



*Cottonwood-Middle Minnesota*  
Comprehensive Watershed Management Plan

Developed for the

**Cottonwood-Middle Minnesota Partnership**

BWSR Approval Draft: September 2024



# Plan Acknowledgements

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## Planning Partnership

Brown County and SWCD  
Cottonwood County and SWCD  
Lyon County and SWCD  
Redwood County and SWCD  
Murray County and SWCD  
City of Springfield  
Redwood-Cottonwood Rivers Control Area  
Area II Minnesota River Basin Projects



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## Advisory Committee Partners

Board of Water and Soil Resources	Cottonwood Cattle Producers
Minnesota Department of Agriculture	Lower Sioux Community
Minnesota Department of Health	Red Rock Rural Water
Minnesota Department of Natural Resources	University of Minnesota – Southwest Research and Outreach Center
Minnesota Pollution Control Agency	Natural Resource Conservation Service
City of Sleepy Eye	United States Fish and Wildlife Service
City of New Ulm	Public Citizens

Created in Collaboration with





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# Acronyms

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IWIP	One Watershed, One Plan
BMP	Best Management Practice
BWSR	Board of Water and Soil Resources
CIP	Capital Improvement Project
CMMW	Cottonwood-Middle Minnesota Watershed
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
CWF	Clean Water Fund
CWMP	Comprehensive Watershed Management Plan
DNR	Minnesota Department of Natural Resources
DO	Dissolved Oxygen
DWSMA	Drinking Water Supply Management Area
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FSA	Farm Service Agency
FWS	Fish and Wildlife Service
GAM	Grants Administration Manual
HUC	Hydrologic Unit Code
LGU	Local Government Unit
LSOHC	Lessard-Sams Outdoor Heritage Council
MAWQCP	Minnesota Agricultural Water Quality Certification Program
MDA	Minnesota Department of Agriculture



MDH	Minnesota Department of Health
MOA	Memorandum of Agreement
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer Systems
MSHA	MPCA Stream Habitat Assessment
NLCD	National Land Cover Database
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PTMApp	Prioritize, Target, and Measure Application
RCPP	Regional Conservation Partnership Program
RIM	Reinvest in Minnesota
SSTS	Subsurface Sewage Treatment System
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TNC	The Nature Conservancy
TP	Total Phosphorus
UMN	University of Minnesota
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WASCOB	Water and Sediment Control Basin
WBIF	Watershed-Based Implementation Funding
WCA	Wetland Conservation Act
WMA	Wildlife Management Area

Executive Summary	Land and Water Resources Narrative	Priority Issues	Measurable Goals	Targeted Implementation	Plan Implementation Programs	Plan Administration and Coordination
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WPLMN Watershed Pollutant Load Monitoring Network  
WRAPS Watershed Restoration and Protection Strategy  
WWTF Wastewater Treatment Facilities

Executive Summary	Land and Water Resources Narrative	Priority Issues	Measurable Goals	Targeted Implementation	Plan Implementation Programs	Plan Administration and Coordination
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# 1. Executive Summary



# Section 1. Executive Summary

The Cottonwood-Middle Minnesota Watershed (CMMW), located in southwestern Minnesota, includes land in Blue Earth, Brown, Cottonwood, Murray, Redwood, and Lyon Counties. The watershed planning area includes the drainage area around and tributaries to the Cottonwood River, Little Cottonwood River, Spring Creek, and John’s Creek. John’s Creek is situated on the western side of the Minnesota River in the Minnesota River - Mankato Watershed. CMMW’s major cities include New Ulm, Tracy, Sleepy Eye, and Springfield.

The watershed has changed significantly in the past two centuries. Landscapes that used to be primarily prairie have been converted to productive agricultural land. Today, 85% of the watershed is used as cropland for growing primarily corn and soybeans. The watershed also hosts over a thousand miles of streams and numerous lakes, which community members and visitors alike enjoy through boating, fishing, and swimming.



*Above: Cottonwood River (DNR Cottonwood River State Water Trail).*



*Left: Jeffers Petroglyphs (Minnesota Historical Society)*

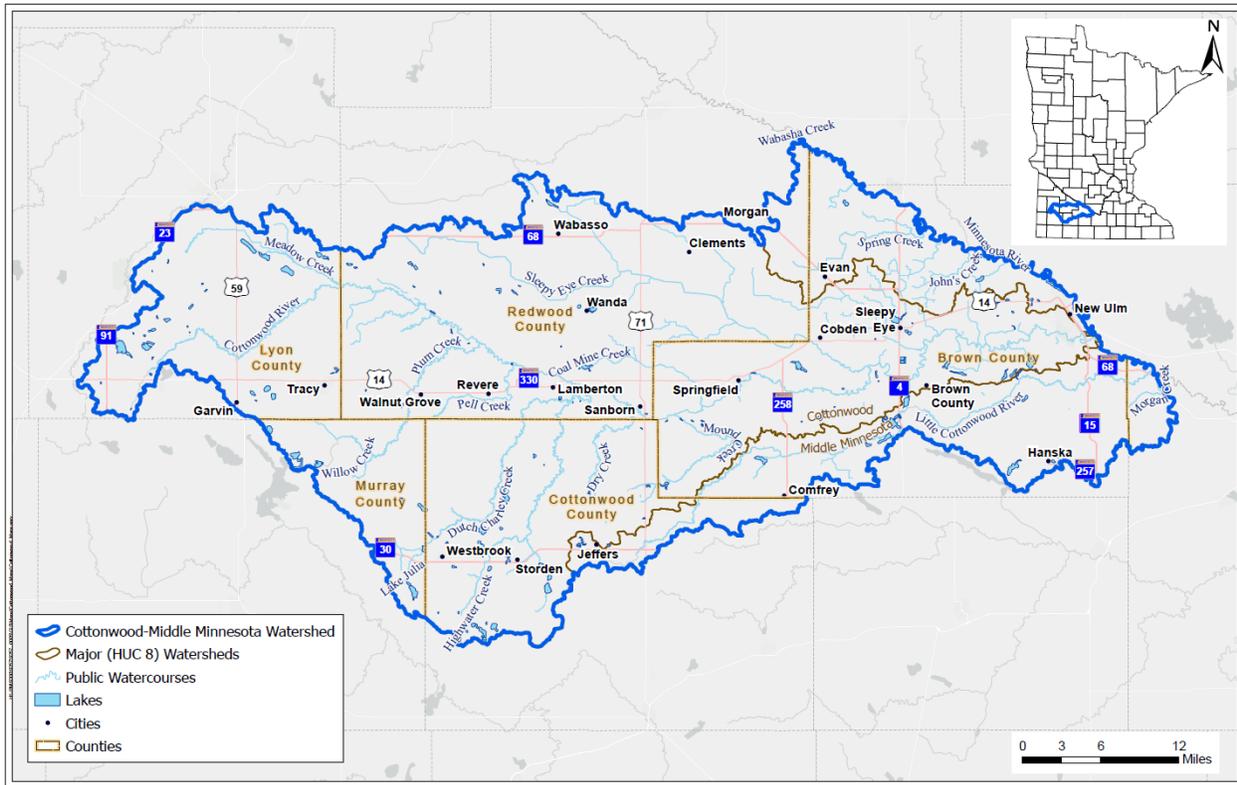


Figure I-I: CMMW plan area.

## Comprehensive Watershed Management Plan

This Cottonwood-Middle Minnesota Watershed Comprehensive Watershed Management Plan (CWMP) was developed from 2023-2024 through the Minnesota Board of Water and Soil Resources (BWSR) One Watershed, One Plan (IWIP) program. IWIP was created to transition water planning in Minnesota to be along watershed boundaries rather than jurisdictional and political ones. Prior to this plan, each county had its own Local Water Management Plan. This CWMP creates one guiding roadmap to which local governmental units (LGUs) partner to implement actions and meet shared goals for managing water and natural resources.

This plan identifies watershed priority issues, sets 10-year measurable goals, and plans specific actions to make progress towards those goals. The CWMP has a 10-year lifespan, at which point the issues, goals, and actions will be reevaluated. Progress will be assessed on an annual basis along with a mid-point evaluation.

## Planning Partners

The CWMP began with a planning Memorandum of Agreement (MOA) (**Appendix A**), between the local entities partnered to work on the plan. Blue Earth County declined to be involved as their county only has a small amount of the land in the watershed. The planning process was guided through decisions made by three committees: the Steering Committee, the Advisory Committee, and the Policy Committee.

Steering Committee	<ul style="list-style-type: none"> <li>Consists of LGU staff, state agency staff, and consultant</li> <li>Developed plan content</li> </ul>
Advisory Committee	<ul style="list-style-type: none"> <li>Consists of local stakeholders</li> <li>Advised on plan content</li> </ul>
Policy Committee	<ul style="list-style-type: none"> <li>Consists of one representative from each member of the MOA</li> <li>The plan decision-making body</li> </ul>



*Joseph A. Tauer Prairie Scientific and Natural Area (DNR SNA web page, 2024).*



The entities involved in the planning MOA include the counties and Soil and Water Conservation Districts (SWCDs) of Brown, Cottonwood, Lyon, Redwood, and Murray, the City of Springfield, the Redwood-Cottonwood Rivers Control Area (RCRCA) and Area II Minnesota River Basin Projects (Area II) (Figure I-2).

The CMMW CWMP will be implemented through a Joint Powers Agreement. Entities involved in the Joint Powers Agreement include the counties and SWCDs of Brown, Cottonwood, Lyon, Redwood and Murray. While not a part of the formal agreement, the City of Springfield, the RCRCA, and Area II remain important local collaborators during plan implementation.



 <b>Planning</b> Planning MOA		 <b>Implementation</b> Joint Powers Agreement	
<ul style="list-style-type: none"> <li>• Cottonwood County</li> <li>• Cottonwood SWCD</li> <li>• Brown County</li> <li>• Brown SWCD</li> <li>• Redwood County</li> <li>• Redwood SWCD</li> </ul>	<ul style="list-style-type: none"> <li>• Murray County</li> <li>• Murray SWCD</li> <li>• Lyon County</li> <li>• Lyon SWCD</li> <li>• RCRCA</li> <li>• Area II</li> <li>• City of Springfield</li> </ul>	<ul style="list-style-type: none"> <li>• Cottonwood County</li> <li>• Cottonwood SWCD</li> <li>• Brown County</li> <li>• Brown SWCD</li> <li>• Redwood County</li> <li>• Redwood SWCD</li> </ul>	<ul style="list-style-type: none"> <li>• Murray County</li> <li>• Murray SWCD</li> <li>• Lyon County</li> <li>• Lyon SWCD</li> </ul>

Figure I-2: CWMP planning and implementation partners.

## Issues

Two public kickoff events were held in 2023 to inform watershed residents about the CWMP process and solicit feedback on perception of issues that should be included in the plan. The nearly 40 attendees identified streambank erosion, flooding and high flows, and pollutants such as sediment, nutrients, and bacteria as top issues. Public opinion, state priority letters, existing reports, and committee expertise were utilized to develop a list of high, medium, and low priority issues facing the CMMW. High and medium priority issues are addressed by goals in this plan, while low priority issues are recognized but not directly addressed. High priority issues are listed in **Table I-I**. Medium and low priority issues are also summarized in **Section 3- Priority Issues**.

**Table I-I: High priority issues for the CMMW.**

Resource	Issue Theme	Issue Description
 Groundwater	<b>Groundwater Contamination</b>	Protection of private and public drinking water from contaminants, including nitrates and pesticides, especially in areas with groundwater and surface water interaction.
 Surface Water	<b>Nutrients</b>	Excess nutrient delivery to surface waterbodies causing algal blooms and impacting aquatic life and recreation.
	<b>Overland Runoff</b>	Accelerated overland runoff leading to turbidity, sedimentation, and other water quality issues.
	<b>Bacteria</b>	Elevated levels of bacteria ( <i>E. coli</i> ) in surface waters impacting aquatic recreation and human health.
	<b>Eroding Banks</b>	Increased erosion along streams and riverbanks impacting water quality and aquatic habitat.
	<b>Protection</b>	Protection of high recreational use and high-value waters.
	<b>Altered Hydrology and Water Storage</b>	Decreased water storage and increased delivery of peak flow from altered hydrology (tile, drainage ditches, and climate) which impacts channel stability, infiltration rates, and water quality degradation

Resource	Issue Theme	Issue Description
Excess Water	Flooding	Flood damage to crops, agricultural land, urban areas, and infrastructure; human health impacts of floodwater.
	Drainage Management	Lack of adequate drainage management and coordination to meet drainage network needs and promote water quality.
 Lands	Soil Health	Protection and improvement of soil health and minimizing wind erosion and surface water runoff.
	Wetlands	Loss of historic wetlands and associated habitat and water storage benefits.

## Goals

Quantifiable and measurable goals are an essential component of effective watershed planning and resource management. Planning partners developed eight measurable goals to address high and medium priority issues. They are summarized in **Table I-2**.

**Table I-2: Summary of watershed wide 10-year goals.**

Goal Name	10-Year Goals
<b>Sediment and Nutrients</b>	Overland loading reduced by: <ul style="list-style-type: none"> <li>• Nitrogen: <b>5%</b>, or 328,800 lbs/yr</li> <li>• Total Phosphorus: <b>5%</b>, or 17,600 lbs/yr</li> <li>• Sediment: <b>12%</b>, or 135,700 tons/yr</li> </ul>
<b>Storage, Flooding, and Hydrology</b>	Add <b>7,000 acre-ft of storage</b> (900 acre-ft permanent; 6,100 acre-ft temporary) to mitigate the impacts of altered hydrology and minimize flooding.
<b>Groundwater</b>	Implement recharge conservation practices as a means of improving groundwater recharge and protection on <b>1,000 acres</b> with high recharge potential and/or within vulnerable Drinking Water Supply Management Areas.

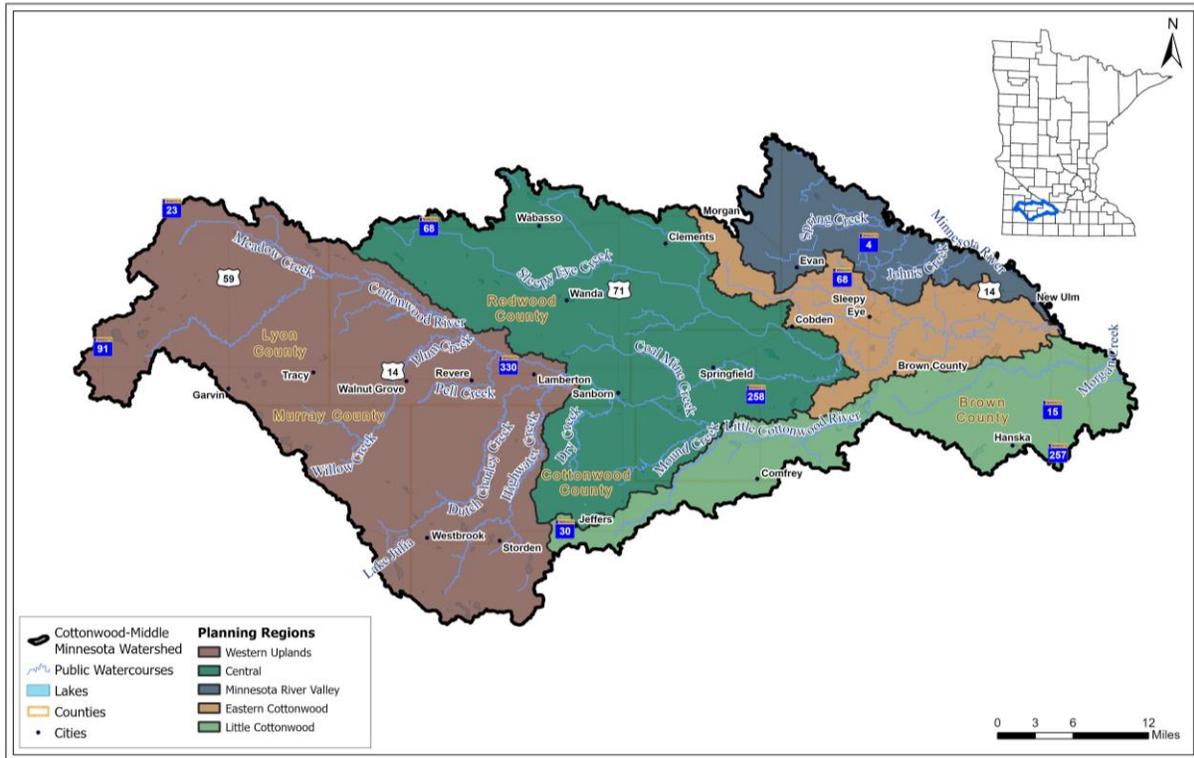
Goal Name	10-Year Goals
<b>Bacteria</b>	Protect drinking water from contamination by <b>sealing 16 wells per year</b> , or 160 wells over the 10-year plan.
	<p>Draft an additional <b>10 manure management plans</b> focused on non-CAFO operations that aren't required to have a plan.</p> <p>Enroll <b>40 feedlot producers</b> in the MAWQCP watershed-wide.</p> <p>Address <b>160 septic systems</b> to protect groundwater and surface water, with a focus on systems identified as imminent public health threats and failing to protect groundwater, with special consideration for low-income residents.</p>
<b>Stream Habitat and Connectivity</b>	Address <b>5 structural barriers</b> that restrict flow, accumulate debris, and/or inhibit aquatic life.
<b>Stormwater</b>	Treat <b>290 acres</b> of urban area or developed area with Best Management Practices (BMPs) (and/or stormwater retrofits) to improve water quality in receiving waters.
<b>Soil Health</b>	Implement soil health practices on <b>18,150 acres</b> .
<b>Protection</b>	Protect high quality surface waters by <b>enrolling or re-enrolling 15,000 acres</b> in temporary or permanent protection programs, focusing efforts along protection streams and lakes.



*Cottonwood River (MPCA web page, 2024).*

# Targeting Actions

The CMMW spans over one million acres. The issues impacting resources (and importance of those issues) can vary from the western to eastern extents of the watershed. In recognition of this, local planning partners organized the watershed into five planning regions based on Hydrologic Unit Code (HUC)-10 boundaries (**Figure I-3**).



**Figure I-3: Planning regions in the CMMW.**

Goals and actions are targeted to specific planning regions in order to reflect the changing issues from one region to another. As such, **Section 4 - Measurable Goals** contains planning region milestones for each 10-year measurable goal and a focus area map identifying where work is best focused to make progress towards goals. An overall watershed priority map was created by overlaying all the goal maps into one comprehensive map. The resulting comprehensive priority ranking map will be used to prioritize where work should take place for actions aimed at multiple benefits (**Figure I-4**).

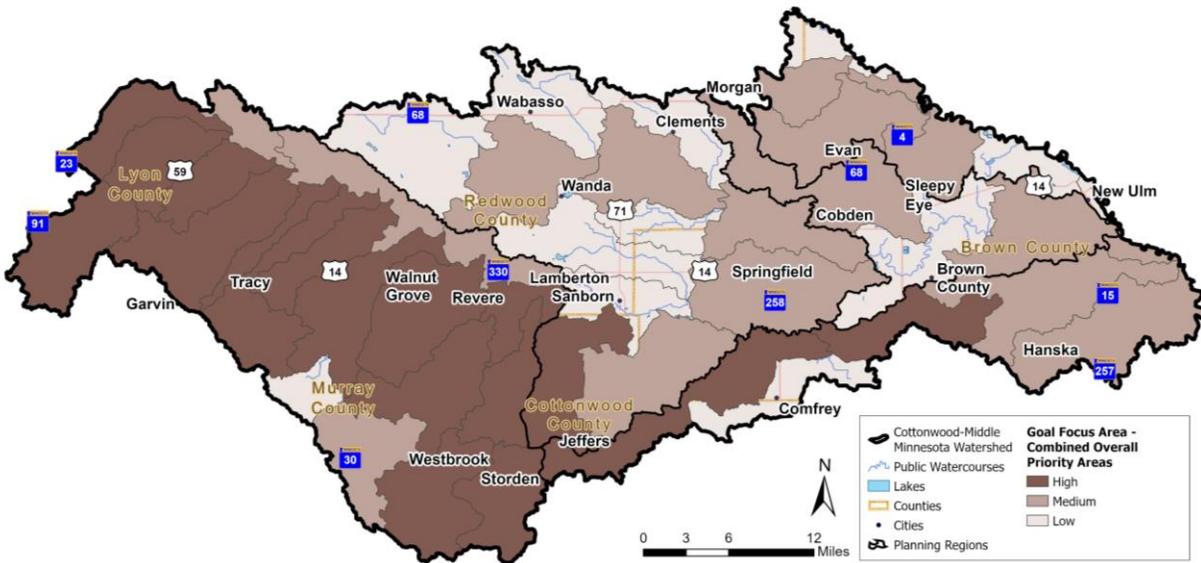


Figure I-4: Comprehensive watershed priority map.

The colored bars in the watershed-wide milestone chart (Figure I-5) shows how progress will be made within planning regions to reach the plan’s 10-year goals (on the right). Each planning region has its own goal progress chart.

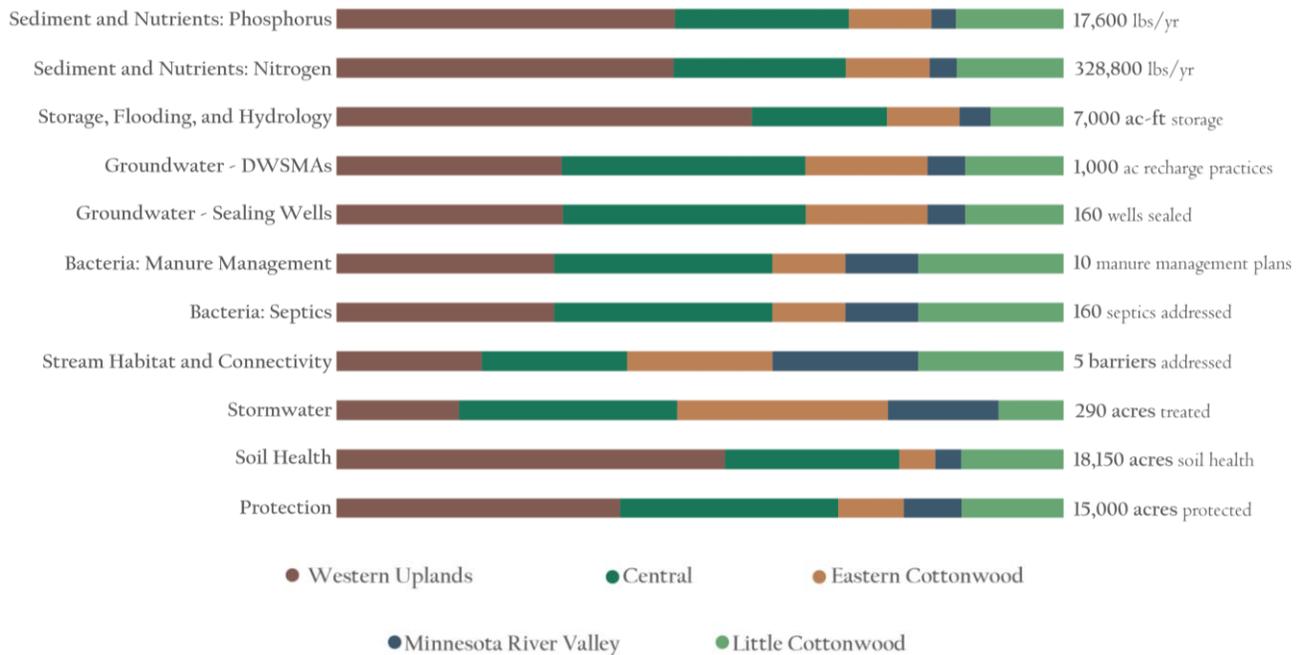


Figure I-5: Planning region goal milestone chart.



# Implementation

The progress towards goals planned in **Figure I-5** will be achieved through implementation of specific actions. Actions are organized into one of five implementation programs, as described in **Figure I-6**. Section 5- Implementation contains a series of action tables implementing activities within each of these programs.



Figure I-6: CMMW plan programs.

Each action table includes a description, focus area, measurable output, estimated timeline and cost, and responsible implementation entity. As the prominence of each priority issue changes by planning region, some actions are implemented at a planning region scale. This is especially true of activities in the Project and Practices Implementation Program. As such, each planning region has its own section for Projects and Practices, containing information specific to how each planning region makes progress towards watershed-wide goals.

Example Projects and Practices actions include:

- Agricultural and multi-benefit storage conservation practices
- Soil health and non-structural management practices
- Seal unused or abandoned wells
- Manure management
- Address non-compliant septic systems
- Riparian management
- Stormwater management practices
- Address structural connectivity barriers
- Incentivize or enroll / re-enroll temporary or permanent habitat easements
- Additional soil health and non-structural management practices



*Cottonwood River Prairie SNA (DNR SNA web page, 2024).*

## Funding

Making progress toward goals is dependent on many factors. One of these factors is the amount of reliable funding available during implementation, as more actions can be implemented with more funding. To include a realistic number of actions that can be accomplished with predictable local and state funding, this plan includes an estimated amount of current “baseline” funding that will continue to be available during plan implementation.

During implementation, the CMMW will be eligible to receive additional state funding. As one example, with this approved and adopted CWMP, the CMMW is eligible to receive non-competitive Watershed Based Implementation Funding (WBIF) through BWSR. In



recognition of this, an assumed \$1,000,000 annually has been added to current baseline funding to develop a realistic cost for implementing this plan with additional state and baseline funding (Baseline + State Funding) (Table I-3).

The local governments in the CMMW recognize that to make progress towards all plan goals, some actions will be pursued or funded by partnering entities (e.g., MPCA, DNR, USFWS, The Nature Conservancy [TNC]), federal dollars (e.g., Conservation Reserve Program [CRP], Conservation Reserve Enhancement Program [CREP]), or other competitive funding programs. These actions are included in the action tables, therefore, costs from “Other Funding” are also shown (Table I-3). This funding is needed to fully meet goals of this plan.

Table I-3: Cost of implementing the CMMW CWMP.

	Baseline + State (10-Year)	Other Funding (10-Year)
<b>Projects and Practices</b>	\$9,060,000	\$64,220,000
<i>Project Development</i>	\$2,810,000	
<i>Technical Assistance</i>	\$1,000,000	
<b>Research and Data Gaps</b>	\$510,000	N/A
<b>Education and Outreach</b>	\$3,020,000	\$20,000
<b>Local Controls</b>	\$2,470,000	N/A
<b>Capital Improvements</b>	\$3,600,000	N/A
Operations and Maintenance	\$420,000	N/A
Plan Administration	\$1,200,000	N/A
<b>Total Cost</b>	<b>\$24,090,000</b>	<b>\$64,240,000</b>

Figure I-7 below shows the benefits of meeting plan goals through implementation of actions in this plan.

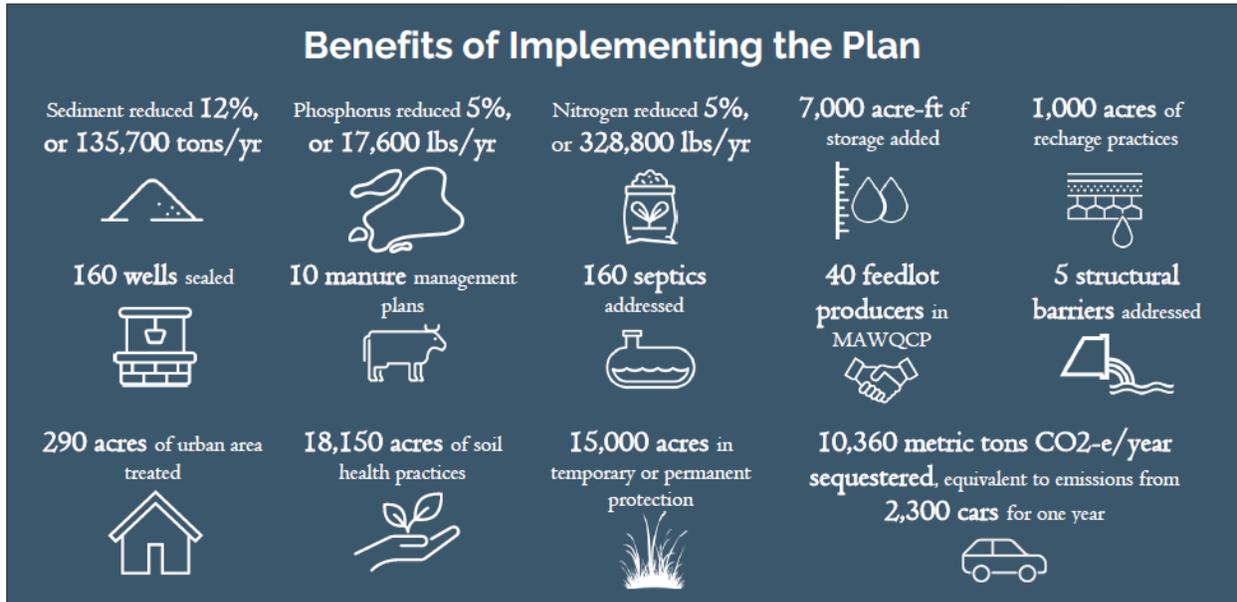


Figure I-7: Benefits of implementing the CMMW CWMP.



*Rock Ridge Prairie Scientific and Natural Area (DNR SNA web page, 2024).*



## 2. Land and Water Resources Narrative



# Section 2. Land and Water Resources Narrative

The Cottonwood-Middle Minnesota Watershed (CMMW) spans 1,076,000 acres of land that drains into the Cottonwood and Minnesota Rivers. It consists of two major Hydrologic Unit Code (HUC)-8 watersheds: all the Cottonwood River Watershed plus part of the Minnesota River – Mankato Watershed. The Cottonwood River flows 144 miles east from its headwaters to its confluence with the Minnesota River near New Ulm. The watershed boundary is determined by the area draining into the Cottonwood River and its many tributaries. Counties with land in the watershed include Blue Earth, Brown, Cottonwood, Murray, Redwood, and Lyon. Blue Earth County has a minimal amount of land in the CMMW and thus opted out of the planning efforts. Larger cities in the watershed include New Ulm, Tracy, Sleepy Eye, and Springfield (Figure 2-I).

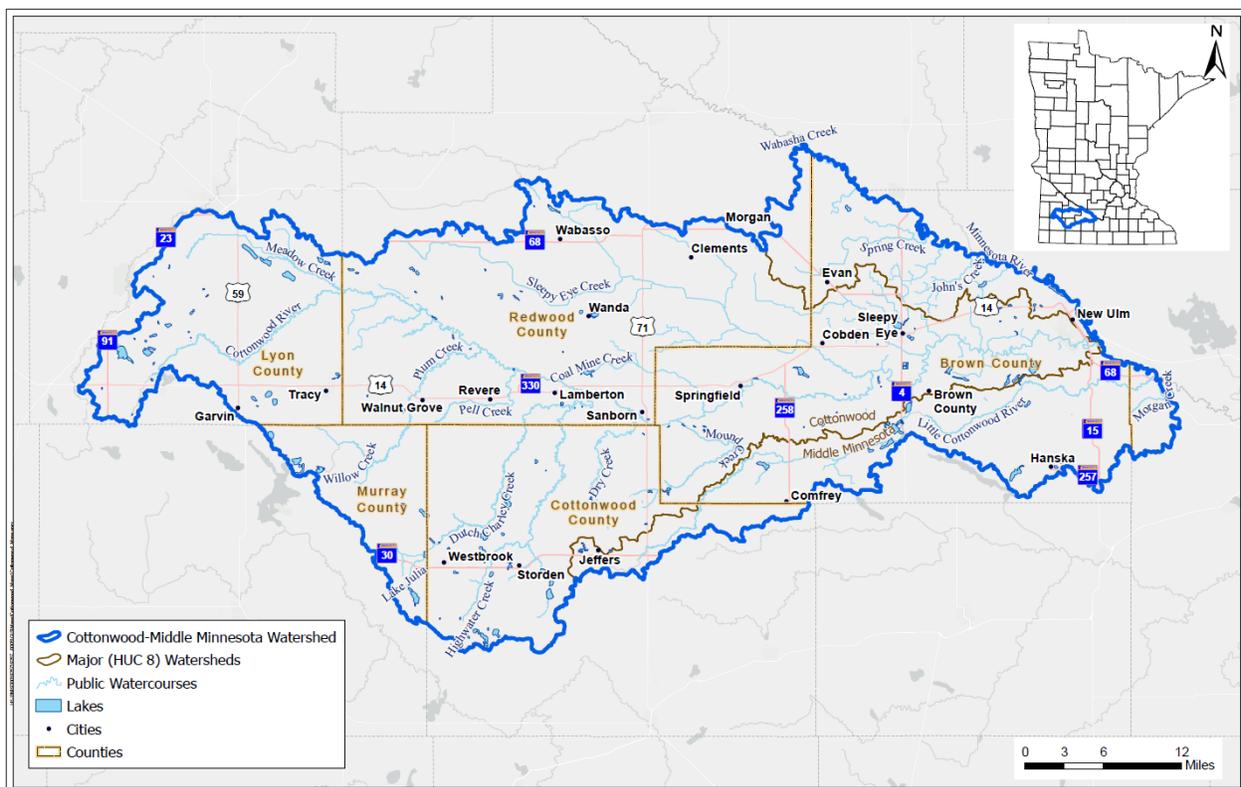


Figure 2-I: CMMW plan area.

The land has undergone drastic changes since the 1880s. Flat and depressional areas were drained to allow for agriculture, and most of the watershed was converted from prairie land into productive land. Today, the watershed supports corn and soybean crops, and provides over a thousand miles of streams and numerous lakes which residents and visitors alike enjoy through boating, fishing, and swimming.

## Topography and History

The Cottonwood River flows over land shaped by glaciers, with prairie potholes and streams that cut through the glacial moraine. Most of the watershed has soils with thick glacial till parent material, with sections of sand and gravel. The Cottonwood River begins on the Coteau des Prairies, a plateau formed by glacial deposits. The elevation drops by 850 feet from the headwaters to the Minnesota River, with most of the elevation change in the headwaters region (MPCA, 2022). The steep slopes of the headwaters region have the potential for significant water erosion. The Cottonwood River rapidly flows down the plateau, meeting with many small tributaries moving down the highland slope. The river enters the Minnesota River Valley and joins the Minnesota River near New Ulm. Steep slopes with high bank erosion are prevalent in a geologic knickzone where the Cottonwood River approaches the Minnesota River (DNR, 2020). Generally, CMMW streams have high bank erosion which results in sediment entering the water.



*Credit: Redwood SWCD*

The western uplands, part of the Prairie Pothole region, is characterized by gentle rolling hills, through which rivers have carved out steep ravines. The soils in the southwestern half of the watershed are generally loamy soils and well-drained, ideal for agriculture. Moving east, the rest of the watershed is primarily loamy glacial till, with scattered gentle slopes. Soils in the northeast half of the watershed are poorly drained and are high in organic matter, but can be productive farmland if drained (NRCS, n.d.).

## People

The first people set foot in what is now the Minnesota River Valley around 6,000 BC, living in villages where they hunted, fished, and grew crops (MRBDC, 2011). Europeans first encountered the region and its Sioux inhabitants, in the late 17th century. The Treaty of Traverse de Sioux, signed in 1851, ceded Sioux land that is now the CMMW to the United States. The first settlers moved into the land in the 1850s and planted oats, flax, and wheat on the soils that were adequately drained. The first drainage ditch was approved in 1905, and the creation of ditches rapidly expanded until most of the poorly drained soils on the eastern half of the watershed were suited for agriculture (Petrolia, 2006).

Today, the Lower Sioux Community resides along the Minnesota River at the northern end of the watershed. The CMMW is home to about 36,000 people, and its abundance of streams provide outdoor recreational opportunities (Minnesota River Board, 2010). The average age is 41, the estimated household income in the watershed is \$61,000, and the top employment sector is social services, including healthcare and education (USCD, 2021).

## Climate

The average temperature in the CMMW is 45°F, with 28 inches of precipitation per year (DNR, 2017). A stable climate is of immense value in the watershed since the livelihood of many residents who farm is linked to the weather. The average annual temperature has been increasing by a trend of 0.15°F per decade since 1895 in the CMMW (DNR, 2023a). This has led to a longer growing season which can be beneficial to farmers, but the increase in very hot days can be detrimental to crops (EPA, 2016). Rainfall patterns are shifting as well, with an increase in overall precipitation but especially in large rain events, which can cause loss in soil and increase flood risk. The average annual precipitation in the watershed has been increasing by 0.21 inches per decade over the past century (DNR, 2023a).



*Flooding in New Ulm (Credit: CBS News)*

The intensification in precipitation events along with altered hydrology of the rivers and streams have brought concerns about flooding to watersheds throughout Minnesota (Figure 2-2). While there is little that watershed managers can do about an increase in precipitation, reducing flood risk and mitigating damages when excess precipitation does occur can be done by increasing water storage throughout the watershed. Wetland restoration and reconnecting streams to the floodplain are important actions to add water storage and reduce flooding.

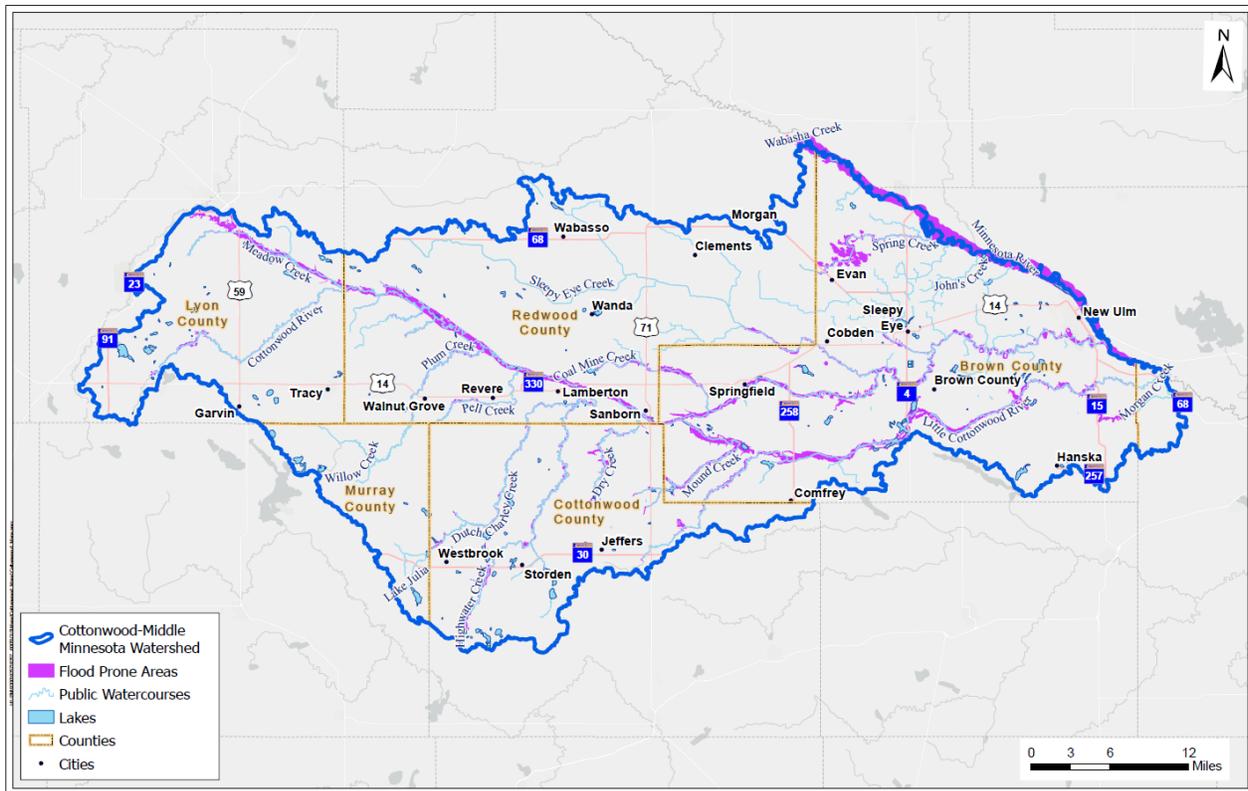


Figure 2-2: Digital Flood Insurance Rate Maps (DFIRM) flood hazard areas

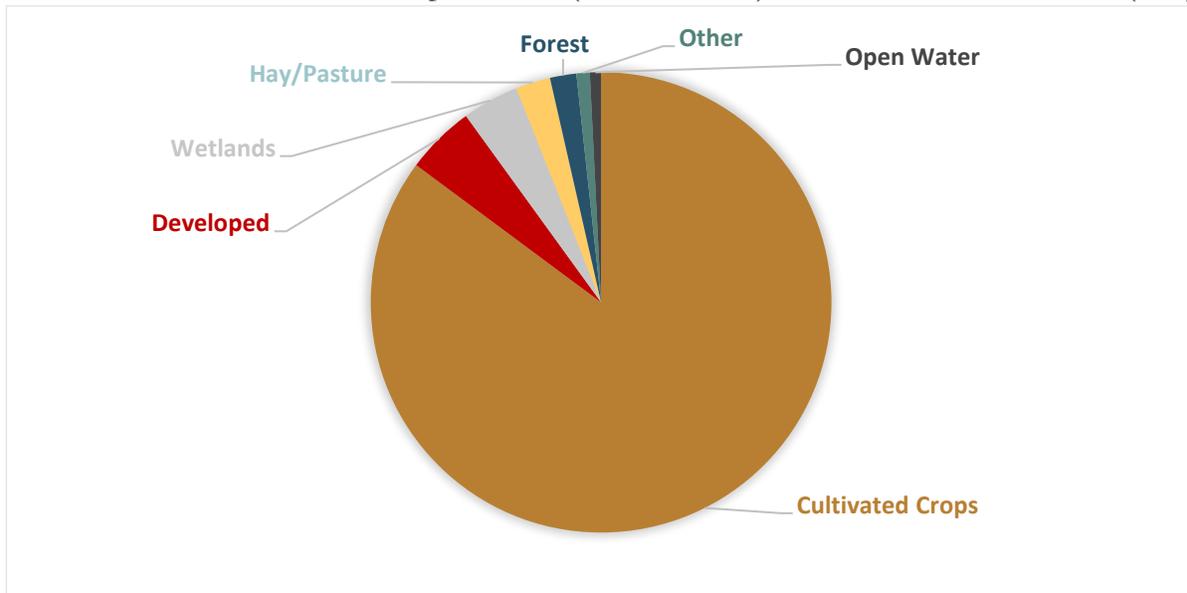
## Land Use

The historic land cover is known from public survey notes from the late 1800s. The Marschner’s Early European Settlement Vegetation Map reveals what the land cover looked like before significant land use conversion was undertaken. This map reports that the CMMW was 96% prairie, 3% river bottom forest, with the remaining land as lakes, hardwoods, and oak openings (DNR, 2017).



*Minnesota prairie (Credit: DNR)*

The wetlands and wet prairies dispersed across the watershed resulted in the construction of drainage ditches to create soils more productive for farming. Over a century later, the land has undergone drastic change (**Figure 2-** and **Figure 2-**). Wetlands and forests remain on 6% of the watershed, with 85% of the land used for cultivated crops, 7% for pasture or urban areas, and less than 1% is open water (USGS, 2019). Land classified as ‘other’ (1%)



**Figure 2-3: Proportion of land use in the CMMW.**

includes herbaceous, shrub, and barren land. Land used to grow corn and small grains has shifted into a watershed dominated by corn and soybean farms. Agricultural production has fueled the local economy; the agriculture sector is responsible for about 10% of watershed jobs (USCB, 2021). While the majority of productive land is used for row crops, there are also many livestock producers with cattle, hogs, sheep, chicken, and more.

Wetlands remain on 4% of the land, and protection programs seek to increase wetland and prairie habitat. The Restorable Wetland Inventory estimates that 121,000 acres of wetland could be restored within the watershed (Ducks Unlimited Inc, 2022). Most land is privately owned—only 0.02% of the land is public land, which includes Flandrau State Park, Minnesota Department of Natural Resources (DNR) South Region Headquarters, four Scientific and Natural Areas, and 79 State Wildlife Management Areas (DNR, 2023b).

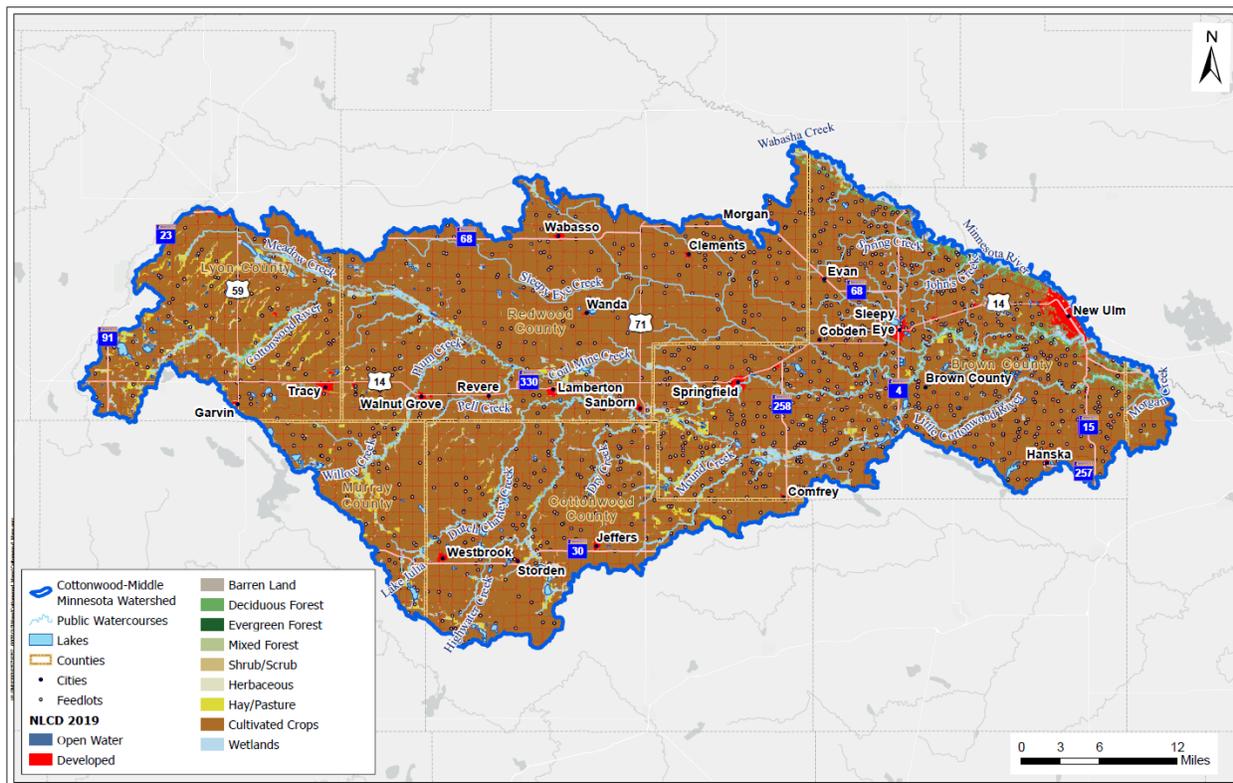


Figure 2-4: Land Cover in the CMMW.



## Habitat

Pockets of diverse habitat and protected land are found throughout the watershed (**Figure 2-**). Ensuring that these areas are protected and connected to each other and to natural land features will be important for wildlife and rare and threatened species conservation. For purposes of establishing a baseline for this planning effort, the area of existing protected land in the watershed was estimated using readily available geospatial data. Protected lands include lakes, conservation easements, Wildlife Management Areas (WMAs), Aquatic Management Areas (AMAs), Scientific and Natural Areas (SNAs), US Fish and Wildlife land, and land assumed protected within buffers of public lakes and streams. It is important to note that the area of each of these lands was calculated separately, and it is very likely that the total area is overestimated, as land in the buffer zones could also be counted in other protected land classes (easements, SNAs, AMAs, etc.) (**Table 2-I**).

**Table 2-I: Acres of protected land in the CMMW.**

Type of Protected Area	Acres	% of Watershed
Surface Water (Lakes)	9,518	0.88
Easements (RIM/CREP)	25,793	2.40
State Parks (Flandrau and Camden)	987	0.09
Wildlife Management Areas (WMA)	14,044	1.31
Aquatic Management Areas (AMA)	110	0.01
Scientific and Natural Area Boundaries	706	0.07
US Fish and Wildlife Service (USFWS) Lands*	2,582	0.24
Buffered Land - Public Waters (assumes 50 ft.)	9,756	0.91
Buffered Land- Regulated Drainage Systems	2,148	0.20
<b>Total</b>	<b>65,644</b>	<b>6.11%</b>

\*Includes Waterfowl Production Areas, National Wildlife Refuge, and Farm Service Agency land

While much of the watershed has been converted into row crops, scattered high-value and rare habitat remain. The watershed contains three calcareous fens near Storden and two trout streams (**Table 2-2**). There are 54 rare plant and animal species present in the watershed that are designated as threatened, endangered, or of special concern (DNR, 2023b).

Table 2-2: Example rare habitat within the CMMW.

Category	Names
Trout stream	John’s Creek
Trout Stream	Spring Creek
Calcareous fen	Amo 2
Calcareous fen	Storden 34
Calcareous fen	Storden 2I

Much of the unique habitat and rare species can be found in riparian zones. It is essential to maintain corridors connecting habitat to keep populations healthy. Protecting plant habitat is important for protecting threatened species, which are linked to the native plant communities. The Minnesota Prairie Conservation Plan details core prairie, wetland, and grassland habitats that should be a priority for protection and restoration, along with corridors that allow species to migrate between them. In the CMMW, there are four habitat corridors, five core areas, and five strategic habitat complexes. Together they cover 210,000 acres, mostly along the southwestern border (Figure 2-5) (TNC, 2018).



Glynn Prairie SNA (Photo Credit: DNR SNA webpage)

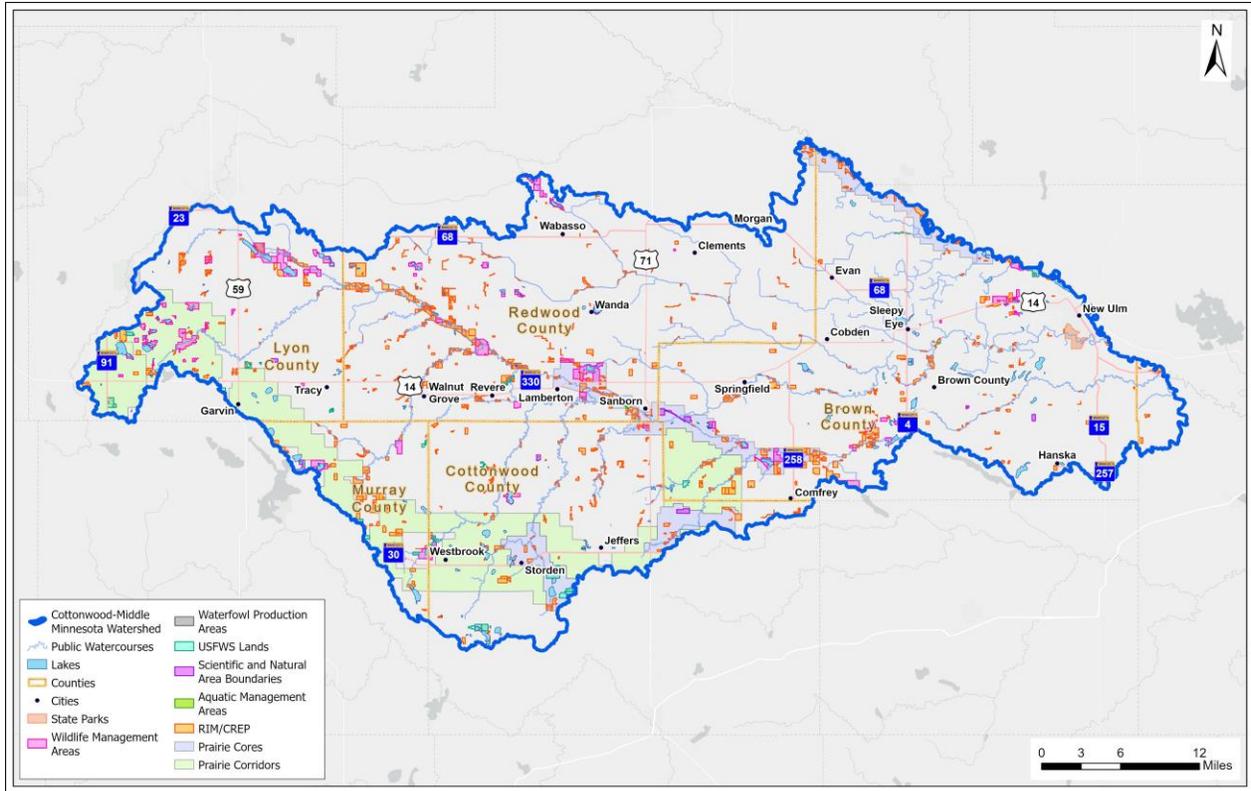
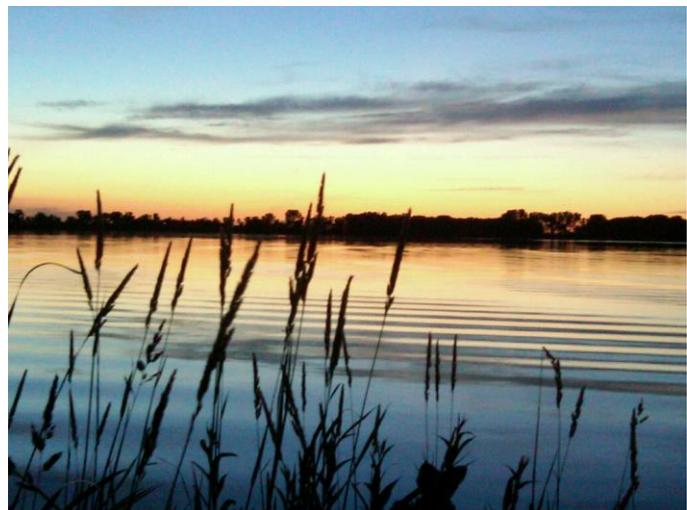


Figure 2-5: Protected lands and prairie areas in the CMMW.

## Water Resources

### Surface Water

The natural hydrology of the watershed has been altered to support cropland. Water storage in the soil has been greatly reduced as perennial vegetation is now corn and soybean, wetlands were drained, and streams were channelized. Along with an increase in rain events, flow monitoring has shown that this altered hydrology has led to an increase in flow over the past few decades. Increased flow and increased peak flows erode streambanks, degrade aquatic habitat, lead to increased nutrient loads, and increase flood risk. Flooding is not only costly to infrastructure and crops but is also a threat to human health and safety.



*Sleepy Eye Lake (Photo credit: City of Sleepy Eye)*



Of the watersheds streams, 39% have maintained their natural channel, 41% have been altered to accommodate agriculture or roadways, and 20% have no definable channel (DNR, 2017). Generally, natural streams are connected to their floodplain and have riparian vegetation preventing excessive streambank erosion, while the altered stream channels have poorer water quality. The altered hydrology of the watershed has shifted the balance of water supply to streams—a larger portion of the flow is now coming from shallow groundwater (DNR, 2020).

Water quality matters to residents and visitors who enjoy the beauty of the many streams and lakes for recreation. The Cottonwood River and the Minnesota River are two of Minnesota’s 35 designated state water trails. These offer opportunities to kayak, canoe, and fish downstream while stopping at campsites and enjoying the natural riparian wildlife along the way. Lakes in the watershed are a major component to the overall land area relative to other southwest Minnesota watersheds. They are also very important to the local quality of life and local economies, yet are sensitive to nutrient enrichment and runoff from shoreland and watershed sources (BWSR 2023).

The Minnesota Pollution Control Agency (MPCA) declares a waterbody impaired after it fails to meet water quality standards for a given parameter, such as aquatic life or recreation. Impaired lakes and streams in the CMMW are shown in **Figure 2-**. The CMMW contains seven lakes with impairments— Altermatt, Bachelor, Bean, Boise, Clear, Double, and Rock Lake—which are impaired due to nutrients. Double and Rock are also declared impaired due to poor fish bioassessments, and Double Lake for the pesticide chlorpyrifos. Given that chlorpyrifos has been banned, the lake is likely to be delisted once concentrations fall. Altered hydrology and nutrients are the main lake stressors.

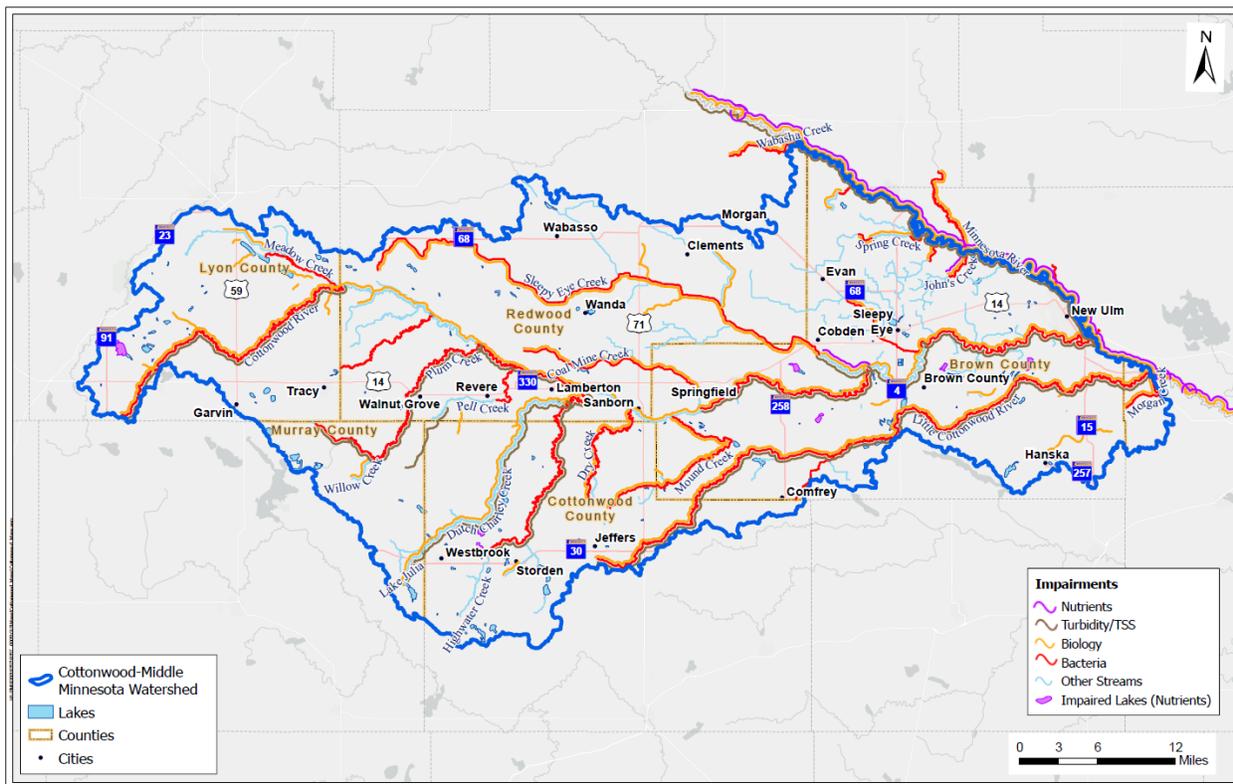


*Wellner-Hageman Reservoir in Brown County (Photo credit: MPCA)*

Within the watershed, stream reaches are impaired due to benthic macroinvertebrate assessments, *E. coli*/fecal coliform, fish bioassessments, turbidity/total suspended solids, mercury in fish tissue, and chlorpyrifos (**Figure 2-6**). The Cottonwood River is impaired in various reaches due to all the above impairments aside from chlorpyrifos. There has been an improvement in the Cottonwood River in total suspended solids and phosphorus, but these will have to continue decreasing for the waterbody to be delisted (MPCA, 2022).

Of the streams that were declared impaired due to poor fish or macroinvertebrate assessments, the MPCA reported insufficient habitat to be the leading cause of the impairment. DNR identified 196 barriers to fish passage in the watershed, which can include culverts or dams that prevent fish migration (DNR, 2020).

Nearly all the nitrogen (99%) and most of the phosphorus (88%) loading in the watershed has been modeled as coming from agricultural fields (MPCA, 2022). Phosphorus in particular contributes to nutrient impairments in lakes. Excess phosphorus fuels algae blooms. These blooms can become toxic which is a nuisance for recreation activities. When algae blooms die, their decomposition lowers dissolved oxygen.



**Figure 2-6: Impairments in the CMMW.**

In addition to water quality impairments, there is concern about the spread of aquatic invasive species (AIS) in the watershed, which can overtake native species and lead to undesirable ecosystem and recreation impacts. Curly leaf pondweed and purple loosestrife have infested lakes in the watershed, while Lake Sarah, Lake Shetek, and the Minnesota River just outside the watershed have zebra mussels (DNR, 2020).



*Zebra mussels, DNR*

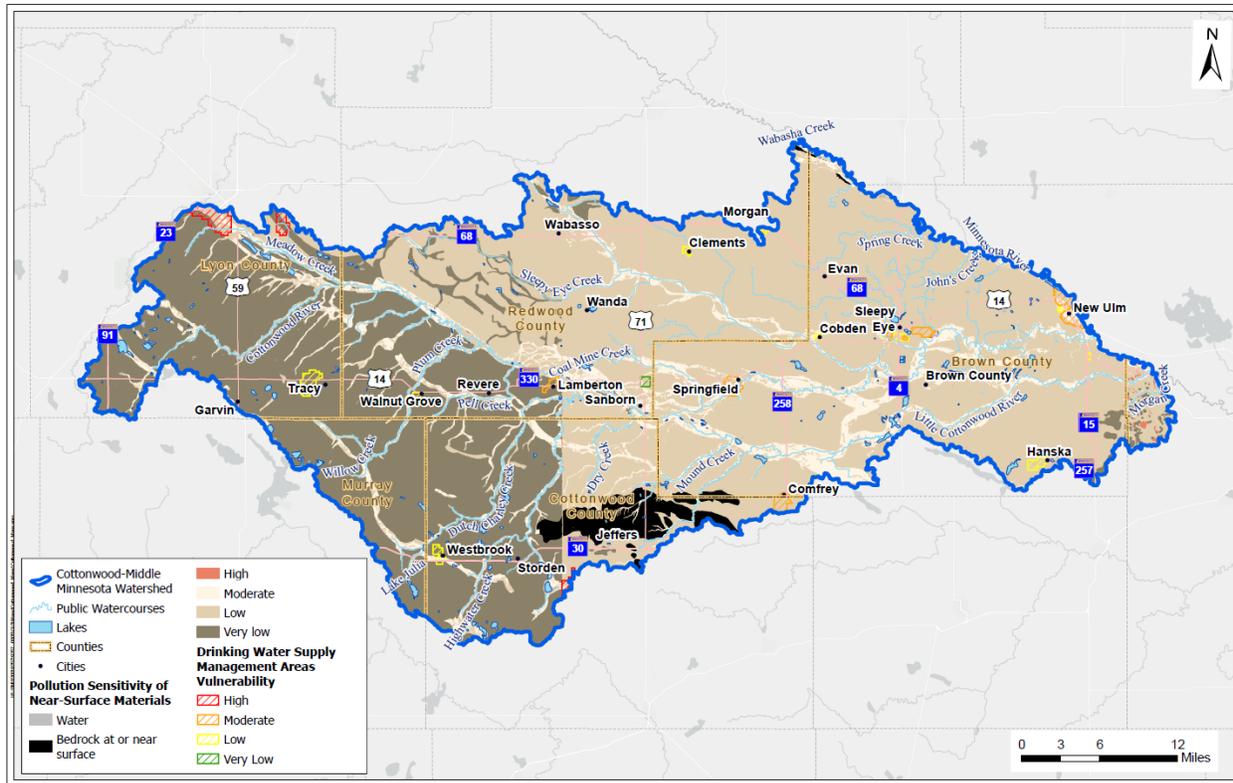
## Stormwater and Drainage

Nearly 5% of the watershed is developed. Cities large enough to require municipal separate storm sewer system (MS4) permits include New Ulm, Redwood Falls, and Marshall (location outside the watershed, but MS4 boundary is partially in CMMW). Other cities are still producing stormwater but are not regulated under the MPCA’s MS4 program. Urban stormwater can contaminate surface water by carrying pollutants such as road salts, phosphorus, nitrogen, sediment, and bacteria. About half of the watershed’s streams have been ditched (MPCA, 2022). Drainage ditches are common in agricultural regions to move water collected from agricultural fields.

## Groundwater

Groundwater is the source of drinking water for all residents in the watershed. The Minnesota Department of Health (MDH) established Drinking Water Supply Management Areas (DWSMAs) which are protected areas that contribute to a public water supply well. Of the community public water suppliers in the watershed, Mankato and Red Rock Rural Water Lake-Augusta and Jeffers have a very high contamination risk. The Marshall Wellfield, Dudley Wellfield, Comfrey, Lamberton, New Ulm, Sleepy Eye East and West, and Springfield DWSMAs have a high contamination risk.

The primary aquifers are mostly buried sand and gravel, then sandstone bedrock. Most of the watershed has a low or very low vulnerability rating due to the overlain clay that lessens surface-groundwater interaction (**Figure 2-**). The Red Rock Ridge near Jeffers is an outcrop of Sioux quartzite that extends across the edge of the Coteau de Prairies. This outcrop (black on **Figure 2-7**) contains the Jeffers Petroglyphs which are images carved thousands of years ago into the rock. This area is vulnerable to groundwater contamination as bedrock is exposed at the surface.



**Figure 2-7: Groundwater vulnerability in the CMMW.**

Groundwater quality in the CMMW is susceptible to contamination from pesticides, nutrients (specifically nitrate), and bacteria. Likely sources of contaminants are manure application on frozen ground or near tile inlets and drainage ditches, along with fertilizer and pesticide applications. Groundwater is also threatened by failing septic systems. The exact number of failing septic systems is unknown but estimates of the percent of septic systems that are severely failing range from 5%-39% among the counties in the CMMW (MPCA, 2022). The Minnesota Department of Agriculture (MDA) oversees the Groundwater Protection Rule, which restricts fall nitrogen application as fertilizer in sensitive areas to reduce nitrate contamination of groundwater. This applies to 87,000 acres



in the watershed, primarily in Brown County (MDA, 2023). Arsenic is a naturally occurring contaminant in groundwater and has been found above the health standard in various wells throughout the watershed.

The Cottonwood River feeds into the Minnesota River, which is a source of drinking water for the City of Mankato. The City of Mankato Ranney Wells provide approximately 70% of the water for Mankato and have concerning levels of nitrates, peaking in early spring and late fall. These two wells are officially designated as “groundwater under the direct influence” of surface water. Due to the nitrate concentrations, the wells require blending with deeper groundwater.

In recent years the overall number of permits for groundwater withdrawal has increased, but actual usage of groundwater has only slightly grown. The groundwater appropriation in the CMMW varies year to year but recently has been about 2.2 billion gallons per year. Most withdrawal occurs near Sleepy Eye and Marshall and is for municipalities, with the next largest portion going towards industry and around 10% used for agricultural irrigation (DNR, 2020). The average potential annual recharge rate is 3.5 inches per year, with the highest recharge occurring in Brown County (Smith, 2015). Thus far, the watershed has had sufficient quantity of groundwater, and recharge rates are exceeding withdrawal. Maintaining the sustainability of groundwater resources will be important in the future as the use of groundwater is predicted to increase due to a larger demand for irrigation for crops and water for concentrated animal feeding operations (CAFOs).

## The Future

While the watershed has nutrient, sediment, and bacteria impairments, there are numerous possibilities for restoration that can improve the water quality. Stream restoration projects re-meander streams, reduce erosion and peak flows, and reconnect the stream to the floodplain. Enrollment of land into protection programs will increase the amount of land available for rare or threatened species and move some land out of production, increasing the perennial vegetation and storing water. Incentivizing agricultural best management practices (BMPs) and conservation practices will minimize nutrient and sediment loss from fields and increase water storage. The future of the CMMW will balance the needs of an agricultural economy while considering the protection and restoration of its natural resources.



### 3. Priority Issues



# Section 3. Priority Issues

The first steps in creating an actionable watershed plan are to compile and prioritize the issues that are impacting the watershed. This plan defines an “issue” as a problem, risk, or opportunity related to a resource. A “resource” is a landscape feature such as lakes, streams, agricultural land, drinking water supplies, or habitat, which can be impacted by an issue. This plan section summarizes the issues impacting resources within the CMMW, gives an overview on public engagement used to guide priority issues, and introduces the priority issues that are the focus of this comprehensive plan (Figure 3-I).



Figure 3-I: Process for prioritizing issues in the CMMW.



Cottonwood River. Photo: DNR, Cottonwood River State Trail webpage.



## Planning Regions

As introduced in Section 2-Land and Water Resources Narrative, the CMMW is a large watershed spanning nearly 1,700 square miles and parts of two major watersheds. Because of the large area, the issues impacting resources (and importance of those issues) can change from the western to eastern extents of the watershed.

In recognition of this, local planning partners organized the watershed into five planning regions based on HUC-10 boundaries (**Figure 3-2**). This allows issues, goals, and actions to be tailored to the area of the watershed where they matter the most.

- 1. Western Uplands:** This region has steeper slopes and many tributaries leading into the Cottonwood River. This region includes the cities of Garvin, Tracy, Walnut Grove, Revere, Westbrook, Storden, and Lamberton.


- 2. Central:** This region surrounds the middle branch of the Cottonwood River as the land flattens out. This region includes the cities of Sanborn, Wanda, Springfield, Wabasso, Clements, and part of Cobden.


- 3. Minnesota River Valley:** Containing land southwest of the Minnesota River, this planning region contains the two trout streams in the watershed: Spring and John’s Creeks. This region also includes the cities of Evan, Morgan, and most of New Ulm, the largest city in the watershed.


- 4. Eastern Cottonwood:** The Cottonwood River travels through the eastern side of the watershed and through wooded valleys before meeting the Minnesota River. This region has sandier soils and groundwater areas of high vulnerability. This region includes the city of Sleepy Eye and parts of Cobden and New Ulm.


- 5. Little Cottonwood:** This region covers the southern side of the watershed and surrounds the Little Cottonwood River. This region includes the cities of Comfrey, Jeffers, and Hanska. It also includes the Jeffers Petroglyphs.



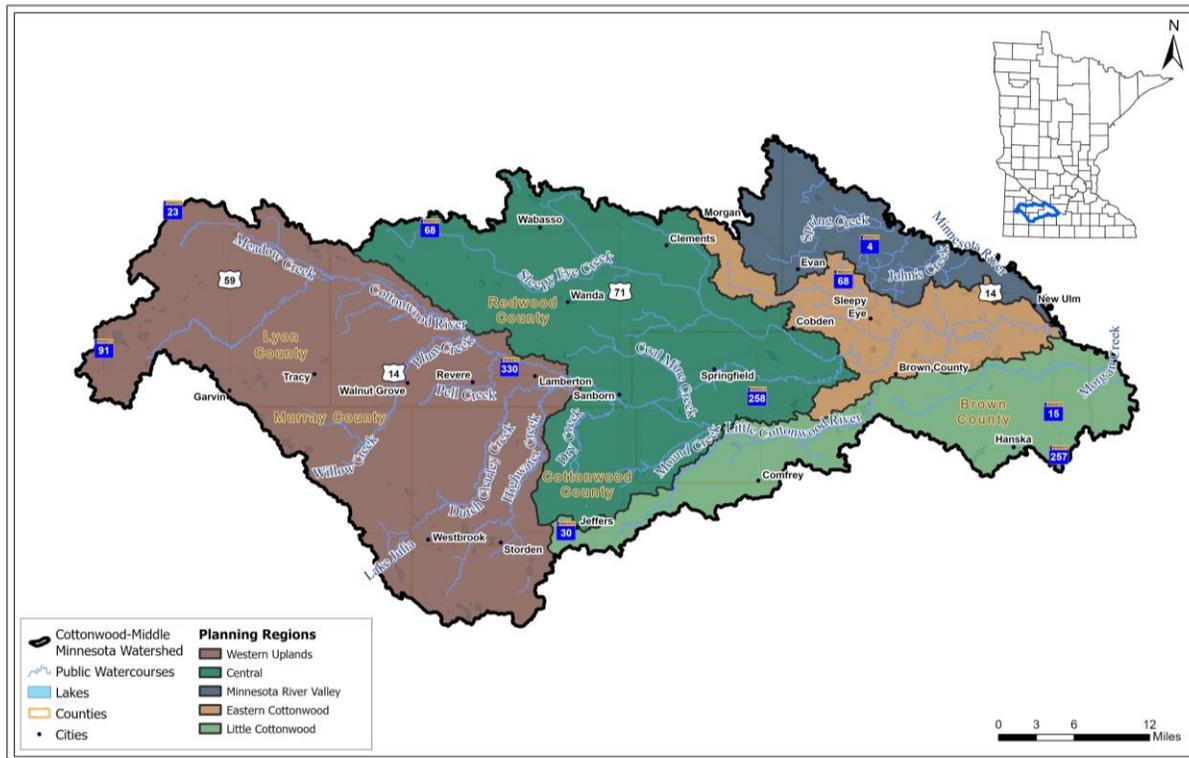


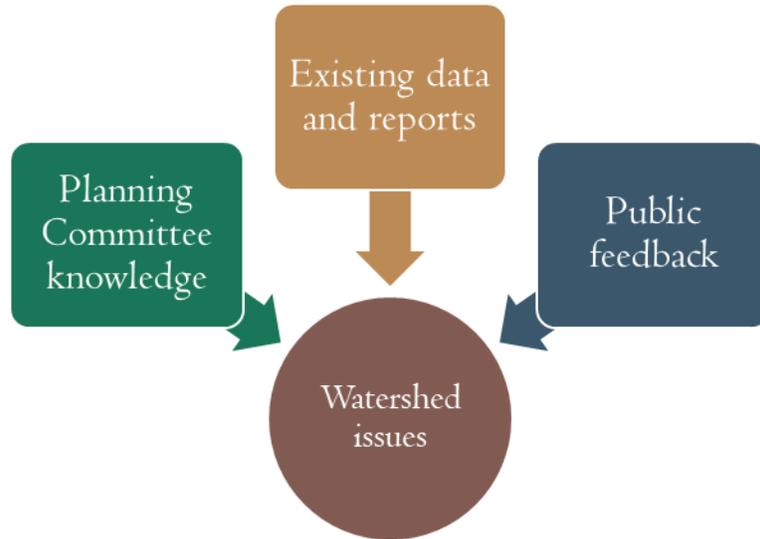
Figure 3-2: Planning regions in the CMMW.

## Compiling Issues

To prioritize the issues as the focus of this plan, the planning partners first needed to compile a list of issues that impact resources in the watershed. Issues were inventoried by reviewing existing watershed data, reports, and plans. These reports and plans provide a rich backdrop of history and data for developing the plan. These included:

- Local county water plans,
- MPCA’s Watershed Restoration and Protection Strategy (WRAPS) reports,
- Natural Resources Conservation Service (NRCS) Rapid Watershed Assessment,
- MDA 2021 Water Quality Monitoring report,
- DNR Watershed Characterization report, and
- Comment letters in response to the 60-day planning notification and supporting material provided by state agencies (**Appendix B**).

The inventoried and compiled issues were grouped based on the resources they impact, creating “resource categories.” These resource categories include Groundwater, Surface Water, Excess Water, and Lands. Local planning committees vetted watershed issues and filled in any gaps in issues identified by local reports. Then, the issues were brought forward to the public for additional feedback.



## Public Feedback

This is a local plan which requires voluntary implementation to be successful. Considering this, planning committees wanted to be sure they were getting feedback from the public on what issues were most important to them. On June 1st and 2nd, 2023, public kickoff meetings were held in Springfield and Walnut Grove to inform the public on the watershed planning process and to get their input on what issues were most important to them.



*Public kick-off meeting.*



Public kick-off meeting.

Attendees went to groundwater, surface water, excess water, and land use/habitat resource stations where they were asked to point out specific problem areas on a map and discuss issues affecting each resource. Participants also took a survey to indicate which issues were most important to them. In total, 38 survey responses were received (Appendix C). The top issues in the survey were streambank erosion, flooding and high flows, and pollutants such as sediment, nutrients, and bacteria.

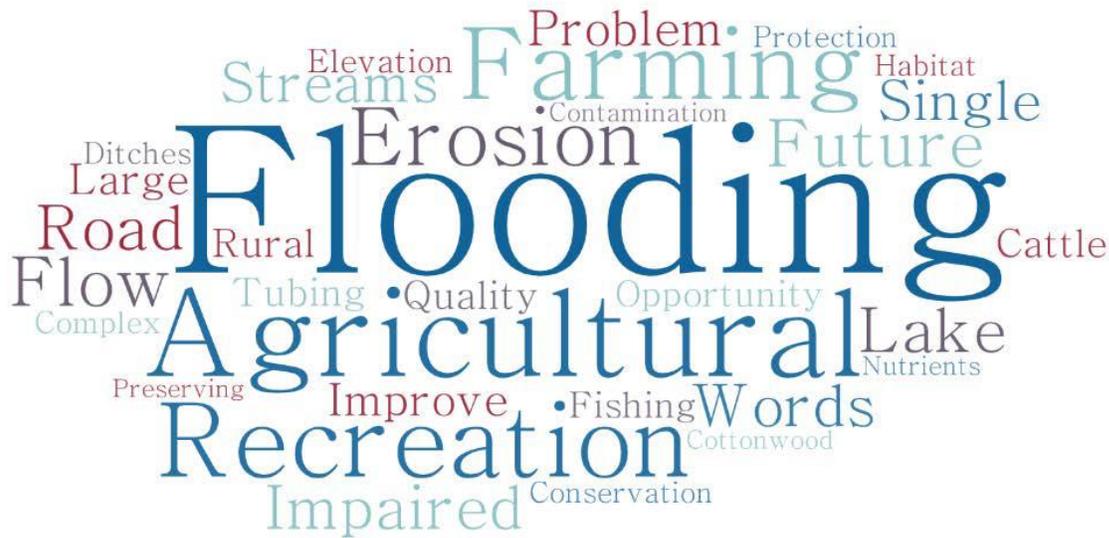


Figure 3-3: Public responses to question “When you think about the Cottonwood-Middle Minnesota Watershed, what comes to mind?”.

## Prioritizing Issues

Although all compiled issues are important, part of developing a watershed plan includes prioritizing issues to most efficiently and effectively direct funding and staff time over the next 10 years. Local planning partners conducted a thorough process to prioritize all compiled issues. First, issues were ranked based on how often they were mentioned in existing reports and by how many sources identified a given issue as a problem (e.g., if an issue was mentioned by the DNR, MPCA, MDA, and the public survey, it would rank higher than an issue that was only mentioned by the existing reports alone). Then, the Steering Committee reviewed those rankings and feedback from the public kick-off meetings and surveys to assign each issue as one of three priority levels, as defined below:

<h3>High Priority</h3>	<ul style="list-style-type: none"> <li>• Most important</li> <li>• Issues the Steering Committee plans to deal with first</li> </ul>
<h3>Medium Priority</h3>	<ul style="list-style-type: none"> <li>• Still important, but secondary to high priority issues and may involve partners</li> </ul>
<h3>Low Priority</h3>	<ul style="list-style-type: none"> <li>• Not a focus of the plan</li> <li>• Issue may be addressed by partners</li> <li>• Issue likely not addressed without additional dollars</li> </ul>

Lastly, the prioritized issues were brought to the Policy Committee for approval. High priority issues (**Table 3-I**) were ranked highest and are the issues to be addressed first. They have goals and action items assigned to them in later plan sections.



*Rock Ridge Prairie SNA. Photo: DNR SNA webpage*

Table 3-I: High priority issues for the CMMW.

Resource	Issue Theme	Issue Description
 Groundwater	Groundwater Contamination	Protection of private and public drinking water from contaminants, including nitrates and pesticides, especially in areas with groundwater and surface water interaction.
 Surface Water	Nutrients	Excess nutrient delivery to surface waterbodies causing algal blooms and impacting aquatic life and recreation.
	Overland Runoff	Accelerated overland runoff leading to turbidity, sedimentation, and other water quality issues.
	Bacteria	Elevated levels of bacteria ( <i>E. coli</i> ) in surface waters impacting aquatic recreation and human health.
	Eroding Banks	Increased erosion along streams and riverbanks impacting water quality and aquatic habitat.
	Protection	Protection of high-recreational use and high-value waters.
 Excess Water	Altered Hydrology and Water Storage	Decreased water storage and increased delivery of peak flow from altered hydrology (tile, drainage ditches, and climate) which impacts channel stability, infiltration rates, and water quality degradation.
	Flooding	Flood damage to crops, agricultural land, urban areas, and infrastructure; human health impacts of floodwater.
	Drainage Management	Lack of adequate drainage management and coordination to meet drainage network needs and promote water quality.
 Lands	Soil Health	Protection and improvement of soil health and minimizing wind erosion and surface water runoff
	Wetlands	Loss of historic wetlands and associated habitat and water storage benefits

Medium priority issues (Table 3-2) are still important, but secondary to high priority issues and may require more involvement from partners. These issues will also have goals and actions addressing the issues in the plan.

Table 3-2: Medium priority issues for the CMMW.

Resource	Issue	Issue Description
 Groundwater	Groundwater Supplies	Protection of groundwater resources and aquifer availability through recharge and wise water use.
 Surface Water	Riparian Habitat	Inadequate riparian (buffer) corridors and habitat and its impact on aquatic life and wildlife.
	Aquatic Connectivity	Lack of stream connectivity causing impacts to fish passage and altering the flow of water.
	Stormwater	Runoff from urban/impervious sources and the increased rates of potential delivery of pesticides, fertilizer, sediment, salt, and other pollutants to surface waters.
	Subsurface Sewage Treatment System (SSTS) and Under-sewered Communities	Noncompliant SSTSs are prevalent and contribute bacteria, nitrogen, and phosphorus to surface waters and groundwater along with posing a threat to human health and recreation.
 Excess Water	Debris	Maintenance of debris (i.e. downed trees) within rivers and streams disrupting flow and damaging streambanks.
	Climate	Changing weather patterns creating heavier rains, leading to higher flows and erosion.
 Lands	Ground Cover	Lack of sufficient perennial cover and crop diversity and its impact on sediment loss, nutrient management, and water infiltration.



Low priority issues (Table 3-3) are those that will be addressed after high and medium priority issues are addressed. While these issues aren't intentionally addressed by this plan, they are still important and may be addressed by partners or with external sources of funding.

Table 3-3: Low priority issues for the CMMW.

Resource	Issue	Issue Description	Rationale
 Surface Water	<b>Downstream Drinking Water</b>	Protection of surface drinking water supplies for downstream communities.	Will be addressed by working on other priority issues, such as “Nutrients”.
	<b>Other Contaminants</b>	Other contaminants, such as chloride, pesticides, and insecticides, and their impact on aquatic life.	Primarily addressed by state and local entities in watershed.
	<b>Lake Shoreline</b>	Increased development pressure and improper lawn maintenance along lake shorelines impacting habitat and natural protection against shoreline erosion.	Primarily addressed by local ordinances.
	<b>AIS</b>	Presence of AIS (fish and plants) threatening native species and water quality.	Primarily addressed by counties.
 Lands	<b>Public Access</b>	Degraded public water access sites on local water resources.	Local agency responsibility and oversight.
	<b>Terrestrial Invasive Species</b>	Presence of terrestrial invasive species and their threat to ecosystems, agriculture, recreation, and human health.	Primarily addressed by local agencies and partners; other funding sources.
	<b>Native Landscapes</b>	Loss or fragmentation of native landscapes and natural areas for wildlife and a functioning and resilient ecosystem.	Will be addressed by working on other priority issues, such as “Ground Cover” and “Soil Health”.

## Emerging Issues

There are issues beyond the traditional scope of CWMP that still impact the natural resources of the CMMW. Solar farms taking up productive land is an emerging issue that some landowners are growing increasingly concerned over.

Solar energy has been growing as an energy source for Minnesota. As of 2024, Minnesota receives a third of its energy from renewable sources, in contrast to the US average of 23% (CEEM, 2024). The



*Photo: Marshall Radio*

increase in demand for solar energy has in some cases brought conflicts with farmers and landowners, as fields that could be used for agriculture are being used as solar farms. Landowners are concerned about a loss of available farmland and the reliability and affordability of solar energy. Balancing the desire for land from multiple sectors will be a challenge for communities. Some projects have begun to meld agriculture and solar panels, with US Solar engaging in ‘agrivoltaics’ in Minnesota, where solar panels are built high enough for livestock to graze underneath or crops growing between rows.

## Planning Lenses

Throughout the issue identification and prioritization process, “planning lenses” were developed. These lenses are based on science, statewide priorities, and local knowledge and are considerations to help in implementation and allocation of resources for the plan. These lenses are not issues themselves but provide a different perspective to examine the issues in this plan at greater depth. Using these lenses for each of the issues will provide greater ability to implement the plan over the next 10 years and align local issues with state priorities and funding opportunities.

## Environmental Justice

Implementing a watershed plan without understanding the demographics of the people in the watershed leaves out a crucial angle. Environmental issues affect everyone in the

watershed, whether people choose to farm, participate in recreational activities, or live within the watershed. When environmental issues affect a population disproportionately, it can be considered an environmental justice issue.

The MPCA has mapped areas throughout the state as either having a high percentage of people living in poverty, people of color, limited English proficiency (LEP), and tribal areas. These areas should be given special consideration to assure the impact of environmental problems are not disproportionately impacting these populations, which has historically led to disparities in environmental conditions and public health. In the CMMW, 42% of the watershed land is an MPCA area of consideration for poverty issues with over 35% of people living below 200% of the federal poverty line (Figure 3-4) (MPCA, 2023b). Implementation and approval of projects should consider project locations that maximize the benefit toward environmental justice communities. For more information and the most current map of environmental justice areas within the CMMW, please visit the MPCA website: <https://www.pca.state.mn.us/about-mPCA/environmental-justice>

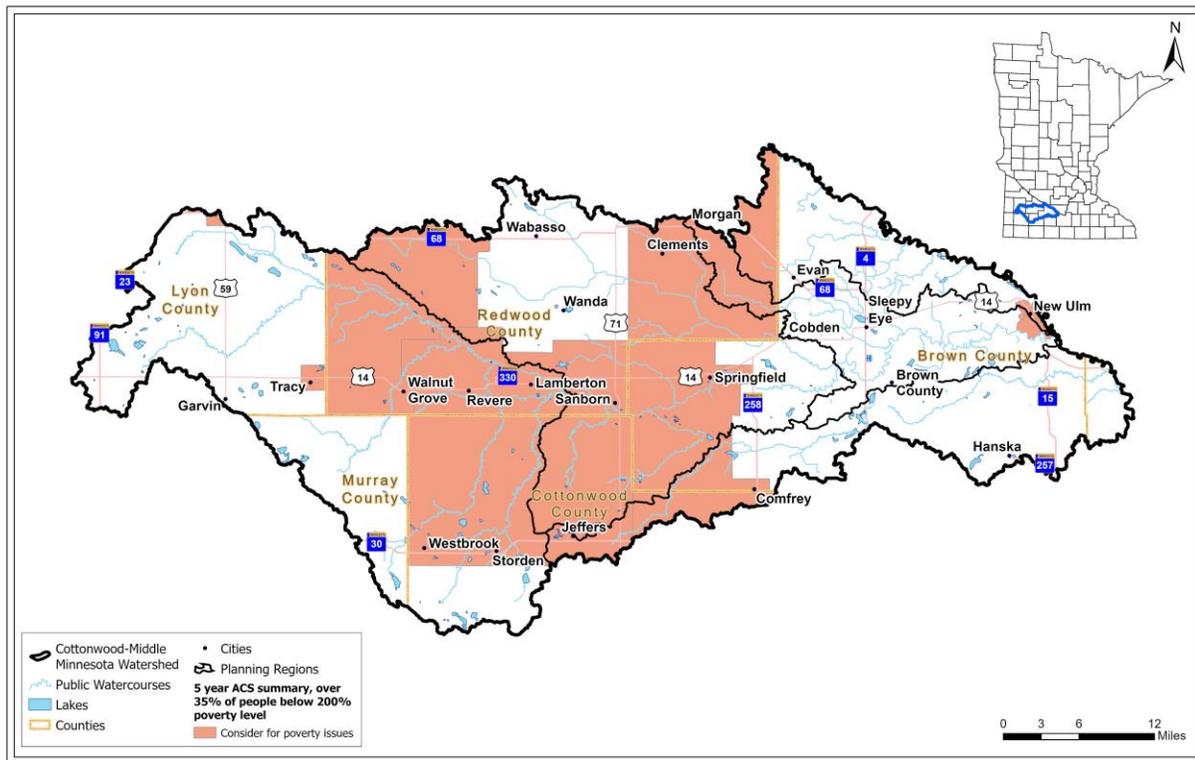


Figure 3-4: Environmental justice areas in the CMMW (MPCA, 2023).



## Resiliency



Agriculture is highly important to the CMMW, both economically and culturally. Cultivating crops depends on a stable and predictable climate, which has been changing in Minnesota. Overall, the state has been getting more rain (an average annual increase of 0.21-0.29 inches per decade in the CMMW since 1895) but the likelihood of drought periods in between more extreme rain events is becoming more common (DNR, 2023). Larger rain events lead to increased flooding, which can impact crops, infrastructure, and waterbodies. Temperatures are shifting as well, especially during winters and higher nighttime temperatures during the summer. The Cottonwood River Watershed has had an average increase in annual temperature of 0.15°F per decade since 1895, and the Mankato-Minnesota River Watershed an increase of 0.13°F (DNR, 2023).

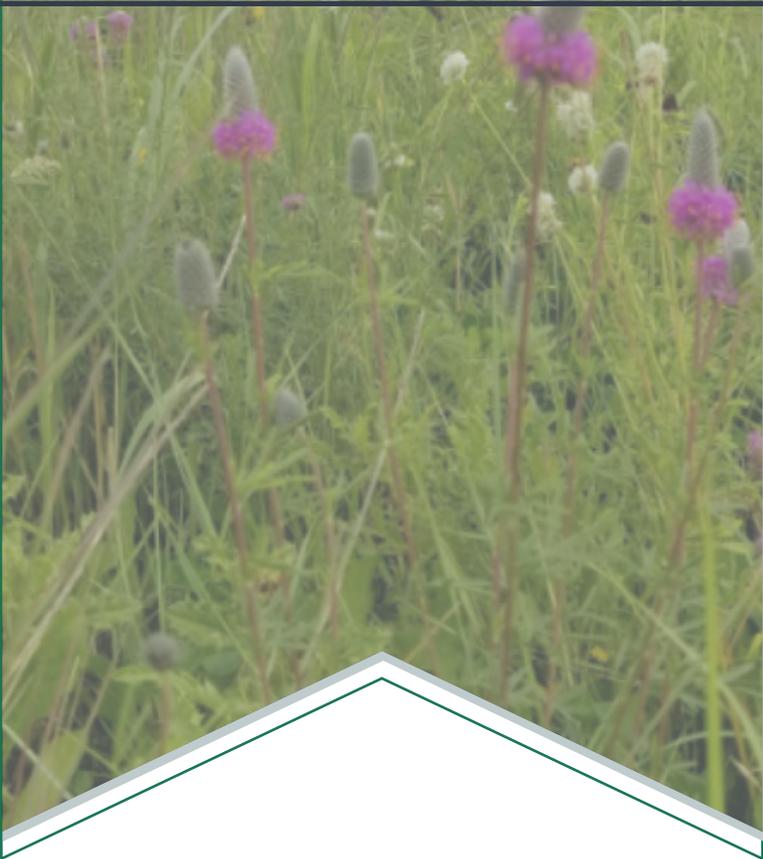
The impact of a more variable climate impacts agriculture, and farmers will need to prepare for changes in weather. Changes resulting in a longer growing season and hotter climate can impact crop yields. Changes in temperature can also result in new or more severe crop diseases, and heat waves can damage crops. The increase in heavy rain events can remove topsoil from fields or cause flooding.

Resiliency to a more variable climate means that when extreme weather events happen, the watershed can mitigate impacts to people and the economy. It includes understanding changes and how they will impact the watershed. Resiliency should be ingrained into planning and management efforts across the watershed. One example is ensuring the use of Atlas-I4 to design resilient projects. A historical comparison of precipitation totals from TP-40 to NOAA Atlas I4 at the outlet of the CMMW identifies a 9.2% increase in precipitation for the 50-year event, and a 13.5% increase for the 100-year event.

Opportunities for building a watershed more resilient to extreme weather will be a priority in selecting implementation actions. BWSR has developed a climate resiliency toolbox, which aims to provide science-based tools and strategies to increase landscape resilience. It is available here: <https://bwsr.state.mn.us/bwsr-climate-resiliency-toolbox>



## 4. Measurable Goals





# Section 4. Measurable Goals

High and medium priority issues are addressed by setting measurable goals for improving resource conditions. This plan sets watershed-wide goals along with planning region specific milestones to focus efforts on locations where the issue is prevalent. There are 10-year goals and desired future conditions. The 10-year goal is the focus of this plan.

## 10-Year Goal



A quantifiable change in the condition of the resource or issue expected through 10-year implementation of this CWMP

## Desired Future Condition



Desired future condition of a resource or issue, regardless of how long it will take to reach the condition.

Measurable goals were determined by reviewing existing information, modeling data, and input from the Steering, Advisory, and Policy Committees. This CWMP establishes eight goals that collectively work to address all plan priority issues:

- Sediment and Nutrients
- Storage, Flooding, and Hydrology
- Groundwater
- Bacteria
- Stream Habitat and Connectivity
- Stormwater
- Soil Health
- Protection

Each of these goals is described in detail in the following pages, with background information on the goal, the priority issues the goal is addressing, a 10-year goal and desired future condition goal, and a heat map showing focus areas for work to be done with planning region-specific milestones. More information on how subwatershed heat maps were created is provided in **Appendix D**.

The impact of a changing climate on precipitation, flooding, agriculture, and the economy has drawn increased attention to carbon sequestration. Agricultural conservation practices not only improve soil health and water quality, but also sequester carbon. Estimating carbon sequestration provides a quantifiable benefit to share with planning partners, state agencies,



and watershed residents as an additional benefit of plan implementation. These numbers are included, as relevant, in the “Stacking Benefits” section of each goal (Appendix E).

A summary of this plan’s measurable goals is provided below. Each goal is detailed in the following pages.

**Table 4-I: Summary of CMMW 10-Year Measurable Goals**

Goal	Priority Issue(s) Addressed	10-Year Goal	Example Actions
<b>Sediment and Nutrients</b>	<ul style="list-style-type: none"> <li>➤ Nutrients</li> <li>➤ Overland Runoff</li> </ul>	Overland loading reduced by: <ul style="list-style-type: none"> <li>➤ <b>Nitrogen: 5%</b>, or 328,800 lbs/yr</li> <li>➤ <b>Total Phosphorus: 5%</b>, or 17,600 lbs/yr</li> <li>➤ <b>Sediment: 12%</b>, or 135,700 tons/yr</li> </ul> Estimated by the Prioritize, Target, and Measure Application at the edge-of-field.	Agricultural and multi-benefit storage conservation practices; Stormwater management practices; Host field days
<b>Storage, Flooding, and Hydrology</b>	<ul style="list-style-type: none"> <li>➤ Altered Hydrology and Water Storage</li> <li>➤ Wetlands</li> <li>➤ Flooding</li> <li>➤ Drainage Management</li> <li>➤ Climate</li> </ul>	Add <b>7,000 acre-ft of storage</b> (900 acre-ft permanent; 6,100 acre-ft temporary) to mitigate the impacts of altered hydrology and minimize flooding.	Agricultural and multi-benefit storage conservation practices; Stormwater management practices; Develop feasibility studies for lake, storage, or other projects
<b>Groundwater</b>	<ul style="list-style-type: none"> <li>➤ Groundwater Contamination</li> <li>➤ Groundwater Supplies</li> </ul>	Implement recharge conservation practices as a means of improving groundwater recharge and protection on <b>1,000 acres</b> with high recharge potential and/or within vulnerable DWSMAs.  Protect drinking water from contamination by <b>sealing 16 wells per year</b> , or 160 over the 10-year plan.	Manure management plans; Address non-compliant septic systems; Inventory unused or abandoned wells; Well testing clinics
<b>Bacteria</b>	<ul style="list-style-type: none"> <li>➤ Bacteria</li> <li>➤ SSTS and Under-sewered Communities</li> </ul>	Draft an additional <b>10 manure management plans</b> focused on non-CAFO operations that aren’t required to have a plan.  Enroll <b>40 feedlot producers</b> in the MAWQCP watershed-wide.	Manure management plans; Address non-compliant septic systems; Host field days



Goal	Priority Issue(s) Addressed	10-Year Goal	Example Actions
		Address <b>160 septic systems</b> to protect groundwater and surface water, with a focus on systems identified as imminent public health threats and failing to protect groundwater, with special consideration for low-income residents.	
<b>Stream Habitat and Connectivity</b>	<ul style="list-style-type: none"> <li>➤ Eroding Banks</li> <li>➤ Riparian Habitat</li> <li>➤ Aquatic Connectivity</li> <li>➤ Maintenance of Debris</li> </ul>	Address <b>5 structural barriers</b> that restrict flow, accumulate debris, and/or inhibit aquatic life.	Address structural connectivity barriers; Riparian enhancements
<b>Stormwater</b>	<ul style="list-style-type: none"> <li>➤ Stormwater</li> </ul>	Treat <b>290 acres of urban or developed area</b> with BMPs (and/or stormwater retrofits) to improve water quality in receiving waters.	Stormwater management practices; Quantify volume and temporal variability of stormwater runoff entering rivers; Educational urban events
<b>Soil Health</b>	<ul style="list-style-type: none"> <li>➤ Ground Cover</li> <li>➤ Soil Health</li> </ul>	Implement <b>soil health practices on 18,150 acres.</b>	Soil health and non-structural management practices; Host field days
<b>Protection</b>	<ul style="list-style-type: none"> <li>➤ Protection</li> </ul>	Protect high quality surface waters by <b>enrolling or re-enrolling 15,000 acres in temporary or permanent protection programs</b> , focusing efforts along protection streams and lakes.	Enroll temporary or permanent habitat easements



*Flooding in Riverside Park, Springfield*



# Sediment and Nutrients

Oftentimes, sediment and nutrients are thought of first when considering water quality. Excess sediment comes from upland wind and water erosion along with streambank or shoreline erosion. Sediment is undesirable in streams and lakes because it alters aquatic habitat by reducing light in the water column and settling on the stream or lakebed, impacting macroinvertebrates and fish spawning sites.

Human activities have greatly increased the concentration of nutrients (phosphorus and nitrogen) in the environment. Excess nutrients cause algal blooms and make recreation undesirable. In-lake processes can also be a source of phosphorus, as water chemistry and rough fish can release phosphorus bound in sediments into the water column. All seven lakes in the CMMW on the impaired waters list are impaired due to nutrients. MPCA reports 99% of nitrogen, 88% of phosphorus, and 27% of the sediment load in the watershed is modeled as coming from agricultural fields, while 65% of the sediment load is modeled as coming from near-channel sources (MPCA, 2022).

Implementing agricultural and urban conservation practices will help reduce nutrient and sediment loading in the watershed. The 10-year goals are informed by the anticipated load reduction benefit from implementing agricultural and urban conservation practices in the PTMApp scenario, summarized in **Section 5- Implementation**.

## Issues Addressed

- Nutrients
- Overland Runoff

## 10-Year Goal

Overland loading reduced by:

- Nitrogen: **5%**, or 328,800 lbs/yr
- Total Phosphorus: **5%**, or 17,600 lbs/yr
- Sediment: **12%**, or 135,700 tons/yr

As estimated by PTMApp, edge-of-field.

## Desired Future Condition

Surface water nitrogen loads are reduced by 60%, and phosphorus and sediment loads are reduced by 50%.

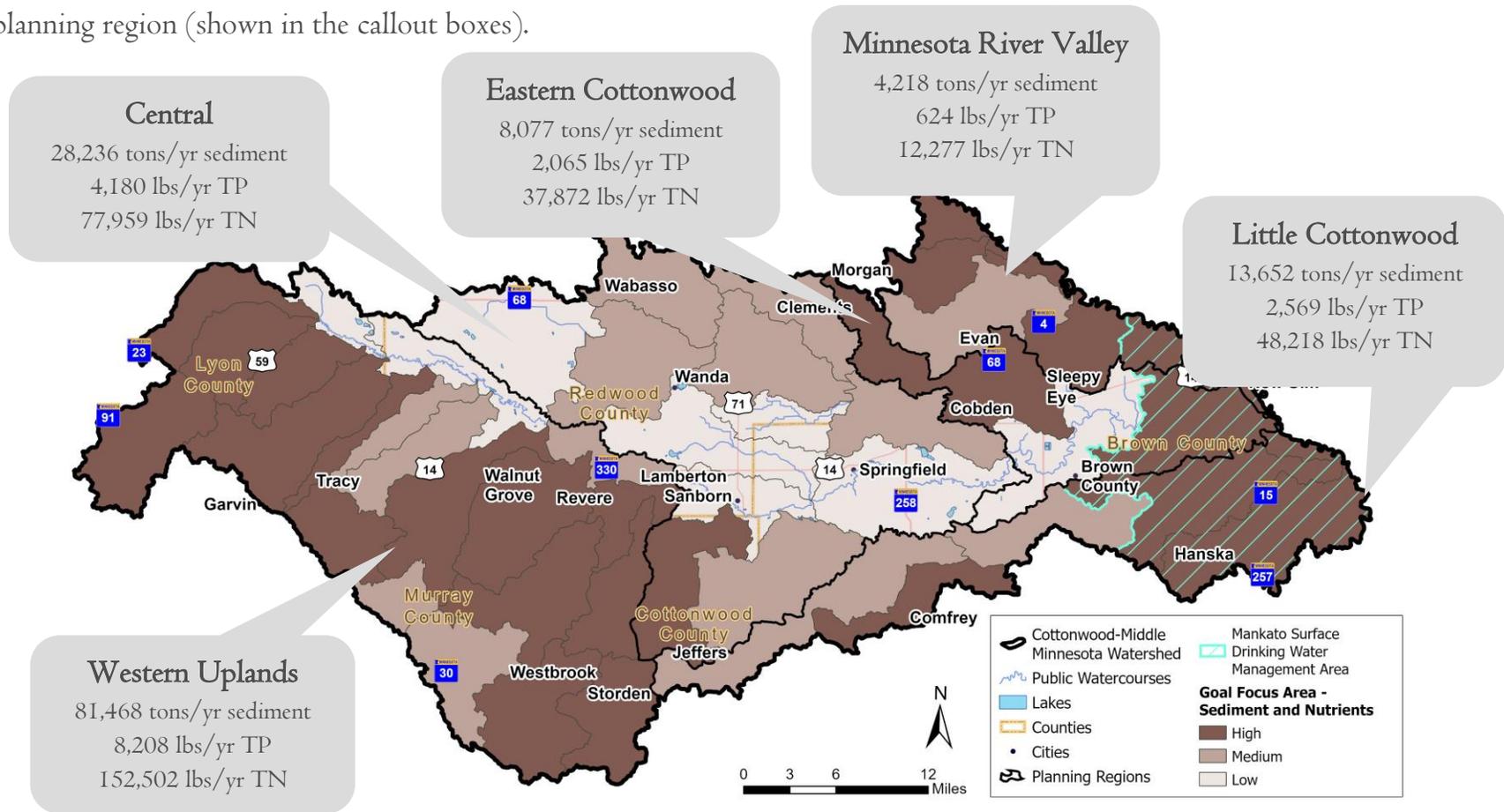
## Stacking Benefits

Work toward this goal will also improve water quality and build climate resiliency.

- Improved soil health
- Improved aquatic habitat
- Carbon sequestered in soils
- Decreased streambank erosion

# Milestones and Focus Areas

Actions related to this measurable goal will be focused on high and medium priority subwatersheds. These subwatersheds have the most total phosphorus, total nitrogen, and sediment loss at the field edge as estimated by PTMApp, or include the Mankato Surface Water DWSMA. Progress towards the 10-year sediment and nutrient goal will be made within each planning region (shown in the callout boxes).





# Storage, Flooding, and Hydrology

“Altered hydrology” is a term commonly used to describe human induced changes to hydrologic paths, including stream channels, wetlands, and drainage. In the past century, human activity has drastically changed how water is stored on the landscape. Converting wetlands and prairie into agricultural fields and developed land has reduced infiltration of precipitation. Drainage ditches, tile, and channelization of streams has also impacted timing of downstream peak flows.

Increased precipitation is compounding the effects of altered hydrology. The CMMW is getting an average of 1-3 additional inches of precipitation per year compared to the historical average (DNR, n.d.). Large precipitation events, and the resulting 100- and 500-year floods, are becoming more common.

Adopting multipurpose drainage management practices, restoring wetland and prairie, and constructing capital improvement projects can store water, protecting the watershed from flooding and improving water quality. This plan’s 10-year goal is framed around the temporary (e.g. drainage water management) and permanent (e.g. ponds) storage that arises from practices in the PTMApp implementation scenario. The desired future condition aims to store 0.93 inches of water across the watershed, mitigating the impacts of altered hydrology in the CMMW (**Appendix F**).

## Issues Addressed

- Altered Hydrology and Water Storage
- Wetlands
- Flooding
- Drainage Management
- Climate

## 10-Year Goal

Add **7,000 acre-ft of storage** (900 acre-ft permanent; 6,100 acre-ft temporary) to mitigate the impacts of altered hydrology and minimize flooding.

## Desired Future Condition

Add 64,500 acre-ft of storage (0.93 inches across the watershed) to mitigate impacts of altered hydrology.

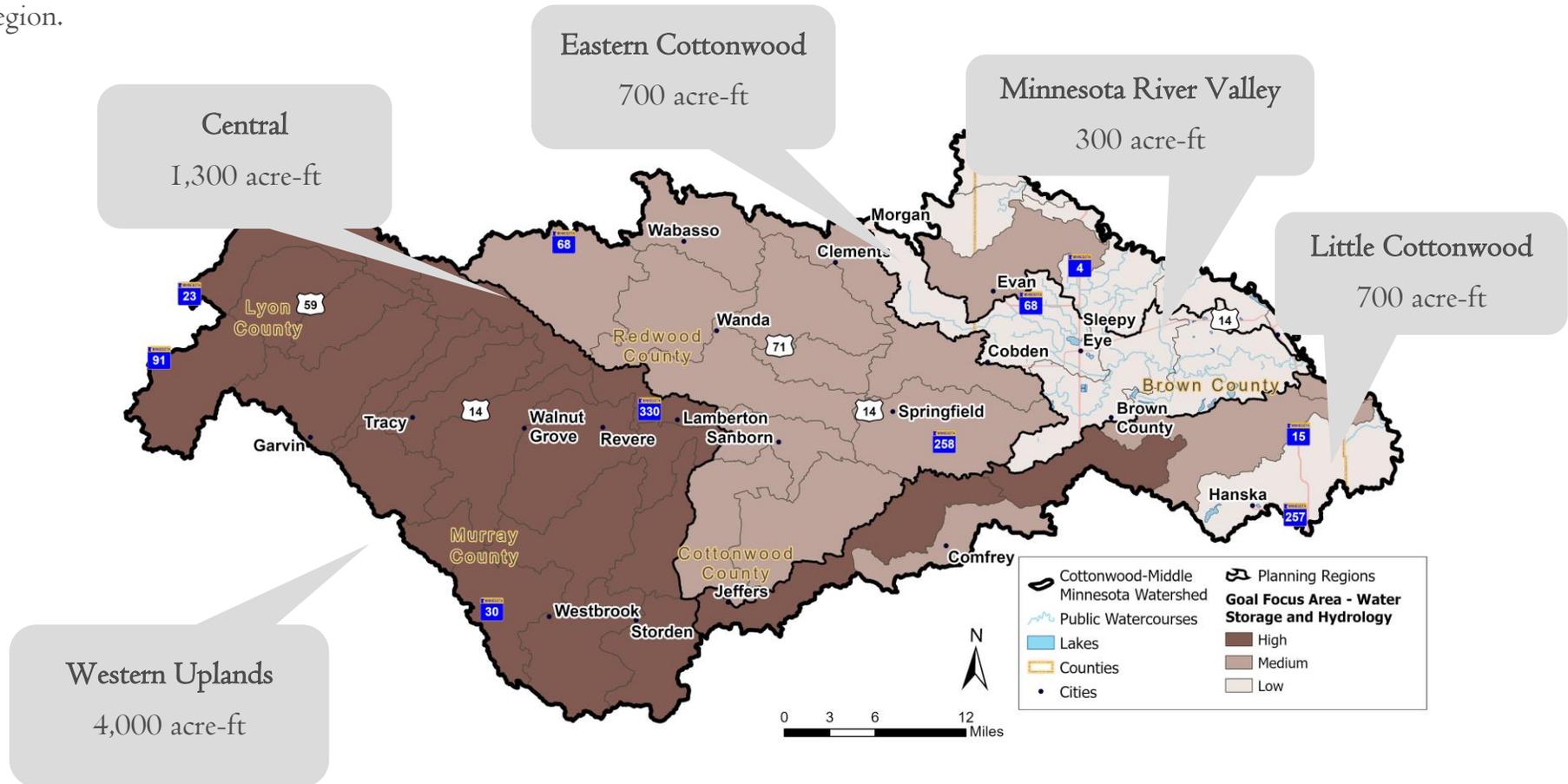
## Stacking Benefits

Work toward this goal will also build climate resiliency and improve water quality.

- Improved aquatic habitat
- Decreased sediment and nutrient loading
- Decreased streambank erosion
- Decreased flooding

## Milestones and Focus Areas

Actions related to this measurable goal will be focused on high and medium priority subwatersheds. These subwatersheds are the highest priority for storing water on the landscape as informed by local knowledge and flood information from the Public Law 87-639 Study. Progress towards the 10-year flooding, storage, and hydrology goal will be made within each planning region.



# Groundwater

All residents in the watershed depend on groundwater for drinking water, underscoring the importance of protecting groundwater quality. Most of the watershed has low, geologic vulnerability to groundwater contamination due to clay that lessens connection from the surface to groundwater. However, where residential development has occurred in both the countryside and in small towns in the watershed, abandoned wells can form a direct conduit for pollutants from the land surface to reach the groundwater. Surface water entering abandoned or unsealed wells is not filtered by soils. As such, part of this plan’s groundwater goal is focused on sealing abandoned wells.

Thus far, the watershed has had sufficient groundwater supplies. Residents in the CMMW rely on adequate groundwater supplies for municipal, industry, and agricultural irrigation uses. Groundwater is replenished through recharge, which can be increased through conservation action. As such, this goal is also focused on implementing innovative recharge conservation practices (e.g. alternative cropping, current or new conservation easements, residue management) to promote infiltration of water where public drinking water is sourced—within DWSMAs.

## Issues Addressed

- Groundwater Contamination
- Groundwater Supplies

## 10-Year Goal

Implement recharge conservation practices as a means of improving groundwater recharge and protection on **1,000 acres** with high recharge potential and/or within vulnerable DWSMAs.

Protect drinking water from contamination by **sealing 16 wells per year**, or 160 over the 10-year plan.

## Desired Future Condition

All 10,000 acres in high and moderate DWSMAs have been assessed for or implemented recharge conservation practices.

All abandoned wells are sealed, and no wells are above the nitrate drinking water standard of 10 mg/L.

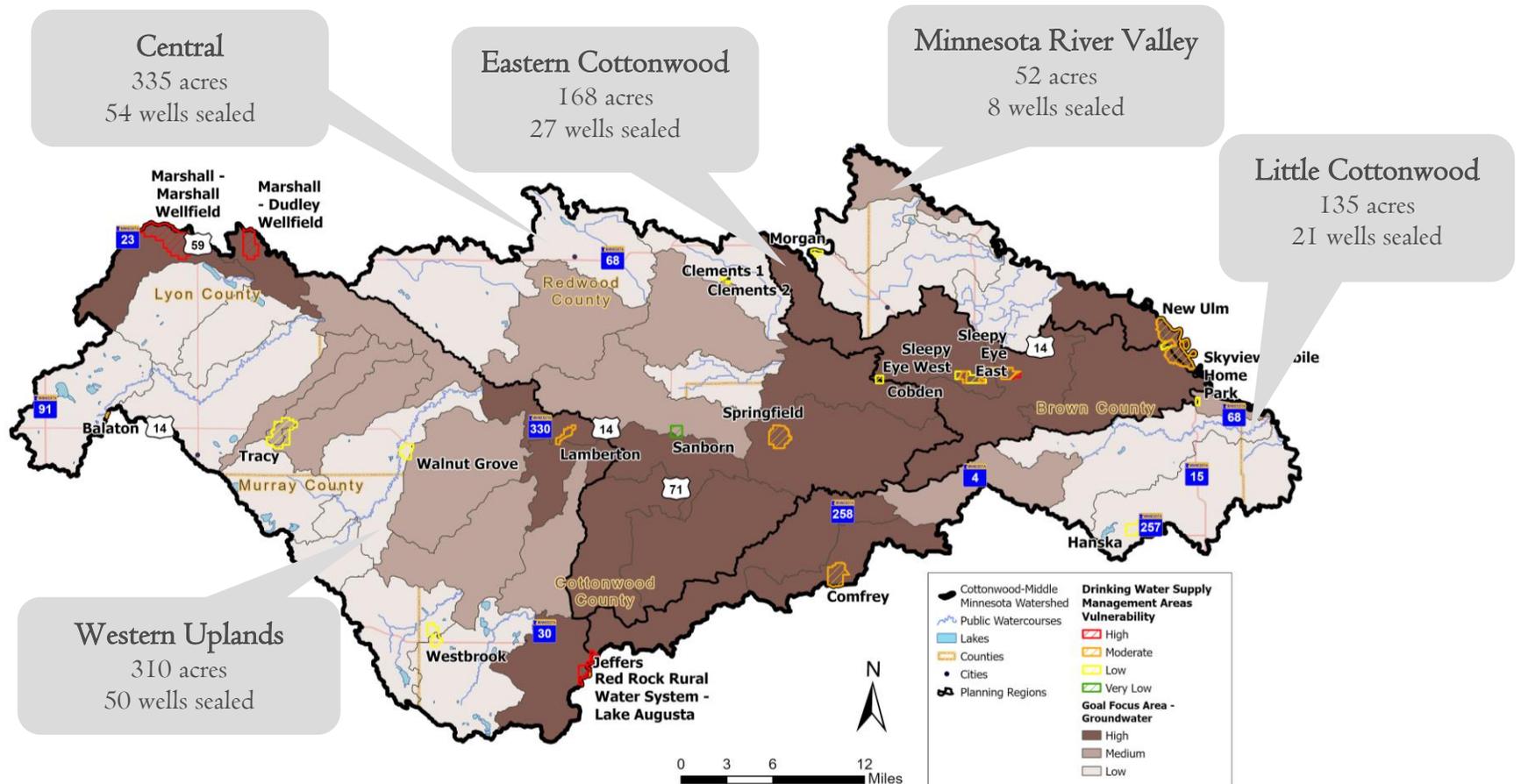
## Stacking Benefits

Work toward this goal also improves watershed storage and climate resiliency.

- Improved soil health
- Carbon sequestered in soils
- Water storage

# Milestones and Focus Areas

Actions related to this measurable goal will be focused on high and medium priority subwatersheds. These subwatersheds have the greatest areas of vulnerable DWSMAs, have high pollution sensitivity or recharge potential, or have nitrate testing results above the drinking water standard. Progress towards the 10-year groundwater goal will be made within each planning region.





# Bacteria

*Escherichia coli* (*E. coli*) is a group of bacteria present in the intestines of animals, including humans, livestock, and wildlife. *E. coli* is monitored in surface waters because if detected, it is an indicator that water may be contaminated and could contain pathogens. There are 19 streams impaired due to *E. coli* in the CMMW.

The largest source of bacteria in the watershed is estimated to be runoff from crops where manure is applied (MPCA, 2020). MPCA identified late winter application of manure as a likely source of bacteria, as manure washes into streams during precipitation when the ground is frozen (MPCA, 2022). Spreading manure on thawed land can also create ruts and compact soil. As such, a primary focus of this plan is on the development of manure management plans and implementation efforts associated with the Minnesota Agricultural Water Quality Certification Program (MAWQCP). Additional sources of bacteria include pets and wildlife, wastewater, and pastures/feedlots. Other bacteria management projects can also reduce bacteria in surface water and will be pursued during implementation.

Unmaintained septic systems can be a source of bacteria as well—it is estimated that 17% of SSTS in CMMW are an imminent threat to public safety (MPCA, 2022). Local planning partners estimate they will be addressing approximately 160 septics over the next 10 years, with a focus on systems that are imminent public health threats and fail to protect groundwater.

## Issues Addressed

- Bacteria
- SSTS and Undersewered Communities

## 10-Year Goal

Draft an additional **10 manure management plans** focused on non-CAFO operations that aren't required to have a plan.

Enroll **40 feedlot producers** in the MAWQCP watershed-wide.

Address **160 septic systems** to protect groundwater and surface water, with a focus on systems identified as imminent public health threats and failing to protect groundwater, with special consideration for low-income residents.

## Desired Future Condition

All septic systems are in compliance and all streams within pastures are managed.

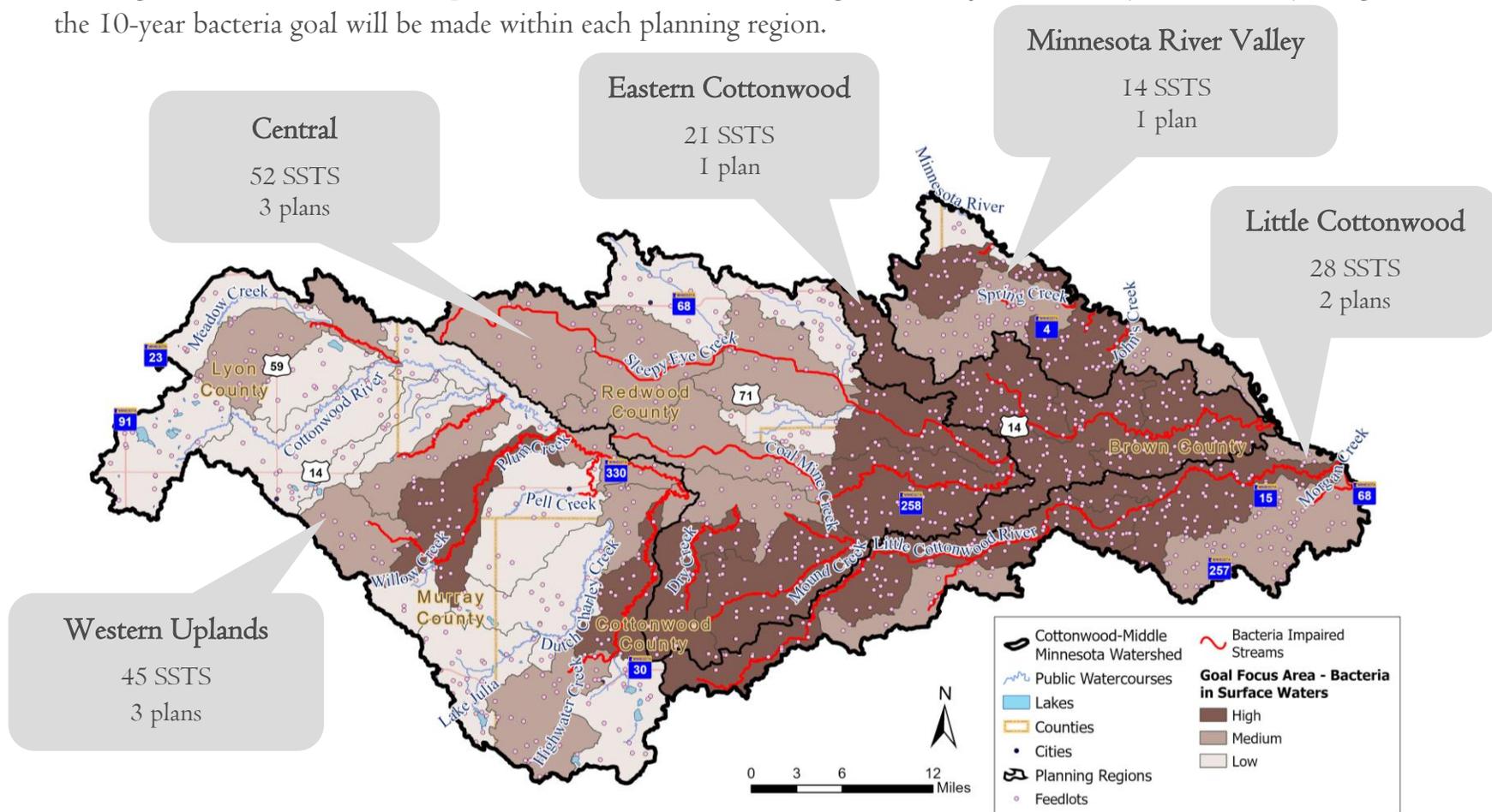
## Stacking Benefits

Work toward this goal also builds climate resiliency and improves water quality.

- Improved aquatic habitat
- Reduced nutrient loading
- Decreased streambank erosion

## Milestones and Focus Areas

Actions related to this measurable goal will be focused on high and medium priority subwatersheds. These subwatersheds have the longest stretches of streams impaired for bacteria, or have the highest density of feedlots (MPCA, 2022). Progress towards the 10-year bacteria goal will be made within each planning region.



# Stream Habitat and Connectivity

Both lateral (stream to the floodplain) and longitudinal (upstream to downstream) connectivity are important for stream water quality and habitat. Streams naturally meander and peak flows overflow banks, exchanging sediment, cycling nutrients, and storing water in floodplain and supporting riparian habitat. When streams are channelized or incised, they no longer access the floodplain and water quality decreases.

Longitudinal connectivity is often blocked by culverts or dams. Fragmentation of stream reaches due to infrastructure impedes fish passage. The DNR has identified 206 natural and built barriers to fish passage in the CMMW (DNR, 2016 and 2020).

In-stream habitat is impacted by excess sediment, nutrients, and lack of riparian vegetation. Addressing the CWMP’s ‘Sediment and Nutrients’ and ‘Water Storage and Hydrology’ goals will also improve aquatic habitat.



Stream debris. Credit: Redwood SWCD

## Issues Addressed

- Eroding Banks
- Riparian Habitat
- Aquatic Connectivity
- Maintenance of Debris

## 10-Year Goal

Address 5 structural barriers that restrict flow, accumulate debris, and/or inhibit aquatic life.

## Desired Future Condition

MSHA scores increase by 25%, indicating improved floodplain, riparian, in-stream, or channel habitat.

All barriers that restrict flow, accumulate debris, and inhibit aquatic life are addressed.

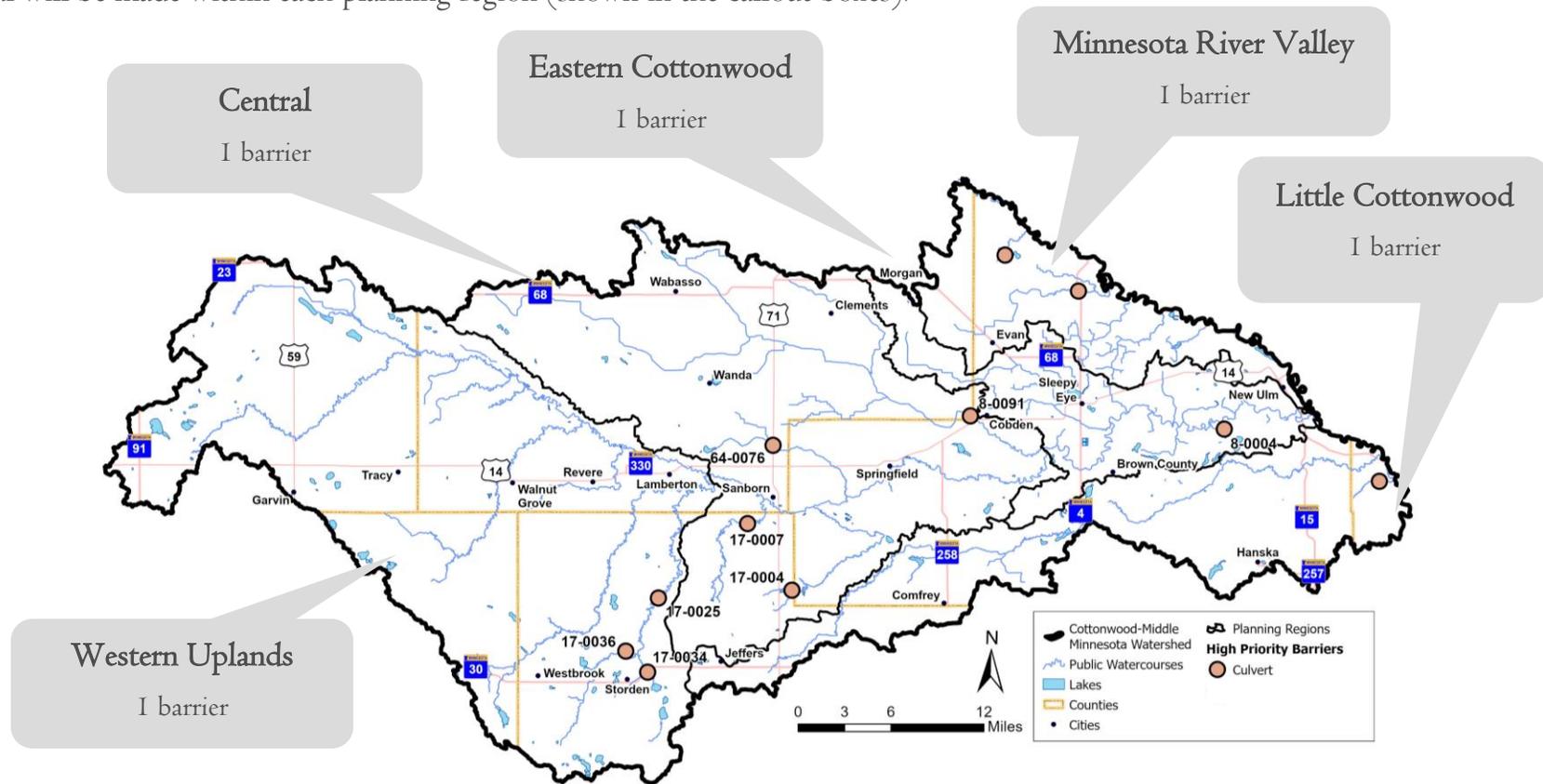
## Stacking Benefits

Work toward this goal also improves water quality.

- Decreased streambank erosion
- Improved aquatic habitat
- Reduced sediment and phosphorus loading

# Milestones and Focus Areas

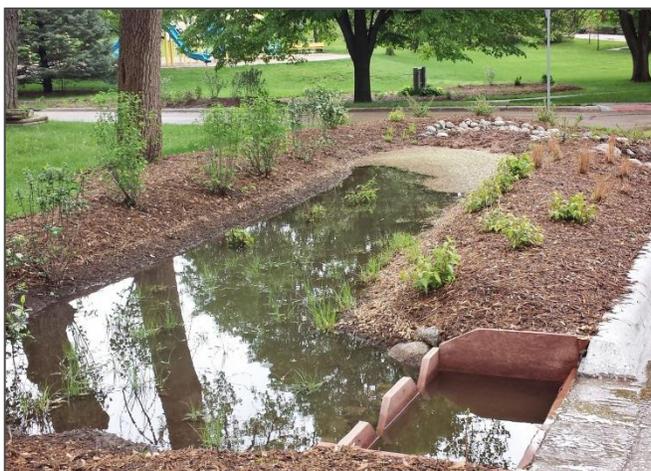
High priority barriers shown are highlighted in the Cottonwood DNR Stream Crossing Inventory and Prioritization Report (DNR, 2018) and Minnesota River-Mankato Stressor Identification Report (MPCA, 2019). These barriers are the highest priority to address, but others impacting water quality or aquatic life will be considered as known. Progress towards the 10-year goal will be made within each planning region (shown in the callout boxes).



# Stormwater

In urban areas, pavement and other impervious surfaces act as a barrier to infiltration of precipitation. Rain and snowmelt move pollutants from urban surfaces into storm drains, where it discharges into rivers and lakes. Stormwater can carry sediment, nutrients, salt, metals, oil, bacteria, and litter into rivers and streams. The New Ulm MS4 and the southern part of Marshall MS4 fall within the watershed and are regulated by a permit, but smaller cities in the watershed may not have stormwater management plans.

Ways to improve stormwater water quality include structural BMPs such as rain gardens and stormwater ponds and non-structural BMPs such as urban forestry and vegetated swales. Larger projects include retention and detention basins and constructed wetlands. Public outreach and education are also a large component of addressing stormwater issues.



*Rain garden.*

## Issues Addressed

- Stormwater

## 10-Year Goal

Treat **290 acres** of urban area or developed area with BMPs (and/or stormwater retrofits) to improve water quality in receiving waters.

## Desired Future Condition

Treat all 28,000 acres of urban area in the watershed with BMPs to improve receiving water quality.

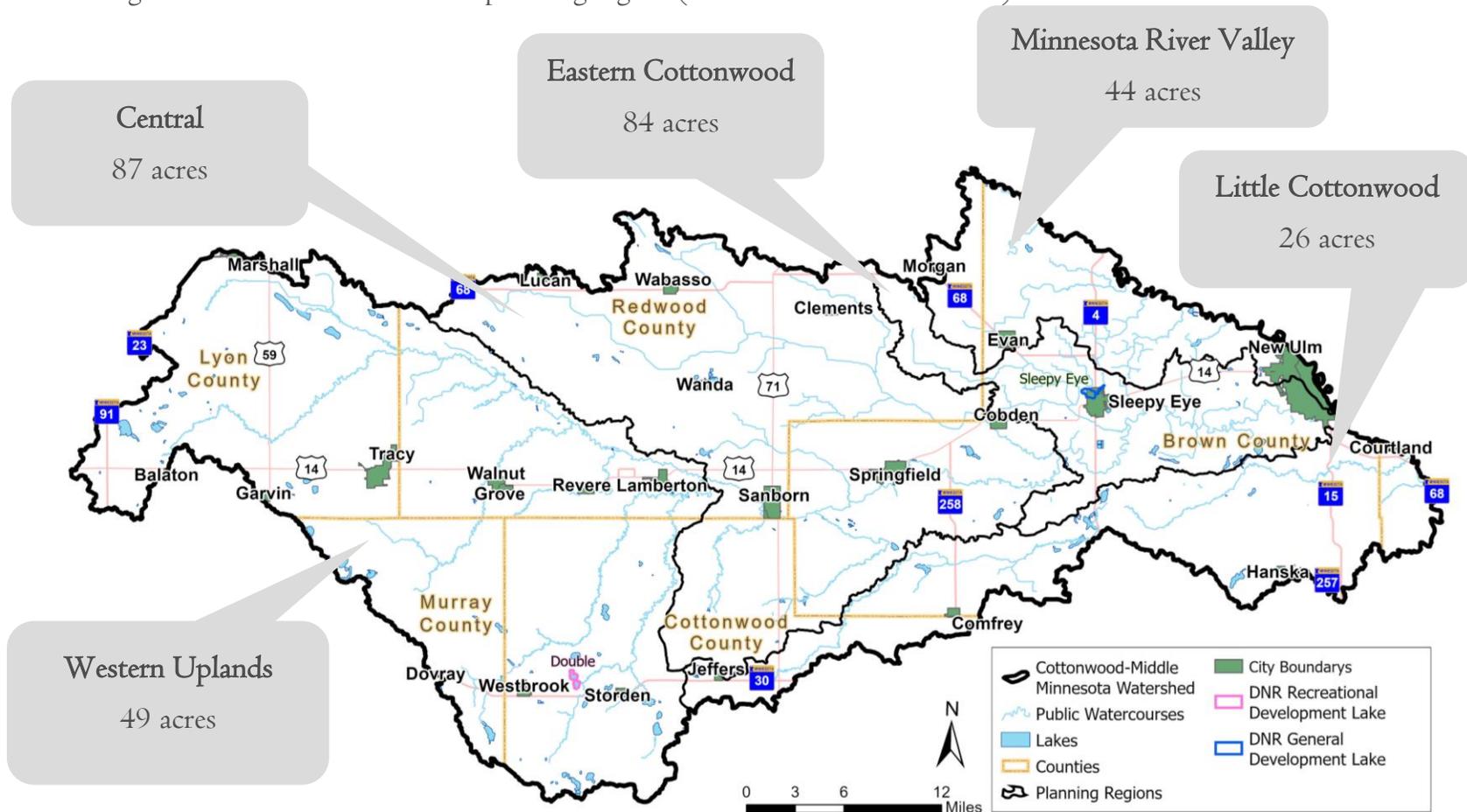
## Stacking Benefits

Work toward this goal also improves watershed storage and climate resiliency.

- Water storage
- Improved aquatic habitat
- Reduced sediment and nutrient loading

# Milestones and Focus Areas

Actions related to this measurable goal will be focused on cities within the watershed. They will also be focused around Double Lake and Sleepy Eye Lake, as they are categorized as Development Lakes by the DNR. Progress towards the 10-year stormwater goal will be made within each planning region (shown in the callout boxes).



# Soil Health

The term “soil health” is defined as the continued capacity of a soil to function as a vital living ecosystem that sustains plants, microorganisms, and humans. They are agriculturally productive, store water, sequester carbon, sustain microorganisms, and filter contaminants. Healthy soils have sufficient organic matter, high levels of microbial activity, and good structure. Healthy soils provide numerous benefits to farmers and to water quality.

Poor quality soil is more easily eroded and has higher nutrient loss. Soil health practices involve conservation practices such as cover crops, nutrient management planning, and conservation tillage. Public outreach and education, such as field days and demonstration sites, can build support for soil health practices.

The short-term goal of an additional 18,150 acres of soil health practices was determined by what is realistic to achieve with available funding. This goal will be reevaluated at the midpoint assessment. With 85% of the CMMW land used for agriculture, adoption of soil health practices will be a powerful tool to improve water quality (NLCD, 2019).



### Issues Addressed

- Ground Cover
- Soil Health

### 10-Year Goal

Implement **soil health practices** on **18,150 acres**.

### Desired Future Condition

All cropland and pasture are assessed for or managed with soil health practices.

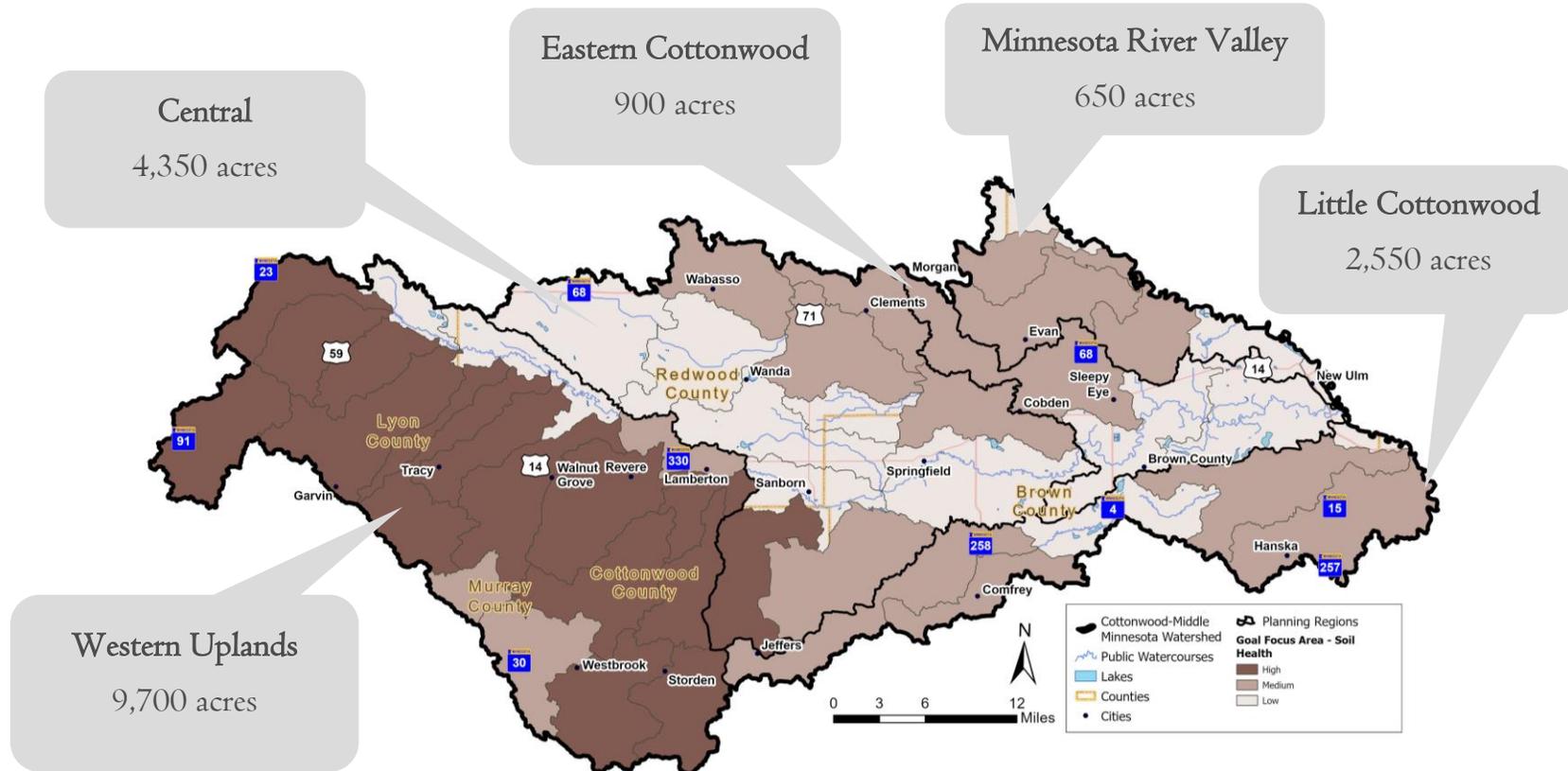
### Stacking Benefits

Work toward this goal also builds climate resiliency and improves water quality.

Reduced sediment and nutrient loading
Improved aquatic habitat
1,961 metric tons CO <sub>2</sub> -e/yr sequestered
Increased water storage

# Milestones and Focus Areas

Actions related to this measurable goal will be focused on high and medium priority subwatersheds. These subwatersheds have the most soil loss reaching the edge of a field, as estimated by PTMApp. Progress towards the 10-year soil health goal will be made within each planning region.





# Protection

The CMMW contains hundreds of stream and river miles with a number of water basins that are home to diverse plants, wildlife, and aquatic organisms. Many of these streams and lakes are high-quality, meaning they are unimpaired or are of high recreational value.

There is a growing focus on maintaining high-quality surface water in the CMMW. Efforts to protect quality resources have multiple benefits. The same practices that protect water quality will also benefit wildlife, groundwater, air quality, soils, and numerous other aspects of our Minnesota environment.

Several streams and lakes in the CMMW were considered priority for protection by the Cottonwood River WRAPS work group. These include streams and lakes that are barely impaired (i.e. within 40% of water quality standards), are of high recreational use and value, or are trout streams (i.e. Spring Creek and John’s Creek). These resources are summarized in the focus area map on the next page. This plan’s 10-year goal is focused on protecting these resources for future generations through land protection programs around these resources.

## Issues Addressed

- Protection

## 10-Year Goal

Protect high-quality surface waters by **enrolling or re-enrolling 15,000 acres in temporary or permanent protection programs**, focusing efforts along protection streams and lakes.

## Desired Future Condition

Surface water quality of high-quality resources is maintained.

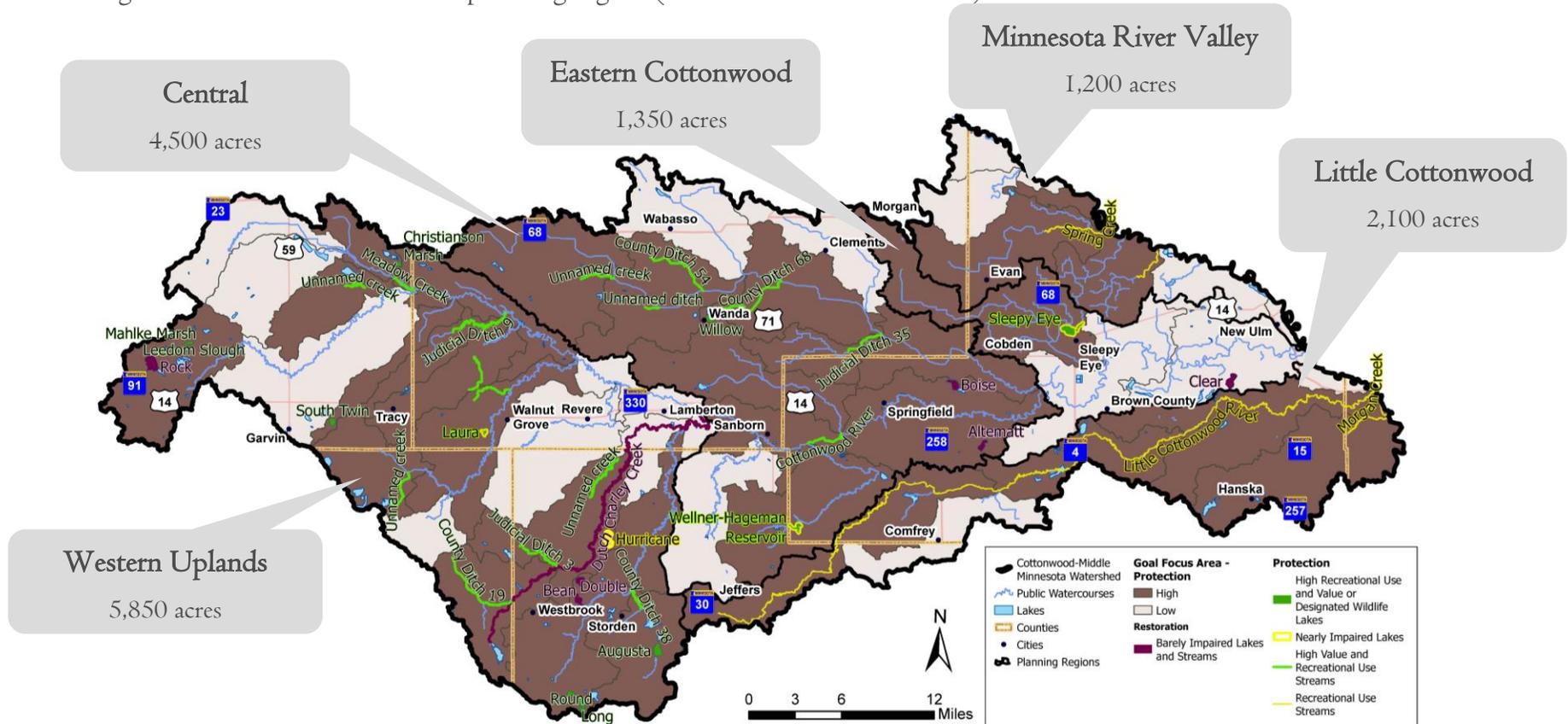
## Stacking Benefits

Work toward this goal also builds climate resiliency and improves water quality.

Improved soil health
Improved aquatic and terrestrial habitat
8,400 metric tons CO <sub>2</sub> -e/yr sequestered
Increased water storage
Reduced sediment and nutrient loading

# Milestones and Focus Areas

The focus area map below shows the lakes and streams prioritized for protection efforts by local and state agency planning partners. These resources include streams and lakes that are nearly or barely impaired, high-value waters, recreational waters, and designated wildlife lakes. A full list of these resources is also provided in **Appendix G**. Progress towards the 10-year protection goal will be made within each planning region (shown in the callout boxes).





## 5. Implementation





# Section 5. Implementation

Each goal has a corresponding list of actions that will help make progress toward that goal. This section of the plan identifies those actions that will be implemented in the lifespan of this plan to address priority issues and make progress toward measurable goals.

The list of actions was developed through discussion of what is currently being implemented in the watershed and committee discussions on what should be done in the next 10 years with funding available to reach plan goals. Actions are organized and summarized into “action tables” that include the following information:

- Action description
  - Program
  - Focus area
  - Trackable output
  - Goals that are directly or indirectly affected by the action
  - LGUs and organizations responsible for action
  - Timeline
  - Funding level and estimated cost
- 

The actions planned in this CWMP will build on work already being done in the watershed. From 2004-2023, an estimated 47,000 acres of no-till, 14,500 acres of cover crops, 230 water and sediment control basins (WASCOBs), 7,000 feet of streambank and shoreline protection, 1,500 acres of prescribed grazing, 50 septic system improvements, and 370 well sealings were reported to the MPCA Healthier Watersheds tracking program (MPCA, 2023). Implementation of practices and BMPs like these will be planned and funded through this plan.

Making progress toward goals is dependent on many factors. One of these factors is the amount of reliable funding, as more actions can be implemented with more funding. The most predictable sources of funding in the CMMW are existing state and local sources. To include a realistic number of actions that can be accomplished with predictable funding, this plan includes an estimated amount of current baseline funding that is dedicated to natural resource issues in the CMMW (Funding Level I: Baseline) (**Table 5-I**).



During implementation, the CMMW will be eligible to receive additional state funding. As one example, with this approved and adopted CWMP, the CMMW is eligible to receive non-competitive Watershed Based Implementation Funding (WBIF) through BWSR. In recognition of this, an assumed \$1,000,000 annually has been added to current baseline funding to develop a realistic cost for implementing this plan (Funding Level 2: Baseline + State Funding). This funding level is the focus of this plan’s implementation section.

The local governments in the CMMW recognize that to make progress towards all plan goals, some actions will be pursued or funded by partnering entities (e.g., MPCA, DNR, USFWS, The Nature Conservancy [TNC]), federal dollars (e.g., Conservation Reserve Program [CRP], Conservation Reserve Enhancement Program [CREP]), or other competitive funding programs. These actions are included in the action tables, highlighting that funding will come from partnering entities, federal, or competitive dollars. It’s also acknowledged that some progress towards plan goals will likely be made independently of local implementation efforts through projects and conservation practices done by landowners without local government assistance.

**Table 5-I: Funding Levels for the CMMW CWMP.**

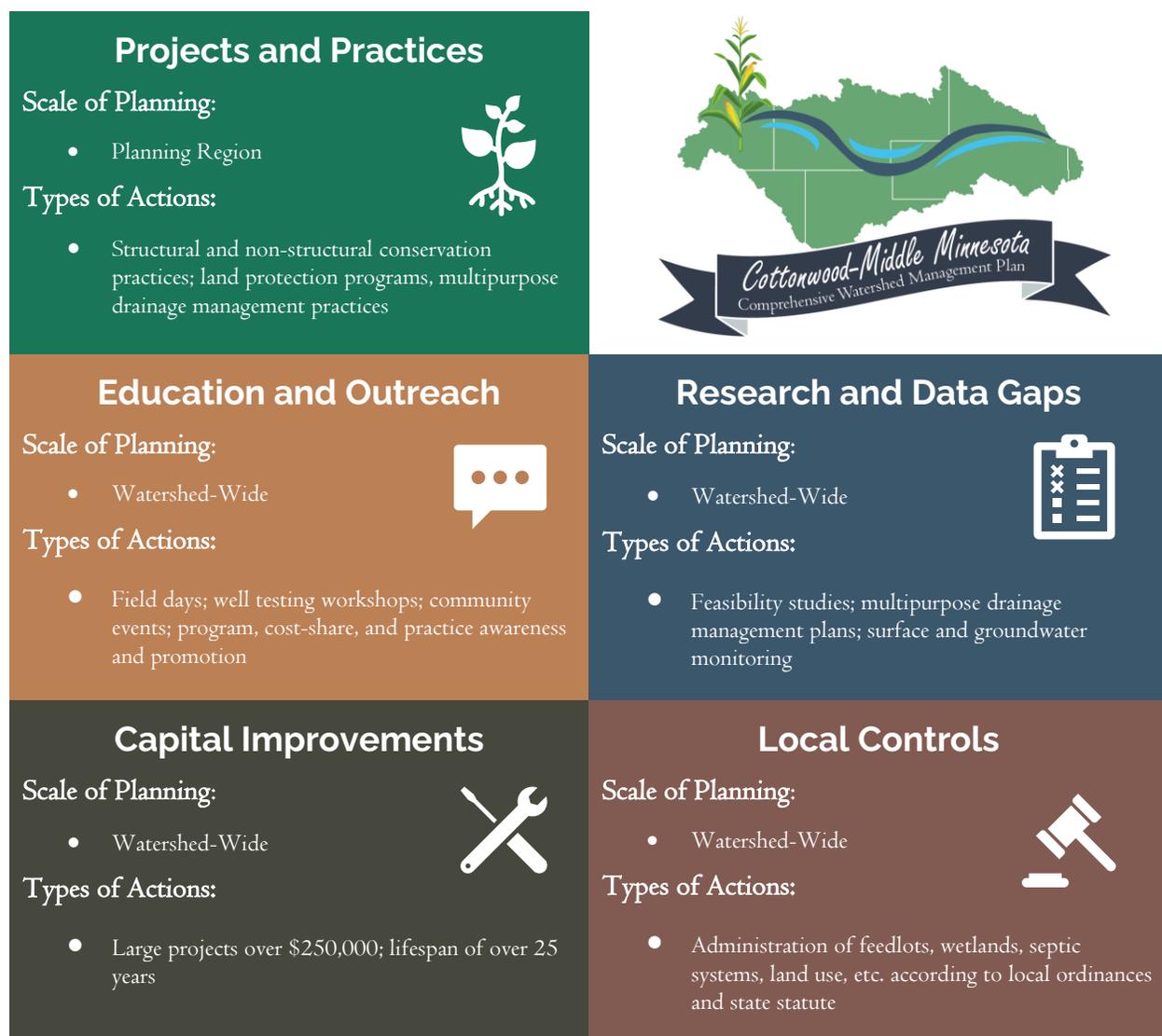
Funding Level	Name	Description
<b>1</b>	<b>Baseline</b>	This is current funding available to LGUs within the plan area.
<b>2</b>	<b>Baseline + State Funding*</b>	This is current funding plus additional \$1,000,000 per year from state funds.
<b>3</b>	<b>Other Funding</b>	This level recognizes there are other organizations and federal agencies doing work in the watershed that can help make progress towards plan goals.

\* Baseline + State Funding is the focus of this plan’s action tables.



# Plan Implementation Programs

Plan actions fall into one of five implementation programs, described in **Figure 5-I**. Implementation programs are the funding mechanism through which actions are implemented. Actions within the Education and Outreach; Research and Data Gaps; Local Controls; and Capital Improvements Implementation Programs are implemented watershed-wide to promote consistency and shared services. Actions within the Projects and Practices Implementation Program are defined at a planning region scale to better reflect changing issues and priorities from one planning region to the next. Actions and corresponding action tables are presented as such in this plan section.



**Figure 5-I: Plan Implementation Programs.**

# Targeting Practices

As the CMMW is over a million acres, focusing work on priority areas is important for effective implementation. Priority areas for each goal are shown in **Section 4 - Measurable Goals**. An overall watershed priority map was created by overlaying all the goal maps into one comprehensive map. The resulting comprehensive priority ranking map will be used to prioritize where work should take place for actions aimed at multiple benefits. Each action in the action table lists a focus area for implementation, some of which refer to previous goal-specific priority areas in maps shown in **Section 4 - Measurable Goals**. Other more multi-benefit actions relate to high and medium priority subwatersheds in this comprehensive priority map.

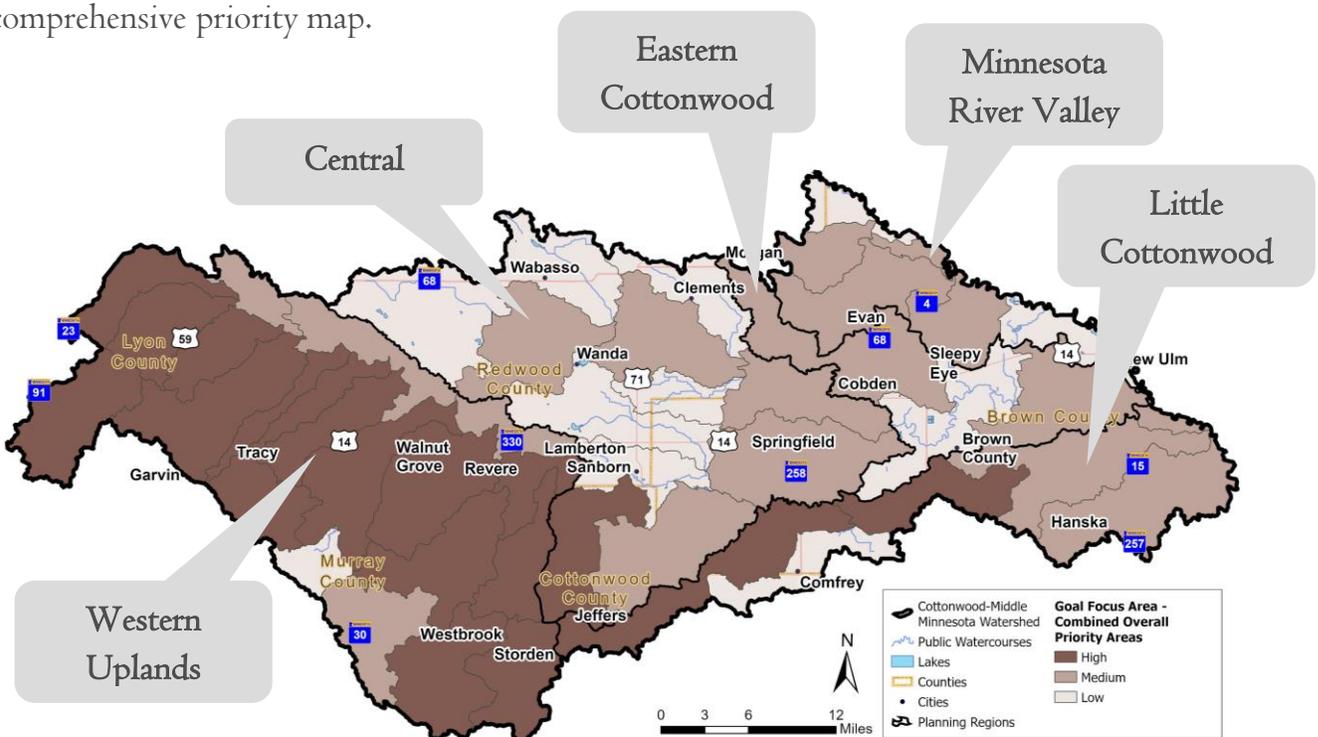


Figure 5-2: Comprehensive priority map.

To best utilize funding and make progress towards plan goals, decisions were made on where in the watershed practices will be more effective and which conservation practices will be implemented. The PTMapp was used to target feasible locations for conservation practices and estimate their cost, water quality benefits, and anticipated progress they will have toward plan goals.



PTMApp estimates existing pollutant loads and water quality benefits for a wide range of conservation practices (full list shown in **Appendix H**). Pollutant loads and water quality benefits are expressed in terms of annual load reductions of sediment, total phosphorus (TP), and total nitrogen (TN) that result from implementing the practice. As with any model, PTMApp has limitations, such as a lack of ability to model wind erosion or near and in-channel sources of sediment and nutrients.

The practices modeled by PTMApp and included in this plan’s action tables were selected to align with voluntary local implementation trends and are most cost-effective for treating sediment, with benefits measured at the edge of the field. See **Appendix H** for more information regarding the PTMApp implementation scenario that was used to inform this plan, and for maps of field-scale conservation practices.

Costs for these practices are estimated by doubling the 2019 Environmental Quality Incentives Program (EQIP) payment rates for each practice and are intended to incorporate partial costs for technical engineering support (estimated at 20% of project implementation cost). However, local plan partners recognize that there will be additional needs for project development and technical assistance to implement this plan. As such, approximately 20% of the total Projects and Practices Implementation Program budget is set aside for project development and technical assistance expenses. For more information on project development and technical assistance expenses, see **Table 5-2** on Page 5-33.

It’s important to note that the numbers, cost, and locations of practices in action tables represent a best-case scenario for planning. A variety of factors may influence implementation that will change implementation outcomes from what was modeled, including:

- Voluntary participation
- New data on resource condition or practices
- Funding availability
- Field verification
- Effectiveness of education and outreach efforts

Projects or practices may emerge that are not modeled in PTMApp or listed in the action tables. These may be implemented, provided the environmental benefits align with plan goals.

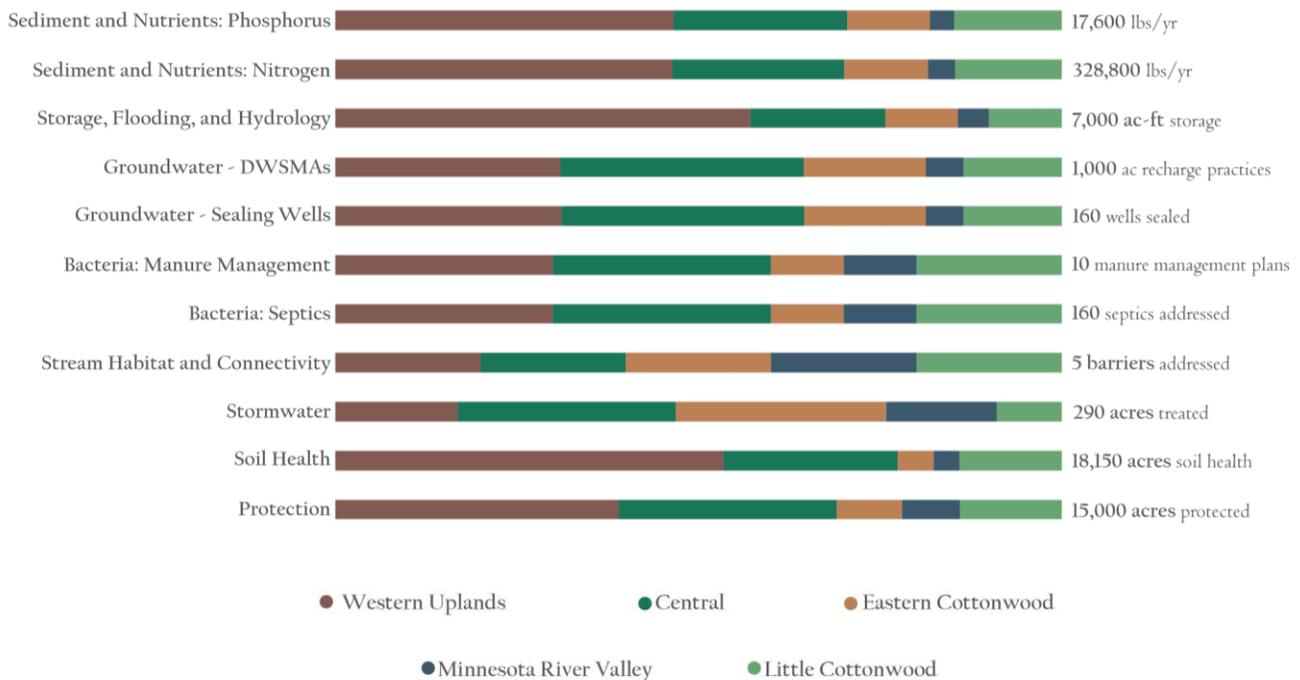


# Planning Region Milestones

The importance of addressing priority issues, and therefore goals, changes by planning region and even by the subwatersheds within each planning region. To reflect this, the Steering Committee elected to create Project and Practices action tables specific to each individual planning region.

**Section 4 - Measurable Goals** contains planning region milestones on each focus area map showing how the 10-year goal will be reached between the planning regions. Planning region progress towards each goal is shown visually by bar charts in this section. Below, the watershed-wide chart shows how progress within planning regions will result in accomplishing the 10-year goal (on the right). Each planning region described in this section has its own goal progress chart.

As shown in graphic below, the Western Uplands Planning Region regularly contributes the most progress towards watershed-wide, 10-year measurable goals. This is because the Western Uplands Planning Region is the largest of the planning regions and contains the largest proportion of high and medium priority watersheds in the comprehensive priority map (**Figure 5-2**).





## Projects and Practices: Watershed-Wide Summary

The following action table is a watershed-wide summary of all the Projects and Practices actions with their planning-region specific outputs. Actions are split into their own tables in each planning region section.

ID	Action	Focus Area	Planning Region	IO-Year Output	Measurable Goals								Responsibility Entity (bold = lead)	Timeline					Level 2 IO-Year Cost		
					Sediment and Nutrients	Storage, Flooding, and Hydrology	Groundwater	Bacteria	Stream Habitat and Connectivity	Stormwater	Soil Health	Protection		2025-2026	2027-2028	2029-2030	2031-2032	2033-2034	Region	Cost	
WW1	<b>Agricultural and multi-benefit storage conservation practices</b> WASCOBs, riparian buffers, filtration strips, grassed waterways, grade stabilization, side water inlets, drainage water management, wetland creation and restoration, groundwater recharge conservation practices, etc.	Comprehensive Priority Subwatersheds, DWSMAs	Western Uplands	36,433 tons/yr sediment 5,947 lbs/yr TP 110,127 lbs/yr TN 4,000 acre-feet storage														Western Uplands	\$2,433,000		
			Central	12,663 tons/yr sediment 3,175 lbs/yr TP 58,864 lbs/yr TN 1,300 acre-feet storage															Central	\$1,085,000	
			Eastern Cottonwood	4,986 tons/yr sediment 1,860 lbs/yr TP 33,856 lbs/yr TN 700 acre-feet storage	•	•	•								•	•	•	•	•	Eastern Cottonwood	\$224,000
			Little Cottonwood	7,253 tons/yr sediment 1,985 lbs/yr TP 36,555 lbs/yr TN 700 acre-feet storage																Little Cottonwood	\$642,000
			MN River Valley	1,898 tons/yr sediment 474 lbs/yr TP 9,273 lbs/yr TN 300 acre-feet storage																MN River Valley	\$166,000
WW2	<b>Soil health and non-structural management practices</b> Cover crops, diverse crop rotation, nutrient and manure management, conservation tillage, perennial cover, groundwater recharge conservation practices, etc.	Comprehensive Priority Subwatersheds, DWSMAs	Western Uplands	9,700 acres 45,036 tons/yr sediment 2,261 lbs/yr TP 42,375 lbs/yr TN														Western Uplands	\$1,458,000		
			Central	4,350 acres 15,572 tons/yr sediment 1,005 lbs/yr TP 19,095 lbs/yr TN															Central	\$651,000	
			Eastern Cottonwood	900 acres 3,091 tons/yr sediment 206 lbs/yr TP 4,016 lbs/yr TN	•	•	•						•		•	•	•	•	•	Eastern Cottonwood	\$134,000
			Little Cottonwood	2,550 acres 6,399 tons/yr sediment 584 lbs/yr TP 11,663 lbs/yr TN																Little Cottonwood	\$384,000
			MN River Valley	650 acres 2,319 tons/yr sediment 150 lbs/yr TP 3,005 lbs/yr TN																MN River Valley	\$99,000



ID	Action	Focus Area	10-Year Output		Measurable Goals							Timeline					Level 2 10-Year Cost				
			Planning Region	Output	Sediment and Nutrients	Storage, Flooding, and Hydrology	Groundwater	Bacteria	Stream Habitat and Connectivity	Stormwater	Soil Health	Protection	Responsibility Entity (bold = lead)	2025-2026	2027-2028	2029-2030	2031-2032	2033-2034			
WW3	<b>Seal unused or abandoned wells</b> Cost-share to well owners.	Groundwater Priority Areas, DWSMAs	Western Uplands	50 wells sealed								<b>Counties, SWCD, Cities, MDH, BWSR</b>						Western Uplands	\$50,000		
			Central	50 wells sealed															Central	\$54,000	
			Eastern Cottonwood	27 wells sealed			•								•	•	•	•	•	Eastern Cottonwood	\$27,000
			Little Cottonwood	21 wells sealed																Little Cottonwood	\$21,000
			MN River Valley	8 wells sealed																MN River Valley	\$8,000
WW4	<b>Manure management plans</b> May also consider rotational grassland grazing, incentive and/or cost-share pasture water supply	Bacteria Priority Subwatersheds	Western Uplands	3 plans								<b>SWCD, MPCA, NRCS, BWSR, MDA, Counties</b>						Western Uplands	\$22,500		
			Central	3 plans															Central	\$22,500	
			Eastern Cottonwood	1 plan	o			•					o							Eastern Cottonwood	\$7,500
			Little Cottonwood	2 plans																Little Cottonwood	\$15,000
			MN River Valley	1 plan																MN River Valley	\$7,500
WW5	<b>Address non-compliant septic systems</b> Focus on systems with imminent public health threats and failure to protect groundwater and special consideration for low-income residents. <i>Cost assumes 20 septic watershed-wide are incentivized.</i>	Bacteria Priority Subwatersheds	Western Uplands	45 systems addressed								<b>Counties, MPCA, BWSR</b>						Western Uplands	\$30,000		
			Central	52 systems addressed															Central	\$25,000	
			Eastern Cottonwood	21 systems addressed																Eastern Cottonwood	\$15,000
			Little Cottonwood	28 systems addressed	o		o	•												Little Cottonwood	\$20,000
			MN River Valley	14 systems addressed																MN River Valley	\$10,000
WW6	<b>Riparian management</b> Critical area planting and native vegetation planting, enhanced buffers, floodplain for community forestry, streambank stabilization	Connectivity Priority Subwatersheds	Western Uplands	300 lineal feet								<b>SWCD, DNR, NRCS, BWSR, MDA</b>						Western Uplands	\$30,000 + \$40,000		
			Central	200 lineal feet															Central	\$20,000 + \$40,000	
			Eastern Cottonwood	200 lineal feet	o	o														Eastern Cottonwood	\$20,000 + \$40,000
			Little Cottonwood	200 lineal feet																Little Cottonwood	\$20,000 + \$40,000
			MN River Valley	200 lineal feet																MN River Valley	\$20,000 + \$40,000
WW7	<b>Stormwater management practices</b> Rain gardens, vegetated swales, sediment basins, stormwater ponds and infrastructure, urban forestry	Cities, Developed Lakes	Western Uplands	49 acres treated								<b>SWCD, Cities, NRCS, BWSR, MPCA</b>						Western Uplands	\$73,500		
			Central	87 acres treated															Central	\$66,000	
			Eastern Cottonwood	84 acres treated	o								•							Eastern Cottonwood	\$126,000
			Little Cottonwood	26 acres treated																Little Cottonwood	\$39,000
			MN River Valley	44 acres treated																MN River Valley	\$130,500
WW8	<b>Address structural connectivity barriers</b>	Connectivity Priority Barriers	Western Uplands	1 barrier addressed								<b>DNR, MPCA, SWCD, County Highway Dept.</b>						Western Uplands	\$30,000 + \$50,000-200,000		
			Central	1 barrier addressed															Central	\$30,000 + \$50,000-200,000	

Executive Summary | Land and Water Resources Narrative | Priority Issues | Measurable Goals | Implementation | Implementation Programs | Plan Administration and Coordination



ID	Action	Focus Area	10-Year Output		Measurable Goals								Timeline					Level 2 10-Year Cost		
			Planning Region	Output	Sediment and Nutrients	Storage, Flooding, and Hydrology	Groundwater	Bacteria	Stream Habitat and Connectivity	Stormwater	Soil Health	Protection	Responsibility Entity (bold = lead)	2025-2026	2027-2028	2029-2030	2031-2032	2033-2034	Planning Region	Cost
			Eastern Cottonwood	I barrier addressed														Eastern Cottonwood	\$30,000 + \$50,000-200,000	
			Little Cottonwood	I barrier addressed															Little Cottonwood	\$30,000 + \$50,000-200,000
			MN River Valley	I barrier addressed															MN River Valley	\$30,000 + \$50,000-200,000
WW9	Incentivize or enroll / re-enroll temporary or permanent habitat easements CRP, CREP, RIM, etc.	Protection Priority Resources	Western Uplands	5,850 acres enrolled or re-enrolled														Western Uplands	\$292,500 + \$24,570,000	
			Central	4,500 acres enrolled or re-enrolled															Central	\$225,000 + \$18,900,000
			Eastern Cottonwood	1,350 acres enrolled or re-enrolled	o	o							•						Eastern Cottonwood	\$67,500 + \$5,670,000
			Little Cottonwood	2,100 acres enrolled or re-enrolled															Little Cottonwood	\$105,000 + \$8,820,000
			MN River Valley	1,200 acres enrolled or re-enrolled															MN River Valley	\$60,000 + \$5,040,000
WW10	Additional soil health and non-structural management practices Pursue additional cover crops, diverse crop rotation, nutrient and manure management, conservation tillage, perennial cover, groundwater recharge conservation practices, etc. with additional dollars available	Watershed-Wide	Western Uplands	5,879 additional acres														Western Uplands	\$882,000	
			Central	2,636 additional acres															Central	\$395,500
			Eastern Cottonwood	545 additional acres															Eastern Cottonwood	\$82,000
			Little Cottonwood	1,545 additional acres	•	o	•						•				•	•	Little Cottonwood	\$232,000
			MN River Valley	394 additional acres															MN River Valley	\$59,000

Key: • = Action tracked for goal; o = Indirect benefit



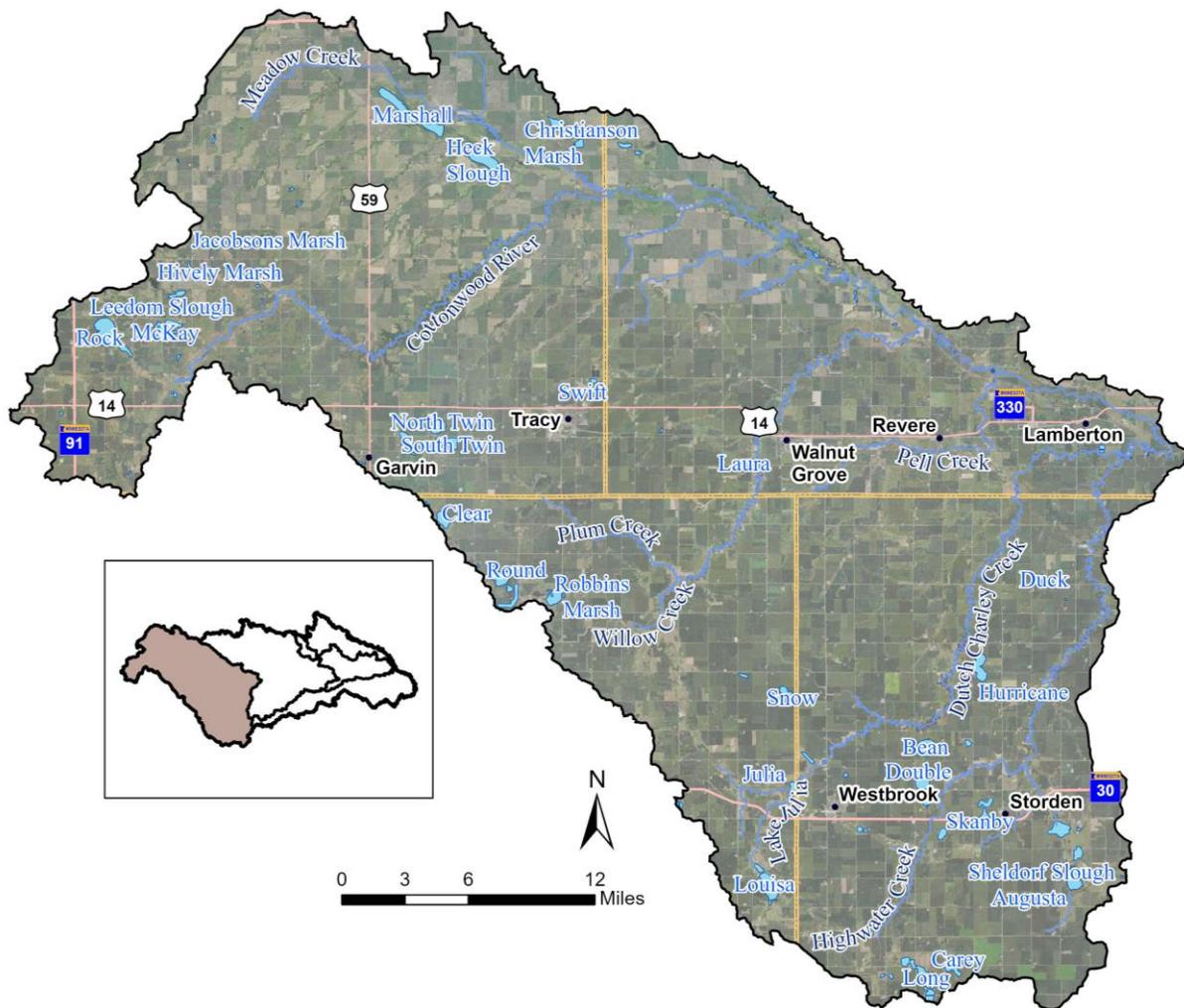
# Western Uplands Planning Region Overview

The Western Uplands Planning Region covers 39% of the watershed

Home to Garvin, Tracy, Walnut Grove, Revere, Lamberton, Storden, and Westbrook  
in Lyon, Redwood, Murray, and Cottonwood Counties

Contains 1,117 miles of streams

and 36 lakes over 10 acres, including Rock, Double, and Louisa

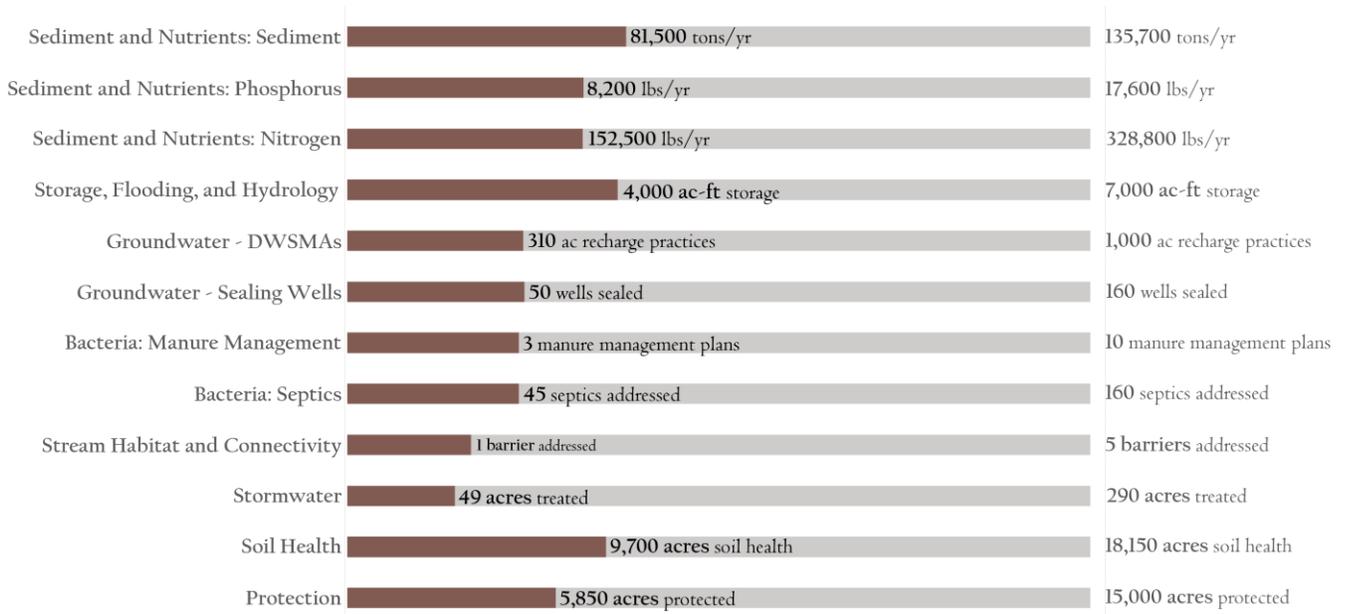




## Western Uplands Goal Milestones

Work planned in the Western Uplands Projects and Practices action table will make progress toward overall watershed goals. This is visually summarized below, with the clay color showing progress planned to occur in this planning region towards each watershed-wide, 10-year goal (end of the grey bar). Actions planned in this region will make the most progress towards the Sediment and Nutrients and Water Storage and Hydrology goals.

● Western Uplands Planning Region

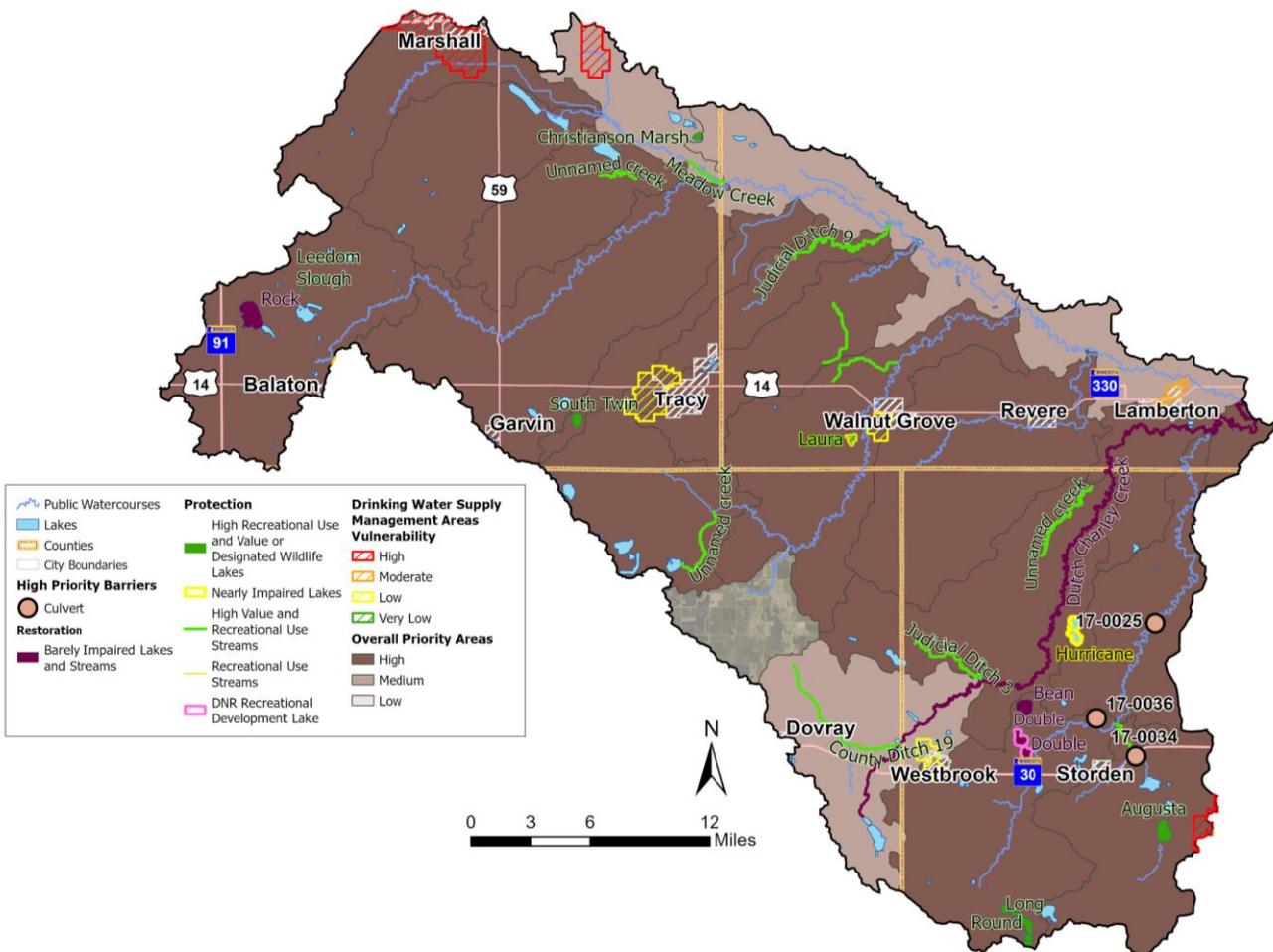


*Deer Lane WMA in Western Uplands Planning Region. Photo: DNR, 2020.*



# Western Uplands Focus Areas

Priority resources in this planning region include nearly and barely impaired lakes and streams, high-value and recreational use surface waters, connectivity barriers, and vulnerable DWSMAs. Also shown are comprehensive, overall priority, subwatershed (HUC-12 scale) priority areas. In the action table on the following page, each action is targeted to one of these locations, identified in the “Focus Area” column. Targeting actions to these locations will make the most progress toward resource improvements and plan measurable goals.







# Central Planning Region Overview

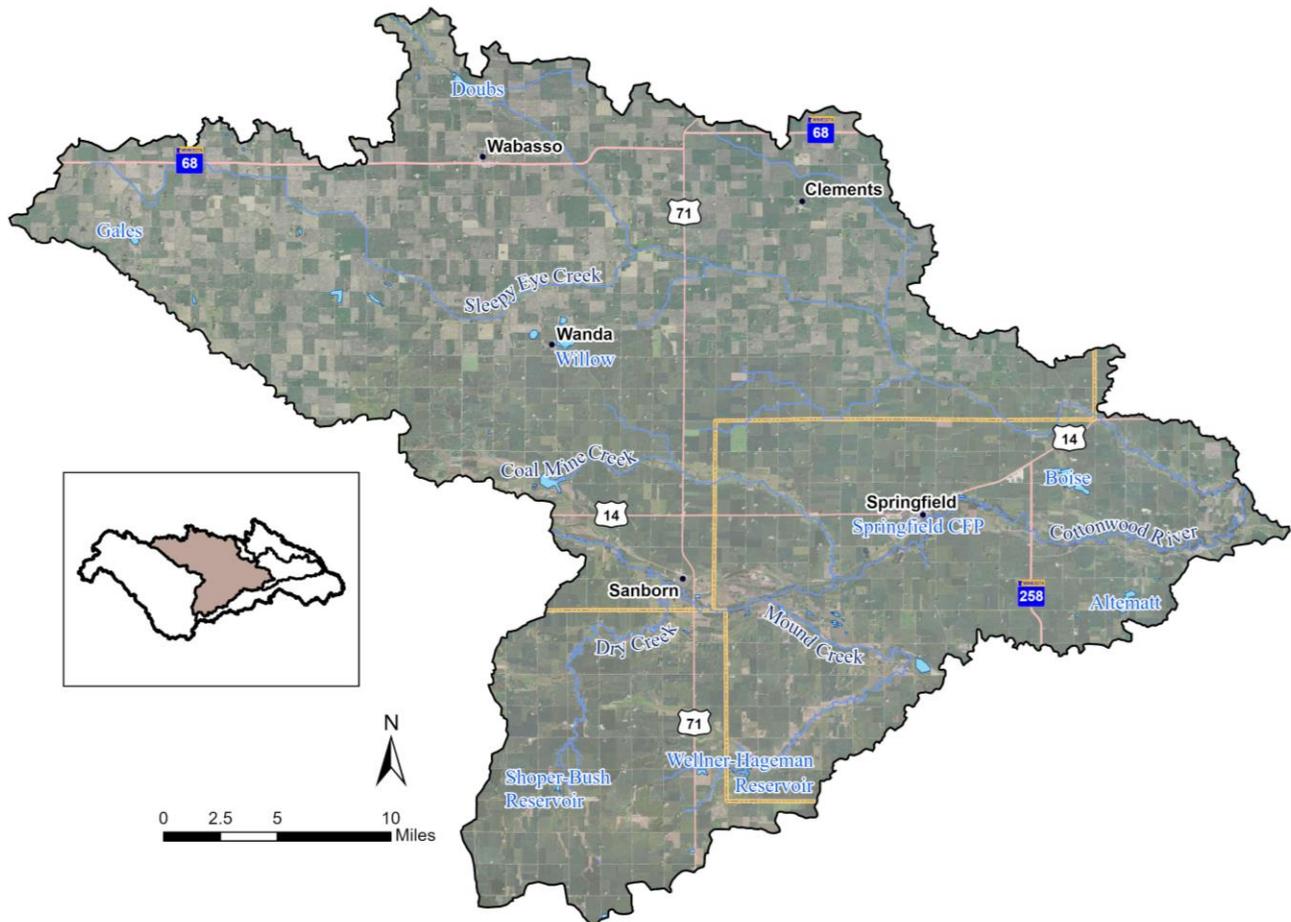
The Central Planning Region covers 30% of the watershed

Home to Sanborn, Wanda, Springfield, Wabasso, Clements, and part of Cobden

Contains 667 miles of streams

Redwood, Brown, and Cottonwood Counties

12 lakes over 10 acres, including Boise and Altermatt

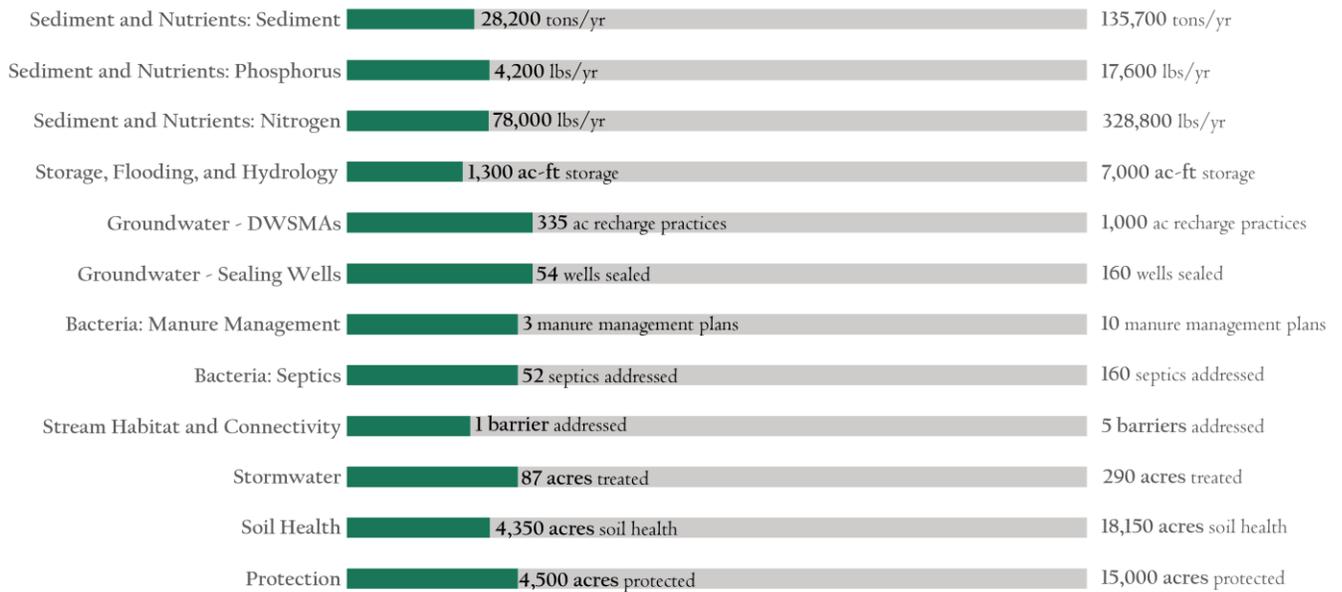




## Central Goal Milestones

Work planned in the Central Planning Region Projects and Practices action table will make progress toward overall watershed goals. This is visually summarized below, with the emerald color showing progress planned to occur in this planning region towards each watershed-wide, 10-year goal (end of the grey bar). Actions planned in the Central region will make the most progress towards the Groundwater goals.

● Central Planning Region



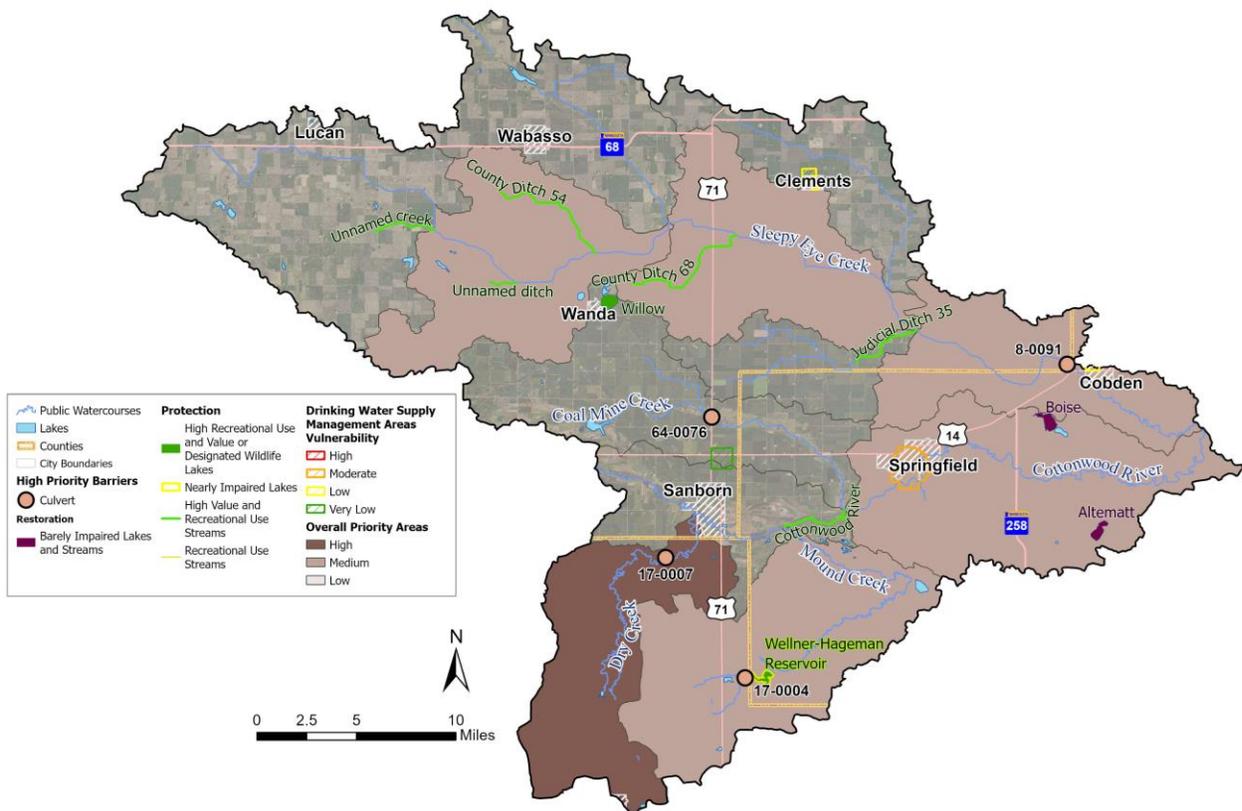
*Little Sleepy Eye Creek in Central Planning Region. Photo: DNR, 2020.*



# Central Focus Areas

Priority resources in this planning region include nearly and barely impaired lakes, high value and recreational use surface waters, connectivity barriers, and vulnerable DWSMAs. Also shown are comprehensive, overall priority subwatershed (HUC-12 scale) priority areas. In the action table on the following page, each action is targeted to one of these locations, identified in the “Focus Area” column. Targeting actions to these locations will make the most progress toward resource improvements and plan measurable goals.

The majority of the Central Planning Region is medium, and low priority subwatersheds, with only the region around Dry Creek as a high priority subwatershed. Work will first be targeted here and in areas contributing to priority resources but may occur in lower priority areas on a case-by-case basis.







# Eastern Cottonwood Planning Region Overview

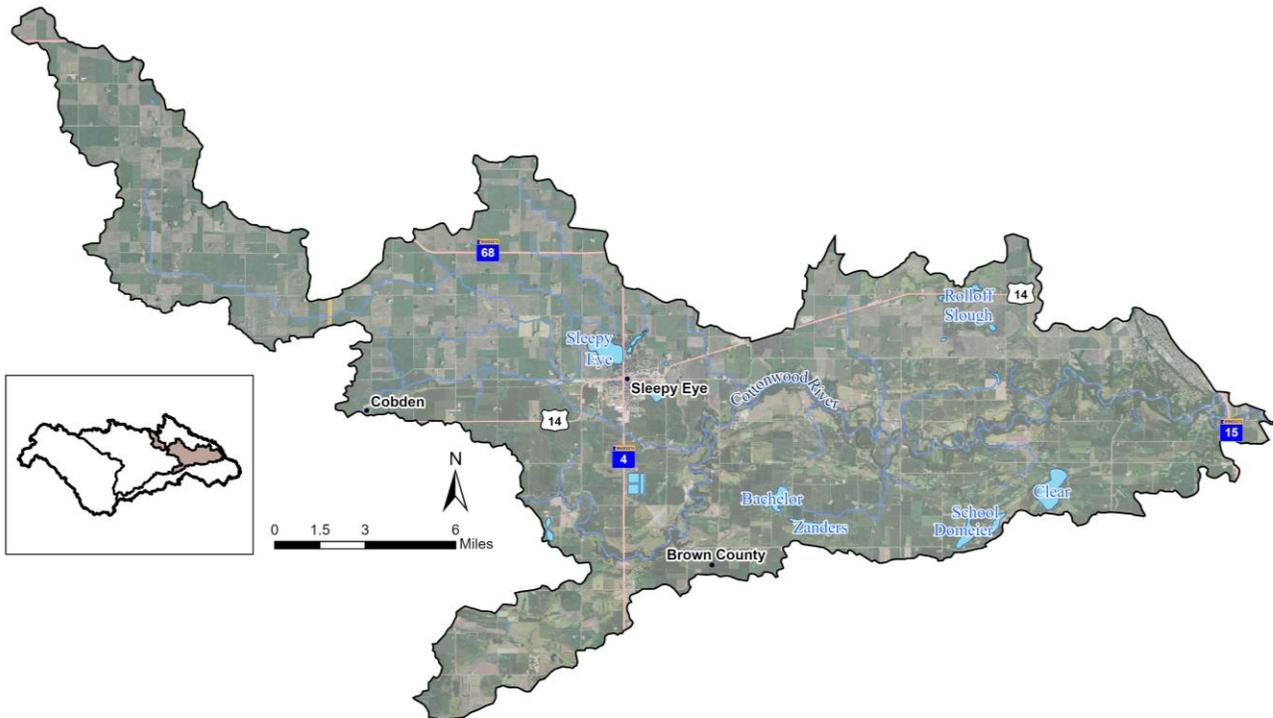
The Eastern Cottonwood Planning Region covers **9%** of the watershed

Home to **Sleepy Eye** and parts of **Cobden** and **New Ulm**, including **Flandreau State Park**

In **Brown** and **Redwood** Counties

Contains **195 miles of streams**

**9 lakes** over 10 acres, including **Clear** and **Sleepy Eye Lakes**

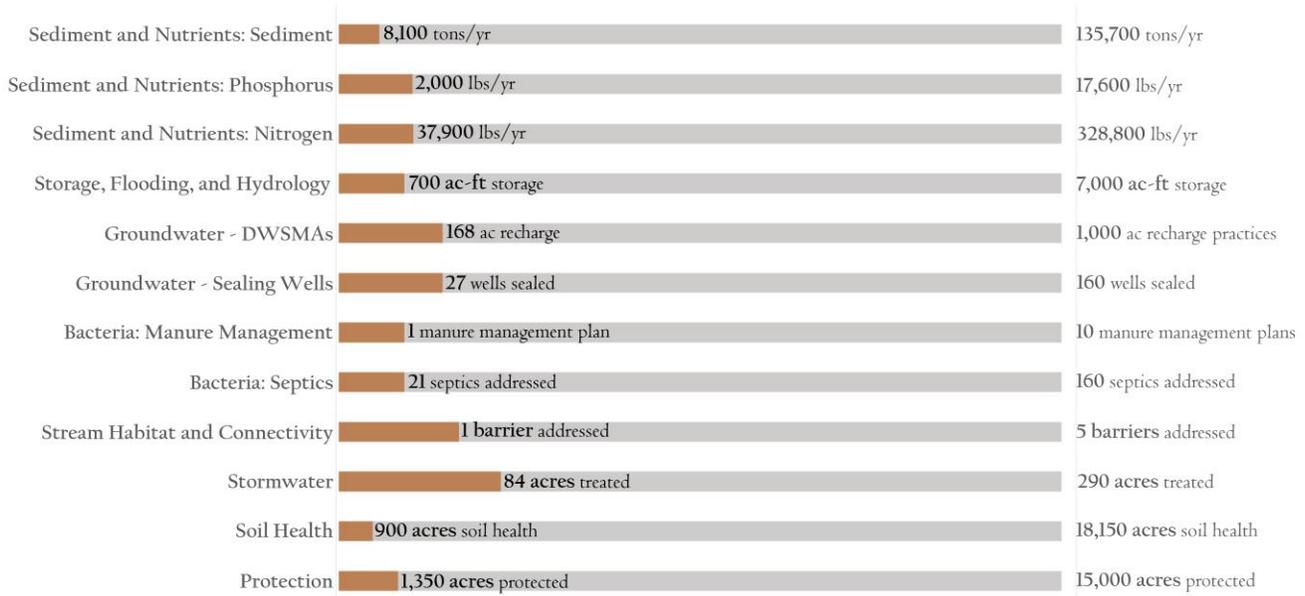




## Eastern Cottonwood Goal Milestones

Work planned in the Eastern Cottonwood Projects and Practices action table will make progress toward overall watershed goals. This is visually summarized below, with the gold color showing progress planned to occur in this planning region towards each watershed-wide 10-year goal (end of the grey bar). Actions planned in the Eastern Cottonwood region will make the most progress towards the Stormwater goal.

● Eastern Cottonwood Planning Region



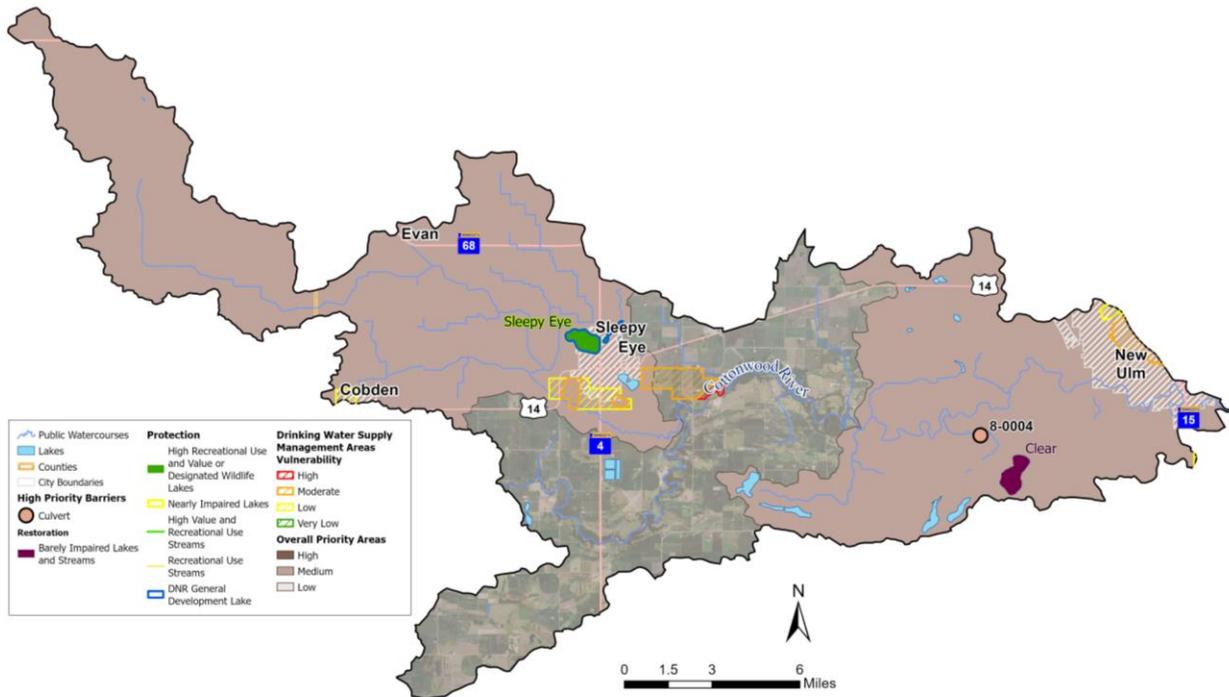
*Flandreau State Park in the Eastern Planning Region. Photo: DNR, Flandreau State Park webpage.*



# Eastern Cottonwood Focus Areas

Priority resources in this planning region include a barely impaired lake, a stormwater priority lake (Sleepy Eye), high value and recreational use surface waters, connectivity barriers, and vulnerable surface and groundwater DWSMAs. Also shown are comprehensive, overall priority subwatershed (HUC-12 scale) priority areas. In the action table on the following page, each action is targeted to one of these locations, identified in the “Focus Area” column. Targeting actions to these locations will make the most progress toward resource improvements and plan measurable goals.

There are no high comprehensive priority subwatersheds in the Eastern Cottonwood planning region, but the region does include some medium priority areas. Work will first be targeted in high and medium priority subwatersheds, but may occur in the low regions in areas contributing to priority resources or on a case-by-case basis and through watershed-wide actions.







# Minnesota River Valley Planning Region Overview

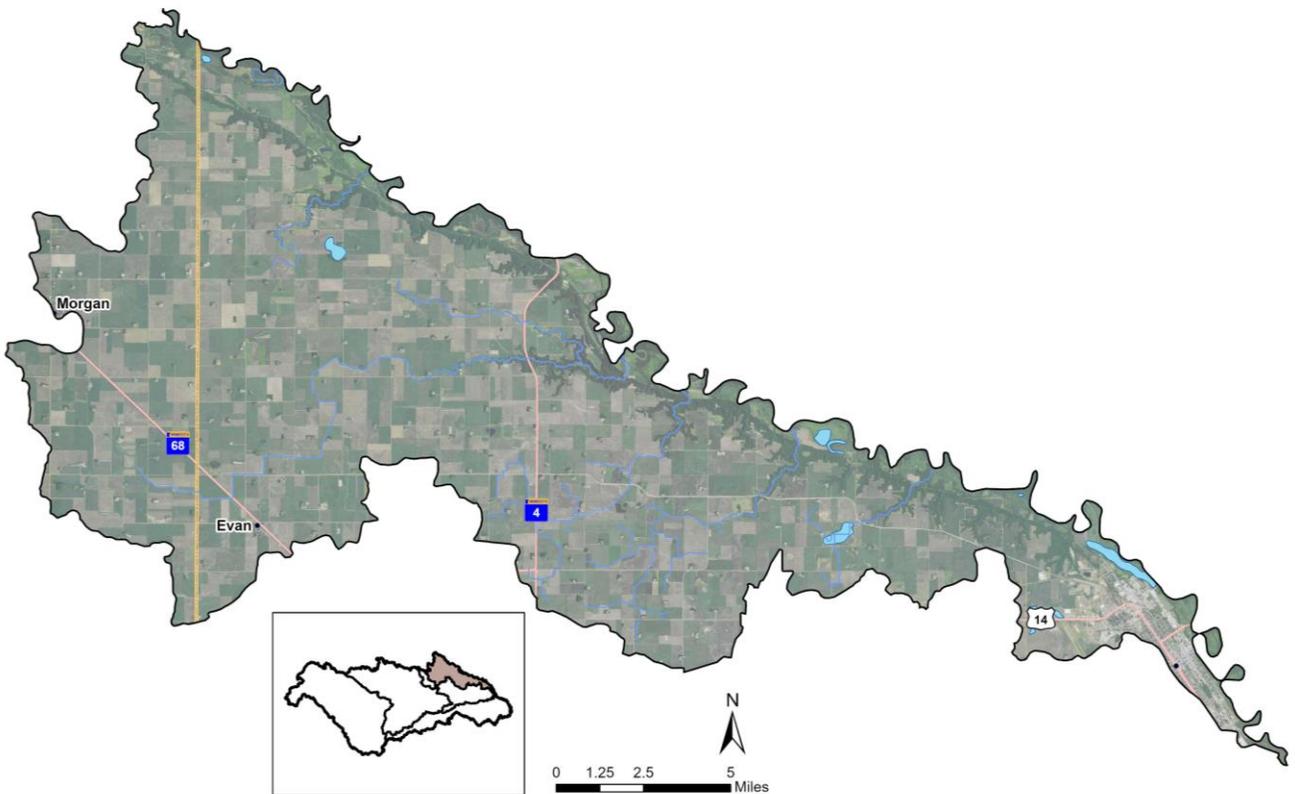
The Minnesota River Valley Planning Region covers **8%** of the watershed

Home to **Evan, Morgan, and most of New Ulm**

In **Brown and Redwood Counties**

Contains **158 miles of streams**

And **5 lakes** over 10 acres, including Lone Tree Lake

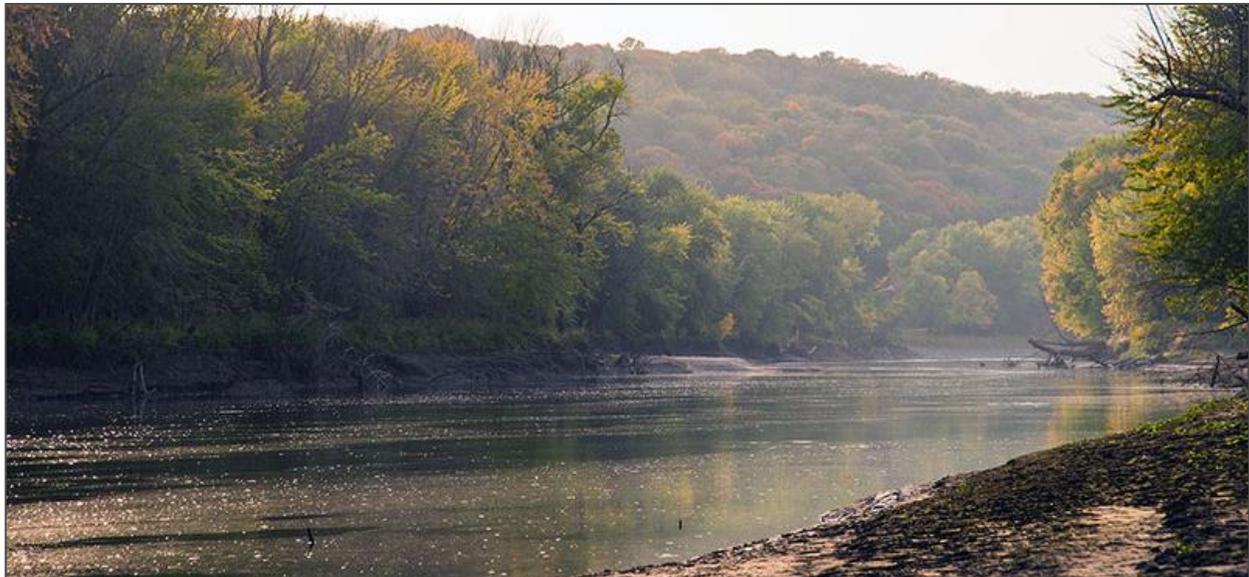
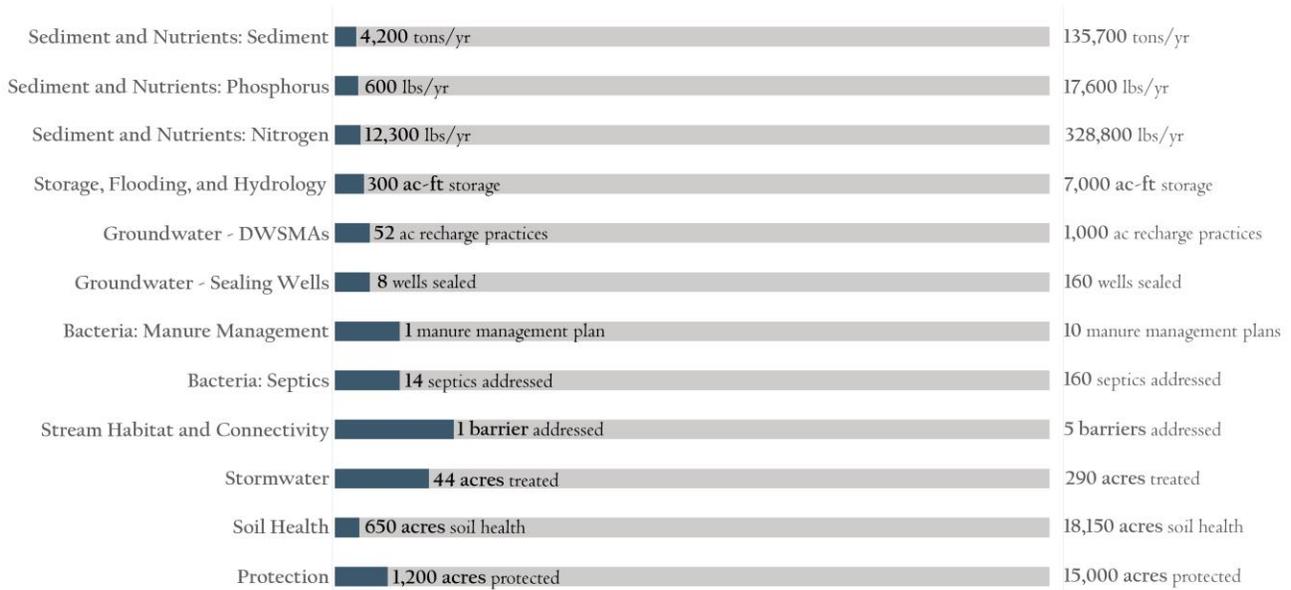




# Minnesota River Valley Goal Milestones

Work planned in the Minnesota River Valley Projects and Practices action table will make progress toward overall watershed goals. This is visually summarized below, with the dark blue color showing progress planned to occur in this planning region towards each watershed-wide 10-year goal (end of the grey bar). Actions planned in the Minnesota River Valley region will make the most progress towards the Stormwater and Stream Habitat and Connectivity goals.

● Minnesota River Valley Planning Region



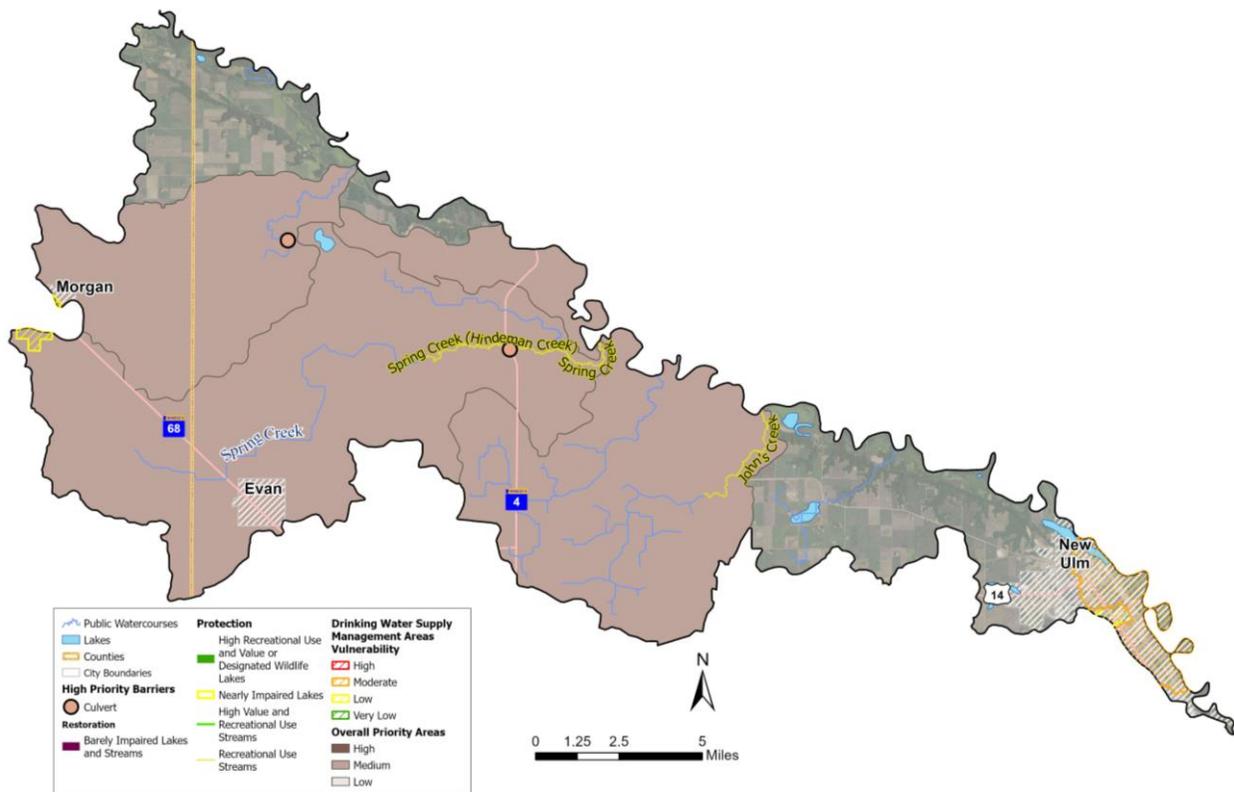
Minnesota River in the Minnesota River Valley Planning Region. Photo: DNR, Minnesota River segments and maps webpage.



# Minnesota River Valley Focus Areas

Priority resources in this planning region include two recreational use surface waters (Spring and John’s Creek), a connectivity barrier, and vulnerable surface and groundwater DWSMAs. Also shown are comprehensive, overall priority subwatershed (HUC-12 scale) priority areas. In the action table on the following page, each action is targeted to one of these locations, identified in the “Focus Area” column. Targeting actions to these locations will make the most progress toward resource improvements and plan measurable goals.

There are no high priority comprehensive subwatersheds in the Minnesota River Valley planning region, but there are some medium priority areas. Work will first be targeted in high and medium priority subwatersheds and areas contributing to priority resources, but may occur in other low priority areas on a case-by-case basis and through watershed-wide actions.







# Little Cottonwood Planning Region Overview

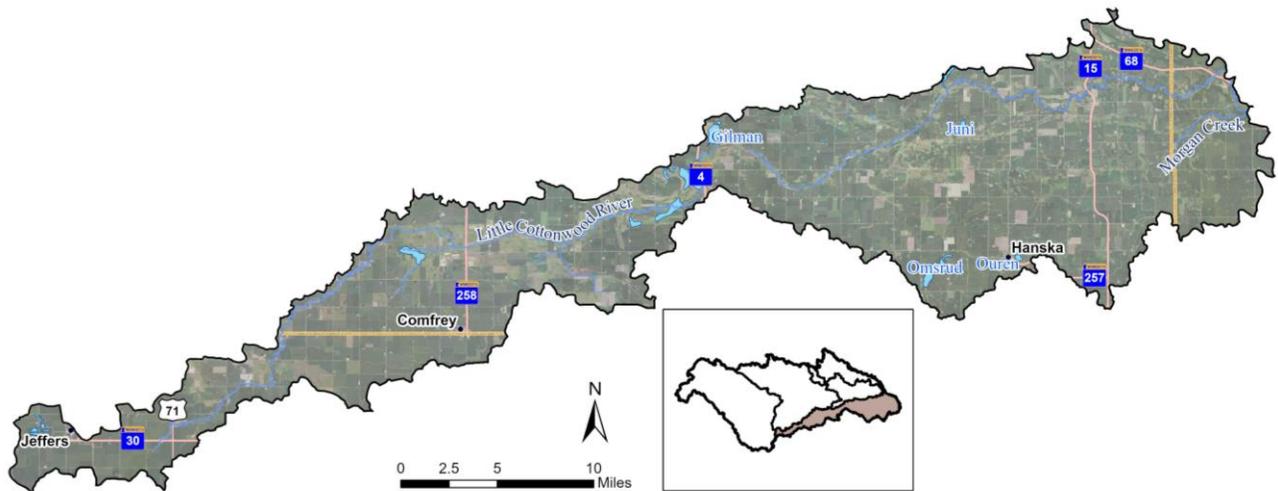
The Little Cottonwood Planning Region is **14%** of the watershed

Home to **Comfrey**, **Jeffers**, and **Hanska** as well as the Jeffers Petroglyphs

In **Brown**, **Blue Earth**, and **Cottonwood** Counties

Contains **337 miles of streams**

And **7 lakes** over 10 acres, including Omsrud and Gilman

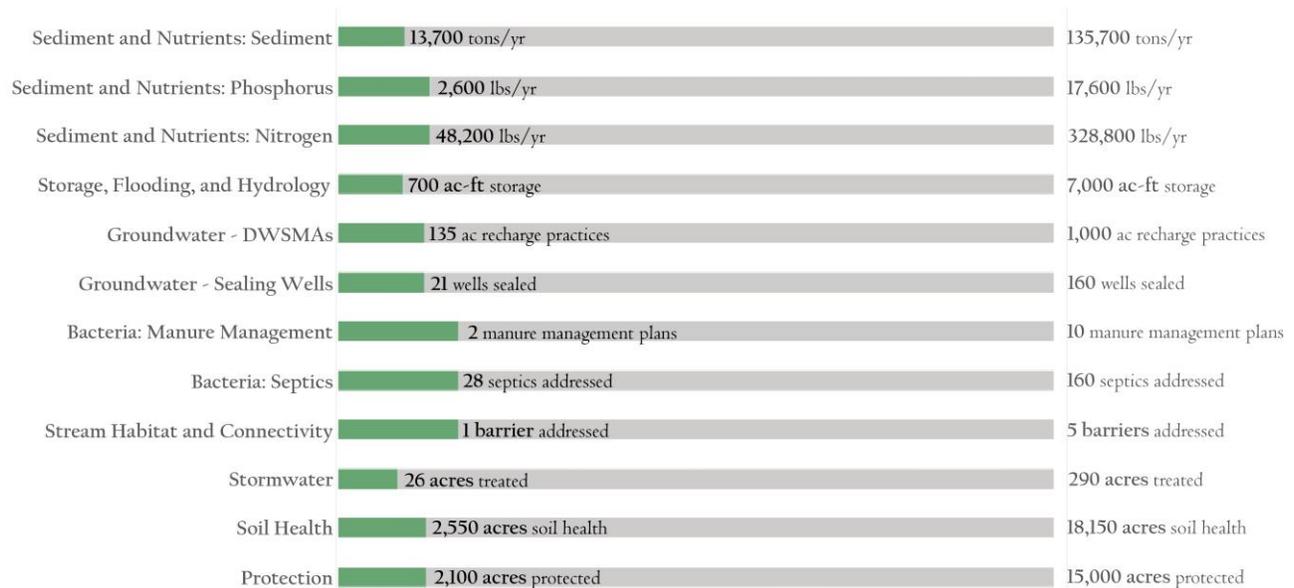




## Little Cottonwood Goal Milestones

Work planned in the Little Cottonwood Projects and Practices action table will make progress toward overall watershed goals. This is visually summarized below, with the light green color showing progress planned to occur in this planning region towards each watershed-wide 10-year goal (end of the grey bar). Actions planned in the Little Cottonwood region will make the most progress towards the Bacteria goal.

### ● Little Cottonwood Planning Region



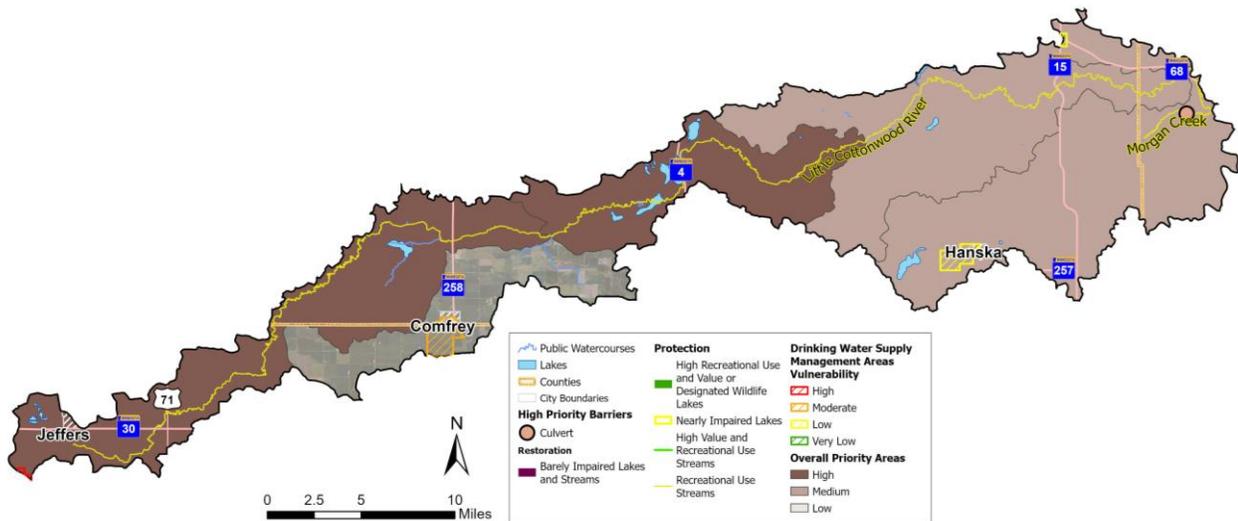
*Jeffers Petroglyphs in the Little Cottonwood Planning Region. Photo: MDH*



# Little Cottonwood Focus Areas

Priority resources in this planning region include recreational use surface waters, a connectivity barrier, and vulnerable surface and groundwater DWSMAs. Also shown are comprehensive, overall priority subwatershed (HUC-I2 scale) priority areas. In the action table on the following page, each action is targeted to one of these locations, identified in the “Focus Area” column. Targeting actions to these locations will make the most progress toward resource improvements and plan measurable goals.

The area around the upper Little Cottonwood River is a high and medium priority region where work will be targeted in this planning region. Actions will also be targeted to areas contributing to priority resources. Actions may occur in low or priority areas on a case-by-case basis and through watershed-wide actions.







## Watershed-Wide: Education and Outreach Action Table

Actions in the Education and Outreach Action Table will be implemented watershed wide. They will be funded by the Education and Outreach Implementation Program, described in Section 6.

ID	Action	Focus Area	10-Year Output	Measurable Goals								Responsibility Entity (bold = lead)	Timeline					Funding Source	Level 2 10-Year Cost	
				Sediment and Nutrients	Storage, Flooding, and Hydrology	Groundwater	Bacteria	Stream Habitat and Connectivity	Stormwater	Soil Health	Protection		2025-2026	2027-2028	2029-2030	2031-2032	2033-2034			
EO 1	Inform private well owners of local drinking water quality and educate them on well testing. Host a well testing clinic or outreach event for: <ul style="list-style-type: none"> <li>▪ Arsenic, lead and manganese (at least once)</li> <li>▪ Nitrate (every other year)</li> <li>▪ Coliform Bacteria (every year)</li> </ul>	Watershed-Wide	1 clinic or event per year			o							Counties, SWCD, MDH	•	•	•	•	•	Baseline + State	\$20,000
EO 2	Encourage landowners to report unused or abandoned wells or non-compliant septic systems and inform them on cost-share and incentive opportunities	Watershed-Wide	50 landowners reached annually			o	o					Counties, SWCD, MPCA, MDH	•	•	•	•	•	Baseline + State	\$10,000	
EO 3	Inform residents on water conservation practices for homes or businesses	Watershed-Wide	Media distributed to homeowners/residents			o						SWCD, Counties, Cities, MDH, Rural Water	•	•	•	•	•	Baseline + State	\$10,000	
EO 4	Host community events (e.g. field days) to promote practice and cost-share of: <ul style="list-style-type: none"> <li>▪ Agricultural and multi-benefit storage practices</li> <li>▪ Soil health or nonstructural management practices</li> <li>▪ Bacteria management practices, including record keeping to return to compliance and manure application education</li> </ul>	Watershed-Wide	10 events	o	o		o			o		SWCD, NRCS, BWSR, MDA, MPCA, U of M	•	•	•	•	•	Baseline + State	\$100,000	
EO 5	Inform residents in riparian areas about stream stabilization and enhancement practices and cost-share opportunities.	Watershed-Wide	Media distributed to landowners					o				Counties, DNR, SWCD, NRCS, MPCA	•	•	•	•	•	Baseline + State	\$20,000	
EO 6	Provide educational events for urban / developed area residents on cost-share programs for urban BMPs and practices that can be implemented on properties to manage stormwater runoff (e.g. lawn management)	Watershed-Wide	5 events							o		SWCD, Cities, DNR, MPCA	•	•	•	•	•	Baseline + State	\$10,000	
EO 7	Inform lakeshore owners on impacts of shoreland development and partner programs for shoreland health and management (e.g. Score-the-Shore)	Watershed-Wide	Mailings distributed to landowners on 10 lakes							o		Counties, DNR, SWCD, NRCS, BWSR	•	•	•	•	•	Baseline + State	\$20,000	
EO 8	Inform landowners with expiring lands in temporary protection programs on incentives for re-enrolling land	Watershed-Wide	1 newsletter / flyer created								o	SWCD, NRCS, BWSR, DNR, FSA	•	•	•	•	•	Baseline + State	\$10,000	
EO 9	Inform feedlot producers about Minnesota Agricultural Water Quality Certification Program	Watershed-Wide	40 feedlot producers enrolled				•					SWCD, MDA	•	•	•	•	•	Baseline + State	\$10,000	
EO 10	Continue baseline general education and outreach activities to support voluntary conservation action and public knowledge	Watershed-Wide	Annual coordination meeting if needed					o			o	SWCD, Counties, NRCS, BWSR, MDA, MPCA	•	•	•	•	•	Baseline	\$2,810,000	



ID	Action	Focus Area	10-Year Output	Measurable Goals								Responsibility Entity (bold = lead)	Timeline					Funding Source	Level 2 10-Year Cost	
				Sediment and Nutrients	Storage, Flooding, and Hydrology	Groundwater	Bacteria	Stream Habitat and Connectivity	Stormwater	Soil Health	Protection		2025-2026	2027-2028	2029-2030	2031-2032	2033-2034			
EO II	Collaborate with DNR, MPCA, Federal partners, and cities to effectively manage debris, balancing flooding and the impacts of infrastructure with water quality, aquatic habitat and hydrology	Watershed-Wide	Annual coordination meeting if needed									o	<b>SWCD, DNR, MPCA Cities, Counties, NRCS</b>	•	•	•	•	•	Other Funding	\$20,000
<b>Education and Outreach Total</b>																			<b>\$3,020,000</b>	

Key: • = Action tracked for goal; o = Indirect benefit

## Watershed-Wide: Capital Improvement Projects

The Capital Improvement Projects Action Table summarizes the actions pertaining to the construction, repair, retrofit, or increased utility or function of physical facilities, infrastructure, or environmental features. Capital improvements require external funding. They will be implemented through the Capital Improvement Projects Implementation Program, described further in **Section 6. Plan Implementation Programs**. Where eligible, the planning partners intend to use approximately \$50,000/year to support implementation of these projects, likely sourcing from WBIF.

Project	Description	Lead	Information Source	Years Start/End	Status	Estimated Cost
Dovray 16 Dam – Murray County	An earthen dam designed in Section 16 of Dovray Township in Murray County. Two options are proposed. The property owner is deciding which option is affordable from his personal standpoint and what other local funds may exist to help with the 25% local match. Project anticipated to create 106 acre-feet of storage for the 100-year storm event.	Area II Minnesota River Basin Projects	2023 cost estimate	2025-2030	Preliminary Design; soil borings needed.	\$221,984 - \$304,034
Springdale 26 Dam – Redwood County	An earthen dam designed in Section 26 of Springdale Township in Redwood County. The sources of the 25% local match are being determined. Project anticipated to create 35 acre-feet of storage for the 100-year storm event.	Area II Minnesota River Basin Projects	2021 cost estimate	2025-2030	Final Design	\$314,979
Stately 9 Dam – Brown County	An earthen dam designed in Section 9 of Stately Township in Brown County. The sources of the 25% local match are being determined. Project anticipated to create 166 acre-feet of storage for the 100-year storm event.	Area II Minnesota River Basin Projects	2021 cost estimate	2025-2030	Preliminary Design; soil borings needed.	\$257,129
CSAH 4 Dam	Dam in CSAH 4 East ROW, 5 Miles N of Jeffers: Repair, replace, or remove	Cottonwood Co Public Works	County Engineer	2030	Not started	\$500,000
JDI8CM	Drainage Improvement Project intended to reduce peak flows and sediment and nutrient loading downstream. Floodwater retention is a goal of this project.	Cottonwood Co Drainage Authority	County Drainage Inspector	2027	Not Started	\$400,000
Industrial Park Regional Storm Pond	Addition of a regional storm pond in the industrial park on the west end of town. This would include the purchase of agricultural land to the south of Wilson Ave. to build upon, as well as construction of the pond/infrastructure. The project would help to prevent future flooding of the area which includes a diesel truck wash and other manufacturing/industrial use facilities. This would improve the water quality of the Cottonwood River by preventing the direct entry of these contaminants.	City of Springfield	City of Springfield	2026/2028	Not Started	\$3,600,000
Sleepy Eye Slough	Drawdown for the wetland area	City of Sleepy Eye	City of Sleepy Eye, DNR	TBD	Not Started	TBD



## Watershed-Wide: Research and Data Gaps

Actions in the Research and Data Gaps Action Table will be implemented watershed wide. They will be funded by the Research and Data Gaps Implementation Program, described in Section 6.

ID	Action	Focus Area	10-Year Output	Measurable Goals								Responsibility Entity (bold = lead)	Timeline					Funding Source	Level 2 10-Year Cost		
				Sediment and Nutrients	Storage, Flooding, and Hydrology	Groundwater	Bacteria	Stream Habitat and Connectivity	Stormwater	Soil Health	Protection		2025-2026	2027-2028	2029-2030	2031-2032	2033-2034				
R1	Quantify volume and temporal variability of stormwater runoff entering rivers	Cities	10 rivers studied	o			o			o			MPCA, DNR, SWCD, U of M		•				Baseline + State	\$50,000	
R2	Map 10-year floodplain to inform protection programs, habitat conservation, and water storage projects	Watershed-Wide	Floodplain maps for each county created		o			o				o	DNR, Counties	•	•	•			Baseline + State	\$40,000	
R3	Develop feasibility studies for lake, storage, connectivity barrier, or other projects	Watershed-Wide	2 studies developed	o	o							o	Counties, SWCD, DNR, U of M	•		•		•	Baseline + State	\$100,000	
R4	Coordinate implementation of Wellhead Protection Plans with public water suppliers	Watershed-Wide	1 coordination meeting annually			o						o	MDH, Cities, Rural Water	•	•	•	•	•	Baseline + State	\$10,000	
R5	Conduct multipurpose drainage management planning	Watershed-Wide	Plans completed for 5 ditches	o	o			o					Counties, SWCD, MDH	•	•	•	•	•	Baseline + State	\$60,000	
R6	Complete a record search for septic	Watershed-Wide	1 inventory completed	o		o	o						Counties, MPCA	•	•	•	•	•	Baseline + State	\$40,000	
R7	Inventory unused or abandoned wells	Watershed-Wide	1 inventory completed			o							Counties, SWCD, MDH	•	•	•	•	•	Baseline + State	\$40,000	
R8	Use Atlas-14 values for BMP design to create more climate resiliency	Watershed-Wide	Project design on case-by-case basis						o				SWCD, NRCS, BWSR, MDA, U of M	•	•	•	•	•	Baseline + State	\$10,000	
R9	Track and address gaps in groundwater observation wells	Groundwater Priority Subwatersheds	1 coordination meeting annually	o		o							DNR, MDH, Counties, MPCA	•	•	•	•	•	Baseline	\$10,000	
R10	Develop a strategy for involvement in the local carbon and ecosystem services market	Watershed-Wide	1 strategy completed									o	SWCD, NRCS, BWSR, MDA, U of M					•	•	Baseline + State	\$60,000
R11	Expand groundwater monitoring to identify vulnerable and sensitive groundwater areas	Watershed-Wide	Vulnerable groundwater identified			o						o	DNR, MPCA, MDH, Counties, SWCD, MDA	•	•	•	•	•	Baseline	\$25,000	
R12	Continue and expand surface water monitoring throughout the watershed, with extra emphasis to include WRAPS update	Watershed-Wide	Annual coordination meeting if needed	o		o	o	o	o				Counties, SWCD, MPCA, DNR	•	•	•	•	•	Baseline	\$45,000	
R13	Complete microbial source assessment to better understand source of bacteria impairments	Bacteria Priority Subwatersheds	1 source assessment completed				o						MPCA, Counties			•	•		Baseline + State	\$20,000	
														<b>Research and Data Gaps Total</b>					<b>\$510,000</b>		

Key: • = Action tracked for goal; o = Indirect benefit



## Implementation Summary

Table 5-2 summarizes the cost for implementing actions in this plan to meet plan goals. “Baseline Annual” and “State Annual” columns summarize how existing and an addition \$1,000,000 in annuals state dollars are projected to be used by each implementation program. The “Baseline + State” columns represent the total cost of implementing actions from “Baseline Annual” plus “State Annual” columns, shown both annually and as 10-year costs. The 10-year costs from “Other Funding” is also shown, inclusive of funding from partnering entities, competitive funding, and federal funding. This funding is needed to fully meet goals of this plan. Costs are included for regulatory actions, plan administration, and administrative costs.

Table 5-2: Estimated cost by program for implementation.

	Baseline Annual	State Annual	Baseline + State (Annual)	Baseline + State (10-Year)	Other Funding (10-Year)
<b>Projects and Practices</b>	\$376,000	\$530,000	\$906,000	\$9,060,000	\$64,220,000
<i>Project Development</i>	\$131,000	\$150,000	\$281,000	\$2,810,000	
<i>Technical Assistance</i>	N/A	\$100,000	\$100,000	\$1,000,000	
<b>Research and Data Gaps</b>	\$26,000	\$25,000	\$51,000	\$510,000	N/A
<b>Education and Outreach</b>	\$277,000	\$25,000	\$302,000	\$3,020,000	\$20,000
<b>Local Controls</b>	\$247,000	\$0	\$247,000	\$2,470,000	N/A
<b>Capital Improvements</b>	\$310,000	\$50,000	\$360,000	\$3,600,000	N/A
Operations and Maintenance	\$42,000	\$0	\$42,000	\$420,000	N/A
Plan Administration	N/A	\$120,000	\$120,000	\$1,200,000	N/A
<b>Total Cost</b>	<b>\$1,409,000</b>	<b>\$1,000,000</b>	<b>\$2,409,000</b>	<b>\$24,090,000</b>	<b>\$64,240,000</b>



Figure 5-3 below shows the benefits of meeting plan goals through implementation of actions in this plan.

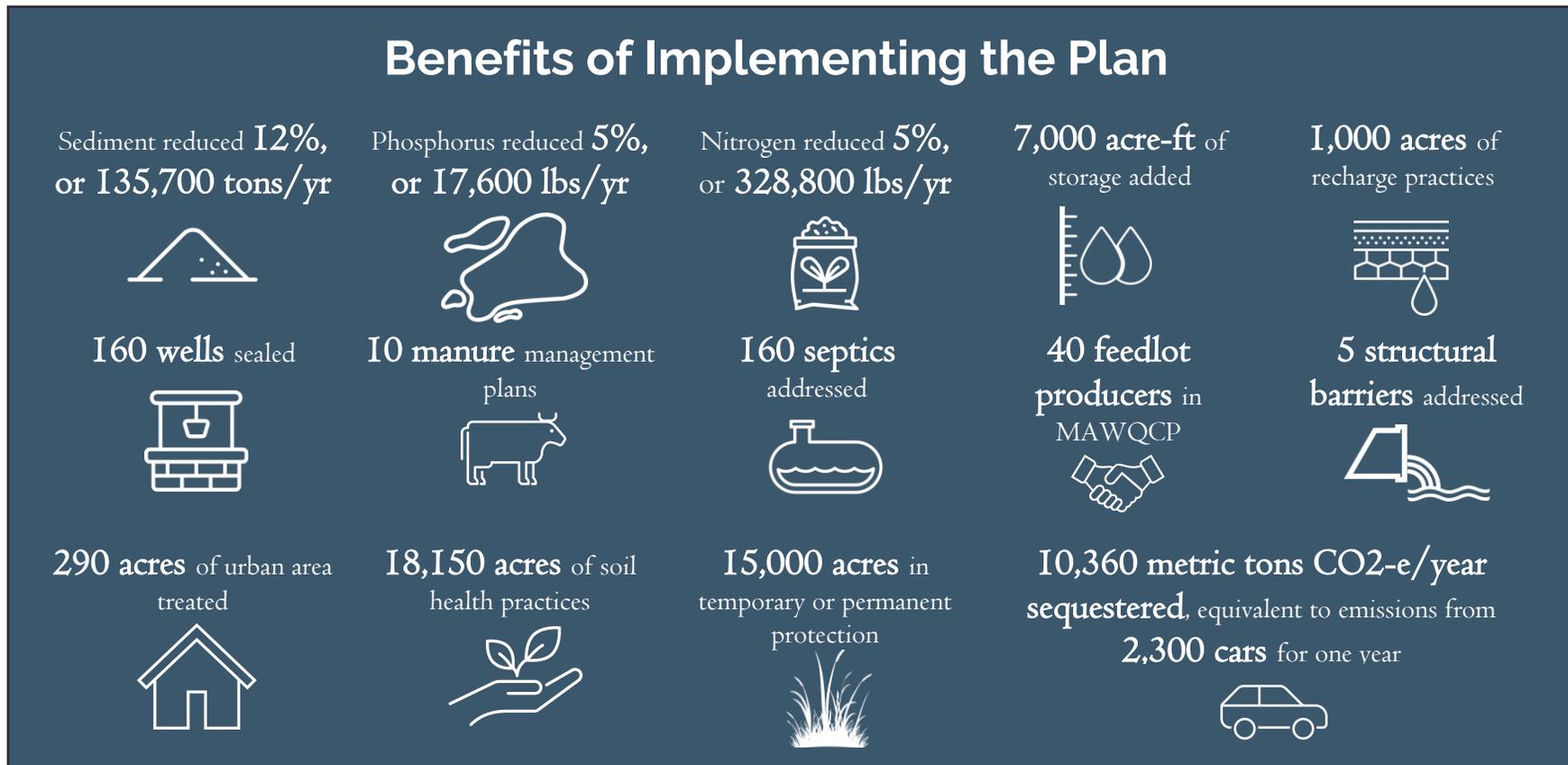


Figure 5-3: Benefits of implementing the CMMW CWMP.

As previously stated, this plan’s actions and goals are primarily focused on what is realistic to accomplish with predictable local and state funding resources. Some actions in the plan also rely on other sources of funding from partnering entities and federal dollars, largely focused on enrolling or re-enrolling land in temporary or permanent easements.



The actions and goals included in this plan do not account for implementation activities that will be funded by other federal programs such as NRCS. During implementation efforts, NRCS funding is projected to augment implementation of agricultural and multi-benefit storage conservation practices, as well as soil health and non-structural management practices. Programs available to assist implementation of these actions include Regional Conservation Partnership Program (RCPP), Conservation Stewardship Program (CSP), and Environmental Quality Incentives Program (EQIP). Based on 2023-2024 watershed data provided by NRCS, **an additional \$25,870,000 over the 10-years of this plan is expected to support implementation efforts through these NRCS programs.** Estimated benefits arising from this additional funding are summarized in **Figure 5-4** below. Numbers provided are cumulative, and include the sediment, phosphorus, and nitrogen benefits from **Figure 5-3** as well.

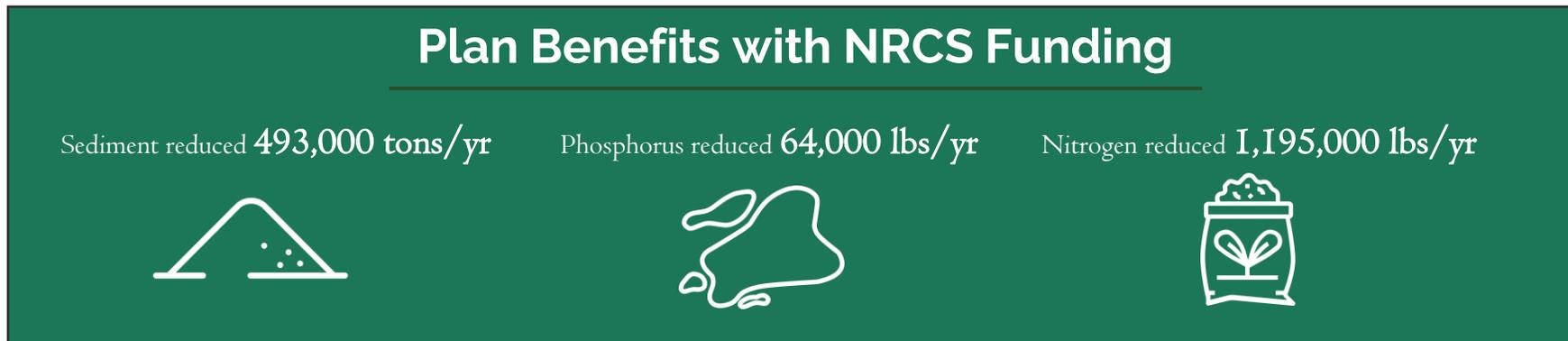


Figure 5-4: Estimated benefits of implementing the plan with additional NRCS funding



## 6. Implementation Programs

# Section 6. Implementation Programs

The CWMP will be implemented through five implementation programs: Projects and Practices, Education and Outreach, Research and Data Gaps, Local Controls, and Capital Improvements. These programs are summarized visually below and will be further discussed throughout this plan section.



Figure 6-I: CMMW Plan Programs.

## Projects and Practices



The Projects and Practices Implementation Program deals with actions related to landscape planning, design, and implementation of conservation practices. It also funds or incentivizes the protection of land. The program assists landowners in implementing voluntary actions through cost share, financial assistance, technical assistance, tax exemption, conservation easement, or land acquisition, and is funded by local, state, and federal dollars.

During implementation, local planning partners will create decision-making processes, such as a ranking and scoring sheet that ranks ‘best’ projects based on priority location and benefits to resources. This method can then be used to select projects and practices for funding. A grant policy document will also be developed to specify funding categories and how much funding practices may receive. This will be completed in conjunction with the local Policy Committee. Funding will be preferentially given to projects and practices identified within the action tables and in priority areas. Future plan amendments may be suggested, consistent with the priority issues and goals established in this plan (more details in **Section 7 – Plan Administration and Coordination**).



*Cottonwood River Prairie SNA (Photo Credit: Minnesota Seasons)*

## Cost-Share and Conservation Incentives

Cost-share programs are available at the local, state, and federal level to financially assist landowners with the cost of installing a project or practice that accrues natural resource benefits. Projects and practices can be structural (i.e., grassed waterways, controlled drainage) or nonstructural (i.e., nutrient management, conservation tillage).

Operations and Maintenance of cost-share projects will be required, as regular on-site inspections and maintenance will ensure the project’s continued function and success. BWSR’s recommended inspection plans, according to the Grants Administration Manual (GAM), includes a conservation practice with a minimum effective life of 10 years. With this practice, inspections are recommended after certified completion at the end of years 1, 3, and 9. Operation and maintenance will be the responsibility of the project owner.

## Land Protection

Land protection programs maintain existing acres within the watershed through temporary set-aside programs or land rental. Land protection can be temporary or permanent easements. There are many state-, federal-, partner-funded, and other perpetual easements of value in the plan area. One example of a temporary protection program is CRP.

CRP is a land conservation program administered by Farm Service Agency (FSA). In exchange for a yearly rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. Contracts for land enrolled in CRP are 10-15 years in length. Land enrolled in CRP and similar protection programs produce numerous environmental benefits including a reduction in runoff, erosion, and nutrients.



*Cottonwood River Prairie SNA (Photo Credit: Minnesota Seasons)*

## Education and Outreach



Implementation of actions in this plan is voluntary and requires willing landowner participation. As such, public participation and engagement are essential for successful implementation. The Education and Outreach Implementation Program funds actions to increase engagement, understanding, and address conservation barriers. The program builds on a foundation of engagement activities already occurring in the watershed through individual partners. This work is expected to continue during plan implementation.

Examples of education and outreach efforts include:

- Youth engagement
  - Earth Day events
  - 4H camps
  - Envirothon events
  - Environmental fairs
- Landowner engagement
  - Field days
  - Demonstrations
  - Workshops tailored to landowners, i.e., lakeshore stabilization, and drinking water testing
- Direct mailings and social media posts



*RCRCA Canoe Trip (Photo Credit: RCRCA)*

## Research and Data Gaps



The Research and Data Gaps Program funds actions that close data gaps to allow for effective and more informed implementation. The program also funds ongoing monitoring efforts aimed at tracking resource conditions and impacts of conservation action.

Currently, a variety of monitoring programs are carried out by multiple government and local organization levels (**Table 6-I**). Data from monitoring efforts were essential in



understanding the current conditions of surface water, groundwater, habitat, as well as developing the goals in this plan.

**Table 6-I: Summary of ongoing water quality and quantity monitoring programs.**

Key: RS = rivers and streams, L = lakes, W = wetlands, and GW = groundwater

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

Source: BWSR

As summarized in **Table 6-I**, ongoing surface water monitoring programs are led by local and state entities. Between the MPCA, local entities, and citizens (through the Citizen Lake Monitoring Program and Citizen Stream Monitoring Program), streams and lakes throughout the CMMW were monitored and findings were shared in the Cottonwood River Watershed and MRMW WRAPS reports. Other agencies responsible for stream gauging in the watershed are MPCA, DNR, MDA, and the federal United States Geological Survey (USGS). Four Watershed Pollutant Load Monitoring Network (WPLMN) sites within the CMMW are benchmark monitoring sites for MPCA. Results from these networks and other ongoing tracking and monitoring programs can be used to document measurable water quality and quantity changes resulting from implementation activities (**Table 6-2**).

Examples of research and data gap actions include:

- Mapping the 10-year floodplain
- Creation of septic and abandoned well inventories
- Complete a microbial source assessment study
- Study stormwater runoff entering rivers

A full list of research and data gap actions is included in **Section 5 – Implementation**.

**Table 6-2: Data levels used to track implementation progress.**

Level	Description	CMMW Application
 <b>Tracking</b>	Tracking the number of practices or acres treated by actions.	Outputs to track are listed for each action in the targeted implementation schedules. Projects will be reported in eLINK.
 <b>Estimating</b>	Using lower resolution calculators and tools to give a sense of the collective impacts of projects.	PTMApp
 <b>Modeling</b>	Incorporating landscape factors and project information to predict future conditions.	PTMApp
 <b>Measuring</b>	Using field-collected information to assess the condition of the water.	WRAPS Cycle 2 in 2024 and 2027.
 <b>Proving</b>	Having enough data to compare with standards and decide if a resource is improved.	MPCA impaired waters list update in 2024, 2026, 2028, 2030, 2032. Implementation partner annual work planning.

Ongoing monitoring efforts also track groundwater supply quantity and quality trends. Current programs include Public Water Supplier Monitoring, MDA's township testing, MPCA's Ambient Groundwater Monitoring Program, DNR high-capacity permitting



program, and the DNR Observation Well Network. These programs have provided valuable information but are not yet extensive enough to fully assess the state of groundwater in the region.

Participating LGUs recognize that project funds are limited and requests for information, tracking, evaluation, and assessment are activities that require staff time and office resources, decreasing the amount of funds available for projects. Outside of projects through watershed-based implementation funds, each LGU will be responsible for providing assessment, tracking, evaluation, and reporting data for their own organization's activities. The Research and Data Gaps Program will be collaborative (especially where efforts cross administrative boundaries), with Partnership entities sharing services wherever possible.

## Capital Improvements



A capital improvement is defined as a major non-recurring expenditure for the construction, repair, retrofit, or increased utility or function of physical facilities, infrastructure, or environmental features. The life expectancy of these projects is generally at least 25 years. Some capital improvements are beyond the 'normal' financial means of the Partnership, often exceeding \$250,000, and are unlikely to get constructed without external funding.

Proposed capital improvements are shown in **Section 5 - Implementation**. Members of the Policy Committee or the Partnership's individual and representative Boards may discuss the means and methods for funding new capital improvements with potential funding partners. Capital improvement projects (CIPs) completed through this plan will be operated and maintained by the owner of the project for its lifespan. Signage for completed projects is encouraged to acknowledge larger projects and funding sources to the public.

As highlighted throughout this plan, public drainage systems are prevalent throughout much of the plan area. Drainage authorities help coordinate implementing the action tables to make progress towards plan goals. Based on this arrangement, drainage authorities could access implementation funds to adopt drainage actions in the action tables during I03D and I03E processes and procedures when the opportunity arises within the planning area. I03B.335 (special taxing district) also allows for these types of projects.

## Operations and Maintenance



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

## Local Controls



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

Participating counties are encouraged to meet and discuss ordinances and notify each other of proposed ordinance amendments. These entities may also review local ordinances that are most relevant to the plan’s issues, goals, and actions. They will look for similarities and differences in local regulatory administration to identify local successes and identify future changes needed to make progress towards goals. A comparison of how local ordinances are used to administer statutory responsibilities most relevant to the issues, goals, and actions in this plan is provided in **Appendix I**.

## Aquatic Invasive Species

The spread of Aquatic Invasive Species can be reduced by management and education. The DNR is in charge of AIS enforcement. Counties receive grants for AIS programs and SWCDs partner with counties for AIS outreach and education programs.

## Buffers

In 2015, Minnesota enacted legislation requiring buffers of perennial vegetation of an average of 50 feet with a minimum of 30 feet on public waters and 16.5 feet for public drainage systems. This program is regulated by BWSR and implemented at the county level. Each county has an ordinance for buffer management, and SWCDs conduct buffer compliance checks.



## Construction Erosion Control

Temporary construction erosion control is the practice of preventing and/or reducing the movement of sediment from a site during construction. All construction projects should follow construction BMPs, but projects disturbing one acre or more of land will require a National Pollutant Discharge Elimination System (NPDES) Permit and Stormwater Pollution Prevention Plan from the MPCA.

## Comprehensive Land Use Plans

Counties are responsible for land use planning, which is administered through local zoning ordinances. Each county and many cities have adopted comprehensive land use plans. Many LGUs in the watershed overlap in land and resource management, resulting in the need for shared goals and strategies. A sample of comprehensive land use plans in the watershed is listed in **Table 6-3**.

**Table 6-3: Example list of local comprehensive land use plans.**

LGU	
Cottonwood County	Cottonwood County Comprehensive Plan (2005)
Murray County	Murray County Comprehensive Plan (2016)
Lyon County	Lyon County Comprehensive Plan (2002)
Redwood County	Redwood County Comprehensive Plan (2007)
Brown County	Brown County Comprehensive Plan (updated 2024)

## Feedlots

MPCA rules govern the collection, transportation, storage, processing, and land application of animal manure and other livestock operation wastes. The MPCA administers the feedlot program in Redwood County. Brown, Cottonwood, Murray, and Lyon Counties are delegated to administer the MPCA feedlot program.



## Floodplain Management

Floodplain zoning regulations manage development in the floodplain to minimize loss of life and property, disruption to government services and the local economy, and interruption of transportation. The DNR has current flood maps on their website. All CMMW counties have floodplain ordinances.

## Hazard Management

Hazard mitigation may be defined as any action taken to eliminate or reduce the future risk to human life and property from natural and human-caused hazards. Climate change adaptation also plays a part in hazard management. These requirements direct the state to administer cost-sharing. Each County has a Hazard Mitigation Plan.

## Public Drainage Systems

Minnesota Drainage Law (Statute 103E) enables multiple landowners to collectively construct, improve, and repair drainage systems across property boundaries and governmental boundaries. These drainage systems can be open ditches and/or subsurface tile. Drainage systems have their own laws and requirements that LGUs must uphold. These ditches are managed by the county for the benefit of the landowners. Counties maintain the public drainage systems (tile drainage and ditches) and repair failing drainage systems when necessary. Counties should follow criteria outlined in Statute §103E.015 for early consideration and coordination of multipurpose drainage management.

## Shoreland Management

Minnesota has shoreland management rules that are administered by the DNR. LGUs are required to have land use controls that protect shorelands along lakes and rivers, and they can adopt stricter ordinances than the state's, if desired. Each County in the CMMW has approved shoreland management ordinances.

## Subsurface Sewage Treatment Systems

Each county has SSTS ordinances. SSTS are often noncompliant with ordinances or failing to treat waste. Maintenance and upgrades of SSTS will be important for reducing bacteria and nutrient loads. Low interest loans and low-income grants are available from the county for replacements or upgrades.



## Solid Waste Management

Counties in the watershed (apart from Brown) jointly created a 10-year plan for managing solid waste. Solid waste management in Minnesota is managed at the county level and includes programs related to mixed municipal solid waste, industrial waste, and non-landfill programs such as recycling to include paper, plastics, metal, tires, electronics, appliances, and other recyclable items. Brown County has its own 10-year plan for managing solid waste.

## Wellhead Protection

The purpose of the Wellhead Protection Program is to prevent contamination of public drinking water supplies by identifying water supply recharge areas and implementing management practices for potential pollution sources found within those areas. MDH is responsible for statewide administration. The program has since expanded to conduct Source Water Assessments and Surface Water Intake Protection Plans for public water supply systems that rely on surface water as a drinking water source.

## Wetland Conservation Act

The Minnesota Legislature passed the Wetland Conservation Act (WCA) in 1991, which requires no net loss of wetlands. It aims to increase the quantity and quality of wetlands that provide numerous ecological and economic benefits to Minnesotans. LGUs are responsible for administering the WCA, which includes regulating and educating landowners. The SWCD is the WCA LGU for all plan counties except Brown, where the county is the WCA LGU.

## Wastewater Treatment

Managing wastewater is an important aspect of urban communities. There are 15 permitted facilities discharging wastewater in the Cottonwood River Watershed HUC-8 (likely more in the Minnesota – River Mankato HUC that is partially in the CMMW). Municipal wastewater treatment is the responsibility of the city or county owner, but MPCA regulates NPDES discharges from permitted facilities.



## 7. Plan Administration and Coordination





# Section 7. Plan Administration and Coordination

The CMMW CWMP will be implemented through a Joint Powers Agreement. Entities involved in the Joint Powers Agreement include the counties and SWCDs of Brown, Cottonwood, Lyon, Redwood and Murray. While not a part of the formal agreement, the City of Springfield, the RCRCA, and Area II remain important local collaborators during plan implementation.

While the roles of each implementation partner are outlined initially in this section, it is the ultimate responsibility of LGUs to fill their roles in plan implementation based on established bylaws. The roles of the Partnership, how the plan will be funded, and the assessment process are explained in this section.



 <b>Planning</b> Planning MOA		 <b>Implementation</b> Joint Powers Agreement	
<ul style="list-style-type: none"> <li>Cottonwood County</li> <li>Cottonwood SWCD</li> <li>Brown County</li> <li>Brown SWCD</li> <li>Redwood County</li> <li>Redwood SWCD</li> </ul>	<ul style="list-style-type: none"> <li>Murray County</li> <li>Murray SWCD</li> <li>Lyon County</li> <li>Lyon SWCD</li> <li>RCRCA</li> <li>Area II</li> <li>City of Springfield</li> </ul>	<ul style="list-style-type: none"> <li>Cottonwood County</li> <li>Cottonwood SWCD</li> <li>Brown County</li> <li>Brown SWCD</li> <li>Redwood County</li> <li>Redwood SWCD</li> </ul>	<ul style="list-style-type: none"> <li>Murray County</li> <li>Murray SWCD</li> <li>Lyon County</li> <li>Lyon SWCD</li> </ul>

# Decision Making

Implementation of the CMMW CWMP will require increased capacity, funding, and coordination from current levels. Successful implementation will depend on continuing and building on partnerships in the watershed with landowners, planning partners, state agencies, and organizations.

Two committees serve this plan during implementation:

- **Policy Committee:** As established in the Joint Powers Entity, the Policy Committee is comprised of elected and appointed board members from the SWCDs and counties.
- **Steering Committee:** Comprised of local staff from the Joint Powers Entity (with their respective alternates) and state agencies, with input from local stakeholders.

Figure 7-I outlines the probable roles and functions of these committees during implementation. Expectations are that the roles of each committee will shift and change focus during implementation. Fiscal and administrative duties may be assigned to a member LGU through a Policy Committee decision as outlined in the formal agreement. The Steering Committee will annually revisit the responsibilities for annual work planning and serving as the fiscal agent and/ or coordinator.

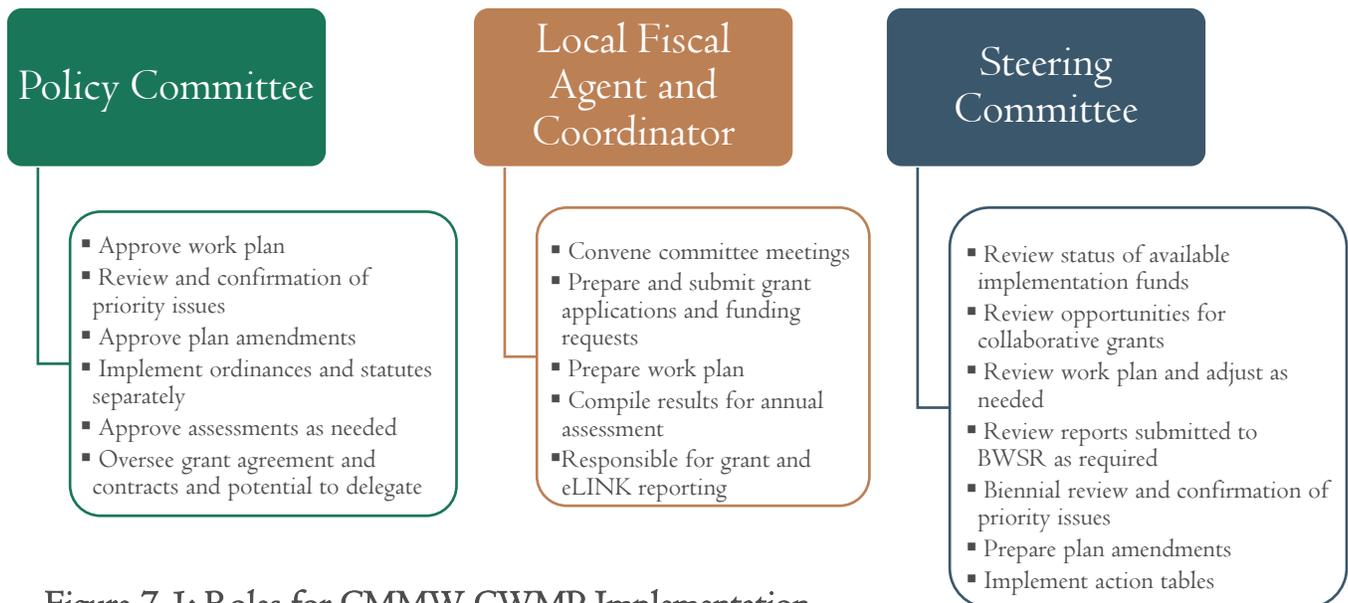


Figure 7-I: Roles for CMMW CWMP Implementation.



# Collaboration

## Between Planning Partners

Although collaboration informally and formally is encouraged, mandatory participation is not required by this plan. LGUs who adopt this CWMP can choose whether to approve or participate in future formal implementation agreements. The benefits of successful collaboration between planning partners will ultimately result in additional water quality benefits, including consistent implementation of actions watershed-wide, increased likelihood of funding, and resource efficiencies gained. The Partnership will pursue opportunities for collaboration with fellow planning partners to gain administrative and program efficiencies, pursue collaborative grants, and provide technical assistance. The Partnership will also review similarities and differences in local regulatory administration to identify successes as well as future changes needed to make progress towards the goals outlined in this plan. However, there are costs associated with collaboration—for example, increased meeting and travel time; increased tracking, assessment, evaluation, and reporting requirements; a decrease of efficiency when actions must be coordinated in concert with IO separately governed organizations, and possible increases to project completion timelines.

## With Other Units of Government

The Partnership will continue coordination and cooperation with other governmental units. This cooperation and coordination occurs both at the local level and at the state/federal level. At the state/federal level, coordination between the Partnership and agencies such as BWSR, US Army Corps of Engineers, DNR, MDH, MDA, and the MPCA are mandated through legislative and permit requirements. Local coordination between the Partnership and comparable units of government, such as municipalities, city councils, township boards, and county boards are a practical necessity to facilitate watershed-wide activities. Intergovernmental coordination and communication are essential for the Partnership to perform its required functions. The Partnership will continue to foster an environment that enhances coordination and cooperation to the maximum extent possible throughout plan implementation.



## With Others

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

## Funding

As introduced this plan recognizes and includes three funding levels (Table 7-I).

**Table 7-I: Funding Overview.**

Funding Level	Type	Estimated Annual Average	Estimated 10-Year Total
1	Baseline	\$1,409,000	\$14,090,000
2	Baseline + State Funding	\$2,409,000	\$24,090,000
3	Other Funding	\$6,424,000	\$64,240,000

Baseline funding is based on the estimated annual revenue and expenditures for plan participants combined and allocated to the plan area based on the percentage of each county's land area in the watershed. Baseline includes local, state, and federal funding as explained in the following sections and summarized in Table 7-2. Federal sources of funding from NRCS like EQIP and CRP are not include in baseline funding estimates.

**Table 7-2: Estimated sources of funding for Funding Level I (Baseline) for the CMMW CWMP. Dollars are for 10 years and are estimated from the historical baseline.**

Implementation Program	Local	State	Federal	Total
Projects and Practices	\$1,027,000	\$4,037,000	*	\$5,064,000
Research and Data Gaps	\$117,000	\$44,000	\$105,000	\$266,000
Education and Outreach	\$661,000	\$2,113,000	*	\$2,774,000
Local Controls	\$489,000	\$1,983,000	*	\$2,472,000
Capital Improvements	\$1,088,000	\$2,013,000	*	\$3,101,000
Operations and Maintenance	\$0	\$417,000	*	\$417,000
Total	\$3,382,000	\$10,607,000	\$105,000	\$14,094,000

\* Federal funding with variable annual amount



## Local Funding

Local revenue is defined as money derived from either the local property tax base or in-kind services of any personnel funded from the local tax base. Examples include local levy, county allocations, and local match dollars (see Local Funding Authorities in **Appendix J**).

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

## State Funding

State funding includes all funds derived from the State tax base. Examples of state funding include conservation delivery, soil health cost share, state cost share program, Clean Water Funds, and SWCD local capacity services. WBIF is also anticipated to be a large source of state funding during implementation.

The planning Partnership may apply as an entity for collaborative grants, which may be competitive or non-competitive. The assumption is that future base support for implementation will be provided to the CMMW as non-competitive WBIF grants (Level 2). Where the purpose of an implementation program aligns with the objectives of various state, local, non-profit, or private programs, these dollars will be used to help fund the implementation programs described by this plan.

## Federal Funding

Federal funding includes all funds derived from the Federal tax base. Federal funding like EQIP and CRP are important components of implementing this plan, but are not calculated as part of the Baseline estimate. Partnerships with federal agencies are an important resource for ensuring implementation success. An opportunity may exist to leverage state dollars through some form of federal program. Where the purpose of an implementation program aligns with the objectives of various federal agencies, federal dollars will be used to help fund the implementation programs described by this plan. For example, as summarized in **Figure 5-4**, the NRCS will likely provide support for agricultural conservation practices, while the FSA may provide land-retirement program funds such as CRP.



## Additional Funding

Current programs and funding (Funding Level I) will not be enough to implement the action tables. As such, the success of implementing the plan will depend on collaboratively sought competitive state, federal, and private grant dollars, and increased capacity.

Plan participants may pursue grant opportunities collaboratively or individually to fund implementation. Within the action table, actions are assigned implementation programs.

**Table 7-3** shows the most used state and federal grants for executing the actions described by this plan cross-referenced to plan implementation programs, thereby showing potential sources of revenue for implementation.

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

**Table 7-3: Example funding sources for the CMMW. Note: List is not all-inclusive.**

Program / Grant		Primary Assistance	Projects and Practices	CIPs	Research and Data Gaps	Ed. and Outreach
Federal Programs / Grants						
NRCS	Conservation Innovation Grant (CIG)	Financial	•			
	Conservation Stewardship Program (CSP)	Financial	•			
	Regional Conservation Partnership Program (RCPP)	Financial	•	•		
	Environmental Quality Incentives Program (EQIP)	Financial	•			
	Agricultural Conservation Easement Program (ACEP)	Easement	•			
FSA	Conservation Reserve Program (CRP)	Easement	•	•		
	Farmable Wetlands Program (FWP)	Easement	•			
	Grasslands Reserve Program (GRP)	Easement	•			
	Wetland Reserve Program (WRP)	Easement	•	•		



Program / Grant		Primary Assistance	Projects and Practices	CIPs	Research and Data Gaps	Ed. and Outreach
FSA/USDA	Source Water Protection Program (SWPP)	Technical				•
USFWS	Partners for Fish and Wildlife Program	Financial/Technical	•			
	Grassland Easements (Working Lands)	Financial/Technical	•			
	Wetland Easements (Working Lands)	Financial/Technical	•			
FEMA	Hazard Mitigation Grant Program (HMGP)	Financial	•	•		
	Pre-Disaster Mitigation (PDM)	Financial	•	•		
	Flood Mitigation Assistance (FMA)	Financial	•	•		
	Risk Mapping, Assessment, and Planning	Technical	•	•		
EPA	Water Pollution Control Program Grants (Section 106)	Financial				•
	State Revolving Fund (SRF)	Loan	•			
	Drinking Water State Revolving Fund (DWSRF)	Loan	•			
	Section 319 Grant Program	Financial	•		•	•
NACD	Technical Assistance Grants	Financial/Technical	•	•	•	•
State Programs / Grants						
LSOHF	Lessard-Sams Outdoor Heritage Fund (LSOHF)	Financial	•	•	•	•
DNR	Aquatic Invasive Species Control Grant Program	Financial/Technical	•			•
	Conservation Partners Legacy Grant Program	Financial	•	•		
	Pheasant Habitat Improvement Program (PHIP)	Financial	•			
	Flood Hazard Mitigation Grant Assistance	Financial	•	•	•	•
	Forest Stewardship Program	Technical	•			
	Aquatic Management Area Program	Acquisitions	•			
	Wetland Tax Exemption Program	Financial	•			
BWSR	Clean Water Fund Competitive Grants	Financial	•	•		•
	Erosion Control and Water Management Program	Financial	•			
	SWCD Capacity Funding	Financial	•		•	•
	Natural Resources Block Grant (NRBG)	Financial	•			•
	Reinvest in Minnesota (RIM)	Financial	•	•		•
	Watershed Based Implementation Funding (WBIF)	Financial	•		•	•



Program / Grant		Primary Assistance	Projects and Practices	CIPs	Research and Data Gaps	Ed. and Outreach
MPCA	Surface Water Assessment Grants (SWAG)	Financial			•	•
	Clean Water Partnership	Loan	•	•		
	WRAPS Clean Water Fund	Technical			•	•
MDH	Source Water Protection Grant Program	Financial	•	•	•	•
	Public and Private Well Sealing Grant Program	Financial	•		•	
MDA	Agriculture BMP Loan Program	Financial	•			
	Minnesota Agricultural Water Quality Certification Program	Financial / Technical	•			•
	Nutrient Management Initiative (NMI)	Financial	•			
	Soil Health Financial Assistance Program Grant	Financial	•			
Other Funding Sources						
Pheasants Forever		Financial/ Technical	•	•	•	•
Ducks Unlimited		Financial/ Technical	•	•	•	•
The Nature Conservancy		Financial	•	•	•	•
Minnesota Land Trust		Financial	•	•	•	•

Plan participants may pursue grant opportunities collaboratively or individually to fund the action table’s implementation. Four example collaborative partner grant opportunities (relevant as of 2024) are presented on the following page and are intended to demonstrate how plan goals and actions can connect to these opportunities.

### Watershed Based Implementation Funding Grant

BWSR has non-competitive WBIF grant funds available upon implementation of this CWMP. WBIF is estimated at \$1,000,000 per year at the time of plan writing.

- WBIF will be used to fund actions within each goal

WBIF is anticipated to be a large source of state funding during implementation, however, WBIF alone will not be adequate to implement all actions in this plan.



### Soil Health Grants

BWSR has Clean Water Fund and delivery grants to support soil health practices for SWCDs, municipalities, and counties.

- Directly connects to the “Sediments and Nutrients” and “Soil Health” goals and actions.



### Water Quality and Storage Grant

The Water Quality and Storage Grant Program is a pilot program through BWSR, through which municipalities, SWCDs, or joint powers with a water management plan may receive funding for water storage projects.

- Directly connects to “Storage, Flooding, and Hydrology” goal and actions.



### Climate Resiliency



MPCA has climate-planning grants for communities to improve stormwater or wastewater system resilience, reduce flood risk, and adapt community services, ordinances, or spaces.

- Directly connects to “Water Storage and Hydrology” and “Stormwater” goal and actions.

### 1W1P RIM Reserve



BWSR expanded the RIM conservation easement program to create a subset of the program that specifically is for easements that contribute to IWIP plan goals.

- Directly connects to “Protection” goal and actions.



# Work Planning

## Local Work Plan

Work planning is envisioned to align priority issues, funds, and roles and responsibilities for implementation. A work plan will be developed by the fiscal agent and/or coordinator based on the action tables. The work plan will be reviewed by the Steering Committee annually and adjusted to align with grant requests and changes identified through self-assessments. In addition, new issues may emerge and/or new monitoring data, models, or research may become available. Refer to each watershed's WRAPS report. The work plan will then be presented as needed to the Policy Committee. The intent of these work plans will be to maintain collaborative progress toward completing the action tables.

## State Funding Request

The Steering Committee will collaboratively develop, review, and submit a WBIF funding request to BWSR. This request will be submitted to and ultimately approved by the Policy Committee before submitting it to BWSR. The request will be developed based on information in the action tables and any adjustments made through self-assessments.

## Assessments

The Steering Committee will provide the Policy Committee with an annual update on the progress of the plan's implementation. During this annual review process, feedback will be solicited from the boards and Policy Committee. This feedback will be presented by the fiscal agent and/or coordinator to the Policy Committee to set the coming year's priorities for achieving the plan's goals and to decide on the direction for collaborative grant submittals. In addition, this feedback will be documented and incorporated into annual and five-year evaluations.

## Mid-Point Evaluation

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

Executive Summary	Land and Water Resources Narrative	Priority Issues	Measurable Goals	Implementation	Implementation Programs	Plan Administration and Coordination	7-10
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to determine if the current course of action is sufficient to reach the goals of the plan or if a change is necessary.

## Reporting

LGUs currently have a variety of reporting requirements related to their activities, programs, and grants or have those that are required by statute. A number of these reporting requirements will remain the LGUs' responsibility. However, reporting related to grants and programs developed collaboratively and administered under this plan (including WBIF) may be reported by the fiscal agent and/or coordinator. The fiscal agent and/or coordinator is responsible for submitting all required reports and completing annual reporting requirements for this plan as required by state law and policy.

## Plan Amendments

The CWMP is effective through 2034 per the BWSR order approving it. Activities described in this plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation. Amendments to this Plan will follow the most current BWSR IWIP Operating Procedures. This provision for flexibility includes changes to the activities.

During the time this plan is in effect, it is likely that new data giving a better understanding of watershed issues and solutions will be generated. Administrative authorities, state policies, and resource concerns may also change. New information, significant changes to the projects, programs, or funding in the plan, or the potential impact of emerging concerns and issues may require activities to be added to the plan. Amendments may be proposed by member local government units. If revisions are required or requested, the plan amendment initiation process will follow Joint Powers Agreement bylaws.



## Citations

Board of Water and Soil Resources (BWSR), 2023. BWSR Priority Concerns. 16 June 2023. Letter delivered to HEI.

Department of Natural Resources (DNR). N.d. Watershed Health Assessment Framework Interactive Map. Data: Average Temperature, Departure from Historic Average. Available at: <https://arcgis.dnr.state.mn.us/ewr/whaf2/>

Department of Natural Resources (DNR). 2016. Minnesota River Mankato Watershed Characterization Report.

Department of Natural Resources (DNR), 2017. Watershed Context Report, Cottonwood River.

Department of Natural Resources (DNR), 2020. Cottonwood River Watershed Characterization Report

Department of Natural Resources (DNR), 2023a. Minnesota Climate Trends. Available at: <https://arcgis.dnr.state.mn.us/ewr/climatetrends/>

Department of Natural Resources (DNR), 2023b. DNR Priorities for the Cottonwood Middle Minnesota Watersheds. 4 April 2023. Letter delivered to HEI.

Ducks Unlimited Inc. (2022). Restorable Wetlands Inventory. Accessed in GIS.

Environmental Protection Agency (EPA), 2016. What Climate Change Means for Minnesota. Available at: <https://www.epa.gov/sites/default/files/2016-09/documents/climate-change-mn.pdf>

Minnesota Department of Agriculture (MDA), 2023. MDA Priority Concerns. 13 June 2023. Letter delivered to HEI.

Minnesota Department of Health (MDH). 2022. Arsenic in Drinking Water. Available at: <https://www.health.state.mn.us/communities/environment/water/contaminants/arsenic.html>

Minnesota Department of Health (MDH). 2022. Nitrate in Drinking Water. Available at: <https://www.health.state.mn.us/communities/environment/water/contaminants/nitrate.html>



Minnesota Department of Health (MDH). 2023. Initial Comment Letter – Cottonwood-Middle Minnesota River Watershed Planning Project. 16 June 2023. Letter delivered to HEI.

Minnesota River Basin Data Center (MRBDC), 2011. Minnesota River Timeline. Available at: <https://mrbdc.mnsu.edu/minnesota-river-timeline>

Minnesota River Board. 2010. Progress Report: Cottonwood River Watershed.

Minnesota Pollution Control Agency (MPCA), 2022. Cottonwood River Watershed Restoration and Protection Strategy Report. Document number: wq-ws4-93a

Minnesota Pollution Control Agency (MPCA), 2023a. Healthier Watersheds: Best management practices by watershed.

MPCA (Minnesota Pollution Control Agency). 2023b. MPCA Environmental Justice. ESRI File Geodatabase.

Natural Resources Conservation Service (NRCS), n.d. Rapid Watershed Assessment: Cottonwood Watershed.

Petrolia, D., 2006. A Brief Agrarian History of the Cottonwood River Watershed in Southwestern Minnesota. Accessed from AgEcon Search.

Smith, E.A., and Westenbroek, S.M., 2015, Potential groundwater recharge for the state of Minnesota using the Soil-Water-Balance model, 1996-2010: U.S. Geological Survey Scientific Investigations Report 2015-5038, 85 p.,[dx.doi.org/10.3133/sir20155038](https://dx.doi.org/10.3133/sir20155038)

The Nature Conservancy (TNC), 2018. Minnesota Prairie Conservation Plan – Prairie Core Areas, Corridor Complexes, Strategic Habitat Complexes. Accessed in GIS.

United States Geologic Survey (USGS), 2019. National Land Cover Database. Accessed in GIS.

United States Census Bureau (USCB) 2021. American Community Survey 5-Year Estimates County Profiles (Redwood, Cottonwood, Lyon, Murray, Becker). Accessed June 2023.