale of voluntary and regulatory actions based on the concentration of nitrate in the well and the use of the BMPs. The MDA will form a local advisory team with farmers, agronomists, and other community members. This team will be involved in reviewing, considering, and advising the MDA on appropriate practices or requirements to reduce nitrate in the drinking water supply management area (DWSMA). Computer modeling of nitrogen loss below cropland and monitoring of groundwater nitrogen levels will also be considered in this process. Based on this information, the MDA will develop a list of best management practices (BMPs) and alternative management tools (AMTs) to protect drinking water in the public wells.

There are four mitigation levels used to determine voluntary and regulatory actions, two voluntary levels and two regulatory levels. All areas will begin at a voluntary level and move to regulation only if BMPs are not adopted or if nitrate contamination in the groundwater increases. Information on the DWMSA mitigation levels determined is available at www.mda.state.mn.us/mitigation-level-determination. Each year updates to DWSMA

mitigation levels are posted in January. Financial and technical support for landowner adoption of the BMPs and AMTs that the MDA defines within each DWMSA will be needed from local partners and other state agencies to accomplish the goal of protecting the community drinking water supply. **There are currently no DWSMAs located in the watershed with a mitigation level determination by the MDA.**

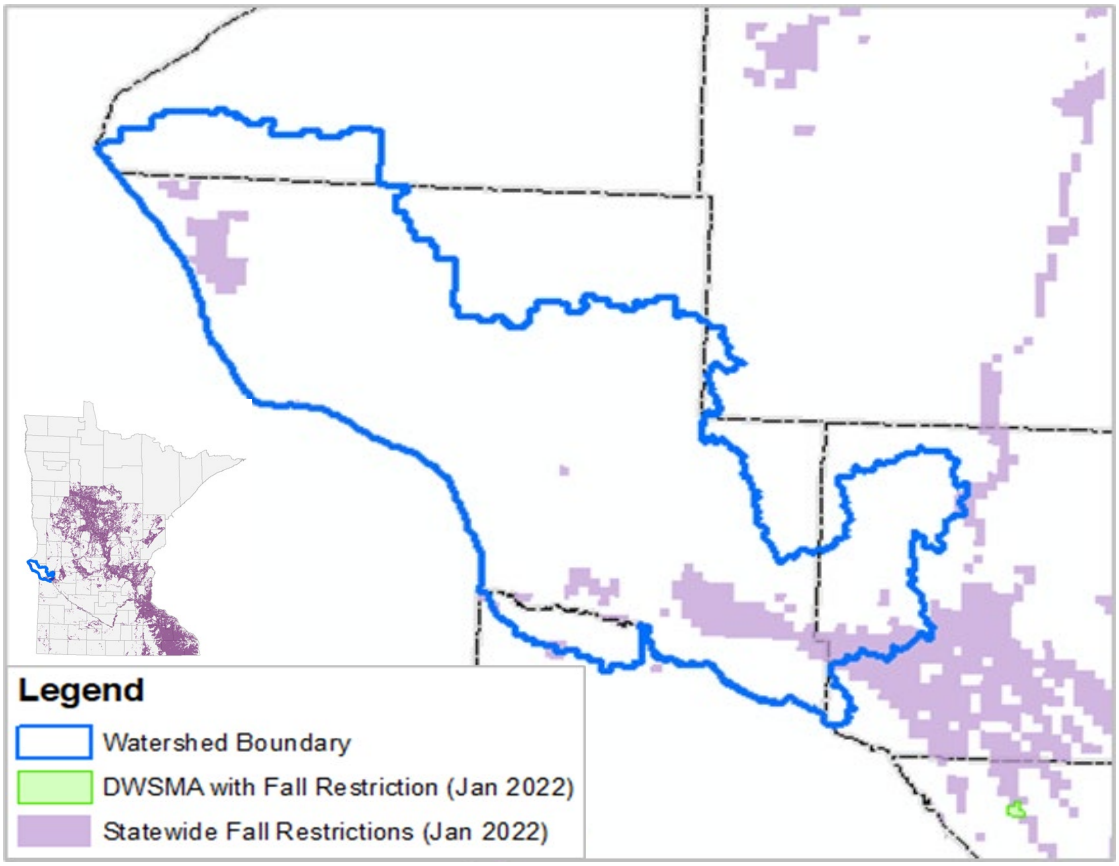


Figure 1. Statewide and Upper Minnesota Watershed GPR DWSMA Mitigation Levels Determined and Fall Nitrogen Use Restriction map. (January 2022)

Township Testing Program (TTP)
https://www.mda.state.mn.us/township-testing-program
Contact: **kimberly.kaiser@state.mn.us**

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

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

Two datasets, 'Initial' and 'Final', are used to evaluate nitrate in the private wells in this program. The initial dataset represents private wells drinking water regardless of the potential source of nitrate. The final dataset was informed through an assessment process to evaluate each well. In the assessment, wells that had nitrate results over 5 mg/L were removed from the final dataset if a potential non-fertilizer source or well problem was identified, there was insufficient information on the construction or condition of the well, or for other reasons which are outlined in the full report. The final dataset represents wells with nitrate attributed to the use of fertilizer.

In the initial results map, seven townships were tested for nitrate in the watershed. One township had more than 10% of the wells over 10 mg/L of nitrate. Six townships had less than 5% of wells over 10 mg/L of nitrate. A total of 162 wells were tested and 5 wells were over 10 mg/L of nitrate.

In the results map, none of the townships had 10% or more of the wells over 10 mg/L. Four of the townships had less than 20 wells sampled, which MDA considers inadequate to characterize a township for the purposes of the Nitrogen Fertilizer Management Plan. Detailed sampling results are available at: https://www.mda.state.mn.us/township-testing-program

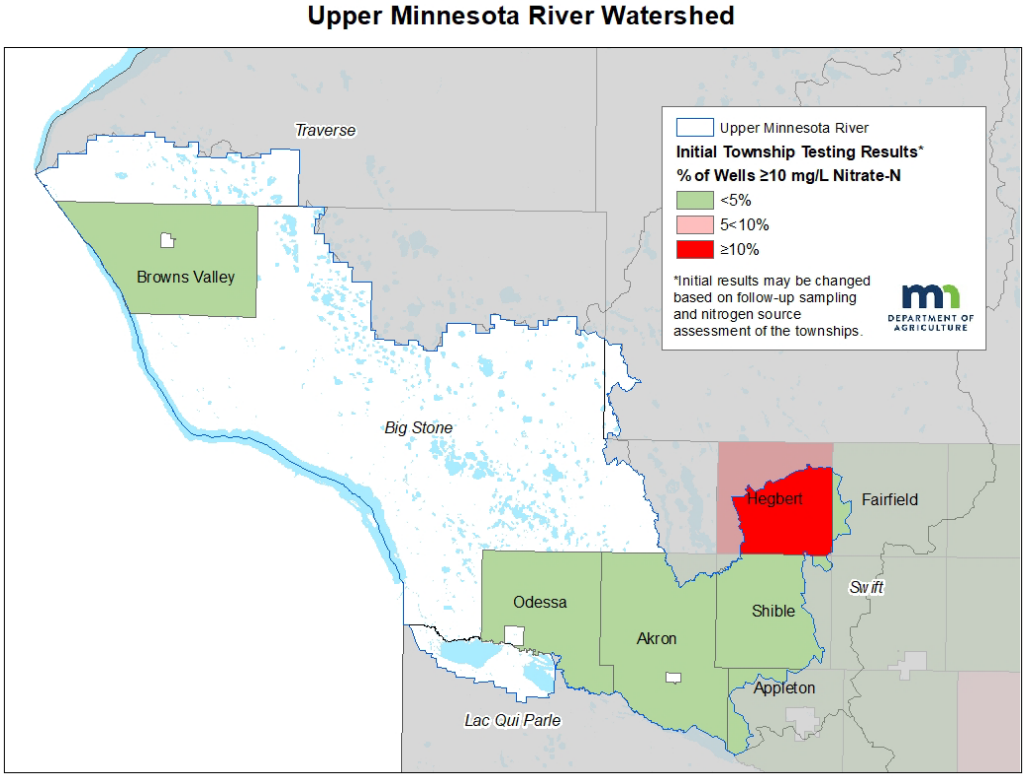


Figure 2. This map displays the Initial Township Testing Program results. Initial results represent private well drinking water regardless of nitrate source.

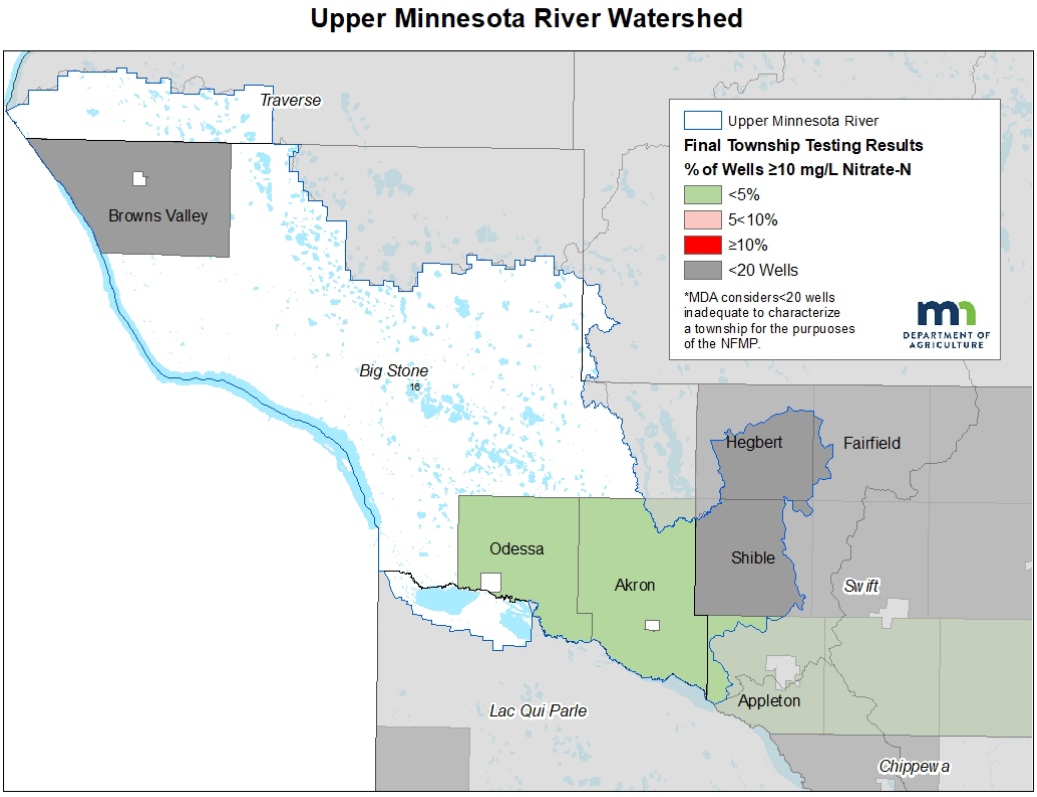


Figure 3. This map displays the Final Township Testing Program results. The final dataset represents wells with nitrate attributed to the use of fertilizer.

Pesticide Water Quality Monitoring

Contact: michael.macdonald@state.mn.us

The MDA has been conducting pesticide monitoring in ground water since 1985, and in surface waters since 1991. Annually, the MDA completes approximately 250 sample collection events from ground water and 800 sample collection events from rivers, streams, and lakes across the state. In general, the MDA collects water samples from agriculture and urban areas of Minnesota and analyzes water for up to approximately 180 different pesticide compounds that are widely used and/or pose the greatest risk to water resources. Groundwater monitoring is conducted by MDA and Minnesota Pollution Control Agency staff. Surface water monitoring is conducted by the MDA and a variety of cooperators. All monitoring is completed following annual work plans and standard operating procedures (SOP's) developed by the MDA.

The purpose of the MDA's pesticide monitoring program is to determine the presence and concentration of pesticides in Minnesota waters, and present long-term trend analysis. Trend analysis requires a long-term investment in monitoring within the MDA's established networks. The MDA releases an annual water quality monitoring report that includes all pesticide water quality data and long term trends available at www.mda.state.mn.us/monitoring. The MDA will continue to conduct statewide pesticide monitoring in the future and will provide additional information related to the occurrence of pesticides in Minnesota waters.

The MDA began evaluating pesticide presence and magnitude in private residential drinking water wells as part of the Private Well Pesticide Sampling (PWPS) Project in 2014 as a companion program to the MDA Township Testing Program (TTP). Townships in different counties were sampled every year with for the PWPS project. The initial project concluded in June 2021, but ongoing sampling in select counties continues.

Townships in the PWPS Project depend on the participation of well owners and may not reflect all the townships sampled in the TTP. Water samples were collected by trained MDA hydrologists and analyzed by a private contract lab for compounds like the MDA ambient water quality monitoring program. All monitoring is completed following annual work plans and standard operating procedures (SOP's) developed by the MDA. Results of the PWPS sampling can be found at the MDA's website for the PWPS Project at **www.mda.state.mn.us/pesticide-fertilizer/private-well-pesticide-sampling-project**.

The figure below presents the locations of the MDA's groundwater and surface water monitoring locations and the PWPS townships that were sampled.

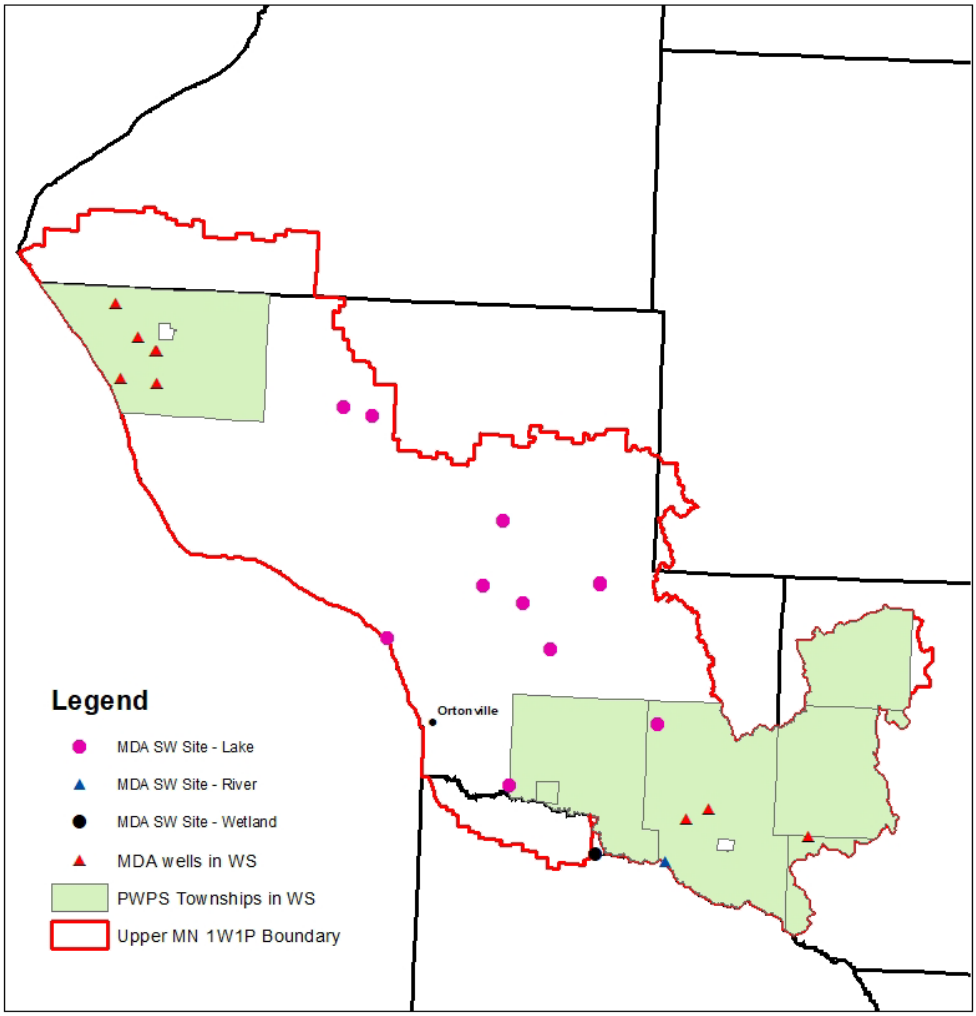


Figure 4. Ambient Monitoring and Private Well Pesticide Sampling locations.

Groundwater

Ambient Monitoring Results

The MDA has sampled nine sites, but currently samples two sites within the watershed.

Historical Monitoring

The seven wells which are not currently sampled were either MN DNR observation wells, USGS monitoring wells, or domestic wells. The four domestic wells were sampled once in 1990 for atrazine and nitrate. Atrazine was not detected, and the nitrate concentrations ranged from 12.7 to 27 mg/L. The health risk limit (HRL) for nitrate is 10 mg/L. The other three wells were sampled between 1986 and 1990 for atrazine and nitrate. Atrazine was not detected, and the nitrate concentrations ranged from not detected to 16.2 mg/L. The health risk limit (HRL) for nitrate is 10 mg/L.

Current Monitoring

The two sites that the MDA currently samples within this watershed have been sampled annually or semiannually since 2006. Nine different pesticides or pesticide breakdown products (or degradates) have been detected in the wells. None have exceeded human health reference values. Nitrate-nitrite (nitrate) concentrations range from 0.39 to 16 mg/L. The health risk limit (HRL) for nitrate is 10 mg/L.

Monitoring of the MDA's sites in the watershed is expected to continue.

PWPS Project Results

As part of the PWPS Project, wells in three townships in Big Stone County and four townships in Swift County that lie within or on the border of the watershed were sampled for approximately 130 pesticide compounds during 2020. The chemistry data is available for the wells; however, due to privacy rules, the well locations cannot be shared.

The county, the year it was sampled, number of wells, and the number of townships that were sampled are listed below:

- Big Stone (2020) – 12 wells in three townships
- Swift (2020) – 11 wells in four townships

The number of pesticides or pesticides degradates that were detected in wells in each county is listed below:

- Big Stone – 12
- Swift - 10

None of the wells had a concentration that exceeded an established human health reference value for the compounds.

Nitrate concentrations within the townships tested ranged from <0.05 to 14 mg/L. The HRL for nitrate is 10 mg/L. The list below presents the number of wells in each county that had a nitrate concentration that exceeded the nitrate health reference value.

- Big Stone – 1
- Swift - 0

The MDA does not currently plan to continue this sampling within the watershed.

Surface Water

The MDA has completed four pesticide water quality sample collection events from a river location from 2010-2015, 11 pesticide water quality sample collection events from 11 lake locations from 2012-2017 and one pesticide water quality sample collection event from one wetland in 2016. While commonly used pesticides were detected at these locations at low concentrations, there are no pesticide water quality impairments in the Upper Minnesota River Watershed.

Nitrogen and Pesticide Use Surveys

The MDA surveys farmers through the National Agricultural Statistics Service (NASS). A summary of the survey data is attached. The most recent nitrogen use survey was for the 2015 crop year, **Survey Results of Nitrogen Fertilizer BMPS on Minnesota 2015 Corn Acres.** The most recent pesticide use survey was from the 2013 crop year.

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

Additional Resources and Opportunities for Incentives or Cost Share

Since there is a significant portion of the watershed in agricultural production, MDA would like to provide the following resources to consider during the 1W1P process.

Minnesota Agricultural Water Quality Certification Program (MAWQCP)
www.mda.state.mn.us/awqcp
Contact: **william.fitzgerald@state.mn.us**

The MAWQCP is a voluntary opportunity for farmers and agricultural landowners to take the lead in implementing conservation practices that protect water quality. Participants that implement and maintain approved farm management practices will be certified and in turn obtain regulatory certainty for a period of ten years. This is a planning program that should be included in the 1W1P because it is an opportunity for agricultural producers to evaluate nutrient and field management practices within the watershed to help reduce losses.

There are currently 9 farmers, 5,792 acres, and 16 new conservation practices that have been installed in the watershed.

- 445 acres of cover crops
- 4 wells decommissioned
- 3 water and sediment control basins
- 7,800 feet of field windbreaks
- 6 acres of conservation cover

MAWQCP has funding available to assist producers in implementing practices through a financial assistance grant that provides 75% cost share, up to $5,000, as well as through the RCPP- Land Management program from NRCS partners. This program is designated for producers that are either certified or working towards certification.

Nutrient Management Initiative (NMI)
www.mda.state.mn.us/nmi
Contact: **ryan.lemickson@state.mn.us**

The NMI assists crop advisers and farmers in evaluating nutrient management practices on their own fields utilizing on-farm trials in corn. This is a great opportunity to promote and compare new strategies to improve yield, fertilizer use efficiency, and help open the door to include local farmers and agronomists in the 1W1P discussion. Ideas in other watersheds included cover crop, fertilizer placement, tillage, and precision agriculture trials. Advanced trials working with University of Minnesota (U of M) researchers help to guide nitrogen rate recommendations.

The Minnesota Wheat Growers conduct an On-Farm Research Network that has funding to support wheat trials. **https://mnwheat.org/council/farm-research-network/**

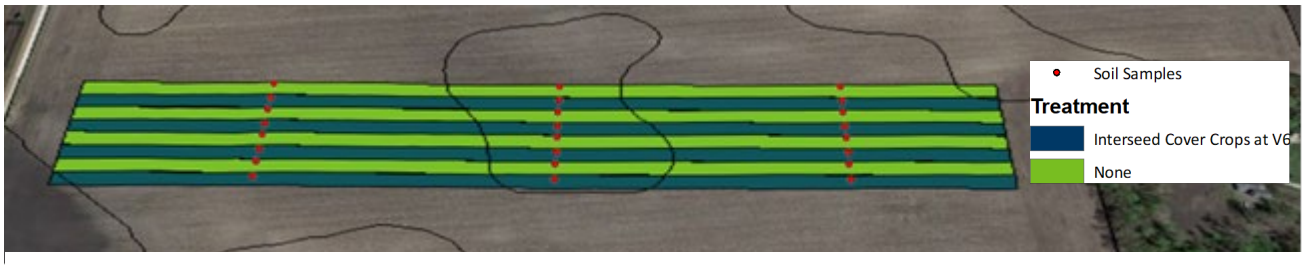


Figure 5. On-farm side by side demonstration trial evaluating cover crops to none in west central Minnesota. Red dots are the residual nutrients and soil health testing locations of each treatment.

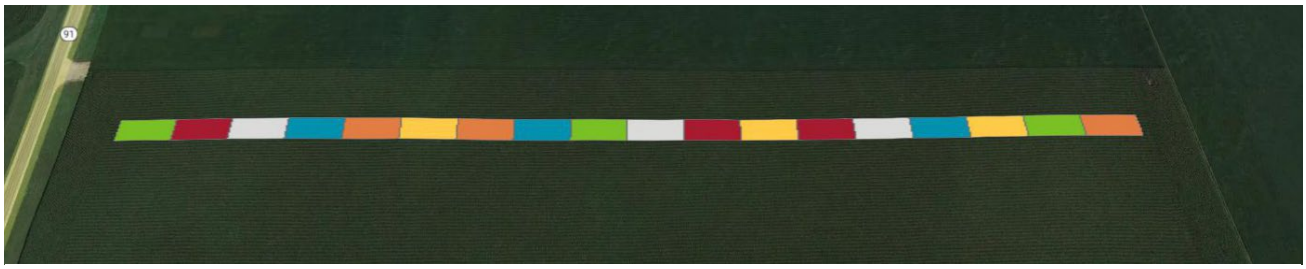


Figure 6. U of M Advanced Nitrogen rate trial in southwest Minnesota. Six nitrogen rates replicated three times across the field. (0 - 221 lbs. N/acre) Results are used to help evaluate U of M Nitrogen rate recommendations.

Regional Conservation Partnership Program (RCPP) to Implement Precision Irrigation Practices
www.agcentric.org/rcpp-precision-irrigation/
Contact: **jeppe.kjaersgaard@state.mn.us**

The program provides financial and technical assistance to irrigators looking to adopt and integrate proven precision irrigation technology and nitrogen management practices to help optimize irrigation system operation. The financial assistance will be available starting early 2022 for irrigation systems located within Becker, Benton, Cass, Dakota, Douglas, East Otter Tail, Grant, Hubbard, Kandiyohi, Meeker, Morrison, Pope, Sherburne, Stearns, Stevens, Swift, Todd, Wadena, Washington and West Otter Tail, and a portion of Mille Lacs Soil and Water Conservation Districts (SWCD).

Irrigators can apply through their local SWCD office. This program will help irrigators implement practices and technology to optimize water and nutrient applications to meet crop needs and reduce nutrient loss to the environment.

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

Agricultural Growth, Research, and Innovation (AGRI) Program
The AGRI program has funding that may be helpful in water quality protection. Specifically:

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

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

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

Minnesota Discovery Farms
https://discoveryfarmsmn.org/
Contact: **scott.matteson@state.mn.us**

Discovery Farms Minnesota is a farmer-led effort to gather field scale water quality information from different types of farming systems in landscapes across Minnesota. The program is designed to collect credible and accurate measurements of sediment, nitrogen, and phosphorus movement over the soil surface and through subsurface drainage tiles. This work leads to a better understanding of the relationship between agricultural management and water quality. There are currently no Discovery Farms or MDA edge-of-field monitoring locations in the watershed, but other sites can be used to provide valuable data that could pertain to the watershed (2012-present).

Runoff Risk Advisory Tool
www.mda.state.mn.us/rraf
Contact: **Heather.Johnson@state.mn.us**

The Minnesota Runoff Risk Advisory Forecast (RRAF) system is a tool designed to help farmers and commercial applicators determine the best time to apply manure. Precipitation, snow melt or other conditions can cause recently applied manure to move off target. The movement can decrease productivity and increase the risk of impairing local bodies of water.

This model accounts for soil moisture content, forecast precipitation, temperatures, snow accumulation and melt to predict the likelihood of daily, next day, and 72-hour runoff events. An interactive map is used to locate fields and find the forecasted risk. The webpage offers a sign-up for text message or email alerts when a designated county is in a severe risk for runoff.

Ag BMP Handbook
This handbook provides a comprehensive summary of BMPs that are practical for Minnesota: **www.mda.state.mn.us/agbmphandbook** . Please let us know if you would like a hard copy for your reference.

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

Sincerely,

Ryan Lemickson
MDA
23070 North Lakeshore Drive
Glenwood, MN 56334
612-209-9181
ryan.lemickson@state.mn.us

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

April 8, 2022

Amber Doschadis
Upper Minnesota River Watershed
211 2nd Street SE
Ortonville, MN 56278
amber@umrwd.org

Subject: Initial Comment Letter – *Upper Minnesota River Watershed Planning Project*

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

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

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

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

MDH Priority Concerns:

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

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

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

Prioritize Sealing Abandoned Wells

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

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

Prioritize Protection of Private Wells

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

Approximately 11.2% of the 134 arsenic samples taken from Minnesota wells in the Upper Minnesota River Watershed have levels of arsenic higher than the Safe Drinking Water Act (SDWA) standard of 10 micrograms per liter (µg/L). Arsenic occurs naturally in rocks and soil and can dissolve into groundwater. Consuming water with low levels of arsenic over a long time

(chronic exposure) is associated with diabetes and increased risk of cancers of the bladder, lungs, liver and other organs. The SDWA standard for arsenic in drinking water is 10 µg/L; however, drinking water with arsenic at levels lower than the SDWA standard over many years can still increase the risk of cancer. The EPA has set a goal of 0 µg/L for arsenic in drinking water because there is no safe level of arsenic in drinking water.

Prioritize Protecting Noncommunity Public Water Supplies

Noncommunity public water supplies provide drinking water to people at their places of work or play (schools, offices, campgrounds, etc.). Land use and management activities (maintaining/upgrading SSTS, well sealing, etc.) should consider effects on these public water systems. Find information regarding noncommunity public water supplies in the watershed in reports titled Source Water Assessments (SWA) at:
https://www.health.state.mn.us/communities/environment/water/swp/swa.html

Source Water Assessments provide a concise description of the water source - such as a well, lake, or river - used by a public water system and discuss how susceptible that source may be to contamination.

Prioritize and promote groundwater conservation & recharge.

The Upper Minnesota River Watershed has areas with deep wells with limited groundwater resources and aquifer availability. Promote conservation practices that improve groundwater recharge and wise water use.

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

Limitation of Existing Tools –

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

Using the Groundwater Restoration and Protection Strategies (GRAPS) Report –

The MDH, along with its state agency partners, are developing a Groundwater Restoration and Protection Strategies (GRAPS) report for the Upper Minnesota River Watershed. GRAPS will provide information and strategies on groundwater and drinking water supplies to help inform the local decision making process of the 1W1P. Information in a GRAPS Report can be used to identify risks to drinking water from different land uses. Knowing the risks to drinking water in a specific area allows targeting of specific activities.

- Prioritize Actions Identified in the Groundwater Restoration and Protection Strategies (GRAPS) report.

Using Wellhead Protection Plans –

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

Using Guidance Documents to Manage Specific Potential Contaminant Sources –

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

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

Attached you will find a listing of MDH data and information to help you in the planning process. Thank you for the opportunity to be involved in your watershed planning process. If you have any questions, please feel free to contact me at (507) 476-4241 or Amanda.strommer@state.mn.us.

Sincerely,

Amanda Strommer, Principal Planner
Minnesota Department of Health, Source Water Protection Unit
1400 E. Lyon Street, Marshall, MN 56282

Attachments

CC via email:

Mark Wettlaufer, MDH Source Water Protection Unit
Yarta Clemens-Billaigbakpu, MDH Source Water Protection Unit
Carrie Raber, MDH Source Water Protection Unit
Jason Beckler, BWSR Board Conservationist
Mark Hiles, BWSR Clean Water Specialist
Ryan Bjerke, DNR
Katherine Pekarek-Scott, MPCA
Ryan Lemickson, MDA

MDH Data and information:

- Drinking Water Statistics – Where do people get their drinking water in the Upper Minnesota River Watershed? One hundred percent obtain their drinking water from groundwater sources. This information can help you understand where people are obtaining their drinking water and develop implementation strategies to protect the sources of drinking water in the watershed.
- A spreadsheet of the public water supply systems in the watershed, status in wellhead protection planning, and any drinking water protection concerns or issues that have been identified in protection areas. This information can help you understand the drinking water protection issues in the watershed, prioritize areas for implementation activities, and identify potential multiple benefits for implementation activities.
  - Shape files of the Drinking Water Supply Management Areas (DWSMA) in the watershed are located at https://www.health.state.mn.us/communities/environment/water/swp/maps/index.htm This information can help you prioritize and target implementation activities that protect drinking water sources for public water supplies.

MDH Figures:

- A figure detailing the "Pollution Sensitivity of Near-Surface Materials" in the Upper Minnesota River Watershed. This information can help you understand the ease with which recharge and contaminants from the ground surface may be transmitted into the upper most aquifer on a watershed scale. Individual wellhead protection areas provide this same information on a localized scale. This is turn can be used to prioritize areas and implementation activities.
- A figure detailing "Pollution Sensitivity of Wells" in the Upper Minnesota River Watershed. This information can help you understand which wells in the watershed are most geologically sensitive based on the vulnerability of the aquifer in which the well is completed. This information allows for targeting of implementation activities to the sources of water people are drinking.
- A figure detailing "Nitrate Results" in the Upper Minnesota River Watershed. This information can help you understand which wells in the watershed contain elevated nitrate levels.
- A figure detailing "Arsenic Results" in the Upper Minnesota River Watershed. This information can help you understand which wells in the watershed contain elevated arsenic levels.
- A figure detailing "DWSMA Vulnerability" in the Upper Minnesota River Watershed. This information can help you understand DWSMA vulnerability to contamination from the ground surface. This figure allows for targeting of implementation activities for public water suppliers.

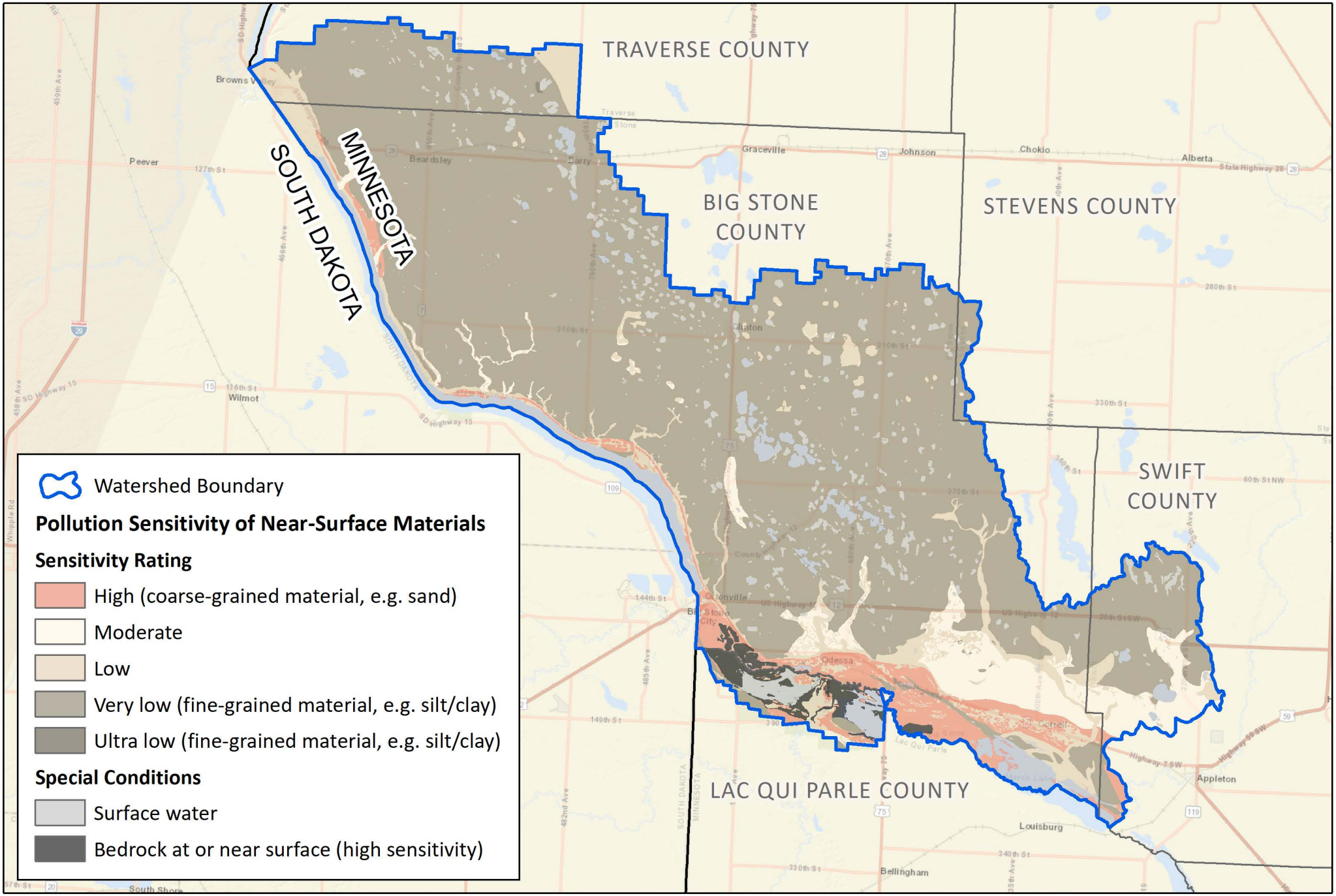
Upper Minnesota River Watershed Public Water Supplies - Drinking Water Protection Concerns for Quality & Quantity

Aquifer Risk	Name	County	Subwatershed	WHP Plan	DWSMA Vulnerability
Very high potential contaminant risk due to connection with surface water - Focus on impacts from land use practices and surface water runoff					
	Beardsley	Big Stone	City of Beardsley	Yes	High/Low
	Browns Valley	Traverse & Big Stone	Big Stone Lake & Little Minnesota River	Yes	High SWCA/High/Moderate
	Odessa	Big Stone	Marsh Lake	Yes	High/Moderate
High/moderate potential contaminant risk - Focus on potential land use contaminant sources that may impact water quality					
	Ortonville	Big Stone & Extends into South Dakota	Big Stone Lake & City of Odessa	Yes	Moderate
Low potential contaminant risk - Focus on sealing of unused wells and old public water supply wells (funding available from MDH)					
	Clinton	Big Stone	Thielke Lake	No	Anticipate Low
	Correll	Big Stone	Marsh Lake	No	Anticipate Low
	Lismore Colony	Big Stone	Salmonson Point	Yes	Low

7 Non-Community Public Water Suppliers

Acronyms:
DWSMA=Drinking Water Supply Management Area
WHP=Wellhead Protection Plan
SWCA=Surface Water Contribution Area

Upper Minnesota River Watershed - Pollution Sensitivity of Near-Surface Materials



Data: DNR
Basemap: ESRI World Street Map

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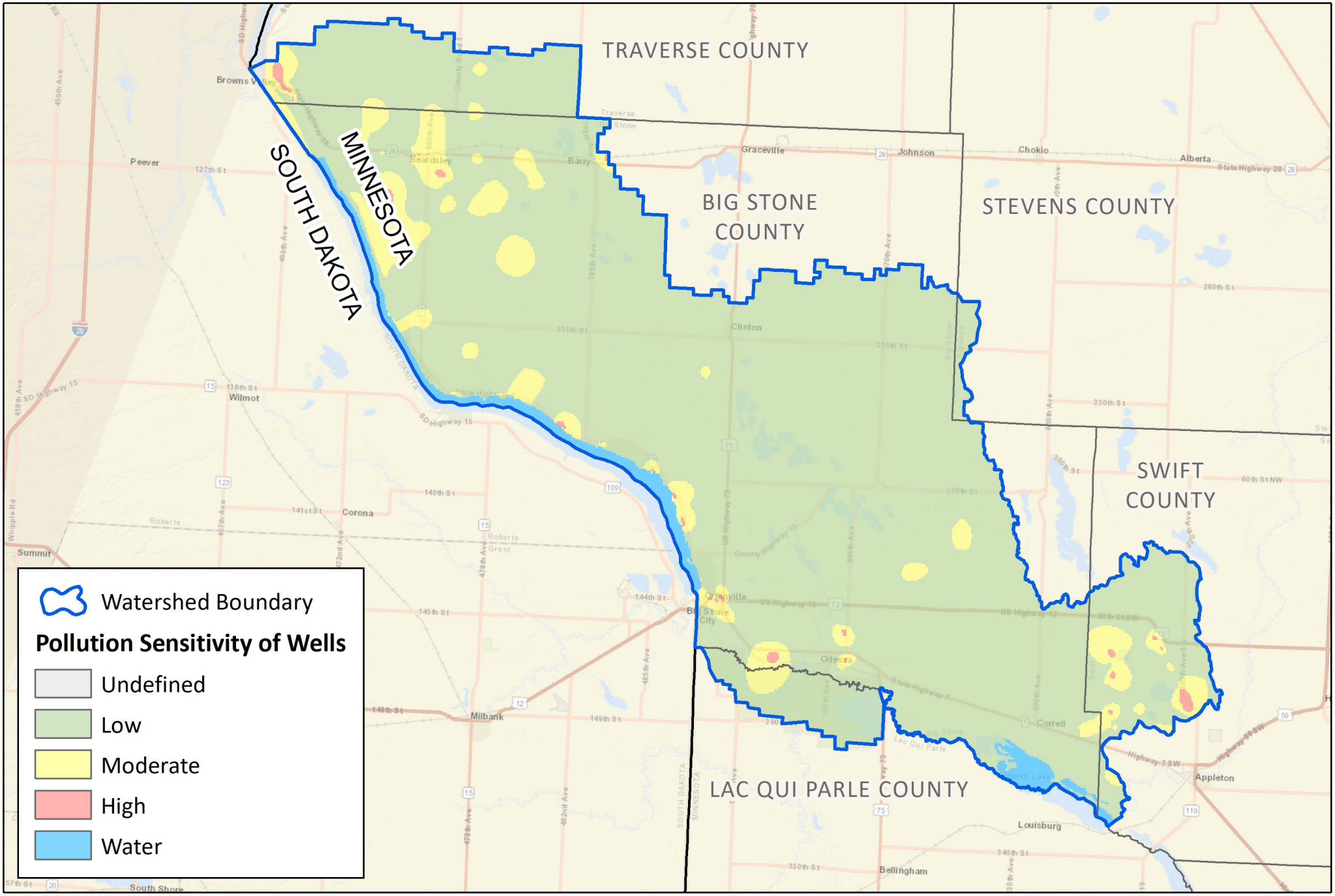
Upper Minnesota River Watershed - Pollution Sensitivity of Wells



Data: MDH

Basemap: ESRI World Street Map

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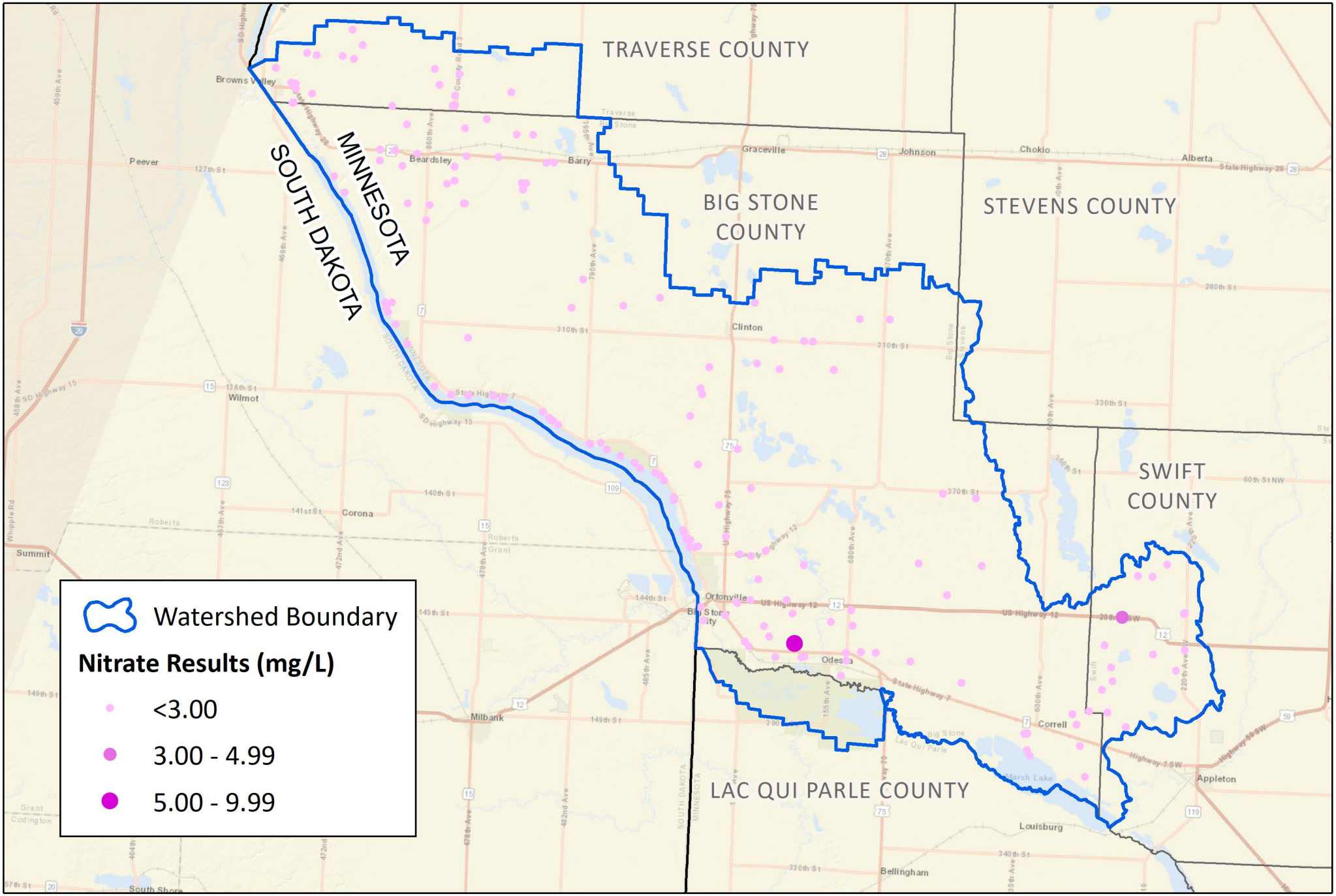
Upper Minnesota River Watershed - Nitrate Results



Data: MDH

Basemap: ESRI World Street Map

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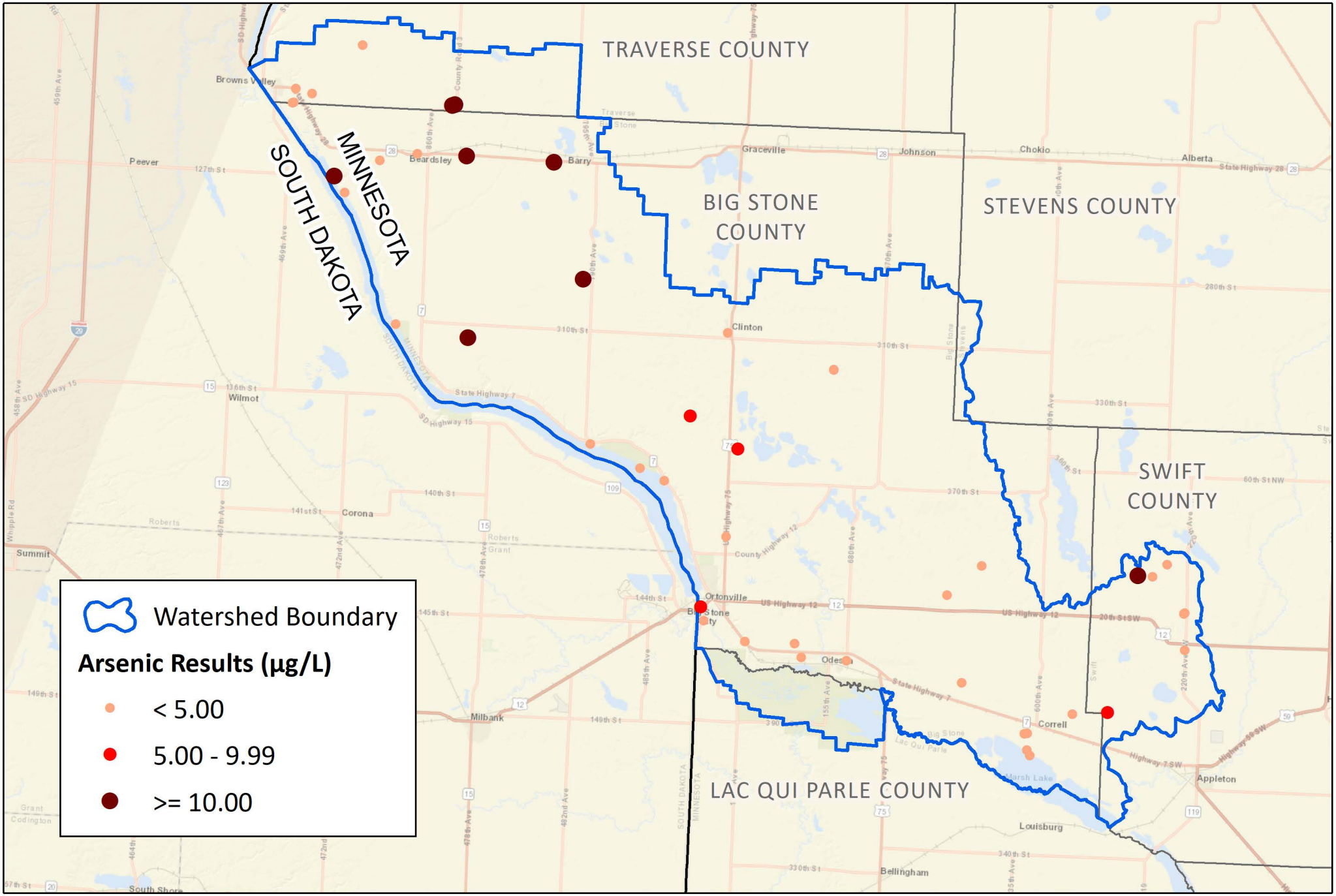
Upper Minnesota River Watershed - Arsenic Results

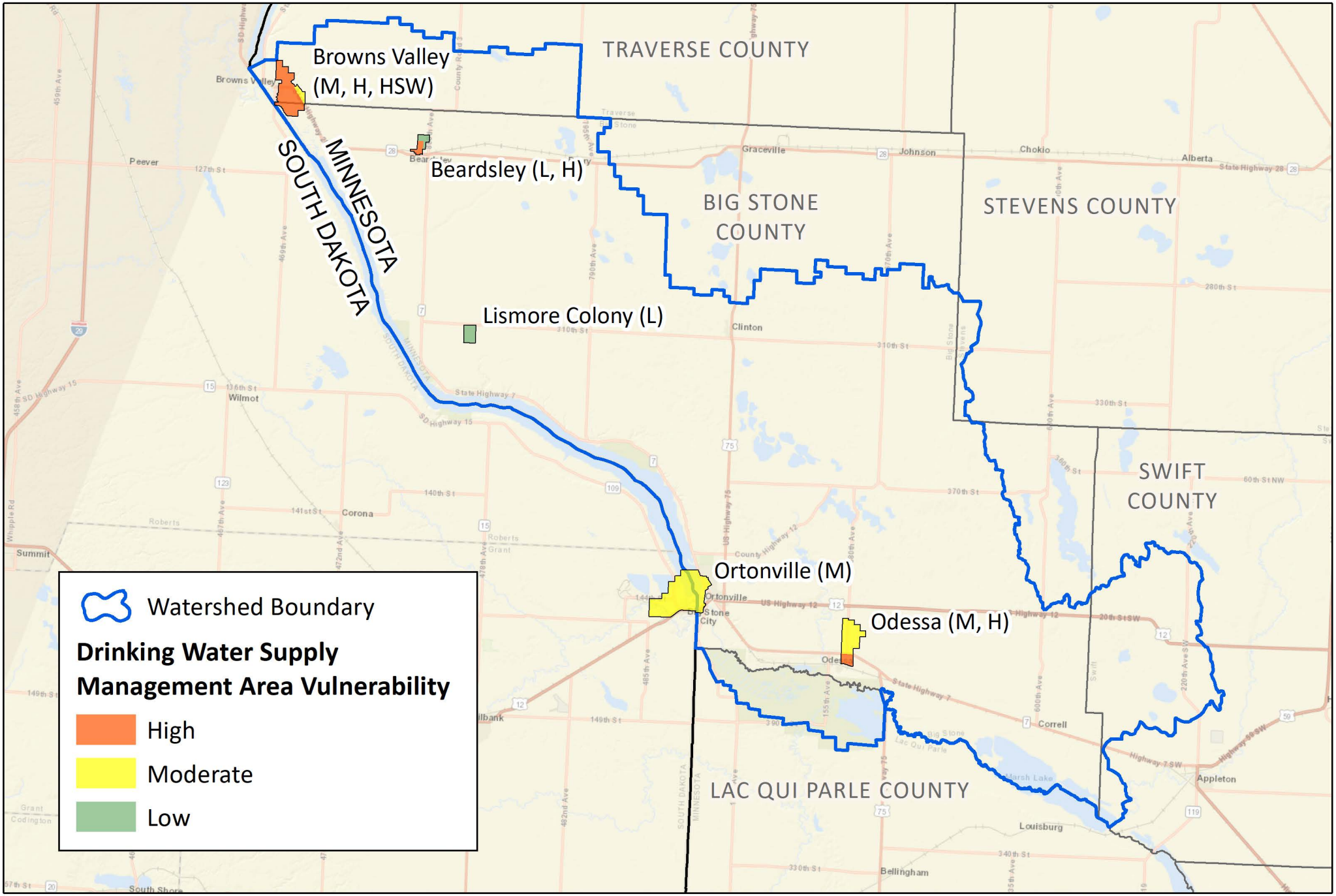


Data: MDH

Basemap: ESRI World Street Map

5 2.5 0 5 Miles

Upper Minnesota River Watershed - DWSMA Vulnerability



Data: MDH

Basemap: ESRI World Street Map

5 2.5 0 5 Miles

MINNESOTA POLLUTION CONTROL AGENCY

Marshall Office | 504 Fairgrounds Road | Suite 200 | Marshall, MN 56258-1688 | 507-537-7146

800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer

April 1, 2022

Amber Doschadis
Administrator
Upper Minnesota River Watershed District
211 2nd St SE
Ortonville, MN 56278

RE: Upper Minnesota River One Watershed, One Plan Priority Concerns

Dear Amber Doschadis:

The Minnesota Pollution Control Agency (MPCA) has received your request to submit water management issues pertinent to the Upper Minnesota River One Watershed, One Plan (Plan) development process. The MPCA appreciates the opportunity to provide input throughout the Plan development process. As part of the MPCA's review, we are providing the following comments we would like to see addressed in the Plan.

The MPCA and other state agencies coordinated with local partners to gather, analyze, and summarize information to develop the Watershed Restoration and Protection Strategies (WRAPS) report for the Minnesota River Headwaters Watershed (MRHW). The reports summarized in the WRAPS report are located on the MPCA Watershed webpage https://www.pca.state.mn.us/water/watersheds/minnesota-river-headwaters. The following pages provide a brief summary of available information from the watershed approach process. The MPCA requests you consider this information during development of the Plan.

Background Information

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

1. Watershed monitoring and assessment
2. Stressor identification (SID) of biological impairments
3. Total Maximum Daily Loads (TMDLs)
4. WRAPS

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

Monitoring and Assessment

In 2015, a comprehensive approach was taken to monitor and assess surface water bodies in the MRHW for aquatic life, recreation, and fish consumption use support. For details on the data collected, refer to the *Minnesota River – Headwaters Watershed Monitoring and Assessment Report (wq-ws3-07020001b)* https://www.pca.state.mn.us/sites/default/files/wq-ws3-07020001b.pdf.

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

Within the Upper Minnesota River planning area, there are 12 stream and 3 lake impairment listings. In addition, there are two impaired lakes (Lac qui Parle – NW Bay and Lac qui Parle – SE Bay) directly downstream of the planning area. **Table 1** lists assessment results for streams and **Table 2** lists assessment results for lakes. See the Monitoring and Assessment reports mentioned above for details. Assessments for aquatic life (AqL), aquatic recreation (AqR) and drinking water (DW) in the MRHW are shown in **Figure 1** for streams and **Figure 2** for lakes.

Table 1

Stream (WID)	Reach Description	Aquatic Life								Aquatic Life Assessment	Aq. Rec.
		Fish Index of Biotic Integrity	Macroinvertebrate Index of Biotic integrity	Dissolved oxygen	Turbidity/TSS	Un-ionized ammonia	River Eutrophication	Chloride	pH		Bacteria
Little Minnesota River (508)	MN/SD border to Big Stone Lk	+	X	?	?	+	?	+	+	X	X
Minnesota River (552)	Big Stone Lk to Marsh Lk Dam		X							X	X
Unnamed creek (541)	Unnamed cr to Big Stone Lk	X	+	?	+	+	?	?	+	X	X
Unnamed creek (West Salmonsen Creek) (504)	Unnamed cr to Big Stone Lk	?	+	?	+	+	?		+	?	X
Unnamed creek (Meadowbrook Creek) (568)	340th St to Big Stone Lk	X	X	?	+	+	?	+	+	X	X
Fish Creek (571)	Headwaters to CSAH 33	X	X	?	+	+	?	+	+	X	X
Whetstone River (539)	MN/SD border to Minnesota R			?	+	?			+	?	?
Unnamed Creek (560)	Unnamed cr to Unnamed cr	X	+	?	?	?	?		?	X	
Unnamed Creek (559)	Unnamed cr to Unnamed cr	X		?	?	?	?		?	X	
Stony Run Creek (538)	Bentsen Lk to Unnamed lk (06-0060-00)										?
Stony Run Creek (536)	Long Tom Lk to Unnamed cr			?	+	?	?		+	?	X
Stony Run Creek (531)	Unnamed cr to Minnesota R	X	X	?	?	+	?	+	+	X	X
County Ditch 2 (562)	Unnamed cr to Unnamed cr	+		?	?	?	?		?	+	
County Ditch 2 (Five Mile Creek) (574)	-96.1283, 45.2472 to T121 R43W S31, south line	X	+	?	?	?	?	?	?	X	
Unnamed creek (Five Mile Creek) (521)	Unnamed cr to Marsh Lk	X	+	?	+	+	+	+	+	X	X

Table 2

Lake	Lake ID	Aquatic Life Use		Aquatic life Assessment	Aquatic recreation Assessment
		F-IBI	Un-ionized Ammonia		
Big Stone	06-0152-00	+		+	X
Long Tom	06-0029-00				X
Unnamed	06-0060-00				X
Lac qui Parle (SE Bay)	37-0046-01		X	X	X
Lac qui Parle (NW Bay)	37-0046-02			?	X

X	=	Impaired
?	=	Inconclusive (need more data)
+	=	Supporting
-	=	Not Assessed
<blank>	=	No data

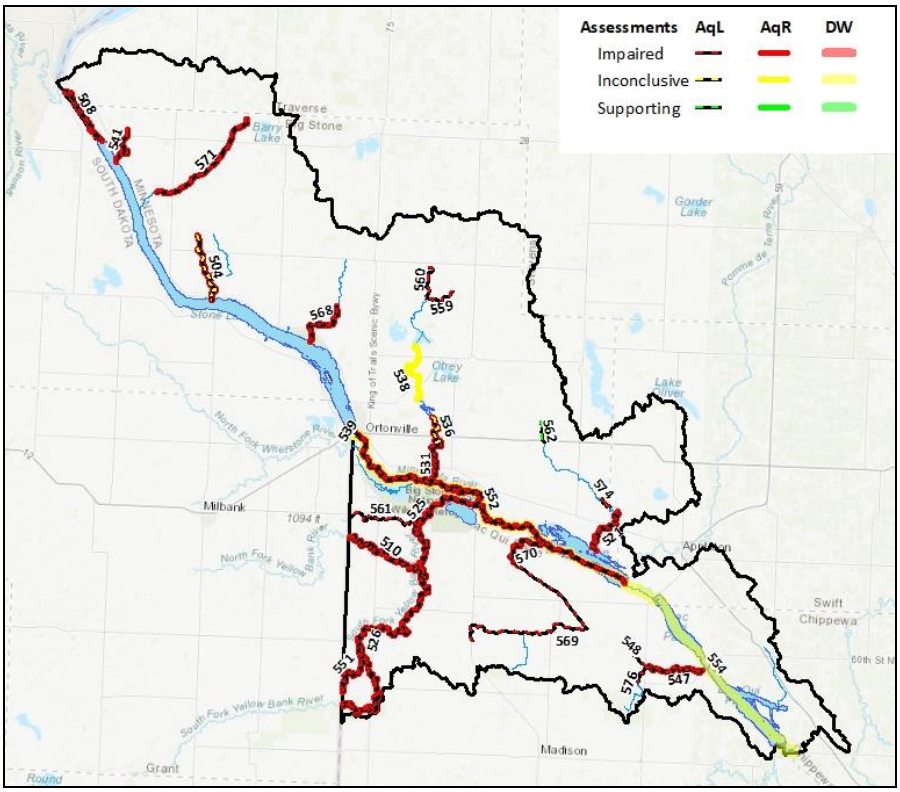


Figure 1

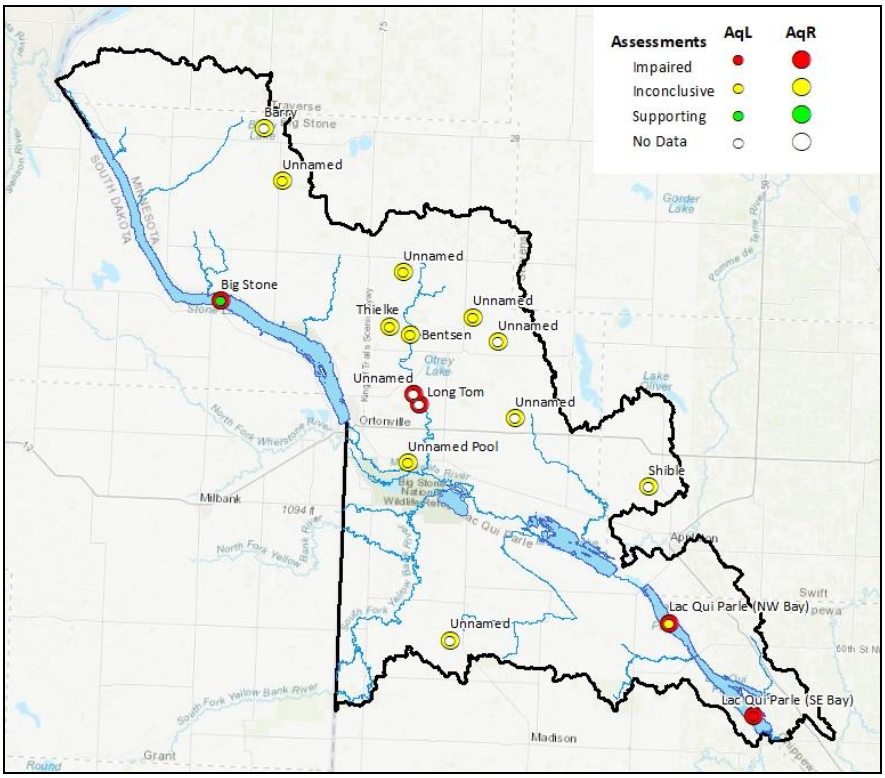


Figure 2

Stressor Identification

SID is performed on biological impairments to determine what pollutant and nonpollutant stressors are causing impairments to the aquatic biological community. The process is described in more detail and documented in the *Minnesota River – Headwaters Watershed SID Report (wq-ws5-070200001a)* https://www.pca.state.mn.us/sites/default/files/wq-ws5-07020001a.pdf. SID was completed on eight waterbodies in the Plan area within the MRHW for biota (fish and/or macroinvertebrates) impairments. **Table 3** summarizes the primary stressors identified in the Upper Minnesota River planning area.

Table 3

Primary Stressor	Number of Reaches Identified
Altered Hydrology	8
Dissolved Oxygen	6
Eutrophication	5
Connectivity	4
Habitat	4
Nitrate	2
Suspended Solids	1

Total Maximum Daily Loads

The Clean Water Act requires TMDLs be developed for waters that do not support their designated uses. A TMDL essentially provides the allowable pollutant loading, as well as needed reductions, to attain and maintain water quality standards in waters that are not currently meeting standards. There are three

TMDL reports either completed or drafted for the impaired waterbodies in the Upper Minnesota River One Watershed, One Plan planning area.

- Draft Minnesota River Headwaters Watershed TMDL Report
  https://www.pca.state.mn.us/sites/default/files/wq-iw7-57e.pdf

- Minnesota River Bacteria TMDL Report
  https://www.pca.state.mn.us/sites/default/files/wq-iw7-48e.pdf

- Lac qui Parle – Yellow Bank Bacteria, Turbidity, and Low Dissolved Oxygen TMDL Report
  https://www.pca.state.mn.us/sites/default/files/wq-iw7-24e.pdf

Watershed Restoration and Protection Strategies

Much of the information presented in WRAPS reports is synthesized from the Monitoring and Assessment, SID, and TMDL reports. However, the WRAPS report presents additional data and analyses including watershed-scale models and tools, detailed analyses and output from these work products, and a set of potential strategies for point and nonpoint source pollution that will cumulatively achieve, or otherwise make significant progress toward, water quality targets. The *Minnesota River Headwaters WRAPS Report* can be found at https://www.pca.state.mn.us/sites/default/files/wq-ws4-75a.pdf.

Two key products of the WRAPS report are the strategies table and the priorities section, each developed with input and review from county, Soil and Water Conservation District (SWCD) and watershed district staff, state natural resource, and conservation professionals. The strategies table provides high level strategies necessary to restore and protect water bodies in the watershed. The priorities section presents criteria to identify priority areas for water quality improvement.

Goals and 10-year Targets

Among the required elements of WRAPS are timelines for achieving water quality goals and interim milestones within 10 years of strategy adoption as shown in **Table 4** for the Upper Minnesota planning area. Further descriptions of the goals and targets are found in Section 2.1.3 (page 41) of the WRAPS report. It is the intent that the implementing organizations in the watershed make steady progress in terms of pollutant reduction. However, needed pollutant load reductions are moderately high and will require significant adoption of conservation practices. Factors that may result in slower progress include limits in funding or landowner acceptance, challenging fixes, (e.g., unstable bluffs and ravines, invasive species) and unfavorable climatic factors. Conversely, there may be faster progress for some impaired waters, especially where high-impact fixes are slated to occur or where the watershed is subject to focused efforts.

Table 4

Parameter (Stressor/Pollutant)	**Current Status**	**Water Quality Goal Summary**	**Watershed-wide Goal**	**10-year Target**	**Years to Reach Goal (from 2020)**
Altered Hydrology	Stressor in 8 stream reaches	Aquatic life populations are not stressed by altered hydrology (too high or too low river flow). Hydrology is not accelerating other parameters (sediment, etc.). Decrease intermediate flood peaks (2-yr to 10-yr events).	Increase storage by 0.54 inch (16,468 acre-ft) across watershed	Increase storage by 0.1 inch (3,050 acre-ft) across watershed	40
Bacteria	9 stream reaches impaired	Average monthly geomean of stream samples is below 126 org/100mL.	36% reduction; 19% - 81% reduction for impaired streams	10% reduction	65
Habitat	Stressor in 4 stream reaches	Increase in average MSHA* scores. Aquatic life not stressed by poor habitat.	27% increase in the average MSHA score to 66	10% increase in MSHA score	75
Phosphorus	5 lakes impaired; Stressor in 5 stream reaches	Summer average phosphorus concentrations below 150 ug/L. for streams, 90 ug/L for lakes. Aquatic life not stressed by phosphorus. Meet Minnesota's phosphorus reduction goals for watershed.	69% reduction, 41% to 72% for impaired lakes	12% reduction	60
Sediment	Stressor in 1 stream reach	90% of stream concentrations are below 65 mg/L. Aquatic life populations are not stressed by sediment.	28% reduction to meet 65 mg/L FWMC across the watershed	10% reduction	65
Connectivity	Stressor in 4 stream reaches	Aquatic life populations not stressed by human-caused barriers.	Assess identified barriers	Address identified barriers	45
Nitrogen	Stressor in 2 stream reaches	Aquatic life not stressed by nitrate. Protect groundwater and drinking water throughout the watershed. Meet Minnesota's nitrogen reduction goal for watershed.	45% reduction	20% reduction	65
Parameters that are impacted/addressed by the above pollutants and stressors					
Macroinvertebrate Bioassessments	5 stream reaches impaired	Aquatic life populations are measured and numerically scored with IBIs. IBIs meet thresholds based on stream class/use.	Because these are in response to (caused by) the above pollutants/stressors, the other watershed-wide goals are (indirect) goals for these parameters.	Meet other 10-year targets	60
Fish Bioassessments	8 stream reaches impaired				60
Dissolved Oxygen	Stressor in 6 reaches	Minimum concentrations of 5 mg/L in all streams. Aquatic life not stressed by low dissolved oxygen.			60

WRAPS Strategies
A set of restoration and protection strategies were developed to achieve water quality goals for waterbodies addressed in the MRH WRAPS report. Where possible, the strategies were derived through quantitative methods; however, in other cases, only more qualitative characterization of actions was feasible. The chief goal of providing this information is to inform local planning. Specifically, by providing an overall set of actions needed to meet the goals (over some period of years or decades), local planners can focus on a subset of actions to take on for their shorter-term (e.g., 10-year) planning cycle. This provides a means to gauge a plan's ability to make progress over time as well as make adjustments through adaptive management.

Prioritizing and Targeting
Several tools are included throughout the WRAPS report that can be used to help identify priority areas. These include the goals maps, Hydrologic Simulation Program – Fortran (HSPF) model maps, altered hydrology summary, and GIS estimated altered hydrology maps. Table 31 (Page 130-131) in the WRAPS report identifies priority areas along with data sources and specific examples. The MPCA recognizes that some restoration practices, particularly soil health practices, will need to be implemented watershed-wide to achieve water quality goals. However, the MPCA also highly recommends focusing efforts on some of the priority subwatersheds that were identified in the WRAPS report.

MPCA Water Management Priorities
The MPCA recommends focusing on the following priorities in the Upper Minnesota River One Watershed, One Plan. Additional information on each of these priorities can be found in the previously referenced Minnesota River Headwaters WRAPS, TMDLs, SID report, and Monitoring and Assessment report.

Biota (Aquatic Life)
Address the stressors to aquatic life in the Plan. Aquatic life use impairments within the watershed are complex. Biotic impairments are a result of nonpoint source pollution and localized stress linked to altered hydrology, poor habitat condition, excessive nutrients, and low dissolved oxygen. Stabilizing hydrology, increasing riparian buffer width, and stabilizing stream banks would greatly help the in-stream habitat.

Altered Hydrology
Seek changes to the landscape that reduce peak flows and annual volumes while still meeting land management needs. Delivery of pollutants (sediment, nutrients, bacteria, etc.) to surface waters has been accelerated because of altered hydrology. Increasing rainfall infiltration and water retention, and improving vegetative cover and soil health are activities that are needed to stabilize hydrology and reduce impairments.

Bacteria
Control pathways delivering human and livestock feces to the MRHW. High levels of bacteria are widespread across the watershed. Proper manure management and pasture management along with practices to capture manure runoff should be prioritized as well as updates to noncompliant septic systems.

Nutrients
Reduce nutrient delivery to the watershed. High levels of phosphorus are driving nuisance algae blooms in the watershed's impaired lakes, and threatening other lakes. Algae blooms can deprive lakes of their

oxygen as the algae die off and decay, causing fish kills. High levels of algae cause increased levels of turbidity, degrading aquatic recreation and aquatic life. Blue-green algae can also cause serious health issues for humans and pets. Phosphorus and nitrogen have been identified as stressors to the aquatic biology and a causal factor for low dissolved oxygen in streams of the planning area. Nutrient management plans that appropriately value the nutrient worth of manure and previous crops and focus on the timing and intensity of nutrient applications will help reduce the amount of phosphorus and nitrogen reaching surface waters.

Watershed wide practice implementation

While geographic targeting of specific practices and funding is important, some practices will need to be implemented at the major watershed scale. The MPCA recommends some of the implementation funding for the Upper Minnesota River planning area is flexible and available watershed wide, to provide options for landowners to try soil health and cover crop practices, work with SWCD staff, and communicate with other landowners who are implementing these practices. The MPCA recommends developing a network of local staff and operators who can provide technical, financial, and practical assistance to landowners implementing soil health principles.

Drainage Watershed Management

The MPCA recommends the Plan identify an approach for addressing petitions for drainage improvement projects in the MRHW. Currently, drainage improvement projects have limited input from local staff to aid in the integration of conservation practices that would help to alleviate hydrology concerns and downstream impacts from increases in water volume. The MPCA recommends early coordination with landowners, SWCD staff, State agencies, and engineers to develop improvement projects that account for volume increases.

Previous drainage improvement engineering reports in the Minnesota River Basin have indicated that drainage improvement projects are a TMDL implementation practice. The current WRAPS and TMDL reports do not include drainage improvement projects as a means for improving water quality. The MPCA encourages the planning group to discuss watershed drainage management and consider water quality with an emphasis on finding ways to store and/or reduce the increased volume of water by working with landowners in areas where drainage improvement will eventually be considered.

Priority Areas

As indicated above in this letter, Table 31 (Page 103-131) in the WRAPS report identifies suggested priority areas. Nearly impaired waters such as Minnesota River from Big Stone Lake to Marsh Lake (-552) and barely impaired waters such as Stony Run Creek (-531) and Meadowbrook Creek (-568) should receive consideration as priority areas. The fully supporting stream of County Ditch 2 (-562) in the Five Mile Creek Subwatershed and its drainage area should be considered as a priority for protection.

Environmental Justice

The MPCA is committed to ensuring that pollution does not have a disproportionate impact on any group of people — the principle of environmental justice. This means that all people — regardless of their race, color, national origin or income — benefit from equal levels of environmental protection and have opportunities to participate in decisions that may affect their environment or health.

The MPCA uses the U.S. Census tract as the geographic unit to identify areas of environmental justice concerns. The agency considers a census tract to be an area of concern for environmental justice if it meets one or both of these demographic criteria: (1) the number of people of color is greater than 50%

or (2) more than 40% of the households have a household income of less than 185% of the federal poverty level. See the MPCA website (https://www.pca.state.mn.us/about-mpca/mpca-and-environmental-justice) for more information regarding environmental justice.

Two areas within the MRHW were identified as areas of environmental justice concern based on the percentage of residents living below the poverty level (**Figure 3**). The MPCA requests that developers of the Plan consider (1) prioritizing water bodies within these Environmental Justice Concern areas or water bodies known to be utilized by these traditionally underserved communities, (2) focus additional outreach and education of available programs to the Areas of Environmental Concern and (3) include narrative about the Environmental Concern Areas when describing the socioeconomic characteristics of the watershed.

The Lower Sioux Indian Community of Minnesota, Upper Sioux Community of Minnesota, and Sisseton-Wahpeton Oyate have cultural interest in the Plan area, even though their tribal boundaries are not within this area. The MPCA requests that developers of the Plan consider reaching out to these tribal nations to inform them of planning efforts and to ascertain their level of interest in participating on the advisory committee.

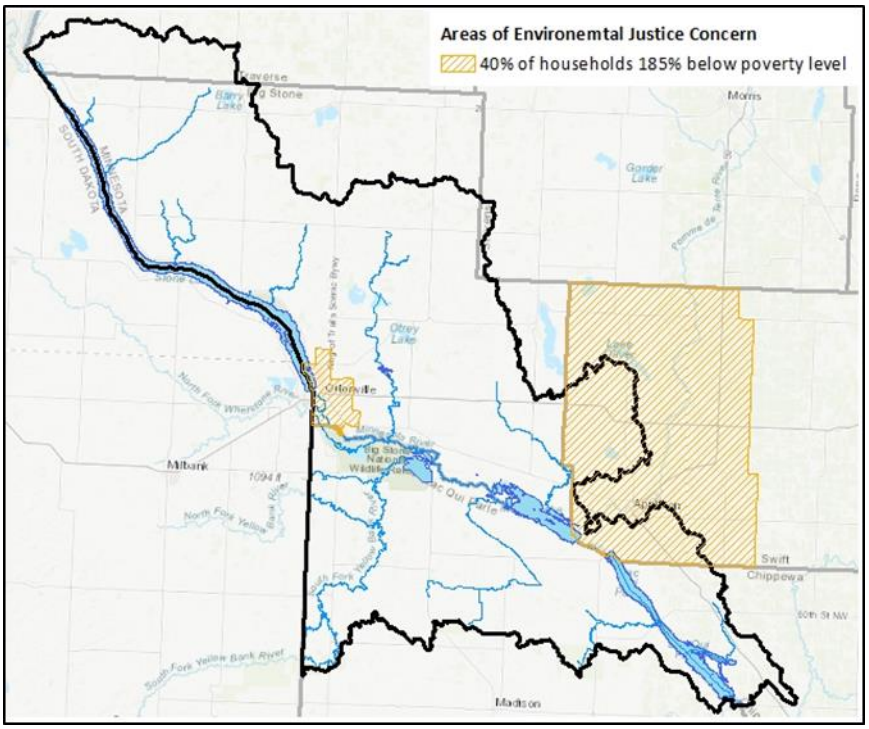


Figure 3

Continued Civic Engagement

Through the WRAPS development process, efforts were made to engage watershed stakeholders to gather insights into the watershed and to educate residents. The MPCA encourages local partners to continue civic engagement work with the citizen networking group. It is also recommended to continue cooperating with local partners from South Dakota to work toward the common goal of improving water quality.

Modeling considerations

The MPCA requests that any modeling efforts for implementation utilize HSPF model output and WPLMN data to calibrate pollutant load and flow estimates. This would allow for reduction calculations

to be comparable to WRAPS goals and targets for load and flow reductions. If this is not feasible, consider explaining differences between load and/or flow reduction estimates in the Plan and the WRAPS.

The MPCA recognizes all of the cooperation and work from the local partners within the MRHW, and offers our continued support in local water planning. Thank you for the opportunity to provide comments during the planning process. If we may be of further assistance, please contact Katherine Pekarek-Scott at katherine.pekarek-scott@state.mn.us or 507-476-4284.

Sincerely,

Katherine Pekarek-Scott

This document has been electronically signed.

Katherine Pekarek-Scott
Environmental Specialist
Watershed Division

PKS:jdf

Summary of Watershed Issues for Upper Minnesota River's One Watershed, One Plan

Big Stone National Wildlife Refuge, part of the US Fish and Wildlife Service (FWS), recently completed a Water Resource Inventory and Assessment (WRIA) Summary Report (USFWS 2021). The full report can be provided upon request. The report identified five ongoing threats to water resources on the refuge:

1) Sedimentation

2) Other contaminants/altered water chemistry

3) Loss/alteration of wetland habitat

4) Altered flow regimes

5) Compromised water management capacity

Three causes were identified:

1) Agricultural runoff

2) Non-FWS management of water infrastructure

3) Inefficient, inadequate, or damaged water management infrastructure on the refuge

Two of these causes (Agricultural runoff and Non-FWS management of water infrastructure) are of particular relevance to the One Watershed, One Plan as they pertain to the watershed as a whole. Addressing these issues are beyond the immediate control of the Refuge and will require a watershed approach in order to resolve.

A summary of these threats is in Table 1. Key points/statistics related to these threats are found in Table 2. Water quality and quantity data are generally lacking for the Refuge. No groundwater data area available. In general, the refuge receives too much water too quickly and more data on water quality are needed.

Reference:

[USFWS] U.S. Fish and Wildlife Service. 2021. *Big Stone National Wildlife Refuge Water Resource Inventory and Assessment (WRIA) Summary Report.* US Fish and Wildlife Service Region 3, Bloomington, MN. 75 pp.

Submitted by:

Michael Budd
Project Leader/Refuge Manager
Big Stone National Wildlife Refuge

Table 1: This table is adapted from the *Big Stone National Wildlife Refuge Water Resource Inventory and Assessment (WRIA) Summary Report*. All water issues noted below are considered high severity, current threats.

Threat	Description	Example	Threat Cause
Sedimentation	Tributary entry points into the Minnesota River throughout the area of the Refuge suffer from excessive sedimentation that prevents effective management of some impoundments and use of some water control structures.	Sedimentation	Agricultural Runoff
Other Contaminants/Altered Water Chemistry	The majority of the streams flowing into, through, and out of the Refuge are impaired for turbidity, *E. Coli*, or aquatic life.	Water quality problems in water supply to the Refuge	Agricultural Runoff
Loss/Alteration of Wetland Habitat	Cattail encroachment is an issue within some wetland impoundments.	Cattail expansion	Agricultural Runoff
Altered Flow Regimes	The Refuge lies between two dams, one upstream and one downstream of the Refuge. Both dams are operated for different purposes and although FWS does communicated with the entities managing the dam, FWS cannot effectively manage water in the Refuge due to management of these dams.	Inability to control water on the Refuge due to location between to Non-FWS controlled Dams	Non-FWS Management of Water Infrastructure
Compromised Water Management Capacity	Most of the infrastructure throughout the Refuge has failed or is failing preventing effective water management.	Inadequate infrastructure and issues with sedimentation effecting infrastructure capacity	Inefficient, Inadequate, or Damaged Water Management Infrastructure
Compromised Water Management Capacity	Original water supply and management design appears to have been inadequate and failed to account for geomorphic evolutions of streams, ditches, and impoundments behind the upstream dam.	Water supply issues to impoundments	Inefficient, Inadequate, or Damaged Water Management Infrastructure

Table 2: Key points and statistics related to the threats described in Table 1. All information is from the *Big Stone National Wildlife Refuge Water Resource Inventory and Assessment (WRIA) Summary Report*.

Threat	Facts/Stats	Possible Source
Sedimentation	• Whetstone reconnection project could exacerbate this • Ditched portion of Minnesota River sloughing/collapsing • Width increases up to 10 ft	Whetstone/Yellow Bank Rivers Agriculture

Other Contaminants/Altered Water Chemistry	• Increased summer (+2.24°F) and winter (+3.47°F) temps from 1895-2017
	• Increased precipitation (+2.6 in) from 1895-2017
	• Tubidity impairment (MN River)
	  • Mean = 14.62 NRTU (SD = 24.70 NRTU)
	• Dissolved oxygen (MN River)
	  • Mean = 8.80 mg/L (SD = 3.13 mg/L)
	• *E. coli*
	  • 303(d) impaired waters from 2018 listing (MN EPA category 5)
	• Aquatic life impairment
	  • 303(d) impaired waters from 2018 listing (MN EPA category 5)
	• High total phosphorus (MN River)
	  • Mean = 0.33 µg/L (SD = 0.41 µg/L)
	• Total nitrogen (MN River)
	  • Mean = 2.7 µg/L (SD = 0.7 µg/L)
		Climate change
		
		Discharge pipes near quarry on N side of refuge? City of Odessa sewage ponds?
		
		Agriculture

Loss/Alteration of Wetland Habitat	• Lengthened growing season (+19.02 days above average) from 1900-2019 • Increasing non-native cattails • Hydrographs indicate sharp streamflow fluctuations and prolonged high/low periods, negatively impacting species that need gradual variation • 2-780 cfs annual mean discharges (max 5,680 cfs) for MN River	Climate change Whetstone/Yellow Bank Rivers Agriculture

	• 4-402 cfs annual mean discharges (max 6,970 cfs) for Yellow Bank River	
Altered Flow Regimes	• Whetstone River project • Failed weir system on MN River channel limits water flow into historic MN River • Big Stone dam (northwest of refuge) and US Army Corps of Engineers Hwy 75 dam (east side of refuge) are operated primarily for flood management, not for refuge habitat goals • Ditched portion of MN River sloughing/collapsing • Width increases up to 10 ft	Whetstone River projects Sedimentation/agriculture
Compromised Water Management Capacity	• 45 year old failing infrastructure • Sedimentation	Age Sedimentation

Appendix C

Resource Concern	Resource Category	Issue Description	60 day ranking	LGU ranking	dot ranking	state score	Sum	Final Ranking
Land Stewardship	Agricultural Lands	Healthy soils provide increased agricultural productivity and downstream benefits for water quality and water quantity. In addition, healthy soils provide opportunities to increase climate resiliency. Maintaining or improving soil health within the watershed can produce multiple benefits.	3	3	3	3	12	High
Habitat	Wetlands	Many land use and land management decisions have resulted in a loss of wetlands or decline in the quality of wetlands. These changes have impacts on habitat as well as issues connected to surface water.	3	3	3	3	12	High
Surface Water	Streams and Drainage Systems	Water speed across agricultural fields is causing concentrated flow paths which result in gully formation. In turn, high sediment and nutrient yields may occur, impacting drainageways and stream and lake health	3	3	3	3	12	High
Groundwater	Drinking Water	Well Head Protection Areas and Drinking Water Supply Management Areas to may need protection to safeguard drinking water quality	2	3	2	3	10	High
Groundwater	Drinking Water	Groundwater is threatened due to unsealed abandoned wells and STSS that are failing or are an immediate threat to public health. Due to the significant reliance on groundwater for personal consumption, private wells should be protected for pesticides, arsenic, and nitrates.	3	3	1	3	10	High
Habitat	Aquatic	Aquatic habitat can become disconnected in many ways. This includes latitudinal (e.g., floodplain connectivity) and longitudinal (e.g., obstructions in rivers that block fish passage, like a dam). These connectivity impacts decrease the quality of aquatic habitat.	3	2	2	2	9	Medium

Surface Water	Streams and Drainage Systems	Lost storage can impact chronic bank-full flooding, increase crop damage, drive cross-watershed flood events, and increase flashiness of ditch systems. The sizing of infrastructure impacts flow and storage, such as culverts, can also be connected to this issue.	3	2	1	3	9	Medium
Surface Water	Streams and Drainage Systems	Streams and ditches can erode at rates that create issues that impact adequate drainage, infrastructure, aquatic life, aquatic recreation, and water quality	2	3	1	3	9	Medium
Surface Water	Lakes	Surface waters can become impaired from a range of water constituents (e.g., dissolve oxygen, nutrients, sediment, E. coli, mercury) that impact their use for recreation and impact aquatic life. There are a number of surface waters in the watershed impaired for aquatic life and recreation	3	3	1	2	9	Medium
Land Stewardship	Agricultural Lands	Upland surface erosion (inclusive of ravine, gully, and wind erosion) causing detachment and transport of valuable soils and sediment to surface water, impacting aquatic life and recreation.	1	2	3	3	9	Medium
Groundwater	Aquifer	Water quantity in Well Head Protection Areas and Drinking Water Supply Management Areas can be impacted if recharge is not balanced against withdrawal. These public water supplies may need to be protected against depletion.	1	3	3	2	9	Medium
Habitat	Aquatic	Altered hydrology is creating flow regimes that are either too high or too low, impacting aquatic life and creating impassible culverts due to improper culvert elevations	3	1	2	2	8	Medium
Surface Water	Streams and Drainage Systems	Numerous forms of drainage are found within the watershed. This includes systems such as public ditches, private ditches, bridges, culverts, and tile drainage. Inadequate drainage can lead to flooding and water quality issues. To much drainage can cause downstream	1	2	3	2	8	Medium

		impacts. In addition, once drainage is in place, it can become impacted from excess sediment.						
Habitat	Terrestrial	Current land uses and land management can decrease the quality of terrestrial habitat, thereby impacting populations of terrestrial biotic organism like wildlife, plants, and insects.	3	1	2	1	7	Low
Surface Water	Streams and Drainage Systems	Permitted municipal and industrial point sources of pollution impacting water quality conditions.	1	3	1	2	7	Low
Surface Water	Streams and Drainage Systems	Increase precipitation intensities, quantities, and annual timing is degrading water quality watershed wide by exacerbating erosion and nutrient movement	2	1	2	1	6	Low
Land Stewardship	Agricultural Lands	Over grazing or grazing in sensitive areas of the landscape like shorelands can have impacts on water quality and quantity. Similarly, improperly managed livestock feeding operations can have impacts on surface waters.	1	1	1	3	6	Low
Land Stewardship	Rural and Urban Communities	Private subsurface sewage treatment systems and small communities with wastewater needs can have impacts on the water quality of downstream receiving waters.	1	1	2	1	5	Low
Land Stewardship	Rural and Urban Communities	As upgrades are made and development pressure intensifies, sustainable development will be necessary to help reduce environmental impacts	1	1	1	1	4	Low

Appendix D

HOUSTON engineering, inc.

Technical Memorandum

To: Upper Minnesota River Watershed District

From: Scott Kronholm, PE
Houston Engineering, Inc.

Subject: Targeted Conservation Practices

Date: May 3, 2023

Project: 5304-0025

The targeted BMPs in this section were selected using BMP information from the Prioritize Target and Measure Application (PTMApp). PTMApp provided nearly 325,000 possible locations for BMP placement within the Upper Minnesota River Watershed. These were culled to eliminate any BMPs that fell outside of the Minnesota portion of the watershed, leaving ~114,000 BMPs. The remaining BMPs were screened for load reduction efficiency (ability to treat load delivered to the BMP) and overall load reduction potential (total mass reduced). This eliminated another ~43,000 small or inefficient BMPs.

BMP costs were adjusted from the default PTMApp values (**Table 1**). The default estimated BMP implementation cost within PTMApp (based on EQIP payment rates) were most often doubled to better represent total BMP cost. However, grade stabilization, grassed waterways, and WASCOBs were assigned unit values representing typical installation costs for the area.

One further screening step was used to eliminate BMPs that have very poor cost-effectiveness for reducing sediment load. Any BMP requiring more than $5,000 per ton of sediment reduction was removed from any further analysis. This left a total of 65,034 PTMApp-based BMPs to analyze for targeting practices to meet watershed-wide or planning region specific water quality goals.

Table 1: Modified PTMApp BMP costs

Prioritized BMPs	NRCS_code	Notes
WASCOB	638	$10,000/ea.
Grassed waterways	412	$15,000/ea.
Saturated buffers	604	EQIP x2
Regional wetland	656	EQIP x2
Wetland restoration	656	EQIP x2
2-stage ditch	582	EQIP x2
Grade stabilization	410	$40,000/ea.
Cover crops	340	EQIP x2
Reduced tillage	345	EQIP x2
Nutrient management	590	EQIP x2
Prescribed grazing	528	EQIP x2
Perennial cover	327	EQIP x2

There are 24 different BMP types analyzed within PTMApp. Based on local preferences and likelihood of stakeholder buy-in, a common set of BMPs were defined that will be prioritized for use in all planning regions and watershed-wide actions. Twelve of the 24 BMP types were considered for targeting. They were split into structural practices (WASCOB, regional wetland, wetland restoration, saturated buffer, multi-stage ditch, grade stabilization, grassed waterway) and management practices (perennial crops, cover crops, reduced tillage, prescribed grazing, and nutrient management). Structural BMPs and management BMPs within each planning region were separately ordered from greatest sediment reduction to least, and were selected sequentially until relevant water quality goals were reached (**Table 2**).

Table 2: Water quality goals, water quantity goals, and implementation goals

Planning Region	Sediment Goal	Water Storage Goal	Structural practices	Management practices
Upper Big Stone Lake	3,449 tons/yr reduction at the planning region outlet	700 ac-ft	Treat 1000 acres. 5 streambank stabilization projects. 1 wetland project	Treat 1500 acres/year (total – not additional)
Lower Big Stone Lake				
Stony Creek	5,163 tons/yr reduction at the planning region outlet	887 ac-ft	Treat 1000 acres. 500 additional acres of wetland. 5 streambank stabilization projects.	Treat 4000 acres
Five-mile Creek			Treat 3,000 acres with wetlands	
Watershed-wide				5000 acres of soil health practices

Table 3a and **Table 3b** show the estimated costs, load reduction, additional water storage potential, and acreage of soil health practices of targeted BMPs. Although most of the implementation efforts will be focused within the Upper Big Stone Lake and Stony Creek Planning Regions, a selection of optional management BMPs were also included in the Lower Big Stone Lake and Five-mile Creek planning regions in the event that targeted BMPs in the other planning regions are not feasible or possible to implement.

Table 3a. Estimated BMP cost and load reductions from targeted BMPs

Planning Region	Number of targeted BMPs	Total Cost	Sediment Reduction* (tons/yr)	TP Reduction* (lbs/yr)	TN Reduction* (lbs/yr)
Upper Big Stone Lake	184	$1,330,000	3,470	940	13,900
Lower Big Stone Lake[1]	99	$190,000	3,750	710	9,400
Stony Creek	408	$1,950,000	5,190	1,700	31,900
Five-mile Creek[1]	73	$190,000	970	380	5,600

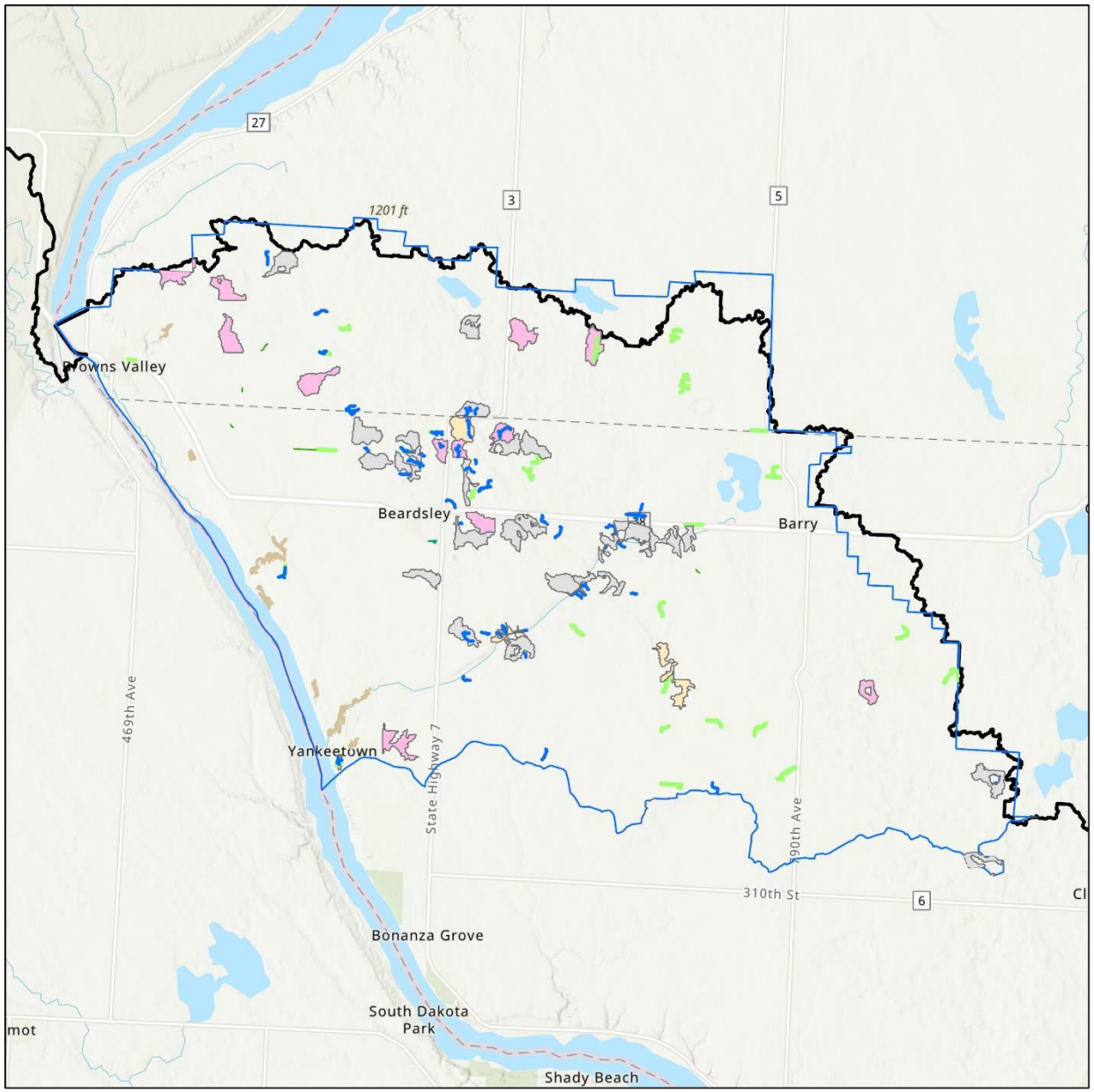
*as measured at the planning region outlet

[1]Optional BMPs for implementation if BMPs in other planning regions are not feasible

Table 3b. Estimated BMP water storage and acres of management practices from targeted BMPs

Planning Region	Additional water storage (ac-ft)	Soil health area (acres)
Upper Big Stone Lake	130	7,000
Lower Big Stone Lake	0	6,800
Stony Creek	182	24,700
Five-mile Creek	0	6,600

The values summarized in the previous tables are presented in the following maps.



Upper Minnesota River
Watershed Planning Region:
Upper Big Stone Lake

Legend

- Upper Minnesota River Watershed
- Planning Region Boundary

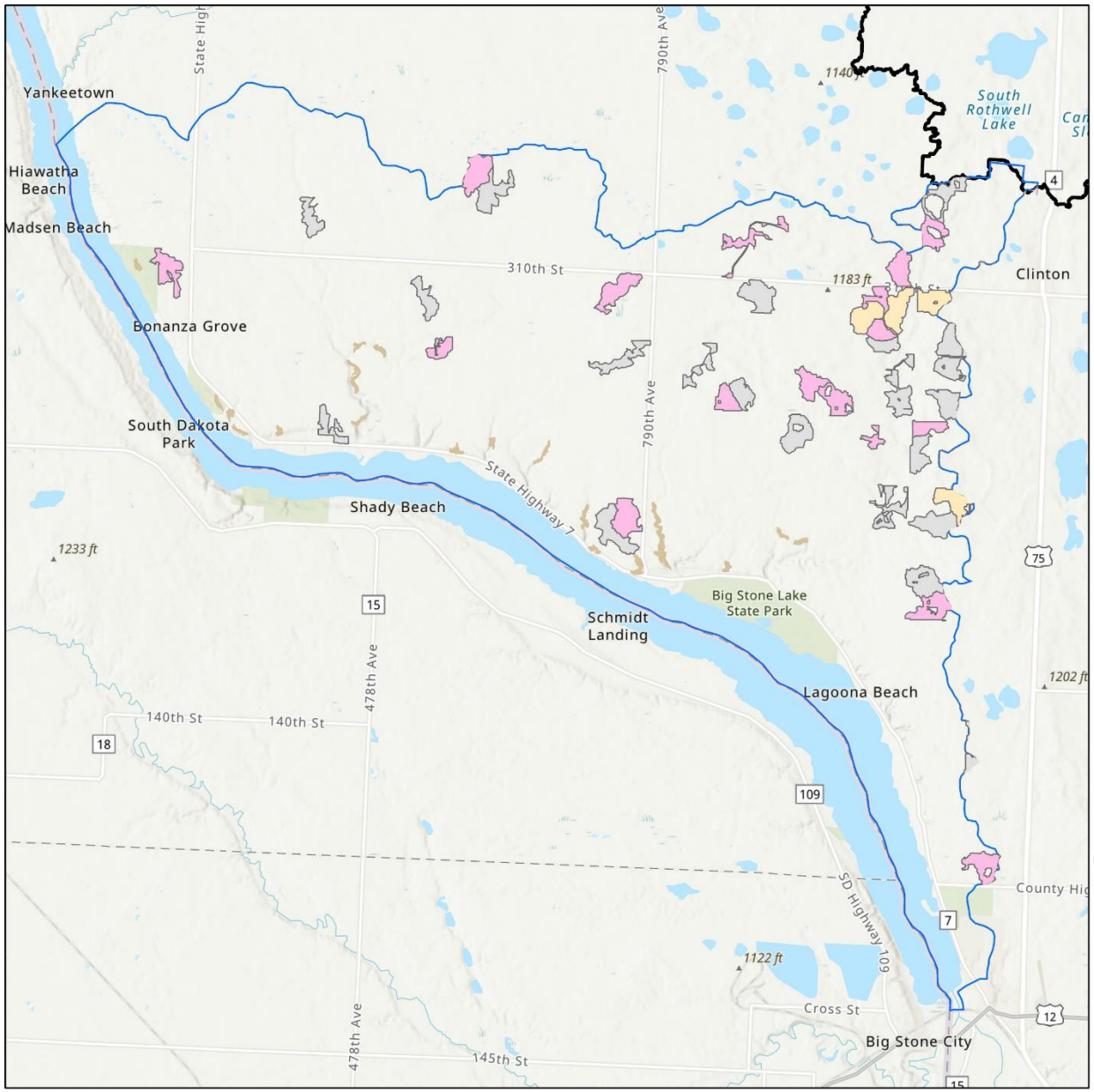
Practice Type (NRCS code)

- Perennial Crops (327)
- Cover Crops (340)
- Reduced Tillage (345)
- Grade Stabilization (410)
- Grassed Waterway (412)
- Prescribed Grazing (528)
- Multi-stage Ditch (582)
- Nutrient Management (590)
- WASCOB (638)
- Wetland Restoration (656)

N
W E
S

0 1.25 2.5 5
Miles

Upper Minnesota River Comprehensive Watershed Management Plan



Upper Minnesota River Watershed Planning Region: Lower Big Stone Lake

Legend

- Upper Minnesota River Watershed
- Planning Region Boundary

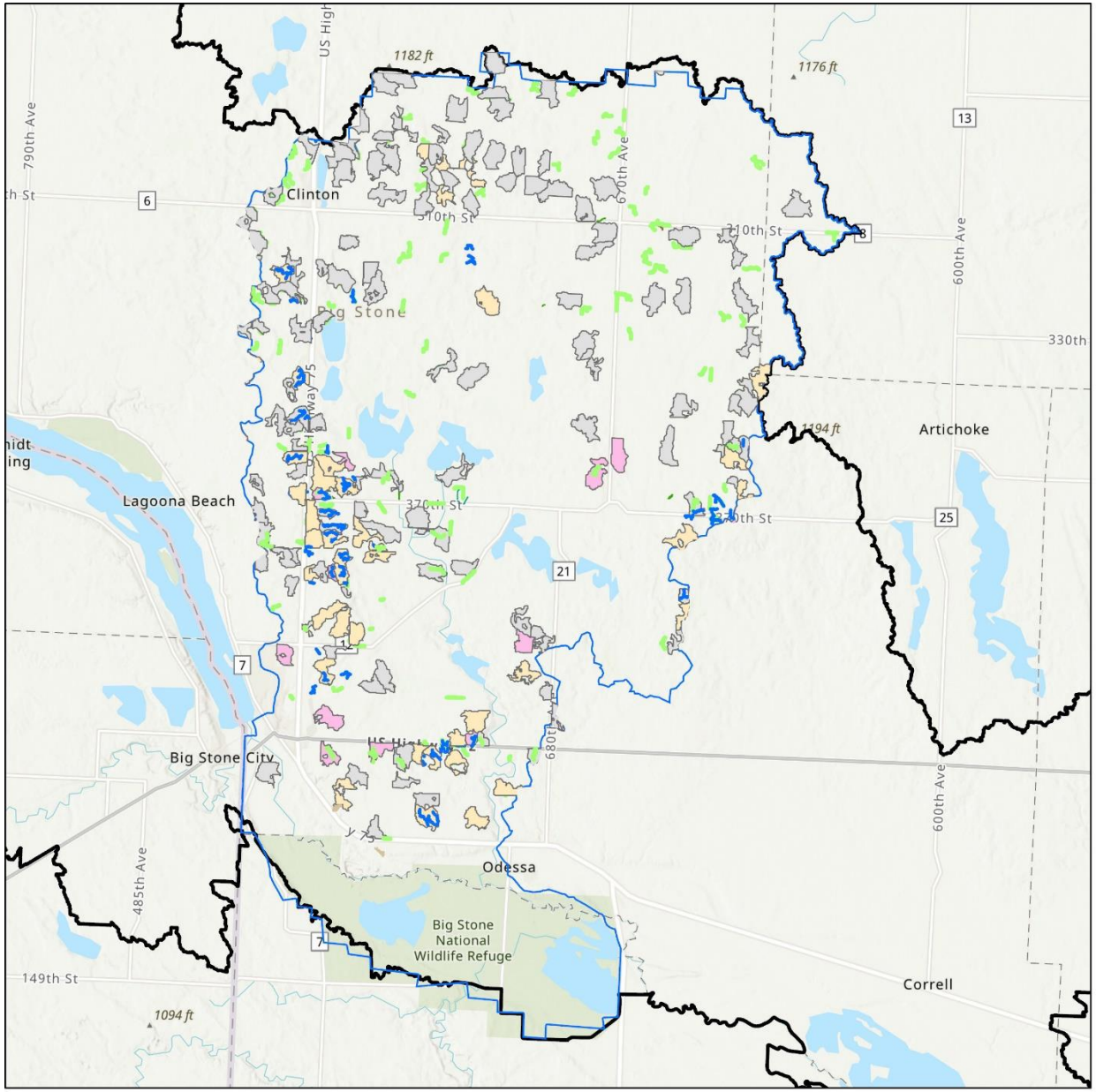
Practice Type (NRCS code)

- Perennial Crops (327)
- Cover Crops (340)
- Reduced Tillage (345)
- Grassed Waterway (412)
- Prescribed Grazing (528)
- Nutrient Management (590)

N W E S

0 1 2 4 Miles

Upper Minnesota River Comprehensive Watershed Management Plan



Upper Minnesota River
Watershed Planning Region:
Stony Creek

Legend

- Upper Minnesota River Watershed
- Planning Region Boundary

Practice Type (NRCS code)

- Perennial Crops (327)
- Cover Crops (340)
- Reduced Tillage (345)
- Grade Stabilization (410)
- Grassed Waterway (412)
- Prescribed Grazing (528)
- Multi-stage Ditch (582)
- Nutrient Management (590)
- WASCOB (638)
- Wetland Restoration (656)

N
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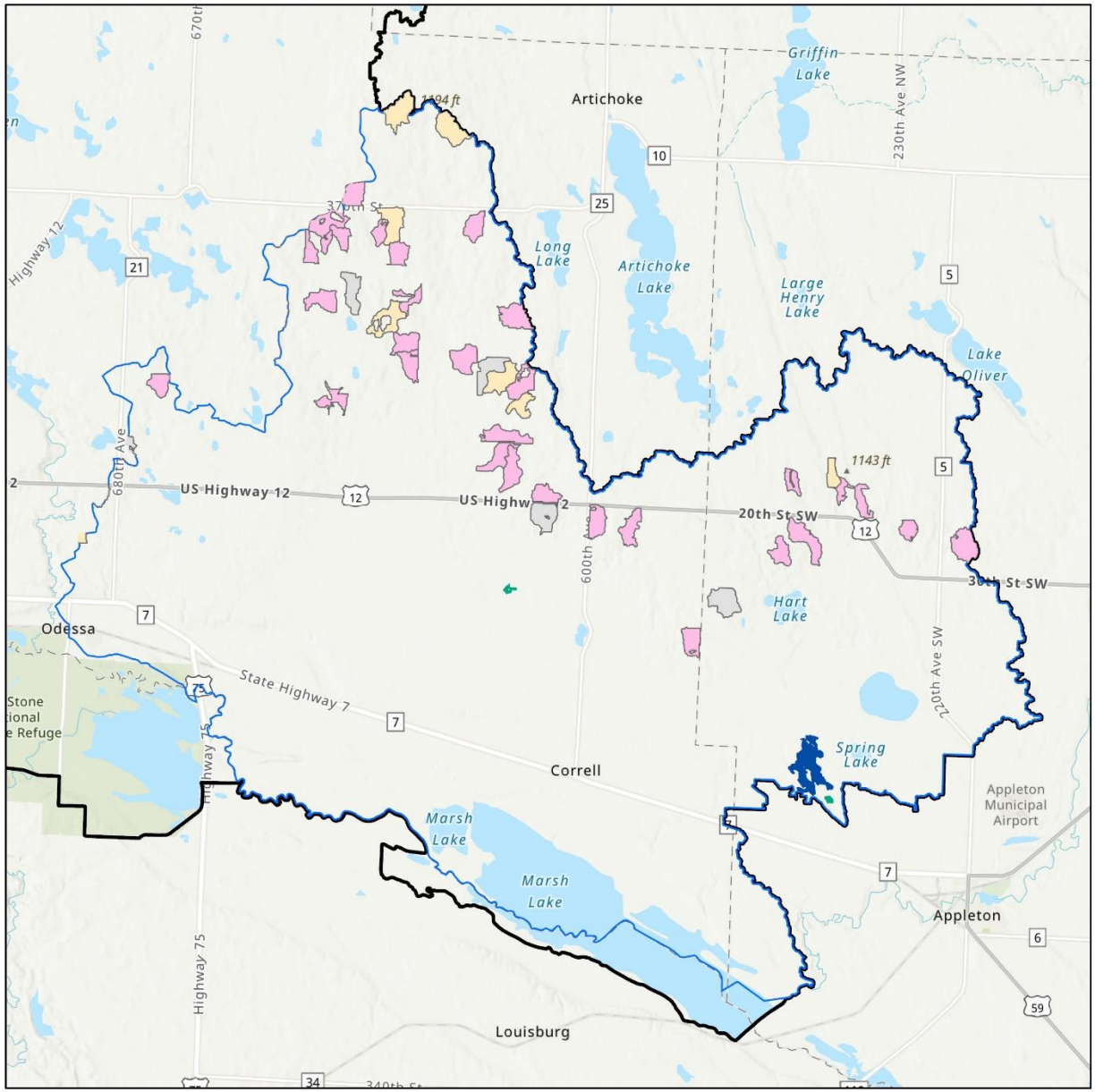
0 1.25 2.5 5
Miles

Upper Minnesota River
Comprehensive Watershed Management Plan



Upper Minnesota River Watershed Planning Region: Five-Mile Creek

Legend

- Upper Minnesota River Watershed
- Planning Region Boundary

Practice Type (NRCS code)

- Perennial Crops (327)
- Cover Crops (340)
- Reduced Tillage (345)
- Nutrient Management (590)
- Regional Wetland (656)
- Wetland Restoration (656)

N
W
E
S

0 1 2 4 Miles

Upper Minnesota River Comprehensive Watershed Management Plan

BMPs necessary to meet water storage goals within the Upper Big Stone Lake and Stony Creek Planning Regions are not presented in the preceding tables and maps. To meet water storage goals utilizing PTMApp targeted BMPs, an additional 2.8 million dollars would need to be invested toward installing 278 WASCOBs in the Upper Big Stone Lake Planning Region and an additional 3.1 million dollars would need to be invested toward installing 305 WASCOBs in the Stony Creek Planning Region. The necessary expenditure and number of required water storage BMPs suggests that large-scale, non-PTMApp based analysis may produce more feasible and cost-effective locations for water storage.

Appendix E

Local Rules, Ordinances, and Statutes

Many of the issues affecting priority issues can be addressed in part through administration of statutory responsibilities and ordinances. This document is intended to be used to summarize the existing local rules, ordinances and statutes that are currently being administered by planning entity, to understand areas of duplication, gaps, and opportunities. Lac qui Parle County occupies a portion of the planning region. However, it was not included in this table as 100% of those lands are within a U.S. Fish and Wildlife Service Refuge.

Table 1. Example Table Template

	Statute, Ordinance, or Rule Name	Swift SWCD	Swift Cnty	Big St. SWCD	Big St. Cnty	Traverse SWCD	Traverse Cnty	Up Mn. WD
Statutory Responsibilities	Shoreland Management *(MN Rules 6120.3300)*	n/a	Has rules	n/a	Has rules	n/a	Has rules	n/a
	Floodplain Management *(MN Statutes 103F, 104, 394)*	n/a	Has rules	n/a	Has rules	n/a	Has rules	n/a
	Individual Subsurface Sewage Treatment Systems (ISTS) *(MN Rules 7080)*	n/a	Has rules	n/a	Has rules	Has rules	Has rules	n/a
	Solid Waste Management *(MN Statutes 115A, 400)*	n/a	Has rules	n/a	Has rules	n/a	Has rules	n/a
	Hazard Management *(MN Statute Chapter 12)*	n/a	Has rules	n/a	Has rules	n/a	Has rules	n/a
	Feedlots *(MN Rules 7020)*	n/a	Has rules	n/a	Has rules	Has rules	Has rules	n/a
	Buffers (*MN Statute 103F.48)*	X (Lead)	Has rules	Has rules	Has rules	Has rules	Has rules	n/a
	Public Drainage Systems *(MN Statute 103E)*	n/a	Has rules		Has rules	n/a	County has delegated most of the authority to Bois de Sioux Watershed District, Jamie Beyer District Administrator. http://www.bdswd.com/	X Working with BSCounty
	Wellhead Protection *(MN Rules 4720.5100-4720.5590)*	n/a	Has rules		n/a	n/a	n/a	n/a
	Wetland Conservation Act *(MN Rule 8420)*	X	Has rules (Lead)		Has rules	Has rules	County Board retains some decision-making authority/responsibility. Some decisions are delegated to staff.	n/a

Statute, Ordinance, or Rule Name	Swift SWCD	Swift Cnty	Big St. SWCD	Big St. Cnty	Traverse SWCD	Traverse Cnty	Up Mn. WD
Aggregate Management	n/a	X	n/a	Has rules	n/a	Has rules	n/a
Construction Erosion Control	n/a	X	n/a	Has rules	n/a	Has rules	n/a
Land Use	n/a	X	n/a	Has rules	n/a	Has rules	n/a
Stormwater Runoff	n/a	X	n/a	Has rules	n/a	Has rules	n/a
Aquatic Invasive Species	n/a	X	n/a	Has rules	n/a	Has rules	n/a

Appendix F

UPPER MINNESOTA RIVER WATERSHED DISTRICT
RULES AND REGULATIONS

The rules and regulations of the District are to effectuate the purposes of Minnesota Statues, Chapter 103D and the authority of the managers therein prescribed. These rules and regulations are deemed necessary to implement the law administered by them.

These rules and regulations were adopted pursuant to Minnesota Statutes, Chapter 103D on November 14, 1972. The Board of Managers recognize that water resource issues have changed over time and will continue to change. Therefore, to address both current and possible future water resource issues the District will review and revise the rules and regulations on an as needed basis.

1. General Policy:

The Managers accept the responsibilities with which they are charged as a governing body. While there is no intention to usurp the authority or responsibilities of other agencies or governing bodies, neither will they shirk their responsibilities. They will cooperate to the fullest extent feasible with personal groups, state and federal agencies and other governing bodies.

It is the intention of the managers that no person shall be deprived or divested of any previously established beneficial use or right to natural resources by any rule or regulation of the District without due process of the law, and that all rules and regulations of the District shall be construed to said intention; and by the use of these rules and regulations to assist in the orderly use and conservation of the waters of the District.

If any part of these rules and regulations is for any reason held to be invalid, such decision shall not affect the validity of the remaining portion of these rules and regulations.

If any rule or regulation is inconsistent with the provisions of Minnesota Statutes, Chapter 103D or other applicable state laws, the provisions of such laws shall govern.

2. Definitions:

For the purposes of these regulations, the following terms shall have the meanings attached to them:

District: All of the land area within the established boundary of the Upper Minnesota River Watershed District.

Managers: The Board of Managers of the District.

Person: An individual, firm, partnership, association, or corporation that does not include public or political subdivisions.

Public Corporations: A country, town, school district, or a political division or subdivision of the state.

Public Health: Includes any act or thing tending to improve the general sanitary conditions of the District.

General Welfare: Includes any act or thing tending to improve or benefit or contribute to the safety or well-being of the general public or benefit the inhabitants of the District.

Drainageway: An artificial or natural channel which provides a course for water flowing continuously or intermittently.

Legal Drainageway: All artificially constructed Judicial or County ditch Systems.

Private Drainageway: An individual or mutual drainage system.

Plan: A map or drawing and supporting data for proposed works.

Work or Works: Any construction, maintenance, repairs, or improvement.

Floodplain: All of the land area along channels and drainageways including the area around lakes, marshes, and lowlands which would become inundated as a result of a flood occurring on the average of once every 100 years.

Normal High Water Level: A mark delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape. Commonly it is that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial.

Water Impoundment Structure: A structure constructed to retain or contain runoff water such as dams, reservoirs, dikes, but does not include pits or dugouts in which the water level is maintained by seepage.

3. Works Paid by Assessment:

All works of the District which are to be paid by assessment upon benefited properties shall be instituted only upon a petition filed with the Managers, as prescribed in Minnesota Statutes, Chapter 103D.625, subd. 2. A copy of the law is on file in the District office.

4. Permits:

The Board of Managers requires that permits be secured from the District prior to the start of all planned works of improvements. The request for permits is not intended to be a denial or a delay of any project. The permits are necessary for the Managers to be informed of planned projects and to insure the orderly development of the natural resources in accordance with the Overall Plan.

A. All permits when issued shall be signed by the Administrator, chairman and/or secretary of the District or their designates.

B. No works requiring a permit shall be commenced prior to the issuance of the permit.

C. Unless specified in the permit, works for which a permit is issued must be completed within 3 years. The Managers further request that they be notified when the works of improvement are completed.

D. Completed Applications for a permit will be acted on by the District within 60 days from the date that the request is made to the Board of Managers.

E. If a permit application is refused or granted subject to conditions, the applicant may, within 30 days, demand a hearing on the application at the next Board of Manager's Meeting.

F. The issuance of a permit by the District does not relieve the applicant from the responsibility of obtaining permits from other agencies.

G. Applications for a permit may be filed with the District at: Upper Minnesota River Watershed District, 211 2nd Street SE, Ortonville, MN 56278.

H. An aerial photo of the project, including labels and descriptions of all project features must accompany the application, and the District may request additional information.

I. There will be no charge for permits except where additional resources are requested by the applicant. The managers may charge, in addition, a field inspection fee of at least $35. The inspection fee must be used to cover actual costs related to a field inspection. Inspection costs include investigation of the area affected by the proposed activity, analysis of the proposed activity, services of a consultant, and any required subsequent monitoring of the proposed activity. Costs of monitoring an activity authorized by permit may be charged and collected as necessary after issuance of the permit. Inspection fees will be set by the District annually.

J. The District maintains the right to request additional conditions before approving a permit.

K. The District maintains the right to require any additional information, as determined necessary, from the applicant in order to take action on a permit.

5. Drainage:

Every person shall use his land reasonably in disposing of surface water and he may turn into a natural drainageway all of the surface water that would naturally drain there, but he may not burden a lower landowner with more water than is reasonable under the circumstances.

Surface water shall not be artificially removed from upper land to and across lower land without adequate provisions being made on the lower land for its passage, nor shall the natural flow of surface water be obstructed so as to cause an overflow onto the property of others. The following rules and regulations shall govern drainage projects in the District:

A. The District will enforce and comply with the drainage laws under the Minnesota Drainage code.

B. The District will assume the legal responsibility for all new and improved drainage systems within its boundary. When so authorized, it will accept the legal responsibility of all existing legal drainage systems within the District.

C. No person or public corporation shall cut an artificial drainageway across a subwatershed and thereby deliver water into another subwatershed without a permit and thourough review of the area.

D. No person or public corporation shall divert water to or cast water by any artificial means into any legal drainage system from any land not assessed to said drainage system without complying with the proper statutory procedure therefore, and securing a permit from the District.

E. A permit shall be secured from the District prior to any works or alterations undertaken on any private drainage system. A permit is also required before any repair or alteration is started on any legal drainage system under the jurisdiction of the District.

F. All new and improved outlets into existing legal or natural drainageways shall be constructed in such design which will not cause a deterioration of the channel or impede the flow of water.

G. All new and improved legal drainageways shall be assessed annually for a specific amount of Maintenance where necessary.

H. The permit applicant must aquire permission from downstream landowner(s) who may be impacted by the project. The downstream landowner(s) must sign a permit application consent form or attend a District meeting to express their concerns.

6. Soil Erosion and Sedimentation:

Soil and water conservation practices on the land are recognized as an important part of good water management program. Stopping rain where it falls allows more infiltration of moisture into the soil to be used by the growing crops. Reducing runoff and soil erosion will prolong the life of all works of improvement below.

It shall be the policy of the Managers to cooperate with the Soil and Water Conservation District and other agencies and to encourage the adaptation of proper land use practices.

To control and alleviate soil erosion and siltation of the drainageways, reservoirs, and lakes in the District the following will apply:

A. Each landowner and operator is expected to apply the proper land use practices to minimize runoff and soil erosion from sloping land.

B. Sloping land abutting drainageways, lakes, ponds, or reservoirs shall be used in such manner so as to provide reasonable control of sediment.

C. All new or improved drainageways shall be constructed with side slopes, as determined by proper engineering practices, so as to reasonably minimize soil erosion, giving due consideration to the intended capacity of the drainageway, its depth, width, and elevation, and the character of the soils through which the drain passes.

D. The District maintains the right to require additional conditions before approving a permit.

7. Water Quality:

The Managers will cooperate with public corporations and state and federal agencies in the application of ordinances and rules concerning water quality within the District.

The Managers will cooperate with the various agencies in South Dakota to attain uniform regulations which will improve the quality of the joint boundary waters to enhance their recreational and aesthetic values.

A. In the interest of public health and to prevent pollution of waters within the District, the applicable county ordinances and the rules of the State Board of Health and the Minnesota Pollution control Agency regarding the disposal of wastes, are by reference hereby adopted as rules and regulations of the District within the limits of the statutory authority granted to the Managers.

B. A permit must be secured from the District prior to the construction of all new or relocated livestock feedlots.

C. A permit must be secured from the District prior to any activity in the lakes which would cut and remove aquatic weeds or the use of chemicals to control algae or weeds.

D. A permit must be secured from the District to dump or spray industrial or municipal liquid wastes on or in any land, lake, reservoir, slough, marsh, river ditch, or natural waterway. Liquid wastes discharged into public waters must meet the minimum standards established by state and federal agencies.

E. Dumping of solid wastes into lakes, reservoirs, sloughs, marshes, rivers, ditches, or natural waterways is prohibited.

F. Wastes from chemical toilets in boats or cabins, or used by campers must be disposed of in approved disposal areas.

8. Flooding and Water Impoundment Structures:

Flooding is an annual occurrence in some parts of the watershed. While soil and water conservation practices on the land will help to reduce runoff, some structural measures might be necessary to alleviate the problems.

Multi-purpose reservoirs, farm ponds and other water detention structures are encouraged by the Mangers. Some diking might be necessary to protect low lands from water overflow.

To provide for orderly development of flood control and water conservation measures the following rules shall govern:

A. A permit shall be secured from the District prior to the construction, alteration, or removal of any reservoir or water impoundment structure.

B. A permit shall be secured form the District before a dike is constructed, altered, or removed on or near any drainageway, or any lake or marsh.

C. Normal maintenance which does not decrease the effectiveness of a structure, or harvesting of grass from a water impoundment structure or dike may be done without a permit.

D. A permit is required for construction of pits or dugouts.

9. Accelerated Soil Erosion Caused by Construction:

A. A permit shall be obtained from the District prior to the start of any road or building construction or land development activities including ditching, grading, stripping, cutting or filling which would:
   1. Remove top soil and/or vegetation from an area one acre or more.
   2. Increase, concentrate, or dispose of runoff on a temporary or permanent basis which might cause or increase soil erosion.

B. A request for such a permit shall include plans for the construction which shall include a description of the erosion control measures to be followed during and after construction. A work schedule and time table for erosion control measures and construction shall be included in the plan.

C. Individuals or developers carrying out the erosion control measures for a permit, and all subsequent owners of the property involved, shall effectively maintain all erosion control features.

10. Bridges, Culverts, and Drains:
No bridge, culvert, or drain shall be constructed, reconstructed, laid, to or across any natural, legal, or private drainageway without a permit from the District. They shall be suitably located, have adequate waterway openings and shall have adequate shoulder and bank protection.

11. Water Use Permit:
A permit shall be obtained from the District to appropriate surface or underground water for irrigation, municipal, or industrial use. No permits are required for individual dwellings or farm water supplies.

12. Shoreland Protection and Floodplain Zoning:
Each of the counties involved in the District have established or will establish Shoreland Protection and Floodplain Zoning regulations in accordance with Minnesota State criteria. Procedures for administration of these regulations have been developed by each county. The District will adopt and comply with these regulations and the counties will retain the administration of the regulations.

13. Wildlife:
The Managers will encourage private land owners to retain non-agricultural land for wildlife purposes. They will cooperate with state and federal agencies and private persons and organizations in their habitat development and land purchase programs.

A. No marsh shall be drained without a permit from the District.

B. Notification to the District is requested prior to any land acquisition for wildlife habitat by state and federal agencies and by private persons and organizations.

14. Penalty:
In the event of a violation or a threatened violation of these rules and regulations, the Managers may institute appropriate actions or proceedings to prevent, restrain, correct, or abate such violations or threatened violations as provided for by Minnesota Statutes 103D.545, Subd. 2.

15. Appeal:
Any party aggrieved by the adoption or enforcement of these rules and regulations or by any order of the Managers thereof may appeal in accordance with the appellate procedure and review as provided in Minnesota Statutes, Chapter 103D.537.

16. Changes in Rules and Regulations:
All changes in these rules and regulations shall be made with the approval of the Advisory Committee. Any person or public corporation may petition the Managers for such changes. The Managers may initiate changes in these rules and regulations.

17. Effective Date:
These rules and regulations were adopted pursuant to Minnesota Statutes, Chapter 103D, on the 9th day of February, 2021.

DNR General Permiting:

General Permit #97-4241 authorizes the UMRWD to issue permits for various types of activities in protected waters.

Permitable activities include the installation of natural riprap rock; replacement of bidges and culverts (in kind); channel cleanouts in altered natural watercourses; installation of outlets for landlocked basins (above the OHW); and bioengineering erosion control. All work must be done in accordance with all the general and special provisions that follow and those that are applicable based on project type.

GENERAL PROVISION

1. The permittee is not released from any rules, regulations, requirements or standards of any applicable federal, state or local agencies; including, but not limited to, the U.S. Army Corps of Engineers, Board of Water and Soil Resources, MN Pollution Control Agency, watershed districts, water management organizations, county, city and township zoning. This permit does not release the permittee of any permit requirement of the St. Paul District, U.S. Army Corps of Engineers, Army Corps of Engineers Center, 190 Fifth Street East, St. Paul, MN 55101-1638.

2. This permit is not assignable by the permittee except with the written consent of the Commissioner of Natural Resources.

3. The permittee shall notify the UMRWD at least five days in advance of the commencement of the work authorized hereunder and notify him/her of its completion within five days.

4. The permittee shall make no changes, without written permission previously obtained from the UMRWD in the dimensions, capacity, or location of any items of work authorized hereunder.

5. The permittee shall grant access to the site at all reasonable times during and after construction to authorized representatives of the UMRWD for inspection of the work authorized hereunder.

6. This permit amy be terminated by the UMRWD at any time deemed necessary for the conservation of water resources of the state, or in the interest of public health and welfare, or for violation of any of the provisions or applicable law of this permit, unless otherwise provided in the Special Provisions.

7. Construction work authorized under this permit shall be completed on or before the date specified above. The permittee may request an extension of time to complete the project, stating the reason thereof, upon written request to the UMRWD.

SPECIAL PROVISIONS

RIPRAP PROTECTION PROJECTS

1. The riprap materials shall consist of a gradation of natural rock of sufficient size, quality, and thickness to withstand ice and wave action. The riprap shall be ungrouted.

2. The minimum finished slope shall be no steeper than 2:1 (horizontal to vertical).

3. A filter consisting of geotextile fabric and/or well-graded gravel or crushed stone is installed to prevent undercutting of the riprap

4. The encroachment into the water is the minimum amount necessary to provide protection and does not unduly interfere with the flow of water. The maximum encroachment waterward of the ordinary high water elevation is 10 feet.

5. The riprap shall conform with the natural alignment of the shoreline (i.e. maintaining an undulating or meandering shoreline). At each end of the stabilized shoreline, the finished slope of the riprap shall be varied in a fashion to produce a smooth transition with the natural shoreline.

6. The sub-permittee shall routinely inspect the authorized project and any needed maintenance work. Prior to commencing any maintenance work, the sub-permittee shall advise the Upper Minnesota Watershed District of the extent and method of maintenance. Maintenance shall not be commenced until sub-permittee receives written approval from the Upper Minnesota Watershed District.

EXCAVATION FOR BIOENGINEERING (I.E. SHORELINE/BANK STABILIZATION WITH PLANT MATERIALS

1. The project must be approved by the DNR Area Fisheries Manager (320) 839-2656). If aquatic plants (seed or root stock) are proposed to be transplanted from another basin or supplied by a vendor, an Aquatic Plant Management permit must be obtained from DNR-Section of Fisheries.

2. The project shall not involve cribs, tree anchoring or other bioengineering methods that encroach on the shoreline, streambank profile or floodway (Note: permitted methods include: willow wattling, brush layering, willow-posts, etc).

EXCAVATION IN ALTERED NATURAL WATERCOURSES

1. Permits shall only be issued for removal of accumulated silt and sediment on altered natural watercourses where channel maintenance has been conducted within the last 25 years and there is no forested buffer strip. Finished sideslopes are to be 3:1 or less steep.

2. Adequate methods shall be employed where necessary to prevent and/or correct erosion of channel banks resulting from entry of surface waters from adjacent lands and/or tributaries. Such methods may include drop structures, inlet pipes, riprap, and establishment and maintenance of vegetation.

3. The authorized work shall be done only under low flow conditions to minimize erosion and siltation caused by excavation.

4. Spoil material is to be placed landward of the grassed buffer strip, in an upland area. (Channel improvment-deepening or enlargement is not allowed).

5. The Sub-Permittee shall level all spoil piles to a depth of less than one foot and seed to grasses and/or legumes all side slopes, plus a strip of land 16.5 feet wide (minimum) along both sides of the new channel. This work shall be completed as soon as spoil material moisture conditions allow and within 180 days of completion of the excavation. The grassed strips shall not be mowed until after July 31 of each year.

6. Excavation which shall partially or wholly drain protected waters or wetlands is NOT authorized under this permit. All channel excavation authorized under this general permit is prohibited within 500 feet of any DNR Protected Waters or Wetlands. Contact the UMRWD if work is proposed within 500 feet of a protected lake or wetland.

INKIND REPLACEMENT OF BRIDGE & CULVERTS

1. A DNR Protected Waters Permit is required if the structure serves a water level control for a "Protected Waters Basin."

2. The Sub-Permittee is responsible for maintaining existing navigation and access to navigation.

3. Barn and cliff swallows often nest under bridges. Both of these species are protected by federal and state law. The permittee is responsible to determine if swallows nest under this bridge. If so, it will be necessary to obtain a U.S. Fish and Wildlife Service permit to destroy swallow nests or eggs. The permittee should be aware of the policy to not grant such permits if the eggs have hatched and young are still in the nest. For questions regarding the federal permit, contact the U.S. Fish and Wildlife Service at 612-725-3530.

4. The culvert nearest the deepest potion of the stream channel shall be depressed six inches to concentrate low stream flows within this culvert and allow for free passage for fish migration.

5. All material in, or resulting from the demolition of the existing structure shall be completely removed from the floodplain of the river and disposed of in accord with all local, state, or federal regulation.

6. Unless otherwise authorized, MDOT Class III natural rock riprap shall be used to armor both the upstream and downstream ends of the culvert(s). The channel banks and roadway embankment shall be shaped to a 3:1 (horizontal:vertical) finished slope. Riprap shall be placed along the channel and roadway embankment to an elevation one foot above the top of the culvert. Riprap shall be a minimum of 1.5 feet thick and extend at least 25 feet from the ends of the culvert(s).

7. No access roads or temporary channel diversions to aid in construction of any project are allowed below the OHW of public waters unless specifically authorized in writing by the Division of Waters.

8. No change in the existing flowline/gradient shall occur unless specifically authorized in writing by DNR Waters.

9. For the replacement of existing structure, stage increase for the regional (100 year) flood may be allowed up to that created by the existing structure provided there are no structures in the reach affected by the stage increase. For new structures, the maximum increase in the regional flood is 0.5 foot or the more restrictive provisions of a local government floodplain ordinance. Stage increases in excess of these

thresholds must be approved in writing by the Department.

10. This permit is not valid until completion of environmental review if the bridge/culvert construction is part of a road project that includes other features that require a mandatory Environmental Assessment Worksheet. The Environmental Assessment Worksheet results may change the location or conditions of this permit.

OUTLETS FOR LANDLOCKED BASINS

1. Proposed control elevation must be above Ordinary High Water Level.

2. Outlet rights and/or flowage eastments for the proposed discharge have all been obtained.

3. The project is implemented in a manner that will not cause significant erosion and/or flooding to downstream areas (i.e. limiting flow rate, restricting outflow to non-flooding periods & employing adequate energy dissipation structures at the point of discharge).

Appendix G

Upper MN

Comment and Response Table: 11/2023

KEY

Material Comments represent changes in material and content of the plan.
Editorial Comments represent spelling, grammatical, clarification, or visual issues with graphics.
Note Generally consist of an statement expressing an perspective.

Comment #	Commenter	Section	Page #	Comment	Material	Editorial	Note	Change needed	Change Made	Response
1	DNR	E	48, 52, 56, 59	As specified in the tables on pages 4, 26, and 35 of the draft plan, soil health and agricultural surface flow and drainage are watershed-wide high priority issues. But they are still labeled as medium priority issues in the planning-region specific issues tables. Additionally, agricultural surface flow and drainage is listed in the issue table for the Upper Big Stone Lake planning region, but it's shortened to agricultural surface flow in the issues tables for the other planning region. Please correct these oversights.		X		Y	Y	Soil health and ag surface flow and drainage changed to high priority. 'and drainge' added to issue description
8	DNR	Implementation	64	In a planning area where 99% of water quality pollutants are derived from non-point sources, numerous issues and goals in the draft plan correctly state that most impairments are driven by excess runoff. Maintaining the status quo regarding agricultural drainage without due consideration for vital water quantity and quality mitigation will not help improve aquatic life and/or recreation impairments for nearly all fully assessed waters in the planning area. Additionally, an item in the watershed-wide capital improvement table seeking to "repair, maintain, and improve legal drainage systems" would exacerbate existing impairments. We ask that this item be removed from the draft plan and that the county drainage authority and watershed district, as regulators, work to ensure that agricultural drainage projects mitigate increased flows and water quality pollutants by requiring offsetting water storage practices when drainage projects are approved.	X			Y	Y	Add language to expand CP-2. Connect language to broader benefits on legal drainage systems.
10	BWSR	TOC		List Appendices in the Table of Contents and title the actual title pages of each appendix. ("Appendix A – MOA/Planning Agreement", Appendix B – "Initial Comments", Appendix C – "XXXXXXXX", etc.)		X		Y	Y	Appendices added to the TOC
11	BWSR	Executive Summary	3	Figure A-2 (page 3) – Outlines the priority issue categories and lists 9 separate issues to be addressed in the plan; three high priority issues and six medium-high priority issues. The "medium-high" Issues table (Table A-2; pgs. 5-6) has five issues listed – there appears to be some sort of consolidation? Or are we missing an issue? Make note of consolidation of issues in the narrative.		X		Y	Y	Figure A2 edited to say 5 medium high priority issues and 5 low priority issues, edited in issues section as well.
12	BWSR	Executive Summary	6	Would be easier to compare issues and measurable goals if the measurable goal column in Table "A3" (pgs. 6-7) were ordered the same as the issue column of Tables A1 and A2; also, there appears to be another consolidation – now down to 7 measurable goals. Make note of the consolidation of issues in the narrative.		X		Y	Y	Swapped the 2nd and 3rd row so that the goal order is the same as the order in the issue tables. There are 7 goals because water storage includes both agricultural surface flow and drainage and loss of water storage. Text on their combination is included in Section 4, and Table A3 shows their consolidation thorugh parentheses.
13	BWSR	Executive Summary	4	Relate the "Resource Category" column icon and description of Tables A1 and A2 and reference the narrative on page 22 for details of each category.	X			Y	Y	Added text to page 3 that says 'Resource categories include groundwater, habitat, land stewardship, and surface water. Refer to Section C for details of each category.'
14	BWSR	Goals	37	Multiple places (Table A3 and Goals Section of plan, pgs. 37-43) where there was inconsistent labeling of watershed wide or planning region goals – either clarify if the goal is watershed wide or regional and list the specific name of sub-shed for all goals or don't name them - no need to list both priority area goals as well as watershed wide goals. Some of the short-term goals specifically call out the planning region by name and others just say "both planning areas" – list them out.	X			Y	Y	Additional column added to table A3 which says the goal is either watershed-wide or lists the planning regions for the goal. Name of planning regions specified in text for goals.
15	BWSR	LWRN	10	Page 10 – Figure B1 – May be worth noting the portion of the watershed area in Minnesota as a percentage of the whole and that the North Dakota and South Dakota portion, by and large, contribute independently to the Minnesota River than the portion this plan covers.	X			Y	Y	784 sq miles of total watershed area' in paragraph 2 changed to percent of the total watershed area. Sentence added: 'The North and South Dakota portion of the watershed contributes water to the Minnesota River independently of the Minnesota portion of the watershed.'
16	BWSR	Issues	23	Page 23 – Committee Ranking Section – Reference Appendix "C" somewhere.		X		Y	Y	Added: 'See Appendix C for the full ranking table.'
17	BWSR	Goals	6	Pages 35, 36 – Table D1 – Suggest: Goal Scale Column – Color scheme added to Table A3 as it is in D1	X			Y	Y	Goal scale column added to table A3 and colored to match D1. 11/6 edit- cannot match green / yellow color scheme because the watershed wide and planning region specific issues are combined. Color sheme in Table A3 matches the rest of the table but not Table D1.
18	BWSR	Goals	37-43	Pages 37-43 – Individual Goals – Specify planning region names where specific priority areas exist and split out goal values for each planning region where applicable.		X		Y	Y	Planning regions named in each relevant goal. Goal value already the number per planning region, not the total.

19	BWSR	Goals	42	Pages 42 and 43 – "Groundwater Quantity Protection" Goal and "Groundwater Quality/Protection of Private Wells and Public Water Supplies" – Noting 1500 acres used for the GW quantity; (short term goal). Should this be the two priority areas listed or the Upper Big Stone Lake area only (the only planning area that references work to be done in the implementation section)? 1500 acres covering quality and quantity or 1500 acres for each?		X		Y	Y	1500 acres of practices is the goal for Big Stone Lake- that applies to both quality and quantity goals. Groundwater goals should say 1 priority planning region, this is amended.
20	BWSR	Goals	42	Pages 42 and 43 - List practices used to accomplish groundwater goals specific to quantity and specific to quality	X			Y	Y	Add list of practices in each description. A clarification will be added to make sure that it is clear that they are two separate goals.
21	BWSR	Goals	34	General Goal Comment – some sort of reference to phosphorus and nitrogen (nutrient) goals shall be incorporated in current goals sections given the Big Stone Lake reduction values in the TMDL/WRAPS – Perhaps a conversion factor from the acres treated as was done with the sediment (tons and pounds reductions)	X			Y	Y	A short-term nutrient goal will be added for the erosion and sediment goals. This goal will be consistent with the sediment goal and alligned with information from the WRAPS/TMDL.
22	BWSR	Implementation	50	Page 50, 54 – Table E4, E7 – "Erosion and Sediment" row – "Indicator" column – expand on how goals translate into tracking implementation. "PTMapp used to estimate lbs. and tons based on acres treated to track pace of progress toward goal.	X			Y	Y	Rephrased as suggested
24	BWSR	Implementation	51,55,56	Page 51, 55, 62 – Table E5, E8, E14 – "Progress Toward Goal" column – reference table E4, E7, E13 and relate indicators to acres in E4, E7, E13		X		Y	Y	Added 'See indicator column in Table X' to the progress towards goal heading, and 'see progress towards goal column in Table X' to goal table indicator heading
25	BWSR	Programs	75	Page 75 – Table F3 – Swift County – Fill in the blanks for the CLMP		X		Y	Y	Will update if found otherwise not available- 11/6 edit: was not found online, this was put into the plan
26	BWSR	Admin	83	Page 83-84 – Water Management District – Eliminate the 8-step process to create an WMD and reference the external BWSR document. The process is separate from planning but certain actions of the plan are a part of the method to accomplish some of the procedure to create a Watershed Management District.	X			Y	Y	Edited to align with comment
27	BWSR	Admin		Be more clear that this plan is establishing a WMD.	X			Y	Y	Added the following: 'The watershed district will establish a WMD to help with plan implementation.'
28	BWSR	Admin		The plan language is inconsistent on amendments. Page 84 indicates the UMRWD may create different WMDs under future plan amendments. Page 87 indicates plan amendments may be proposed by any agency, person, local government, the plan amendment process shall be initiated by the Policy Committee. Please clarify the amendment process and be consistent in both locations	X			Y	Y	Amendment language clarified. After performing revisions to this section, BWSR staff will be consulted for consistency with plan content and guidance documents
31	MPCA	LWRN?	15	The MPCA appreciates the inclusion of environmental justice areas of concern. The map produced by the MPCA of environmental justice areas of concern has recently been updated and now includes more areas of the planning region for people in poverty. The MPCA recommends updating the language to include the additional areas as well as including a definition of the poverty level for these purposes. Information about these areas is found at https://mpca.maps.arcgis.com/apps/MapSeries/index.html?appid=f5bf57c8dac24404b7f8ef1717f57d00	X			Y	Y	EJ areas updated and a definition of the MPCA poverty level is included.
32	MDA	LWRN	18	second paragrph: The Milan Wellhead Protection Area, or Drinking Water Supply Management Area (DWSMA), is in the Chippewa River Watershed. Please remove Milan from the third sentence.		X		Y	Y	Milan deleted.
33	MDA	Issues	32	This section mentions agricultural irrigation in the watershed, noting 82 active agricultural irrigation permits in the watershed. If available, it could be useful to note if the amount of agricultural irrigation permits has been increasing, or staying the same, over time. Based on the results of research by the University of Minnesota, the irrigated acres could provide new outreach or education opportunities to implement other goals associated with this comprehensive watershed plan. (Soil health, Groundwater Quality/Protection of Private Wells and Public Water Supplies, and Groundwater Quantity protection) For reference, there is significant new irrigation-based research related to variable rate applications, reduced irrigation rates, cover crops, perennial cover, as well as nitrogen use and water quality impacts. Although this research is not being completed in the watershed, the information should be relevant and informative to share in areas where agriculture irrigation is active. See the links below for more information. o U of M Irrigation: https://extension.umn.edu/soil-and-water/irrigation o Pope county SWCD - Rosholt Farm: www.mda.state.mn.us/rosholtfarm	X			Y	Y	Request information for DNR to see if comment can be satisfied. 11/6 edit: irrigation permit data over time found on DNR website and issues section updated to include this
34	MDA	Admin	82, Table G3	Implementation programs and related funding sources for the UMRW watershed. Next to MDA, please add: Soil Health Financial Assistance Program Grant. • This is a new program that could be a valuable option for supporting landowners in the watershed with financial assistance for soil health equipment and to help meet the Soil Health acreage goals. https://www.mda.state.mn.us/soil-health-grant	X			Y	Y	Soil Health Grant added to the table
36	MDH	Executive Summary	7, Table A3	Table A3, Page 7 lists short term groundwater goals acreage that does not match other sections in the plan.	X			Y	Y	3000 changed to 1500
37	MDH	LWRN	18	delete Milan from list of wellhead protection areas in this watershed.		X		Y	y	Milan deleted.

38	MDH	Implementation	67	Table E19, Page 67 includes an action to hold workshops on private well testing. MDH recommends the following wording change to the action: Make information available to private well users about local drinking water quality and well testing. Host a well testing clinic or provide resources to well users to have their water tested for: ▪ Coliform Bacteria (every year) ▪ Nitrate (every other year) ▪ Arsenic (at least once) ▪ Lead (at least once) ▪ Manganese (at least once)		X		Y	Y	Action edited as suggested.
Minor changes made by HEI										
40	HEI	Implementation				X		Y	Y	made Tables E3 and E12 all caps to match other issue tables.
41	HEI	Implementation				X		Y	Y	bolded research and monitoring implementation table to match the others
42	HEI	Goals			X			Y	Y	Changed groundwater goals to be focused on one planning region (matches icons, text had said 2)
43	HEI	General				X		Y	Y	Changed Stony Run to Stony Run Creek
44	HEI	Executive Summary				X		Y	Y	Changed issue tables in ES to be landscape orientation so they fit on the page
45	HEI	Executive Summary				X		Y	Y	Moved funding text and Table A4 to previous page to remove empty space on page