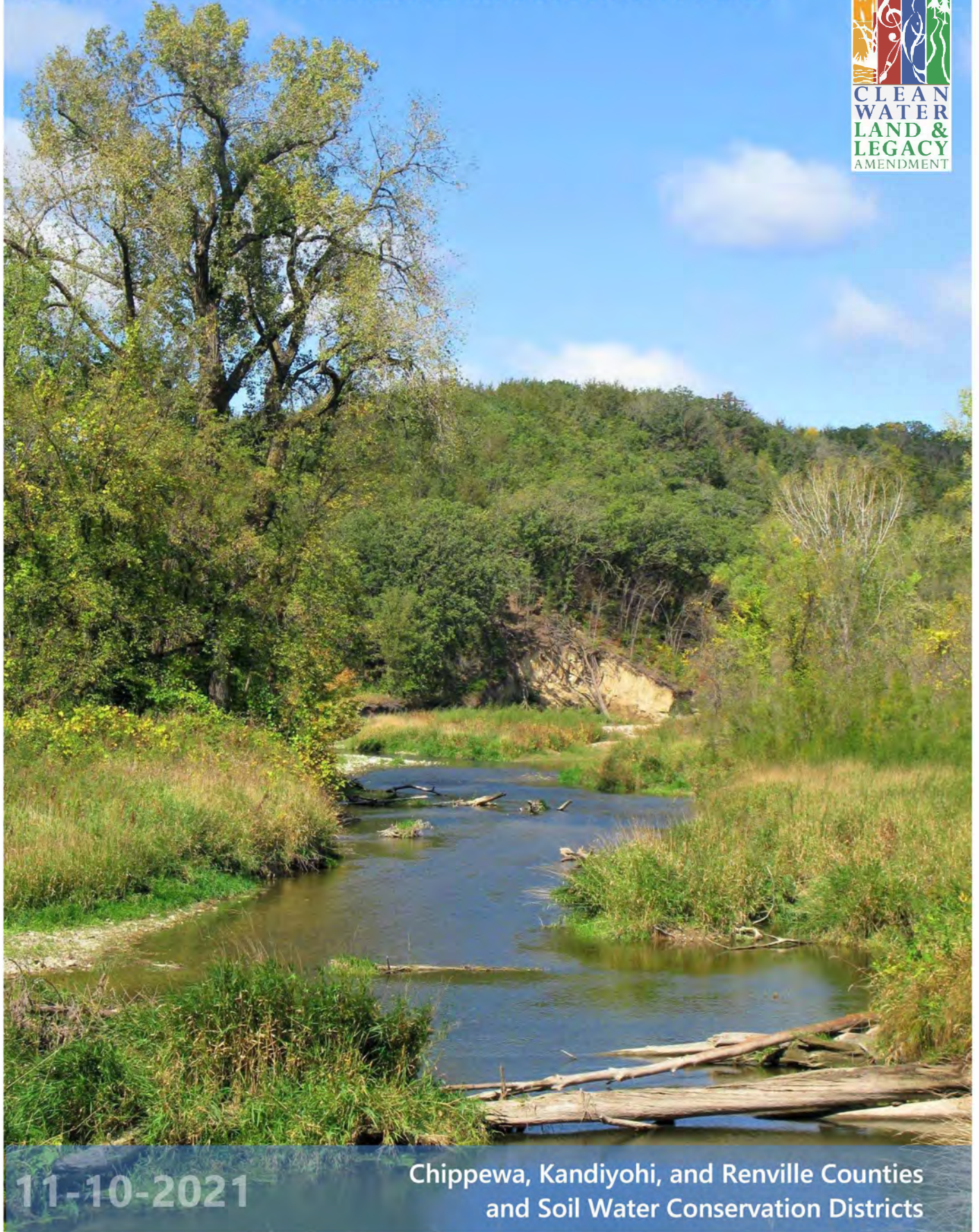


Central Minnesota River Watershed Partnership

COMPREHENSIVE WATERSHED MANAGEMENT PLAN



11-10-2021

Chippewa, Kandiyohi, and Renville Counties
and Soil Water Conservation Districts

Cover Image: Hawk Creek at Skalbakken Park – Renville County, MN



Emmons & Olivier Resources, Inc.

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County Board of Commissioners

Chippewa County Board of Commissioners

Kandiyohi County Board of Commissioners

Renville County Board of Commissioners

Soil and Water Conservation District Board of Supervisors

Chippewa SWCD Board of Supervisors

Kandiyohi SWCD Board of Supervisors

Renville SWCD Board of Supervisors

Hawk Creek-Middle Minnesota CWMP Policy Committee

Supervisor Brandon Smith, Kandiyohi SWCD

Commissioner Candice Jaenisch, Chippewa County

Commissioner Corky Berg, Kandiyohi County

Supervisor Dean Schroeder, Renville SWCD

Commissioner David Hamre, Renville County

Commissioner Greg Snow, Renville County - Alternate

Supervisor Jeff Johnson, Chippewa SWCD - Alternate

Commissioner Jeffrey Lopez, Chippewa County

Supervisor Jerry Schwitters, Chippewa SWCD – Alternate

Supervisor Jim Hebrink, Renville SWCD - Alternate

Supervisor Dr. Kathryn Kelly, Renville SWCD - Alternate

Supervisor Michelle Overholser, Chippewa SWCD - Alternate

Commissioner Rick Schmidt, Renville County

Commissioner Rollie Nissen, Kandiyohi County

Supervisor Steve Sunderland, Chippewa SWCD

Hawk Creek-Middle Minnesota CWMP Steering Team

Diane Mitchell, Renville County

Ellie Faber, Kandiyohi SWCD

Eric VanDyken, Kandiyohi County

JoAnn Blomme, Chippewa County

Holly Hatlewick, Renville SWCD

Kyle Richter, Renville SWCD

Rick Reimer, Kandiyohi SWCD

Zach Bothun, Chippewa SWCD



Hawk Creek-Middle Minnesota CWMP Advisory Committee

Aicam Laacouri, MDA

Amanda Strommer, MDH

Aric Koenen, Hinterland Winery

Bob Marcus, Marcus Well Drilling

Bob Sportel, Resident

Bryan Spindler, MPCA

Carmen Clementson, Resident Willmar Lakes

Chad Gunter, Farmer

Chris Zimmer, Farmer

Dean Schroeder, Supervisor Renville SWCD

Dorian Gatchell, Minnesota Ag Service

Ethan Jenzen, MNDNR

Glenn Arfstrom, Farmer

Greg Snow, Commissioner Renville County

Heidi Rauenhorst, Hawk Creek Watershed Project Coordinator

Jeff Johnson, Jeff's Septic Solutions

Jeff Marlowe, Engineer Renville County

Jeremy Maul, BWSR Board Conservationist

Josh Macziewski, Chippewa County Drainage Department

Julie Bentson, Resident City of Morton

Ken Tre, Prinsco

Kent Rodelius, Prinsco

Larry Thielen, Renville County FSA

Leroy Dahlke, Resident/Local Sportsman Group

Les Plumley, Renville County / Southern Minnesota

Beet Sugar Cooperative

Mark Hiles, BWSR Clean Water Specialist

Melanie Dickman, District Conservationist Kandiyohi County NRCS

Michael Weckwerth, MPCA

Mike Bosch, Chippewa County Corn and Soybean Growers

Mitch Grussing, Farmer

Ron Lippert, Resident City of Willmar

Sara Sietsema, City of Willmar

Sean Christensen, Engineer City of Willmar

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ACRONYMS

AC – Acres	MDA – Minnesota Department of Agriculture
AIS – Aquatic Invasive Species	MDH – Minnesota Department of Health
AMC – Association of Minnesota Counties	MN – Minnesota
1W1P – One Watershed, One Plan	MNDNR – Minnesota Department of Natural Resources
BMP – Best Management Practice	MPCA – Minnesota Pollution Control Agency
BOD – Biological Oxygen Demand	MS4 – Municipal Separate Storm Sewer System
BWSR – Minnesota Board of Water and Soil Resources	MSHA – MPCA Stream Habitat Assessment
CFU – Colony Forming Units	N – Nitrate
Chl-A – Chlorophyll A	NA – Not Applicable
CR – County Road	NCED – National Conservation Easement Database
CREP – Conservation Reserve Enhancement Program	NE – Northeast
CRP – Conservation Reserve Program	NPDES – National Pollutant Discharge Elimination System
CWF – Clean Water Funds	NRBG – Natural Resources Block Grant
CWMP – Comprehensive Watershed Management Plan	NRCS – Natural Resources Conservation Service
DO – Dissolved Oxygen	NW – Northwest
DWSMA – Drinking Water Supply Management Area	NWS – National Weather Service
DU – Ducks Unlimited	P – Phosphorus
EOR – Emmons & Olivier Resources, Inc.	PPB – Parts per Billion
ERA – Emergency Response Area	RIM – Reinvest in Minnesota
FID – Object ID Field	SE – Southeast
FWMC – Flow Weighted Mean Concentration	SNA – Scientific Natural Area
GIS – Geographic Information System	SSTS – Subsurface Sewage Treatment System
GRAPS – Groundwater Restoration and Protection Strategy	SWCD – Soil and Water Conservation District
HA – Hectare	TMDL – Total Maximum Daily Load
HCMM – Hawk Creek-Middle Minnesota	TP – Total Phosphorous
HSPF-SAM – Hydrological Simulation Program—Fortran Scenario Application Manager	TSS – Total Suspended Sediment
HUC – Hydrologic Unit Code	µg – Microgram
ID – Identity or Identification	UMN – University of Minnesota
JPA – Joint Powers Agreement	US – United States
JPE – Joint Powers Entity	USDA – United States Department of Agriculture
LB – Pound	USFWS – United States Fish and Wildlife Service
LGU – Local Government Unit	USGS – United States Geologic Survey
MASWCD – Minnesota Association of Soil and Water Conservation Districts	WASCOB – Water and Sediment Control Basin
MAWD – Minnesota Association of Watershed Districts	WIA – Walk-in Access
Mg/L – Milligrams per Liter	WMA – Wildlife Management Area
MBS – Minnesota Biological Survey	WPA – Waterfowl Protection Area
	WRAPS – Watershed Restoration and Protection Strategy
	YR – Year

GLOSSARY

Aquifer – A body of permeable rock that can contain or transmit groundwater.

Altered hydrology – Changes in the hydrologic response of the landscape compared to a reference condition caused by shifts in climate and changes to water conveyance and water storage processes of the landscape. Hydrology is always changing, so any discussion of altered hydrology must indicate the time scale or baseline used as a reference, as well as the spatial scale.

Best Management Practice (BMP) – Structural and nonstructural practices and methods that can be used in both agricultural and urban settings to decrease runoff, erosion, and pollutants and improve water quality, soil health, and land use activities.

Calcareous Fen – A rare and distinctive wetland characterized by a substrate of non-acidic peat and dependent on a constant supply of cold, oxygen-poor groundwater rich in calcium and magnesium bicarbonates.

Climate Change – A long-term change in climate measures such as temperature and rainfall. Changes in climate have a large impact on water quality as well as lake and wetland water levels and stream and river flows.

Contaminants – Substances that, when accidentally or deliberately introduced into the environment, may have the potential to harm living organisms, including people, wildlife, and plants.

Dissolved Oxygen – The level of free, non-compound oxygen present in water or other liquids. It is an important parameter in assessing water quality because of its influence on the organisms living within a body of water.

Drainage Authority – A board or joint county drainage authority having jurisdiction over a drainage system or project.

Drainage System – A system of ditch and/or tile, used to drain property, including laterals, improvements, and improvements of outlets. "Drainage system" includes the improvement of a natural waterway used in the construction of a drainage system and any part of a flood control plan proposed by the United States or its agencies in the drainage system.

Drinking Water Supply Management Area – The surface and subsurface area surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in a wellhead protection plan. This area is delineated using identifiable landmarks that reflect the scientifically calculated wellhead protection area boundaries as closely as possible.

Drinking Water Supply Management Area Vulnerability – An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from overlying land and water uses. It is based upon criteria that are specified under Minnesota Rules, part 4720.

***Escherichia coli* (abbreviated as *E. coli*)** – A fecal coliform bacteria that comes from human and animal waste. The Environmental Protection Agency (EPA) uses *E. coli* measurements to determine whether fresh water is safe for recreation.

eLINK – Web-based grant tracking system hosted by the Board of Water and Soil Resources.

Flooding – A general and temporary condition where two or more acres of normally dry land, or two or more properties, are inundated by water or mudflow (Federal Emergency Management Agency, 2016).

Groundwater – Water located below ground in the spaces present in soil and bedrock.

Groundwater Dependent Natural Resources – Natural resources, especially fens, wetlands, lakes, and streams, whose characteristics would change significantly if they were deprived of groundwater.

Groundwater Recharge – The process of water infiltrating through the ground surface to become groundwater.

HSPF-SAM – The Hydrologic Simulation Program FORTRAN (known as HSPF) is a mathematical model developed to simulate hydrologic and water quality processes in natural and manmade water systems. HSPF is an analytical tool

that has applications in planning, designing, and operating water-resources systems. The model enables using probabilistic analysis in the fields of hydrology and water quality management. HSPF uses information such as the time history of rainfall; temperature; evaporation; and parameters related to land-use patterns, soil characteristics, and agricultural practices to simulate the processes that occur in a watershed.

Hydrology – The movement of water. Often used in reference to water movement as runoff over the soil after a rainfall event as it contributes to surface water bodies.

Hydrologic Unit Code – A sequence of numbers or letters that identifies a hydrological feature like a river, river reach, lake, or area like a drainage basin or catchment.

Impervious Surfaces – Surfaces that severely restrict the movement of water through the surface of the earth and into the soil below. Impervious surface typically refers to man-made surfaces such as non-porous asphalt or concrete roadways, buildings, and heavily compacted soils.

Infiltration – Penetration of water through the ground surface.

Invasive Species – Organisms not endemic to a geographic location. They often displace native species and have the potential to cause environmental change.

Municipal Separate Storm Sewer System - A municipal separate storm sewer system (MS4) is a conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, storm drains, etc.) that is also:

- *Owned or operated by a public entity (which can include cities, townships, counties, military bases, hospitals, prison complexes, highway departments, universities, sewer districts, etc.)*
- *Designed or used for collecting or conveying stormwater*
- *Not a combined sewer*
- *Not part of a publicly owned treatment works*

Municipal Wastewater Treatment System – A process of collecting, treating and ejecting the harmful pollutants from wastewater. Sewers collect sewage and wastewater from homes, businesses, and industries and deliver it to wastewater treatment facilities where the pollutants are treated by various methods like Physical, Chemical, and Biological process before it is discharged to water bodies or land, or reused.

Nitrate – A negatively charged compound (NO_3^-) that is water soluble, available for plant uptake, and a product of both organic matter and synthetic fertilizer.

Nonpoint Sources (pollution) – Any source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act. Nonpoint source pollution, unlike pollution from industrial and sewage treatment plants (point source pollution), comes from many diffuse sources. Typically, it is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing into lakes, rivers, wetlands, coastal waters and ground waters.

Nonstructural Practices – Management practices that directly reduce the amount of pollutants and runoff generated from agricultural fields including cover crops, conservation tillage, and soil health practices.

Nutrients – A group of chemicals that are needed for the growth of an organism. Within surface water systems, added nutrients such as phosphorus and nitrogen can lead to the excessive growth of algae.

Nutrient Reduction Strategy – A statewide assessment of nutrient sources and the magnitude of nutrient reductions needed to meet in-state and downstream water quality goals.

One Watershed, One Plan - A BWSR program that aligns local water planning on major watershed boundaries with state strategies towards prioritized, targeted, and measurable implementation plans.

Other Waters – Perennial, seasonal streams or drainage ditches excluding watercourses depicted on the DNR Protection map.

Peak Flows – A term typically used to define the characteristic high flow period of a stream or river.

Point Sources (pollution) - Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

Pollutant – A substance that makes land, water, air, etc., dirty and not safe or suitable to use.

Pollution Sensitivity – The level of risk of groundwater degradation through the migration of waterborne contaminants.

Prioritization – Determination of and/or the process of determining the relative importance and precedence of the resources and issues identified in the plan. This includes determining what items should be tackled in the first 10-years of the Plan.

Priority Areas – Areas identified by planning partners in which to focus implementation efforts for restoration or protection. These areas are where planning partners will measure progress towards goals.

Private Drainage System – A drainage system is classified as private when responsibility for maintaining and repairing the system and its components, lies with the private owner and management is not regulated under Chapter 103E.

Protection – Strategies that protect high quality and threatened resources ~~that are~~ essential to preventing further degradation and future impairment of Minnesota’s waters.

Protection Area – Higher quality areas where preventive measures will be implemented to maintain quality.

Public Drainage System – This type of drainage system is owned by the benefited property owner(s) but established, constructed, and maintained by a public drainage authority in accordance with Chapter 103E.

Restoration – Strategies that seek to restore or improve the quality of a resource which is currently impaired, threatened, and/or degraded.

Riparian – A vegetated ecosystem alongside a waterbody, characteristically with a high water table and subject to periodic flooding.

Runoff – Water from rain, snow melt, or irrigation that flows over the land surface.

Secchi Depth – A lake monitoring tool and measure of transparency. The depth at which an opaque disk, called a Secchi Disk ceases to be visible from the water’s surface.

Shoreland – Land adjacent to public waters that has been designated and delineated as shoreland by local ordinance as approved by the Department of Natural Resources.

Soil Health – Defined by the U.S. Department of Agriculture as “the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.”

Stakeholder – An individual or group with an interest or concern in watershed management.

Stormwater Best Management Practices (BMPs)/Infrastructure – Methods used to control the speed and total amount of stormwater that flows off a site after a rainfall event and used to improve the quality of the runoff water.

Structural Practices – Long-lasting constructed practices to reduce pollutants and runoff. Common structural practices include water and sediment control basins, alternative tile intakes, rain gardens, cattle exclusions, waste pit closures, grade stabilization, terraces, grassed waterways, and wetland restorations.

Subsurface Sewage Treatment Systems (SSTS) – A system where sewage effluent is treated and disposed of into the soil by percolation and filtration, and includes trenches, seepage beds, drainfield, at-grade systems, and mound systems.

Subwatershed – A smaller geographic section of a larger watershed unit with a typical drainage area between 2 and 15 square miles and whose boundaries include all the land area draining to a specified point.

Total Maximum Daily Loads (TMDLs) – The total amount of a pollutant or nutrient that a water body can receive

and still meet state water quality standards. TMDL also refers to the process of allocating pollutant loadings among point and nonpoint sources.

Total Phosphorus – A measure of the amount of all phosphorus found in a water column, including particulate, dissolved, organic and inorganic forms.

Total Suspended Solids (TSS) – A measure of the amount of particulate material in suspension in a water column.

Turbidity – The cloudiness of the water that is caused by large numbers of individual particles that are generally invisible to the naked eye.

Watershed – A land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays and the ocean.

Water Quality –A descriptor for the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular use. In the case of surface waters, uses are typically swimming and fishing. In the case of groundwater, uses are typically drinking and irrigation.

Wellhead Protection Plan – A plan developed to prevent contaminants from entering an aquifer where a public water supplier draws drinking water.

EXECUTIVE SUMMARY

The Hawk Creek–Middle Minnesota Comprehensive Watershed Management Plan (HCMM CWMP) also referred to as the “Plan”, represents over two years of collaborative work between six entities that have sought to understand, improve, and protect the surface and groundwater resources of the region. The planning area (displayed in the map on the following page) encompasses five counties (Chippewa, Kandiyohi, Nicollet, Renville and Sibley) and is nearly 1,262 square miles. It is home to three watershed zones that encompass both high-valued recreational lakes and streams, as well as many impaired waters impacted by intensive row crop agriculture and increased sediment and pollutants transported by rainfall. These waters drain to the Minnesota River, one of ten major river basins in Minnesota, and then ultimately to the Mississippi River.

The land use and climate-related issues identified in this Plan are not unique to the Hawk Creek–Middle Minnesota planning area, and in fact, affect the health of watersheds throughout the Upper Midwest. Addressing these challenges will require a new way of thinking and a strong commitment from private landowners, local municipalities, and government agencies alike.

The Hawk Creek–Middle Minnesota Partners responsible for this Plan development include Chippewa, Kandiyohi and Renville counties, along with each county’s respective Soil and Water Conservation District. With the approval of this Plan by the Minnesota Board of Water and Soil Resources (BWSR) local government units that adopt the Plan will meet minimum eligibility requirements for state funds for the implementation of projects and programs needed to achieve the restoration and protection goals included in this Plan.



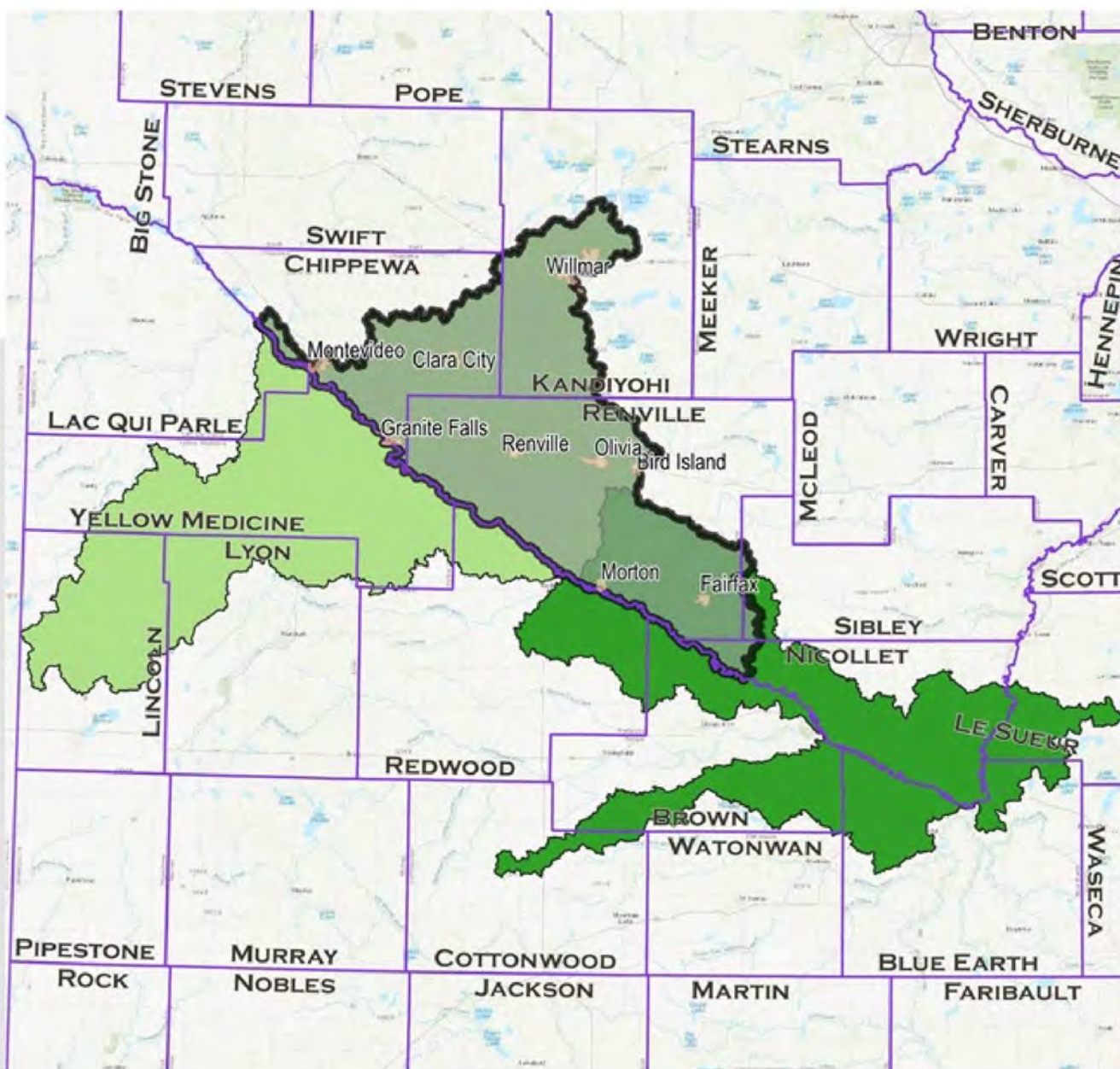
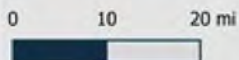
Granite outcropping, Minnesota River



Hawk Creek-Middle Minnesota One Watershed, One Plan

Planning Area

- Minnesota River -Mankato
- Minnesota River -Yellow Medicine
- Hawk Creek -Middle Minnesota (Planning Boundary)



PURPOSE, ROLES AND RESPONSIBILITIES



The HCMM CWMP was developed following guidelines set by the Minnesota Board of Water and Soil Resources (BWSR) One Watershed, One Plan (1W1P) planning process. The purpose of the process is to align local water planning along major watershed boundaries, not just local governmental jurisdictions (e.g. county lines). All 1W1Ps must contain targeted, prioritized, and measurable implementation plans, with the purpose of achieving meaningful and lasting results for Minnesota's water resources.

A Memorandum of Agreement (MOA) between Chippewa Soil and Water Conservation District, Chippewa County, Kandiyohi Soil and Water Conservation District, Kandiyohi County, Renville Soil and Water Conservation District, and Renville County was established as the first step in the planning process. A representative from each governmental unit was appointed to serve on the Policy Committee, which is the decision-making body for this Plan. Chippewa County was the fiscal agent for this project. The Steering Team, which guides the planning process and develops plan content, was comprised of staff from these same governmental units.

An Advisory Committee was formed to provide valuable input to the planning process. For the HCMM CWMP, a wide range of stakeholders formed the Advisory Committee including state agencies, cities, lake associations, agricultural groups/cooperatives, certified crop advisors, members of the septic and well industry, the Hawk Creek Watershed Project, and residents and farmers.

PLANNING APPROACH

The planning approach used for the HCMM CWMP followed the steps outlined below. Building from an existing body of work (plans and studies), the Advisory Committee used their local knowledge, and shared their values and vision for the health of the watershed to identify the highest priority issues for the Plan. In addition to identifying **what** needs to be addressed first, the Steering Team, Advisory Committee and Policy Committee participated in prioritizing **where** the partnership should focus its efforts for the next 10 years.

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PROJECT KICK-OFF MEETING – Gather Stakeholder Input	COMPILATION AND REVIEW OF EXISTING DOCUMENTS – Highlight potential issues, goals, objectives and action items already identified for the watershed	ISSUE PRIORITIZATION AND TARGETING – Prioritize issue statements and determine where on the landscape to focus efforts (priority resources)	GOAL DEVELOPMENT – Created measurable goals using available watershed models, data, & local knowledge	IMPLEMENTATION (ACTIONS) TABLE – Develop table compiling all of the actions needed to achieve watershed goals, including costs and partners

Steps in the development of the HCMM CWMP

ISSUES IDENTIFICATION



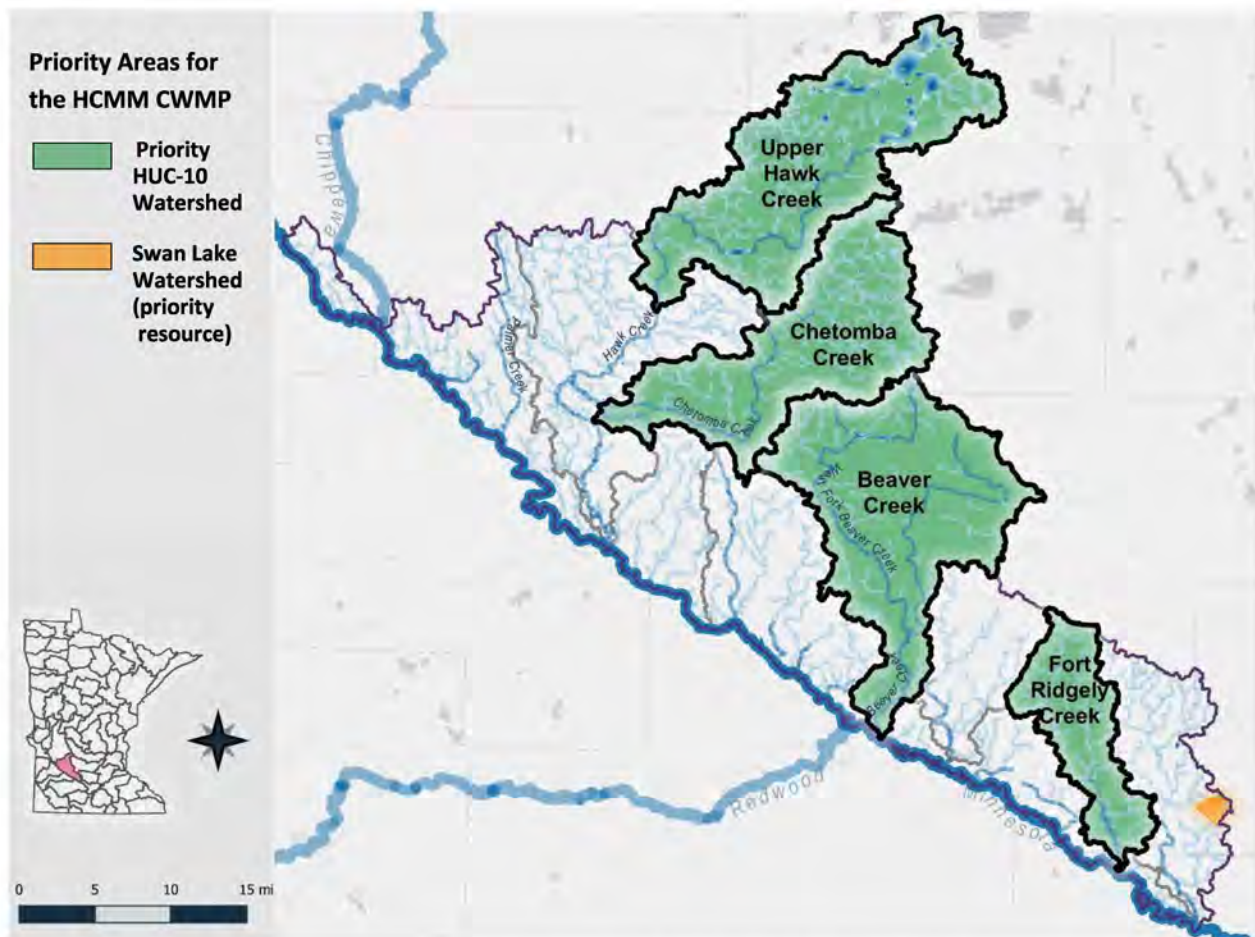
A series of kick-off meetings were held in Willmar and Renville in September of 2019 to gather watershed residents and stakeholders and introduce them to the One Watershed, One Plan (1W1P) program and planning process. These meetings were an opportunity to showcase the planning area, introduce participants to issues and concerns, and hear what people had to share about their knowledge, experiences, and concerns for the resources. In addition, a review of past plans and studies was used to compile previously identified issues. Issues called out in the State Agencies Responses to the planning effort were also added to the list. After compiling and grouping common issues the following list of themes was identified for this planning effort (in no particular order):

- Impaired Lakes and Streams
- Altered Hydrology
- Soil Erosion and Sediment Loss
- Groundwater Supply & Drinking Water Protection
- Flooding
- Recreation
- High Quality Lakes and Streams
- Climate Resiliency
- Urban Stormwater Management
- Hazardous Materials, Solid Waste and Environmental Contamination
- Monitoring and Data Collection
- Aquatic Invasive Species
- Wildlife Habitat
- Subsurface Sewage Treatment Systems
- Agricultural Practices and Runoff Management
- Education and Outreach (Social Based Challenges)

PRIORITY ISSUES AND PRIORITY AREAS

Recognizing that the early planning stages identified more issues than can be addressed in the 10-year Plan timeframe, participants were asked to prioritize **what** needs to be addressed first and **where** the partnership should focus its efforts.

During a series of workshops held in the fall and winter of 2019, the Advisory Committee evaluated how the issues change depending upon location in the watershed and identified priority subwatersheds where specific concerns are most prevalent. The evaluation included a stacking exercise, in which various data sets are layered on top of each other to highlight where multiple issues or opportunities are concentrated on the landscape. The Steering Team, Advisory Committee, and Policy Committee were given a worksheet and asked to prioritize the resources and corresponding subwatersheds that should be the focus of this planning effort. At the end of these workshops, the participants identified the following priority areas for the HCMC CWMP: Upper Hawk Creek, Chetomba Creek, Beaver Creek, Fort Ridgely Creek, and Swan Lake which is located in Sibley County.



The final step of the prioritization process was to identify the highest priority issues for each of the four Priority Areas as well as others which may be located elsewhere or be watershed wide. Using a spreadsheet tool organized by the logic model framework, the planning partners evaluated the issues and ranked them as high priority, medium priority, or low priority for each Priority Area. The following definitions were established to facilitate this ranking exercise:

**High Priority
(TIER I)**

Issue which will be assigned a significant measurable goal and funding for implementation will be a priority of this Plan

**Medium Priority
(TIER II)**

Issues which are important to pursue as a second priority; goal is more difficult to define (i.e. not as measurable) and funding for implementation may involve cost-share

**Low Priority
(TIER III)**

Issues that are strongly linked to a High Priority or Medium Priority issue and will see improvements/benefits as a result of addressing those issues; broad goals or implementation activities related to these issues (rather they are assigned to the High Priority or Medium Priority Issues)

Swan Lake, located in Sibley County (*Little Rock Creek Watershed*), was identified as a priority resource for protection due to the outstanding habitat value it provides for plants and wildlife in the western reaches of the county.

The results of this final prioritization exercise are summarized in the following table:

Priority Area	High Priority (TIER I)	Medium Priority (TIER II)	Low Priority (TIER III)
Upper Hawk Creek	<ul style="list-style-type: none"> - Impaired Lakes and Streams (Long Lake, Ringo Lake, Hawk Creek) - Altered Hydrology - Soil Erosion and Sediment Loss - High Quality Lakes and Streams - Agricultural Practices and Runoff Management - Education and Outreach 	<ul style="list-style-type: none"> - Drinking Water Protection - Subsurface Sewage Treatment Systems - Monitoring and Data Collection 	<ul style="list-style-type: none"> - Groundwater Supply - Flooding - Recreation - Climate Resiliency - Urban Stormwater Management - Hazardous Materials, Solid Waste and Environmental Contaminants - Wildlife Habitat
Chetomba Creek	<ul style="list-style-type: none"> - Impaired Lakes and Streams (Olson Lake) - Altered Hydrology - Soil Erosion and Sediment Loss - Recreation - Agricultural Practices and Runoff Management - Education and Outreach 	<ul style="list-style-type: none"> - Drinking Water Protection - High Quality Lakes and Streams - Wildlife Habitat - Subsurface Sewage Treatment Systems - Monitoring and Data Collection 	<ul style="list-style-type: none"> - Impaired Lakes and Streams (Chetomba Creek) - Groundwater Supply - Flooding - Climate Resiliency - Urban Stormwater Management - Hazardous Materials, Solid Waste and Environmental Contaminants
Beaver Creek	<ul style="list-style-type: none"> - Impaired Lakes and Streams (Beaver Creek East Fork, County Ditch 31, County Ditch 59, Beaver Creek, Beaver Creek West Fork) - Altered Hydrology - Soil Erosion and Sediment Loss - Drinking Water Protection - Agricultural Practices and Runoff Management - Education and Outreach 	<ul style="list-style-type: none"> - Subsurface Sewage Treatment Systems - Monitoring and Data Collection 	<ul style="list-style-type: none"> - Groundwater Supply - Flooding - Recreation - High Quality Lakes and Streams - Climate Resiliency - Urban Stormwater Management - Hazardous Materials, Solid Waste and Environmental Contaminants - Wildlife Habitat
Fort Ridgely Creek	<ul style="list-style-type: none"> - Impaired Lakes and Streams (Fort Ridgely Creek lower reach) - Altered Hydrology - Soil Erosion and Sediment Loss - High Quality Lakes and Streams - Agricultural Practices and Runoff Management - Education and Outreach 	<ul style="list-style-type: none"> - Drinking Water Protection - Recreation - Subsurface Sewage Treatment Systems - Monitoring and Data Collection 	<ul style="list-style-type: none"> - Groundwater Supply - Flooding - Climate Resiliency - Urban Stormwater Management - Hazardous Materials, Solid Waste and Environmental Contaminants - Wildlife Habitat

MEASURABLE GOALS

The priority issues are used to develop the Plan's goals. Goals are a guide for what quantifiable changes the Plan can accomplish in its 10-year timeframe and are based on calculations linked to water quality improvements. Measurable goals have been developed for both the Tier I (High Priority) and the Tier II (Medium Priority) issues. Given that the Tier III (Lower Priority) issues are strongly linked to a High Priority or Medium Priority issue, there will be improvements/benefits as a result of addressing those issues. There are ten (10) measurable goals for the Tier I (High Priority) Issues (see Section 4 Establishment of Measurable Goals):

Goals for the Tier I (High Priority) and Tier II (Medium Priority) Issues

Impaired Lakes and Streams

- Goal 1:** Achieve a seven (7) percent reduction in total suspended solids (TSS) loads at the downstream end of Beaver Creek, Chetomba Creek, Upper Hawk Creek and Fort Ridgely Creek.
- Goal 2:** Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Willmar Lake (34-0180-01), or 111 ppb.

Altered Hydrology

- Goal 1:** Reduce annual runoff from the Priority Areas, as follows:
- *Upper Hawk Creek – Reduce average annual runoff by 0.25 inches (2,606 ac-ft)*
 - *Beaver Creek – Reduce average annual runoff by 0.25 inches (2,642 ac-ft)*
 - *Chetomba Creek - Reduce average annual runoff by 0.25 inches (2,119 ac-ft)*
 - *Fort Ridgely Creek - Reduce average annual runoff by 0.25 inches (929 ac-ft)*
- Goal 2:** Work to achieve no net increase in existing runoff volumes to the Minnesota River from changes in land use or land use practices for non-priority subwatersheds, as follows:
- *Lower Hawk Creek -Maintain baseline (1996-2012) flow of 132,177 AF/year*
 - *Stony Run Creek – Minnesota River - Maintain baseline (1996-2012) flow of 1,325,250 AF/year*
 - *Wood Lake Creek – Minnesota River - Maintain baseline (1996-2012) flow of 1,639,789 AF/year*
 - *Sacred Heart Creek – Minnnesota River - Maintain baseline (1996-2012) flow of 1,875,246 AF/year*
 - *Birch Coulee Creek - Maintain baseline (1996-2012) flow of 18,176 AF/year*
 - *Spring Creek – Minnesota River - Maintain baseline (1996-2012) flow of 2,092,539 AF/year*
 - *Little Rock Creek - Maintain baseline (1996-2012) flow of 22,607 AF/year*

High Quality Lakes and Streams

- Goal 1:** Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Eagle Lake (34-0171-00), or 35 ppb.
- Goal 2:** Achieve no net increase in the 10-year summer average in-lake total phosphorus (TP) concentration in Swan Lake (Sibley County: *Little Rock Creek Subwatershed*).

Agricultural Practices, Soil Erosion and Runoff Management

- Goal 1:** Change knowledge and attitudes about agricultural practices to manage runoff and improve soil health (so the adoption rate increases).

- Goal 2:** Increase the adoption rate of agricultural practices to manage runoff and improve soil health in priority subwatersheds.
- Goal 3:** Protect and increase intact wetland and grasslands in priority subwatersheds.
- Goal 4:** Implement components of Multipurpose Drainage Management through the use of practices to reduce erosion, increase storage, improve water quality and reduce maintenance.

Drinking Water Protection

- Goal 1:** Make information available to private well users about local drinking water quality and well testing.
- Goal 2:** Protect public drinking water supplies with moderate and high vulnerability by implementing best management practices that protect groundwater in the wellhead protection areas.
- Goal 3:** Reduce risk to public health from abandoned or poorly maintained wells through education of well decommissioning and sealing programs.

Subsurface Sewage Treatment Systems

- Goal 1:** Reduce bacterial and nutrient loading to surface waters and groundwater by reducing Phosphorus by 5300 lbs, Nitrogen by 13,550 lbs, Bacteria by 369.5E+14 CFU, TSS by 89.750 lbs, and BOD by 162,450 lbs.

Wildlife Habitat

- Goal 1:** Increase and enhance wildlife habitat and improve habitat connectivity by adding 100 acres of wetland and 200 acres of upland habitat through wetland restoration, conservation easements and purchases.

Recreation

- Goal 1:** Improve recreational opportunities in the Planning Area by increasing the amount of recreational land (by 160 acres) and public access (by 600 acres) to recreational lands.

Monitoring and Data Collection

- Goal 1:** Collect continuous stream flow and event-based TP/TSS concentrations from the NE and SE tributaries to Eagle Lake to monitor TP load reductions to Eagle Lake from implementation of agricultural BMPs in the watershed.
- Goal 2:** Collect 10 years of continuous flow monitoring data at the outlet of all four (4) priority subwatersheds.

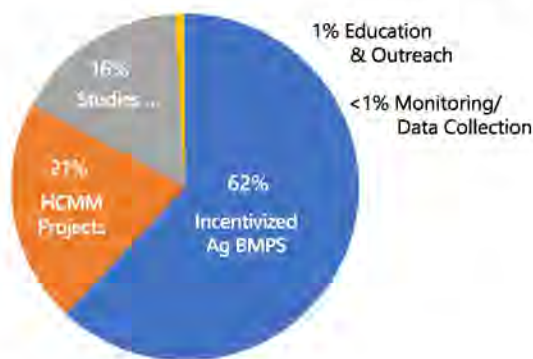
Education and Outreach

- Goal 1:** Provide educational, technical and financial assistance, as available, to promote water quality and focus education and outreach efforts in the Priority Areas integrating those efforts with the goals of the Hawk Creek Watershed Project, WRAPS, and GRAPS.

ACTIONS

Plan actions and their associated cost estimates can be found in the Targeted Implementation Schedule (see Section 5 Targeted Implementation Schedule). This schedule is the 10-year road map the Hawk Creek–Middle Minnesota Partners will use to do the work identified in this Plan. Actions were compiled from the public kick-off meeting, the Watershed Restoration and Protection Strategies (WRAPS), County Water Plans, the Groundwater Restoration and Protection Strategy (GRAPS), and other past planning efforts and input from members of the Advisory Committee. The Plan actions focus on outreach, knowledge exchange and the adoption of conservation practices on the land. The three pie charts below illustrate how the activities (actions) identified in the Plan fall into the following mechanisms and types of expenditures to be used in implementing the Plan.

Overall Implementation Plan by Expenditure Type



Incentivized Agricultural BMPs:

The Planning Team identified a suite of in-field conservation practices (refer to the activities listed in Table 5-2 through Table 5-7) as the primary mechanism to reduce nutrient and sediment loading in the Priority Areas. The nature of these practices necessitates their implementation by a willing landowner. The HCMM CWMP will provide cost share funding to landowners as a means of incentivizing these practices. For optimal siting (incorporating spatial and economic considerations), the MDA highly recommends the use of PTMapp and ACPF programs.

HCMM Led Projects:

In addition to the in-field conservation practices to be implemented through a cost-share approach, the Plan identifies several implementation activities that will be built or implemented by the HCMM JPE or its member organizations. These are typically larger, regional scale practices.

Studies, Programs, and Policies:

The Plan identifies several programmatic and policy approaches to achieve its goals (e.g. cost-share programs, SSTS program). Also included in this category are recommended further studies and investigations.

Education and Outreach:

The Plan identifies many opportunities for education or outreach implementation activities in an effort to change behavior or increase stewardship in the watershed.

Monitoring & Data Collection:

Implementation of the Plan also requires activities aimed at evaluating potential improvements achieved towards Plan goals.

The Plan provides a framework for the Hawk Creek–Middle Minnesota Partners to work towards goals that maximize environmental benefits, but the Partners cannot accomplish the work on their own. Collaborators that will help with Plan implementation include state agencies such as BWSR, MPCA, DNR, MDH, MNDOT and MDA, along with other organizations such as the Hawk Creek Watershed Project, Cities, Townships, Lake Associations, conservation groups and many others.

PLAN ADMINISTRATION

The HCMM CWMP planning effort was conducted through a Memorandum of Agreement (MOA) between Chippewa, Kandiyohi, and Renville Counties and SWCDs (Appendix A). The parties plan to form a Joint Powers Entity (JPE) for administering the Plan beginning in 2022.

Several committees formed during the planning process may continue into implementation. During this transitional period, the parties will create a formal agreement that establishes decision-making powers for implementation. The agreed-upon process will encompass approval of the annual work plans, reports, grant applications and any Plan amendments. The Steering Team will continue to meet and work with the Plan Coordinator to review and identify collaborative funding and project opportunities, complete the annual work plan, identify and apply for additional funding opportunities, update the Policy Committee on what projects are completed and where funding is spent, and implement the Targeted Implementation Schedule.



1 INTRODUCTION

The Hawk Creek–Middle Minnesota is a partnership of Counties and Soil and Water Conservation Districts (SWCDs) within the Hawk Creek–Middle Minnesota Planning Area. The partnership was formed as part of the One Watershed, One Plan (1W1P) program detailed in Minnesota Statutes 103B.101. The planning partners prepared this document, the Hawk Creek–Middle Minnesota Comprehensive Watershed Management Plan (CWMP), to meet the requirements of the 1W1P program.

1.1 PURPOSE AND SCOPE

This Comprehensive Watershed Management Plan (One Watershed, One Plan) was developed following the guidelines established by the Minnesota Board of Water and Soil Resources (BWSR). This voluntary program and planning effort:

- *Aligns water planning along watershed boundaries and enhances existing county water plans*
- *Uses existing authorities and funding mechanisms*
- *Is based on the most current information and data available from state agencies*
- *Charts a course of actions for the next 10 years*
- *Identifies metrics and methods to monitor and track progress towards achieving measurable goals*
- *Provides opportunity for bi-annual funding through a non-competitive process regulated by legislature control.*

1.2 ONE WATERSHED, ONE PLAN PROGRAM

The One Watershed, One Plan (1W1P) program is a watershed management framework that seeks to align local water planning on hydrologic boundaries instead of political boundaries by the year 2025. Under this voluntary program, a Comprehensive Watershed Management Plan (CWMP) is proposed to be developed for each designated watershed area covering the state of Minnesota, replacing the need to develop individual local water management plans and watershed management plans, and to transition to statewide planning by watershed by 2025. Building off of existing planning efforts such as Watershed Restoration and Protection Strategies (WRAPS), Groundwater Restoration and Protection Strategies (GRAPS), Total Maximum Daily Load (TMDL) studies, and other agency plans, CWMPs include prioritized, targeted, and measurable implementation plans which guide the work of the local partners for the next ten years.

The 1W1P program stemmed from work initiated by the Local Government Water Roundtable, a group made up of the Association of Minnesota Counties (AMC), the Minnesota Association of Soil and Water Conservation Districts (MASWCD), the Minnesota Association of Watershed Districts (MAWD) and BWSR, which served in an advisory capacity. Based on the recommendations of the Local Government Water Roundtable, the State passed legislation in 2012 (Minnesota Statutes 103B.101, subd. 14) giving BWSR the authority to develop and implement a comprehensive watershed management planning approach emphasizing coordination on a watershed basis. This legislation led to the establishment of the One Watershed, One Plan (1W1P) Program at BWSR.

Additional legislation was passed in 2015 (Minnesota Statutes 103B.801) that outlines the purpose of and requirements for comprehensive watershed management plans developed through the 1W1P program. Additional information about the 1W1P program can be found on the BWSR website.

1.3 PLAN BOUNDARY

The Hawk Creek–Middle Minnesota Planning Area is contained within the Minnesota River Basin, which drains to the Minnesota River and is one of ten river basins in the state of Minnesota (Figure 1-1). It is made up of portions of two Hydrologic Unit Code (HUC)-8 watersheds, the Minnesota River–Yellow Medicine River major HUC-8 watershed (07020004) and the Minnesota River–Mankato major HUC-8 watershed (07020007). Both watersheds drain directly to the Minnesota River.

The planning area for Hawk Creek–Middle Minnesota is approximately 807,500 acres (1,262 square miles) and is located in the following five counties: Chippewa, Kandiyohi, Renville, Sibley, and Nicollet (Table 1-1).

Table 1-1. Breakdown of County Acres in Planning Area

County	Acres in Planning Area	% of Planning Area	% of County
Chippewa	169,397	21%	45%
Kandiyohi	165,502	20%	30%
Nicollet	15,286	2%	5%
Renville	448,459	56%	71%
Sibley	8,690	<1%	2%

A more complete description of the planning area is provided in the Land and Water Resources Narrative.

1.4 PLANNING PARTNERS AND PLAN DEVELOPMENT

The Hawk Creek–Middle Minnesota Planning Area includes the following six entities that are committed to the development and implementation of this Plan through execution of the Formal Agreement included in Appendix A:

- *The Counties of Chippewa, Kandiyohi and Renville by and through their respective County Board of Commissioners.*
- *The Chippewa, Kandiyohi and Renville Soil and Water Conservation Districts (SWCDs) by and through their respective SWCD Board of Supervisors.*

The above entities collectively form the Hawk Creek–Middle Minnesota Watershed Partners and are referred to in this Plan as the “Partners.” Due to the limited portion of the planning area located in Nicollet County and Sibley County, participation of these counties and their SWCDs in the development of this Plan was minimal.

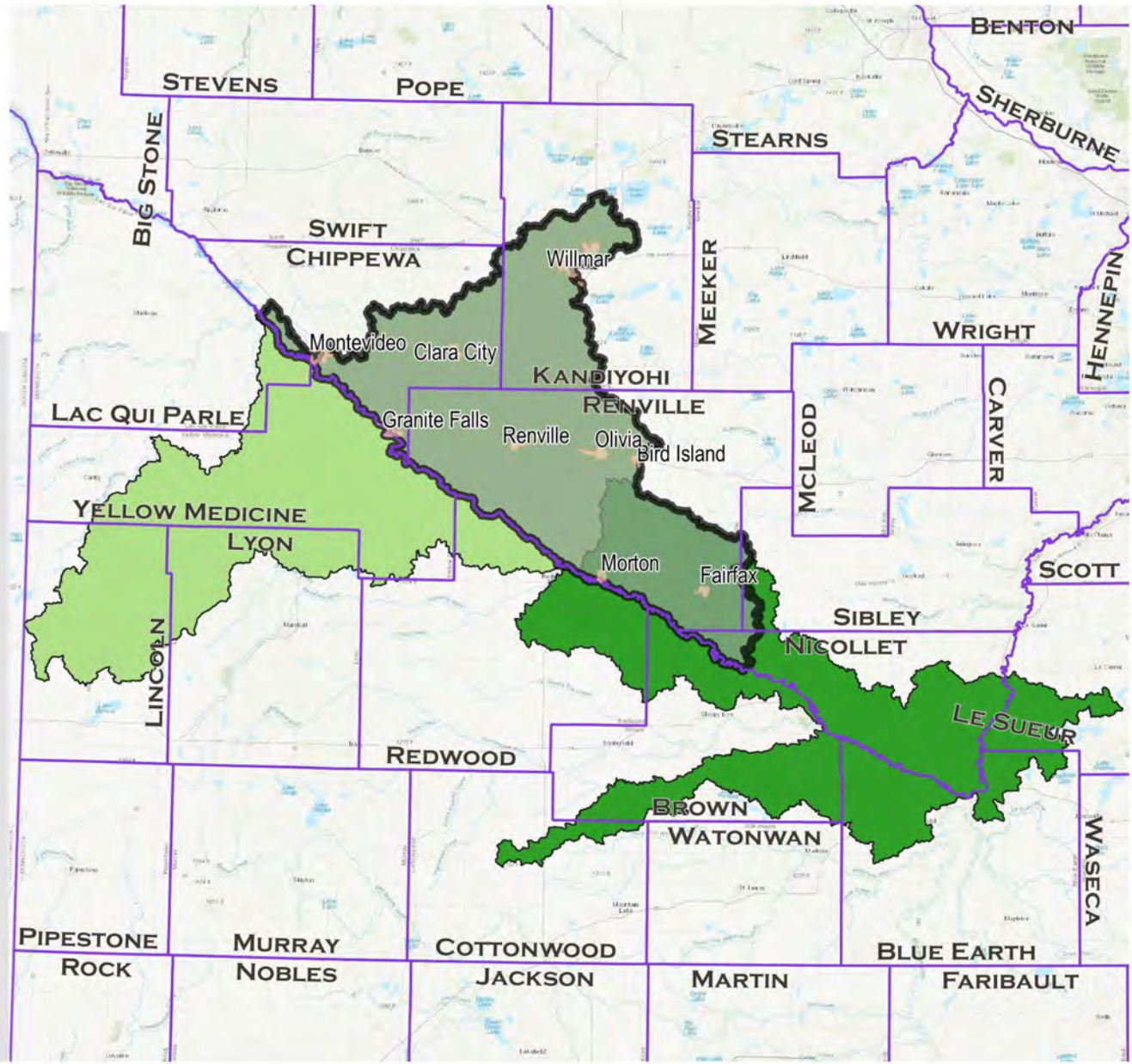
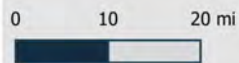
Figure 1-1. Planning Area Boundary



Hawk Creek-Middle Minnesota One Watershed, One Plan

Planning Area

- Minnesota River -Mankato
- Minnesota River -Yellow Medicine
- Hawk Creek -Middle Minnesota (Planning Boundary)



In addition to the primary implementation responsibilities of the Partners, implementation of this Plan will rely on the involvement and cooperation of other federal, state, and local entities. Cooperators were involved in the development of the Plan through the establishment and participation of the following committees:

The **Policy Committee** served as the decision-making authority for the planning process. In addition, the Policy Committee served as a liaison to their respective governing bodies and acted on behalf of their governing bodies in all matters. The Committee was made up of a representative from three of the counties and Soil and Water Conservation Districts in the Planning Area (Renville, Kandiyohi, and Chippewa).

The **Advisory Committee** served to provide input to the Policy Committee regarding the planning process and Plan content, including supplying technical information throughout Plan development. The Committee was composed of local, State, and Federal agency staff, representatives from agricultural and conservation groups, and other stakeholders. A complete list of participants is included in the Acknowledgements section.

The **Steering Team** guided the logistics of the planning process and drafted the Plan. The Steering Team was composed of local government staff from the counties and SWCDs in the planning area, as well as BWSR staff. A complete list of participating organizations is included in the Acknowledgements section.

Input from the partners, cooperators, and public served a critical role in the development of this Plan and contributed to a plan that prioritizes local interests in coordination with the broader goals. The Partners kicked off the planning process by conducting the following activities:

- **Notification of Plan Update** – On May 17, 2019, the Partners solicited input from state agencies regarding issues to be addressed by the Plan and data relevant to the plan development process. The Partners received input from the following agencies:
 - *Board of Water and Soil Resources (BWSR)*
 - *Minnesota Department of Agriculture (MDA)*
 - *Minnesota Department of Health (MDH)*
 - *Minnesota Department of Natural Resources (MNDNR)*
 - *Minnesota Pollution Control Agency (MPCA)*
- **Public Kickoff Meetings** – On September 5th and 6th of 2019 the Partners hosted two public kickoff meetings: one in Willmar and one in Renville. Members of the Steering Team and Policy Committee were also in attendance. Kenneth Blumenfeld, Senior Climatologist of the Minnesota State Climate Office was the guest speaker presenting on local climate trends. BWSR staff, state agencies, and the Partners planning consultant, Emmons & Olivier Resources, Inc. (EOR), presented relevant data in poster format and solicited input from attendees regarding local knowledge, priority concerns and resource use.

Throughout the planning process, stakeholder input was shared, received, and considered through frequent meetings of the Steering Team, Advisory Committee and Policy Committee as described in this section of the Plan. Table 1-2 presents a timeline of key committee meetings held during the Plan development process.

Table 1-2. Meetings Held During Plan Development

Date	Committee	Major Agenda Items
August 9, 2019	Steering Team	Preparing for Public Kickoff Meeting
August 21, 2019	Steering Team	Kickoff Meeting preparation, Advisory Committee and Policy Committee meeting schedules set
September 4, 2019	Policy Committee	State agency presentation from MPCA staff and review Scope of Services from EOR
September 5, 2019	All	Planning kickoff meeting in Willmar, MN
September 6, 2019	All	Planning kickoff meeting in Renville, MN
October 2, 2019	Policy Committee	Introduction to the 1W1P planning process, kickoff meeting summary of events, state agency presentation from MDH staff, and review Advisory Committee member list and appoint ex-officio member
October 23, 2019	Steering Team	Introduction to Accounting of Local Funds and Description of Existing Programs Exercises
November 20, 2019	Steering Team	Local Funding Capacity sources identified
November 20, 2019	Advisory Committee	Introduction to Planning Area and Issues Identification
December 4, 2019	Policy Committee	Final Advisory Committee member list reviewed
January 8, 2020	Policy Committee	State agency presentation from DNR staff
January 15, 2020	Steering Team	Identification of Priority Issues and Resources
January 15, 2020	Advisory Committee	Identification of Priority Issues and Resources
February 5, 2020	Policy Committee	Identification of Priority Issues and Resources
February 19, 2020	Steering Team	Identification of Priority Issues and Resources; Developing Desired Future Condition
February 19, 2020	Advisory Committee	Identification of Priority Issues and Resources; Developing Desired Future Conditions
March 4, 2020	Policy Committee	Identification of Priority Issues and Resources; Developing Desired Future Conditions
March 18, 2020	Steering Team	Issues Prioritization and Plan Structure
March 25, 2020	Steering Team	Issues Prioritization for the Upper Hawk HUC-10 Subwatershed
April 1, 2020	Steering Team	Issues Prioritization for the Chetomba Creek HUC-10 Subwatershed
April 8, 2020	Steering Team	Issues Prioritization for the Beaver Creek and Fort Ridgely Creek HUC-10 Subwatersheds
April 29, 2020	Steering Team	Issues Prioritization for issues/resources outside of Priority Areas; selecting indicators used to describe progress towards goals
May 13, 2020	Steering Team	HSPF-SAM Scenario Planning Exercise/Workshop
May 20, 2020	Steering Team	HSPF-SAM Scenario Planning
May 27, 2020	Steering Team, Advisory Committee – State Agency Representatives	Identification of Priority Issues and Resources
June 10, 2020	Steering Team	Targeting, Practices and Priority Areas

Date	Committee	Major Agenda Items
June 10, 2020	Policy Committee	Planning progress update (Covid-19 impacts), MCIT presentation discussion
August 5, 2020	Steering Team	Drafting Measurable Goals
August 20, 2020	Steering Team	Implementation Budget, Drafting Measurable Goals, Draft Plan review
September 2, 2020	Policy Committee	Planning process update and status of MCIT presentation
September 3, 2020	Advisory Committee – Lakes Area Sub-Committee	Establishing goals for the Willmar chain-of-lakes
September 16, 2020	Steering Team	Drafting Measurable Goals
October 7, 2020	Steering Team	Drafting Measurable Goals
October 9, 2020	Advisory Committee – Lakes Area Sub-Committee	Establishing goals for the Willmar chain-of-lakes and identifying implementation activities
October 13, 2020	Advisory Committee – Lakes Area Sub-Committee	Establishing goals for the Willmar chain-of-lakes and identifying implementation activities
October 21, 2020	Steering Team	Measurable Goals, identifying implementation activities and populating Targeted Implementation Schedule
November 4, 2020	Steering Team	Finalizing Measurable Goals, identifying implementation activities and populating Targeted Implementation Schedule
November 4, 2020	Policy Committee	Planning process update, Organizational Structures for Implementation – MCIT presentation, Yellow Medicine 1W1P Implementation presentation – Michelle Overholser
November 18, 2020	Steering Team	Finalizing Measurable Goals, identifying implementation activities and populating Targeted Implementation Schedule
December 2, 2020	Policy Committee	Planning process update – planning documents
January 20, 2021	Steering Team	Status of the draft Plan, Implementation Schedule, Ranking tool, Policy Committee meeting/New elected officials
February 3, 2021	Policy Committee	Introducing new Policy Committee members to the BWSR One Watershed, One Plan (1W1P) Planning Process
March 3, 2021	Policy Committee	Organizational Structures for Implementation
March 17, 2021	Steering Team	Organizational Structures for Implementation
March 22, 2021	Policy Committee	Special Meeting to continue discussions regarding Organizational Structures for Implementation



2 LAND AND WATER RESOURCES NARRATIVE

2.1 PLANNING AREA ZONES

There are three distinct zones in this watershed differentiated by their geographic and ecological characteristics. These Zones include the “Lakes Zone,” the “Agricultural Zone,” and the “Minnesota River Zone” (see Figure 2-1).

2.1.1 Lakes Zone

Geographic Setting

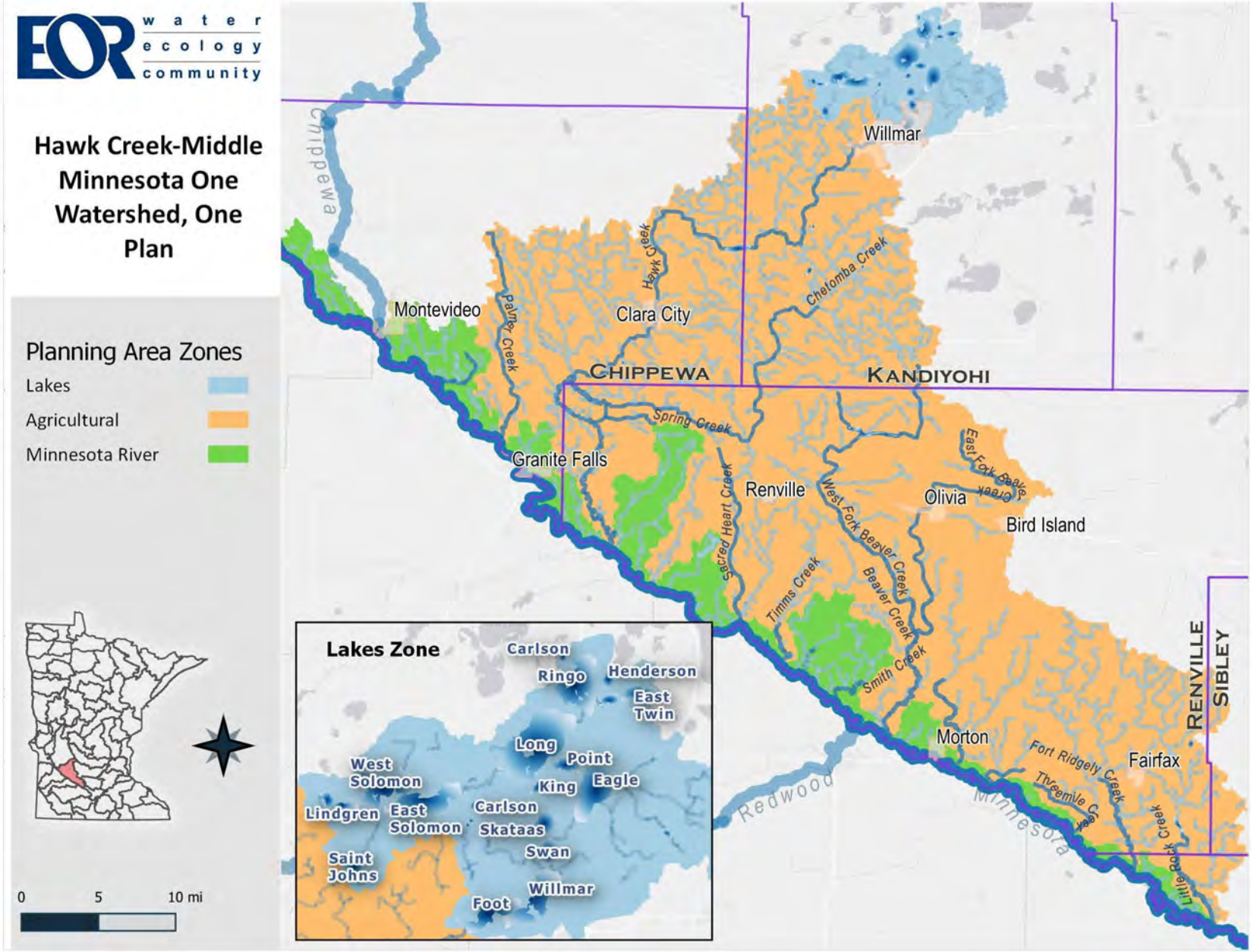
The Lakes Zone of the Hawk Creek–Middle Minnesota Planning Area is in the northernmost region of the watershed in Kandiyohi County. This Zone is located in the headwaters of the watershed. As such, many of the activities that occur in this region impact downstream resources, particularly Hawk Creek and the Minnesota River. This Zone is part of the Upper Hawk Creek Subwatershed, which drains to the Lower Hawk Creek Subwatershed (along with the Chetomba Creek Subwatershed). This larger, more connected drainage pattern is unique from the rest of the watershed, which is comprised of individual subwatersheds that drain directly to the Minnesota River.

The predominant land uses in this Zone include lakes and wetlands, grasslands and hay, agriculture, and developed land. The City of Willmar (population 19,600) is located in this Zone. The City operates on a Municipal Separate Storm Sewer System (MS4) General Permit, meaning their sanitary sewer is separate from their storm sewer and they are under stricter regulatory requirements than other non-MS4 municipalities. Their wastewater treatment plant discharges directly into Hawk Creek just south of Foot Lake. Stormwater management is an important issue in this area given the amount of impervious coverage and the amount of development that occurred prior to the establishment of a formal stormwater management program. The City of Willmar is currently working on their 2020 Comprehensive Plan, which is proposed to be completed in the summer of 2021. The urban growth boundary, according to the City’s public GIS map, extends north and surrounds Eagle Lake.

Water Resources and Hydrology

The glacial lakes in this region, carved from the Alexandria Moraine, are a key feature. The region carved by this particular moraine contains the thickest glacial drift in the state and reaches the highest altitudes in western Minnesota. Its rugged topography and heavily wooded vegetation make the area well suited for recreational land as opposed to agricultural land (Simms and Morey 1972). To view this topography, follow the Glacial Lakes State Trail, which starts north of the watershed. Eagle Lake is at the headwaters of Hawk Creek, which travels through Swan, Willmar (main and south basin), and Foot Lakes before heading south into the Agricultural Zone. These lakes are used heavily by watershed residents and tourists for various purposes including summer and winter fishing, swimming, and boating.

Figure 2-1. Zones of the Hawk Creek-Middle Minnesota Planning Area



Six of the seven lakes on the 2018 Impaired Waters List are in the Lakes Zone and seven of the lakes in this Zone are high quality lakes that are fully supporting for recreation (Table 2-1). Eagle Lake is of particular interest to many residents because it is expected to have a large amount of development and is on the brink of being impaired. Eagle Lake Association and Willmar/Foot Lake Association are both active Lake Associations working to protect, preserve, and enhance the quality of the area's lakes. There is also a great deal of agricultural activity both within and to the south of this region. Therefore, partnerships between the urban and agricultural communities to address issues in the watershed were identified as being very important to watershed stakeholders. While there are many wetlands in this Zone, many have also been drained resulting in unfavorable conditions associated with altered hydrology. Some of these conditions include eroding shorelines, eroding streambanks, increased rate of stream flow, and increased flooding.

The Lakes Zone is home to a calcareous fen which is located in the Sweep Waterfowl Production Area (WPA). Calcareous fens are a unique type of wetland that are among the rarest natural communities in the United States and support multiple rare plant species. Their dependence on groundwater makes them highly vulnerable to changes in the quantity and quality of the groundwater that feeds these resources. Additionally, there are a number of lakes, ponds, and wetlands that may be susceptible to changing groundwater aquifer levels in this Zone. Some of these resources include Lake Henderson, Lake Skataas, Ringo Lake, and Long Lake. Many residents have private wells around the lakes, particularly on Eagle Lake, and many of these wells have been monitored for nitrate and arsenic by the Minnesota Department of Health. Results of this monitoring indicate that the groundwater is at risk for arsenic (a naturally occurring contaminant) and nitrate contamination. Pesticide applications also pose a risk to contamination in the groundwater. There are multiple communities in the Lakes Zone with Wellhead Protection Plans including the cities of Willmar and Pennock. These plans demonstrate that the Drinking Water Management Supply Areas (DWSMAs) have moderate to low vulnerability and are not highly susceptible to contamination.

Table 2-1. Impaired and Fully Supporting Lakes from 2018 Assessed Lakes (source: MPCA)

AUID	Lake Name	Aquatic Recreation	Aquatic Consumption
34-0186-00	Swan	o	
34-0193-00	Point	•	
34-0116-00	Henderson	•	•
34-0246-00	East Solomon		•
34-0115-00	East Twin	•	
34-0245-00	West Solomon	o	
34-0117-00	West Twin	•	
34-0266-00	Olson*	o	
34-0283-00	Saint Johns	o	
34-0171-00	Eagle	•	•
34-0180-01	Willmar (main basin)	o	
34-0172-00	Ringo	o	
34-0181-00	Foot	•	
34-0180-02	Willmar (south basin)	•	
34-0192-00	Long	o	•

• = fully supporting; o = impaired; *not in Lakes Zone

2.1.2 Agricultural Zone

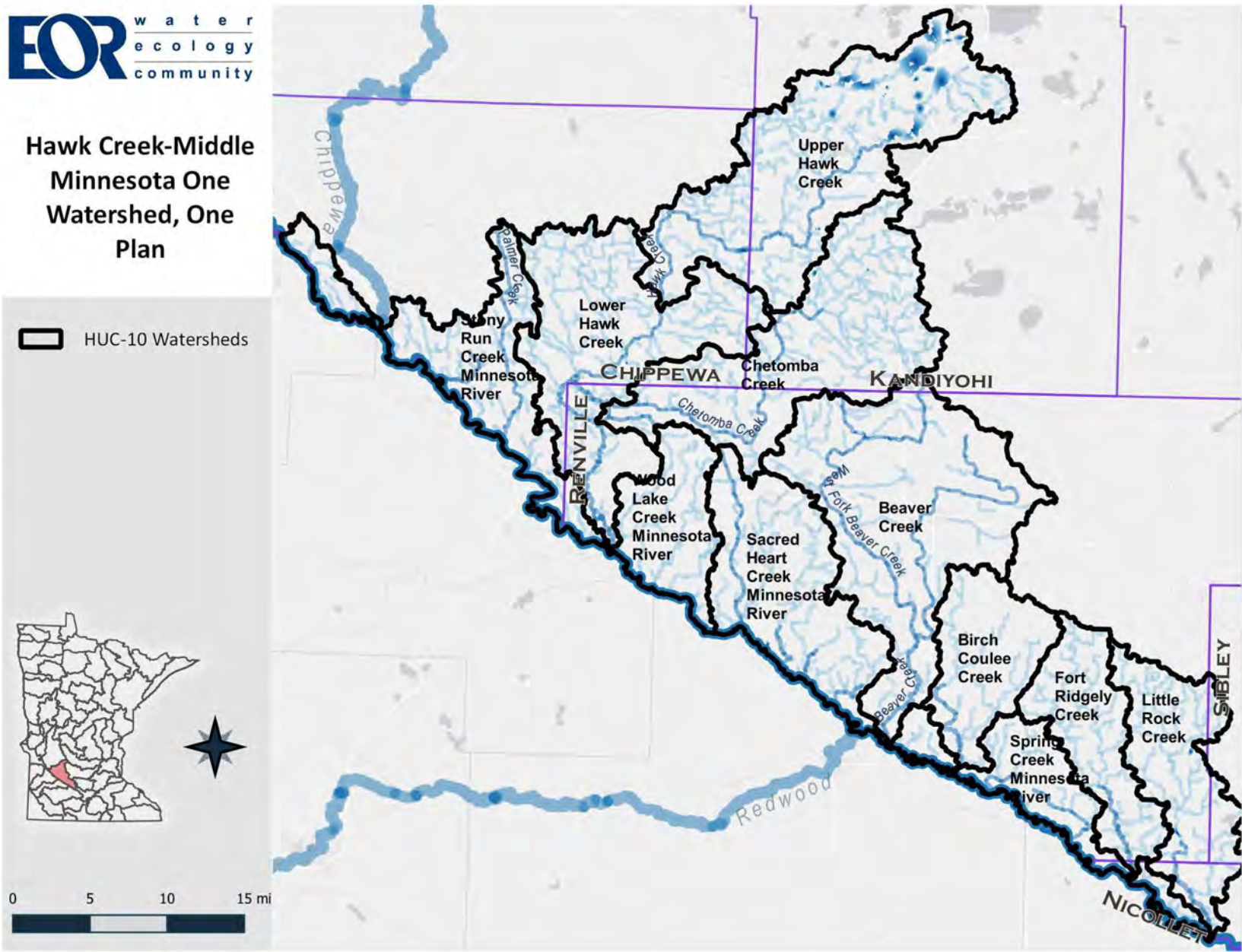
Geographic Setting

The Agricultural Zone is the largest zone in the Hawk Creek-Middle Minnesota Planning Area, encompassing portions of all five counties and the majority of the farmed acres in the watershed. The primary crops are corn, soybeans, and sugar beets. Livestock production includes beef, turkey, swine, and dairy. Portions of 11 of the 17 communities in the Planning Area are located in this Zone, along with many of the key stakeholders, organizations, and industries.

There are twelve distinct subwatersheds draining to the Minnesota River in this Planning Area (Figure 2-2). Uniquely, nine of these drainage areas discharge directly to the Minnesota River. As a result, the river is particularly susceptible to nutrient pollution: the runoff from agricultural land use activities in each of these subwatersheds accumulates in the river and must be treated separately to mitigate downstream impacts.



Figure 2-2. HUC-10 Watersheds of the Hawk Creek-Middle Minnesota Planning Area



Water Resources and Hydrology

Many streams weave through this Zone and drain into the Minnesota River. A large number of streams and one lake (Olson Lake) are on the 2018 Impaired Waters List, and very few are supporting aquatic life (MnDNR 2019). The landscape is heavily disturbed due to drainage alterations (i.e. tile drainage and ditching). Many of the historic wetlands have been altered by drainage and/or filled for agricultural use (75%-95%), resulting in limited water storage capacity across the landscape (MPCA 2017; 2019). This is a huge point of importance in this watershed because altered hydrology has impacted so much of the landscape and is the result of large-scale land alterations across the Agricultural Zone. Stakeholders have reported significant changes in the hydrology of the landscape, resulting in flooding of roads and downstream communities (e.g. the City of Morton).

Recreation is fairly limited in this portion of the planning area, with some recreational land for hunting (primarily Waterfowl Production Areas and Wildlife Management Areas) scattered throughout the watershed and a portion of Fort Ridgely State Park in the southern portion of the Fort Ridgely Creek HUC-10 watershed. Across this Zone, sand and gravel deposits occur in the glacial deposits where meltwater flowed along channels through the glacier or in front of the glacier. These buried sand and gravel aquifers are important drinking water sources. The aquifers are long and linear, with some extending for miles while others were eroded and cut short by later glacial activity. The water level in the buried aquifers can vary significantly depending on the connection to surface recharge areas and the history of pumping from the aquifer, which results in a great deal of variability in finding places to drill new wells. There are 11 communities with completed or in-progress Wellhead Protection Plans in the Agricultural Zone (MDH 2020).

2.1.3 Minnesota River Zone

Geographic Setting

The Minnesota River Zone is located on the western border of the planning area following the Minnesota River corridor all the way down to Nicollet County. It is composed of the land draining directly to the Minnesota River and includes portions of Chippewa County, Renville County, and Nicollet County. The Minnesota River is a Wild and Scenic Recreational River and the entire drainage area is around 17,000 square miles. The Minnesota River enters the Hawk Creek–Middle Minnesota Planning Area immediately downstream of Lac qui Parle Lake, a large reservoir on the Minnesota River. Between 11 and 9 thousand years ago, the Minnesota River Valley was formed through the drainage of Glacial Lake Agassiz, which was one of the largest freshwater lakes in the world occupying around 123,500 square miles and stretching far into Canada. This drainage created the River Warren, which carried huge quantities of water from Lake Agassiz, sometimes stretching as wide as 5 miles. The path of River Warren carved out the Minnesota River Valley, which now leaves the path of a gentle prairie river, the Minnesota River, tiny in comparison to River Warren (Minnesota River Basin Data Center 2004; Seitz 2016; Jennings 2007).

This Zone is distinguished by the Minnesota River and the large bluffs seen along the banks. Bedrock outcrop is found in portions along the Minnesota River Valley and includes variants of gneisses and diorites. One example is the Morton Gneiss which is exposed in the town of

Morton. Bedrock throughout the watershed is primarily very old (more than 500 million years) igneous and metamorphic rocks. The Minnesota River Valley through the planning area is a tremendous resource for anglers, hunters, paddlers, camping, and outdoor recreationists. It includes both private and public parcels, opportunities for ecotourism, scenic drives, and tours of historical landmarks. There are sensitive animal and plant communities found here, as well as rock outcrops within rare prairies, and boulder dominated rapids in steep tributaries to the Minnesota River, such as Birch Coulee Creek. Fishing, paddling and other outdoor activities are popular, but opportunities have decreased due to dramatic flow alterations. The Minnesota River Fishery is an important recreational resource for anglers along the Minnesota River Valley and protecting this resource provides great opportunity for supporting recreation in this Zone.

Water Resources and Altered Hydrology

The Minnesota River Zone is impacted by many upstream activities but is the least altered of the entire landscape. The majority of watercourses are impacted by significant change in slope and drop of the Minnesota River Valley. These watercourses are differentiated from the streams in the Agricultural Zone by higher slopes and more potential for erosion. There are many protected species that inhabit this area as a result of there being numerous natural streams, wetlands, forested areas, and remnant prairies. Some key features include a calcareous fen near the Fort Ridgely State Park, three Scientific and Natural Areas, a number of county parks, Wildlife Management Areas, and Waterfowl Production Areas. It has been identified as a key prairie corridor in the Minnesota Prairie Conservation Plan (MnDNR 2011) and a conservation focus area in the Minnesota Wildlife Action Plan (MnDNR 2016). There is high recreational value in this Zone, with opportunities for boating, hiking, sightseeing, hunting, and fishing.

Turbidity impairments in the Minnesota River have resulted in significant work to assess the sources of sediment. The Minnesota River Sediment Delivery Analysis (Davis 2017) and a Sediment Reduction Strategy (Gunderson et al. 2015) were developed to address this issue.

There are multiple communities in the Minnesota River Zone with Wellhead Protection Plans including the cities of Franklin, Morton and Watson. These plans demonstrate that the Drinking Water Management Supply Areas (DWSMAs) have vulnerabilities that range from low to highly vulnerable-with a surface water contribution area.



2.2 CLIMATE CONDITIONS

According to data developed by the Minnesota State Climatology Office, the average annual temperature and precipitation have shifted to much warmer and wetter conditions, respectively, in the last 30 years (1987-2018) compared to prior recorded years (1895-1986). This trend is shown in Figure 2-3. In this figure, annual precipitation is displayed in inches on the Y-axis and annual average temperature is shown in Fahrenheit on the X-axis. The four quadrants represent the following conditions:

- *Upper left quadrant: lower temperatures, higher precipitation*
- *Lower left quadrant: lower temperatures, lower precipitation*
- *Lower right quadrant: higher temperatures, lower precipitation*
- *Upper right quadrant: higher temperatures, higher precipitation*

The green dots represent the conditions between 1895 and 1986, while the red dots represent the conditions between 1987 and 2018. As shown in Figure 2-3, there is a shift in the latter years into the upper right quadrant, representing higher temperatures and more precipitation.

With that, there are two key trends that have been observed by climatologists in Minnesota relating to climate conditions:

1. *Wetter conditions due to more precipitation, more snow, and more frequent & larger extremes.*
2. *Increasing temperatures especially at night, during winter, and when it is cold.*

Additionally, while the State Climatologist has not observed heat extremes or droughts getting worse in Minnesota, these are projected to get worse by mid-century.

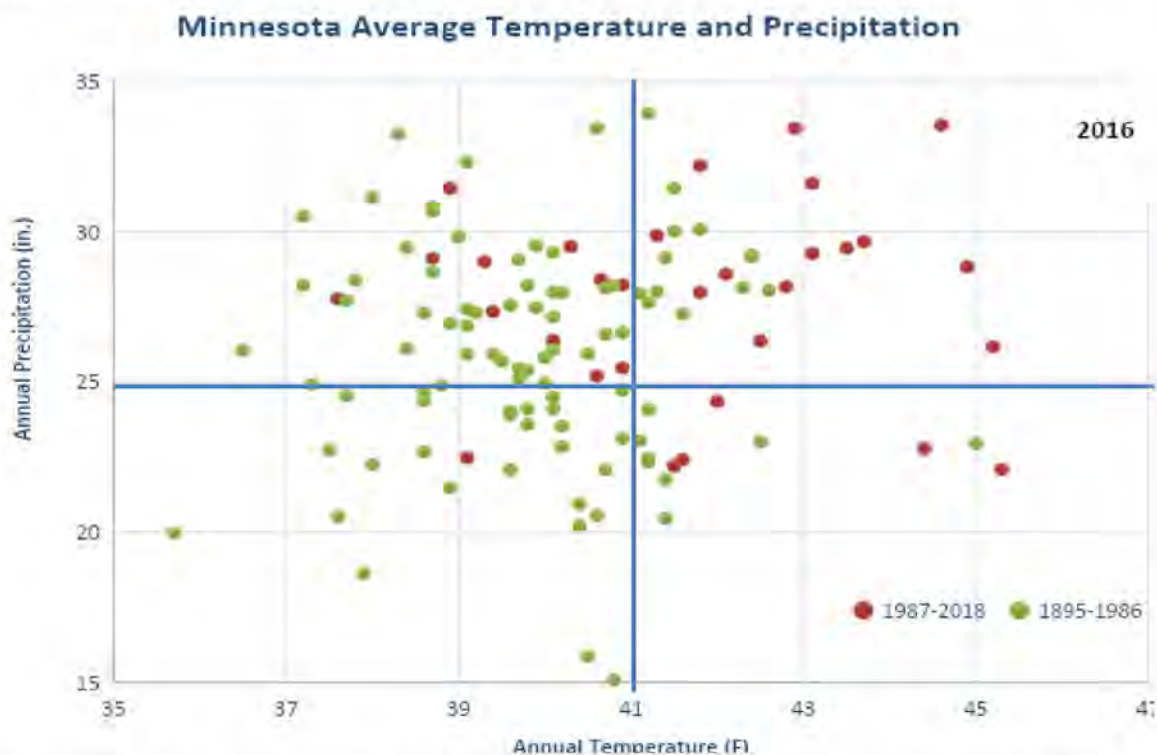


Figure 2-3. Minnesota Average Temperature and Precipitation (Source: MN State Climatology Office)

3 IDENTIFICATION AND PRIORITIZATION OF RESOURCES AND ISSUES

The identification of priority issues and where they will be addressed in the Hawk Creek-Middle Minnesota Planning Area is an important component of the Comprehensive Watershed Management Plan development process. According to BWSR guidance, this part of the planning process should result in:

“A prioritized list of issue statements that clearly convey the most pressing problems, risks, and opportunities facing the watershed, and maps depicting locations of priority resources”.

Not every issue can be addressed everywhere in the planning area within 10-years, therefore the Policy Committee, Advisory Committee, and Steering Team used a multi-step, iterative process for prioritizing resources and targeting areas for implementation during the 10-year timeframe of the Plan. Several tools were utilized during the issue prioritization process, including review of existing planning documents, an interactive web-mapping tool, and the ranking of issues by Priority Area.

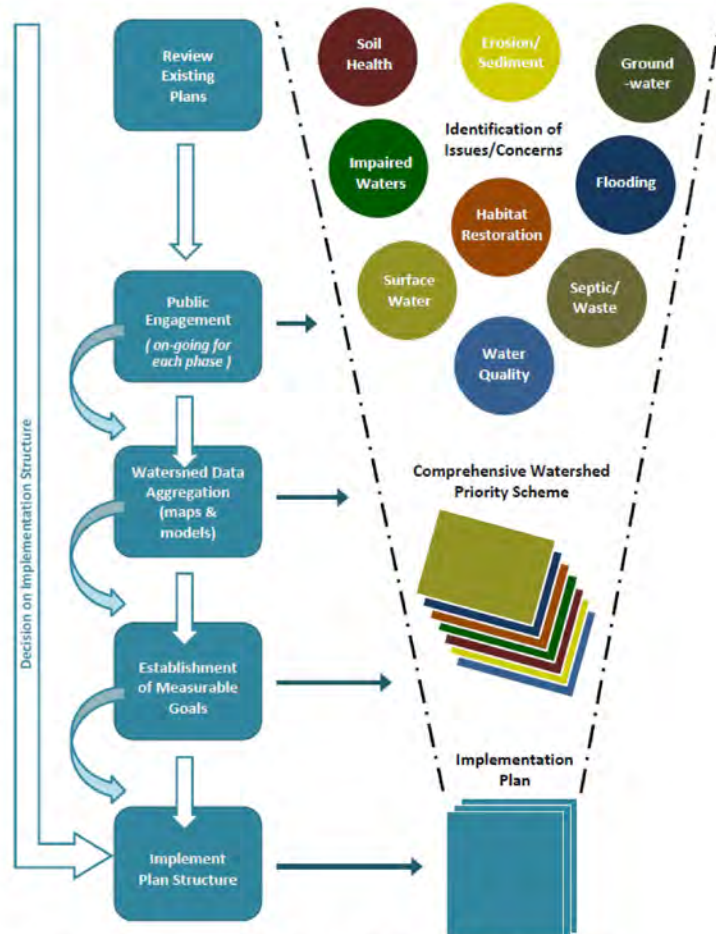


Figure 3-1. Schematic of the Comprehensive Watershed Management Plan Planning Process

This section of the Plan describes the process used to identify the issues and priorities that will be addressed within the 10-year timeframe of this Plan (generally depicted in Figure 3-1).



3.1 COMPILATION AND REVIEW OF EXISTING DOCUMENTS

Approximately 50 documents were compiled to create a comprehensive list of plans to inform the Hawk Creek - Middle Minnesota Comprehensive Watershed Management Plan (HCMM CWMP) planning process (Appendix B). Information contained in these plans was entered into a database which was used to highlight potential issues, goals, objectives, and action items already identified for the planning area. The planning documents reviewed can be categorized as follows:

- *County Local Water Management Plans*
- *Surface water management plans (e.g. Middle Minnesota – Mankato Watershed Restoration and Protection Strategy, Hawk Creek Watershed Restoration and Protection Strategy)*
- *Groundwater management plans (e.g. Hawk Creek-Middle Minnesota Watershed Groundwater Restoration and Protection Strategies report)*
- *State resources and documents (e.g. 2016 Nonpoint Priority Funding Plan, Minnesota Nutrient Reduction Strategy, Sediment Reduction Strategy for the Minnesota River Basin and South Metro Minneapolis, Total Maximum Daily Load)*
- *Known pollutant modeling and assessment efforts for local resources (HSPF-SAM, Upper Hawk Creek and Willmar Chain of Lakes Section 319 Nine Key Element Plan)*
- *Natural resources management plans (e.g. Minnesota's Prairie Conservation Plan, MNDNR Wildlife Action Plan)*

As part of the local water management process, and pursuant to Minnesota Statutes: 103B.304-103B.355, a notification letter is required to be sent to Plan review authorities and other stakeholders of the Comprehensive Watershed Management Plan development process. This notification letter invites Plan review authorities and other stakeholders to submit priority issues and concerns for consideration in the Plan development process. Issues flagged by the state agencies to be addressed by the Plan were also included in the database.

3.2 INTERACTIVE WEB-MAPPING TOOL

EOR developed an interactive web-mapping tool for the planning partners to use during the prioritization process. This interactive web-mapping tool allows the user to clip data layers to the Hawk Creek-Middle Minnesota Planning Area and stack the various layers of information on top of each other. Not only does this tool allow the user to see where there are specific restoration or protection needs (e.g. areas with high nutrient loading), it also highlights areas where multiple restoration or protection needs are concentrated (e.g. areas with high nutrient loading, high pollution sensitivity of near surface materials and local recreational value). This spatial platform allowed the planning partners to see where the greatest needs are in the watershed and where restoration and protection strategies would address multiple issues.

3.3 PRIORITY ISSUES

At the end of the issues identification and prioritization process, the planning partners developed draft issue statements to describe the problems that will be addressed in the Plan.

3.3.1 Impaired Lakes and Streams

The Hawk Creek-Middle Minnesota Planning Area is unique in that it consists of numerous drainage areas, each of which contains stream systems that discharge directly to the Minnesota River. Poor quality of surface water has resulted in state-classified impairments of 7 lakes and 39 stream reaches for a handful of reasons including high levels of phosphorus, sediment loading, bacteria (*E. coli*) and nitrogen as a stressor. These resources are at risk of contamination from a multitude of sources, including livestock and manure contamination, fertilizers, agricultural drainage, stormwater runoff, sanitary sewer treatment systems (SSTS), erosion and sediment loading to downstream waterbodies, construction site runoff, and industrial activity. Over the years, residents have seen a decline in the quality of water while recreating, fishing, and hunting on these resources.

3.3.2 Altered Hydrology

The Hawk Creek-Middle Minnesota Planning Area's hydrology has changed over the last century. Because of several broad factors, the landscape has transitioned from perennial (prairie) to agricultural landcover impacting infiltration rates and evapotranspiration patterns. These hydrologic changes will be further exacerbated by changes to our climate and precipitation patterns. There has been a loss of wetlands, soil water holding capacity, and increased impervious surfaces on the landscape impacting infiltration and stream flows. Streams have been transformed into efficient drainage systems that quickly remove excess water for agricultural production and/or development. There has also been a change in the amount of rainfall and an increase in the severity of rainstorms. The combination of environmental and landscape changes has led to increased surface runoff, a change in the timing and magnitude of stream flows and a degradation of aquatic habitat. These alterations of the landscape's water balance and hydrologic regime are summarized by the term "altered hydrology".

3.3.3 Soil Erosion and Sediment Loss

Sediment is transported across land by water and wind activity. Excessive quantities of sediment can have negative implications for aquatic life and recreation. Excess suspended sediment is a serious problem in the Minnesota River Basin. Many stations along the Minnesota River and its tributaries are greatly exceeding water quality standards for turbidity, with 5 stream reaches impaired for turbidity in the Hawk Creek-Middle Minnesota Planning Area. Streambanks in the watershed have been severely eroded, causing increased sediment transport. Stream and ditch bank erosion account for an estimated half of the sediment load in the watershed; however, much of this is due to unnaturally accelerated erosion of stream banks caused by the altered hydrology. Data show that the lower half of the watershed (the area closer to the Minnesota River) tends to have higher concentrations of sediment, with small portions of the watershed currently meeting sediment standards.

3.3.4 Groundwater Supply & Drinking Water Protection

Groundwater accounts for 100 percent of the region's drinking water, which is why the quality and the quantity of groundwater are important to the health and safety of those who reside, work and recreate in the watershed. Groundwater has a greater risk to contamination in areas of high pollution sensitivity. Most of the watershed is protected by layers of dense glacial till and other fine-grained sediments, but some localized areas in the central and southern portions of the watershed have permeable sand and gravel at the land surface. Many land-use activities (including row crop agriculture, stormwater, subsurface sewage treatment systems, and tank/landfills) within the Planning Area could contaminate groundwater if pollutants are not carefully managed, especially in areas of high pollution sensitivity. Contaminants of concern, both naturally occurring and from human activity, include nitrates, arsenic, bacteria, and pesticides. In addition, there are active tank sites and leak sites that may cause localized groundwater pollution if not properly managed.

Of the 20 community public water systems, two exhibit a very high and/or high vulnerability in all or part of their Drinking Water Supply Management Area (Renville North and Montevideo). There are over 3,000 domestic water supply wells in the Hawk Creek-Middle Minnesota Planning Area. While public water systems are required to ensure safe and reliable drinking water for the end-user, private well users are responsible for making sure their water is safe for everyone in the household to drink.

3.3.5 Flooding

Excessive flooding threatens public safety, property, and riparian systems. Impacts from flooding experienced in the Hawk Creek-Middle Minnesota Planning Area include damages to structures (such as homes), property, roads and other infrastructure, and recreational trail systems. Excessive flooding carries a high cost for affected communities and individuals, including flood fighting costs, post-flood cleanup costs, business and agricultural losses, increased expenses for normal operating and living during a flood situation, and benefits paid to owners from flood insurance. Communities like the City of Morton are grappling with the effects of flooding and trying to determine how best to address the need to improve existing infrastructure and make their community more resilient in the face of a changing climate.



3.3.6 Recreation

Outdoor recreation is a vital component of this watershed due to its direct connection with the Minnesota River and historic glacial lakes region. While there are a number of parks, Scientific and Natural Areas, and Waterfowl Protection Areas in the Planning Area (e.g. Fort Ridgely State Park, Joseph R. Brown State Wayside, Gneiss Outcrops SNA, River Warren Outcrops SNA, Morton Outcrops SNA), there are very few recreational lands/opportunities in the Agricultural Zone. Many of the resources local stakeholders and tourists enjoy throughout the seasons are experiencing pressure from activities such as intensive farming and urban development.

3.3.7 High Quality Lakes and Streams

Lakes and streams are under stress from climatic variability and land use changes. Certain lakes in the Hawk Creek-Middle Minnesota Planning Area are highly valued because they have outstanding water quality and/or support diverse biological communities including fisheries. Within the Planning Area, there are nine streams and six lakes that have been identified for protection by the Watershed Restoration and Protection Strategies reports (Table 3-1). Additionally, the MNDNR notification letter identified Limbo Creek and Sacred Heart Creek as high value stream reaches because their tributaries are largely unaltered and because they contain large portions of remaining floodplain wetlands. Swan Lake, a large Type V wetland in Sibley County was also identified because it has outstanding biological diversity.

Table 3-1. Protection Resources Designated by WRAPS (source: MPCA)

WRAPS Designation	AUID	Resource Name
Streams for Protection	07020007-672	County Ditch 111
	07020007-707	Judicial Ditch 12
	07020007-663	Unnamed Creek
	07020007-665	County Ditch 100
	07020007-668	Unnamed Creek
	07020007-525	County Ditch 3
	07020007-664	County Ditch 115
	07020004-610	Brafees Creek
	07020004-675	County Ditch 45
Lakes for Protection	34-0171-00	Eagle Lake
	34-0181-00	Foot Lake
	34-0193-00	Point Lake
	34-0115-00	East Twin Lake
	34-0117-00	West Twin Lake
	34-0116-00	Henderson Lake

3.3.8 Climate Resiliency

Changes in climate conditions are taking place globally and are drastically impacting the priorities and risks of developing communities as they plan for future growth. In the Minnesota River Valley, seasonal changes in climate conditions include increases in the size and severity of precipitation events and increased temperatures. This is resulting in the presence of more extreme weather conditions, including large and damaging storms. These climactic changes are not only having immediate impacts to heavily urbanized communities, but also, in a large part, to agricultural landscapes. Threats to public health and safety are increasing as the risk for flooding of homes, fields, roads are becoming more severe. Because climate change is an emerging concern, the state of the science on this topic is constantly changing, resulting in large challenges in the realm of planning and policy development.

3.3.9 Urban Stormwater Management

There are 17 cities and townships within the Planning Area, including three urban clusters - defined by the U.S. Census Bureau as a community with a population between 2,500 and 50,000 people (2018). These urban clusters are Willmar, Montevideo, and Granite Falls. Both the cities of Willmar and Montevideo are required to operate with a Minnesota NPDES Municipal Separate Storm Sewer System (MS4) permit which means they implement a Storm Water Pollution Prevention Program to address stormwater-related impacts to downstream resources. While MS4 communities have the programs and plans in place to address stormwater management, the needs can be significant, particularly in communities such as Willmar, which has multiple resources with impairments and significant development pressure. For non-MS4 communities, with limited resources, the challenges include understanding the stormwater management needs, condition of existing infrastructure system, and financial resources.

3.3.10 Hazardous Materials, Solid Waste and Environmental Contaminants

There are a number of sites across the watershed with hazardous materials, solid waste, and environmental contaminants. The greatest number of these sites lies within and around the City of Willmar and include underground storage tanks, above ground storage tanks, generators, and closed landfill (Clarence Flykt Demolition Landfill) (MPCA 2021). These sites all pose threats to the quality of the land and water resources in this region. (See Sections 3.3.15 Agricultural Practices and Runoff Management and 6.4.1 County Regulations for more information on managing the environmental risk posed by feedlots.)

3.3.11 Monitoring and Data Collection

While there is an existing watershed monitoring framework (MPCA Intensive Watershed Monitoring, Watershed Pollutant Load Monitoring Program, volunteer monitoring programs) being implemented, there are gaps in baseline information that make the establishment of restoration and protection goals for surface water and groundwater resources difficult. For example, Tetra Tech's 2011 HSPF memorandum states that there is only one USGS station with a long period of record in the Planning Area near Granite Falls, which is historically a difficult gage to calibrate. Additionally, the Hawk Creek Watershed Project has conducted additional gaging on Hawk Creek and Beaver Creek since 1999, but these gages only operate seasonally (April through September). While long-term monitoring data exists, there is the need to expand the program to include additional resources and to continue monitoring in the future to fill gaps and assess progress towards achieving the resource goals established in this Plan.

3.3.12 Aquatic Invasive Species

Aquatic Invasive Species (AIS) threaten the habitat and water quality of lakes and streams in the Hawk Creek-Middle Minnesota Planning Area. Eagle Lake is on MDNR's infested water list for zebra mussels (which puts the entire chain of lakes at risk), but many other water bodies have confirmed new or existing populations of AIS. Existing and possible future AIS in this watershed include zebra mussels, starry stonewort, curly leaf pondweed, Eurasian watermilfoil, and common carp. The spread of AIS is of particular concern in bodies of water that have many boat access points, particularly those that see lots of traffic. There is a need to protect lakes and streams at risk for spread of invasive species from other infested water bodies.

3.3.13 Wildlife Habitat

In-stream and riparian (upland) habitat are essential to protecting surface water quality, groundwater quality, and fish and wildlife habitat. The WRAPS report identified habitat problems including loss and degradation of aquatic and riparian habitat, lack of natural buffers, and excess sediment in the stream bed primarily due to altered hydrology. Protecting and increasing natural areas within the watershed are key factors to protecting water quality, increasing wildlife habitat, and enhancing recreational and hunting opportunities in the watershed.

3.3.14 Subsurface Sewage Treatment Systems

According to county inventories and staff estimates, a relatively small number of failing subsurface sewage treatment systems (SSTS), are located in the Hawk Creek-Middle Minnesota Planning Area. Failing SSTS can pollute both surface water and groundwater by not providing adequate treatment. Inadequate treatment of sewage allows bacteria, viruses, parasites, nutrients, and other disease-causing pathogens to enter surface and groundwater resulting in contaminated water. There are also synthetic cleaning products, pharmaceuticals, and other chemicals used in the house that can be toxic to humans, pets, and wildlife which if allowed to enter a septic system these products may reach groundwater, nearby surface water, or the ground surface due to the soil not being able to treat them. To ensure adequate treatment it is necessary to have a trained professional ensure adequate unsaturated and suitable soil exists below the soil treatment area to allow for complete wastewater treatment. Proper installation, usage and maintenance is key to maintaining adequate treatment and help in improving or preserving safe water quality.

3.3.15 Agricultural Practices and Runoff Management

Agriculture is a vital component of this Planning Area's economy and landscape and is the dominant land use type, making up 84% (678,160 acres) of the entire watershed. Much of this landscape has been altered to increase production including the channelization of streams and tiling of wetlands and large-scale pattern tiling, which has led to many of the issues described above (i.e. altered hydrology, erosion and sediment loss). The adoption of agricultural BMPs is a strategy being employed by many to mitigate some of these adverse impacts of agricultural production. These BMPs can be structural or non-structural in nature. Structural practices are typically longer duration constructed practices used to treat pollutants and runoff (e.g. water and sediment control basins, alternative tile intakes, rain gardens, cattle exclusions, waste pit

closures, grade stabilization, terraces, grassed waterways, and wetland restorations) whereas nonstructural practices are management practices that directly reduce the amount of pollutants and runoff generated from agricultural fields (e.g. cover crops, conservation tillage, and soil health practices). These types of BMPs are one of the primary methods to manage runoff and mitigate water quality and quantity issues in the watershed. However, according to data collected by MPCA on the BMPs implemented by watershed, the rate of adoption is very low (1-2% of suitable land) (MPCA 2018). Therefore, there is great opportunity for improving water quality using farmland that has not yet adopted agricultural BMPs. Education and outreach will play an important role for increasing adoption rates within this watershed. For BMP siting, MDA highly recommends using PTMapp and ACPF to optimize economical and environmental benefits.

3.3.16 Education and Outreach (Social Based Challenges)

Water resource managers in Minnesota are increasingly investing scarce resources in outreach education programs and technical assistance programs to promote landowner adoption of conservation practices. Given the predominance of agricultural land use (84%) in the Hawk Creek-Middle Minnesota Planning Area, most of the actions needed to restore its natural resources require citizens to voluntarily adopt the practices needed to make substantial improvements happen. A social science assessment of landowner conservation behavior in the Middle Minnesota planning area (conducted by the Center for Changing Landscapes and the Department of Forest Resources in collaboration with Nicollet County) found that, “overall, landowners are highly concerned about the consequences of water pollution and feel a sense of personal obligation to protect water resources”. This assessment found that the greatest constraints to water resource conservation are the lack of personal financial resources, equipment, community financial resources, and community leadership and that there is a need to reduce the complexity of conservation programs and to provide evidence that conservation practices improve water resources.



Soil Health Field Day – Renville County, MN

3.4 PRIORITY RESOURCES

To supplement the information presented in the Interactive Web Mapping Tool with local knowledge and values, the planning partners were asked to participate in a series of workshops. During these workshops, participants identified issues within the watershed and identified priority subwatersheds within the watershed where these concerns are most prevalent.

The first workshop took place in November 2019, where the planning partners were asked to identify priority issues and resources within each of the following zones: Lakes, Agricultural, and Minnesota River. The exercise began with an introduction to the Planning Area using the interactive web-mapping tool. Using poster-sized aerial maps of the Planning Area, the Partners performed the following activities:

- Identified what they considered to be the most important issues in the landscape and added sticky notes explaining where these issues are most concerning to the local representatives.
- Identified additional information about the resources or landscape that had not been reflected in the interactive web mapping tool.

At the end of the meeting, participants summarized their highest priority issues for each of the three planning Zones, as reflected in Figure 3-2. These issues are also restated in Table 3-2.

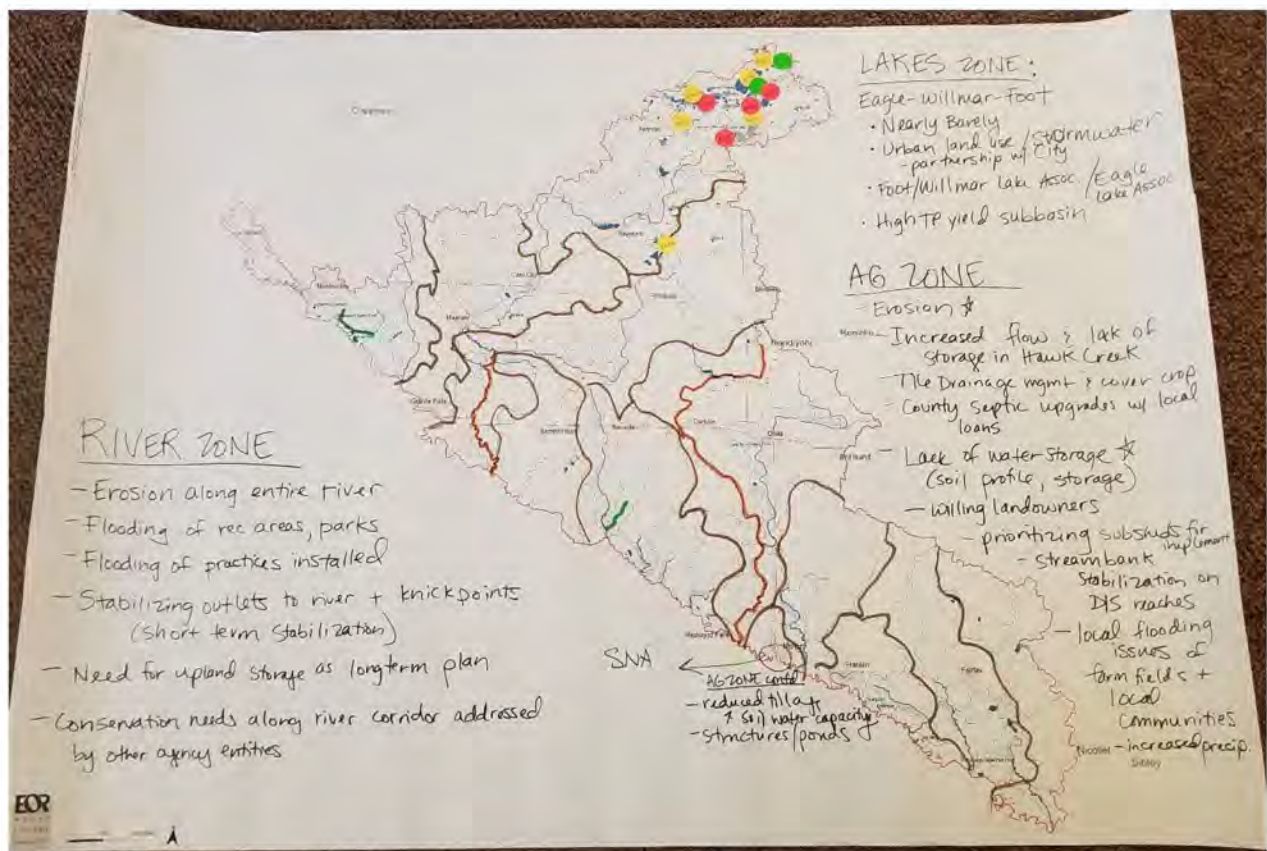


Figure 3-2. Summary of top issues for each zone as identified at the Advisory Committee Meeting – Nov. 20, 2019

Table 3-2. Summary of Top Issues for Each Zone as Identified at the Advisory Committee Meeting – Nov. 20, 2019,

Zone	Comment(s)
Lakes Zone	Eagle-Willmar-Foot Chain of Lakes (Priority)
	Priority characteristics: Nearly-Barely resources, urban land use/stormwater, partnerships w/city, Lake Associations (Foot/Willmar & Eagle Lake), higher TP yields in subwatershed
Agricultural Zone	Erosion
	Increased flow and lack of storage in Hawk Creek subwatershed
	Tile drainage management and need for cover crops
	County septic upgrades with local loans
	Lack of water storage (soil health)
	Willing landowners for volunteer adoption
	Streambank stabilization on downstream reaches
	Regional flooding in communities along Hawk Creek and local flooding of farm fields
	Increased precipitation
Minnesota River	Erosion along entire river
	Flooding of recreational areas/parks
	Flooding of installed practices
	Stabilizing outlets to river and knickpoints (short-term stabilization)
	Need for upland storage as a long-term plan
	Conservation needs along Minnesota River corridor addressed by other agency entities



The second workshop took place in January 2020. The goal of this workshop was to identify:

1. Highest priority subwatersheds (for further evaluation)
2. Highest priority resources within these subwatersheds
3. Issues or concerns used to rank these areas/resources as a higher priority.

Unlike the first workshop which was conducted jointly for the Steering Team and the Advisory Committee, this workshop was conducted separately for each group. The Steering Team, Advisory Committee and Policy Committee each went through a similar exercise of identifying the highest priority subwatersheds, resources and issues.

For this workshop, Partners were given a worksheet (Figure 3-3) and asked to prioritize subwatersheds, resources and issues using a series of maps which summarized the information included in the interactive web mapping tool. The datasets that inform the content of these maps is provided in Table 3-3. As the Consultants reviewed how each of the figures was generated and how the information may inform the prioritization process, meeting participants were asked to fill in the worksheets. In addition to selecting their top three HUC-10 subwatersheds, each meeting participant answered the following three questions for each subwatershed:

1. Which resources are of greatest priority to you (e.g. Ringo Lake, Hawk Creek)?
2. Which maps best informed your decision?
3. What additional information informed your decision (i.e. what else do you know about the area that informed your decision)?

This information was summarized on a single map of the Planning Area. Subwatersheds were then ranked by the planning partners (Appendix C). These figures show how many times a subwatershed was identified as a high priority by each group and includes call-out boxes that summarize the issues and opportunities identified for each HUC-10 subwatershed.

The third and final workshop for the prioritization of resources and issues phase of the planning process took place on February 19, 2020. At this workshop, the planning partners were asked to select the highest priority HUC-10 subwatersheds for goal setting and implementation. Both groups selected Upper Hawk Creek, Chetomba Creek, Beaver Creek and Fort Ridgely Creek to be the focus of this planning effort (Figure 3-4).



Priority Resource / Issue Targeting

Subbasins with highest pollution yields shown in darker orange/red

HSPF Total Sediment (tons/acre/year)

HSPF Total Nitrogen (lbs/acre/year)

HSPF Total Phosphorus (lbs/acre/year)

Highly Altered Hydrology

Surface Water Management

Groundwater Dependent Natural Resources

Areas of high Pollution Sensitivity / Groundwater Recharge

Drinking Water Wells With High Nitrate Levels

Groundwater Management

Streams / Lakes Fully Supporting of Aq. Life or Aq. Rec

Areas of High Citizen Conservation

Areas with Multiple Public Conservation / Recreation Opportunities

Recreation and Wildlife Habitat

What are your top 3 Subwatersheds?

	#1 Subwatershed	#2 Subwatershed	#3 Subwatershed
Subwatershed Name			
Priority Resource(s) in Subwatershed			
Which map(s) informed your decision?			
Other factors that informed your decision?			

Figure 3-3. Worksheet filled out by participants at the January 2020 Advisory Committee Meeting

Table 3-3. Comprehensive Watershed Priority Scheme Documenting Supporting Methods and Tools

Comprehensive Watershed Priority Scheme Feature		Resource	Criteria for Identifying Priority Areas
Surface Water Mgmt.	Nitrate, Phosphorus, and Sediment Basin Load Rates	HSPF-SAM Modeling Tool <ul style="list-style-type: none"> - Total Phosphorus (lbs/acre/year) - Total Nitrogen (lbs/acre/year) - Sediment (tons/acre/year) 	Based on gradient from high to low (with high being the most red)
	Altered Hydrology	2017 Hawk Creek Watershed Protection and Restoration Strategies Report <ul style="list-style-type: none"> - Altered Hydrology Map 2019 Minnesota River-Mankato Watershed Protection and Restoration Strategies Report <ul style="list-style-type: none"> - Altered Hydrology Map 	Subbasins categorized as being "high" for altered hydrology were shown in red.
Groundwater Management	Groundwater Dependent Natural Resources	2020 Hawk Creek-Middle Minnesota Watershed Groundwater Restoration and Protection Strategies Report <ul style="list-style-type: none"> - Groundwater dominated lakes - Calcareous Fens (https://gisdata.mn.gov/dataset/biota-nhis-calcareous-fens) - Native Plant Community Systems Connected to Groundwater (https://gisdata.mn.gov/dataset/biota-dnr-groundwater-npc) (Figure 32: GRAPS) 	Selected all subbasins with a lake that is groundwater dependent and with a calcareous fen. Also selected all subbasins with a high concentration of native plant community systems connected to groundwater using the "eyeball" method. All selected subbasins shown in red.
	Areas of High Pollution Sensitivity/Groundwater Recharge	<ul style="list-style-type: none"> - Pollution Sensitivity of Near-surface materials (https://gisdata.mn.gov/dataset/geos-hydrogeology-atlas-hg02) - NRCS Soil survey (https://www.mngeo.state.mn.us/chouse/soil.html) - Pollution sensitivity of buried aquifers and the bedrock surface 	Selected subbasins with high concentration of A or A/D soils and with high vulnerability to pollution. All selected subbasins shown in red.
	Drinking Water Wells with High Nitrate Levels	Minnesota Department of Health <ul style="list-style-type: none"> - Nitrate levels in Drinking Water Wells 	Selected all subbasins with a well with recorded levels greater than 10 mg/L, and some subbasins with both nitrate between 3 & 10 mg/L and highly vulnerable. All selected subbasins shown in red.
Wildlife and Recreation	Streams/Lakes Fully Supporting Aquatic Recreation or Aquatic Life	MPCA 2018 Assessed Waters (Lakes & Streams)	Selected all subbasins with a waterbody (lake or stream) supporting aquatic recreation or aquatic life. All selected subbasins shown in red.
	Areas of High Citizen Conservation	RIM Reserve (https://gisdata.mn.gov/dataset/bdry-bwsr-rim-cons-easements) <ul style="list-style-type: none"> - Acres of RIM easements in each HSPF subbasin – zonal statistics, sum acres eLINK (https://gisdata.mn.gov/dataset/env-state-cons-bmp-locs) <ul style="list-style-type: none"> - Number of BMPs in each HSPF subbasin – zonal statistics, count FID 	Categorized each into three equal intervals and selected all subbasins in highest category (highest RIM acres range & highest BMP count range) and then selected the two remaining subbasins that had a medium score for both. All selected subbasins shown in red.
	Areas with Multiple Public Conservation/Recreation Opportunities	State Wildlife Management Areas, Native Plant Communities, MnDNR Native Prairies, MBS Sites of Biodiversity Significance, Public Water Access, State Parks, Recreation Areas, Waysides, Knowledge of county parks	Selected Subbasins with most native prairie/wildlife management/SNA land units and all subbasins with public access. All selected subbasins shown in red.

Hawk Creek-Middle Minnesota One Watershed, One Plan

Priority Areas

- Priority HUC-10 Watershed
- Swan Lake Watershed (Priority Resource)

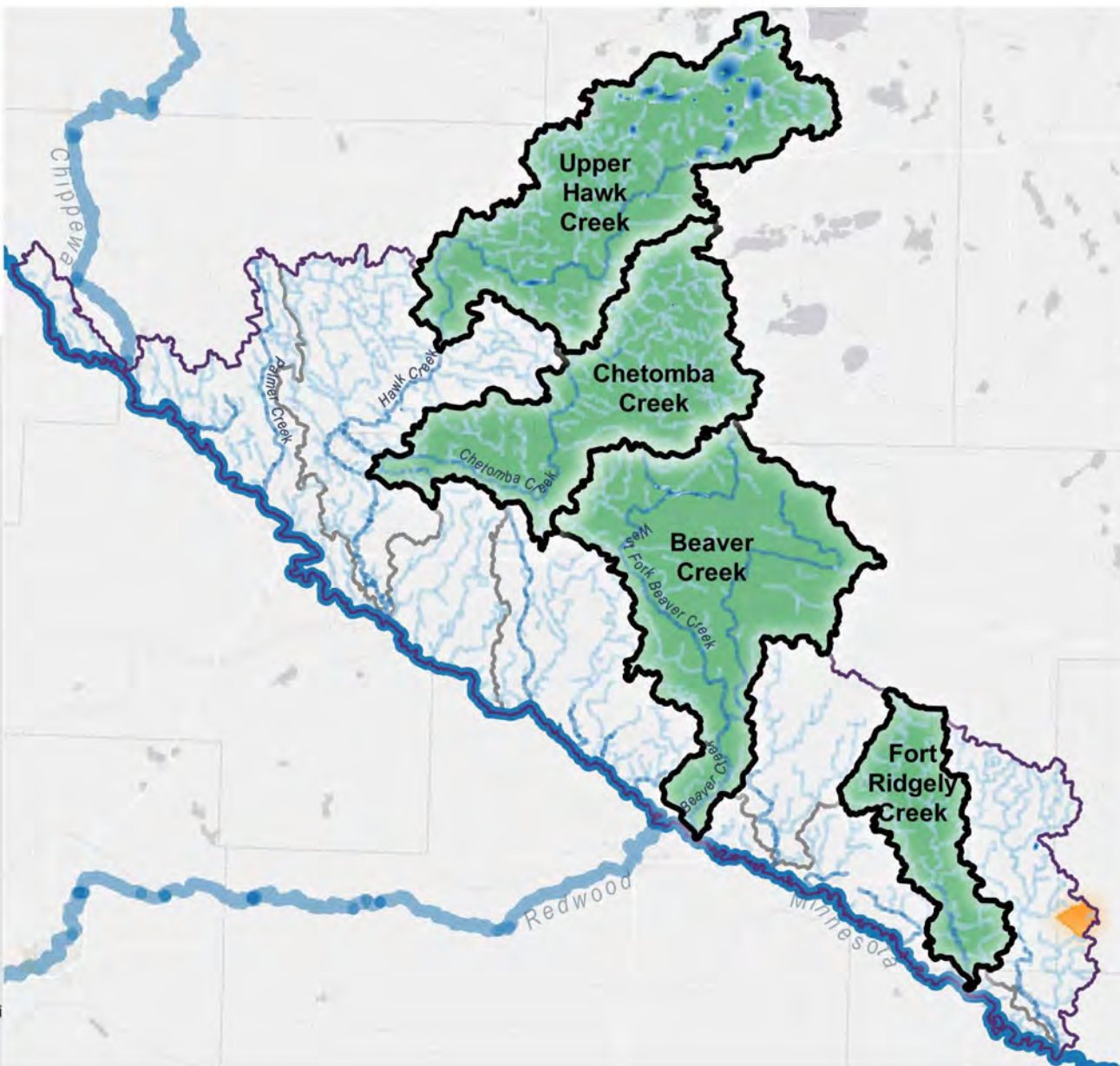
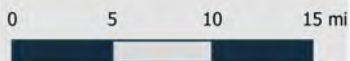


Figure 3-4. Priority Areas selected for the Planning Area

3.5 RANKING OF ISSUES BY PRIORITY AREA

The final step of the prioritization process was to identify the highest priority issues for each of the four Priority Areas as well as others which may be located elsewhere or be watershed-wide. Using a spreadsheet tool, organized using the logic model framework, the planning partners evaluated the issues and ranked them as high priority, medium priority, or low priority for each Priority Area. The following definitions were established to facilitate this ranking exercise:

High Priority - Issue which will be assigned a significant measurable goal and funding for implementation will be a priority of this Plan

Medium Priority - Issues which are important to pursue as a second priority; goal is more difficult to define (i.e. not as measurable) and funding for implementation may involve cost-share

Low Priority - Issues that are strongly linked to a High Priority or Medium Priority issue and will see improvements/benefits as a result of addressing those issues; no measurable goals (beyond maintaining what is currently being done via existing programs) or implementation activities assigned to these issues (rather they are assigned to the High Priority or Medium Priority Issues)

This exercise illustrated that the issues and resource restoration and protection needs vary across the watershed. While the issues of altered hydrology, soil and sediment loss, and agricultural runoff are consistent across the Planning Area, the need to address impaired resources, protect high quality resources and protect drinking water varies from subwatershed-to-subwatershed. Additionally, the evaluation process uncovered opportunities to implement projects with multiple benefits, as addressing many of the high priority issues also lead to improvement in low priority issues. Restoring streams and lakes improves wildlife habitat, habitat continuity, and recreation, while decreasing flooding impacts and erosion. Working with the agricultural community to protect soil health will also benefit soil water retention, which in turn reduces downstream peak flows. Further opportunities for education and outreach may arise from investment into relationships with this community as well. The results of this final prioritization exercise are provided in Table 3-4, Table 3-5, Table 3-6, and Table 3-7.

During this exercise, the planning partners evaluated the need to include resources that fall outside of the four priority areas as a high priority. They also evaluated the need to identify issues that should be addressed watershed wide. One additional resource was identified as a high priority resource for this planning effort due to its unique characteristic and opportunities, identified in MNDNR's notification letter (Appendix B): Swan Lake (Sibley County: *Little Rock Creek Watershed*).



Anderson Lake - Renville County, MN

Table 3-4. Issues Prioritization for the Upper Hawk Creek HUC-10 (0702000407) Subwatershed

Tier	Issue	Rationale
TIER I (High Priority)	Impaired Lakes and Streams <ul style="list-style-type: none"> • Long Lake • Ringo Lake • Hawk Creek 	Highly valued resources that need to be restored for public use and wildlife habitat. Restoration of riparian areas can also improve biodiversity through increasing habitat continuity and strengthen floodplain connectivity.
	Altered Hydrology	Affects everything else in the watershed; addressing altered hydrology positively influences all of the other issues. For example, increases in storage and reduction in discharge to receiving waters has multiple benefits, including decreased potential for flood damage impacts, increased floodplain and riparian area connectivity, improved water quality, increased groundwater recharge, and resiliency to extreme precipitation events.
	Soil Erosion and Sediment Loss	Focus on stream monitoring sites for measuring and setting goals, actions should include addressing specific practices on farmland. Addressing soil erosion and sediment loss will address many other water quality issues.
	High Quality Lakes and Streams <ul style="list-style-type: none"> • Eagle Lake • Foot Lake 	Focus on high quality (unimpaired) resources in need of protection and Nearly/Barely (on the threshold of impairment) resources as these can be restored more cost-effectively.
	Agricultural Practices and Runoff Management	Cultivated cropland accounts for approximately 84% of the land use in the Planning Area with conventional farming practices leading to substantial contributions of altered hydrology and all pollutants and stressors. The greatest opportunity to address issues is the adoption of Agricultural BMPs and improvements to soil health. These strategies also provide multiple benefits including increasing soil water retention and reducing downstream peak flows.
	Education and Outreach (Social Based Challenges)	To get landowners/homeowners to adopt more sustainable practices, they need to understand why it's important and how it benefits both them and the environment.
TIER II (Medium Priority)	Drinking Water Protection	According to the GRAPS, there is one nitrate result in a drinking water well with a result of 3.00 – 9.99 mg/L in the upper portion of the subwatershed and approximately seven DWSMA's with moderate to low vulnerability.
	Subsurface Sewage Treatment Systems	For agricultural portion of the UHC, there is more of a risk that septic system failures will have a direct impact to surface waters because they are likely to be connected to a non-conforming systems or inadequate soil treatment.
	Monitoring and Data Collection	There is a need to support on-going watershed monitoring and information gathering efforts as well as to collect information that will allow local partners to track progress towards achieving the goals of this Plan.
TIER III (Lower Priority)	Groundwater Supply	Added benefit of addressing Altered Hydrology: Providing more storage in the subwatershed will promote recharge and replenish the aquifers.
	Flooding	Positively Influenced by Altered Hydrology: Retaining (storage, infiltration, and evapotranspiration) more water on the landscape will reduce the rate and volume of water being delivered to downstream resources and low-lying areas. City of Willmar taking an active role in stormwater management and addressing extreme high water levels on area lakes. Smaller communities may need assistance.

Tier	Issue	Rationale
TIER III (Lower Priority) ...continued	Recreation	Most of the recreational opportunities in the upper portion of the HUC-10 are benefited by addressing the TIER I Issues (e.g. Impaired Lakes and Streams, Altered Hydrology, Soil Erosion and Sediment Loss and High-Quality Lakes and Streams).
	Climate Resiliency	Addressed by Altered Hydrology: Implementation of practices such as storage, wetland restoration, stormwater infiltration, improved soil health) will make the landscape more resilient to extreme events.
	Urban Stormwater Management	As an MS4, Willmar is already required to manage its stormwater runoff. BMPs that go above-and-beyond the City's requirements would be addressed by the following TIER I Issues: Impaired Lakes and Streams or High-Quality Lakes and Streams.
	Hazardous Materials, Solid Waste and Environmental Contaminants	Addressed by an existing program: Continue to provide education on the subject and maintain existing services (e.g. waste disposal facilities).
	Wildlife Habitat	Addressed by the TIER I Issues including: Impaired Lakes and Streams, Altered Hydrology, and High-Quality Lakes and Streams.



Table 3-5. Issues Prioritization for the Chetomba Creek HUC-10 (0702000408) Subwatershed

Tier	Issue	Rationale
TIER I (High Priority)	Impaired Lakes and Streams <ul style="list-style-type: none"> • <i>Olson Lake</i> 	Resource would greatly benefit from restoration activities and receiving less pollutant loads (e.g. 4 pump stations delivering agricultural runoff). Ducks Unlimited (DU) was involved in restoration of Olson Lake and is interested in additional improvements. Currently, the Lake has vital waterfowl habitat which could be improved with cleaner discharge. Restoration of shoreland areas can also improve biodiversity through increasing habitat continuity and strengthen floodplain connectivity. There is on-going management by USFWS. Need to maintain and protect the few resources remaining in the Planning Area.
	Altered Hydrology	Affects everything else in the watershed; addressing altered hydrology positively influences all of the other issues. For example, increases in storage and reduction in discharge to receiving waters has multiple benefits, including decreased potential for flood damage impacts, increased floodplain and riparian area connectivity, improved water quality, increased groundwater recharge, and resiliency to extreme precipitation events.
	Soil Erosion and Sediment Loss	Focus on streams for measuring and setting goals, actions should include addressing specific practices on farmland. Addressing soil erosion and sediment loss will address many other WQ issues.
	Recreation	There are few recreational opportunities in this region. Recreation could be benefited by improvements to Olson Lake. Support increasing opportunities for access in this area (e.g. walk-in access program).
	Agricultural Practices and Runoff Management	Cultivated cropland accounts for approximately 84% of the land use in the Planning Area with conventional farming practices leading to substantial contributions of altered hydrology and all pollutants and stressors. The greatest opportunity to address issues is the adoption of Agricultural BMPs and improvements to soil health. These strategies also provide multiple benefits including increasing soil water retention and reducing downstream peak flows.
	Education and Outreach	Every priority in this watershed has an education component to it. Education and Outreach will be a key component in prioritizing implementation in these areas, especially when reaching out to landowners to adopt practices.
TIER II (Medium Priority)	Drinking Water Protection	There are minimal risks to drinking water in this area. It is important to protect the DWSMAs, but both communities with DWSMAs (Blomkest and Prinsburg) have low vulnerability.
	High Quality Lakes and Streams <ul style="list-style-type: none"> • <i>Headwaters of CD31 (07020004-572)</i> • <i>Tributary of Chetomba Creek (07020004-608)</i> 	These are fully supporting reaches for aquatic life and because they are in the headwaters to Chetomba Creek the focus (for this HUC-10) should be the headwaters vs. the lower portion of the watershed. Restoration and protection of headwaters resources benefits the entire downstream watershed.

Tier	Issue	Rationale
TIER II (Medium Priority) ...continued	Wildlife Habitat	This subwatershed would benefit from additional wildlife habitat – particularly making linkages to other resources and making improvements to the habitat complex. Minimal wildlife habitat in the area.
	Subsurface Sewage Treatment Systems	Moving into drained country, there is more of a risk that septic system failures will have a direct impact to surface waters because they are likely to be connected to non-conforming systems or inadequate soil treatment.
	Monitoring and Data Collection	There is a need to support on-going watershed monitoring and information gathering efforts as well as to collect information that will allow local partners to track progress towards achieving the goals of this Plan.
TIER III (Lower Priority)	Impaired Lakes and Streams • Chetomba Creek	Not feasible to restore. The resource is almost entirely ditched/channelized and is included as a county ditch. Efforts should be focused on portions of the system that need protection or can be restored. The Altered Hydrology goal will increase storage in the subwatershed which will reduce the amount and timing of flows in the system and to downstream waterbodies.
	Groundwater Supply	Added benefit of addressing Altered Hydrology: Providing more storage in the subwatershed will promote recharge and replenish the aquifers.
	Flooding	Positively Influenced by Altered Hydrology: Retaining (storage, infiltration and evapotranspiration), more water on the landscape will reduce the rate and volume of water being delivered to downstream resources and low-lying areas. Community flooding not much of an issue in this area and agricultural flooding is difficult to address directly.
	Climate Resiliency	Addressed by Altered Hydrology: Implementation of practices such as storage, wetland restoration, stormwater infiltration, improved soil health) will make the landscape more resilient to extreme events.
	Urban Stormwater Management	Minimal urban landuse in Chetomba Creek. Communities such as Prinsburg do not have a large need for this.
	Hazardous Materials, Solid Waste and Environmental Contaminants	Addressed by an existing program: Continue to provide education on the subject and maintain existing services (e.g. waste disposal facilities).



Flooding - Renville County, MN

Table 3-6. Issues Prioritization for the Beaver Creek HUC-10 (0702000411) Subwatershed

Tier	Issue	Rationale
TIER I (High Priority)	<p>Impaired Lakes and Streams</p> <ul style="list-style-type: none"> • <i>Beaver Creek East Fork</i> • <i>County Ditch 31</i> • <i>County Ditch 59</i> • <i>Beaver Creek</i> • <i>Beaver Creek West Fork</i> 	Beaver Creek is a highly eroded stream which flows through a county park. Addressing impairments is a high priority although some stressors (e.g. DO) may be addressed by addressing another high priority issue (e.g. altered hydrology if low flow is the issue). Restoration of riparian areas can also improve biodiversity through increasing habitat continuity and strengthen floodplain connectivity.
	Altered Hydrology	Affects everything else in the watershed; addressing altered hydrology positively influences other issues. For example, increases in storage and reduction in discharge to receiving waters has multiple benefits, including decreased potential for flood damage impacts, increased floodplain and riparian area connectivity, improved water quality, increased groundwater recharge, and resiliency to extreme precipitation events.
	Soil Erosion and Sediment Loss	Focus on streams for measuring and setting goals, actions should include addressing specific practices on farmland. Addressing soil erosion and sediment loss will address many other water quality issues.
	Drinking Water Protection	The only highly vulnerable DWSMA (Renville) is located in this subwatershed. East-west line across northern Renville County more sensitive to pollution due to surficial sand and gravel deposits and the location of a drainage ditch that flows near the city wells and intersects the Emergency Response Area.
	Agricultural Practices and Runoff Management	Cultivated cropland accounts for approximately 84% of the land use in the Planning Area with conventional farming practices leading to substantial contributions of altered hydrology and all pollutants and stressors. The greatest opportunity to address issues is the adoption of Agricultural BMPs and improvements to soil health. These strategies also provide multiple benefits including increasing soil water retention and reducing downstream peak flows. E. coli issues may be attributed to having more livestock in the channel in this subwatershed. Grazing and lack of exclusion may be more problematic than regulated feedlots although there are a number of feedlots that are smaller than the threshold for registered feedlots.
	Education & Outreach	Every priority in this watershed has an education component to it. Education and Outreach will be a key component in prioritizing implementation in these areas, especially when reaching out to landowners to adopt practices.

Tier	Issue	Rationale
TIER II (Medium Priority)	Subsurface Sewage Treatment Systems	Moving into drained country, there is more of a risk that septic system failures will have a direct impact to surface waters because they are likely to be connected to non-conforming systems or inadequate soil. Additionally, Beaver Creek has bacteria issues, so this source is important to manage.
	Monitoring and Data Collection	There is a need to support on-going watershed monitoring and information gathering efforts as well as to collect information that will allow local partners to track progress towards achieving the goals of this Plan.
TIER III (Lower Priority)	Groundwater Supply	Added benefit of addressing Altered Hydrology: Providing more storage in the subwatershed will promote recharge and replenish aquifers.
	Flooding	Positively Influenced by Altered Hydrology: Retaining (storage, infiltration and evapotranspiration), more water on the landscape will reduce the rate and volume of water being delivered to downstream resources and low-lying areas. There has been flooding in the Beaver Creek County Park (closures and damage to Park roads) and around HWY 71 but no flooding of communities. Some crop damage that is temporary and seasonal.
	Recreation	Beaver Falls County Park is the only public access to Beaver Creek. All recreation in the subwatershed is Park related. Minimal fishing or other opportunities for aquatic recreation within Beaver Creek.
	High Quality Lakes and Streams	No high-quality resources in this subwatershed but do want to maintain and improve existing quality of resources to improve the Minnesota River.
	Climate Resiliency	Addressed by Altered Hydrology: Implementation of practices such as storage, wetland restoration, stormwater infiltration, improved soil health will make the landscape more resilient to extreme events.
	Urban Stormwater Management	Olivia and Danube are in the upper portion of the watershed. Their outputs contribute to the high-water levels in the system but it is not significant enough to make a high priority.
	Hazardous Materials, Solid Waste and Environmental Contaminants	Addressed by an existing program: Continue to provide education on the subject and maintain existing services (e.g. waste disposal facilities). Renville County Landfill is located in this Subwatershed. There is a portion of the Landfill (which is closing) that is unlined and it is close to Beaver Creek but it is being continuously monitored and managed by others.
	Wildlife Habitat	Must maintain and improve the resources that already exist. There is not a lot of wildlife habitat beyond the Park boundaries. There is some CREP and CRP that provides wildlife habitat in the subwatershed.

Table 3-7. Issues Prioritization for the Fort Ridgely Creek HUC-10 (0702000703) Subwatershed

Tier	Issue	Rationale
TIER I (High Priority)	Impaired Lakes and Streams <ul style="list-style-type: none"> • <i>Fort Ridgely Creek lower reach</i> 	Highly valued resource that need to be restored for public use and wildlife habitat. Restoration of riparian areas can also improve biodiversity through increasing habitat continuity and strengthen floodplain connectivity.
	Altered Hydrology	Affects everything else in the watershed; addressing altered hydrology-positively influences all of the other issues. For example, increases in storage and reduction in discharge to receiving waters has multiple benefits, including decreased potential for flood damage impacts, increased floodplain and riparian area connectivity, improved water quality, increased groundwater recharge, and resiliency to extreme precipitation events.
	Soil Erosion and Sediment Loss	Focus on streams for measuring and setting goals, actions should include addressing specific practices on farmland. Addressing soil erosion and sediment loss will address many other water quality issues.
	High Quality Lakes and Streams <ul style="list-style-type: none"> • <i>County Ditch 3</i> • <i>County Ditch 115</i> • <i>Unnamed Creek</i> 	Recognize the value of protecting higher quality reaches of existing stream systems.
	Agricultural Practices & Runoff Management	Cultivated cropland accounts for approximately 84% of the land use in the Planning Area with conventional farming practices leading to substantial contributions of Altered Hydrology and all pollutants and stressors. The greatest opportunity to address issues is the adoption of Agricultural BMPs and improvements to soil health. These strategies also provide multiple benefits including increasing soil water retention and reducing downstream peak flows. Focus on a combination of structural and non-structural practices in this subwatershed.
	Education & Outreach	Every priority in this watershed has an education component to it. Education and Outreach will be a key component in prioritizing implementation in these areas, especially when reaching out to landowners to adopt practices.
TIER II (Medium Priority)	Drinking Water Protection	Don't have a lot of risks to drinking water in this area. Communities with DWSMA have moderate vulnerability (Fairfax). High for Protection.
	Recreation	Need to maintain and improve. The only State Park in the watershed and some private clubs (e.g. golf course) are located in this area. Water recreation occurs in the State Park. The bulk of what needs to be done will happen upstream of the resource via altered hydrology.

Tier	Issue	Rationale
TIER II (Medium Priority) ... continued	Subsurface Sewage Treatment Systems	Moving into drained country, there is more of a risk that septic system failures will have a direct impact to surface waters because they are likely to be connected to a non-conforming systems or inadequate soil treatment. E. coli is an issue in the southern stretch of Fort Ridgely Creek – septic system sources need to be managed.
	Monitoring and Data Collection	There is a need to support on-going watershed monitoring and information gathering efforts as well as to collect information that will allow local partners to track progress towards achieving the goals of this Plan.
TIER III (Lower Priority)	Groundwater Supply	Added benefit of addressing Altered Hydrology: Providing more storage in the subwatershed will promote recharge and replenish the aquifers.
	Flooding	Positively Influenced by Altered Hydrology: Retaining (storage, infiltration and evapotranspiration), more water on the landscape will reduce the rate and volume of water being delivered to downstream resources and low-lying areas. Flashy systems and more elevation in this subwatershed. There is too much water moving too fast causing damage to areas. Mack Lake has had flooding but it's Minnesota River driven.
	Climate Resiliency	Addressed by Altered Hydrology: Implementation of practices such as storage, wetland restoration, stormwater infiltration, improved soil health) will make the landscape more resilient to extreme events.
	Urban Stormwater Management	Issues were not identified within the City of Fairfax.
	Hazardous Materials, Solid Waste and Environmental Contaminants	Addressed by an existing program: Continue to provide education on the subject and maintain existing services (e.g. waste disposal facilities).
	Wildlife Habitat	Maintain and improve the resources that already exist.

Fort Ridgely State Park hiking trail - Fairfax, MN
(Tony Webster – CC BY-SA 2.0)



Following the ranking of issues for each priority area, an overall tier assignment was given to each issue as a function of how many priority areas ranked in each tier. For example, Drinking Water Protection was ranked Tier II in more than half of the priority areas, so overall it was given a Tier II rank. This assignment is shown in the second column of Table 3-8.

Table 3-8. Summary of Issues Prioritization by Priority Area

Issue	Final assignment of prioritization	Priority Areas				
		Upper Hawk Creek HUC-10 (0702000407) Subwatershed	Chetomba Crk HUC-10 (0702000408) Subwatershed	Beaver Creek HUC-10 (0702000411) Subwatershed	Fort Ridgely Creek HUC-10 (0702000703) Subwatershed	Swan Lake (Sibley County: Little Rock Crk Watershed)
Impaired Lakes and Streams	Tier I	Tier I	Tier I – Olson Lake Tier III – Chetomba Crk	Tier I	Tier I	NA
Altered Hydrology	Tier I	Tier I	Tier I	Tier I	Tier I	NA
High Quality Lakes and Streams	Tier I	Tier I	Tier II	Tier III	Tier I	Tier I
Agricultural Practices, Soil Erosion and Runoff Management	Tier I	Tier I	Tier I	Tier I	Tier I	NA
Drinking Water Protection	Tier II	Tier II	Tier II	Tier I	Tier II	NA
SSTS	Tier II	Tier II	Tier II	Tier II	Tier II	NA
Wildlife Habitat	Tier II	Tier III	Tier II	Tier III	Tier II	NA
Recreation	Tier II	Tier III	Tier I	Tier III	Tier II	NA
Monitoring and Data Collection	Tier II	Tier II	Tier II	Tier II	Tier II	NA
Education and Outreach	Tier I	Tier I	Tier I	Tier I	Tier I	NA
Groundwater Supply	Tier III	Tier III	Tier III	Tier III	Tier III	NA
Floodplain and Shoreland Management	Tier III	Tier III	Tier III	Tier III	Tier III	NA
Climate Resiliency	Tier III	Tier III	Tier III	Tier III	Tier III	NA
Urban Stormwater Management	Tier III	Tier III	Tier III	Tier III	Tier III	NA
Hazardous Materials, Solid Waste & Environmental Contaminants	Tier III	Tier III	Tier III	Tier III	Tier III	NA
Aquatic Invasive Species	Tier III					NA

4 ESTABLISHMENT OF MEASURABLE GOALS

Per BWSR's plan content requirements, a measurable goal is, "the quantifiable change in resource condition expected after implementation of the 10-year (Comprehensive Watershed Management) Plan". It should relate to the ultimate long-term goal for the resource, which is referred to as the Desired Future Condition, and express what portion of the Desired Future Condition the partners will make during the 10-year plan implementation period. Progress towards achieving the measurable goals can be predicted through modeling the results of implementation (outputs/outcomes) or they can be measured directly through monitoring (as described in more detail in Section 6).

As stated previously, measurable goals were established for both the Tier I and the Tier II issues. Goals for the Tier I (Highest Priority) issues were developed using the 10-year goals established in the WRAPS, as well as the HSPF-SAM and BATHTUB modeling tools. Practices and tools, including RUSLE2, PTMapp, site visits and evaluations, and engaging experience and local knowledge, can refine the goals and targeting practices at a smaller scale. Goals for the less quantifiable Tier I (High Priority) issues and Tier II (Medium Priority) issues were developed by the local partners.

This section of the Plan describes the specific steps taken to establish the measurable goals for this planning effort using HSPF-SAM, BATHTUB and local input.

4.1 GOALS ESTABLISHED USING HSPF-SAM

This section describes the steps taken to establish the goals for the impaired lakes and streams and altered hydrology. Using the state-supported modeling approach and tool HSPF-SAM, the local partners could determine how much treatment would be needed to meet the 10-year goals identified in the Watershed Restoration and Protection Strategies (WRAPS) for the priority resources. From there, the local partners could evaluate how much of the 10-year goal they could realistically achieve relative to the other goals in the Plan and local capacity for project implementation.

STEP 1.

Defined the agricultural BMPs that are most likely to be adopted by agricultural stakeholders. This list of BMPs was initially selected based on the HSPF-SAM modeling work conducted for the Middle Minnesota-Mankato WRAPS and further refined by the planning partners.

These BMPs include:

- Nutrient Management
- Reduced Tillage (30%)
- Conservation Crop Rotation
- Water and Sediment Control Basin
- Restored Tiled Wetland
- Corn and Soybean with Cover Crops

STEP 2.

Defined the level of adoption needed to achieve the WRAPS 10-year reduction goal for a 10% reduction in Total Suspended Solids (TSS). TSS was selected to be the pollutant used to target practices and establish a realistic measurable goal recognizing that TSS and flow are strongly correlated in the HSPF-SAM modeling tool (i.e. TSS reductions are most impacted by flow reductions).

STEP 3.

Applied this level of adoption to the entire HUC-10 boundary for each priority area.

STEP 4.

Recognizing that the implementation of practices in the upstream portions of the drainage area have benefits to downstream resources, the local partners developed a Project Implementation Ranking Tool to facilitate targeting the HSPF-SAM drainage areas (approximately equivalent to a HUC-12 watershed) that would become the focus of this planning effort.

STEP 5.

Determined the pollutant load reductions for flow reductions to establish measurable goals for the Tier I issue Altered Hydrology.

4.2 GOALS ESTABLISHED USING BATHTUB

This section describes the steps taken to establish the goals for the Upper Hawk Creek Chain of Lakes using the modeling software BATHTUB (Version 6.1) as developed by William W. Walker for the U.S. Army Corps of Engineers (Walker 1999). The 2017 Hawk Creek Watershed TMDL include BATHTUB modeling results for Swan Lake (34-0186-00) and the 2020 Upper Hawk Creek and Willmar Chain of Lakes Section 319 Nine Key Element Plan includes BATHTUB modeling results for Willmar Lake (34-0180-01). These model results were discussed with MPCA and used to guide calibration of the BATHTUB models developed as part of this Plan for Eagle, Swan, Willmar, Willmar (southern basin) and Foot Lakes.

The inputs and assumptions required to run the BATHTUB model are included in Appendix E. The models were calibrated to existing water quality data and then were used to determine the phosphorus loading capacity of each lake.

4.2.1 Determination of Lake Load Reductions to Achieve Plan Goals

Using the calibrated existing conditions model as a starting point, the phosphorus concentrations associated with upstream lakes or subwatersheds were reduced according to Table 4-1 to achieve the in-lake phosphorus goals listed in Table 4-2. In Swan Lake, excess internal loads were also reduced to achieve the in-lake phosphorus goal. The tributary TP concentrations to Swan Lake were below the ecoregion stream baseline of 150 µg/L indicating that watershed loads have been adequately addressed and implementation can proceed to internal load reductions (see: <https://www.pca.state.mn.us/sites/default/files/wq-s1-98.pdf>). Internal load reductions may be achieved through a whole-lake alum treatment or aquatic plant and fish management practices.

Swan, Willmar and Foot Lakes are shallow (at least 80% of the lake has depths less than 15 feet) and, therefore, watershed load reductions may not have a direct impact on lake water quality without reduction of internal loads or other in-lake management activities (see Section 4.2.2).

Table 4-1. Existing and Goal In-Lake TP Concentrations

Modeled Lake	Existing In-lake TP (µg/L)	Goal In-lake TP (µg/L)	% Reduction
Eagle (34-0171-00)	38	35	8%
Swan (34-0186-00)	111	90	19%
Willmar (34-0180-01)	130	119	8%
Willmar (southern basin) (34-0180-02)	64	63	2%
Foot (34-0181-00)	69	65	6%

Table 4-2. Phosphorus Source Reduction Scenarios to Achieve In-Lake Phosphorus Goals.

Modeled Lake	Phosphorus Source	Existing		Goal	
		TP Conc. or Internal Load (µg/L or mg/m2)	TP Load (lb/yr)	TP Conc. or Internal Load (µg/L or mg/m2)	TP Load (lb/yr)
Eagle (34-0171-00)	NE Tributary	370.2	1,994.4	295.0	1,589.2
	SE Tributary	459.5	537.9	-	-
	Direct Drainage	189.6	327.9	-	-
	Point Lake (34-0193-00)	27.0	18.4	-	-
Swan (34-0186-00)	Direct Drainage	145.0	116.8	-	-
	Eagle Lake (34-0171-00)	38.0	340.8	-	-
	Skataas Lake (34-0196-00)	102.0	262.1	-	-
	Excess Internal Load	2.65	1,749.5	1.75	1,155.4
Willmar (34-0180-01)	Direct Drainage	197.3	906.0	157.9	724.8
	NE Tributary	416.3	228.4	312.3	171.3
	NW Tributary	390.3	577.7	292.7	433.3
	Swan Lake	111.0	1,370.2	90.0	1,111.0
	Excess Internal Load	1.72	2,505.1	-	-
Willmar (southern basin) (34-0180-02)	Direct Drainage	256.4	150.1	150.0	87.8
	Willmar Lake (34-0180-01)	130.0	2,465.3	-	-
Foot (34-0181-00)	Direct Drainage	280.8	406.9	150.0	217.3
	Willmar (southern basin) (34-0180-02)	64.0	1,251.2	-	-
	Excess Internal Load	0.51	836.1	-	-

4.2.2 Shallow Lakes

The relationship between TP concentration and the response variables (Chl-*a* and Secchi depth transparency) is often different in shallow lakes as compared to deeper lakes. In deeper lakes, algae abundance is often controlled by physical and chemical factors such as light availability, temperature, and nutrient concentrations. The biological components of the lake (such as microbes, algae, aquatic plants, zooplankton and other invertebrates, and fish) are distributed throughout the lake, along the shoreline, and on the bottom sediments. In shallow lakes, the biological components are more concentrated into less volume and consequently exert a stronger influence on the ecological interactions within the lake. There is a denser biological community at the bottom of shallow lakes than in deeper lakes, because oxygen is replenished in the bottom waters and light can often penetrate to the bottom. These biological components can control the relationship between TP and the response variables algae and water clarity.

The result of biological components' impact on water clarity is that shallow lakes normally exhibit one of two ecologically alternative stable states (Figure 4-1): the turbid water, algae-dominated state, and the clear water, aquatic plant-dominated state (Scheffer *et al.* 1993). The clear state is the most ecologically preferred, since algae communities are held in check by diverse and healthy zooplankton and fish communities. Fewer nutrients are released from the sediments in this state. This is because roots of aquatic plants stabilize the sediments, lessening the amount of sediment stirred up by wind-driven mixing.

Nutrient reduction or addition in a shallow lake does not lead to linear improvement or degradation in water quality (indicated by algal biomass in Figure 4-2). As external nutrient loads are decreased in a lake in the turbid water, algae-dominated state, no improvements in water quality may occur at first. Drastic reductions in nutrient loads or a change in the biological community, will cause the lake to abruptly shift from the turbid water, algae-dominated state to the clear water, aquatic plant-dominated state. Conversely, as external nutrient loads are increased in a shallow lake in the clear water, aquatic plant-dominated state, only slight degradations in water quality may occur at first. At some point, further increase in nutrient loads will cause the shallow lake to abruptly shift from the clear water, aquatic plant-dominated state to the turbid water, algae-dominated state. The general pattern in Figure 4-2 is often referred to as "hysteresis," meaning that when forces are applied to a system, it does not return completely to its original state nor does it follow the same trajectory on the way back.

Olson Lake restoration - Kandiyohi County, MN



The biological response of the lake to TP inputs will depend on the state that the lake is in. For example, if the lake is in the clear state, the aquatic plants may be able to take up phosphorus instead of the algae. However, if enough stressors are present in the lake, increased TP inputs may lead to a shift to the turbid state with an increase in algal density and decreased transparency.

The two main categories of stressors that can shift the lake to the turbid state are:

Disturbance to the aquatic plant community, for example from wind-driven mixing, bottom feeding fish (such as carp), boat motors, or light availability (influenced by algal density or water depth); and

A decrease in the number of zooplankton can result in an increase in algae. A decrease in the number of zooplankton is usually caused by an increase in the number of fish that feed directly on zooplankton due to a decrease in or absence of piscivorous fish.

One implication of the alternative stable states in shallow lakes is that different management approaches are used for shallow lake restoration than those used for restoration of deeper lakes. Shallow lake restoration often focuses on restoring the macrophyte, zooplankton, and fish communities to the lake. This is commonly achieved through a whole lake drawdown.



Clear-Aquatic Plant Dominated State

Balanced fish community and abundant aquatic plants keep water clear.



Turbid-Algae Dominated State

Too many rough fish and/or too few aquatic plants keep water turbid.

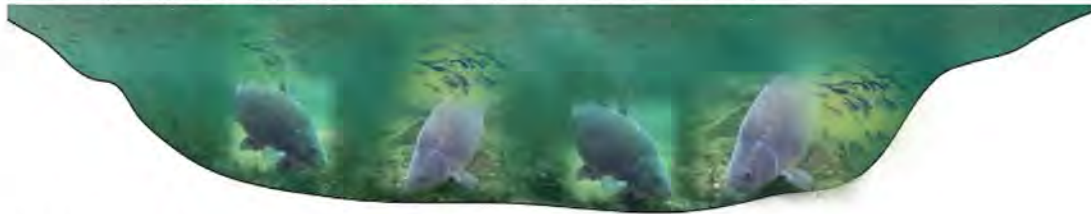


Figure 4-1. Clear and turbid water states in shallow lakes (EOR)

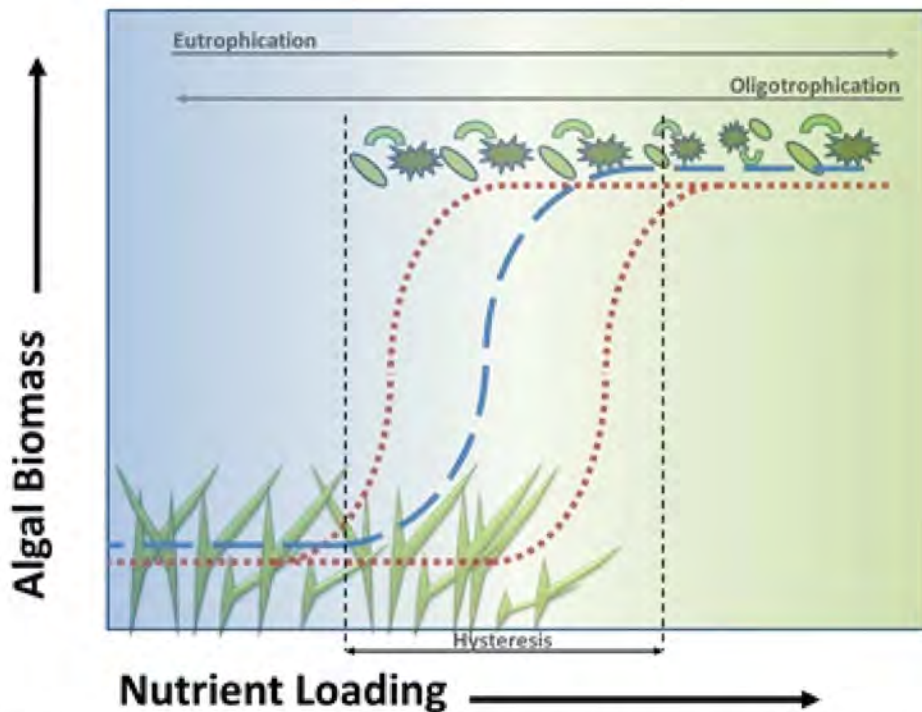


Figure 4-2. Nutrient loading and algae biomass hysteresis of alternative stable states in shallow lakes (Scheffer *et al.* 1993).

The red dotted lines represent the two relationships between nutrient loading and the amount of algae in shallow lakes (hysteresis) as they become more eutrophic (delayed growth of algae as nutrient loading increases, and delayed loss of algae as nutrient loading decreases). In other words, there is a delay in shallow lake water quality changes in response to increases or decreases in nutrient loading.

4.3 IMPLEMENTATION TO ADDRESS PRIORITY ISSUES

This section establishes the implementation program to address priority issues identified in Section 3. Action items describe specific measures that the Watershed intends to implement, in cooperation with appropriate local, state and federal agencies and organizations. Action items listed below were reached by consensus and are not necessarily in rank order. Ranking for priority subwatersheds are listed in Table 3-4, Table 3-5, Table 3-6 and Table 3-7.

Issues identified as Tier 1 (High Priority) or Tier II (Medium Priority) will follow the following structure:

Desired Future Condition (Long-Term Goal):	The desired future condition to accomplish, regardless of time frame.
Measurable Goal (Short-Term Goal):	Interim conditions to accomplish during the 10-year lifespan of this plan.
Implementation Activities:	What needs to be accomplished to achieve the Measurable (Short-Term) Goal.
Metrics and Indicators:	How local partners will measure progress towards achieving the goal. Information regarding the metrics and indicators are referenced in the Implementation Schedule.
Justification for the Goal:	How the goal was established.

Items identified as Tier III (Lower Priority) issues did not develop measurable goals beyond maintaining what is currently being done via existing programs. As a result, there are no implementation activities assigned to the Tier III issues. It is recognized that the work being done to address the Tier 1 and Tier II issues will have benefits to the Tier III issues.

Index to the following Tier I, Tier II and Tier III issues:

- 4.3.1 Impaired Lakes and Streams
- 4.3.2 Altered Hydrology
- 4.3.3 High Quality Lakes and Streams
- 4.3.4 Agricultural Practices, Soil Erosion and Runoff Management
- 4.3.5 Drinking Water Protection
- 4.3.6 Subsurface Sewage Treatment Systems
- 4.3.7 Wildlife Habitat
- 4.3.8 Recreation
- 4.3.9 Monitoring and Data Collection
- 4.3.10 Education and Outreach
- 4.3.11 Groundwater Supply
- 4.3.12 Floodplain and Shoreland Management
- 4.3.13 Climate Resiliency
- 4.3.14 Urban Stormwater Management
- 4.3.15 Hazardous Materials, Solid Waste and Environmental Contaminants
- 4.3.16 Aquatic Invasive Species

Short- and long-term goals are presented to align with WRAPS efforts, set milestones for resource improvement, and allow for resource management flexibility during implementation efforts. Many of the implementation activities included in this Plan address multiple goals from the Tier I, Tier II and Tier III categories within the individual priority areas. Unless otherwise stated, the timeline for the goals listed is the 10-yr implementation of the Plan.

4.3.1 Impaired Lakes and Streams

Desired Future Condition (Long-Term Goal):

Lakes and streams meet the State's water quality standards and their designated uses (i.e. drinkable, swimmable, fishable, or useable in other, designated ways). The Hawk Creek WRAPS and the Minnesota River – Mankato WRAPS identify long-term water quality goals which represent the comprehensive change needed to restore the resources. For some impaired lakes and streams, Total Maximum Daily Load (TMDL) studies provide resource-specific load reduction goals to achieve State water quality standards. The approximate timeframe for these comprehensive changes is 50 years. These long-term goals are summarized in Table 4-3, below:

Table 4-3. WRAPS Long-Term Goals

Resource	Pollutant	WRAPS Long-Term Goal*
Lakes	TP	50% reduction in lake concentration/loads (lake average concentration from 0.17 to 0.09 mg/L)
Streams and Minnesota River	DO	Increase DO to 5 mg/L, minimize fluctuation
	Habitat	45% increase in average MSHA score (score from 48 to 66)
	TP	60% reduction in river concentrations/loads (stream FWMC from 0.39 to 0.15 mg/L)
	TSS	50% reduction in river sediment concentration/loads (FWMC from 130 to 65 mg/L)
	N	45% reduction in river concentration/loads (FWMC from 9.2 to 4.9 mg/L)
	Bacteria	80% reduction in river concentration/loads (averaged monthly geomean from 600 to 126 cfu/100 mL)

* WRAPS Long-Term Goals were taken from Table 14A of the Hawk Creek Watershed and Surrounding Direct Minnesota River Tributaries Restoration and Protection Strategies and Table 21 of the Minnesota River – Mankato Watershed Restoration and Protection Strategies.



Hawk Creek – Renville County, MN

Measurable Goals (Short-Term Goal):

- Goal 1:** Achieve a seven (7) percent reduction in total suspended solids (TSS) loads at the downstream end of Beaver Creek, Chetomba Creek, Upper Hawk Creek and Fort Ridgely Creek.
- Goal 2:** Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Willmar Lake (34-0180-01), or 111 ppb.

Implementation Activities:

Goal 1: Impaired Streams

- A. Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the direct drainage area of Priority Areas (as identified in Table 4-5). More information on the locations of the drainage areas along with how these BMPs were identified is included in Appendix D.

Goal 2: Impaired Lakes

- B. Construct five (5) stormwater Best Management Practice (BMP) demonstration sites (one every two years) at strategic locations in the City of Willmar (e.g. MinnWest Technology Campus, K.R.A. Speedway, Willmar City Hall/Community Center and Highway 71 bridge).
- C. Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the direct drainage area of Willmar Lake using the adoption rates provided in Table 4-4.

Table 4-4. Estimated HSPF-SAM identified agricultural BMP adoption rates needed to achieve 5%, 20% and 25% reductions in watershed phosphorus loads in the Upper Hawk Priority Area

Upper Hawk Creek HSPF-SAM Agricultural BMP Scenario	Adoption Rate to achieve 5% P Reduction (%)	Adoption Rate to achieve 20% P Reduction (%)	Adoption Rate to achieve 25% P Reduction (%)
Nutrient Management	3.5%	14%	18%
Reduced Tillage (30% residue cover)	6%	24%	30%
Conservation crop rotation	15%	60%	75%
WASCOBs	5%	20%	25%
Restore tiled wetlands	5%	20%	25%
Corn & Soybean with cover crop	15%	60%	75%



Table 4-5. Acres of BMPs Per Priority Area Needed to Achieve the Goal for Impaired Streams.

Priority Area [HUC-10]	Priority Area Drainage Areas*	Estimated Implementation of HSPF SAM identified BMPs** [Acres]						Load Reductions from Baseline Conditions			
		Nutrient Management	Reduced Tillage, (30%)	Conservation Crop Rotation	WASCOB	Restored Tiled Wetland	Corn and Soybean with Cover Crops	Discharge [AF/yr]	Sediment [tons/yr]	Total Nitrogen [lbs/yr]	Total Phosphorus [lbs/yr]
Upper Hawk Creek	A213	264	68	1,147	68	113	975	41.9	56.0	4,301.9	150.7
	A212	480	123	2,082	123	205	1,772	118.0	160.1	12,132.0	415.5
	A208	45	10	193	10	15	144	6.1	2.7	348.5	10.1
	A211	702	127	3,101	137	187	2,309	195.3	288.6	22,488.0	746.0
	A207	649	139	2,781	150	212	2,079	92.6	130.3	8,883.3	293.4
	A206	357	65	1,579	70	95	1,176	314.9	487.0	33,893.2	1,138.1
Beaver Creek	A232	479	123	2,055	103	164	1,517	29.6	39.9	4,957.7	141.4
	A233	825	101	3,615	136	287	2,819	100.4	157.0	13,423.8	415.4
	A235	304	73	1,303	61	106	1,053	19.4	25.2	3,173.8	91.0
	A234	966	296	4,172	297	351	3,263	91.8	134.8	14,617.8	418.1
	A231	703	263	3,131	274	212	2,704	160.5	296.1	22,208.5	682.4
	A230	443	181	1,898	194	133	1,636	277.4	499.3	39,958.2	1,189.1
Chetomba Creek	A220	581	178	2,234	148	214	1,915	69.0	107.5	9,023.0	289.6
	A221	589	237	2,700	197	223	2,313	81.0	129.9	10,862.5	350.2
	A219	978	218	3,745	182	291	3,222	259.5	426.0	33,010.5	1,065.5
	A218	311	31	1,245	44	65	906	20.8	44.6	2,838.3	100.3
	A217	346	94	1,338	89	96	1,148	308.1	541.5	38,224.3	1,265.3
	A417	123	33	475	32	34	408	317.8	562.0	39,547.3	1,312.4
Fort Ridgely Creek	A171	535	229	1,271	98	78	1,207	101.2	142.1	12,906.9	402.5
	A173	413	153	954	64	62	876	74.6	102.4	9,583.8	300.6
	A175	131	65	325	27	22	298	187.7	255.2	24,622.6	767.0
	A177	77	38	191	16	13	175	7.0	5.5	1,228.3	36.9
	A179	176	88	437	37	29	400	210.5	275.7	28,590.8	882.3
Key:		High	Upstream: No upstream inputs								
		Medium	Middle drainage: Inputs from upstream subbasins								
		Low	Downstream: Inputs from upstream and middle drainage subbasins								

* Recommended Implementation ranks (high, medium, low) based on position in the drainage system: color coded by the following

** Local partners can choose to replace these practices with other agricultural BMPs provided they achieve an equivalent level of treatment.

Justification for the Goals:

Goal 1: This goal was established using HSPF-SAM to determine how much implementation of locally accepted agricultural best management practices is needed to achieve the WRAPS 10-year goal for TSS. The process used to target and establish measurable goals using HSPF-SAM for the Hawk Creek – Middle Minnesota CWMP is documented in a technical memorandum which can be found in Appendix D. After comparing the estimated cost of achieving the WRAPS 10-year goal for TSS with the accounting of local funds and local capacity, it was decided that the goal should be adjusted from a 10% reduction in TSS to a 7% reduction in TSS.

Goal 2: Willmar and Foot Lakes are part of a chain of lakes that begins in the north with Eagle Lake and then flows through Swan, Willmar, Willmar (southern basin) and Foot Lakes before it becomes the start of Upper Hawk Creek (Figure 4-3). Eagle, Willmar (southern basin) and Foot Lakes are currently not impaired for excess nutrients/eutrophication. A phosphorus reduction goal was set for Eagle Lake in the 'High Quality Lakes and Streams' section. The rest of the lakes are discussed here. The proportion of phosphorus load by source to each lake are summarized in Figure 4-4 through Figure 4-8 and Table 4-6 through Table 4-9 to illustrate the strongest influences on water quality in each lake.



Figure 4-3. Chain-of-lakes in the Upper Hawk Creek HUC-10

Sources of phosphorus to Eagle Lake come mostly from watershed runoff (90%) followed by atmospheric deposition (10%) and a very small amount from upstream Point Lake (1%). Phosphorus reductions to improve water quality in Eagle Lake should be focused on watershed best management practices, particularly agricultural BMPs.

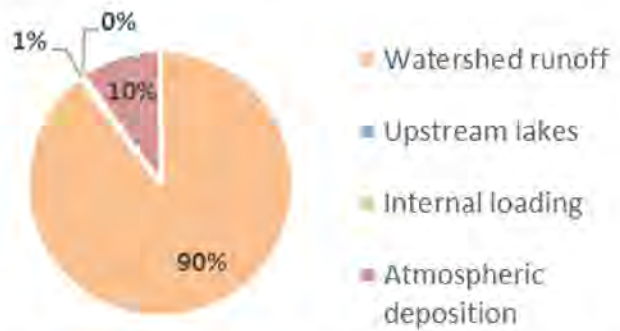


Figure 4-4. Fraction of phosphorus load by source to Eagle Lake as a percent of the 2010-2019 total phosphorus load

Sources of phosphorus to Swan Lake come mostly from internal loading (69%), followed by the upstream lakes, Eagle (13%) and Skataas (10%), watershed runoff (5%) and atmospheric deposition. Due to the low percentage of watershed runoff sources to Swan Lake, reductions in phosphorus to improve lake water quality should come from in-lake management or upstream lake improvements.

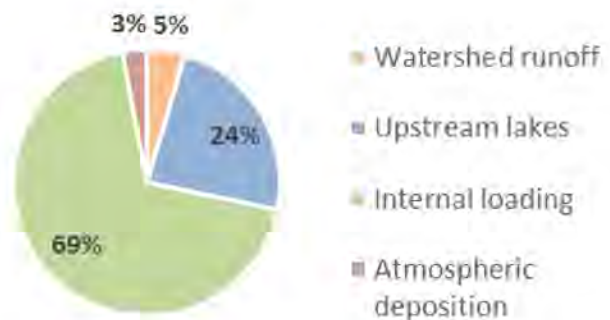


Figure 4-5. Fraction of phosphorus load by source to Swan Lake as a percent of the 2010-2019 total phosphorus load

Sources of phosphorus to Willmar Lake are mixed, with just under half from internal loading (44%), followed by watershed runoff (30%), upstream Swan Lake (24%), and atmospheric deposition (3%). Improvements to water quality in Willmar Lake should be focused on phosphorus reductions from watershed runoff and improvements in upstream Swan Lake first, followed by in-lake management (such as aquatic plant or carp control) to reduce internal loading.

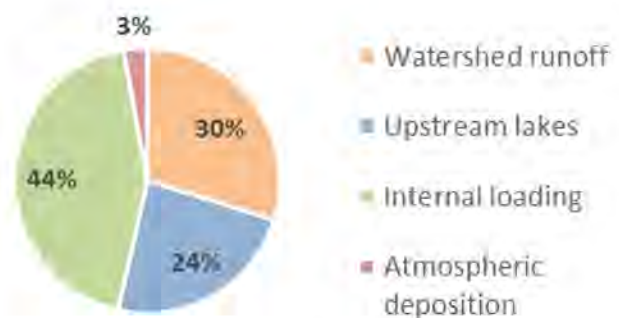


Figure 4-6. Fraction of phosphorus load by source to Willmar Lake as a percent of the 2010-2019 total phosphorus load

Sources of phosphorus to the Willmar (southern basin) between Willmar and Foot Lakes are almost entirely from upstream Willmar Lake (92%) with a small fraction from watershed runoff (6%) and atmospheric deposition (3%). Watershed runoff phosphorus reductions to the Willmar (southern basin) will not result in measurable improvements in lake water quality without improvements in upstream Willmar Lake. Therefore, implementation efforts to improve the Willmar (southern basin) should focus on Willmar Lake.

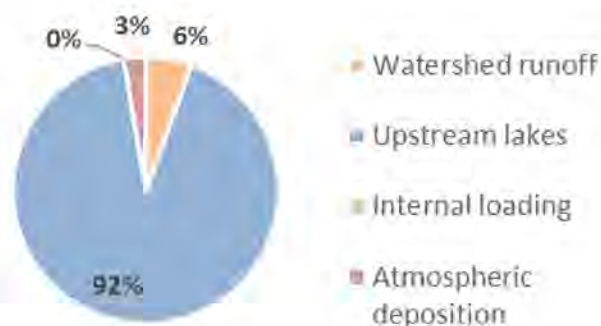


Figure 4-7. Fraction of phosphorus load by source to Willmar (southern basin) as a percent of the 2010-2019 total phosphorus load

About half of the phosphorus sources to Foot Lake are from upstream Willmar (southern basin), followed by internal loading (31%), watershed runoff (15%) and atmospheric deposition. Improvements to water quality in Foot Lake should focus on improvements in upstream Willmar (southern basin) and in-lake management. Watershed BMPs are important to maintain the current water quality of Foot Lake, which is not impaired for excess nutrients/eutrophication, but will likely not result in measurable improvements in lake water quality.

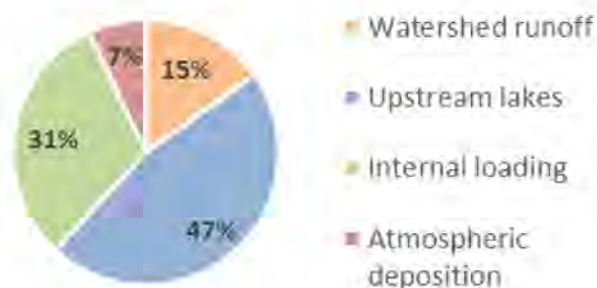


Figure 4-8. Fraction of phosphorus load by source to Foot Lake as a percent of the 2010-2019 total phosphorus load

An eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Willmar Lake (34-0180-01) can be achieved from 20-25%, or 383 lb/yr, reduction in watershed loads from the direct drainage areas to Willmar Lake (Table 4-6) and 19%, or 259 lb/yr, reduction in upstream lake loads from Swan Lake (34-0186-00). The existing 10-year (2010-2019) summer average in-lake TP concentration in Willmar Lake is 130 ppb and the State water quality standard goal is 90 ppb. The existing 10-year (2010-2019) summer average in-lake TP concentration in Swan Lake is 111 ppb

and the State water quality standard goal is 90 ppb. Swan Lake achievement of the State water quality standard goal of 90 ppb can be achieved through 34%, or 594 lbs/yr, reduction of legacy internal loads (Table 4-7).

The planning partners also considered load reduction goals in the next two downstream lakes, Willmar (southern basin) (34-0180-02) and Foot Lake (34-0181-00), which are currently not impaired for excess nutrients/eutrophication. However, due to the strong influence of upstream lake loads on both of these lakes, it was determined that feasible levels of watershed load reduction practices would not achieve a measurable improvement in the 10-year summer average in-lake total phosphorus (TP) concentration. The contributing areas and existing TP loads by source are provided for both lakes so that any phosphorus reductions achieved from agricultural and urban stormwater BMPs implemented within the direct drainage areas to these two lakes can be accounted for by the planning partners.

Table 4-6. Existing phosphorus loads and phosphorus reductions by source needed to achieve an 8% reduction in the 10-year average summer in-lake total phosphorus (TP) concentration in Willmar Lake (34-0180-01), or 111 ppb.

Willmar Lake Phosphorus Sources	Contributing Area (ac)	Existing TP Load (lb/yr)	% Total Load	TP Reduction (lb/yr)	% Reduction	Cropland (ac)
Direct Drainage	3,410	906	16%	181	20%	1,604
NE Tributary	761	228	4%	57	25%	326
NW Tributary	1,510	578	10%	144	25%	1,078
Swan Lake	14,376	1,371	24%	259	19%	
Excess Internal Load	--	2,505	44%			
Atmospheric Deposition on Lake Surface	447	166	3%			
Total	20,504	5,754		642	11%	



Eagle Lake – Kandiyohi County, MN

Table 4-7. Existing phosphorus loads and phosphorus reductions by source needed to achieve a 19% reduction in the 10-year average summer in-lake total phosphorus (TP) concentration in Swan Lake (34-0186-00), or 90 ppb.

Swan Lake Phosphorus Sources	Contributing Area (ac)	Existing TP Load (lb/yr)	% Total Load	TP Reduction (lb/yr)	% Reduction	Cropland (ac)
Direct Drainage	704	117	5%			185.7
Eagle Lake (34-0171-00)	12,177	341	13%			
Skataas Lake (34-0196-00)	1,292	262	10%			781.3
Excess Internal Load	--	1,750	69%	594	34%	
Atmospheric Deposition on Lake Surface	203	75	3%			
Total	14,376	2,548		594	23%	

Table 4-8. Existing phosphorus loads by source to Willmar (southern basin) (34-0186-00) based on the existing 10-year (2010-2019) summer average in-lake phosphorus concentration of 64 ppb.

Willmar (southern basin) Phosphorus Sources	Contributing Area (ac)	Existing TP Load (lb/yr)	% Total Load	Cropland (ac)
Direct Drainage	647	150	6%	7.6
Willmar Lake (34-0180-01)	20,504	2,465	92%	
Atmospheric Deposition on Lake Surface	190	71	3%	
Total	21,341	2,686		

Table 4-9. Existing phosphorus loads by source to Foot Lake (34-0181-00) based on the existing 10-year (2010-2019) summer average in-lake phosphorus concentration of 69 ppb.

Foot Lake Phosphorus Sources	Contributing Area (ac)	Existing TP Load (lb/yr)	% Total Load	Cropland (ac)
Direct Drainage	1,636	407	15%	381.6
Willmar (southern basin) (34-0180-02)	21,341	1,251	47%	
Excess Internal Load	--	836	31%	
Atmospheric Deposition on Lake Surface	503	187	7%	
Total	23,480	2,681		

4.3.2 Altered Hydrology

Desired Future Condition (Long-Term Goal):

Mitigate changes to the hydrologic functions of the landscape by achieving the long-term goal for altered hydrology identified in the Hawk Creek and Minnesota River – Mankato WRAPS: 25% reduction in annual flow volume (or yield), with a 25% decrease in 2-year peak flow and duration, and an increase in dry season base flow (goal represents a drop in the average annual water yield from 5.9 to 4.4 inches) (Table 14A HC WRAPS). As the Justification for the Goals (below) explains, the 25% reduction in annual flow volume was converted to a subwatershed wide depth (in inches) by dividing 25% of the baseline flow (AF/year) generated by HSPF-SAM by the size of the Priority Area (acres).

Measurable Goals (Short-Term Goal):

Goal 1: Reduce annual runoff from the Priority Areas, as follows:

- *Upper Hawk Creek – Reduce average annual runoff by 0.25 inches (2,606 ac-ft)*
- *Beaver Creek – Reduce average annual runoff by 0.25 inches (2,642 ac-ft)*
- *Chetomba Creek – Reduce average annual runoff by 0.25 inches (2,119 ac-ft)*
- *Fort Ridgely Creek – Reduce average annual runoff by 0.25 inches (929 ac-ft)*

Goal 2: Work to achieve no net increase in existing runoff volumes to the Minnesota River from changes in land use or land use practices for non-priority subwatersheds as follows:

- *Lower Hawk Creek*
 - *Maintain baseline (1996-2012) flow of 132,177 AF/year*
- *Stony Run Creek – Minnesota River*
 - *Maintain baseline (1996-2012) flow of 1,325,250 AF/year*
- *Wood Lake Creek – Minnesota River*
 - *Maintain baseline (1996-2012) flow of 1,639,789 AF/year*
- *Sacred Heart Creek – Minnesota River*
 - *Maintain baseline (1996-2012) flow of 1,875,246 AF/year*
- *Birch Coulee Creek*
 - *Maintain baseline (1996-2012) flow of 18,176 AF/year*
- *Spring Creek – Minnesota River*
 - *Maintain baseline (1996-2012) flow of 2,092,539 AF/year*
- *Little Rock Creek*
 - *Maintain baseline (1996-2012) flow of 22,607 AF/year*

Note: The Baseline Flow is the reach load reported in HSPF-SAM, which measures the compounded load of all upstream discharges at the most downstream end. Therefore, this number includes flow from upstream areas.

Implementation Activities:

Goals 1 & 2:

- A. Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the direct drainage area of Priority Areas (as identified in Table 4-5).
- B. Conduct an analysis to identify non-contributing (i.e. landlocked or semi-landlocked) portions of the Priority Areas.
- C. Work with 10 landowners to maintain these landlocked or semi-landlocked portions of the landscape (so they don't become connected in the future).
- D. Conduct a terrain analysis using the Restorable Wetlands Inventory and LiDAR to identify restorable wetland sites for improving water quality and reducing peak flows.
- E. Implement soil health practices on 10% of available cropland in priority areas (can be correlated with activities listed under 4.3.4 Agricultural Practices, Soil Erosion and Runoff Management).
- F. Establish a program to offer incentives to homeowners for on-lot infiltration practices, including reduced lot grading and rain gardens to control runoff at its source and promote recharge to the groundwater.
- G. Attend 30 staff trainings over the course of the plan to continue to be engaged and informed regarding on-going research to understand the impacts of drainage or other land use practices on ground water recharge rates and the means to quantify these impacts.
- H. Host 10 workshops (one (1) annually) to promote cover crops and soil health to further support the adoption of these practices for local farmers (can be correlated with activities listed under 4.3.4 Agricultural Practices, Soil Erosion and Runoff Management).

Justification for the Goals:

Goal 1: The long-term goal of achieving a 25% reduction in annual flow volume varies for each of the Priority Areas as follows: Beaver Creek - 1.07 inches; Chetomba Creek - 1.22 inches; Fort Ridgely Creek - 1.68 inches; and Hawk Creek - 1.25 inches. This was determined by dividing 25% of the baseline flow (AF/year) generated by HSPF-SAM by the size of the Priority Area (acres). This simple calculation estimates the depth of runoff that equates to the 25% long-term flow reduction goal.

The goal for each priority area is a fraction of the long-term flow reduction goal but represents what the planning partners consider to be a viable storage goal for the next 10 years. This goal was determined by summing the amount of flow reduction and storage provided by the BMPs needed to achieve the water quality goals identified under Section 3.3.1 Impaired Lakes and Streams. Specifically, the goals for each Priority Area were determined using the following steps summarized in Table 4-10 through Table 4-13 on the following page:

1. **Estimated Water Storage** – *This is an estimate of the volume of storage needed to retain ¼ inch of runoff on the landscape. This is the measurable goal that needs to be achieved within the 10-year lifespan of this plan measured in acre-feet.*
2. **Volume Control** – *Annual average discharge reduction (acre-feet) achieved by implementing the six agricultural BMPs at adoption rates that were identified as being the most cost-effective for achieving a seven (7) percent reduction in total suspended solid (TSS) loads at the downstream end of the Priority Areas (see Goal 1 of Impaired Lakes and Streams). These agricultural BMPs include: Nutrient Management; Reduced Tillage; Conservation Cover Crop; WASCOPS; Restored Tiled Wetlands; and Corn and Soybean Rotation with Cover Crop. See the row labeled "Volume control due to Agricultural BMPs (HSPF-SAM)".*
3. **Volume Control** – *Annual discharge reduction (acre-feet) as a result of improved soil health. This reduction was determined by applying a loss of 1/9 inch of runoff per acre to 10% of total cropland in the Priority Areas. See the row labeled "Volume control due to improved soil health".*
4. **Rate Control** – *Storage provided by creating live storage as a component of the HSPF-SAM restored tiled wetlands. The depth of storage needed to achieve the goal varies by Priority Area and is identified in the row labeled "Rate control".*

As stated previously, the sum of the volume control and rate control practices is needed to achieve the 10-year measurable goal of reducing average annual runoff by 0.25 inches.

Table 4-10. Summary of BMPs Needed to Achieve Storage Goal for the Upper Hawk Creek Priority Area

Upper Hawk Creek Priority Area (125,073 acres)	
Goal: Estimated water storage based on 0.25" of runoff is 2,606 AF	
Volume control due to Agricultural BMPs (HSPF-SAM) identified in Table 4-5 (equates to 532 acres of reduced tillage, 10,883 acres of conservation crop rotation practices and 8,455 acres of cover crops)	315
Volume control due to improved soil health on 10% of available cropland* (equates to 7,255 acres)	79
Rate control provided by creating 2.75' of bounce in the 827 acres of restored tiled wetlands needed to meet Impaired Lakes and Stream Goal	2,274
Total	2,668

* Volume assumes a 1/9-inch of runoff reduction per acre (Source: Anna Cates, State soil health specialist - 2021)

Table 4-11. Summary of BMPs Needed to Achieve Storage Goal for the Beaver Creek Priority Area

Beaver Creek Priority Area (126,821 acres)	
Goal: Estimated water storage based on 0.25" of runoff is 2,642 AF	
Volume control due to Agricultural BMPs (HSPF-SAM) identified in Table 4-5 (equates to 1,037 acres of reduced tillage, 16,174 acres of conservation crop rotation practices and 12,992 acres of cover crops)	277
Volume control due to improved soil health on 10% of available cropland* (equates to 10,783 acres)	100
Rate control provided by creating 2' of bounce in the 1,253 acres of restored tiled wetlands needed to meet Impaired Lakes and Stream Goal	2,506
Total	2,883

* Volume assumes a 1/9-inch of runoff reduction per acre (Source: Anna Cates, State soil health specialist - 2021)

Table 4-12. Summary of BMPs Needed to Achieve Storage Goal for the Chetomba Creek Priority Area

Chetomba Creek Priority Area (101,688 acres) Goal: Estimated water storage based on 0.25" of runoff is 2,119 AF	Volume [acre-feet]
Volume control due to Agricultural BMPs (HSPF-SAM) identified in Table 4-5 (equates to 613 acres of reduced tillage, 9,503 acres of conservation crop rotation practices and 7,997 acres of cover crops)	318
Volume control due to improved soil health on 10% of available cropland* (equates to 9,029 acres)	83
Rate control provided by creating 2.5' of bounce in the 709 acres of restored tiled wetlands needed to meet Impaired Lakes and Stream Goal	1,773
Total	2,174

* Volume assumes a 1/9-inch of runoff reduction per acre (Source: Anna Cates, State soil health specialist - 2021)

Table 4-13. Summary of BMPs Needed to Achieve Storage Goal for the Fort Ridgely Creek Priority Area

Fort Ridgely Creek Priority Area (44,576 acres) Goal: Estimated water storage based on 0.25" of runoff is 929 AF	Volume [acre-feet]
Volume control due to Agricultural BMPs (HSPF-SAM) identified in Table 4-5 (equates to 573 acres of reduced tillage, 3,178 acres of conservation crop rotation practices and 2,956 acres of cover crops)	210
Volume control due to improved soil health on 10% of available cropland* (equates to 3,973 acres)	43
Rate control provided by creating 3' of bounce in the 229 acres of restored tiled wetlands needed to meet Impaired Lakes and Stream Goal	687
Total	940

* Volume assumes a 1/9-inch of runoff reduction per acre (Source: Anna Cates, State soil health specialist - 2021)

Goal 2: Given the amount of work proposed to achieve the runoff reduction goals in the four priority areas, a no net increase in runoff goal is proposed for the remainder of the Hawk Creek – Middle Minnesota Planning Area.



4.3.3 High Quality Lakes and Streams

Desired Future Condition (Long-Term Goal):

The number of high-quality lakes and streams located in the Hawk Creek – Middle Minnesota Planning Area has increased as a result of educational efforts, partnerships and improved stewardship.

Measurable Goals (Short-Term Goal):

Goal 1: Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Eagle Lake (34-0171-00), or 35 ppb.

Goal 2: Achieve no net increase in the 10-year summer average in-lake total phosphorus (TP) concentration in Swan Lake (Sibley County: *Little Rock Creek Subwatershed*).

Implementation Activities:

Goal 1:

- A. Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres, according to the adoption rates listed in Table 4-14 needed to achieve a 20% phosphorus reduction in the NE tributary subwatershed of Eagle Lake, or 405 lb/yr.
- B. Implement a management plan for manipulation of the PW Basin #34-540 outlet structure to manage water levels for optimum water quality in the impoundment.
- C. Seek to acquire the PW Basin #34-540 outlet and associated impoundment and upland habitat in cooperation with local and state agencies and conservation groups (can be correlated with activities listed under 4.3.7 Wildlife Habitat and 4.3.8 Recreation).
- D. Hold two (2) meetings (estimated effort) with the Eagle Creek Golf Course to evaluate opportunities to reduce the application of fertilizers and herbicides and to convert portions of the golf course to native vegetation

Goal 2:

- E. Implement 100% of HSPF-SAM identified agricultural BMPs on suitable cropland acres within the direct drainage area of Swan Lake (Sibley County: *Little Rock Creek Subwatershed*). Note: 100% of identified HSPF-SAM agricultural BMPs include the adoption of 16 feet of additional buffer around the existing lakeshore buffer, cover crops on 50% of corn and soybean, reduced tillage on 50% corn and soybean, nine (9) alternative tile intakes, and one (1) tiled wetland restoration are needed to maintain the goal.

Justification for the Goals:

Goal 1: An eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Eagle Lake (34-0171-00) can be achieved from a 405 lbs/yr reduction in watershed loads to Eagle Lake (Table 4-14). The existing 10-year (2010-2019) summer average in-lake TP concentration in Eagle Lake is 38 ppb and the State water quality standard goal is 40 ppb.

Watershed load reductions should be targeted in the NE tributary drainage area (7,270 acres), which contributes 62% of the existing TP load to Eagle Lake.

A water level control structure was constructed to provide management potential for Public Waters Wetland #34-540-00. Following installation, water quality conditions in the basin improved. Over time, conditions degraded, and the basin is now in a turbid water state with little submergent or emergent vegetation. Over time, the impoundment system has degraded due to lack of management. Internal cycling/mixing of sediment and phosphorus due to carp activity, a static pool depth, and poor emergent and submergent vegetative growth has resulted in significant nutrient and sediment loads to Eagle Lake.

In order to reduce and minimize ongoing discharge of pollutants from this basin to Eagle Lake, management that provides sediment consolidation, facilitates rough fish winterkill, and rejuvenates submerged plant growth is of primary importance. There are a number of private, public/private, and public options that might allow for such management. If opportunities arise for public acquisition, such an acquisition would have the added benefit of further enhancing wildlife habitat and recreational opportunities in the area.

Watershed reductions could also be achieved in the SE Tributary (1,777 acres) and the Direct Drainage area (1,804 acres) to achieve the in-lake TP goal if all the reductions cannot be achieved from implementation within the NE Tributary, or the improvement of the NE Tributary inlet to Eagle Lake is deemed no longer achievable within a reasonable timeframe (10-20 years).

Table 4-14. Existing phosphorus loads and phosphorus reductions by source needed to achieve an 8% reduction in the 10-year average summer in-lake total phosphorus (TP) concentration in Eagle Lake (34-0171-00), or 35 ppb.

Source	Contributing Area (ac)	Existing TP Load (lb/yr)	TP Reduction (lb/yr)	% Reduction
NE Tributary	7,270	1,994	405	20%
SE Tributary	1,777	538		
Direct Drainage	1,804	328		
Point Lake	477	18		
Excess Internal Load	--	0		
Atmospheric Deposition on Lake Surface	850	316		
Total	12,177	3,195		13%

Goal 2: Swan Lake (Sibley County: *Little Rock Creek Subwatershed*) is currently meeting water quality standards. Watershed BMPs are proposed at the same adoption rates as the other lakes in the Upper Hawk Creek priority area. Implementation of agricultural BMPs in the Swan Lake watershed are meant to maintain the existing water quality of Swan Lake but not necessarily additional improvements.

4.3.4 Agricultural Practices, Soil Erosion and Runoff Management

Desired Future Condition (Long-Term Goal):

The agricultural operators of the Hawk Creek – Middle Minnesota Planning Area have adopted agricultural best management practices (e.g. no-till practices, cover crops, soil health practices, etc.) across the landscape. The land is planted year-round and the soils are healthy, stabilized, and infiltrating and storing large quantities of water.

Measurable Goals (Short-Term Goal):

- Goal 1:** Change knowledge and attitudes about agricultural practices to manage runoff and improve soil health so adoption rate increases
- Goal 2:** Increase the adoption rate of agricultural practices to manage runoff and improve soil health in priority subwatersheds.
- Goal 3:** Protect and increase intact wetland and grasslands in priority subwatersheds.
- Goal 4:** Implement components of Multipurpose Drainage Management through the use of practices to reduce erosion, increase storage, improve water quality and reduce maintenance (can be correlated with the goal listed under 4.3.2 Altered Hydrology).

Implementation Activities:

Goal 1:

- A. Conduct a survey twice over the course of the next 10 years to determine how many producers and local crop advisors are implementing manure and nutrient management plans.
- B. Host one (1) manure/nutrient management workshop per year and invite farmers and local crop advisors.
- C. Conduct a survey to evaluate the adoption of soil health principles in the watershed and create a database to track the percentage of fields that have increased soil water holding capacity from increased soil organic matter due to conservation/no tillage, increased vegetation, etc.
- D. Educate 300 producers and five (5) local crop advisors annually on soil health principles.
- E. Organize one (1) watershed-wide event annually that highlights conservation practices that benefit water quality, focusing on soil health (non-structural BMPs) and win-win solutions for farmers.

Goal 2:

- F. Develop and implement 40 manure and 80 nutrient management plans.
- G. Implement four (4) structural and five (5) non-structural BMPs annually that will reduce soil erosion and sediment loss from agricultural land.
- H. Implement five (5) residential and agricultural water quality improvement projects within the watershed to reduce nutrient loading or runoff volume.
- I. Replace 431 open tile intakes with alternative tile intakes on 2% (4,305 treated acres) of the fields in priority subwatersheds.

Goal 3:

- J. Maintain a total of 24,112 acres of wetlands and grasslands in various conservation cover and/or easement programs (Source: Minnesota Natural Atlas, National Conservation Easement Database (NCED)).
- K. Enroll 600 new acres of wetlands and grassland with the use of state and federal programs (can be correlated with activities listed under 4.3.7 Wildlife Habitat). (Source: Minnesota Natural Atlas, National Conservation Easement Database (NCED)).

Goal 4:

- L. Establish permanent easements for three (3), 40 acre large-scale, multipurpose drainage projects that would mitigate the impacts to altered hydrology (in correlation with activities listed under 4.3.2 Altered Hydrology).
- M. Review 100% of new ditch, lateral, and improvement projects, during early coordination (one (1) meeting annually), for opportunities for large-scale, multipurpose drainage projects that mitigate the impacts of altered hydrology. Determine project identification, feasibility and preliminary designs, and cost estimation (in correlation with activities listed under 4.3.2 Altered Hydrology).
- N. Meet annually with BWSR and the State Legislature to increase benefits value threshold for conservation as it relates projects that will improve water quality, reduce flows and stabilize outlets.

Justification for the Goals:

Goal 1: While it is recognized that most farmers have developed and follow nutrient and manure management plans in order to comply with state regulations and to realize cost savings, there are still opportunities for improvement. Education and outreach will improve the flow of information between research and educational projects and programs and agricultural professionals.

Goal 2: According to *An Assessment of Landowner Conservation Behavior in Nicollet County, MN (UMN, 2017)* education and technical assistance programs, particularly those that are targeted at landowners that are not highly engaged in conservation have the potential to enhance landowner knowledge and skills to use conservation practices. Additionally, one of the biggest drivers of conservation action is providing evidence that conservation practices improve water resources.

Goal 3: This goal was established by the local planning partners based on past implementation numbers and an evaluation of local capacity to implement these types of BMPs in the priority areas.

Goal 4: This goal was established in consultation with the local drainage authorities. Multi-purpose drainage improvement projects are complicated. Recognizing that landowners are interested in these types of conservation projects, the local partners have established a goal which will facilitate the identification of potential projects by initiating the conversation of incorporating Multipurpose Drainage Management when the opportunities for improvements arise.

4.3.5 Drinking Water Protection

Desired Future Condition (Long-Term Goal):

Residents of the Hawk Creek-Middle Minnesota Planning Area have access to high quality drinking water. As stewards of the watershed, they employ best management practices such as reduced tillage, cover crops, nutrient, and pest management. There is an increase in the amount of storage on the landscape through efforts to slow runoff and promote groundwater recharge. Residents and businesses have reduced contamination sources and practice groundwater conservation.

Measurable Goals (Short-Term Goal):

- Goal 1:** Make information available to private well users about local drinking water quality and well testing.
- Goal 2:** Protect public drinking water supplies with moderate and high vulnerability by implementing best management practices that protect groundwater in the wellhead protection areas.
- Goal 3:** Reduce risk to public health from abandoned or poorly maintained wells through education of well decommissioning and sealing programs.



Implementation Activities:

Goal 1:

- A. Direct 75 private well owners annually to testing programs for nitrates and total coliform bacteria.
- B. 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)*
- C. Provide or direct private well owners to financial assistance for private well water testing.
- D. Issue five (5) watershed-wide direct mailings that provide private well users with safety guidelines and water conservation information for proper well maintenance.
- E. Repair and replace 36 private drinking water wells when improvement loan programs and funding are available.

Goal 2:

- F. Hold two (2) meetings to discuss and incorporate sensitive groundwater recharge areas maps (source MN DNR) into the local land use decision-making process.
- G. County and SWCD staff will attend a minimum of two (2) meetings to review wellhead protection plans and coordinate partnering opportunities with communities. Staff will also serve on wellhead protection planning teams, as requested.
- H. Conduct two (2) direct mailings to landowners about completing BMP projects within Drinking Water Supply Management Areas (DWSMAs).
- I. Implement 10 BMPs in urban and rural areas that promote infiltration and groundwater recharge.
- J. Conduct five (5) mailings to provide education on water conservation practices that can be adopted in people's homes and businesses.

Goal 3:

- K. Inventory existing wells watershed-wide
- L. Target sealing 100 abandoned wells through use of cost-share well sealing assistance.

Justification for the Goals:

Goal 1: According to the Groundwater Restoration and Protection Strategy (MDH, 2019) there are numerous areas in the Hawk Creek-Middle Minnesota Planning Area where groundwater has a greater risk to contamination due to higher pollution sensitivity. Nearly two percent of tested drinking water wells had levels at or above the Safe Drinking Water Act standard of 10 mg/L. The MDA Township Testing Program showed that five to 10 percent of the water samples in Chippewa County and greater than 10 percent of the samples in Nicollet County exceeded the drinking water standard for nitrate. Finally, sampling data from northwestern Renville County (MDA ambient monitoring well) recorded a nitrate result of 11.4 mg/L in 2018. Increased awareness and action is needed to help private well owners to protect and maintain their wells to ensure a source of safe drinking water that meets drinking water quality standards.

Goal 2: According to the Groundwater Restoration and Protection Strategy (MDH, 2019) there are seven (7) community public water supply systems with moderate or high vulnerability. These community public water supply systems include Renville North (High), Fairfax (Moderate), Morton (Moderate), Danube (Moderate), Raymond 2, 3 and 5 (Moderate), Watson (Moderate) and Willmar SW (Moderate). Increased collaboration with communities and landowners to implement Best Management Practices (BMPs) will help to ensure the protection of these drinking water sources and groundwater resources.

Goal 3: According to the Groundwater Restoration and Protection Strategy (GRAPS) the groundwater pollution sensitivity rating in the Hawk Creek – Middle Minnesota Planning Area is primarily “low” throughout, with some localized areas of “moderate” to “high” sensitivity. Further, groundwater testing demonstrates that there are elevated levels of nitrates, arsenic and pesticides within the Planning Area. To further protect drinking water from these types of contaminants, the planning partners established this goal to eliminate direct connections to the groundwater system.



4.3.6 Subsurface Sewage Treatment Systems

Desired Future Condition (Long-Term Goal):

Achieve full compliance with state minimum standards for subsurface sewage treatment systems through replacement of nonconforming systems. Maintain compliance perpetually through county program administration that facilitates the ongoing replacement of systems and promotes proper operation and maintenance of existing systems for optimal treatment and longevity.

Measurable Goal (Short-Term Goal):

Goal 1: Reduce bacterial and nutrient loading to surface waters and groundwater by reducing phosphorus by 5,300 lbs, nitrogen by 13,550 lbs, bacteria by $369.5E+14$ CFU, TSS by 89.750 lbs, and BOD by 162,450 lbs.

Implementation Activities:

Goal 1:

- A. Complete 750 SSTS upgrades
- B. Use 90 newspaper ads, and radio announcements, along with assistance from SSTS Contractors to help spread information to homeowners that funds are available to help with upgrades.

Justification for the Goals:

Goal 1 The planning partners established the goal of completing 75 SSTS upgrades annually using internal record-keeping and past accomplishments.

4.3.7 Wildlife Habitat

Desired Future Condition (Long-Term Goal):

There is an increase in wildlife habitat in the Hawk Creek – Middle Minnesota Planning Area. Much of this habitat is located on private lands in the form of enhanced stream corridors to allow for better connections to the Minnesota River and maximize the benefits of this ecosystem restoration work.

Measurable Goals (Short-Term Goal):

Goal 1: Increase and enhance wildlife habitat and improve habitat connectivity by adding 100 acres of wetland and 200 acres of upland habitat through wetland restoration, conservation easements and purchases.

Implementation Activities:

Goal 1:

- A. Restore 100 acres of wetlands with associated riparian and upland habitat.
- B. Acquire 200 acres of upland habitat through wetland restoration, conservation easements, and purchases.

Note: Activities A and B can be correlated with activities listed 4.3.2. Altered Hydrology, 4.3.3 High Quality Lakes and Streams, 4.3.4 Agricultural Practices, Soil Erosion, and Runoff Management, and 4.3.8 Recreation.

Justification for the Goals:

Goal 1: The planning partners established this goal based on historical records of easement acquisitions and enrollment in conservation programs.

4.3.8 Recreation

Desired Future Condition (Long-Term Goal)

The Hawk Creek – Middle Minnesota Planning Area has a wide diversity of recreational opportunities across the Planning Area: from swimming and fishing to bird watching and pollinator gardens. The surface water and groundwater resources are clean and healthy, supporting recreational opportunities year-round.

Measurable Goals (Short-Term Goal):

Goal 1: Improve recreational opportunities in the Planning Area by increasing the amount of recreational land (by 160 acres) and public access (by 600 acres) to recreational lands.

Implementation Activities:

Goal 1:

- A. Pursue 160 acres of additional public recreational land acquisitions (WMA, WPA, US Fish & Wildlife, etc.): three in the Chetomba subwatershed and one in remaining priority areas totaling four (4) acquisitions in 10 years (can be correlated with activities listed under 4.3.3 High Quality Lakes and Streams).
- B. Enroll 600 acres in the Walk-in Access program.

Justification for the Goals:

Goal 1: During the plan development process it was recognized that the Chetomba Creek Priority Area has little recreational area. Where there is recreational area, it is fragmented and would benefit by being better connected. As a result, three of the four land acquisitions will be targeted for the Chetomba Creek Priority Area. These land acquisitions will also have overlap in achieving the storage goal for Altered Hydrology.

4.3.9 Monitoring and Data Collection

Desired Future Condition (Long-Term Goal):

There is sufficient surface water and groundwater data to evaluate baseline conditions and to perform trend analyses. State and local partners have expanded their monitoring programs to include additional resources (e.g. smaller waterbodies) and additional parameters (e.g. soil moisture). There has been a significant increase in the number of private wells tested for drinking water quality.

Measurable Goals (Short-Term Goal):

- Goal 1:** Collect continuous stream flow and event-based TP/TSS concentrations from the NE and SE tributaries to Eagle Lake to monitor TP load reductions to Eagle Lake from implementation of agricultural BMPs in the watershed.
- Goal 2:** Collect 10 years of continuous flow monitoring data at the outlet of all four (4) priority subwatersheds.

Implementation Activities:

Goal 1:

- A. Install a NE tributary monitoring station to Eagle Lake (see Figure 4-3). This monitoring station should be located upstream of the outlet structure to better measure TP reductions associated from implementation of agricultural BMPs only.
- B. Install a SE tributary monitoring station (see Figure 4-3) to get a more complete picture of the total loads discharging to Eagle Lake.

Goal 2:

- C. Install flow stations on Chetomba Creek and Fort Ridgely Creek and maintain flow stations located on Upper Hawk Creek and Beaver Creek.

Justification for the Goals:

Goal 1: To gain knowledge of progress towards goals.

Goal 2: While local partners will be tracking progress towards the goals established for Impaired Lakes and Streams and High-Quality Lakes and Streams using HSPF-SAM it will also be important to collect in-stream data to verify the modeling results. While this is not always feasible in larger systems due to cost, these tributaries are smaller and more conducive to effectiveness monitoring to measure pollutant reductions. This will be valuable information state-wide since there isn't a lot of project effectiveness monitoring being conducted at this point in time.

Goal 3: To evaluate performance in achieving the goals for Impaired Lakes and Streams and Altered Hydrology, the planning partners should have flow data on the downstream end of the Priority Areas. As the Table 4-15 identifies, two of the resources (Beaver Creek and Hawk Creek) have existing flow stations. Flow stations will need to be installed on Chetomba Creek and Fort Ridgely Creek.

Table 4-15. Summary of Available Flow Data for the Streams in the Four Priority Areas.

Priority Area	Flow Station	Source	Period of Record
Beaver Creek	Beaver Creek nr Beaver Falls, CSAH2 (25053002)	MN DNR, MPCA, Hawk Creek Watershed Project	1999-2020
Chetomba Creek	NA	NA	NA
Fort Ridgely Creek	NA	NA	NA
Upper Hawk Creek	Hawk Creek nr Maynard, MN23 (25024001)	MN DNR, MPCA, Hawk Creek Watershed Project	1999-2020
	Hawk Creek nr Granite Falls, CR52 (25037001)	MN DNR), MPCA, NWS	1999-2020

4.3.10 Education and Outreach

Desired Future Condition (Long-Term Goal):

Individuals who live, work, and recreate in the Hawk Creek – Middle Minnesota Planning Area understand and value the importance of the land and water resources. Any entities involved in educational programming are promoting positive and consistent messages across the urban and rural landscape to create a common understanding of stewardship and the need for conservation practices. Many excellent programs are in place and provide the opportunity to educate the youth in the school system and throughout social media sites.

Measurable Goals (Short-Term Goal):

Goal 1: Provide educational, technical, and financial assistance to promote water quality and focus education and outreach efforts in the Priority Areas integrating those efforts with the goals of the Hawk Creek Watershed Project, WRAPS, and GRAPS.

Implementation Activities:

Goal 1:

- A. Host an annual workshop to facilitate relationship-building between ag producers, ag industry, and bank staff that provide loans to producers and conservation professionals.
- B. Continue to implement BMP education programs focusing on ag soil health and altered hydrology, residential stormwater management, SSTS, manure management and other key issues that help increase knowledge and participation in BMP's by reaching 100 contacts annually.
- C. Provide education and outreach opportunities at a minimum of three (3) times annually by participating in public events such as County Fairs, Environmental Field Days, schools, Woman's Day event and bus tours.
- D. Reach 500 landowners by utilizing social media (radio, newspaper, internet sites), direct mailings, and annual reports to provide education and outreach opportunities.

Note Activities A through D can be correlated with activities listed under 4.3.2. Altered Hydrology, 4.3.4 Agricultural Practices, Soil Erosion and Runoff Management, and 4.3.5 Drinking Water Protection.

Justification for the Goals:

Goal 1: Public awareness and knowledge of water management issues is an essential component to improving water resources in the Hawk Creek – Middle Minnesota Planning Area. In a watershed where most nonpoint sources of pollution are non-regulated or minimally regulated (e.g. runoff from cultivated crops and subsurface tile system discharge, runoff from yards, smaller cities, and storm sewer networks, runoff from manure-applied crops, and runoff from livestock feedlots and pastures) it will be important to promote the voluntary adoption of conservation practices through education and by providing technical and financial support.



Ditch with Terrace - Chippewa County, MN

4.3.11 Groundwater Supply

Desired Future Condition (Long-Term Goal):

See the Desired Future Condition for Drinking Water Protection under Tier II Issues.

Measurable Goals (Short-Term Goal):

There are no goals established for this issue as the implementation activities addressing Impaired Lakes and Streams and Altered Hydrology will also address groundwater supply by capturing and infiltrating runoff on site.

4.3.12 Floodplain and Shoreland Management

Desired Future Condition (Long-Term Goal):

Cities and the agricultural community are more prepared for increased flooding and related issues as a result of changes in precipitation patterns. By adopting a range of shoreland management and protection practices, including riparian herbaceous cover and forested buffer, communities can also benefit from better water quality, expanded floodplain storage, increased floodplain connectivity, and improved bank stability. Furthermore, protecting and restoring floodplains provides more room for rivers to accommodate large floods and keep downstream farms and communities safe, ultimately improving climate resiliency (4.3.13).

Measurable Goals (Short-Term Goal):

Maintain what is being done via existing programs (see Section 6).

4.3.13 Climate Resiliency

Desired Future Condition (Long-Term Goal):

Cities and the agricultural community have become more resilient to changes in climate (e.g. extreme precipitation events) by adopting practices that increase storage capacity. Both the cities and the agricultural community have found that the adoption of these practices (e.g. green infrastructure, wetland restoration, agricultural conservation practices) has economic benefits by reducing capital investments and improving yields.

Measurable Goals (Short-Term Goal):

There are no goals established for this issue as the implementation activities addressing Impaired Lakes and Streams and Altered Hydrology will also address climate resiliency by capturing and infiltrating runoff on site.

4.3.14 Urban Stormwater Management

Desired Future Condition (Long-Term Goal):

The larger communities have adopted a stormwater utility fee to help prevent and correct issues related to stormwater management. Low Impact Development and Green Infrastructure has become the norm and has been integrated into most commercial and residential development. Residents understand the need to do their part and practices like raingardens are found throughout the urban landscape. Salt application and snow management are conducted in a manner that protects the quality and integrity of downstream BMPs and natural resources.

Measurable Goals (Short-Term Goal):

There are no goals established for this issue as the implementation activities addressing Impaired Lakes and Streams, High Quality Lakes and Streams and Education and Outreach will address urban stormwater management by increasing the number of demonstration sites and stormwater Best Management Practices located in the City of Willmar and promote the awareness of urban stormwater management.

4.3.15 Hazardous Materials, Solid Waste and Environmental Contaminants

Desired Future Condition (Long-Term Goal):

There is a significant reduction in the amount of new waste and contaminants being disposed of on the landscape. People who live, work and recreate in the Hawk Creek – Middle Minnesota Planning Area use proper disposal practices which is made easier through the use of social media and easy-to-access waste disposal facilities.

Measurable Goals (Short-Term Goal):

Maintain what is being done via existing programs (see Section 6).

4.3.16 Aquatic Invasive Species

Desired Future Condition (Long-Term Goal):

The counties in the Hawk Creek – Middle Minnesota Planning Area have successful AIS programs that address: (1) Prevention; (2) Early Detection, Rapid Response and Containment; and (3) Management.

Measurable Goals (Short-Term Goal):

Maintain what is being done via existing programs (see Section 6).

5 TARGETED IMPLEMENTATION SCHEDULE

This section describes the Targeted Implementation Schedule which identifies when and where specific actions will be implemented within the Hawk Creek – Middle Minnesota Planning Area to achieve the desired goals for the 10-year timeframe of the Plan. The Targeted Implementation Schedule includes both structural, non-structural and programmatic elements, recognizing that effective watershed management needs to address the root causes and drivers of environmental impacts, not just the symptoms, in order to achieve long-term solutions.

The inclusion of an action in the Targeted Implementation Schedule is a statement of intent by the Planning Partners. Implementation rests on further HCMM JPE decisions to budget for and fund the action which will be made in response to routine evaluation of performance in achieving the goals of this Plan. Similarly, over the period of 10-years, as priorities evolve and new concerns emerge or new approaches are developed, the Planning Partners may choose to undertake an action not included in the Targeted Implementation Schedule. The listing of actions in the Targeted Implementation Schedule is not intended to exclude other actions that are consistent with the issues, goals and policies identified in Section 4. In such cases, undertaking an action not explicitly identified in the Targeted Implementation Schedule may require amending the Plan as described in Section 7 *Plan Administration and Coordination*.



5.1 TARGETED IMPLEMENTATION PLAN STRUCTURE

The Targeted Implementation Schedule of the Hawk Creek – Middle Minnesota Comprehensive Watershed Management Plan (CWMP) includes the implementation activities identified in Section 4.0 *Implementation to Address Priority Issues*. Tables 5-2 through 5-5 contain the specific HSPF-SAM identified agricultural BMPs for each of the four Priority Areas as follows:

- *Upper Hawk Creek (Table 5-2) – Identify the specific activities corresponding to Implementation Activity 1 in Table 5-1*
- *Beaver Creek (Table 5-3) - Identify the specific activities corresponding to Implementation Activity 2 in Table 5-1*
- *Chetomba Creek (Table 5-4) - Identify the specific activities corresponding to Implementation Activity 3 in Table 5-1*
- *Fort Ridgely Creek (Table 5-5) - Identify the specific activities corresponding to Implementation Activity 4 in Table 5-1*

Additionally, Tables 5-6 through 5-7 contain the following:

- *Willmar Lake Implementation Plan (Table 5-6) - Identify the specific activities corresponding to Implementation Activity 6 in Table 5-1*
- *Eagle Lake Implementation Plan (Table 5-7)- Identify the specific activities corresponding to Implementation Activity 15 in Table 5-1*

Each of these tables (Table 5-1 through Table 5-7) contain the following information:

- Implementation activities for the Tier I and Tier II priority issues (actions)
- The corresponding priority issue(s) and goal(s) addressed by the activity
- Estimated total cost and anticipated local contribution
- Estimated time when implementation of the activity will occur within the 10-year timeframe of the Plan
- Project lead and project partners
- Description of how outcomes of the action will be measured

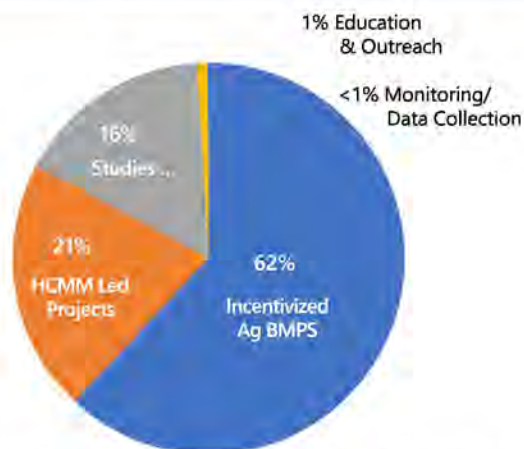


Figure 5-1. Overall Implementation Plan Distribution by Expenditure Type

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Table 5-1. Implementation Table: Priority Issues

Activity #	Section ID #	Implementation Activity	Priority Issues									Goals	Measurable Output for this Location		Budget Schedule for the Next 10 Years (2022-2031) (\$)										10-year Project Cost	Estimated Local Contribution	Lead	Supporting Local Partners				
			Impaired...	Altered...	High Quality...	Agricultural...	Drinking...	Subsurface...	Wildlife	Recreation	Monitoring				Education...	'22	'23	'24	'25	'26	'27	'28	'29	'30					'31			
1	4.3.1.A	Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the Upper Hawk Creek Priority Area (see Table 4-5 for further detail)	X	X	X	X							Achieve a seven (7) percent reduction in total suspended solids (TSS) loads at the downstream end of Beaver Creek, Chetomba Creek, Upper Hawk Creek and Fort Ridgely Creek	Refer to Table 5-2		902,700	902,800	902,700	902,700	902,800	902,700	902,700	902,800	902,700	902,700	9,027,300	2,256,825	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner			
2	4.3.1.A	Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the Beaver Creek Priority Area (see Table 4-5 for further detail)	X	X	X	X								Refer to Table 5-3		1,378,900	1,378,900	1,378,900	1,378,900	1,378,900	1,378,900	1,378,900	1,378,900	1,378,900	1,378,900	13,789,000	3,447,250	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner			
3	4.3.1.A	Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the Chetomba Creek Priority Area (see Table 4-5 for further detail)	X	X	X	X								Refer to Table 5-4		1,022,400	1,022,400	1,022,400	1,022,400	1,022,400	1,022,400	1,022,400	1,022,400	1,022,400	1,022,400	10,224,000	2,556,000	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner			
4	4.3.1.A	Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the Fort Ridgely Creek Priority Area (see Table 4-5 for further detail)	X	X	X	X								Refer to Table 5-5		302,600	302,600	302,600	302,600	302,600	302,600	302,600	302,600	302,600	302,600	302,600	302,600	756,500	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner		
5	4.3.1.B	Construct five (5) stormwater Best Management Practice (BMP) demonstration sites (one every two years) at strategic locations in the City of Willmar (e.g. MinnWest Technology Campus, K.R.A. Speedway, Willmar City Hall/Community Center and Highway 71 bridge)	X										Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Willmar Lake (34-0180-01), or 111 ppb.	5	Stormwater BMP		0	15,000	0	15,000	0	15,000	0	15,000	0	15,000	0	15,000	75,000	18,750	SWCD, Municipalities	USDA, BWSR, MPCA, County, HCWP, Property Owner(s)
6	4.3.1.C	Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the direct drainage area of Willmar Lake using the adoption rates provided in Table 4-4.	X											Refer to Table 5-6		23,592	23,592	23,592	23,592	23,592	23,592	23,592	23,592	23,592	23,592	235,920	58,980	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner			
7	4.3.2.A	Implement HSPF-SAM identified agricultural BMPs on suitable cropland acres within the direct drainage area of Priority Areas (as identified in Table 4-5)	X	X	X	X							Reduce annual runoff from the Priority Areas. • Upper Hawk Creek – Reduce average annual runoff by 0.25 inches (2,606 ac-ft) • Beaver Creek – Reduce average annual runoff by 0.25 inches (2,642 ac-ft) • Chetomba Creek - Reduce average annual runoff by 0.25 inches (2,119 ac-ft)	Refer to Tables 5-2 to 5-5	See the costs, Estimated Local Contribution, Lead and Supporting Partners information provided for Implementation Activities #2 through 5 above.																	
8	4.3.2.B	Conduct an analysis to identify non-contributing (i.e. landlocked or semi-landlocked) portions of the Priority Areas.		X										1	Analysis		0	2000	0	0	0	0	0	0	0	0	0	2000	500	SWCD	County, BWSR, DNR, MPCA, HCWP	
9	4.3.2.C	Work with 10 landowners annually to maintain landlocked or semi-landlocked portions of the landscape (so they do not become connected in the future).		X										10	Landowners		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	10000	2500	SWCD	County, BWSR, DNR, MPCA, HCWP		

Activity #	Section ID #	Implementation Activity	Priority Issues									Goals	Measurable Output for this Location	Metric	Budget Schedule for the Next 10 Years (2022-2031) (\$)										10-year Project Cost	Estimated Local Contribution	Lead	Supporting Local Partners			
			Impaired...	Altered...	High Quality...	Agricultural...	Drinking...	Subsurface...	Wildlife	Recreation	Monitoring				Education...	'22	'23	'24	'25	'26	'27	'28	'29	'30					'31		
10	4.3.2.D	Conduct a terrain analysis using the Restorable Wetlands Inventory and LIDAR to identify restorable wetland sites for improving water quality and reducing peak flows.		X								<ul style="list-style-type: none">Fort Ridgely Creek - Reduce average annual runoff by 0.25 inches (929 ac-ft)	1	Analysis	1000	0	0	0	0	0	0	0	0	0	0	1000	250	SWCD	County, BWSR, DNR, MPCA, HCWP		
11	4.3.2.E	Implement soil health practices on 10% of available cropland in priority areas.		X		X						AND Work to achieve no net increase in existing runoff volumes to the Minnesota River from changes in land use or land use practices for non-priority subwatersheds as follows:	10%	Available Cropland	160000	160000	160000	160000	160000	160000	160000	160000	160000	160000	160000	1600000	400000	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner		
12	4.3.2.F	Establish a program to offer incentives to homeowners for on-lot infiltration practices, including reduced lot grading and rain gardens to control runoff at its source and promote recharge to the groundwater.	X	X	X							<ul style="list-style-type: none">Lower Hawk Creek – Maintain baseline (1996-2012) flow of 132,177 AF/year	1	Incentive Program	0	2000	0	0	0	0	0	0	0	0	0	2000	500	County	SWCD, USDA, BWSR, MPCA, Municipalities, Homeowners, HCWP		
13	4.3.2.G	Attend 30 staff trainings over the course of the plan to continue to be engaged and informed regarding on-going research to understand the impacts of drainage or other land use practices on ground water recharge rates and the means to quantify these impacts.		X		X						<ul style="list-style-type: none">Stony Run Creek – Minnesota River – Maintain baseline (1996-2012) flow of 1,325,250 AF/yearWood Lake Creek – Minnesota River – Maintain baseline (1996-2012) flow of 1,639,789 AF/year	30	Trainings	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	18000	4500	SWCD	USGS, DNR, MDH, MDA, County	
14	4.3.2.H	Host 10 workshops (one (1) annually) to promote cover crops and soil health to further support the adoption of these practices for local farmers.		X		X						<ul style="list-style-type: none">Sacred Heart Creek – Minnesota River - Maintain baseline (1996-2012) flow of 1,875,246 AF/yearBirch Coulee Creek - Maintain baseline (1996-2012) flow of 18,176 AF/yearSpring Creek – Minnesota River – Maintain baseline (1996-2012) flow of 2,092,539 AF/yearLittle Rock Creek- Maintain baseline (1996-2012) flow of 22,607 AF/year <p>Note: The Baseline Flow is the reach load reported in HSPF-SAM, which measures the compounded load of all upstream discharges at the most downstream end. Therefore, this number includes flow from upstream areas.</p>	10	Workshops	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	20000	5000	SWCD, USDA	County, HCWP, Landowner

Activity #	Section ID #	Implementation Activity	Priority Issues									Goals	Measurable Output for this Location	Metric	Budget Schedule for the Next 10 Years (2022-2031) (\$)										10-year Project Cost	Estimated Local Contribution	Lead	Supporting Local Partners	
			Impaired...	Altered...	High Quality...	Agricultural...	Drinking...	Subsurface...	Wildlife	Recreation	Monitoring				Education...	'22	'23	'24	'25	'26	'27	'28	'29	'30					'31
15	4.3.3.A	Implement HSPF-SAM Identified agricultural BMPs on suitable cropland acres according to the adoption rates listed in Table 4-14 needed to achieve a 20% phosphorus reduction in the NE tributary subwatershed of Eagle Lake, or 405 lb/yr .			X								20%	Phosphorus Reduction (see Table 4-14)	5716	5716	5716	5716	5716	5716	5716	5716	5716	5716	57,160	14,290	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner	
16	4.3.3.B	Implement a management plan for manipulation of the PW Basin #34-540 outlet structure to manage water levels for optimum water quality in the impoundment.			X								Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Eagle Lake (34-0171-00), or 35 ppb.	1	Management Plan	0	0	0	2000	0	0	0	0	0	0	2000	500	County	DNR; SWCD, USDA, BWSR, MPCA, HCWP, Landowner
17	4.3.3.C	Seek to acquire the PW Basin #34-540 outlet structure and associated impoundment and upland habitat in cooperation with local and state agencies and conservation groups.			X								1	Water Control Structure	0	0	0	2000	0	0	0	0	0	0	2000	500	County	DNR, SWCD, USDA, BWSR, MPCA, HCWP, Landowner	
18	4.3.3.D	Hold two (2) meetings (estimated effort) with the Eagle Creek Golf Course to evaluate opportunities to reduce the application of fertilizers and herbicides and to convert portions of the golf course to native vegetation.			X								2	Meetings	0	0	0	1,000	0	0	0	0	0	0	1000	250	SWCD	County, USDA, BWSR, Eagle Creek Golf Course	
19	4.3.3.E	Implement 100% of HSPF-SAM identified agricultural BMPs within the direct drainage area of Swan Lake. Note: 100% of identified HSPF-SAM agricultural BMPs include the adoption of 16 feet of additional native vegetation buffer around the existing lakeshore buffer; cover crops on 50% of corn and soybean; reduced tillage on 50% of corn and soybean; nine (9) alternative tile intakes; one (1) tilled wetland restoration are needed to maintain the goal.			X								Achieve no net increase in the 10-year summer average in-lake total phosphorus (TP) concentration in Swan Lake (Sibley County).	100 %	Adoption of HSPF-SAM Identified BMPs	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	260,000	65,000	SWCD, USDA	County, BWSR, MPCA, Landowner
20	4.3.4.A	Conduct a survey twice over the course of the next 10 years to determine how many producers and local crop advisors are implementing manure and nutrient management plans.				X							2	Surveys	0	0	250	0	0	0	250	0	0	0	500	125	SWCD, USDA	County, BWSR, Landowner	
21	4.3.4.B	Host one (1) manure/nutrient management workshop per year for farmers and local crop advisors.				X							10	Workshops	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000	2,500	SWCD, USDA	County, BWSR, Landowner	

Activity #	Section ID #	Implementation Activity	Priority Issues									Goals	Measurable Output for this Location	Metric	Budget Schedule for the Next 10 Years (2022-2031) (\$)										10-year Project Cost	Estimated Local Contribution	Lead	Supporting Local Partners
			Impaired...	Altered...	High Quality...	Agricultural...	Drinking...	Subsurface...	Wildlife	Recreation	Monitoring				Education...	'22	'23	'24	'25	'26	'27	'28	'29	'30				
22	4.3.4.C	Conduct a survey to evaluate the adoption of soil health principles in the watershed and create a database to track the percentage of fields that have increased soil water holding capacity from increased soil organic matter due to conservation/no tillage, increased vegetation, etc.				X							1	Survey	0	250	0	0	0	0	0	0	0	0	250	62.5	SWCD	USDA, County, BWSR, Landowner/O perators
23	4.3.4.D	Educate 300 producers and five (5) local crop advisors annually on soil health principles.				X							305	Producers / Crop Advisors	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	20000	5000	SWCD	USDA, County, BWSR, Landowner/O perators, Producers, Crop Advisors
24	4.3.4.E	Organize one (1) watershed-wide event annually that highlights conservation practices that benefit water quality, focusing on soil health (non-structural BMPs) and win-win solutions for farmers.				X							10	Watershed Events	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	15,000	3,750	SWCD, USDA, HCWP	County, BWSR, MPCA, Local crop advisors, Landowner/O perator
25	4.3.4.F	Develop and implement 40 manure and 80 nutrient management plans.				X							120	Manure & Nutrient Management Plans	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	180,000	45,000	SWCD	USDA, HCWP, County, BWSR, MPCA, Landowner/O perator
26	4.3.4.G	Implement four (4) structural and five (5) non-structural BMPs annually that will reduce soil erosion and sediment loss from agricultural land.				X							9	BMPs	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	8,500	85,000	21,250	SWCD	USDA, HCWP, County, BWSR, MPCA, Landowner/O perator
27	4.3.4.H	Implement five (5) residential and agricultural water quality improvement projects within the watershed to reduce nutrient loading or runoff volume.				X							5	Water Quality Projects	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	25,000	SWCD	USDA, HCWP, County, BWSR, MPCA, Landowner/O perator
28	4.3.4.I	Replace 431 open tile intakes with alternative tile intakes on 2% (4,305 treated acres) of the fields in priority subwatersheds.				X							431	Alternative Tile Intakes	17,240	17240	17,240	17,240	17,240	17,240	17,240	17,240	17,240	17,240	172,400	43,100	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner
29	4.3.4.J	Maintain a total of 24,112 acres of wetlands and grasslands in various conservation cover and/or esement programs.				X							24,112	Acres	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000	750,000	SWCO	USDA, DNR, USFWS, County, Landowner
30	4.3.4.K	Enroll 600 new acres of wetlands and grassland with the use of state and federal programs (Source: Minnesota Natural Atlas, National Conservation Easement Database (NCED)).				X							600	Acres	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000	750,000	SWCD, USDA	BWSR, USFWS, DNR, County, Landowner

Activity #	Section ID #	Implementation Activity	Priority Issues									Goals	Measurable Output for this Location	Metric	Budget Schedule for the Next 10 Years (2022-2031) (\$)										10-year Project Cost	Estimated Local Contribution	Lead	Supporting Local Partners
			Impaired...	Altered...	High Quality...	Agricultural...	Drinking...	Subsurface...	Wildlife	Recreation	Monitoring				Education...	'22	'23	'24	'25	'26	'27	'28	'29	'30				
31	4.3.4.L	Establish permanent easements for three (3) 40-acre large-scale, multipurpose drainage projects that would mitigate the impacts to altered hydrology.				X							120	Acres	0	0	200000	0	0	200000	0	0	200000	0	600,000	150,000	SWCD	USDA, County, Landowner
32	4.3.4.M	Review 100% of new ditch, lateral, and improvement projects, during early coordination (one (1) meeting annually), for opportunities for large-scale, multipurpose drainage projects that mitigate the impacts of altered hydrology. Determine project identification, feasibility and preliminary designs, and cost estimation.				X							10	Meetings	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000	25,000	County	SWCD, USDA, HCWP, Landowner, DNR
33	4.3.4.N	Meet annually with BWSR and the State Legislature to increase benefits value threshold for conservation as it relates projects that will improve water quality, reduce flows and stabilize outlets				X							10	Meetings	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000	2,500	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner/O perator
34	4.3.5.A	Direct 75 private well owners annually to testing programs for nitrates and total coliform bacteria.					X						750	Well Tests	5,250	5,250	5,250	5,250	5,250	5,250	5,250	5,250	5,250	5,250	52,500	13,125	County	Public Health agencies, MDH, MDA, SWCD, BWSR, MPCA
35	4.3.5.B	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						75	Well Tests	2,625	2,625	2,625	2,625	2,625	2,625	2,625	2,625	2,625	2,625	26,250	6,563	County	Public Health agencies, MDH, MDA, SWCD, BWSR, MPCA, Landowner
36	4.3.5.C	Provide or direct private well owners to financial assistance for private well water testing.					X						All	Private Well Owners	250	250	250	250	250	250	250	250	250	250	2500	625	County	MDH
36	4.3.5.D	Issue five (5) watershed wide direct mailings that provide private well users with safety guidelines and water conservation information for proper well maintenance.					X						5	Mailings	0	6,000	0	0	0	0	6,000	0	0	0	12,000	3,000	County	Public Health agencies, MDH, MDA, SWCD, BWSR, MPCA, Landowner
37	4.3.5.E	Repair and replace 36 private drinking water wells when improvement loan programs and funding are available					X						36	Wells	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	900,000	22,500	County, SWCD	MDH, MPCA, MDA, Landowner
38	4.3.5.F	Hold two (2) meetings to discuss and incorporate sensitive groundwater recharge areas maps (source MN DNR) into the local land use decision-making process					X						2	Meetings	0	1000	0	0	1000	0	0	0	0	0	2000	500	County, SWCD	DNR, MDH, MDA, MPCA, BWSR, USDA, Landowner

Activity #	Section ID #	Implementation Activity	Priority Issues									Goals	Measurable Output for this Location	Metric	Budget Schedule for the Next 10 Years (2022-2031) (\$)										10-year Project Cost	Estimated Local Contribution	Lead	Supporting Local Partners
			Impaired...	Altered...	High Quality...	Agricultural...	Drinking...	Subsurface...	Wildlife	Recreation	Monitoring				Education...	'22	'23	'24	'25	'26	'27	'28	'29	'30				
39	4.3.5.G	County and SWCD staff will attend a minimum of two (2) meetings to review wellhead protection plans and coordinate partnering opportunities with communities. Staff will also serve on wellhead protection planning teams, as requested					X						2	Meetings	0	0	1000	0	0	1000	0	0	0	0	2000	500	County, SWCD, Municipalities	MDH, MDA, MPCA, BWSR, USDA, Landowner
40	4.3.5.H	Conduct two (2) direct mailings to landowners about completing BMP projects within Drinking Water Supply Management Areas (DWSMAs).					X						2	Direct Mailings	0	0	300	0	0	0	300	0	0	0	600	150	County, Municipalities, SWCD	MDH, MPCA, BWSR, USDA, Landowner, MDA
41	4.3.5.I	Implement 10 BMPs in urban and rural areas that promote infiltration and groundwater recharge.					X						10	BMPs	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	25,000	HCWP, Municipalities	MDH, MPCA, BWSR, USDA, Landowner, MDA, County, SWCD
42	4.3.5.J	Conduct five (5) mailings to provide education on water conservation practices that can be adopted in people's homes and businesses.					X						5	Mailings	0	500	0	500	0	500	0	500	0	500	2500	625	County, Municipalities	Public Health agencies, MDH, MDA, SWCD, BWSR, MPCA, Landowner
43	4.3.5.K	Inventory existing wells watershed-wide.					X						1	Inventory	500	500	500	500	500	500	500	500	500	500	5,000	1,250	County, SWCD	BWSR, MDH, Municipalities, Landowner
44	4.3.5.L	Target sealing 100 abandoned wells through use of cost-share well sealing assistance.					X						100	Wells	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	40,000	10,000	County, SWCD	BWSR, MDH, Municipalities, Landowner
45	4.3.6.A	Complete 750 new SSTS upgrades.					X						750	SSTS Upgrades	825,000	825,000	825,000	825,000	825,000	825,000	825,000	825,000	825,000	825,000	8,250,000	2,062,500	County	MPCA, Landowner, MDA
46	4.3.6.B	Use 90 newspaper ads and radio announcements, along with assistance from SSTS Contractors to help spread information to homeowners that funds are available to help with upgrades.					X						90	Advertisements	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	18,000	4,500	County	BWSR, SSTS Contractors
47	4.3.7.A	Restore 100 acres of wetlands with associated riparian and upland habitat.							X				100	Acres	0	130,000	0	130,000	0	130,000	0	130,000	0	130,000	650,000	162,500	SWCD, USDA	BWSR, USFWS, DNR, Landowner
48	4.3.7.B	Acquire 200 acres of upland habitat through wetland restoration, conservation easements, and purchases.							X				200	Acres	0	200,000	0	200,000	0	200,000	0	200,000	0	200,000	1,000,000	250,000	SWCD, USDA	BWSR, USFWS, DNR, Landowner
49	4.3.8.A	Pursue 160 acres of additional public recreational land acquisitions (WMA, WPA, US Fish & Wildlife, etc.): three in the Chetomba subwatershed and one in remaining priority areas totaling four (4) acquisitions in 10 years.								X			160	Acres	0	160,000	0	160,000	0	160,000	0	160,000	0	160,000	800,000	200,000	DNR, USFWS	Landowners
50	4.3.8.B	Enroll 600 acres in the Walk-In Access (WIA) program.								X			600	Acres	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	150,000	37,500	SWCD	DNR, Landowners

Activity #	Section ID #	Implementation Activity	Priority Issues									Goals	Measurable Output for this Location	Metric	Budget Schedule for the Next 10 Years (2022-2031) (\$)											10-year Project Cost	Estimated Local Contribution	Lead	Supporting Local Partners	
			Impaired...	Altered...	High Quality...	Agricultural...	Drinking...	Subsurface...	Wildlife	Recreation	Monitoring				Education...	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31					
51	4.3.9.A	Install a NE tributary monitoring station to Eagle Lake. This monitoring station should be located upstream of the outlet structure to better measure TP reductions associated from implementation of agricultural BMPs only.									X		Collect continuous stream flow and event-based TP/TSS concentrations from the NE and SE tributaries to Eagle Lake to monitor TP load reductions to Eagle Lake from implementation of agricultural BMPs in the watershed.	1	Monitoring Station	0	5000	0	0	0	0	0	0	0	0	0	5,000	1,250	HCWP, MPCA	BWSR, Eagle Lake Improvement Association
52	4.3.9.B	Install a SE tributary monitoring station to get a more complete picture of the total loads discharging to Eagle Lake.									X			1	Monitoring Station	0	5000	0	0	0	0	0	0	0	0	0	5,000	1,250	HCWP, MPCA	BWSR
53	4.3.9.C	Install flow stations on Chetomba Creek and Fort Ridgely Creek and maintain flow stations located on Upper Hawk Creek and Beaver Creek.									X		Collect 10 years of continuous flow monitoring data at the outlet of all four (4) priority subwatersheds.	2	Flow Stations	0	5000	0	0	0	0	0	0	0	0	5000	1250	HCWP, MPCA	BWSR	
54	4.3.10.A	Host an annual workshop to facilitate relationship-building between ag producers, ag industry, and bank staff that provide loans to producers, and conservation professionals through an annual workshop.									X			10	Workshops	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	12,500	3,125	County, SWCD	HCWP, USDA, BWSR	
55	4.3.10.B	Continue to implement BMP education programs focusing on ag soil health and altered hydrology, residential stormwater management, SSTS, manure management and other key issues that help increase knowledge and participation in BMP's by reaching 100 contacts annually.									X			1000	Contacts	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	25,000	County, SWCD, USDA, HCWP	BWSR, MPCA	
56	4.3.10.C	Provide education and outreach opportunities at a minimum of three (3) times annually by participating in public events such as County Fairs, Environmental Field Days, schools, Woman's Day event and bus tours.									X			30	Events	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	30,000	7,500	County, SWCD, USDA, HCWP	BWSR, MPCA	
57	4.3.10.D	Reach 500 landowners by utilizing social media (radio, newspaper, internet sites), direct mailings, and annual reports to provide education and outreach opportunities.									X			500	Landowners	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	12,500	County, SWCD, USDA, HCWP	BWSR, MPCA	
																	TOTAL CONTRIBUTION:											\$14,264,096		
																	PLAN TOTAL:											\$53,603,980		

Table 5-2. Upper Hawk Creek Implementation Plan

Implementation Activity	Tier I (Priority) Issue				Goal(s)	Measurable Output for this location	Metric	Schedule for the Next 10 Years (2022-2031)										10-yr Project Cost	Estimated Local Contribution	Lead	Supporting Partners
	Impaired ...	Altered ...	High Quality ...	Agricultural ...				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031				
Implement nutrient management practices in the Upper Hawk Creek HUC-10 Drainage Area	X	X	X	X	Achieve a seven (7) percent reduction in total suspended solids (TSS) loads at the downstream end of Beaver Creek, Chetomba Creek, Upper Hawk Creek and Fort Ridgely Creek	2,497	Acres	\$21,000	\$21,100	\$21,000	\$21,000	\$21,100	\$21,000	\$21,000	\$21,100	\$21,000	\$210,300	\$52,575	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Achieve 30% reduced tillage in the Upper Hawk Creek HUC-10 Drainage Area	X	X	X	X		532	Acres	\$10,300	\$10,300	\$10,300	\$10,300	\$10,300	\$10,300	\$10,300	\$10,300	\$10,300	\$103,000	\$25,750	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Implement conservation crop rotation practices in the Upper Hawk Creek HUC-10 Drainage Area	X	X	X	X		10,883	Acres	\$424,000	\$424,000	\$424,000	\$424,000	\$424,000	\$424,000	\$424,000	\$424,000	\$424,000	\$4,240,000	\$1,060,000	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Install Water and Sediment Control Basins (WASCOB) in the Upper Hawk Creek HUC-10 Drainage Area	X	X	X	X		558	Acres	\$28,400	\$28,400	\$28,400	\$28,400	\$28,400	\$28,400	\$28,400	\$28,400	\$28,400	\$284,000	\$71,000	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Restore tiled wetlands in the Upper Hawk Creek HUC-10 Drainage Area	X	X	X	X		827	Acres	\$25,800	\$25,800	\$25,800	\$25,800	\$25,800	\$25,800	\$25,800	\$25,800	\$25,800	\$258,000	\$64,500	SWCD, USDA, DNR, USFW	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner	
Implement Corn and Soybean with Cover Crops in the Upper Hawk Creek HUC-10 Drainage Area	X	X	X	X		8,455	Acres	\$393,200	\$393,200	\$393,200	\$393,200	\$393,200	\$393,200	\$393,200	\$393,200	\$393,200	\$3,932,000	\$983,000	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Totals:								\$902,700	\$902,800	\$902,700	\$902,700	\$902,800	\$902,700	\$902,700	\$902,800	\$902,700	\$902,700	\$9,027,300	\$2,256,825		

Table 5-3. Beaver Creek Implementation Plan

Implementation Activity	Tier I (Priority) Issue				Goal(s)	Measurable Output for this location	Metric	Schedule for the Next 10 Years (2022-2031)										10-yr Project Cost	Estimated Local Contribution	Lead	Supporting Partners
	Impaired ...	Altered ...	High Quality ...	Agricultural ...				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031				
Implement nutrient management practices in the Beaver Creek HUC-10 Drainage Area	X	X		X	Achieve a seven (7) percent reduction in total suspended solids (TSS) loads at the downstream end of Beaver Creek, Chetomba Creek, Upper Hawk Creek and Fort Ridgely Creek	3,720	Acres	\$31,400	\$31,400	\$31,400	\$31,400	\$31,400	\$31,400	\$31,400	\$31,400	\$31,400	\$314,000	\$78,500	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Achieve 30% reduced tillage in the Beaver Creek HUC-10 Drainage Area	X	X		X		1,037	Acres	\$20,200	\$20,200	\$20,200	\$20,200	\$20,200	\$20,200	\$20,200	\$20,200	\$20,200	\$20,200	\$202,000	\$50,500	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner
Implement conservation crop rotation practices in the Beaver Creek HUC-10 Drainage Area	X	X		X		16,174	Acres	\$630,000	\$630,000	\$630,000	\$630,000	\$630,000	\$630,000	\$630,000	\$630,000	\$630,000	\$630,000	\$6,300,000	\$1,575,000	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner
Install Water and Sediment Control Basins (WASCOB) in the Beaver Creek HUC-10 Drainage Area	X	X	X	X		1,065	Acres	\$54,200	\$54,200	\$54,200	\$54,200	\$54,200	\$54,200	\$54,200	\$54,200	\$54,200	\$54,200	\$542,000	\$135,500	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner
Restore tiled wetlands in the Beaver Creek HUC-10 Drainage Area	X	X	X	X		1,253	Acres	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$390,000	\$97,500	SWCD, USDA, DNR, USFW	County, BWSR, MPCA, HCWP, Landowner
Implement Corn and Soybean with Cover Crops in the Beaver Creek HUC-10 Drainage Area	X	X		X		12,992	Acres	\$604,100	\$604,100	\$604,100	\$604,100	\$604,100	\$604,100	\$604,100	\$604,100	\$604,100	\$604,100	\$6,041,000	\$1,510,250	SWCD, USDA	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner
Totals:								\$1,378,900	\$1,378,900	\$1,378,900	\$1,378,900	\$1,378,900	\$1,378,900	\$1,378,900	\$1,378,900	\$1,378,900	\$13,789,000	\$3,447,250			

Table 5-4. Chetomba Creek Implementation Plan

Implementation Activity	Tier I (Priority) Issue				Goal(s)	Measurable Output for this location	Metric	Schedule for the Next 10 Years (2022-2031)										10-yr Project Cost	Estimated Local Contribution	Lead	Supporting Partners
	Impaired ...	Altered ...	High Quality ...	Agricultural ...				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031				
Implement nutrient management practices in the Chetomba Creek HUC-10 Drainage Area	X	X		X	Achieve a seven (7) percent reduction in total suspended solids (TSS) loads at the downstream end of Beaver Creek, Chetomba Creek, Upper Hawk Creek and Fort Ridgely Creek	2,347	Acres	\$24,700	\$24,700	\$24,700	\$24,700	\$24,700	\$24,700	\$24,700	\$24,700	\$24,700	\$247,000	\$61,750	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Achieve 30% reduced tillage in the Chetomba Creek HUC-10 Drainage Area	X	X		X		613	Acres	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$15,500	\$155,000	\$38,750	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Implement conservation crop rotation practices in the Chetomba Creek HUC-10 Drainage Area	X	X		X		9,503	Acres	\$457,200	\$457,200	\$457,200	\$457,200	\$457,200	\$457,200	\$457,200	\$457,200	\$457,200	\$4,572,000	\$1,143,000	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Install Water and Sediment Control Basins (WASCOB) in the Chetomba Creek HUC-10 Drainage Area	X	X	X	X		544	Acres	\$35,200	\$35,200	\$35,200	\$35,200	\$35,200	\$35,200	\$35,200	\$35,200	\$35,200	\$352,000	\$88,000	SWCD, USDA	County, BWSR, MPCA HCWP, Landowner	
Restore tiled wetlands in the Chetomba Creek HUC-10 Drainage Area	X	X	X	X		709	Acres	\$28,800	\$28,800	\$28,800	\$28,800	\$28,800	\$28,800	\$28,800	\$28,800	\$28,800	\$288,000	\$72,000	SWCD, USDA, DNR, USFW	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner	
Implement Corn and Soybean with Cover Crops in the Chetomba Creek HUC-10 Drainage Area	X	X		X		7,997	Acres	\$461,000	\$461,000	\$461,000	\$461,000	\$461,000	\$461,000	\$461,000	\$461,000	\$461,000	\$4,610,000	\$1,152,500	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Totals:								\$1,022,400	\$1,022,400	\$1,022,400	\$1,022,400	\$1,022,400	\$1,022,400	\$1,022,400	\$1,022,400	\$1,022,400	\$10,224,000	\$2,556,000			

Table 5-5. Fort Ridgely Creek Implementation Plan

Implementation Activity	Tier I (Priority) Issue				Goal(s)	Measurable Output for this location	Metric	Schedule for the Next 10 Years (2022-2031)										10-yr Project Cost	Estimated Local Contribution	Lead	Supporting Partners
	Impaired ...	Altered ...	High Quality ...	Agricultural ...				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031				
Implement nutrient management practices in the Fort Ridgely Creek HUC-10 Drainage Area	X	X		X	Achieve a seven (7) percent reduction in total suspended solids (TSS) loads at the downstream end of Beaver Creek, Chetomba Creek, Upper Hawk Creek and Fort Ridgely Creek	1,332	Acres	\$11,300	\$11,300	\$11,300	\$11,300	\$11,300	\$11,300	\$11,300	\$11,300	\$11,300	\$113,000	\$28,250	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Achieve 30% reduced tillage in the Fort Ridgely Creek HUC-10 Drainage Area	X	X		X		573	Acres	\$11,200	\$11,200	\$11,200	\$11,200	\$11,200	\$11,200	\$11,200	\$11,200	\$11,200	\$112,000	\$28,000	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Implement conservation crop rotation practices in the Fort Ridgely Creek HUC-10 Drainage Area	X	X		X		3,178	Acres	\$123,800	\$123,800	\$123,800	\$123,800	\$123,800	\$123,800	\$123,800	\$123,800	\$123,800	\$1,238,000	\$309,500	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Install Water and Sediment Control Basins (WASCOB) in the Fort Ridgely Creek HUC-10 Drainage Area	X	X	X	X		242	Acres	\$12,300	\$12,300	\$12,300	\$12,300	\$12,300	\$12,300	\$12,300	\$12,300	\$12,300	\$123,000	\$30,750	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Restore tiled wetlands in the Fort Ridgely Creek HUC-10 Drainage Area	X	X	X	X		204	Acres	\$6,500	\$6,500	\$6,500	\$6,500	\$6,500	\$6,500	\$6,500	\$6,500	\$6,500	\$65,000	\$16,250	SWCD, USDA, DNR, USFW	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner	
Implement Corn and Soybean with Cover Crops in the Fort Ridgely Creek HUC-10 Drainage Area	X	X		X		2,956	Acres	\$137,500	\$137,500	\$137,500	\$137,500	\$137,500	\$137,500	\$137,500	\$137,500	\$137,500	\$1,375,000	\$343,750	SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Totals:								\$302,600	\$302,600	\$302,600	\$302,600	\$302,600	\$302,600	\$302,600	\$302,600	\$302,600	\$302,600	\$756,500			

Table 5-6. Willmar Lake Implementation Plan

Implementation Activity	Tier I (Priority) Issue				Goal(s)	Measurable Output for this location	Metric	Schedule for the Next 10 Years (2022-2031)										10-yr Project Cost	Estimated Local Contribution	Lead	Supporting Partners
	Impaired ...	Altered ...	High Quality ...	Agricultural ...				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031				
Implement nutrient management practices in the Willmar Lake Drainage Area	X	X		X	Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Willmar Lake (34-0180-01), or 111 ppb.	56 Nutrient Management Plans	Number of Plans	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$474	\$4,740		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Achieve 30% reduced tillage in the Willmar Lake Drainage Area	X	X		X		573	Acres	\$1,056	\$1,056	\$1,056	\$1,056	\$1,056	\$1,056	\$1,056	\$1,056	\$1,056	\$10,560		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Implement conservation crop rotation practices in the Willmar Lake Drainage Area	X	X		X		3,178	Acres	\$9,373	\$9,373	\$9,373	\$9,373	\$9,373	\$9,373	\$9,373	\$9,373	\$9,373	\$93,730		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Install Water and Sediment Control Basins (WASCOB) in the Willmar Lake Drainage Area	X	X	X	X		242	Acres	\$2,354	\$2,354	\$2,354	\$2,354	\$2,354	\$2,354	\$2,354	\$2,354	\$2,354	\$23,540		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Restore tiled wetlands in the Willmar Lake Drainage Area	X	X	X	X		204	Acres	\$329	\$329	\$329	\$329	\$329	\$329	\$329	\$329	\$329	\$3,290		SWCD, USDA, DNR, USFW	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner	
Implement Corn and Soybean with Cover Crops in the Willmar Lake Drainage Area	X	X		X		2,956	Acres	\$10,006	\$10,006	\$10,006	\$10,006	\$10,006	\$10,006	\$10,006	\$10,006	\$10,006	\$100,060		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Totals:								\$23,592	\$23,592	\$23,592	\$23,592	\$23,592	\$23,592	\$23,592	\$23,592	\$23,592	\$235,920				

Table 5-7. Eagle Lake Implementation Plan

Implementation Activity	Tier I (Priority) Issue				Goal(s)	Measurable Output for this location	Metric	Schedule for the Next 10 Years (2022-2031)										10-yr Project Cost	Estimated Local Contribution	Lead	Supporting Partners
	Impaired ...	Altered ...	High Quality ...	Agricultural ...				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031				
Implement nutrient management practices in the Willmar Lake Drainage Area	X	X		X	Achieve an eight (8) percent reduction in the 10-year summer average in-lake total phosphorus (TP) concentration in Eagle Lake (34-0171-00), or 35 ppb.	56 Nutrient Management Plans	Number of Plans	\$115	\$115	\$115	\$115	\$115	\$115	\$115	\$115	\$115	\$1,150		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Achieve 30% reduced tillage in the Willmar Lake Drainage Area	X	X		X		573	Acres	\$256	\$256	\$256	\$256	\$256	\$256	\$256	\$256	\$256	\$2,560		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Implement conservation crop rotation practices in the Willmar Lake Drainage Area	X	X		X		3,178	Acres	\$2,271	\$2,271	\$2,271	\$2,271	\$2,271	\$2,271	\$2,271	\$2,271	\$2,271	\$22,710		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Install Water and Sediment Control Basins (WASCOB) in the Willmar Lake Drainage Area	X	X	X	X		242	Acres	\$570	\$570	\$570	\$570	\$570	\$570	\$570	\$570	\$570	\$5,700		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Restore tiled wetlands in the Willmar Lake Drainage Area	X	X	X	X		204	Acres	\$80	\$80	\$80	\$80	\$80	\$80	\$80	\$80	\$80	\$800		SWCD, USDA, DNR, USFW	County, BWSR, DNR, USFW, MPCA, HCWP, Landowner	
Implement Corn and Soybean with Cover Crops in the Willmar Lake Drainage Area	X	X		X		2,956	Acres	\$2,424	\$2,424	\$2,424	\$2,424	\$2,424	\$2,424	\$2,424	\$2,424	\$2,424	\$24,240		SWCD, USDA	County, BWSR, MPCA, HCWP, Landowner	
Totals:								\$5,716	\$5,716	\$5,716	\$5,716	\$5,716	\$5,716	\$5,716	\$5,716	\$5,716	\$57,160				

5.2 IMPLEMENTATION EXPENDITURE TYPES

This section illustrates how the Hawk Creek-Middle Minnesota Comprehensive Watershed Management Plan will be implemented by expenditure type recognizing that various mechanisms will be used to implement the activities (actions) identified in the Targeted Implementation Schedule. Given the predominance of agricultural land use in the Planning Area, it is important to recognize that successful implementation hinges on the participation of individual landowners.

Figure 5-1 illustrates how the activities (actions) identified in the Plan fall into the following mechanisms and types of expenditures to be used in implementing the Plan.

Incentivized Agricultural BMPs:

The Plan identified a suite of in-field conservation practices (refer to the activities listed in Table 5-2 through Table 5-5) as the primary mechanism to reduce nutrient and sediment loading in the Priority Areas. The nature of these practices necessitates their implementation by a willing landowner. The Plan will provide cost share funding to landowners as a means of incentivizing these practices.

HCMM JPE Led Projects:

In addition to the in-field conservation practices to be implemented through a cost-share approach, the Plan identifies several implementation activities that will be built or implemented by the HCMM JPE or its member organizations. These are typically larger, regional scale practices.

Studies, Programs, and Policies:

The Plan identifies several programmatic and policy approaches to achieve its goals. Also included in this category are recommended further studies and investigations.

Education and Outreach:

Implementation activities that involve education or outreach in an effort to change behavior or increase stewardship in the watershed.

Monitoring & Data Collection:

Implementation activities aimed at evaluating potential improvements achieved through implementation of the Plan.



5.3 PRIORITIZATION OF PROGRAMS AND PROJECTS

As the Planning Partners evaluated the implementation activities (actions) identified during the Plan development process, the following criteria were applied in determining which of the activities should be eliminated, implemented first or implemented later in the 10-year timeframe of the Plan:

- **Is the Action Likely to be Adopted or Promote Adoption?**
– *Given that most of the action needed in the Hawk Creek-Middle Minnesota CWMP depends upon voluntary action it was important to identify the agricultural BMPs that are most likely to be adopted by the agricultural community.*
- **Priority Issues**
– *Does the action address the Tier I and Tier II priority issue(s) and goal(s) described in Section 3 Identification and Prioritization of Resources and Issues?*
- **Priority Areas**
– *Does the action address the issue(s) and goal(s) of the priority resources and areas described in Section 3 Identification and Prioritization of Resources and Issues?*
- **Planning Area**
– *Does the action address issue(s) and goal(s) that were determined to be a priority for the entire Planning Area and are necessary for successful, future implementation at a local scale (e.g., Drinking Water Protection, Subsurface Sewage Treatment Systems, Recreation, Education and Outreach)?*
- **Addresses Multiple Issues (Co-Benefits of Implementation)**
– *Does the implementation activity address multiple issues, including Tier II (Lower Priority) issues?*
- **Suitable Entity**
– *Is the Hawk Creek-Middle Minnesota Planning Area JPE the most appropriate entity to implement the activity in question or is another entity more appropriate (e.g. state agency)?*
- **Address a Gap in the Knowledge Base**
– *Does the implementation activity enhance the Planning Partners' understanding of the resource protection and/or restoration needs thereby allowing the Hawk Creek-Middle Minnesota Planning Area JPE to make more effective management decisions?*
- **Funding**
– *Priority was given to those actions that are not currently funded by the counties/SWCDs at a level needed to achieve the goal(s) of the Plan.*



Beaver Falls Park -Renville County, MN

5.3.1 Identification of Roles and Responsibilities towards Implementation

It is anticipated that this will include the adoption of cost share policies to define how and when funding will be used towards the measurable goals within the Planning Area. See Section 7.4 on criteria that may be used for project selection. It is also anticipated that certain roles and decision authorities will be delegated to staff to allow for efficient Plan implementation.

It is not anticipated that the HCMM JPE will have a role in approving landowner contracts to install landowner projects; that role and responsibility will belong to an individual Planning Partner where the project is being installed or implemented.

Vital to effective Plan implementation will be the need to develop a fiscal and administrative process that can account for resources expended and accomplishments completed. Similar to the Plan development process, it is anticipated that once the HCMM JPE is formed, a fiscal agent and Plan Coordinator will be identified, and their roles defined through a Contracted Service Agreement. An expected role of the Plan Coordinator will be to manage a reporting system whereas each Planning Partner or outside consultant will identify their accomplishments towards the Targeted Implementation Schedule. The Joint Powers Entity will have the responsibility to ensure that resources and accomplishments are being directed towards implementation activities identified and sufficient level of effort towards the measurable goals are being made.

As the Planning Partners move forward with implementing the Comprehensive Watershed Management Plan, they will be making decisions about who will be responsible for completing the various steps that go into installing individual projects or implementing various activities identified in Table 5-1 through Table 5-7. It is anticipated that a variety of options will be considered during the life of the Plan to determine methods on how targeted implementation activities will best be accomplished. Consideration will be given to contracting for services, using existing Plan Partner staff, hiring staff through an identified Plan Partner, or using a retainer agreement for services.

To assist with the process of identifying roles and responsibilities towards implementation, a workload analysis will be completed by the Planning Partners in conjunction with the short-term work plan and budgeting effort (biennial or triennial work plan). The purpose of the workload analysis will be to:

1. *Refine the anticipated hours and costs to complete individual implementation activities based on actual fund availability;*
2. *Consider whether the implementation activity is either on-going or involves a limited duration;*
3. *Assess capacity among Plan Partner staff; and*
4. *Evaluate capacity and willingness of other Federal, State or local partners to assist with implementation.*

Conducting this workload analysis will allow the Plan Partners to have a strategic plan for both staffing and contracting needs and will be used to account for changing demands in the actual pace of progress towards goals and implementation activities.

5.4 ACCOUNTING FOR LOCAL FUNDS

It is understood that funding for implementation of the Plan will come from a variety of local, state, and federal sources. One of the final steps in the development of the Targeted Implementation Schedule was to estimate current water management expenditures for the Hawk Creek – Middle Minnesota Planning Area in order to set a baseline of activity. To conduct this estimate, each local unit of government was asked to identify how much locally generated money (funds derived from the ad valorem levies, fees, services, or donations from citizens, local organizations, or local chapters of national organizations) they accounted for in one year in order to project what is expected to be used within the Planning Area in future years. Dollars were organized by program type. If a program was a county wide program, the dollars were prorated to only reflect the percentage of land area within the Hawk Creek-Middle Minnesota Planning Area. If a program already reflected the Hawk Creek – Middle Minnesota Planning Area one hundred percent of the program dollars were accounted for. Since the accounting activity only looked at 2019, some programs have no state or local dollars even though the planning entities may have dollars in these programs in past or future years. A summary of estimated funds for the Planning Area in 2019 is provided in Table 5-8.

Federal dollars are included in the table in order to reflect the contributions of our federal partners to the Hawk Creek – Middle Minnesota Planning Area. These dollars could have reflected multiple federal sources implemented by the local units of government, but upon completion of the exercise local units of government only reflected dollars that they had some role in. Therefore, the federal dollars are primarily USDA-NRCS Environmental Quality Incentives Program (EQIP) dollars implemented in the Hawk Creek – Middle Minnesota Planning Area. Some local units of government have utilized Environmental Protection Agency (EPA) dollars in past years but are not included as none had dollars in 2019. Use of EPA funds could be an opportunity for local units of government or the HCMM JPE in future years.

As Table 5-8 indicates, there is approximately \$1.4 million currently being allocated to water management activities in the Hawk Creek – Middle Minnesota Planning Area. These existing state and local dollars will be allocated to ongoing activities in the Planning Area. Additional funds will need to be secured by the Planning Partners to implement the activities identified in the Targeted Implementation Schedule. Based on the average annual cost of actions identified in the Targeted Implementation Schedule, it is estimated that the Hawk Creek – Middle Minnesota Comprehensive Watershed Management Plan could increase the level of watershed management work being done in the Planning Area by nearly a factor of 4.

Table 5-8. Estimated Water Management Activity Funds Allocated in the Planning Area in 2019

Fund Allocations	Source	State Dollars in 2019				Match/Local/Federal Dollars in 2019			State Dollars Pro-rated to Percentage of County in Watershed				Match/Local/Federal Pro-rated to Percentage of County in Watershed		
		Kandiyohi	Chippewa	Renville	HCWP	Kandiyohi	Chippewa	Renville	Kandiyohi 29.67%	Chippewa 44.82%	Renville 71.11%	HCWP	Kandiyohi 29.67%	Chippewa 44.82%	Renville 71.11%
Clean Water Funds - Buffer	BWSR	\$30,000	\$70,000	\$45,000					\$8,901	\$31,374	\$32,000				
Clean Water Funds - Local Capacity	BWSR	\$90,000	\$110,000	\$110,000		\$10,000	\$10,000	\$10,000	\$26,703	\$49,302	\$78,221		\$2,967	\$4,482	\$7,111
Conservation Delivery	BWSR	\$19,501	\$18,947	\$19,500					\$5,786	\$8,492	\$13,866				
Cooperative Weed Management Area	BWSR														
CREP Implementation	BWSR	\$24,186	\$10,454	\$30,000		\$9,717			\$7,176	\$4,685	\$21,333		\$2,883		
Easement Delivery	BWSR	\$9,850	\$8,800	\$2,000		\$3,000			\$2,922	\$3,944	\$1,422		\$890		
State Cost Share Program	BWSR	\$14,294	\$11,213	\$10,400					\$4,241	\$5,026	\$7,395				
Natural Resources Base Grant:	BWSR														
Feedlot		\$45,100		\$29,805				\$20,667	\$13,381		\$21,194				\$14,696
Local Water Management		\$12,023	\$14,881	\$18,047				\$10,383	\$3,567	\$6,670	\$12,833				\$7,383
Shoreland Administration		\$6,753	\$2,625	\$2,662				\$21,432	\$2,004	\$1,177	\$1,893				\$15,240
SSTS Administration		\$18,600	\$18,600	\$18,600				\$21,677	\$5,519	\$8,337	\$13,226				\$15,414
SSTS Low-Income Fix-Up Grant		\$45,000	\$15,000						\$13,352	\$6,723	\$0				
Wetland Conservation Administration		\$21,641	\$8,778	\$17,478			\$5,000	\$8,700	\$6,421	\$3,934	\$12,429			\$2,241	\$6,187
Drainage Records Modernization Grant	BWSR		\$50,000				\$100,000			\$22,410				\$44,820	
Hawk Creek-Middle MN CWMP (1W1P)	BWSR		\$251,360							\$112,660					
Aquatic Invasive Species	DNR	\$251,039	\$17,300	\$18,637					\$74,483	\$7,754	\$13,253				
County to SWCD's						\$149,000	\$82,000	\$105,000					\$44,208	\$36,752	\$74,666
CWP/MPCA SSTS LI Loan Funds	MPCA	\$330,000	\$122,700	\$207,694					\$97,911	\$54,994					
Farm Bill Assistance		\$8,714	\$37,593			\$29,250	\$3,759		\$2,585	\$16,849			\$8,678	\$1,685	
MDA MAWQCP	MDA	\$3,215		\$6,000					\$954		\$4,267				
MDA AgBMP Low-Interest Loan funds	MDA		\$33,000	\$146,249						\$14,791	\$103,997				
MPCA - grants	MPCA				\$160,000							\$160,000			
TOTALS		\$929,916	\$801,251	\$682,071	\$160,000	\$200,967	\$200,759	\$197,858	\$275,906	\$359,121	\$337,330	\$160,000	\$59,627	\$89,980	\$140,697

* Existing State and Local Dollars in this table will be allocated to ongoing activities in the Planning Area. These funds don't replace the total dollars needed to fund the Targeted Implementation Schedule.

6 EXISTING IMPLEMENTATION PROGRAMS

The programs described below form the current baseline of watershed management in the Hawk Creek – Middle Minnesota Planning Area and are the tools and systems that will be used to implement the actions identified in the targeted implementation schedule. Currently, these programs are administered by the counties and the Soil and Water Conservation Districts (SWCDs). These entities work together to secure and distribute financial and technical resources for the implementation of practices needed to achieve watershed management goals. These programs include:

- Incentive Programs
- Capital Improvement Projects
- Operation and Maintenance Programs
- Regulation and Enforcement Programs
- Public Participation and Engagement Programs
- Data Collection and Monitoring

Through the Hawk Creek-Middle Minnesota Planning Area Joint Powers Entity (HCMM JPE), Local Government Units utilize joint resources to coordinate like-programs within the Planning Area when appropriate. The HCMM JPE will coordinate these efforts through the implementation of the Hawk Creek – Middle Minnesota Comprehensive Watershed Management Plan.

6.1 INCENTIVE PROGRAMS

Much of the progress toward the natural resource improvements identified in this Plan will rely on voluntary implementation and installation of best management practices (BMPs) by landowners. This work will often depend on programs aimed at incentivizing landowners to make changes to their land or operations, or to go “above and beyond” existing requirements in reducing pollutants during development or redevelopment. Upgrading subsurface sewage treatment systems, installing residential raingardens, and restoring shorelines or wetlands are examples of the types or practices commonly incentivized through these programs.

Incentive programs are programs used to encourage participation in certain activities or programs. Various mechanisms can be used for conducting incentive programs, such as providing technical assistance, financial assistance, or other benefits to those who enroll in the programs. Financial incentives may be used to encourage landowners to install or adopt land management practices that improve or protect water quality.

Each organization’s incentive programs are different. Specific information about each program can be found on individual websites (e.g. MDA’s programs for BMP adoption including the Ag BMP Loan Program and the Nutrient Management Incentive Program). The BMPs implemented through this Plan that use Watershed Based Implementation Funds (WBIFs) will be chosen with a Project Ranking Tool. This tool uses a prioritization and scoring process to target projects where they will provide the best benefit for the resource at the lowest cost to the taxpayers.

6.1.1 Cost-Share Programs

A cost-share program is one where the costs for erosion control, sedimentation control, or water quality improvements are shared between the landowner and a funding agency. Numerous cost-share programs are available at the local, state, and federal level. Cost-share programs often provide funding for structural practices (e.g. water and sediment control structures, grassed waterways, wetland restoration, or controlled drainage practices) or nonstructural practices (e.g. cover crops, no-till, or nutrient management). Cost-share programs also provide funding for water quality benefits (e.g. well sealing, rain gardens, and septic programs). Example programs include State Cost Share, Soil Health Cost Share, Local Cost Share, Clean Water Partnership (CWP), Conservation Stewardship Program (CSP), and Environmental Quality Incentive Program (EQIP). Landowners seeking cost-share assistance should contact their local SWCD office to obtain information on available funding sources in their area.

6.1.2 Low-Interest Loans

Low- or no-interest loans provide financing typically at below-market rates and are often combined with flexible repayment terms. Low interest loans have been an essential part of helping landowners complete necessary BMP's since 1995. The largest funded activity is septic system upgrades. Loan funds may be available for livestock waste-management system updates, septic system replacement, conservation tillage equipment, small community wastewater-treatment systems, private well replacement, or other BMPs that improve water quality. MDA's AgBMP loan program provides low-interest loans to farmers, rural landowners, and agriculture supply businesses to implement BMPs. Contact local county environmental offices for more information.

6.1.3 Regulatory Assistance Programs

Regulatory assistance programs often require landowners to achieve certain standards (i.e. water quality) in return for (1) certainty that the standard will not change for a defined period, (2) recognition of participation, and (3) priority for other financial and technical assistance. An example of a regulatory assistance program is the Minnesota Agricultural Water Quality Certification program (MAWQCP). Interested landowners should reach out to their local SWCD for more information.

6.1.4 Conservation Restoration Programs

Conservation restoration programs are voluntary legal agreements that are made by a landowner and a qualified agency or non-profit organization. These programs conserve targeted resources to prevent land uses that are incompatible with the long-term health of the watershed while keeping land in private ownership, whether it is permanent or over the length of a contract. Conservation restoration programs are available through state and local government agencies (e.g. Natural Resource Conservation Service (NRCS) within the U.S. Department of Agriculture (USDA), MN Board of Water and Soil Resources (BWSR), MN Department of Natural Resources (DNR)) as well as several non-profit organizations such as The Nature Conservancy and the Minnesota Land Trust. Some conservation restoration programs, such as Reinvest In Minnesota (RIM) and Conservation Reserve Enhancement

Program (CREP), are recorded on property deeds and inspected regularly to ensure that the provisions of the easement agreement are maintained. Other programs, like Conservation Reserve Program (CRP), protect land for a certain number of years to revitalize the landscape. The counties recognize the value in taking a comprehensive, long-term approach to land conservation by working with willing landowners and partners to protect and restore important land throughout the watershed. Landowners interested in protecting and restoring their land are encouraged to contact their local SWCD staff to discuss options and opportunities.

6.1.5 Permanent Protection

Permanent protection measures are necessary to ensure conservation areas are protected in perpetuity in an undisturbed, restored state and to ensure that projects designed to meet the goals of the Plan are operated and maintained at an effective performance level.

Permanent protection is typically provided via a conservation easement. An easement is a limited right of use that one entity has on someone else's property. The Planning Partners' role in acquiring conservation easements would likely entail connecting private landowners to existing state and Federal programs so that the landowner could enter into a binding agreement to preserve the property. Under an existing program, the State or Federal government would hold the easement and be responsible for enforcing its conditions. The land-use restrictions placed on the property would remain in place even if the property changes ownership.

Permanent protection over a project would work in a similar fashion. Typically, stormwater management projects and BMPs, whether regional facilities or located on an individual property, are protected by a drainage or utility easement. These easements are needed for draining water (stormwater runoff) and installing utilities such as water, sewer and storm sewer lines, gas lines, and buried phone, electric, and cable lines. They are also needed to ensure that access is provided for ongoing maintenance of the BMPs. These easements are usually created when a property is developed and are typically located along border lot lines. However, some properties contain easements that are not placed in these typical locations. Easements can also serve as protective buffers for environmentally sensitive areas such as lakes, streams, and wetlands. Like conservation easements, these easements would remain in place if the property changes ownership. In this case, the Planning Partners would not have a role in the acquisition of a drainage and utility easement or recorded buffer as these requirements typically fall under existing city or county ordinance.

Soil and Water Conservation Districts also promote many other easement programs provided by State, Federal, and Non-Governmental entities though they may not be the main contact for implementation. Programs include but are not limited to:

- *US Natural Resource Conservation Service: Agricultural Conservation Easement Program,*
- *US Fish and Wildlife: Wetland, Tallgrass Prairie, and Grassland Easements,*
- *MN Department of Natural Resources-Native Prairie Bank, Walk-In Access, Working Lands, Wildlife Management Areas,*
- *Board of Water and Soil Resources-Wetland Bank and Mitigation easements, CREP, RIM, and Road Bank Easements,*

Interested landowners should reach out to their local SWCD to inquire about available programs (availability varies based on funding sources).

6.1.6 Services

Several counties and SWCD's provide additional service for hire. These services may include tree sales, seed sales, equipment rental, and operation and maintenance service on conservation practices. Contact local SWCD for information on services in your area.

6.2 CAPITAL IMPROVEMENT PROJECTS

Capital improvements are beyond the "typical" financial means of the involved entities and include larger, non-recurring expenditures for the construction, repair, retrofit or increased utility or function of physical facilities, infrastructure, or environmental features. Capital improvement projects are often completed in cooperation with multiple entities including counties, SWCDs, watershed districts, cities/townships, state agencies, and private landowners.

The first step in the implementation of capital improvements is to conduct a study to refine the project scope and identify the most appropriate project(s). Projects will be chosen using multiple prioritization factors such as, location within the Planning Area, project feasibility, cost-benefit analysis, landowner cooperation, and available financing. In many cases, ownership of these improvements and on-going operations and maintenance responsibilities reside with the landowner.

Members of the HCMM JPE are expected to discuss the means and methods for funding water quality aspects of new capital improvements with potential funding partners. Capital improvement projects that receive funding for water quality purposes through this Plan will be operated and maintained by the sponsoring organization. Some examples of potential capital improvement projects that may afford the locals to partner with a road authority on additional water quality treatment options are county and state road bridge replacements and road improvement projects, several of which are currently in a 10-year planning process by county highway departments.

6.3 OPERATION AND MAINTENANCE PROGRAMS

The routine Operation and Maintenance of any Best Management Practices (BMPs) are critical in ensuring the life of the practice. This will be the responsibility of the landowner (unless an alternative agreement is made) anywhere the BMP practice was installed using cost share assistance funds of any kind. Plan partners will ensure these measures are getting done. Municipal and county governments, as well as watershed management entities, are responsible for inspecting, operating, and maintaining stormwater infrastructure projects, public works, facilities, and natural and artificial watercourses completed or owned by the county, municipality, or watershed management entity. The Planning Partners have similar requirements for the operation and maintenance by private landowners that are included in the cost share contract. Similarly, all projects that use funding from the Natural Resource Conservation Service (NRCS) have specific operations and maintenance requirements that are included in a contract with landowners.

Operations and maintenance of any capital improvement implemented through this Plan will be the responsibility of the landowner where the practice is installed, unless an alternative agreement is made. After construction of a project, the responsible party will perform regular inspections and maintenance to ensure the project functions at its design capacity over its intended life expectancy. Operation and Maintenance plans must be prepared before construction and must include the expected activities, timing of activities, and inspection schedule. The Operation and Maintenance plan will include the procedural activities that will take place if inspections determine that maintenance is required or if required maintenance has not been performed, including potential penalties or enforcement actions. Minnesota State Rules Chapter 8400.1700 and 8400.1750 outline the program requirements for the projects funded through state cost-share programs.

For the numerous public works facilities (e.g. bridges, culverts, dams, wastewater treatment facilities) located in the Hawk Creek – Middle Minnesota Planning Area, the counties have the Operation and Maintenance Programs in place to ensure that this infrastructure is operating as designed. Additionally, each county's drainage management program addresses the on-going Operation and Maintenance needs of the public drainage system as described in Section 6.4.1.

6.4 REGULATION AND ENFORCEMENT PROGRAMS

Many of the Planning Area's priority concerns can be addressed, at least partially, through local regulations and policies, especially zoning and other land use ordinances. This plan calls for local authorities (counties) to maintain local regulatory controls, and certain land management practices, as well as improved coordination by the Planning Partners of regulatory activities to reduce impacts from altered drainage and increased groundwater demands. The Planning Partnership does not intend to develop or enforce any of its own regulations. Instead, the Planning Partners will coordinate enforcement with local governmental authorities.

6.4.1 County Regulations

Minnesota statutes administered by the Planning Partners are described below. The responsibility for implementing these authorities will remain with the respective counties. There are multiple types of state laws and local ordinances in the Hawk Creek-Middle Minnesota Planning Area:

- Subsurface Sewage Treatment Systems
- Wetland Conservation Act
- Shoreland Management
- Minnesota River Management District
- Floodplain Management
- Feedlot Management
- Buffer Management
- Zoning, Erosion and Sediment Control and Stormwater Management
- Drainage

A summary of regulatory controls most related to watershed management is provided in the following descriptions.

Subsurface Sewage Treatment Systems (SSTS)

The Subsurface Sewage Treatment System (SSTS) program was established to protect the public health and the environment through adequate dispersal and treatment of sewage from dwellings or other establishments that generate less than 10,000 gallons per day. MPCA developed technical and compliance criteria and has established requirements for local SSTS programs. Counties are required to adopt SSTS ordinance and administer SSTS programs that comply with the state rules.

SSTS regulations are based on the following state laws:

1. *Minimum technical standards for individual and mid-size SSTS (Chapter 7080 & 7081);*
2. *A framework for local administration of SSTS programs (Chapter 7082); and*
3. *Statewide licensing and certification of SSTS professionals, SSTS product review and registration, and establishment of the SSTS Advisory Committee. (Chapter 7083)*

Within the planning area there are varying approaches to SSTS management. The potential for greater SSTS upgrades through universal inspection requirements during the property transfer was discussed, but ultimately Chippewa County determined it prefers to have the financial sector drive inspection requirements at times of property transfer. Gains in record keeping and SSTS databases may help to advance knowledge of compliance rates and lead to upgrades over time.

Wetland Conservation Act

The Wetland Conservation Act was designed to maintain and protect Minnesota's wetlands and the benefits they provide and reach the goal of no-net-loss of wetlands. The Wetland Conservation Act requires any proposal to drain, fill, or excavate to follow these guidelines: 1) avoid all wetland disturbances; 2) If unable to avoid impact, minimize any impact on the wetland; and, 3) replace any lost wetland acres, functions, and values. Some activities are exempt from replacement, check with your local agency. The Wetland Conservation Act is administered under Minnesota Administrative Rules, Chapter 8420, Wetland Conservation.

Within the Planning Area, Chippewa Soil & Water Conservation District, Kandiyohi County, and Renville Soil and Water Conservation District implement the WCA program.

Shoreland Management

Minnesota state law (Minn. Rules §§ 6120.2500 – 6120.3900) delegates authority to regulate shorelands to Local Government Units. Shorelands include both river and lake shore areas. This authority includes regulating 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. Local governments enforce this statute with a land use ordinance. These ordinances are the backbone of land use controls to protect and provide orderly development of Minnesota's shorelands.

Partner Counties will continue to enforce shoreland standards as is applicable while continuing to look for opportunities to enhance educational and enforcement efforts for greater public buy-in and cooperation. The lakes region and Minnesota River corridor provide the greatest opportunities for continued and enhanced efforts.

Minnesota River Management District

Chippewa County and Renville County administers the Minnesota River Management District which is geographically identified in Minnesota Rules Part 6105.1290. This District contains bluffland and riverland development in order to protect and preserve the outstanding scenic, recreational, natural, historic, and scientific values that the Minnesota River provides to the state of Minnesota. Within the Minnesota River Management District, the land is divided into two sub-districts, the portion that is designated Scenic and the portion that is designated Recreational.

Floodplain Management

Floodplain zoning regulations are designed 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 during a flood threat. The Federal Emergency Management Agency (FEMA) administers federal floodplain management, mapping, insurance, and flood-assistance programs. The MNDNR oversees the state program and administers the National Flood Insurance program for the state. By combining quality engineering with updated flood hazard data, FEMA provides accurate and easy-to-use information to enhance local mitigation plans, improve community outreach, and increase local awareness of flood hazards. Local zoning regulations identify permitted land uses in the floodway, flood fringe, and floodplain. These regulations are designed 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 during a flood threat.

Recent FEMA mapping updates within the watershed have enhanced accuracy and provided better tools for floodplain regulation.

Feedlot Management

The Minnesota Pollution Control Agency (MPCA) established rules for local governments to manage feedlots in Minn. Rules § 7020. Counties may be delegated by the MPCA to administer the program for feedlots that are not required to have a state or federal operating permit. The feedlot rule regulates the collection, transportation, storage, processing and disposal of animal manure and livestock processing activities, and also provides assistance to counties and the livestock industry. The rules apply to all aspects of livestock production areas including the location, design, construction, operation and management of feedlots, feed storage, stormwater runoff, and manure handling facilities. Most counties provide feedlot regulatory oversight and technical assistance programs, and maintain a feedlot inventory.

The greatest opportunity within the planning area for enhanced feedlot regulation is the oversight enhancement of manure management, planning, application, and record-keeping activities.

Buffer Management

In 2015, the Minnesota legislature enacted the Buffer and Soil Loss Legislation (Minnesota Statute, Section § 103F.48), commonly referred to as the Minnesota Buffer Law. This law requires a 50-foot average, 30-foot minimum width, continuous buffer of perennial vegetation around public waters identified in the DNR Buffer Protection Map. Additionally, a 16.5-foot minimum width continuous buffer of perennial vegetation is mandatory along all public drainage systems. In some cases where a County may be enforcing its own buffer ordinance, the County-specific ordinance will take precedence over the Minnesota Buffer Law if its regulations are more strict. Additionally, a list of Alternative Practices, approved by the local County, Soil and Water Conservation District, and BWSR, may be installed in lieu of a buffer where practices have an equivalent water quality benefit.

This Law also requires “Other Waters” (waterways not identified in the DNR Buffer Protection Map) to be summarized for protection through the Local Water Plan approved by Counties and Soil and Water Conservation Districts. Chippewa and Renville SWCDs have summarized by resolution “other waters” and they are included in Appendix F.

With buffer compliance rates high in the planning area, maintaining compliance over time will be an area of importance.

Zoning, Erosion and Sediment Control and Stormwater Management

County zoning and subdivision ordinance controls promote the public health, safety and general welfare of the public; protect agricultural land from urban sprawl; and provide a basis for the orderly development of land resources. The county zoning ordinance addresses land use impacts on steep slopes, impacts of grading and filling, impacts of erosion and sediment control, and stormwater management requirements. It should be noted that some member communities also have stormwater ordinances, which regulate the impacts of stormwater to the watershed’s lakes, rivers, streams, and wetlands.

The planning process identified no areas for zoning ordinance amendment or enhancement relative to this planning area.

Drainage

The public drainage systems within the Planning Area are managed by drainage authorities on behalf of the landowners receiving benefit from the drainage system. The individual county governments serve as the drainage authority. These drainage systems, typically open ditches or in some cases underground tiles, were established to enhance agricultural production on lands frequently too wet to produce crops. The cost for original establishment of the public drainage system and subsequent improvements is borne by the benefitted properties. The drainage authority acts on behalf of all the benefitted property owners to assess fees for the level of drainage benefit each landowner receives. Chapter 103E of the Minnesota Statutes, known as the Minnesota Drainage Law or Drainage Code, provides the framework for managing the public drainage systems.

Additionally, under Minnesota Statute § 103E.011, Subd. 5, a drainage authority may accept and use funds from sources other than, or in addition to, those derived from assessments based on the benefits of the drainage system for the purpose of wetland preservation or restoration or creation of water quality improvements or flood control. The sources of funding authorized under this subdivision may also be used outside the benefitted area but must be within the watershed of the drainage area. Contact your local county office for details on your area's specific drainage authority.

6.4.2 Comprehensive Land Use Plans

A comprehensive plan is a document that outlines the general policies and goals of the county and should be considered as the county reviews, creates, and amends ordinances and regulations; considers County Board resolutions on specific issues; and establishes procedures for policy-making. Most of the counties have a Comprehensive Land Use Plan which guides the various land uses in the watershed: Chippewa County plan adopted in 2002, Kandiyohi County plan adopted in 2001, Nicollet County adopted in 2021, Renville County plan adopted in 2002, Sibley County plan adopted in 2013.

Adoption of updated comprehensive plans on an ongoing basis within the planning area will serve to enhance and maintain land use controls such that they keep pace with current development trends.



6.5 PUBLIC PARTICIPATION AND ENGAGEMENT PROGRAMS

The vast majority of the implementation of this Plan and the resource impacts it seeks will be accomplished through voluntary actions by landowners. The importance of engaging and educating various stakeholders cannot be overstated, and there is a direct correlation between the amount of education provided to a group of stakeholders and the implementation of projects and practices. Public participation and education programs utilize education and outreach to address issues impacting a priority concern and make progress towards a measurable goal. Listed below are examples of existing public participation and engagement programs within the planning area that address many of our plan goals:

Public Outreach

Annual reports, newsletters, webpages and social media platforms, radio advertisements, paper articles and direct mailings.

Educational and Outreach Events

Kids in the Community (clean up) event, youth field events, county fair displays, Household Hazardous Waste (HHW) programs, Problem Material Collections, Little Peoples Garden, Women's Field Day event, and stormwater management events.

Conservation Program Outreach Events

Conservation Reserve Program (CRP) workshops, cover crop and soil health workshops and field demonstrations, annual township meetings.

The above programs currently facilitate relationship-building between agricultural producers, agricultural industry and conservation professionals. They maintain communication and technical assistance with contractors, homeowners, and landowners inquiring about programs or best management practices (BMP's) they would like to implement.

The planning partners will continue to implement BMP education programs focusing on agricultural soil health and altered hydrology, residential stormwater management, SSTS, nutrient management, and other key issues that help increase knowledge and participation in BMP's supporting the goals of this plan. The success of our outreach and education programs is very dependent on with the availability of program funding, impacts of the changing climate (i.e. large rain events, flooding, drought, etc.), and landowner participation in voluntary programs.



6.6 DATA COLLECTION AND MONITORING

This section describes how data collection and monitoring activities will be used to reasonably evaluate progress toward plan goals and describes additional data collection activities needed to fill gaps that have been identified during the planning process.

6.6.1 Monitoring Summary

Existing water monitoring programs carried out by the Local Partners, the Hawk Creek Watershed Project (HCWP), agencies, and others in the Planning Area vary in their scope depending on the location, available funding, staffing levels, specific study needs, etc. These programs are expected to continue for the duration of this Plan. Data gathered through these programs will be utilized when appropriate to assess progress on the measurable outputs and goals of this Plan.

A summary of water quality data and analysis for stream reaches and lakes within the Hawk Creek-Middle Minnesota Planning Area can be found in the Hawk Creek WRAPS and the Middle Minnesota-Mankato WRAPS (MPCA 2019; 2017).

Data on specific waterbodies can be found on the MPCA's Water Quality Data webpage: <https://www.pca.state.mn.us/water/water-quality-data>. A summary of groundwater quality and quantity data can be found in the Hawk Creek – Middle Minnesota Planning Area (HCMM) Groundwater Restoration and Protection Strategies Report (MDH 2020).

6.6.2 Assessment of Plan Progress and Current Data

In the short-term, implementation of activities and measuring progress toward goals will be tracked by project type and the organization implementing the project. In the long-term, the Planning Partners will use monitoring data to assess trends in water quality improvement. It should be recognized that there are other factors which will confound the direct relationship between watershed activities and changes in resource trends such as climate change, land-use patterns, and drainage management.

Existing monitoring data has been collected from our partners such as the Minnesota Department of Health (MDH), Minnesota Department of Natural Resources (DNR), Minnesota Pollution Control Agency (MPCA), and local volunteers. Lakes in the watershed, such as Eagle, Swan, and Willmar, have data available from local volunteers. You will find data on Secchi depth, total phosphorous, chlorophyll, and lake levels. Data is also available on the streams within the watershed, which include Beaver, Chetomba, Upper Hawk, and Fort Ridgely. The data collected from these streams by MPCA consist of information on fish and macroinvertebrates, total phosphorus, suspended solids, and continuous stream flows. Public water suppliers and MDH collect groundwater quality information.

6.6.3 Additional Data Collection

While there are substantial amounts of data available in parts of the watershed, some datasets, maps, surveys and models are not fully available everywhere. In many areas, there is a lack of baseline information and/or additional data are needed to help the Planning Partners make informed management decisions that target and prioritize projects at a finer scale. This information will also be used to help assess progress toward meeting measurable outcomes and goals and will help in the development of biennial work plans and possible future plan amendments.

There are numerous data collection efforts included in the Targeted Implementation Schedule. As much of this work is not eligible for WBIF, collaboration with other entities and use of additional funding sources will be needed to accomplish most of these efforts. The specific data collection and analysis efforts included in the Hawk Creek-Middle Minnesota Comprehensive Watershed Management Plan include:

From Section 4.3.2 Altered Hydrology:

- Conduct an analysis to identify non-contributing (i.e. landlocked or semi-landlocked) portions of the Priority Areas. Work with landowners to maintain these landlocked or semi-landlocked portions of the landscape (so they don't become connected in the future).
- Conduct a terrain analysis with LiDAR to identify restorable wetland sites for improving water quality and reducing peak flows.

From Section 3.3.11 Monitoring and Data Collection:

- Install a NE tributary monitoring station to Eagle Lake. This monitoring station should be located upstream of the outlet structure to better measure TP reductions associated from implementation of agricultural BMPs only.
- Install a SE tributary monitoring station to get a more complete picture of the total loads discharging to Eagle Lake.
- Install flow stations on Chetomba Creek and Fort Ridgely Creek.

The Planning Partners and other entities involved in data collection are committed to performing periodic analysis of the data for quality control purposes (monthly) and to evaluate trends (every 5 years). The Planning Partners are also committed to continuing to collect data in a manner that is consistent with state compatibility guidelines and will submit locally collected data to the appropriate state agency for entry into public databases (e.g. Environmental Quality Information System, EQulS).

7 PLAN ADMINISTRATION AND COORDINATION

The Targeted Implementation Schedule (Section 5) and the Existing Implementation Programs (Section 6) will be coordinated between the Counties, the Soil and Water Conservation Districts, and the other partners in the Hawk Creek - Middle Minnesota Planning Area. This section describes how this coordination will be accomplished through decision making and staffing, collaboration, funding, and work planning.

7.1 DECISION-MAKING AND STAFFING

The Counties and SWCDs are anticipated to sign a Joint Powers Agreement (JPA) that will create a Hawk Creek – Middle Minnesota Joint Powers Entity (HCMM JPE). It should be noted that the Joint Powers Entity (JPE) has yet to be established; therefore, the official name of the organization is subject to change. The HCMM JPE will provide for a watershed-based entity within the Hawk Creek – Middle Minnesota Planning Area and provide the ability for both JPA members and land occupiers to address issues on a watershed scale rather than by individual geographical areas of each local unit of government.

The HCMM JPE will include one representative from each local unit of government that executes the JPA. Once a JPA is signed and a JPE is formed, the HCMM JPE will adopt bylaws and other administrative documents necessary to operate and fulfill the mission of implementing a plan based on a major watershed boundary. During the startup period, it is anticipated that the Minnesota Counties Intergovernmental Trust (MCIT), County attorneys, and other legal counsel will be consulted as necessary.

The JPA does not obligate the HCMM JPE to hire staff. Rather, staff needed to implement the Plan will be employees of an individual member to the JPA or contracted through a Service Agreement. As a new entity, the HCMM JPE will have the ability to enter into contracts with outside consultants and organizations for services. The HCMM JPE will meet regularly throughout the ten-year life of the Plan but no less than twice annually. It is anticipated that more frequent meetings will be needed during the initial years of the Plan and as the HCMM JPE becomes operational.

It is anticipated that the Steering Team will continue to assist the Plan Coordinator with prioritizing work tasks, measuring results, and providing recommendations to the HCMM JPE. Participants of the Steering Team will consist of staff from the participating counties and SWCDs, BWSR, and other state agency staff and local organizations, as needed. Once the Hawk Creek-Middle Minnesota Comprehensive Watershed Management Plan is complete, there will be no on-going role for the Advisory Committee. While the Hawk Creek – Middle Minnesota Comprehensive Watershed Management Plan has identified that agency goals, objectives and strategies are generally compatible with the content of this Plan, there may be some agency goals, objectives, and strategies for resource management within the Planning Area that have not been identified as a priority concern. The responsibility for achieving the goals associated with those potential concerns remains with the respective agency or organization.

7.1.1 Coordination of Shared Services

At the beginning of this Plan's development, no formal agreements existed for sharing services. However, the Planning Partners recognize the importance and potential benefits of coordinating shared service for this Plan, including reporting, data management and distribution, financial coordination, and Plan administration and implementation. In an effort to enhance effectiveness, the Partners will leverage opportunities for collaboration and use of shared-services. Opportunities for coordinated services include reporting on progress in meeting Plan goals; obtaining, administering, and reporting for grants; monitoring outcomes; engaging and educating stakeholders; and implementing activities. These shared services may be accomplished through a Joint Powers Agreement (JPA) and a contract of service, or another such cooperative agreement when formal contracting is appropriate.

It is anticipated that federal and state agencies provide in-kind staff assistance to carry out the implementation activities identified within this Plan in addition to providing or overseeing program funds. These shared and coordinated services among federal and state agency staff, while not required to be identified within this Plan, will be discussed throughout the 10-year life of the Plan through the Steering Team and are considered critical to meeting the goals of the Plan. For example, BWSR staff may be needed to coordinate and develop plans for wetland restoration projects under State easement programs or provide necessary job approval authority and training. In addition, coordination with USDA staff to leverage federal programs and services will be necessary to meet the goals of the Plan.

It is also recognized that current organizational structures are not fully aligned with the One Watershed, One Plan (1W1P) program. For example, for SWCDs there are two different technical service areas (TSAs) that provide engineering services within the Planning Area: West Central and South Central. How these engineering services can be shared or coordinated among the TSAs will be evaluated and coordinated throughout the life of the Plan.

7.2 COLLABORATION WITH OTHER UNITS OF GOVERNMENT

The Partners will continue coordination and cooperation with other governmental units at all levels. Agencies including the Hawk Creek Watershed Project, Minnesota Pollution Control Agency (MPCA), Board of Water and Soil Resources (BWSR), Department of Natural Resources (DNR), US Fish and Wildlife Service (USFWS), Minnesota Department of Agriculture (MDA), Minnesota Department of Health (MDH), Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) are important partners in watershed management in providing program funding, technical assistance, and project opportunity. Cooperation between the HCMM JPE and local units of government such as municipalities, township boards, county boards, and drainage authorities are also important to achieving Plan goals. Partnerships may take various forms, including but not limited to, providing matching funds or in-kind services for grant applications, sharing of staff or other resources, and collaborating on project administration and implementation.

The HCMM JPE and existing partners will also continue to collaborate and identify emerging partners throughout the lifespan of the Plan when it is appropriate.

7.2.1 Collaboration with Non-Governmental Organizations

Planning Partners expect to continue and build on existing collaborations with others, including non-governmental organizations, when opportunities exist that align with Plan objectives, while implementing this Plan. Current and potential future partnerships include, but are not limited to the Minnesota Land Trust, Pheasants Forever, Ducks Unlimited, University of Minnesota Extension, local sporting groups, local service clubs, lake associations, Minnesota Corn Growers, Minnesota Soybean Growers, Minnesota Farm Bureau, Minnesota Farmers Union, and others.

7.3 FUNDING

Local, state, and federal sources of funding were evaluated for each implementation activity by the Planning Partners. The Partners also expect to pursue grant opportunities collaboratively to fund implementation of the Targeted Implementation Schedule. Dependent upon individual project partners, other sources of funding may be evaluated as well.

Cost within the Targeted Implementation Schedule are estimates based on past and current capacity, program availability, and limiting factors such as staff time. Numbers can be expected to increase and decrease and will fluctuate over the lifetime of the Plan as opportunities arise and program availability changes. The amount of funding provided by state, federal, and local sources for implementation of the Comprehensive Watershed Management Plan will have a significant impact on the Plan's success.

7.3.1 Local Funding

Local funds are defined as any locally generated money. Local funds for County offices and Soil and Water Conservation Districts (SWCDs) can be derived from a variety of sources, including tax levies, fees, services and in-kind services, or local organizations. Local funding can be used to accomplish regional initiatives and goals where state and federal funds are unavailable or lacking. Local funding will be used as match for other utilized state and federal grants.

The total estimate of local funds needed for the implementation of activities needed to address Tier I and Tier II issues over the 10-year timeframe of the plan is \$14,264,096 (Table 5-1).

7.3.2 State Funding

State funding includes all funds derived from existing block grants, regulatory programs or base cost share grants and program implementation. State funding excludes general operating funds obtained from BWSR, counties, service fees, and grants or partnership agreements with the federal government or other conservation organizations.

The total estimate of state funds needed for the implementation of activities needed to address Tier I and Tier II issues over the 10-year timeframe of the plan is \$39,339,885 (Table 5-1).

7.3.3 Federal Funding

Federal funding includes programs such as, but not limited to, the Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Conservation Stewardship Program (CSP), and Federal Section 319 competitive grants provided through the Environmental Protection Agency.

Opportunities may exist to leverage state dollars through various federal cost share programs. Where an initiative or project aligns with the objectives of various federal agencies, federal dollars will be sought to help fund the initiatives or projects described by this plan.

7.3.4 Collaborative Grants

Planning Partners and the Hawk Creek Watershed Project have a rich history of collaboratively applying for competitive and non-competitive grants (including Clean Water Funds, Federal Section 319, Surface Water Assessment Grant, and Watershed Restoration and Protection Strategy Implementation) in order to achieve watershed-wide objectives and will continue to do so as opportunities that align with Plan objectives present themselves.

7.3.5 Other Funding Sources

Non-governmental funding sources exist that provide technical assistance and fiscal resources to implement projects whose objectives align with the goals of the HCMM CWMP. The counties and SWCDs have worked with non-governmental organizations on the implementation of conservation practices. It will be important to continue to recognize the impact other conservation organizations have on the overall goals of the watershed and the potential that this Plan could be used to explore future opportunities for partnerships.

Private sector companies, including agribusinesses, are often overlooked as a potential source of implementation funding. Many agribusiness companies are working to improve water quality by providing technical or financial support for implementing management and structural water quality BMPs. Most often this is through Field to Market: The Alliance for Sustainable Agriculture. This Plan could be used to explore private sector funding, especially when the estimated water quality benefits have monetary value.



7.4 WORK PLANNING

The HCMM JPE annual budgeting process will include budget projections, staff capacity, project prioritization, and scheduling details. The HCMM JPE Joint Powers Entity will develop and approve the work plans under advisement of the Steering Team.

The initial work plan will pursue activities identified for years 2022, 2023, and 2024 in the Targeted Implementation Table. Each work plan thereafter will be based on progress made toward goals and new initiatives aimed at either maintaining or accelerating progress in targeted sub-watersheds. Staff and financial resource availability will be considered. Feedback and guidance received will be integrated into the work plan. The work plan will include an indication of each local government's responsibilities for implementing the Plan. The responsibilities of each local government will be adopted and implemented separately by each local government but under advisement and direction of the Planning Partners.

After Plan adoption, the Partners' annual work plans will be developed or revised to include implementation activities identified in this Plan. When feasible, the activities will be coordinated with other agency plans, projects, and timelines.

7.4.1 Project Selection within Targeted Implementation Areas

Best management practices (BMPs) were selected based on feedback from resource professionals on their applicability to address key issues and practice buy-in from local landowners. Implementation of these selected BMPs within the Priority Areas is based on adoption rates identified in the WRAPS. The strategy for implementing practices within the Priority Areas is to begin in the upstream watershed and move downstream.

During the annual work planning process, eligible top ranked practices identified through tools outlined in Table 7-1 will be reviewed in the field by local staff to determine feasibility.

Local staff will use their best professional judgment regarding the potential for project implementation and contact landowners to discuss specific project implementation opportunities. Projects will be scored and ranked by the use of a spreadsheet tool that will assign points to priority areas, practices, and other parameters identified in this Plan. This tool will also store important information that will be used for grant tracking purposes. This tool will be subject to amendments as priority areas and priority practices change throughout the life of the HCMM CWMP.

Locations of septic system improvements will be based on septic inspections conducted by county staff or licensed private inspectors within the targeted implementation areas. The total number of septic system upgrades will be based on compliance and inspection reports.

Pollutant reductions achieved from implementation of practices within the targeted implementation areas will be completed annually using the measuring tools listed in Table 7-1.

Table 7-1. Targeting and Measuring Tools by Project Type

Project Type	Targeting Methodology		Measuring Tool	
	Priority Area Scale	Field Scale	Priority Area Scale	Field Scale
Nutrient Management Practices	HSPF-SAM pollutant loading for prioritizing watersheds and identifying areas with high loading rates	Targeted implementation based on willing landowners	Water quality monitoring to be conducted at the outlet of priority watersheds. Where monitoring data is not available the cumulative pollutant and flow reduction of all projects within a Priority Area will be based on inputting implemented practices in the existing HSPF-SAM model.	The pollutant reduction of each individual project will be based on Design Estimates for some structural BMPs and HSPF-SAM reduction assumptions for source reduction. BATHTUB modeling to estimate changes in in-lake concentrations.
Reduced Tillage				
Conservation Crop Rotations				
Cover Crops				
Tile Intakes	Applied historical adoption rates			
Easements				
Side Inlets				
Buffers				
Water and Sediment Control Basins (WASCOB)	Terrain analysis utilizing LiDAR to determine appropriate sites	Ground-truthing of identified terrain-dependent practices & landowner willingness		
Wetland Restoration				
Stormwater BMPs	City Stormwater Management Plans			
Streambank Stabilization	GIS Terrain Analysis	Shoreline inventories (Implementation Activity) 2018 DNR Erosion Sites surveys	BWSR Water Erosion Pollution Reduction Estimator	
Septic system improvements	Septic system inspections		U of M Estimator for individual SSTs, and Design Estimates for cluster systems.	

7.4.2 Funding Request

Funds are currently used for activities that restore or protect natural resources in the watershed, including board and staff leadership, project identification, outreach, reporting, budgeting, technical support, project implementation, and operation and maintenance duties. The counties utilize general funding to support work related to shoreland, Subsurface Sewage Treatment Systems (SSTS), stormwater, wetland, feedlots, and other local ordinances. Natural Resource Block Grant (NRBG) funds are used by counties and Soil and Water Conservation Districts for local water plan implementation, administrative duties, and the Wetland Conservation Act (WCA). Existing grants fund technical assistance and financial incentives for erosion control and other natural resource projects on private property.

Additional work and staffing time will be supported through successful grant awards from, but not limited to: MPCA, BWSR, DNR, MDH, and USDA. The Planning Partners will consider Clean Water Fund dollars as a major funding source for this Plan. The Plan Partners will ensure that their proposed project aligns with high-level state priorities, key implementation items, and non-point funding priority criteria prior to submitting a grant application.

7.5 ASSESSMENT, EVALUATION AND REPORTING

Assessment and evaluation of the implementation activities within the Plan are critical in tracking progress. Progress reports for various funding sources will provide a record of project performance and how funds were utilized. Progress reporting will also occur through the Minnesota Board of Soil and Water Resources eLINK system. County monitoring and enforcement records will provide progress reports on implementation activities involving SSTS, feedlots, well sealing, and land use ordinance changes. A system for tracking and reporting activities internally and at the local level will be developed as State grant opportunities to implement the Plan become available.

7.5.1 Annual Evaluation

The purpose of the annual evaluation will be to assess progress towards each of the Plans stated goals. Recognizing that all entities are implementing activities to address local priorities (beyond those identified in the Targeted Implementation Schedule), the annual evaluation will include a review of additional activities to see if progress toward meeting Plan goals is being made more quickly. Steering Team members will be asked to participate and provide feedback in these annual meetings. The purpose of the meetings will be to revisit the priorities and focus areas, guide budgeting documents, advise on possible actions to be completed in the upcoming year, and relay the results of the annual evaluation to respective Boards of the Joint Powers Agreement (JPA). The Plan Partners will revisit priorities and focus areas, discuss, and consider new data or findings that could be integrated into the Plan, and discuss areas of possible collaboration on future projects and funding. This annual evaluation will also include a discussion of the need for amendments to the Plan. The method for tracking progress toward Plan goals will be determined after adoption of the Plan and could include one or more of the following: spreadsheet, map-based database, published annual report, or meeting summary. Load reduction estimates from the tools used to identify practices will be used to track progress toward goals. Reduction conversions will be made across tool platforms.

Additional evaluation will occur through separate annual planning documents of each participating local government unit, eLINK reporting, funding source documentation and reporting, and review of related resolutions passed by individual Boards of the HCMM JPE. This information will also be used in the development of annual reports completed by participating local government units.

In addition, the Hawk Creek and Middle Minnesota Watersheds will have completed an updated Watershed Restoration and Protection Strategy (WRAPS) that will include an updated listing of impaired waters, biological stressors, and Total Maximum Daily Loads (TMDL). It is important the Steering Team evaluates the TMDL and WRAPS information (estimated for completion in 2024, but the schedules shown in Table 7-2 for WRAPS updates are tentative and subject to change). Adjustments can be made prior to the five-year evaluation, if necessary.

Table 7-2. MPCA WRAPS Update Schedule for the Hawk Creek and Middle Minnesota Watersheds

Hawk Creek Cycle II Schedule						
2019	2020	2021	2022	2023	2024	
Planning						
	Bio Monitoring					
	Stream & Lake Monitoring					
	Geomorph/Hydrology Monitoring					
			Assess Data			
				Stressor Id		
				TMDL Development		
				WRAPS Development		

Middle Minnesota Cycle II Schedule						
2022	2023	2024	2025	2026	2027	2028
Planning						
	Bio Monitoring					
	Stream & Lake Monitoring					
	Geomorph/Hydrology Monitoring					
				Assess data		
				Stressor Id		
				TMDL Development		
				WRAPS Development		

7.5.2 Partnership Assessment

At the five-year evaluation, members will assess their own and the other partners' participation in this Plan. Assessing the partnership will improve the coordination of implementation activities while capitalizing on the support and perspectives of different individuals and organizations, their corresponding skills and collaboration across the watershed, and the potential pooling of information, technology, and administrative or financial resources. The Assessment will consist of a questionnaire that the Members can complete to examine the strengths and weakness of the partnership. Results from the assessment will be used to guide the Plan Partners and stakeholders in improved decision-making and participation in implementation activities.

7.5.3 Five Year Evaluation

After five-years of Plan implementation, the HCMM JPE, with assistance from the Steering Team, will conduct an evaluation. A summary of information collected through annual evaluation meetings will be reviewed to assess Plan progress. Any necessary Plan revisions will be discussed and included as appropriate. The five-year evaluation will also enable the Steering Team to assess whether any new information, including data and the findings from completed projects should be included in the Plan to improve prioritization, targeting, or measurability. Amendments to the Plan may be made if appropriate or necessary. The HCMM JPE will be the responsible authority to recommend and pursue Plan amendments and distributing the updated Plan to BWSR for final approval and adoption.

7.5.4 Reporting

Annual reporting requirements for the Minnesota Board of Soil and Water Resources will be administered per the BWSR Grant Administration Manual. Funding administration requirements are:

- *Annual eLINK grant reporting, including NRBG and competitive grants*
- *Annual website reporting with current project details*
- *Financial Statements including combined balance sheet, income statement, budgetary comparison statement, notes to the financial statement, and management's discussion and analysis.*

Reporting on collaborative grant funding will be completed by the Plan Coordinator. All other reporting for funding (local, state, or federal) utilized directly through the individual offices will be reported on by respective entities.

7.6 PLAN AMENDMENT PROCESS

7.6.1 Plan Amendment Process

This Plan extends through ten-years past the date it is approved by BWSR (see Appendix G for BWSR order of approval). Revision of the Plan may be needed through an amendment prior to the Plan update if significant changes emerge in the priorities, goals, policies, administrative procedures, or Plan implementation programs. Revision may also be needed if issues emerge that are not addressed in the Plan.

All amendments to this Plan will follow the procedures set forth in this section. Plan amendments may be proposed by any agency, person, or local government to the Steering Team. Proposals must be reviewed by the Steering Team before it is recommended to the Hawk Creek – Middle Minnesota Joint Powers Entity (HCMM JPE). The HCMM JPE must then review and approve initiation of the amendment process. All recommended Plan amendments must be submitted to the Steering Team along with a statement of the problem and need, the rationale for the amendment, and an estimate of the cost to complete the amendment.

Preparers of this Plan recognize it may need to be periodically amended to remain useful as a long-term planning tool. However, the structure and intent of this Plan is to provide flexibility to respond to short-term emerging issues and opportunities. The Steering Team will review and revise its long-range work plan and/or implementation programs through the annual budget and annual work plan.

Technical information (especially water quality data) will require frequent updating, such as when new, site-specific data is generated by state, federal, and regional agencies, counties, cities, or individuals. Generally, these technical updates and studies are considered part of the normal course of operations consistent with the intent of this plan and not a trigger for a Plan amendment. However, when the technical information results in a policy that is a significant change of direction from the Plan or the implementation of a project(s) or implementation program(s), a Plan amendment may be required.

7.7 CRITERIA AND FORMAT FOR AN AMENDMENT

Plan participants recognize the large work effort required to manage water-related issues. The Plan provides the framework to implement this work by identifying priority issues, measurable goals, and action items.

Examples of situations where a Plan amendment may be required include the following:

- Addition of a capital improvement project that is not described by the Plan
- Addition of new programs or other initiatives that have the potential to create significant financial impacts or controversy when inconsistent with the issues, goals, and policies

Plan amendment criteria includes the following:

- Any Local Government Unit (LGU) can propose an amendment.
- Costs are covered by the LGU who proposes the amendment unless the HCMM JPE decides to split costs out because there is mutual benefit among multiple partners.
- The Steering Team will review proposals and recommend proposal to the HCMM JPE who will make final approval to move forward with amendment through a resolution with a majority vote.
- The HCMM JPE holds the hearing.
- Majority vote of the HCMM JPE to submit Plan to BWSR for review and approval – does not need prior approval by each individual LGU if the Steering Team, HCMM JPE or BWSR decides that a Plan amendment is needed, the HCMM JPE will follow a process similar to the County water plan amendment processes:

Step 1: Consult

The Steering Team and HCMM JPE consults with the BWSR Board Conservationist to review the water plan amendment process. Determine the extent of the amendment and review process and the correlated level of effort needed. Extensive amendments typically take 18 months to complete. Set a due date for amendment completion and work backward to develop an internal timeline. Discuss the participants who will be involved with the amendment review and the level of involvement, which depends on the nature of the amendment.

Step 2: Self-Assessment and Develop Proposed Amendment

The Steering Team and HCMM JPE perform self-assessment to evaluate progress on current Plan. This should include a review of Performance Review and Assistance Program (PRAP) reports and other related information. The Steering Team and HCMM JPE review current Plan sections and develop a list of sections to amend, noting areas where information is missing or out of date. Review state reports/plans for the area where the amendment is proposed, such as Groundwater Restoration and Protection Strategies (GRAPS) and Watershed Restoration and Protections Strategies (WRAPS), for possible inclusion into the Plan. The BWSR website

contains information on how to use the WRAPS reports in water plans. At the discretion of the HCMM JPE, drafts of proposed Plan amendments may be sent to all plan review authorities for input before beginning the formal review process.

Step 3: Submit Petition

The Steering Team will recommend that a petition be made to BWSR that the HCMM JPE must then approve prior to submission. The petition to amend the Comprehensive Watershed Management Plan can be in the form of a letter or memo to the BWSR Board Conservationist. The petition may be submitted electronically. The petition should contain background on the Comprehensive Watershed Management Plan, the purpose(s) for the amendment, and a general summary of the amendment (areas of the Plan that will be amended and scope of the amendment if known). The petition should include the proposed amendment, the date of the public hearing, and a copy of the signed resolution passed by the HCMM JPE indicating the intent to amend the Comprehensive Watershed Management Plan. The Resolution to Amend template is located on the BWSR website. BWSR Board Conservationist consults with the BWSR Regional Manager, other BWSR staff, and board members and provides feedback to the Joint Powers Entity regarding the petition and proposed amendment.

Step 4: Notify

The HCMM JPE will maintain a distribution list for copies of the Plan and, within 30 days of adopting an amendment, distribute copies of the amendment to the distribution list. Generally, electronic copies of the amendment will be provided, or documents made available for public access on the internet at a site designated by the HCMM JPE. Printed copies will be made available upon written request and printed at the cost of the requester.

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9 LIST OF APPENDICES

Appendix A – Formal Agreement

Appendix B – Identification of Potential Watershed Concerns and Issues

Appendix C – Results of Priority Area Identification Process

Appendix D - Targeting and Setting Measurable Goals using HSPF-SAM

Appendix E - Upper Hawk Creek Lake BATHTUB Supporting Information

Appendix F – SWCD Resolutions re: “Other Waters”

Appendix G - BWSR Order of Approval