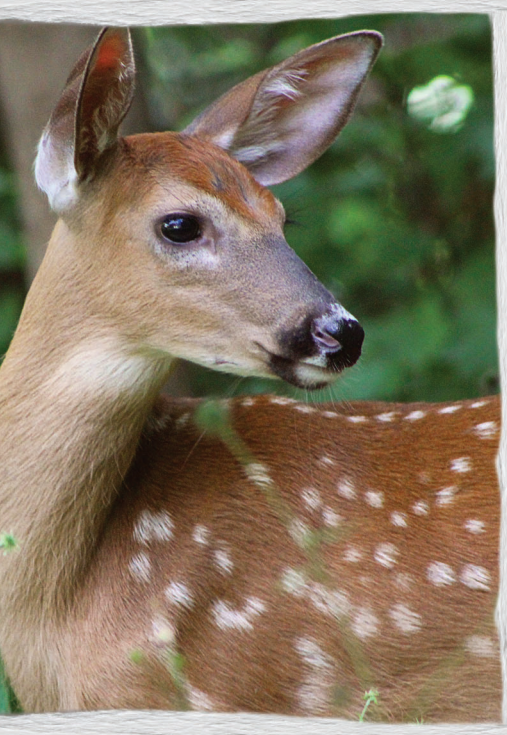
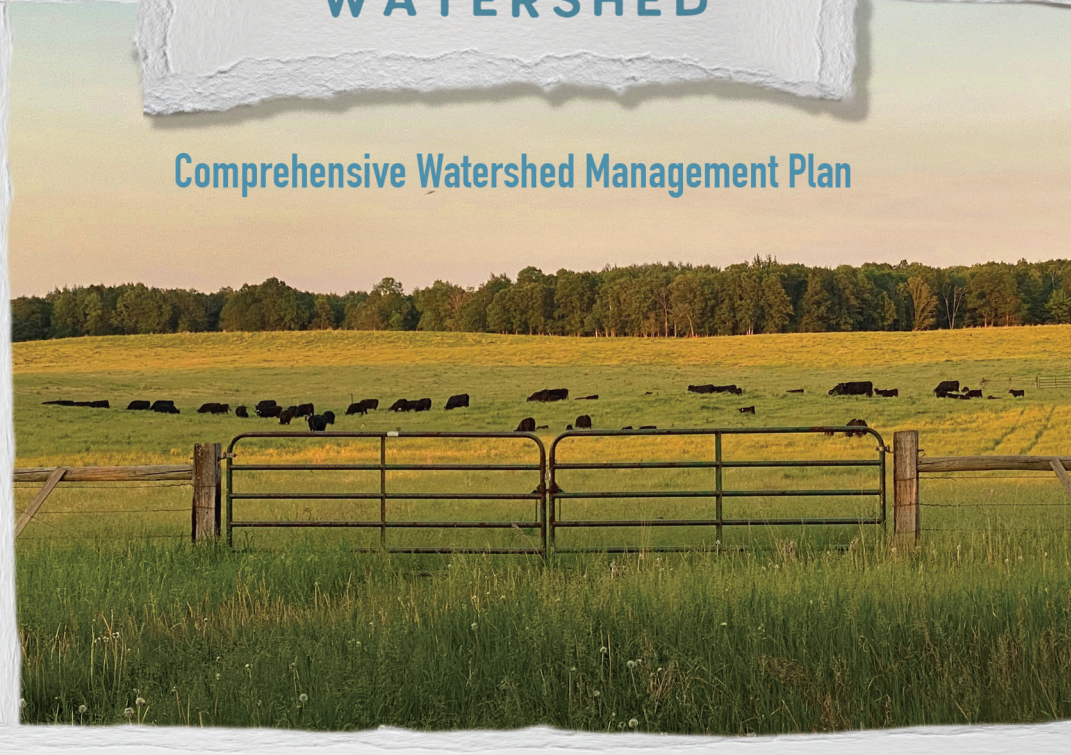
Clearwater River WATERSHED

Comprehensive Watershed Management Plan





CLEAN WATER LAND & LEGACY AMENDMENT

ACKNOWLEDGEMENTS

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Red Lake SWCD
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Funded by

CLEAN WATER LAND & LEGACY AMENDMENT

BWSR

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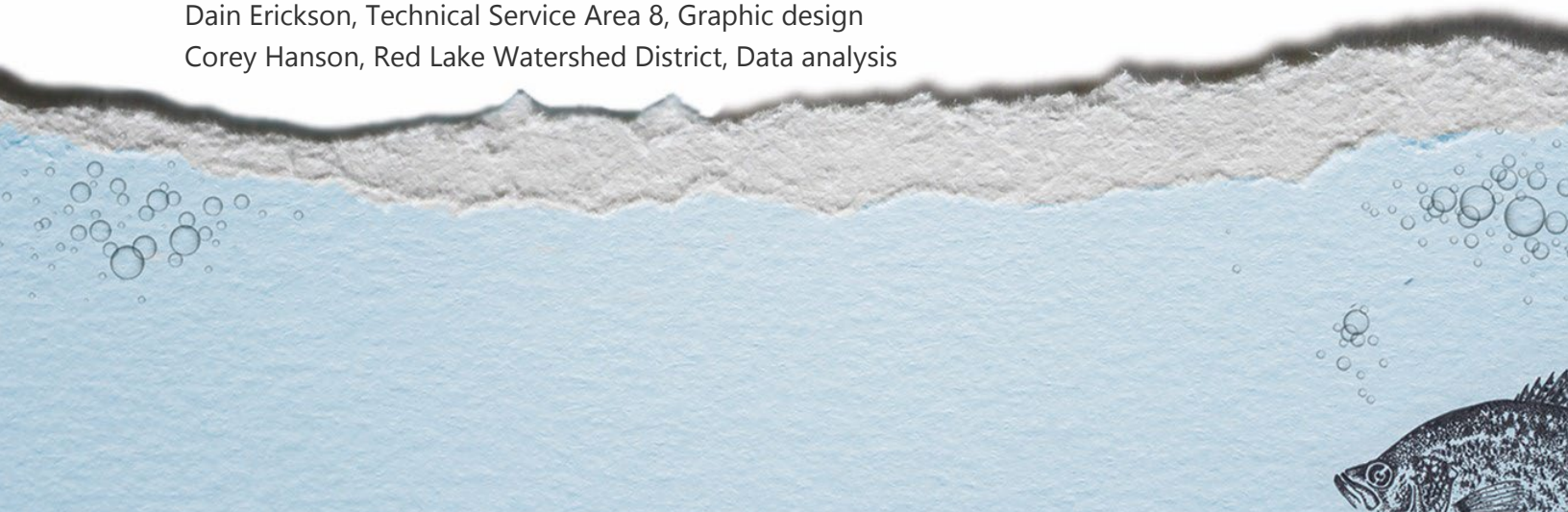

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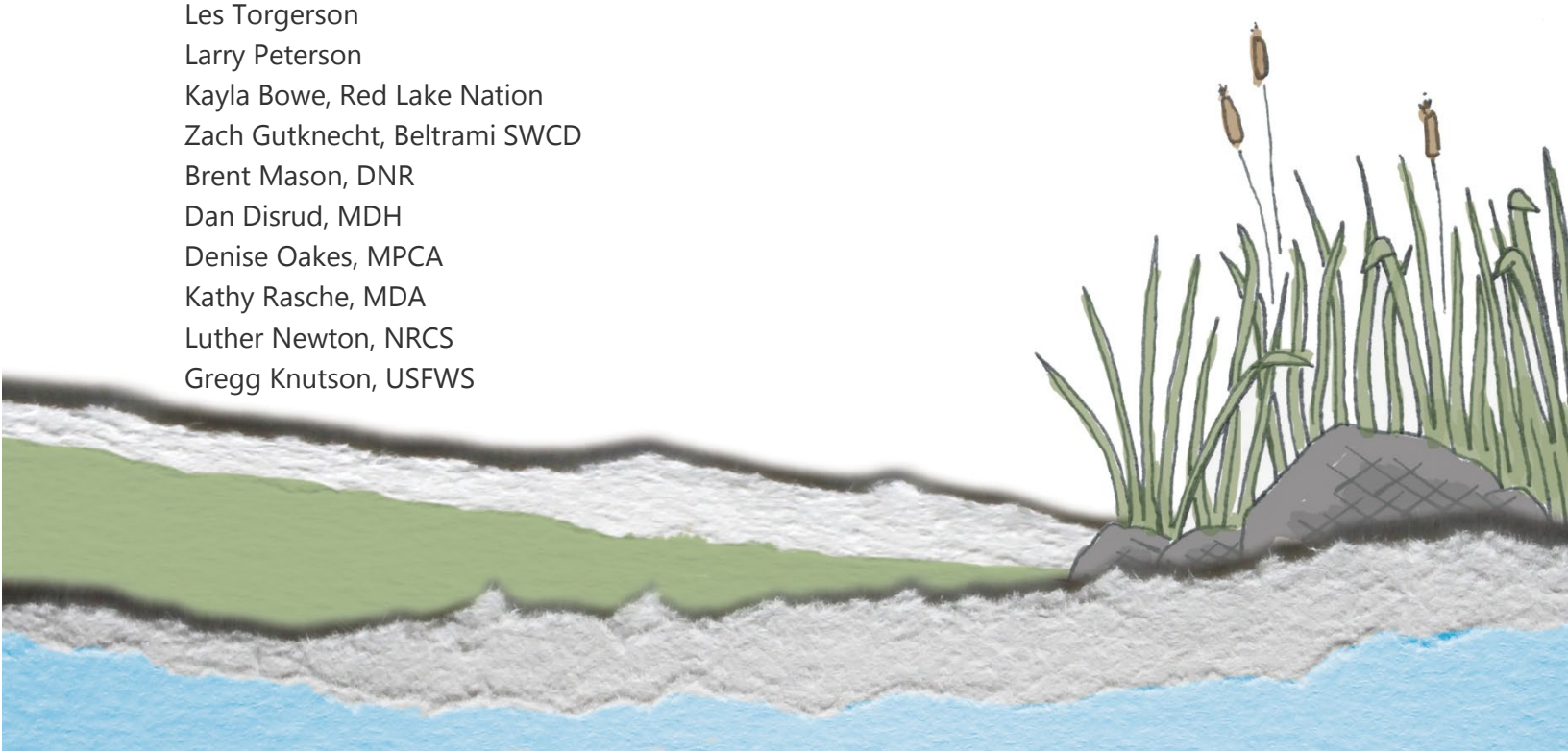

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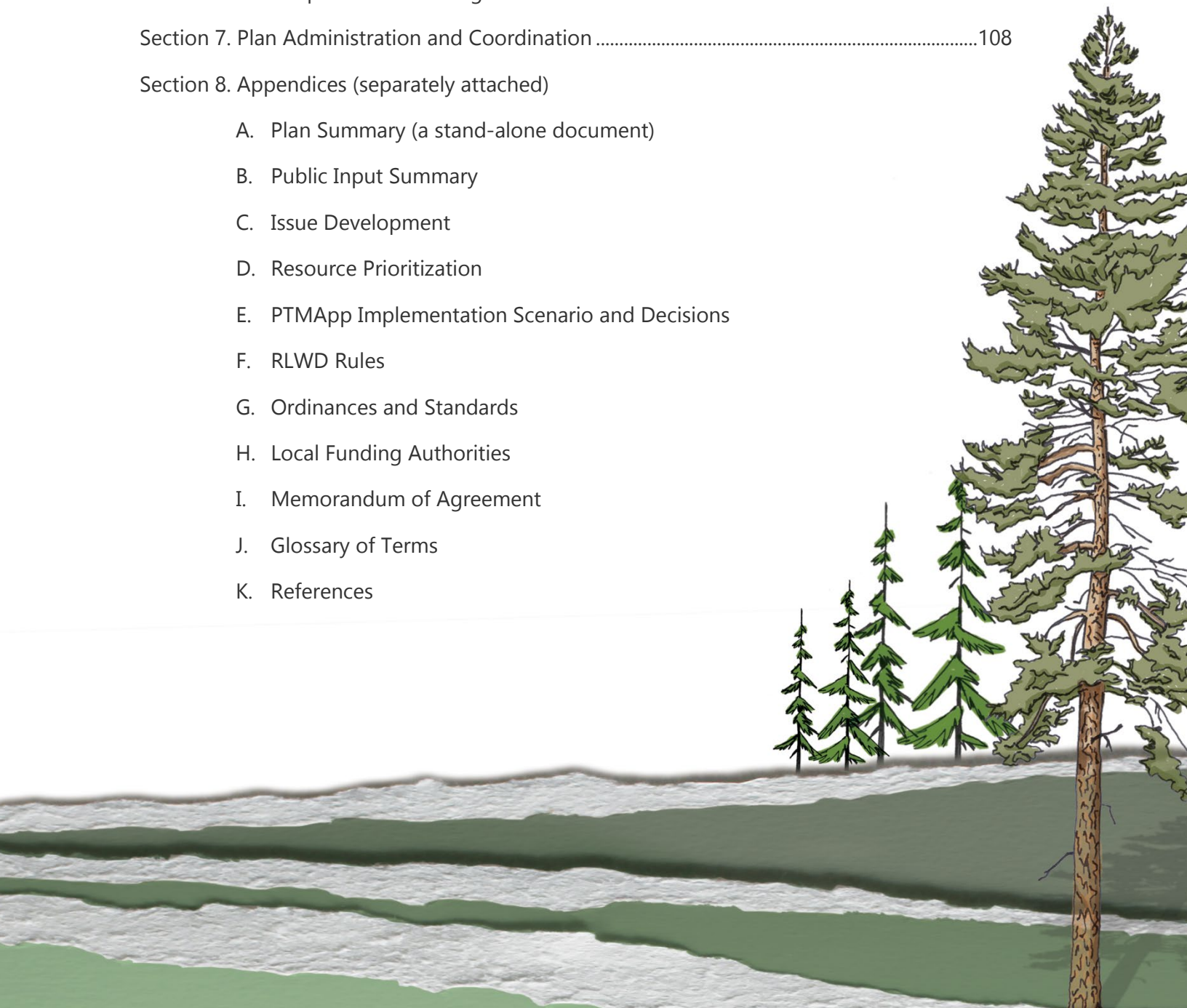


Executive Summary

SECTION 1. EXECUTIVE SUMMARY

The Clearwater River Comprehensive Water Management Plan (CRCWMP) was developed in 2021-2022 through the One Watershed, One Plan program administered by the Board of Water and Soil Resources (BWSR), Minnesota Statutes §103B.801. The purpose of the plan is to guide the watershed managers (local counties, soil and water conservation districts, and watershed district) as they work to protect and restore the watershed's resources.

This plan focuses both on restoration and protection of water quality, hydrology, and habitat. This focus and the diversity of resources is captured in the watershed's vision statement below.

Vision Statement

From the forests in the east to the farmlands in the west, the Clearwater River Watershed hosts a mosaic of recreational and economic opportunities. We aim to sustainably manage our lakes, rivers, forests, farms, and groundwater for future prosperity and enjoyment.

Plan Area

The Plan Area spans portions of six counties in order of percentage in the watershed: Clearwater, Polk, Red Lake, Pennington, Beltrami, and Mahnomen (Figure 1.1 and Figure 1.2). Major towns in the watershed include Bagley, Gonvick, Red Lake Falls, Erskine, and Clearbrook. The White Earth Nation spans a portion of the southern side of the watershed, the Red Lake Nation spans the northeast, and the Red Lake Watershed District covers the entire planning area.

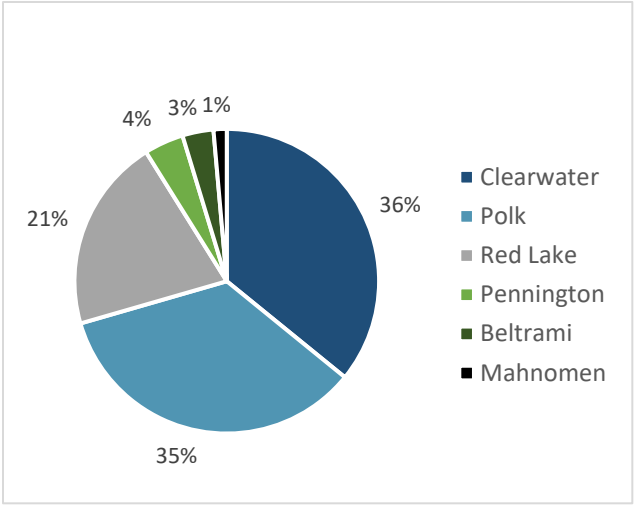


Figure 1.1. Percent of each county in the plan area.

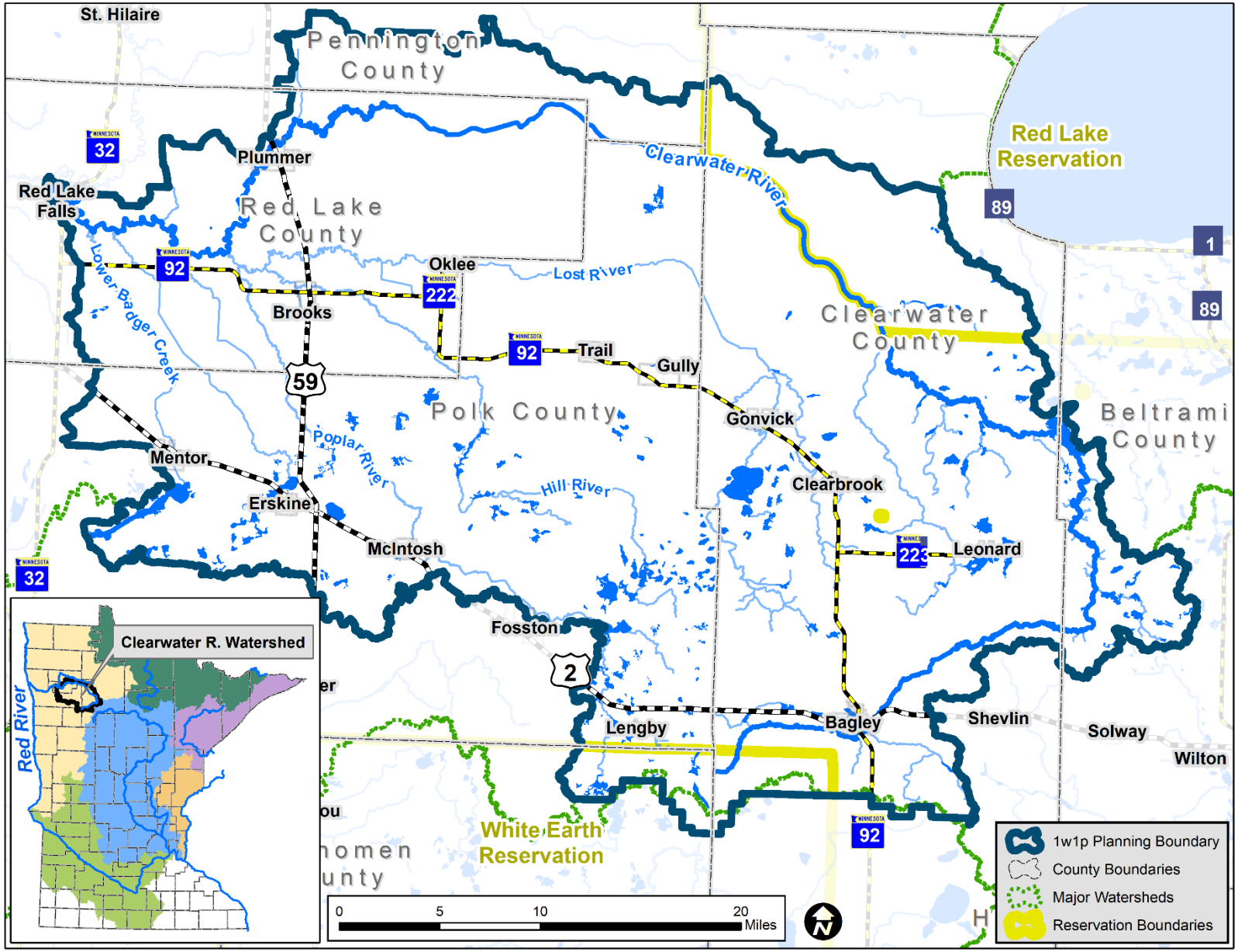


Figure 1.2. Map of plan area.

Purpose, Roles, and Responsibilities

The purpose of One Watershed, One Plan is to align water planning along watershed boundaries, not juridisctional boundaries such as counties as was done in the past. Prior to this single plan, each of the six counties as well as the watershed district had water-related plans that covered portions of this watershed. Water is connected and ignores county boundaries, so to truly manage the resources on the whole, a watershed scale is most efficient and effective.

The CRCWMP began with a memorandum of agreement (MOA) between all the entities in the watershed including Clearwater County, Clearwater Soil and Water Conservation District (SWCD), Polk County, East Polk SWCD, Red Lake County, Red Lake SWCD, Pennington County, Pennington SWCD, and the Red Lake Watershed District. Beltrami and Mahnomen counties chose not to sign onto the MOA because they were such a small portion of the planning area (Figure 1.1).

The One Watershed, One Plan process uses existing authorities; therefore, a representative from each governmental unit in the MOA was appointed by each board to serve on the Policy Committee, which is the decision-making body for this plan. The Clearwater SWCD was the fiscal agent and Coordinator for this project. The Clearwater River Watershed Planning Work Group consisted of staff from each of the entities in the MOA, and generated the content in this plan. The Advisory Committee consisted of state agencies and local stakeholders, and contributed to plan content in an advisory role (Figure 1.3).

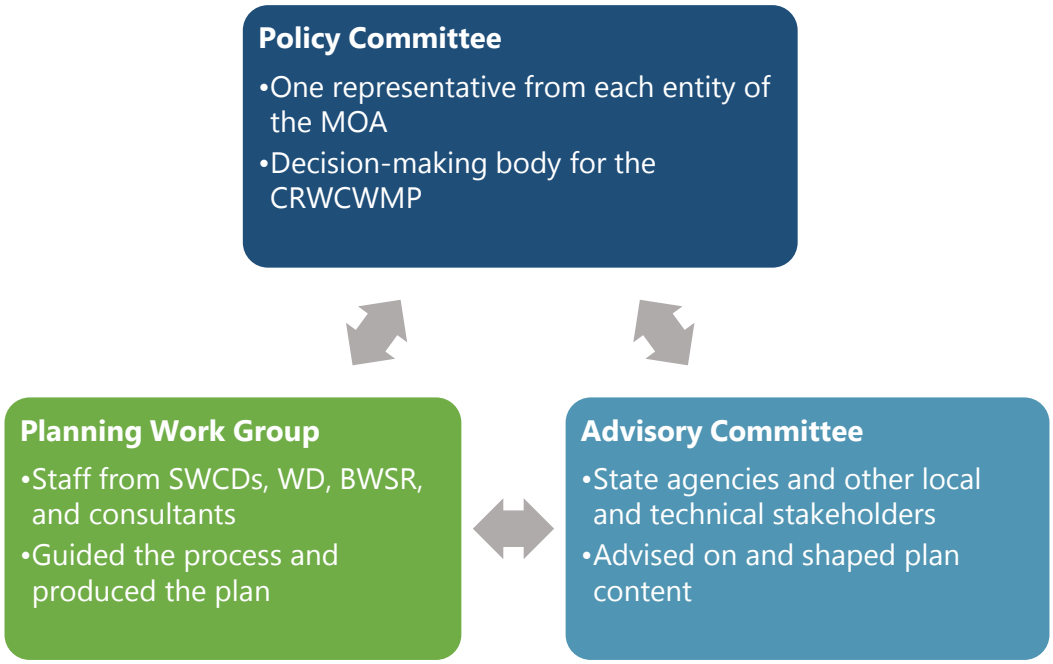


Figure 1.3. Committees formed for the CRCWMP.

Public Involvement

On June 10, 2021, the Clearwater River Watershed Planning Work Group held two public open houses: one at the Brooks Community Center and one at The Trap restaurant in Gonvick (Figure 1.4). An online survey was also designed to obtain feedback from people that weren't able to attend the open house (37 responses). The focus of the public input process was to get feedback on the following items:

- What are their top-rated issues and opportunities they would like included in the plan?
- What resources would they like prioritized for protection and restoration?

Top Public Issues:

- Soil erosion (water and wind)
- Bacteria in streams
- Loss of forests
- Habitat quality

Top Public Resources:

- Productive farmland
- Hunting and recreational land
- Clearwater River
- Lakes

Figure 1.4 Open houses were held in Brooks and Gonvick.

Wind erosion and low water levels were mentioned many times due to the drought in the summer of 2021. Meeting participants and survey respondents were also asked to reflect on questions about the present and the future of the watershed **(Figure 1.5 and Figure 1.6, Appendix B)**. These responses were used by the Advisory Committee to form the watershed vision statement on page 1.

Figure 1.5. Word Cloud of the survey responses about what they **think** the watershed will look like in 50 years.

Figure 1.6. Word Cloud of survey responses about what they **want** the watershed to look like in 50 years.

Priority Issues

The issues for the CRCWMP were generated and prioritized with a variety of input from the general public, the Advisory Committee, the Policy Committee, state agencies, and existing local and regional plans. The Clearwater River Watershed Planning Work Group separated the issues into Priority A and B, as shown below. Resource categories include:

Surface Water  Groundwater  Land Management  Habitat 

Priority A Issues

Priority A issues are the most important issues that will be the focus of implementation efforts and funding in the 10-year plan. The main theme of the issue statement is shown in **bold** text.

Resource Category	Impacted Resource	Issue Statement
	Streams	**Unstable stream channels** and loss of riparian vegetation increases sediment loading and reduces habitat quality.
	Drainage Systems	**Drainage system bank instability and inadequacy** affects agricultural productivity and increases erosion and sedimentation.
	Streams, Drainage Systems	**Altered hydrology** causes variability of flows affecting timing, water quantity, water quality, and erosion.
	Lakes, Streams	**Sediment loading** from wind and water erosion of croplands, uplands, and lakeshore impacts water quality.
	Lakes, Streams	**Phosphorus loading** contributes to elevated concentrations in lakes and streams, causing eutrophication.
	Streams	**Bacteria loading** impacts aquatic recreation and human health.
	Soil	Decreased **soil health** can reduce agricultural productivity and water holding capacity.

Priority B Issues

Priority B issues are important and will be addressed as time and funding allows. The main theme of the issue statement is shown in **bold** text.

Resource Category	Impacted Resource	Issue Statement
	Drinking Water	**Groundwater** is vulnerable to **contamination** from numerous sources.
	Wetlands	**Wetlands** are in continued need of protection and restoration which helps with precipitation storage and provides habitat.
	Aquifer	**Groundwater sustainability** is vulnerable to overuse and loss of recharge.
	Lakes, Streams	**Stormwater runoff** from developed areas and roads causes contamination of lakes and streams.
	Wild Rice, Fens, Trout, Forests, Prairies	**Changes in land use and resource protection impact** high quality resources, land resilience, habitat, and surface and groundwater quality.

Measurable Goals

The issue statements were used in the development of the plan's goals. The goals guide what quantifiable changes to resource conditions this plan expects to accomplish in its ten-year lifespan. The goals were developed by the Clearwater River Watershed Planning Work Group with input from the Advisory Committee and approved by the Policy Committee.

The measurable goals in this plan are laid out in **Section 4**, and in most cases include specific goals per planning region and a map of where the goals will be targeted. Different data sets and models were used to determine the goal numbers. The Watershed Restoration and Protection Strategy (WRAPS), Total Maximum Daily Load report (TMDL), and Prioritize, Target, and Measure Application (PTMApp) were used to define load reduction goals for sediment and phosphorus. Minnesota Department of Health data was used for defining groundwater goals. The Minnesota Prairie Plan was used for protection goals, local information from field surveys was used for stream restoration, stream habitat enhancement, and GIS data were used for bacteria, lakes and forest goals. Measurable goals allow for the planning partners to track their progress during implementation.

Resource Category	Goal Name	Example Actions
	Sediment Reduction	• Water and sediment control basins • Grade stabilizations
	Phosphorus Reduction	• Water and sediment control basins • Grade stabilizations • Cover crops and no till
	Runoff Reduction	• Regional storage projects • Wetland restoration
	Ditch Stabilization	• Grade stabilizations • Side water inlets • Bank stabilizations
	Stream and Riparian Stabilization	• Grade stabilizations • Bank stabilizations
	Soil Health Enhancement	• Cover crops and no till • Pasture management
	Bacteria Reduction	• Cattle exclusion and watering facility • Manure management • Septic system maintenance
	Drinking Water Protection	• Well sealing • Drinking water screening
	High Value Resource Protection	• Forest Mangement Plans • Sustainable Forest Incentive Act (SFIA) • Conservation easements
	Stormwater Reduction	• Stormwater control projects • Rain gardens • Shoreline restoration

Implementation

This plan will be implemented to the degree that additional funding is acquired, and at a locally determined pace of progress. Outreach and incentives will be used to assist with voluntary implementation of plan actions on private lands.

The Targeted Implementation Schedule in **Section 5** describes what work will be done, who will do it, when it will be done, and how much it will cost.

Implementation programs are the mechanism to implement actions in the targeted implementation schedule. This plan establishes common implementation programs within the plan area: Projects & Practices, Capital Improvements, Regulatory & Ordinances, Data Collection & Monitoring, and Education & Outreach (Figure 1.7).

Figure 1.7. Implementation Programs.

Three funding levels are provided in this plan. Funding Level 1 is the estimated total of current funding in the watershed. With the completion of the CRCWMP, the watershed partners will be able to receive Watershed-Based Implementation Funds from BWSR, which increases their available funding to Level 2. Level 2 is additive with Level 1, and the watershed partners plan to operate at Funding Level 2 throughout implementation (Table 1.1).

Table 1.1. Funding levels for the CRCWMP.

Funding Level	Description	Estimated Annual Average	Estimated Plan Total (10 years)
Level 1	Baseline Funding for Current Programs	$927,000	$9,270,000
Level 2	**Baseline + Watershed-Based Implementation Funding (WBIF) + Grants (CWF)**	**$1,544,300**	**$15,544,300**
Level 3	Partner funding (NRCS, USFWS, SFIA, CRP, Lessard-Sams, MPCA, DNR)	$3,750,046	$37,500,460
	Total*	**$5,294,346**	**$52,943,460**

**This total does not include Level 1 because Level 2 is additive with Level 1.*

The watershed partners have a good track record of accomplishing projects to improve water quality and protect habitat. With the new watershed-based implementation funding available, they will be able to accomplish a lot more. Estimated achievements for each resource category are shown in Table 1.2.

Table 1.2. Estimated achievements per resource category at the Level 2 Funding Scenario.

Surface Water	Groundwater	Land Management	Habitat
25,405 tons sediment/yr reduced **6,487 lbs phosphorus/yr** reduced **12.5 miles stream** stabilized in 10 yrs **13.5 miles ditch** stabilized in 10 yrs **9,060 acre-feet** storage in 10 yrs **20 bacteria reduction** projects in 10 yrs **3 stormwater control** projects in 10 yrs	**10 wells/year** sealed	**20,450 acres** soil health practices in 10 years	**17,227 acres** forest and prairie protection in 10 years

Level 3 is a way to recognize the contributions of partner groups in the watershed that are doing work in the watershed that can help make progress towards plan goals. Level 3 funding includes the Conservation Reserve Program (CRP), Sustainable Forest Incentive Act (SFIA), Lessard-Sams Outdoor Heritage Funds, Natural Resource Conservation Service (NRCS), and state agency projects such as surface and groundwater monitoring that are not contracted through the local governments (Table 1.1).

Figure 1.8. Clearwater River. Credit: RLWD.

Plan Administration and Coordination

The CRCWMP will be implemented by the Clearwater River Watershed Planning Work Group. The CRCWMP is a coalition of the following partners:

- Clearwater County and SWCD
- Pennington County and SWCD
- Red Lake County and SWCD
- Polk County and East Polk SWCD
- Red Lake Watershed District

The Partnership previously entered into a formal agreement through an MOA for planning the CRCWMP **(Appendix I)**. The entities will draft an MOA for purposes of implementing this plan. The Policy Committee of the CRCWMP oversees the plan implementation with the advice and consent of the individual county and SWCD boards under the umbrella of the implementation MOA.

Plan activities will be recorded by watershed partners in a tracking system and summarized annually. In addition, the same committees that convened for planning will continue into implementation in the same roles (Figure 1.3).

Figure 1.9. Farm field in Polk County.

Land and Water Resource Narrative

SECTION 2. LAND AND WATER RESOURCE NARRATIVE

The Clearwater River Watershed is one of the Red River Basin's most geographically diverse watersheds spanning forest, recreational rivers, lakes, large intact wetlands, wild rice paddies, beach ridges, pasture, and croplands. It encompasses 1,385 square miles (886,400 acres) of land across Glacial Lake Agassiz in Clearwater, Polk, Red Lake, Pennington, Mahnomen, and Beltrami counties, and includes the Red Lake and White Earth Nations (Figure 2.1).

The streams, wetlands, forests, and prairies of the Clearwater River Watershed have defined its natural and cultural history. These resources attracted the attention of Native Americans and subsequent European settlers, creating a rich heritage, recreational history, and economic opportunity that continue to tether residents to the watershed today.

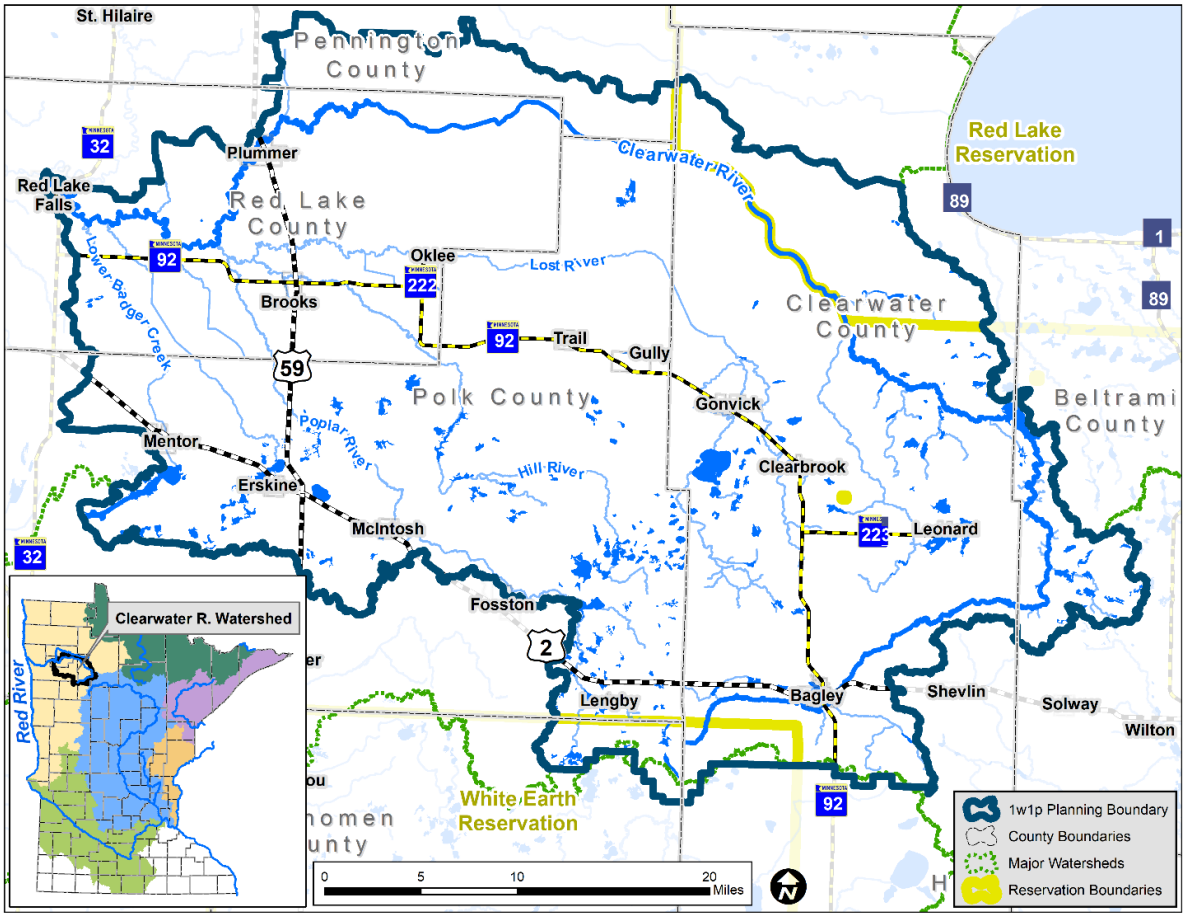


Figure 2.1 Clearwater River Watershed.

Past

Geomorphology

The area that makes up the Clearwater River Watershed was formed around 14,000 years ago by sheets of ice that carved out land features and then retreated during the last ice age (MN DNR). Glacial Lake Agassiz, the lake that filled the Red River Basin, was the largest glacial lake in Minnesota, draining north around 9,000 years ago. The Clearwater River Watershed's beach ridges, moraines, and silt and clay soils are landscape inscriptions from the ancient lakebed (MN DNR).

Red River Basin soils and geologic features mold the four ecoregions within the Clearwater River Watershed. The Northern Lakes and Forests and North Central Hardwood Forests ecoregions meet the Northern Minnesota Wetlands ecoregion on the east side of the watershed. Large swaths of peat provide wet loamy and sandy soils for large wetlands in the northeast. Moving west, the rolling hills of the headwaters near Bagley transition into the flat, Lake Agassiz Plain where the soils are prime for cultivation, a result of lacustrine and till deposits (Figure 2.2).

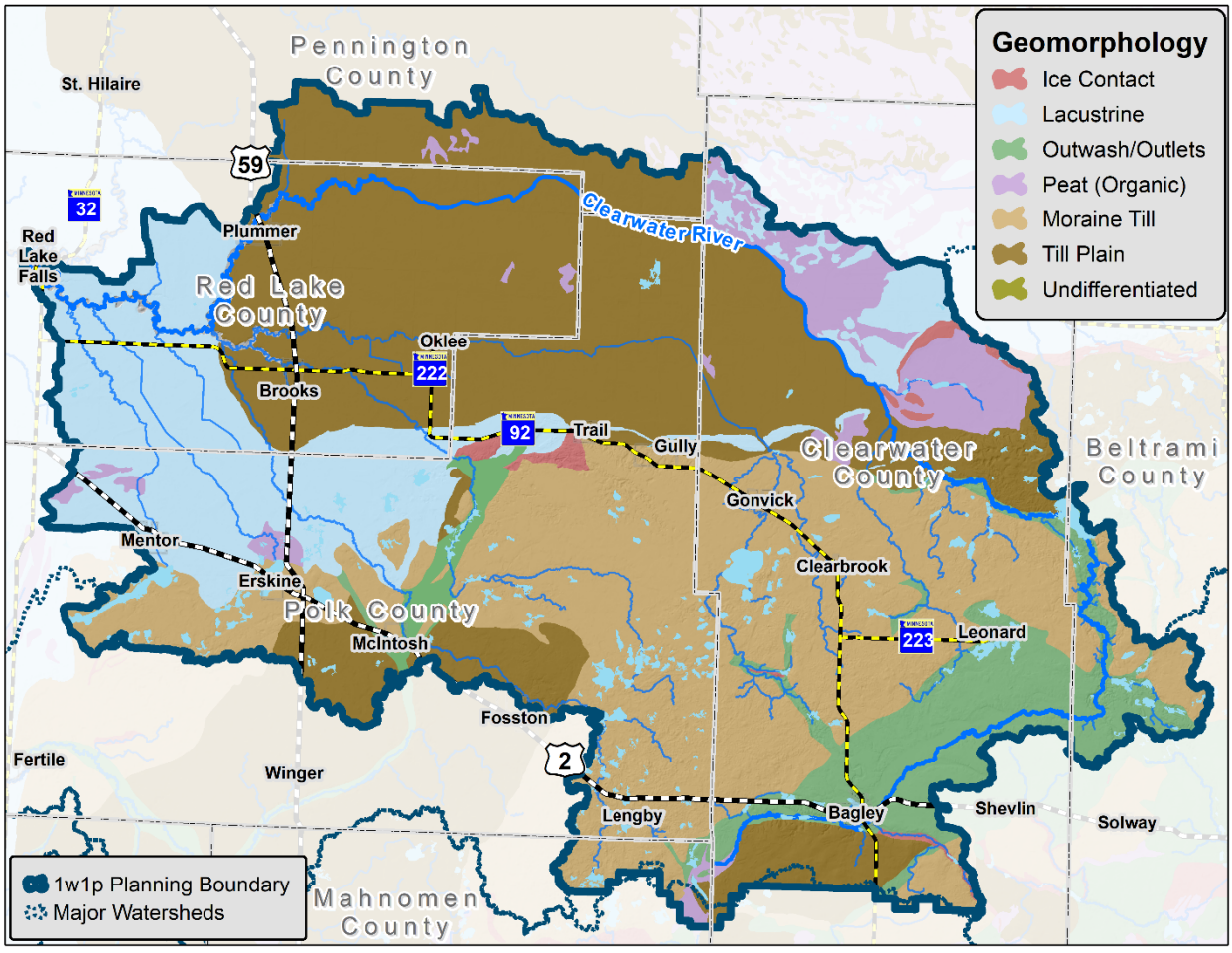


Figure 2.2 The geomorphology of the Clearwater River Watershed.

Watershed History

Historic vegetation follows the same pattern as the watershed's geomorphology. In the past, coniferous forests in the headwaters region transitioned to deciduous forests, wetlands, then prairie, moving westward toward Red Lake Falls. Prior to large-scale European settlement, prairie made up 35% of the Clearwater River Watershed, with forest comprising 40% and wetlands 25% (Figure 2.3) (MNDOT, 2019).

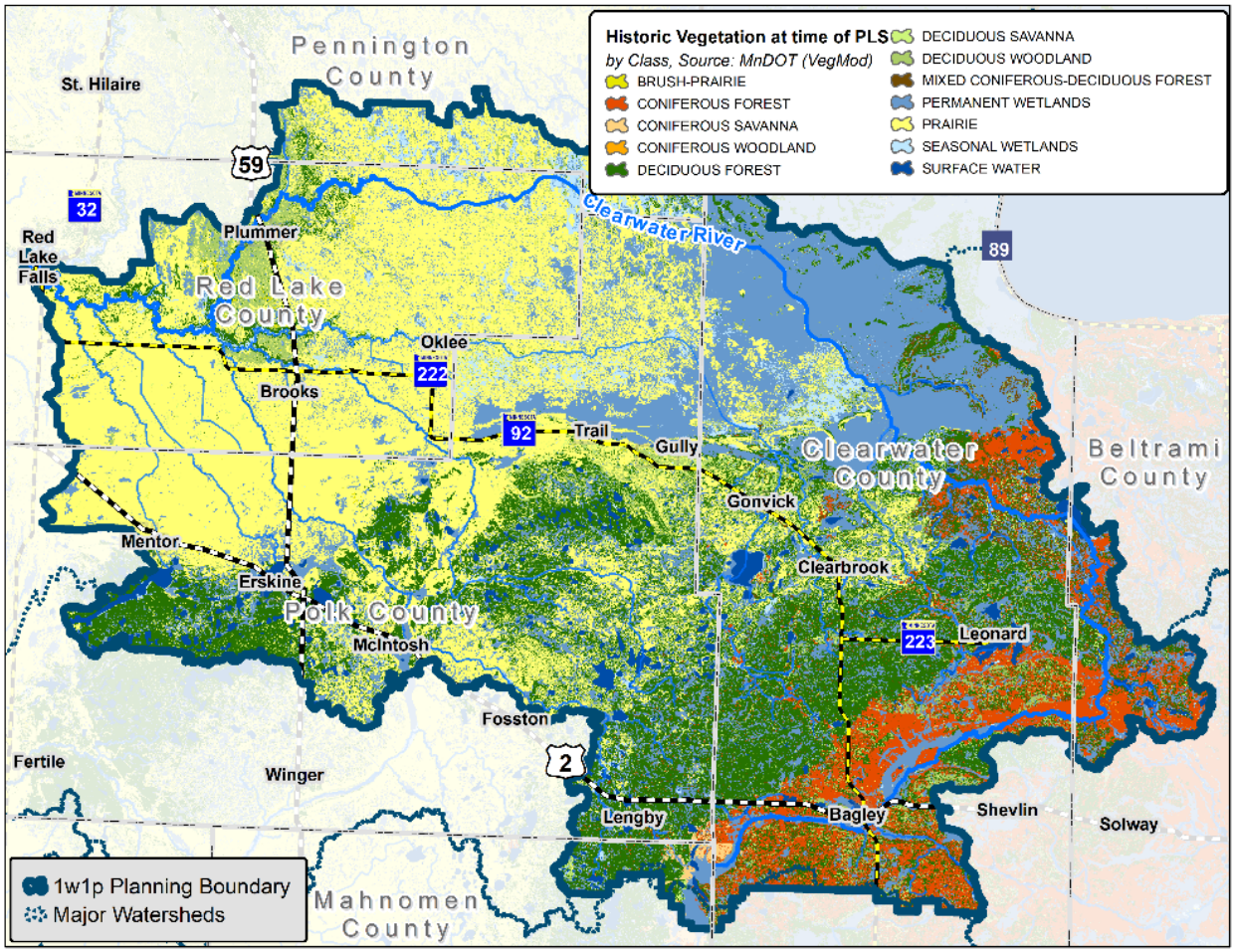


Figure 2.3 Historic vegetation in the Clearwater River Watershed (MNDOT, 2019).

Native plant communities, lakes, and streams attracted human communities throughout the region by providing resources for prairie farms, logging, recreation, and the fur trade (MN DNR). People have been working with the lands and modifying landscapes since they first moved into the region (Minnesota Department of Administration). By AD800, wild rice was a staple in the diets of local native populations (Minnesota Historical Society, 2001). In the 17th century, the Anishinaabe, or Ojibwe (Chippewa), arrived near Red Lake (Red Lake Nation, 2019). With other Anishinaabe communities already present in neighboring regions, the Ojibwe settled the area, forming alliances with French fur traders.

The Clearwater River played a major role in the fur trade. The confluence of the Red Lake and Clearwater Rivers served as a favorite camp and village site for local Native American residents, and in 1794 a fur trading post was established at the site, which eventually became the city of Red Lake Falls. The Old Crossing Treaty, signed in 1863 on the Red Lake River just downstream of the confluence, set the stage for European settlement in the Red River Valley (Red Lake County Historical Society).

Figure 2.4 Logs on the Clearwater River in the 1890s (Red Lake County Historical Society, 2019).

Logging practices that dominated the industry in the region in the late 19th and early 20th century are an iconic part of the Clearwater River Watershed's past (Figure 2.4). Called log drives, the Clearwater River was used to move logs downstream from Clearwater Lake to the Red Lake River, eventually ending up in Crookston and Grand Forks (Red Lake County Historical Society, 1976). Dams and weirs were constructed to aid the movement of logs in the Clearwater River contributed to the modification the river's hydrology over time. Further alteration occurred when, in the 1950s, approximately 38 miles of the Clearwater River was channelized to reduce flood damage to agricultural areas (Figure 2.5) (MPCA).

Watershed Timeline Post-European Settlement

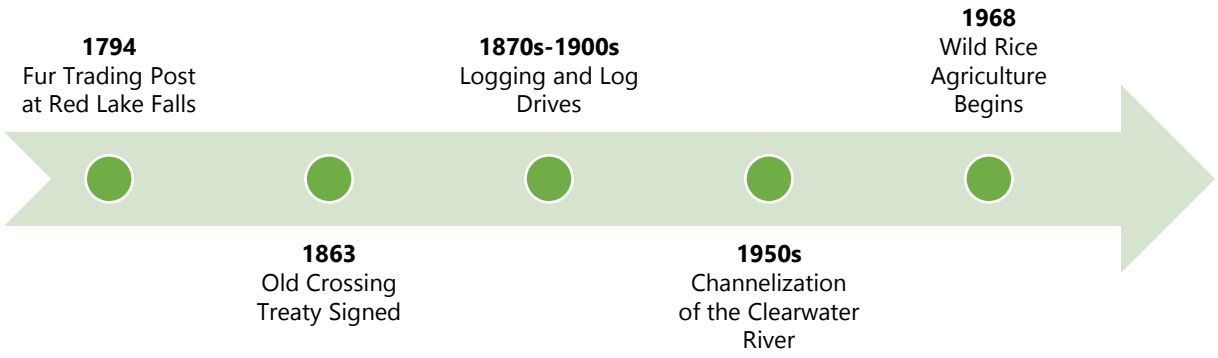


Figure 2.5 Watershed timeline post-European settlement.

Present

Land Use and Socioeconomics

Figure 2.6 Rice paddies (credit: RLWD).

The prevalent land use transitions from forest and rangeland in the eastern portion of the watershed to cultivated cropland in the western portion of the watershed. Presently, agriculture and livestock production are significant drivers of economic growth in the watershed. Approximately 34% of the watershed's land use is dedicated to crop production, while 18% is used as pasture for livestock (Figure 2.7). The most common crops are soybeans and small grains. In the historic peatlands along the northeast portion of the Clearwater River, farmers have adapted to saturated conditions by cultivating wild rice as a domesticated agricultural grain crop (Figure 2.6). Today, there are approximately 15,700 acres of wild rice paddies in the Clearwater River Watershed (MPCA, 2021a). Logging and forestry are other important industries in the watershed. With 22% of the Clearwater River Watershed land area being forest, the proper management of forest resources is a primary goal of local governments and residents (Clearwater County, 2010).

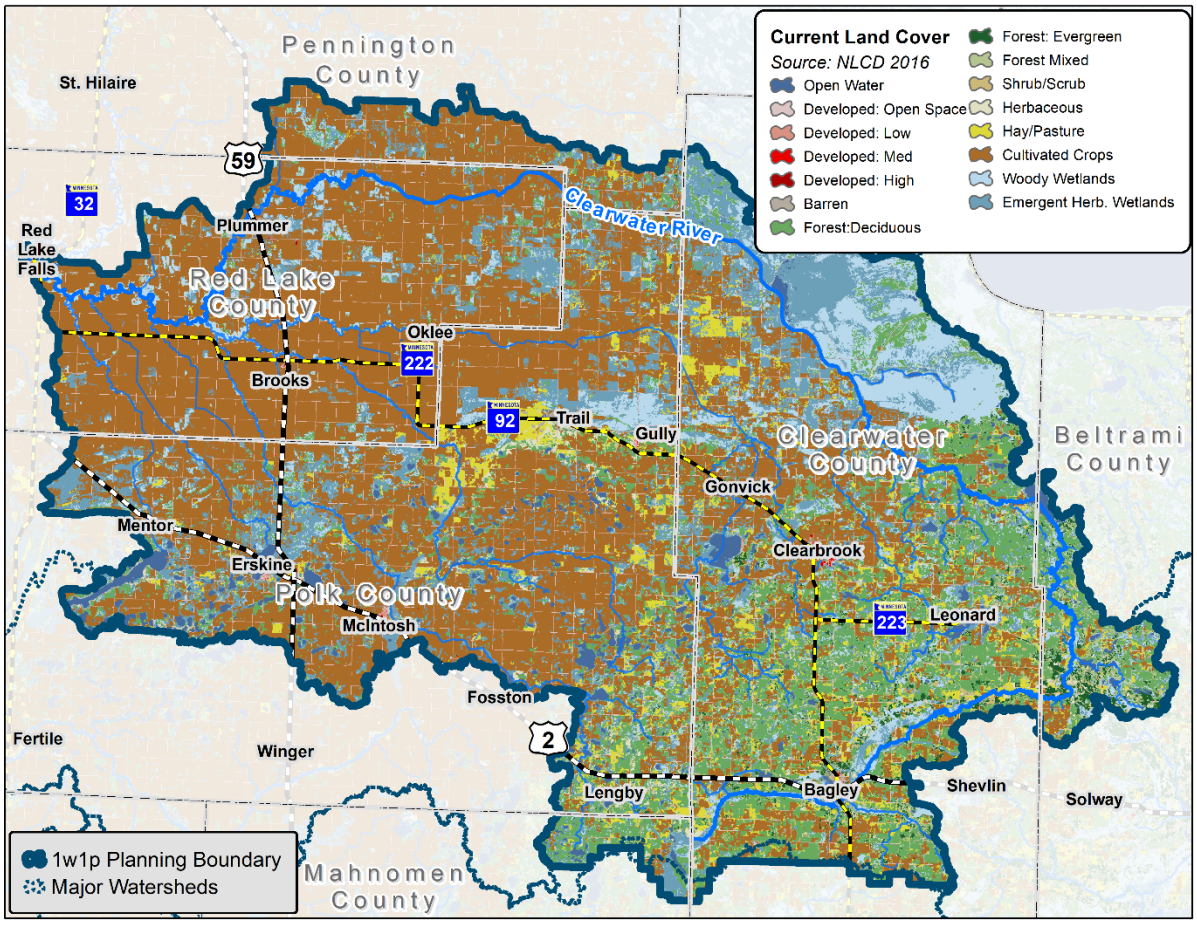


Figure 2.7 Current land use in the Clearwater River Watershed (USGS, 2016).

While developed area makes up only 4% of the watershed, there are 15 cities with a combined population of 7,553, including Bagley on the eastern end and Red Lake Falls on the western end. The total population of the watershed is 14,166 or 10.4 people per square mile (MN DNR, 2017). The majority of watershed residents are white (94%), 5% are Native American, and less than 1% each are Hispanic, Black or African American, or Asian. The demographics, highlighted below, are characteristic of a rural area in northwest Minnesota with relatively stable population change (Figure 2.8).

The watershed falls within the jurisdiction of multiple local government units (LGUs), including the Red Lake Watershed District (RLWD), Clearwater SWCD and County, Pennington SWCD and County, Red Lake SWCD and County, Beltrami SWCD and County, East Polk SWCD and Polk County, and Mahnomen SWCD and County. Portions of the watershed (8% by area) are located within the Red Lake and White Earth Nations where water resources are managed by the Red Lake Department of Natural Resources and the White Earth Division of Natural Resources (Figure 2.1). While the Clearwater River Watershed contains tribal land, this plan does not apply within the jurisdiction of those tribal nations.

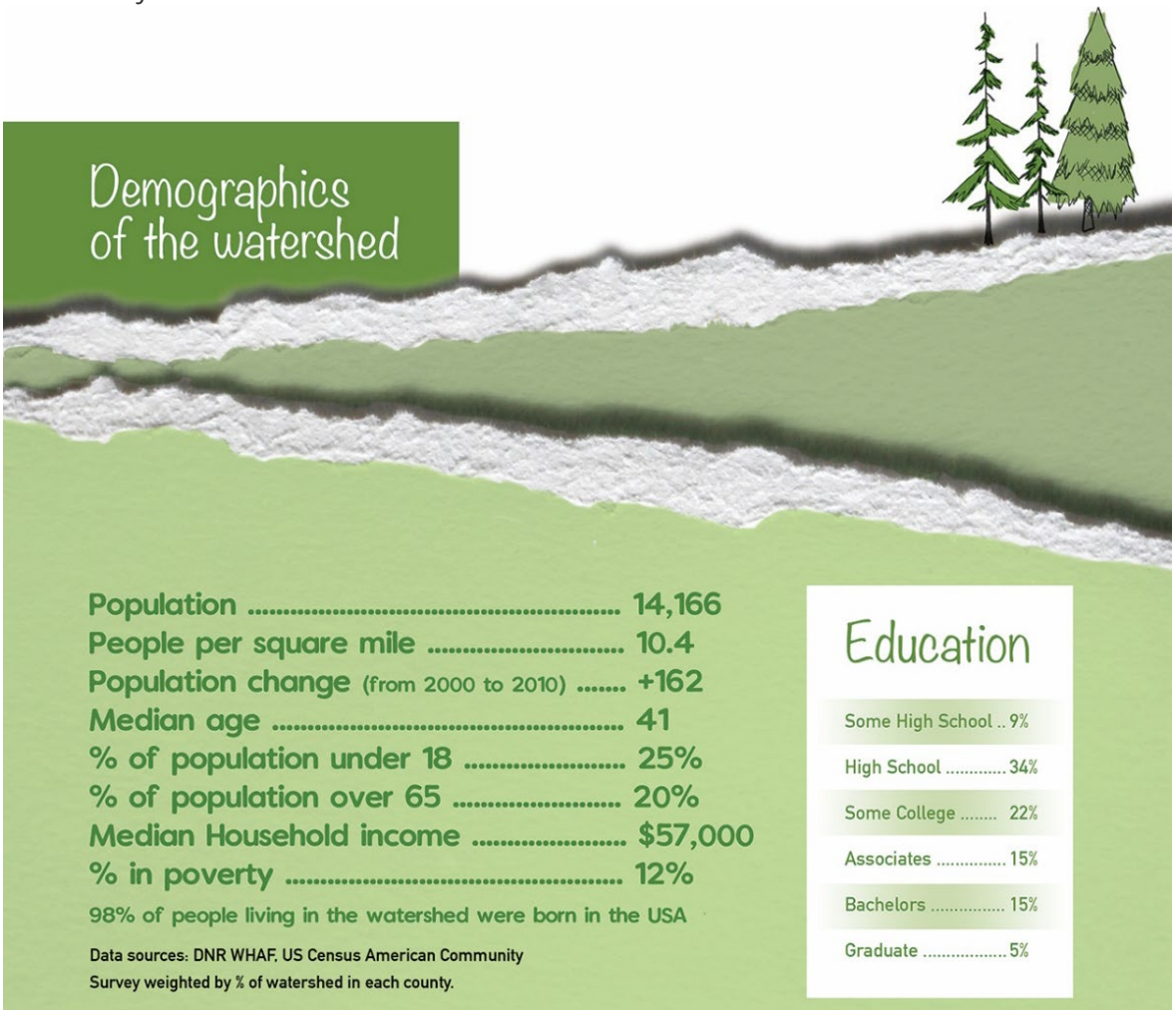


Figure 2.8 Demographics of the Clearwater River Watershed (DNR WHAF)

Surface Water

The Clearwater River is the backbone of this watershed, flowing along the top edge of the watershed boundary (Figure 2.1). It begins at Lower Long Lake in northern Mahnomen County and flows northeast until it reaches Clearwater Lake where it then starts its journey west. The river treats paddlers to great scenery, occasional rapids, and good fishing along the way (Figure 2.9). Three major streams meet the Clearwater River before it joins the Red Lake River to empty into the Red River of the North. These streams are the Lost River, Lower Badger Creek, and Ruffy Brook. Two more major waterways, the Hill River and the Poplar River flow into the Lost River before it meets the Clearwater. There are designated trout streams in the watershed including Lengby Creek, Lost River, and a section of the Clearwater River in Beltrami County, although some of these may not currently provide cold-water habitat (MPCA, 2021).

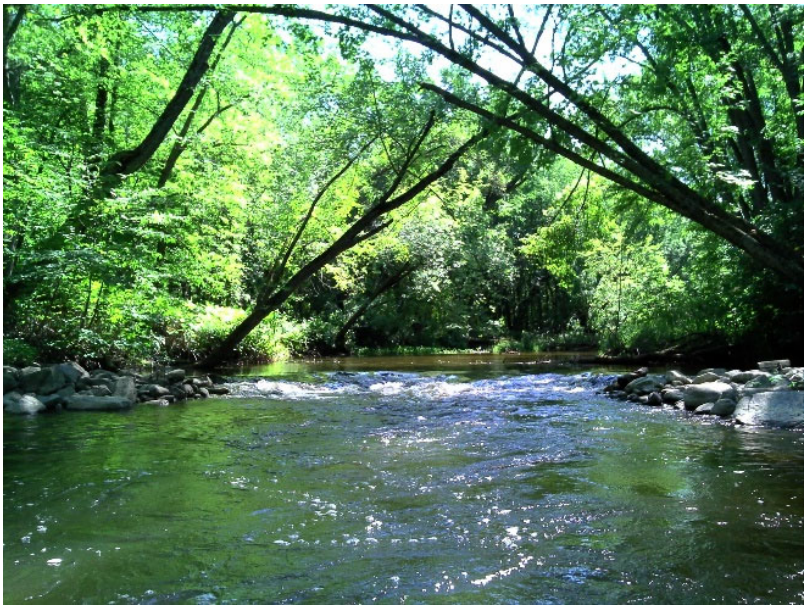


Figure 2.9 Clearwater River (credit: RLWD).

Rivers and streams have seasonally variable patterns in their flows of water, nutrients, and sediments. Nature has its own built-in methods for storing water (wetlands) and draining excess rainwater from the landscape (intermittent streams). Wetland storage upstream can help to prevent flooding downstream, which is a concern for Red River Basin residents. In addition to storing water during flood conditions, these wetlands buffer streamflow, improve base flow, and filter pollutants. Through a US Fish and Wildlife Services (USFWS) program, local landowners have restored over 1,300 wetlands, providing more than 2,900 acre-feet of storage (MPCA, 2021a). Water retention in cultivated paddies is a compound benefit in wild rice production years. Water control structures that are installed as part of main line tile drainage in wild rice paddies help to prevent sediment and nutrient deposition.

The same glacial till that allows for water storage also encourages agricultural development on fertile soils. Ditches, culverts, and tile drainage have assisted farmers in draining the water off the landscape to increase field acreage and provide conveyance systems for large rain events in rural areas. When these practices are prominent in a watershed, the region is often referred to as having altered hydrology. Approximately half of the streams in the watershed are considered altered (53%, (MN DNR)). There are also 10 dams and 4 water level control structures in the watershed, which have the potential to block fish passage.

Legal Ditch Systems are governed by Minnesota State Chapter 103E Drainage Law. Public legal drainage ditches are administered by the local drainage authority, and construction and maintenance are funded by property owners benefiting from that ditch (Figure 2.10). Private ditches are privately managed by the landowner. Two-stage ditches are a type of drainage ditch with floodplain benches within the channel which minimizes erosion and results in stable, low maintenance slopes. Proper ditch maintenance can minimize erosion and issues with stream stability, water quality and aquatic habitat.

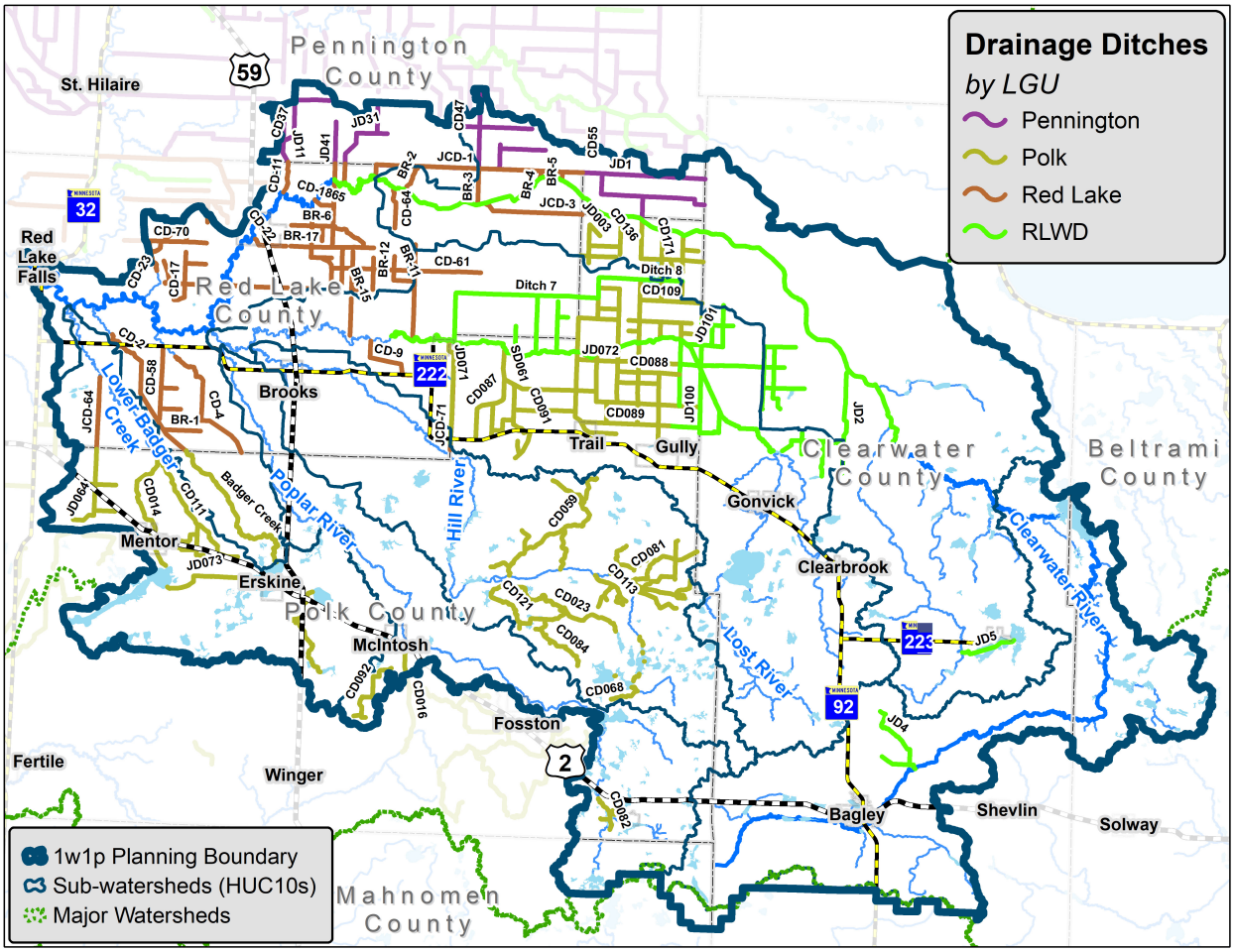


Figure 2.10 Drainage systems in the Clearwater River Watershed.

When surface water is drained more quickly, it may cause more nutrients and sediment to move into the streams and rivers. Excess levels of sediment can affect aquatic life by covering habitat structures such as rubble and woody debris and causing unstable dissolved oxygen levels and increased cloudiness in the water (turbidity).

Historical increases in altered watercourses and drainage of wetlands have also contributed to more frequent and more severe flooding in the watershed and downstream in the Red River, which can have negative economic and environmental consequences. Because of its history of flooding, organizations in the Red River Basin have worked to coordinate flood damage reduction on a basin-wide scale.

Many lakes of varying sizes and depths are in the southern and eastern portions of the Clearwater River Watershed (MPCA, 2021a). The Minnesota Department of Natural Resources (DNR) categorizes lakes as natural environment, recreational development, and general development, depending on size, depth, and the number of dwellings per mile of shoreline (MN DNR, 2021b). The Clearwater River Watershed contains 188 DNR designated lakes, with four classified as general development, four as recreational development, and 180 as natural environment. General and recreational development lakes attract recreational tourism opportunities, providing economic benefit to the area (Figure 2.11). Resorts such as Lakeview and Breezy Point on Maple Lake are popular for locals and tourists alike.

General Development Lakes:
- Lomond
- Spring
- Mitchell
- Cameron

Recreational Development Lakes:
- Clearwater
- Buzzle
- Pine
- Maple

Monitoring data show that no lakes currently have declining water quality trends. Sixteen lakes in the watershed meet the DNR's criteria for Lakes of Biological Significance, meaning they contain sensitive fish or plant species (Minnesota Geospatial Commons, 2020).

Figure 2.11. Clearwater Lake (credit: RLWD).

In 2021, the Minnesota Pollution Control Agency (MPCA) published the WRAPS report for the Clearwater River Watershed (MPCA, 2021a). This associated monitoring effort consisted of assessing existing data and collecting new data, which resulted in the identification of waterbodies that do not meet state standards for water quality, as seen in Figure 2.12. Sediment, bacteria, and aquatic habitat are the main concern for impairments in the streams of the Clearwater River Watershed. Contributors to these impairments include channelization, low gradients, livestock operations, field erosion and sheet rill, and in-stream erosion. Three lakes are impaired for nutrients: Cameron Lake, Long Lake, and Stony Lake (Figure 10). Potential impairments of Oak Lake and Hill River Lake were discovered by recent monitoring conducted by the East Polk SWCD. While nonpoint sources are the greatest contributor to these impairments, there are some point sources in the watershed including seven wastewater treatment facilities (WWTF) and five industrial permits (MPCA, 2021a).

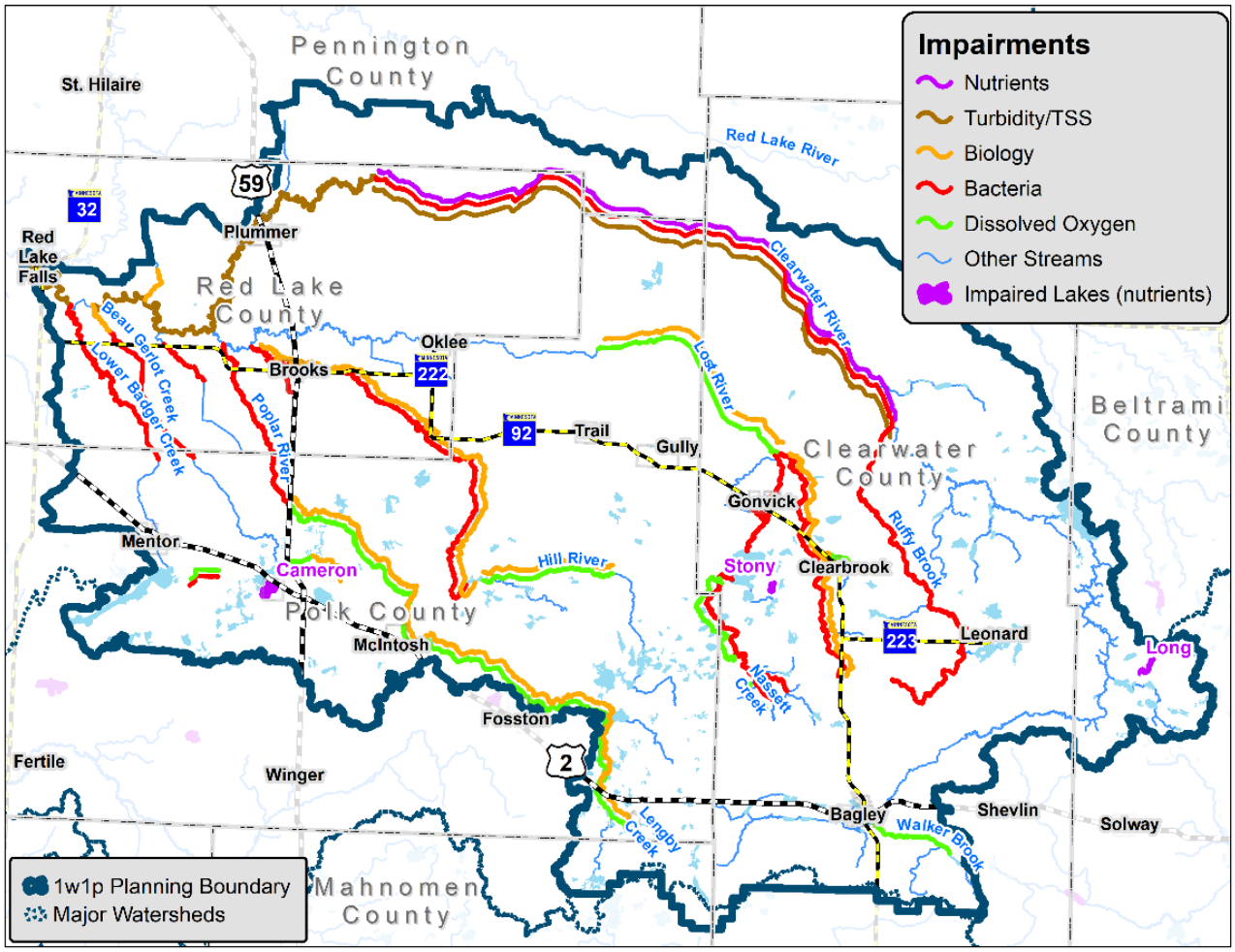


Figure 2.12 Water Quality Impairments in the Clearwater River Watershed (MPCA 2021).

Urban stormwater also contributes runoff to the Clearwater River Watershed's creeks and rivers. Several local studies have identified urban stormwater runoff as a source of non-point source pollution in the watershed. For example, a 1997 study found that stormwater inlets were the primary source of phosphorus loads to Cameron Lake in Erskine (MPCA, 2021a). In 2003, another study identified the Bagley subwatershed as contributing some of the largest loads of sediment and nutrients to the Clearwater River. In response to this study, the Clearwater SWCD, RLWD, and the City of Bagley collaborated on the Bagley Urban Runoff Reduction Project, which also shows that cities can play an important role in addressing water quality issues resulting from stormwater runoff in local streams and lakes.

Unique Features and Landforms

Wild rice cultivation is just one of the many unique features within the Clearwater River Watershed. There is in-river wild rice in the low gradient headwaters of the Clearwater River. The watershed also contains rare habitats and sites of outstanding biodiversity. Elevated beach ridges remain near Red Lake Falls, marking the shores of the former Glacial Lake Agassiz (World Landforms, 2015).

Calcareous fens dot the central part of the watershed. A calcareous fen is a type of wetland that relies on calcium-rich groundwater upwelling to support a highly diverse and unique ecosystem (MN DNR, 2018). These calcium-enriched wetlands are extremely rare and occur on morainal slopes, deposits of glacial outwash, at springs, and on the shores of hard water drainage lakes (Wisconsin DNR). Calcareous fens contain distinctive flora and can intermingle with other types of wetland communities.

Protected Lands and Habitat

Numerous areas have been designated to preserve some of these special features and fish and wildlife habitat within the Clearwater River Watershed. There is a lot of public land along the river in the Upper Clearwater River (Figure 2.14). There are five Aquatic Management Areas, one Scientific and Natural Area, and 36 Wildlife Management Areas (Figure 2.14).

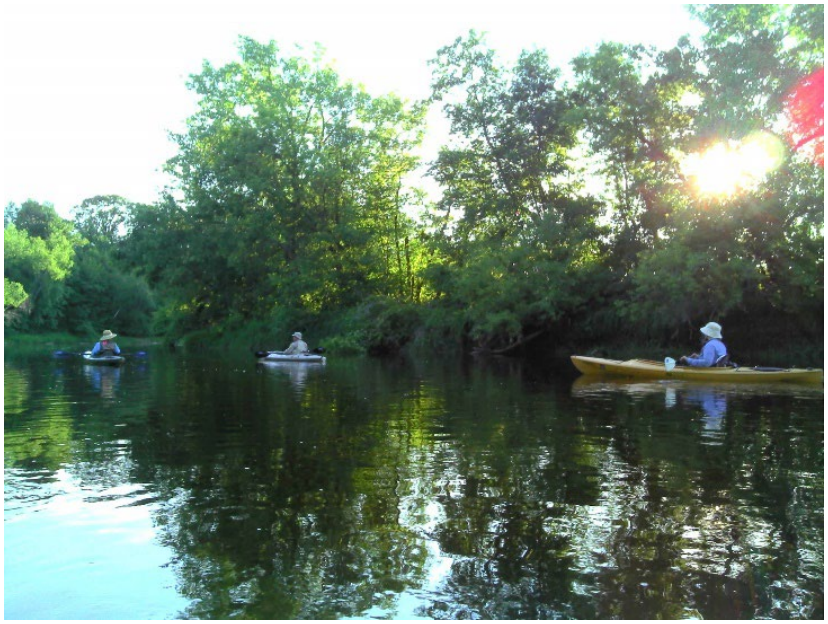


Figure 2.13. Clearwater River (credit: RLWD).

The USFWS also manages many tracts of land across the southern watershed, with many Waterfowl Production Areas (WPA) and two National Wildlife Refuges (NWR) – Glacial Ridge and Rydell. This protected land serves as hunting and breeding grounds for waterfowl and wildlife, including several unique species. Five threatened and endangered species and 23 USFWS Birds of Conservation Concern have the potential to occur in the Clearwater River Watershed (USFWS, 2021).

Privately owned lands can be protected by conservation easements and the Sustainable Forest Incentive Act, which provides incentives to landowners to keep forested lands forested (Figure 2.14).

Improvements to aquatic habitat have occurred, including the replacement of the Crookston Dam on the Red Lake River with rock riffles. This restoration has opened hundreds of miles of tributary streams, covering many within the Clearwater River Watershed, to the migration of fish from the Red River of the North (Groshens, 2005).

Threatened and Endangered Species in the Watershed:

- Northern long-eared bat
- Rusty-patched bumble bee
- Poweshiek skipperling
- Western prairie fringed orchid
- Canada lynx

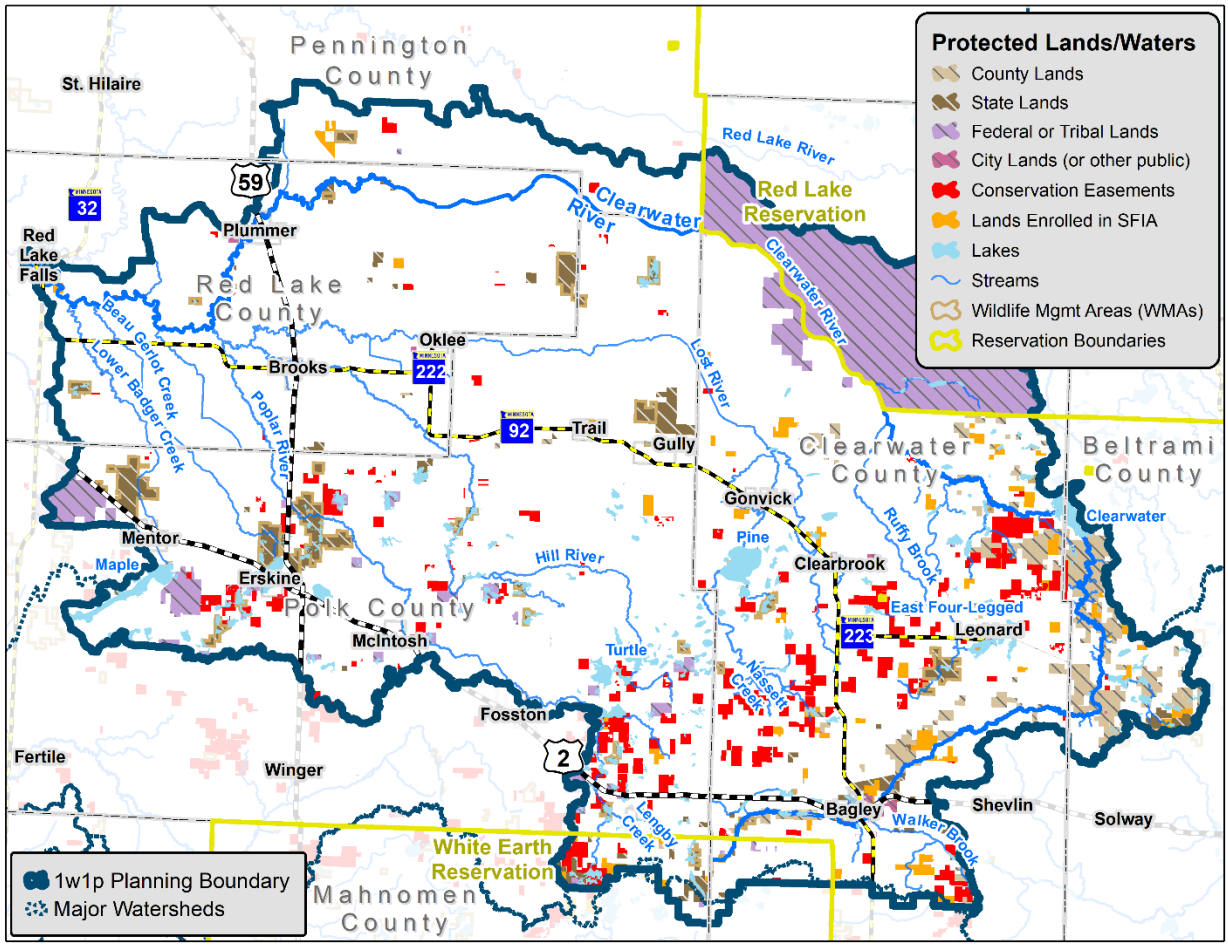


Figure 2.14 Protected areas in the Clearwater River Watershed.

Climate

The climate in the Clearwater River Watershed is characterized by cold winters and short summers (RLWD, 2006). The growing season is typically May through September, which dictates which crops are grown in the area.

Average Annual Temperatures

- Minimum: 29.1 °F
- Average: 39.6 °F
- Maximum: 50.1 °F

Average Annual Precipitation

- 23.4 inches

(MN DNR, 2019a)

Drought, frequent storms, and extreme temperature changes will likely continue creating challenges for Minnesotans in the future. Planning for concerns such as unpredictable growing seasons, flood damages, and drinking water shortages can alleviate undesirable impacts in the future. Recent observations of the 30-year average temperature compared to the entire historical climate record (1895-2018) shows that in the Clearwater River Watershed there is an average annual departure from historical average of +1.4°F. At the same time, local climate stations show a precipitation departure from an historical annual average of +0.6 inches (MN DNR, 2019a). With the proper preparation, residents can adapt to or mitigate future changes.

Groundwater

Groundwater dynamics in the Clearwater River Watershed are also a relic of glacial activity. Due to soil types, the northern half of the watershed has very low groundwater pollution sensitivity. Some areas in the center and eastern portions of the watershed are highly sensitive to pollution because they contain glacial lake sand and gravel, which allows for short travel times to the aquifer (Figure 2.15).

There are currently nine municipal community public water suppliers with Drinking Water Supply Management Areas (DWSMAs) delineated. Their vulnerability is as follows: Oklee (low), Red Lake Falls (very low), Crookston (moderate), Bagley (low), Erskine (mixed vulnerability with high and moderate), Clearbrook (moderate), Plummer (moderate), Gonvick (low), and McIntosh (low) (MDH, 2019) (Figure 2.15). Wellhead Protection Areas (WPA) overlap these same DWSMAs.

Groundwater withdrawals have been increasing in the past two decades, largely driven by agricultural irrigation. In drought conditions like 2021, this withdrawal can interfere with wells.

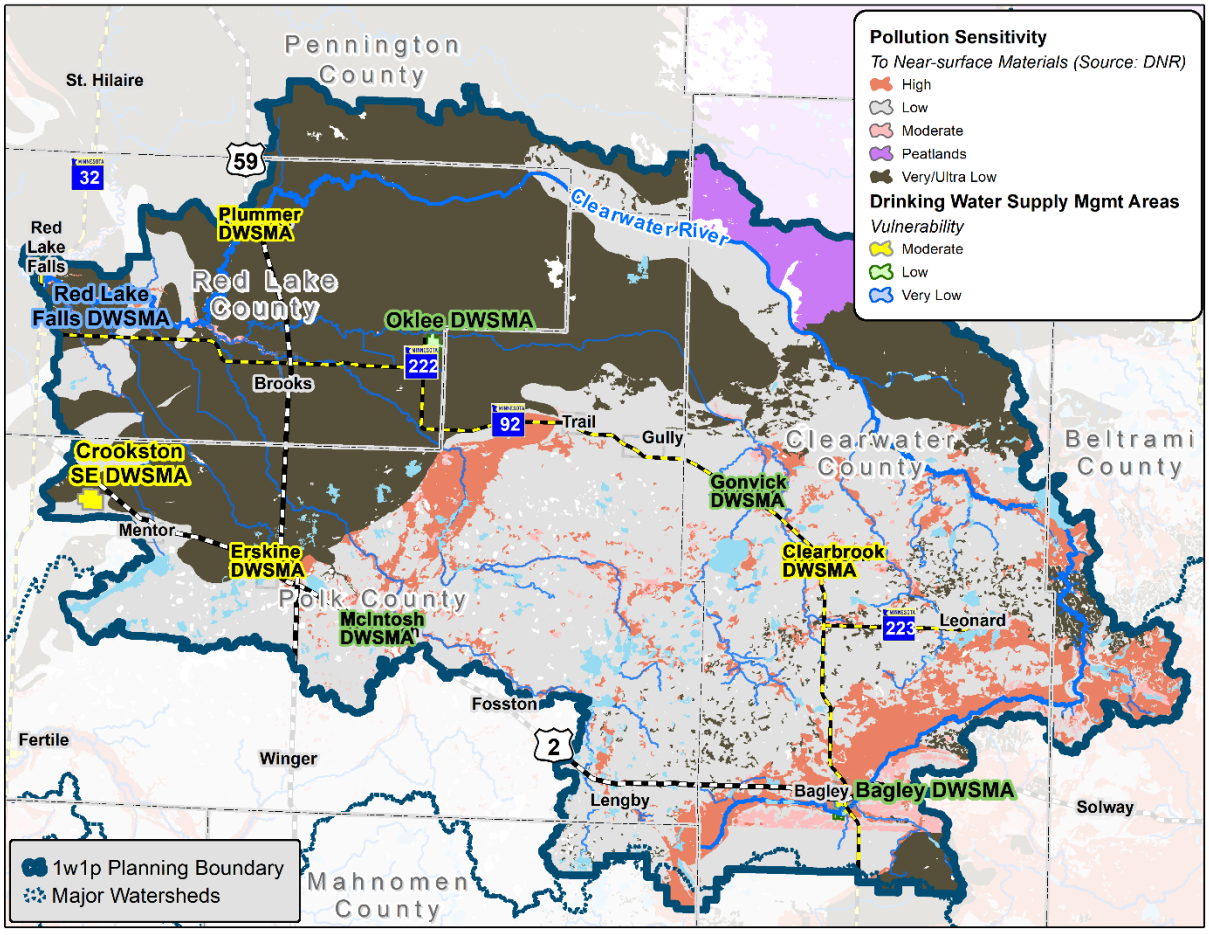


Figure 2.15. Groundwater sensitivity to surface pollution.

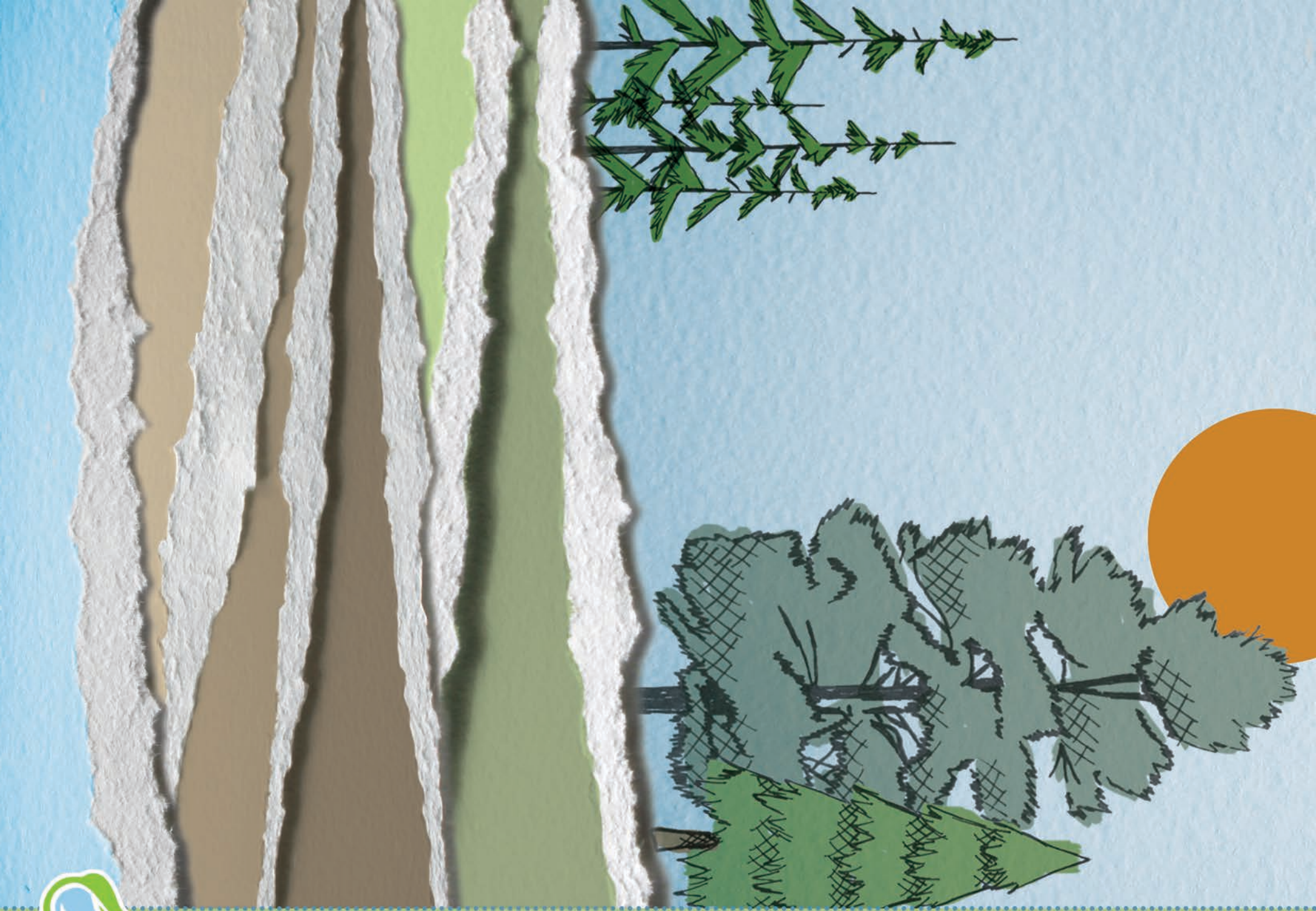
Future

Throughout the history of the Clearwater River Watershed, the land resources have determined the lifestyles of its human inhabitants. In many ways, the land and its resources continue to influence how the watershed's 14,000 people live today. This plan will help preserve the local way of life and livelihoods by protecting the resources they rely on.

Trends in land use since pre-settlement indicate the shift of forests, grasslands, and wetlands to pasture, crops, and development (Figure 2.16) (MPCA, 2021a). These trends give insight to what the future holds for the watershed and drive the actions of this plan. This cooperative planning process will help secure watershed-based funding for prioritized and targeted efforts to make measurable improvements in the water resources of the Clearwater River Watershed.

Future land use management can strike a balance between the development and protection of valuable resources for future generations.

Figure 2.16 Trends summarized from the MPCA WRAPS, 2021



SECTION 3. PRIORITY ISSUES

The first step in developing a Watershed Plan is to determine the priority issues in the watershed. An issue is a problem, risk, or opportunity related to a natural resource's condition. The issues identified in this process will be the basis for the rest of this plan.

Issue Identification

Over the course of several months, the Clearwater River Watershed Planning Work Group gathered a comprehensive list of issues for the watershed. Issues were gathered from numerous sources including existing county water plans, the RLWD Plan, the WRAPS, letters from state agencies and organizations outlining their priorities, an online public survey, two public kick-off events, a Planning Work Group Meeting, and an Advisory Committee meeting.

Each Issue Statement was assigned to one of four resource categories as shown below, which helps frame and communicate the issues throughout the process. Inherently there is overlap between the categories. For example, wetlands are both surface water and provide habitat for aquatic and terrestrial species. In this plan, a specific resource category is identified when that resource is the *primary* concern for a given issue statement. High quality resources are those that are threatened or that contain rare or threatened habitats/communities including wild rice, trout streams, shallow lakes, biologically significant lakes, and calcareous fens.

Resource Categories

Surface Water
- Lakes
- Streams
- Wetlands
- Drainage Systems
- High Quality Resources

Groundwater
- Drinking Water (Quality)
- Aquifers (Quantity)

Land Stewardship
- Agricultural Land
- Forest, Prairie, Grassland

Habitat
- Aquatic
- Terrestrial

Public Involvement

Input from the public was gathered from an online public survey (37 responses) and Public Open House events in Brooks and Gonvick in the summer of 2021. Open house participants and survey respondents were asked to provide input on the issues and opportunities they feel should be included in the plan. Their responses were consistent with many of the issues identified from existing plans and studies in the watershed (Figure 3.1). Most of the concerns on the minds of citizens were issues that can be addressed with actions that would be implemented by planning partners. The full Public Input Summary Report can be found in **Appendix B.**

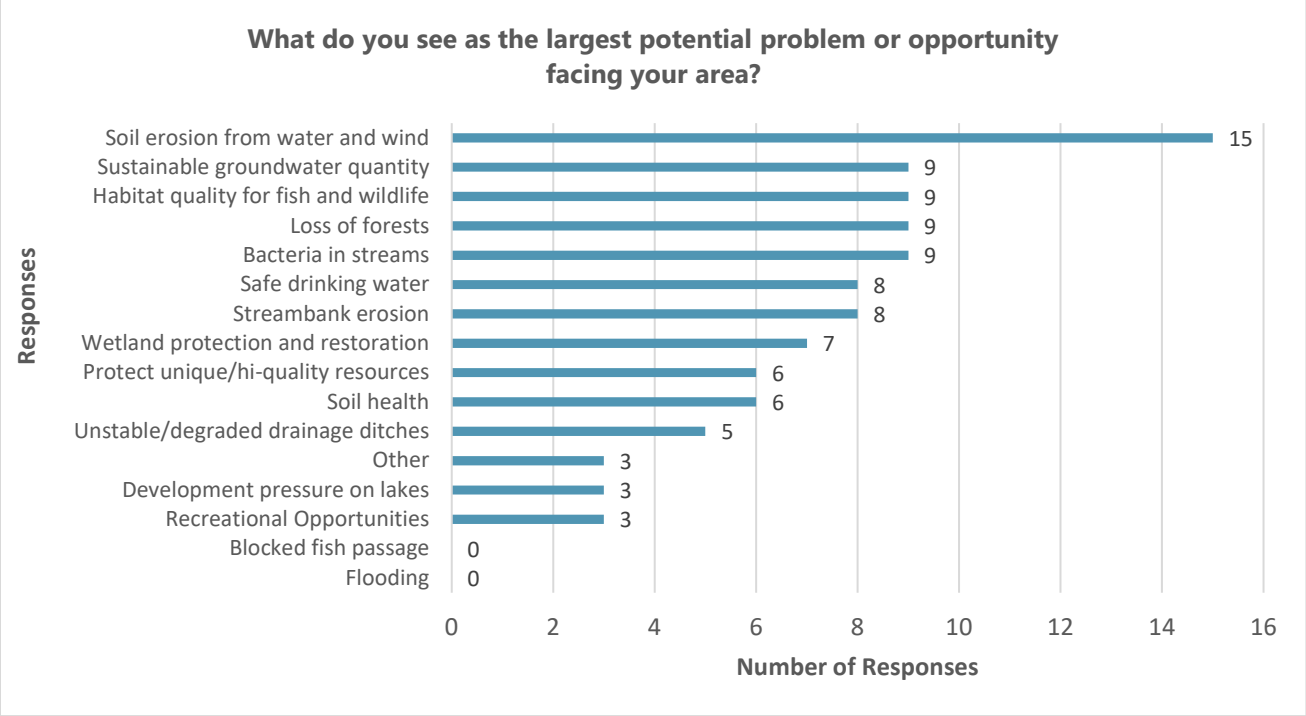


Figure 3.1. Public survey responses rating the largest potential problem or opportunity facing their area.

The public input was incorporated into the comprehensive issues list alongside issues identified in the WRAPS and from other sources. This comprehensive list of issues was then synthesized by the Clearwater River Watershed Planning Work Group, distilled into Issue Statements, reviewed by the Advisory Committee, and reviewed and approved by the Policy Committee on June 23, 2021.

Issue Prioritization

The next step in the planning process was to prioritize issues because funding and time are limited resources. Issues were prioritized based on which would be the focus of the most funding and effort during plan implementation.

In addition to determining "what" is a priority, it is necessary to determine "where" in the landscape these priorities are. This "what" and "where" were accomplished simultaneously by the Clearwater River Watershed Planning Work Group in July and August, 2021. The "where" part of the prioritization process was conducted at the planning region scale.

Planning Regions

Recognizing that resources and needs vary in different parts of the watershed, the Clearwater River Watershed Planning Work Group identified seven regions by which to tailor funding and implementation efforts. These regions align with smaller subwatersheds (HUC10) that follow local streams (Figure 3.2).

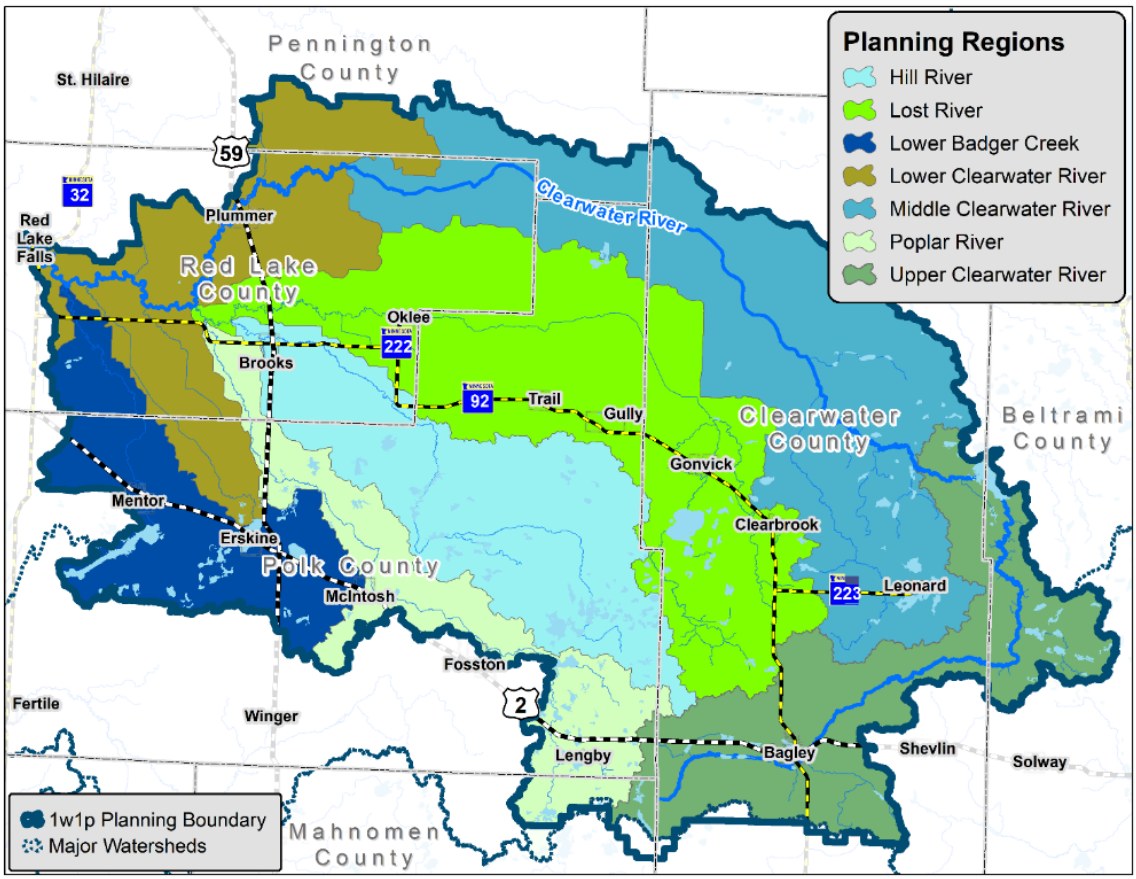


Figure 3.2. Planning Regions in the Clearwater River Watershed (based on HUC-10s).

Lower Clearwater River Receives drainage from five of the other subwatersheds and the towns of Plummer and Red Lake Falls.	**Lost River** Contains Pine Lake, most of the cities in the Watershed (Oklee, Trail, Gonvick, and Clearbook), and the outlets of the Hill and Poplar Rivers.
Middle Clearwater River Consists largely of wetlands and wild rice cultivation as well as the City of Leonard.	**Hill River** Contains numerous streams and small lakes, and the town of Brooks.
Upper Clearwater River The headwaters of the Watershed, includes forest, Clearwater Lake, trout streams, and the town of Bagley.	**Poplar River** Includes the towns of Lengby and McIntosh and the outlet of Spring Lake.
Lower Badger Creek Near the outlet of the watershed, includes Cameron and Maple lakes and the towns of Erskine and Mentor.	

At a meeting in July 2021, members of the Clearwater River Watershed Planning Work Group used maps to identify where issues were most prevalent within the watershed. Many factors were considered in the prioritization including citizen input from public events (Figure 3.3), water quality impairments, groundwater resources, and land use. Planning partners agreed that planning regions for each issue should be prioritized based on documented need (WRAPS), local authority and capacity to address the issue, feasibility, and eligibility for Clean Water Funds. Any issue that was ranked as high priority in at least one of the Planning Regions was considered a Priority 'A' Issue. Priority 'A' Issues are those that will be the main focus during implementation over the next 10 years. Issues that only ranked as a medium priority in any Planning Region were considered Priority 'B' Issues. Priority 'B' Issues are those that will be addressed as time, funding, and partnerships allow. The Clearwater River Watershed Planning Work Group decided that Priority 'A' and Priority 'B' Issues will have goals developed for addressing them. Issues that had a low priority ranking watershed-wide were considered Priority 'C' Issues (Figure 3.4). These issues are not a priority for the next 10 years and will not receive associated goals and actions in this plan. Priority 'C' issues may not currently be relevant to the watershed or may be addressed by other agencies and funding sources. The prioritized issues were discussed and approved by the Advisory and Policy Committees on August 25, 2021.

Figure 3.3. Issue discussion and prioritization at the Public Kickoff meeting in Brooks, MN.

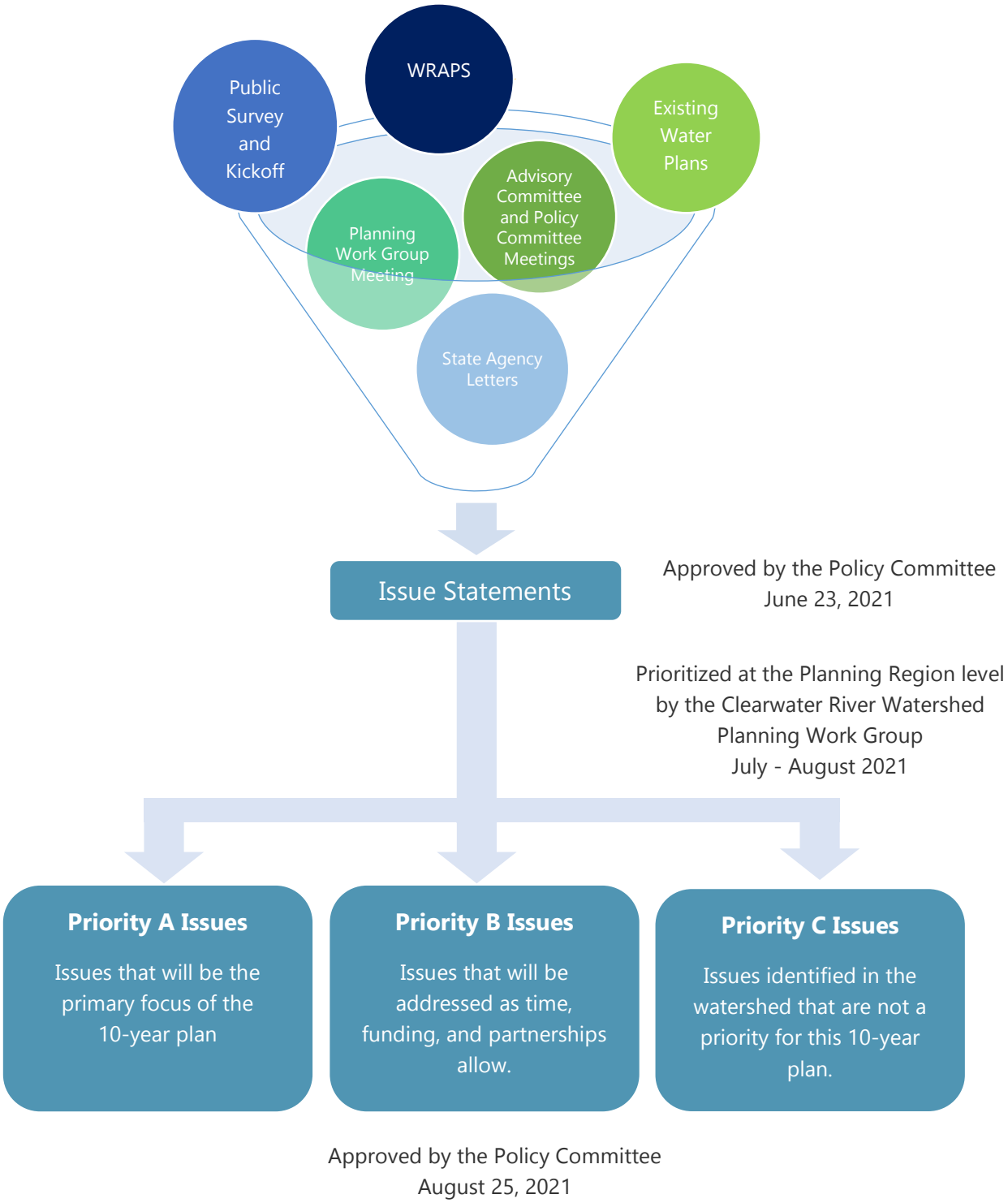
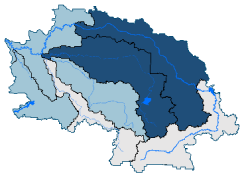
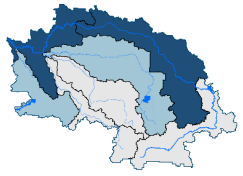
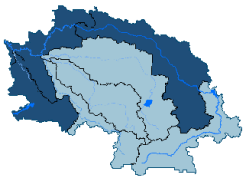


Figure 3.4. Issue prioritization process for the Clearwater River Watershed.

Priority 'A' Issues

Priority A issues received a "high" ranking in at least one planning region. These issues will be the main focus of funding and efforts that result from this plan.

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

Resource Category	Impacted Resource	Issue Statement	Planning Region Prioritization
	Streams	**Bacteria loading** impacts aquatic recreation and human health.	
	Streams	**Unstable stream channels** and loss of riparian vegetation increases sediment loading and reduces habitat quality.	
	Drainage Systems	**Drainage system bank instability and inadequacy** affects agricultural productivity and increases erosion and sedimentation.	
	Streams, Drainage Systems	**Altered hydrology** causes variability of flows affecting timing, water quantity, water quality, and erosion.	
	Lakes, Streams	**Sediment loading** from wind and water erosion of croplands, uplands, and lakeshore impacts water quality.	
	Lakes, Streams	**Phosphorus loading** contributes to elevated concentrations in lakes and streams, causing eutrophication.	
	Soil	Decreased **soil health** can reduce agricultural productivity and water holding capacity.	

Priority 'B' Issues

Priority B issues received a "medium" ranking in at least one planning region and did not have a "high" ranking in any planning region. These issues will be addressed as time, funding, and partnerships allow.

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

Resource Category	Impacted Resource	Issue Statement	Planning Region Prioritization
	Drinking Water	**Groundwater** is vulnerable to **contamination** from numerous sources.	
	Wetlands	**Wetlands** are in continued need of protection and restoration which helps with precipitation storage and provides habitat.	
	Aquifer	**Groundwater sustainability** is vulnerable to overuse and loss of recharge.	
	Lakes, Streams	**Stormwater runoff** from developed areas and roads causes contamination of lakes and streams.	
	Lakes, Wild Rice, Fens, Trout Streams, Forests, Grasslands, Prairies	**Changes in land use and resource protection impact** high quality resources, land resilience, habitat, and surface and groundwater quality.	

Priority 'C' Issues

Priority C Issues were not selected as 10-year priorities by the Clearwater River Watershed Planning Work Group and may already be addressed by other funding sources and plans.

- Increasing **chloride** concentrations from many sources (water softeners, industry, road salts) can impact water quality. *(Emerging issue)*
- **Aquatic Invasive Species (AIS)** impact the aquatic ecosystem, recreation, and economic development. *(Being covered by individual county AIS plans and funding)*
- More **outdoor recreation access** is needed for the public to enjoy the natural resources of the watershed. *(Indirect link to water quality, was a low priority for citizens, and is addressed by separate local, state and federal plans and agencies)*
- More **public outreach and cooperation** is needed for adoption of best management practices. *(Included as an action in the implementation table)*

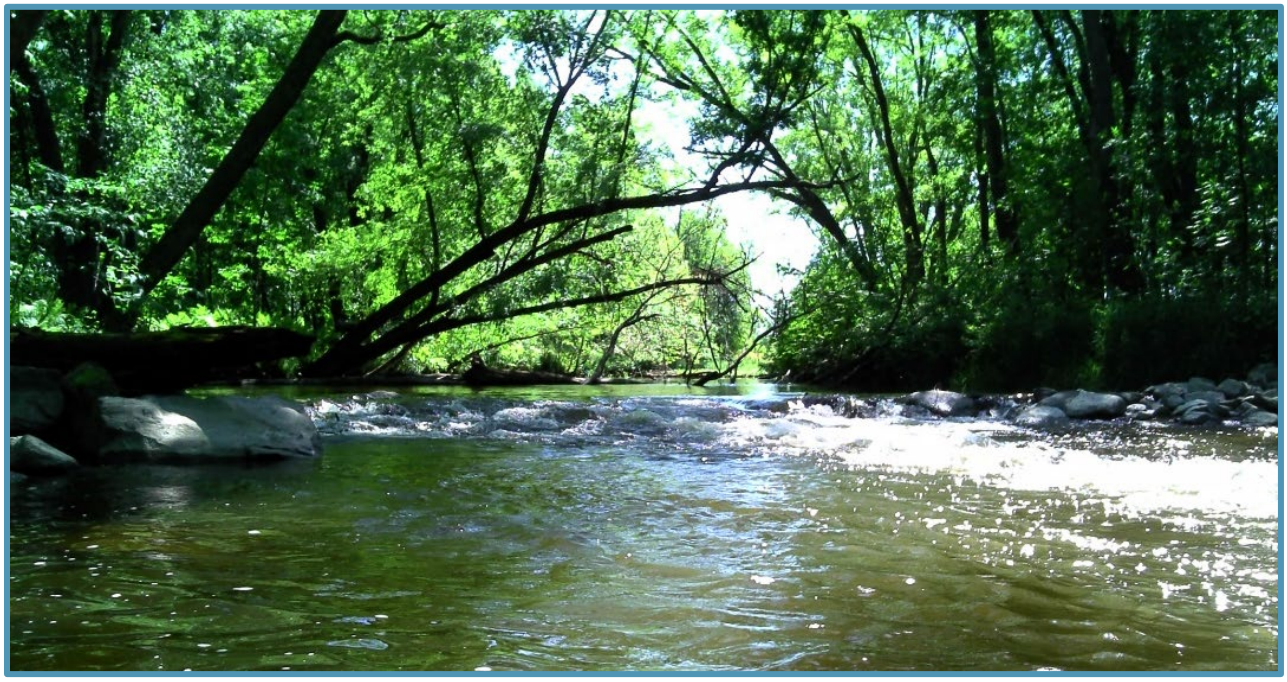


Figure 3.5. Rock riffle grade stabilization structure on the Clearwater River, installed as part of the Clearwater River Stream Bank Stabilization and Revitalization Project (RLWD).

Emerging Issues

Emerging issues affect resources within the Clearwater River Watershed but they either do not yet directly apply to the watershed, are outside the realm of this plan, or are those for which data does not yet exist to drive local decision-making.

Chloride

Chloride enters surface waters from a variety of sources including road salt, water softeners, WWTPs, fertilizer, manure, and dust suppressant. In Minnesota, road salt, fertilizers, and WWTPs are the main sources of chloride (MPCA, 2020). The impact of chloride on water quality in this watershed is less eminent due to the lack of urban population in the watershed.

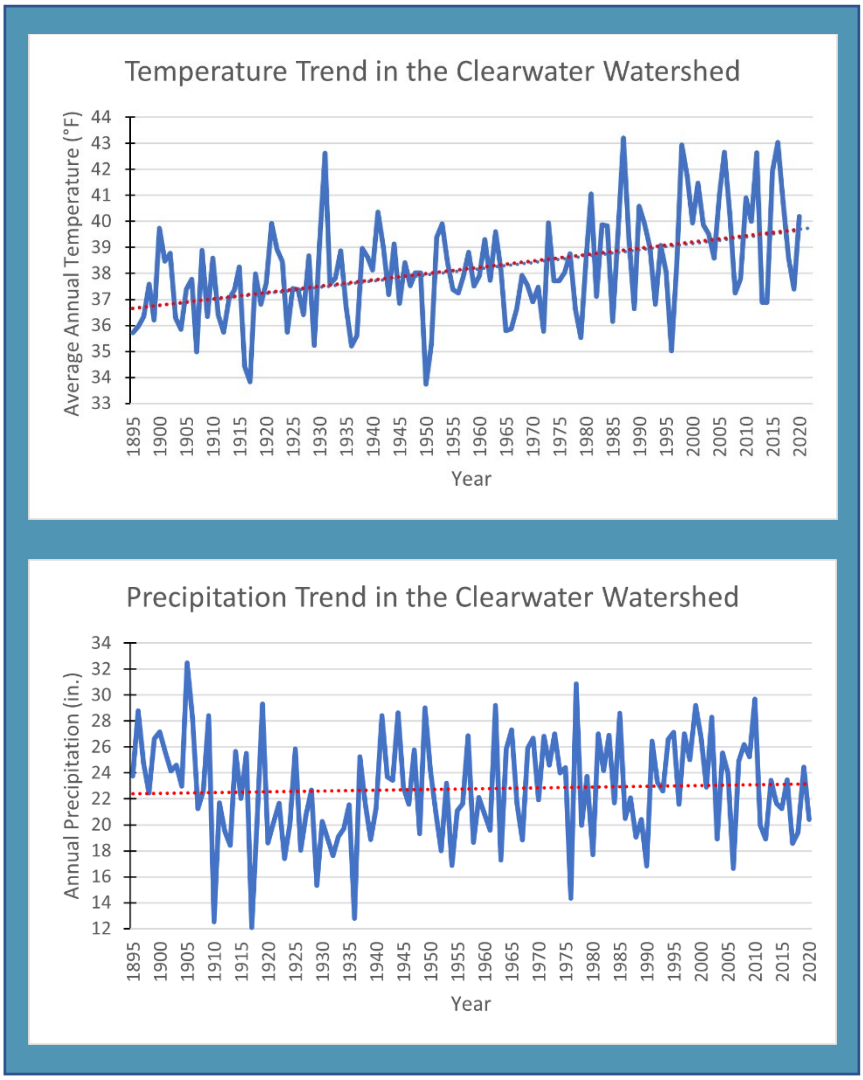
Contaminants of Emerging Concern

Contaminants of emerging concern (CECs) are designated by the US Environmental Protection Agency (EPA) and include everyday items such as pharmaceuticals and personal care products (PPCPs), a large category of synthetic chemicals known as PFAS (per- and polyfluoroalkyl substances), as well as other toxic chemicals (EPA, 2020) (MPCA, 2021b). PPCPs can act as endocrine disrupters that alter the normal functions of hormones resulting in a variety of health effects in humans and aquatic life even at low levels of exposure. PFAS are used in the manufacturing of consumer and industrial goods such as Teflon, stain retardant for carpets and upholstery, water-resistant clothing, PPCPs, cosmetics, food wrapper and paper plate coatings, and firefighting foams. Many CECs are washed down drains and toilets and enter the solid waste stream at people's homes. These contaminants are not treated by WWTPs or broken down in the landfill before they end up in surface and groundwater. The State of Minnesota and the MPCA are in the process of investigating where fish and drinking water have been contaminated in the state and how to address the issue (MPCA, 2021c).

Climate Change

Extreme weather and other impacts of climate change are already affecting farmers and residents in the Clearwater River Watershed. Building an adaptive plan for a resilient watershed is key to having the capacity to address future effects of climate change.

Minnesota has seen an approximate 3-inch increase in precipitation since 1895 alongside an approximate 3°F temperature increase over the same time period, statewide (1895-2020) (MN DNR, 2021a). Winter is warming faster than summer and nights faster than days. Temperature and precipitation increases are expected to continue throughout the century (MN DNR, 2019b). Temperature and precipitation data from the Clearwater River Watershed reflects similar trends as Minnesota overall. Figures 3.6a and 3.6b show average annual temperature and precipitation trends for the Clearwater River Watershed, which are a departure of +1.4°F and +0.6 inches respectively from the historical average. At this rate, the climate of the Clearwater River Watershed will be more like today's southern Iowa by the year 2070 (NG 2021).



Figures 3.5a and b. Annual temperature trend and annual precipitation trend for the Clearwater River Watershed, 1895 - 2020 (MN DNR Climate Data).

These incremental temperature and precipitation changes over a 125-year time period are enough to increase flooding, impact agricultural production, disrupt plant and wildlife communities, and affect water quality. Warmer winters can allow for northern encroachment of invasive species and shorten the duration of ice cover in lakes and rivers. Earlier snowmelt can cause stream flows to peak sooner in the spring, leading to baseflow conditions earlier in the year and drier conditions later in the year. The pairing of earlier snow melt with heavier spring rainfall can increase the magnitude and frequency of spring flooding. This also leads to more runoff from the landscape into lakes and streams, having the potential to impact crop yields and water quality.

To address the potential implications of climate change in the watershed, the activities implemented in this plan aim to include both mitigation (practices that mitigate the effects of climate change by storing carbon in the soil) and adaptation (enhancing the resiliency of the watershed to future changes) (BWSR, 2019).

Sulfate Impairments

Sulfate is a mineral salt that is both naturally occuring in the environment and is the byproduct of certain industries such as mining, power plants, and WWTPs. Various forms of sulfate are used in personal care and cleaning products like detergents and surfactants. Sulfates released into the environment as industrial waste can inhibit wild rice growth and increase the uptake of mercury into fish (Bjorhus, 2021).

Minnesota has had a sulfate standard for waters used for the production of wild rice since 1973, but it has been a source of contention between industry and tribal entities. In 2021, the EPA added several waters to Minnesota's 2020 Impaired Waters List as impaired for sulfate, including one stretch of the Clearwater River (Ruffy Brook to JD 1). The next steps to address the sulfate impairment on the Clearwater River are undetermined at the time of this planning effort.

Other wild rice waters in the Clearwater River Watershed include Clearwater River (Figure 3.7), Bee Lake, Eighteen Lake, Minnow Lake, Second Lake, Walker Brook Lake, First Lake, Lomond Lake, Pine Lake, Second Lake, Third Lake, Round Lake, Bagley Lake, Clearwater Lake, and Spike Lake.

Figure 3.6. Commercial Wild Rice paddies along the Clearwater River (RLWD).

Hazardous Spills

Hazardous spills from pipelines and railways have the potential to threaten surface and groundwater quality. There are several natural gas and crude oil pipelines that cross the Clearwater River Watershed. When spills occur, local governments and their emergency response departments partner with state agencies and emergency response cleanup contractors in site control and public safety issues in an effort to limit and/or prevent surface and groundwater contamination that could harm water quality, habitat, and wildlife. Local entities may have the capacity to enact ordinances that could prevent specific industries that use or store hazardous materials from operation within sensitive areas such as DWSMAs, near shorelands, or over vulnerable aquifers.

Invasive Species

Invasive species, both aquatic and terrestrial, can impact native species, habitat quality, and recreational enjoyment. At the time of this plan (October 2021), there is only one aquatic invasive species infestation in the watershed – Zebra mussel veligers have been documented in Lake Lomond (DNR 2021). The counties in the watershed have programs and funding in place for noxious weed and invasive species management and prevention and receive assistance from the state. These programs will be continued to manage current infestations and work to prevent new infestations.

SECTION 4. MEASURABLE GOALS


Credit: RLWD

Goals describe what measurable change is desired in the priority resources and how progress will be tracked. The Clearwater River Watershed Planning Work Group drafted 10 goals that will guide the implementation of this plan. The goals were reviewed by the Advisory Committee, and then approved by the Policy Committee. They cover the four resource categories: surface water, land stewardship, habitat, and groundwater, and address all the priority issues of the plan (Section 3). Different data sets and models were used to determine the goal numbers. PTMApp, the WRAPS, and TMDLs were used to define load reduction goals for sediment and phosphorus. eLINK data was used for defining well sealing and bacteria reduction goals, and GIS data were used for protection and stormwater goals. Detailed information on actions and costs to reach these goals is described in **Section 5** of this plan. Long-term goals represent the desired future condition; short-term goals represent the 10-year milestones during implementation of this plan.

In this section, goals are laid out with the following items:

- Description: Background and justification for the goal.
- Issues Addressed: Which priority issues the goal addresses (Section 3).
- Goal Metrics: How progress will be measured.
- Stacking Additional Benefits: the other benefits of this goal, including water quality, habitat, and climate resilience (Table 4.1). Climate resilience is the capacity of the ecosystem to cope with stress from heavy rain and extreme heat yet still function.
- Prioritization: Which resources and areas are prioritized

Table 4.1. Stacking additional benefits from implementing the 10-year plan goals.

Water Quality Benefits	**Phosphorus**: the pounds of phosphorus reduced by implementing this goal.
	Sediment: the tons of sediment reduced by implementing this goal.
	Nitrogen: the pounds of nitrogen reduced by implementing this goal.
Habitat Benefits	**Habitat**: acres of habitat protected by implementing this goal.
Climate Resiliency Benefits	**Storage**: the amount of water stored on the landscape or in the soil in acre-feet. One acre-foot is equivalent to a football field being covered in one foot of water.
	Carbon: the amount of carbon stored in existing forest and sequestered by implementing cover crops or converting cropland to pasture or perennial crops.

MEASURABLE GOAL: SEDIMENT REDUCTION

Reduce sediment delivery to streams, lakes, and drainage systems

Description

Sedimentation, measured as suspended sediment, occurs when wind and water erosion move topsoil off the land and deposit it in a different place. Overland erosion is caused when exposed soils encounter heavy rains, rushing water, or strong winds (Ritter, 2018). Human activities can increase erosion when vegetation is removed from the land for agriculture, development, construction, or logging. When sediment is deposited on the land, it can inhibit crop productivity and damage roads and bridges. Sedimentation in streams can increase flooding downstream and decrease the quality of aquatic habitat. Sedimentation in drainage ditches reduces drainage capacity and increases maintenance costs.

Projects such as grassed waterways, water, and sediment control basins (WASCOBs), grade stabilizations, conservation tillage, cover crops, filter strips, and perennial vegetation reduce sediment loading to streams, lakes, and drainage systems.

Issues Addressed

- Sediment Loading
- Phosphorus Loading
- Streambank and Riparian Stabilization
- Soil Health

Goals

Short-Term Goal: Attain sediment load reduction goals for each planning region, as established in the table below.

Long-Term Goal: Attain sediment load reduction targets established by TMDL and WRAPS reports, as summarized by planning region in the table below.

Existing loads for each Planning Region were determined with PTMApp (Appendix E). The short-term goal is shown for both the Planning Region (PR) outlet and the catchment (at the BMP).

Planning Region (PR)	Sediment Load at PR Outlet (tons/yr)	Short-term Goal Reduction at PR Outlet (tons/yr)	Short-term Goal Reduction at Catchment (tons/yr)	Long-term Goal Reduction (WRAPS/TMDL) (tons/yr)
Lower Clearwater River	18,491	767 (4%)	2,901	4,650 (25%)
Lower Badger Creek	4,235	341 (8%)	4,080	424 (10%)
Lost River	13,177	563 (4%)	5,718	1,318 (10%)
Hill River	6,064	157 (3%)	4,671	303 (5%)
Poplar River	3,227	77 (2%)	3,350	161 (5%)
Middle Clearwater River	9,678	843 (9%)	2,601	858 (9%)
Upper Clearwater River	1,223	103 (8%)	2,084	61 (5%)

Measuring

The sediment load reduction goals are based on percentages determined from modeling during the WRAPS and TMDL process. Progress will be monitored using PTMApp estimates of sediment reductions that implemented practices provide.

Prioritization

Sediment prioritization for the Clearwater River Watershed was developed by targeting MPCA nearly impaired and nearly restored (barely impaired) streams (Figure 4.1). Planning regions with more of these streams are prioritized for initial implementation of sediment practices (Appendix D).

Stacking Additional Benefits

Work toward this goal also makes progress towards reductions in phosphorus and nitrogen and increases storage. Stabilizing ditches and stream banks also reduces sediment in the stream.

Water Quality Benefits*	Phosphorus = 554 lbs/yr
	Nitrogen = 9,655 lbs/yr
Climate Resiliency Benefits	Storage = 450 acre-feet from WASCOBs

** As estimated at the planning region outlet by PTMApp*

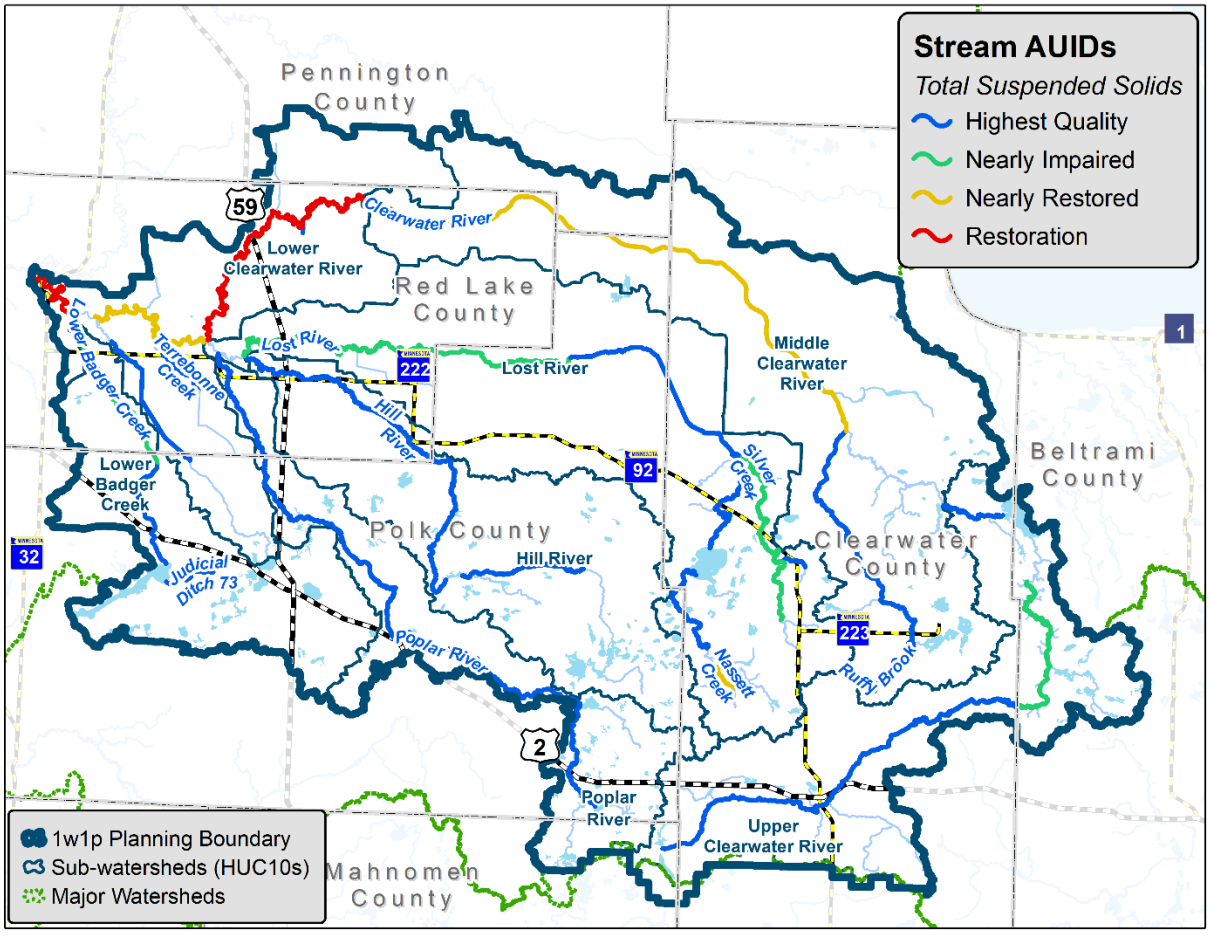


Figure 4.1. Resource categories based on sediment (WRAPS).

MEASURABLE GOAL: STREAMBANK AND RIPARIAN STABILIZATION

Stabilize streams to improve channel integrity and riparian protection.

Description

Over time, streambanks can erode due to natural processes or from channelization. Upstream hydrology changes can also cause incision and other types of erosion in channels as a result of high flows, fast moving water, and a lack of stream sinuosity and natural streambed features. In-channel erosion accounts for large portions of sedimentation in Clearwater River Watershed streams. There are many solutions to address stream instability, including stream restoration and the expansion of riparian and bank vegetation.

Riparian corridors provide benefits such as pollutant filtration, slowing flood waters, wildlife habitat and continuity, and bank stabilization. Deep roots of riparian and bank vegetation hold soil in place, and the loss of this vegetation contributes to sediment loading downstream.

Issues Addressed

Unstable Stream Channels ♦ Sediment Loading ♦ Altered Hydrology ♦ Phosphorus Loading

Goals

Short-Term Goal: 12.5 miles of stream stabilized (bank and in-channel).

Long-Term Goal: Stabilize all "feasible" unstable stream banks.

Planning Region	Short-term Goal (miles)
Lower Clearwater River	4.7
Lower Badger Creek	0.0
Lost River	5.0
Hill River	0.6
Poplar River	0.0
Middle Clearwater River	1.8
Upper Clearwater River	0.4
Total	**12.5**

Measuring

Progress will be measured by miles of stream stabilized. Tons of sediment reduced from these projects could also be determined from engineering estimates. The WRAPS showed that the total suspended solids in watershed streams were from both overland and in-stream sources. For more detail on the proportion of loading from each source, see **Appendix D**.

Stacking Additional Benefits

Work toward this goal also makes progress towards reductions in sediment, phosphorus and nitrogen and improves habitat.

Habitat Benefits	Miles of aquatic habitat = 12.5
Water Quality Benefits*	Phosphorus
	Sediment
	Nitrogen

** As estimated in feasibility studies*

Prioritization

Ground-truthing by RLWD identified stream reaches that needed stabilization (Figure 4.2). Locations prioritized for the short-term goal were determined by the Clearwater River Watershed Planning Work Group, and are locations where projects were already planned in the next 10 years.

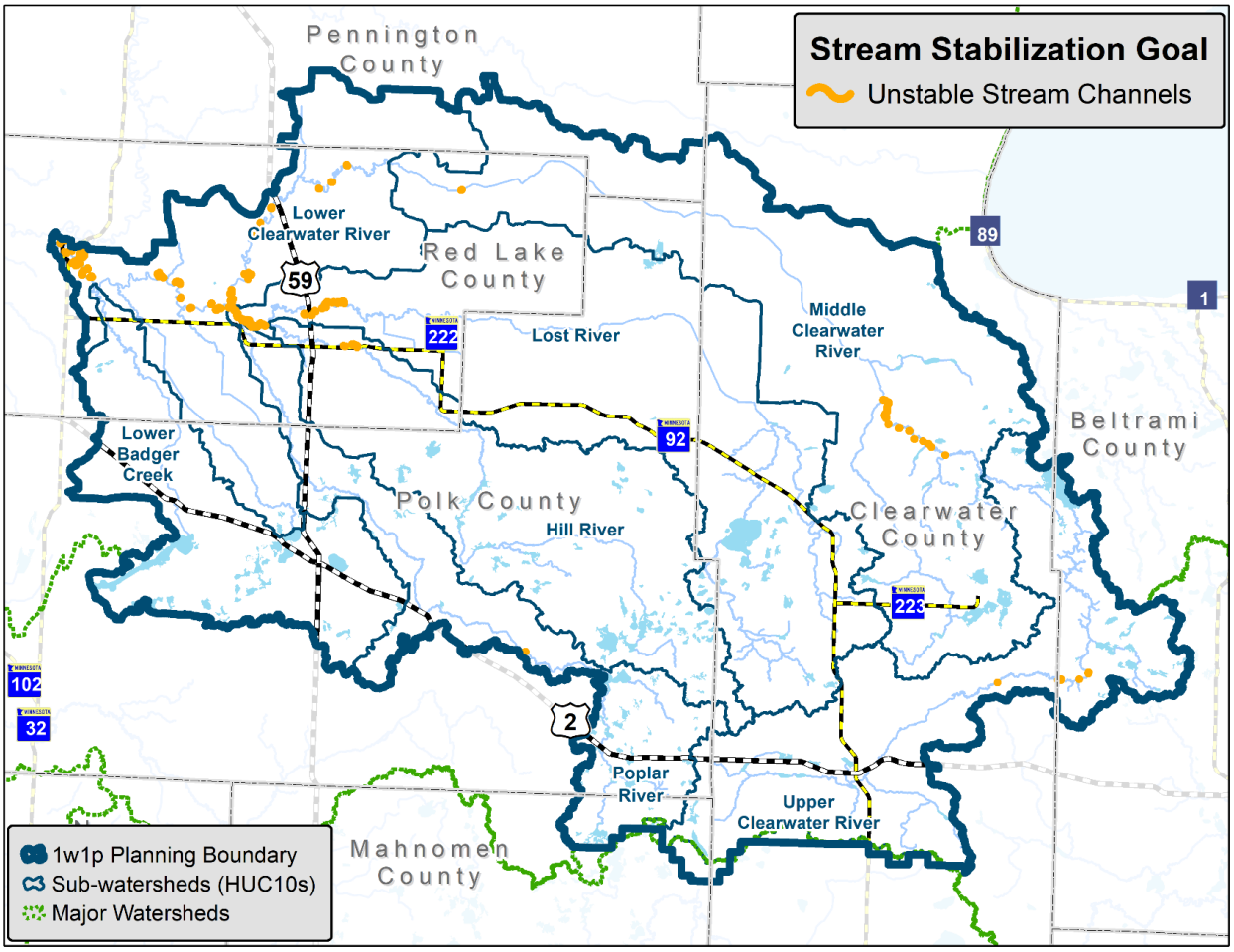


Figure 4.2. Locations for stream stabilization identified by RLWD.

MEASURABLE GOAL: DITCH STABILIZATION

Stabilize ditches to reduce sediment and improve water conveyance.

Description

Due to the flat terrain of the Red River Valley, extensive agricultural drainage networks were developed early on to drain the saturated soils. Over time, some of these ditches have eroded or become unstable. Some indications of ditch instability include bank failure, incision, undercutting or overwidening, and sediment deposition (Roundy, 2020). Ditch stability is affected by human-induced and environmental factors such as proper design and construction to match expected flows, quality vegetation of side slopes, increased flow contributions to the drainage area, and the depth of the water table (Magner, 2010). Regular ditch maintenance can minimize erosion and issues with flooding, stream stability, water quality, and aquatic habitat. This goal will be accomplished by implementing bank and in-channel stabilization projects in ditches and ditch outlets.

Issues Addressed

- Drainage System Instability and Inadequacy
- Sediment Loading
- Phosphorus Loading
- Altered Hydrology

Goals

Short-Term Goal: 13.5 miles of ditch stabilized, and 1 ditch outlet stabilized.

Long-Term Goal: Stabilize all unstable ditch banks and outlets.

Planning Region	Short-term Goal
Lower Clearwater River	1.7
Lower Badger Creek	0.4
Lost River	8.9
Hill River	0
Poplar River	0
Middle Clearwater River	2.6
Upper Clearwater River	0
Total	**13.6**

Measuring

Progress will be tracked by miles of ditch stabilized and number of ditch outlets stabilized. Potential load reductions in tons of sediment will also be measured for each completed project if a feasibility study is completed.

Stacking Additional Benefits

Work toward this goal also makes progress towards reductions in sediment, phosphorus and nitrogen.

Water Quality Benefits*	Phosphorus
	Sediment
	Nitrogen

** As estimated in feasibility studies*

Prioritization

RLWD identified ditches that needed stabilization through ground-truthing (Figure 4.)

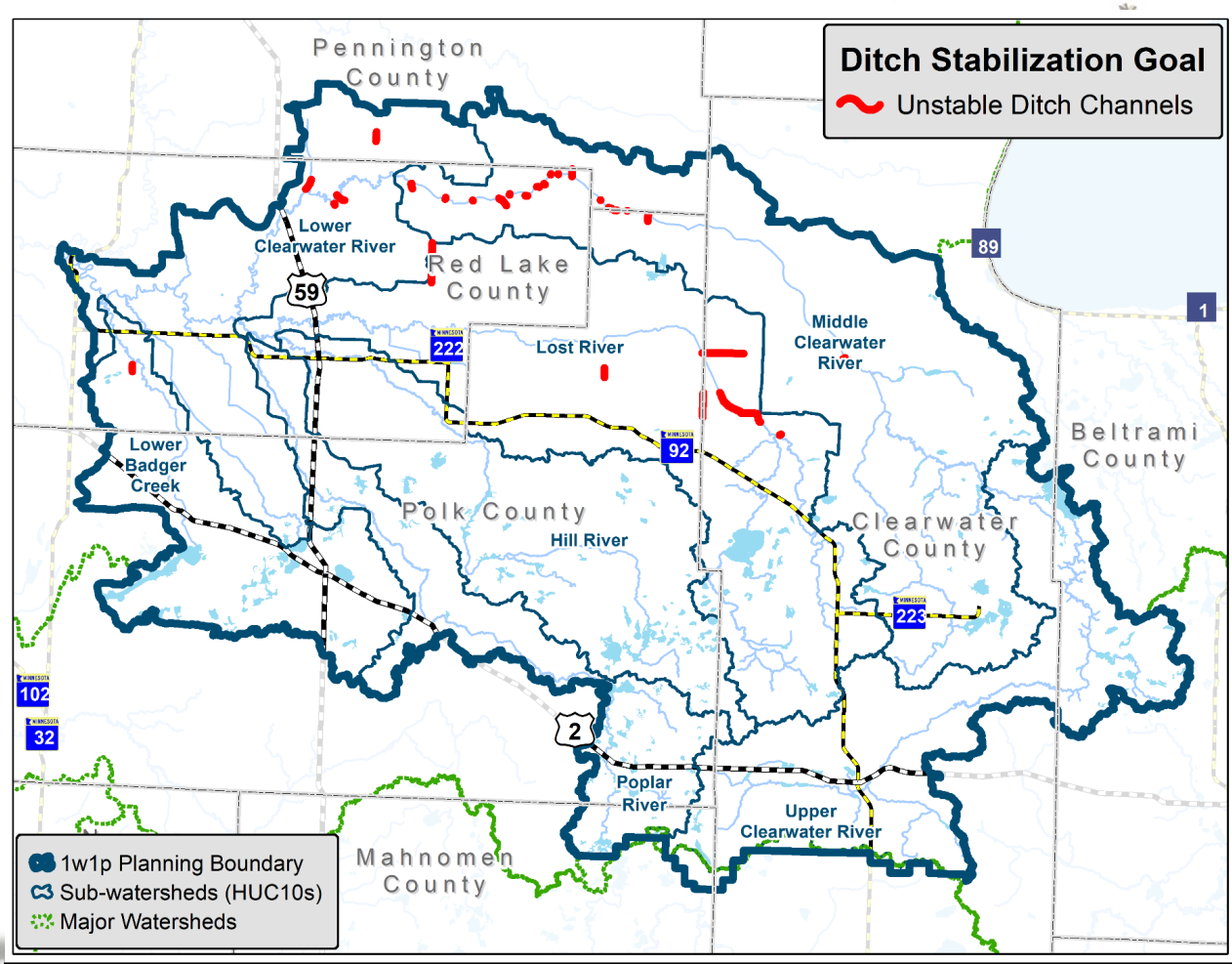


Figure 4.3. Unstable ditch channels and outlets identified by RLWD.

MEASURABLE GOAL: PHOSPHORUS REDUCTION

Reduce phosphorus delivery to streams, lakes, and drainage systems.

Description

Phosphorus is a nutrient that helps plants grow. In excessive amounts, phosphorus can be damaging to an aquatic system, causing harmful algal blooms that can be toxic to humans, pets, and wildlife. Harmful algal blooms also cause eutrophication in lakes and streams, a condition that limits oxygen to aquatic life.

Phosphorus binds to sediment and therefore, when erosion occurs or when sediment is disturbed, phosphorus is released to streams and lakes. Practices that address sediment and erosion also provide phosphorus reductions.

Issues Addressed

- Phosphorus Loading
- Sediment Loading
- Streambank and Riparian Stabilization
- Soil Health
- Bacteria Loading
- Ditch Stabilization

Goals

Short-Term Goal: Attain phosphorus load reduction goals for each planning region and lake, as established in the table below and the next page.

Long-Term Goal: Attain phosphorus load reduction goals established by TMDL and WRAPS reports, as summarized by planning region and lake in the table below and the next page.

Existing loads for each Planning Region were determined with PTMApp. The short-term goal is shown for both the Planning Region (PR) outlet and the catchment (at the BMP).

Planning Region (PR)	Phosphorus Load at PR Outlet (lbs/yr)	Short-term Goal Reduction at PR Outlet (lbs/yr)	Short-term Goal Reduction at Catchment (lbs/yr)	Long-term Goal Reduction (WRAPS) (lbs/yr)
Lower Clearwater River	55,724	554 (1%)	874	5,572 (10%)
Lower Badger Creek	6,966	326 (5%)	1,237	697 (10%)
Lost River	33,309	704 (2%)	1,501	3,331 (10%)
Hill River	11,318	308 (3%)	913	1,132 (10%)
Poplar River	6,084	232 (4%)	680	608 (10%)
Middle Clearwater River	16,734	489 (3%)	745	2,175 (13%)
Upper Clearwater River	3,614	128 (4%)	537	361 (10%)

Table 4.2. Tier 1 lake phosphorus reduction goals (see Appendix D for prioritization). The long-term reduction goal for Cameron Lake is the TMDL reduction.

Lake	Protection/ Restoration Category	PTMApp TP Load Delivered to Lake (lbs/yr)	Short-term Reduction Goal (WRAPS) (lbs/yr)	Long-term Reduction Goal (WRAPS/TMDL) (lbs/yr)
Cameron Lake	Impaired	194	19 (10%)	126 (65%)
Maple Lake	Nearly Impaired	4,330	217 (5%)	433 (10%)
Clearwater Lake	Nearly Impaired	4,663	233 (5%)	466 (10%)
Pine Lake	Nearly Impaired	3,058	153 (5%)	306 (10%)
Turtle Lake	Nearly Impaired	343	17 (5%)	34 (10%)

Table 4.3. Tier 2 lake phosphorus reduction goals. The long-term reduction goal for Stony and Long Lakes is the TMDL reduction.

Lake	Protection/ Restoration Category	PTMApp TP Load Delivered to Lake (lbs/yr)	Short-term Goal Reduction (lbs/yr)	Long-term Goal Reduction (WRAPS/TMDL) (lbs/yr)
Stony Lake	Impaired	37		27 (72%)
Long Lake	Impaired	175		63 (36%)
Whitefish Lake	Nearly Impaired	983		98 (10%)
Bagley Lake	Nearly Impaired	178		18 (10%)
Peterson Lake	Nearly Impaired	139		14 (10%)
Minnow Lake	Nearly Impaired	83	*If opportunities arise, projects will be implemented on these lakes to make progress towards long-term goals.*	8 (10%)
Sabe Lake	Nearly Impaired	43		4 (10%)
Spike Lake	Nearly Impaired	891		89 (10%)
Walker Brook Lake	Nearly Impaired	433		43 (10%)
Johnson Lake	Nearly Impaired	537		54 (10%)
First Lake	Nearly Impaired	2,031		20 (10%)
Second Lake	Nearly Impaired	2,230		22 (10%)
Lindberg Lake	Nearly Impaired	90		9 (10%)
Cross Lake	Nearly Impaired	1,120		11 (10%)
Lake Lomond	Nearly Impaired	323		32 (10%)
Spring Lake (Lengby)	Nearly Impaired	739		74 (10%)
Hill River Lake	Nearly Impaired	NA		10%
Oak Lake	Nearly Impaired	NA		10%

Measuring

Phosphorus load reduction goals for non-impaired streams and lakes were determined by the Clearwater River Watershed Planning Work Group and Advisory Committee and are meant to prevent future impairments. Achievements toward this goal will be measured by phosphorus load reductions from practices implemented on the land as estimated by PTMApp.

Stacking Additional Benefits

Work toward this goal also makes progress towards reductions in sediment, nitrogen, and algae.

Water Quality Benefits (in lakes)	One pound of phosphorus can produce 500 pounds of algae
Water Quality Benefits*	Sediment = 767 tons/year
	Nitrogen = 9,655 lbs/year

** As estimated at the planning region outlet by PTMApp*

Prioritization

Priority streams and lakes were identified using the WRAPS Protection and Restoration analysis (Figure 4.4). Phosphorus load reduction goals for impaired lakes and streams were identified in the TMDL and applied to loading amounts derived from PTMApp.

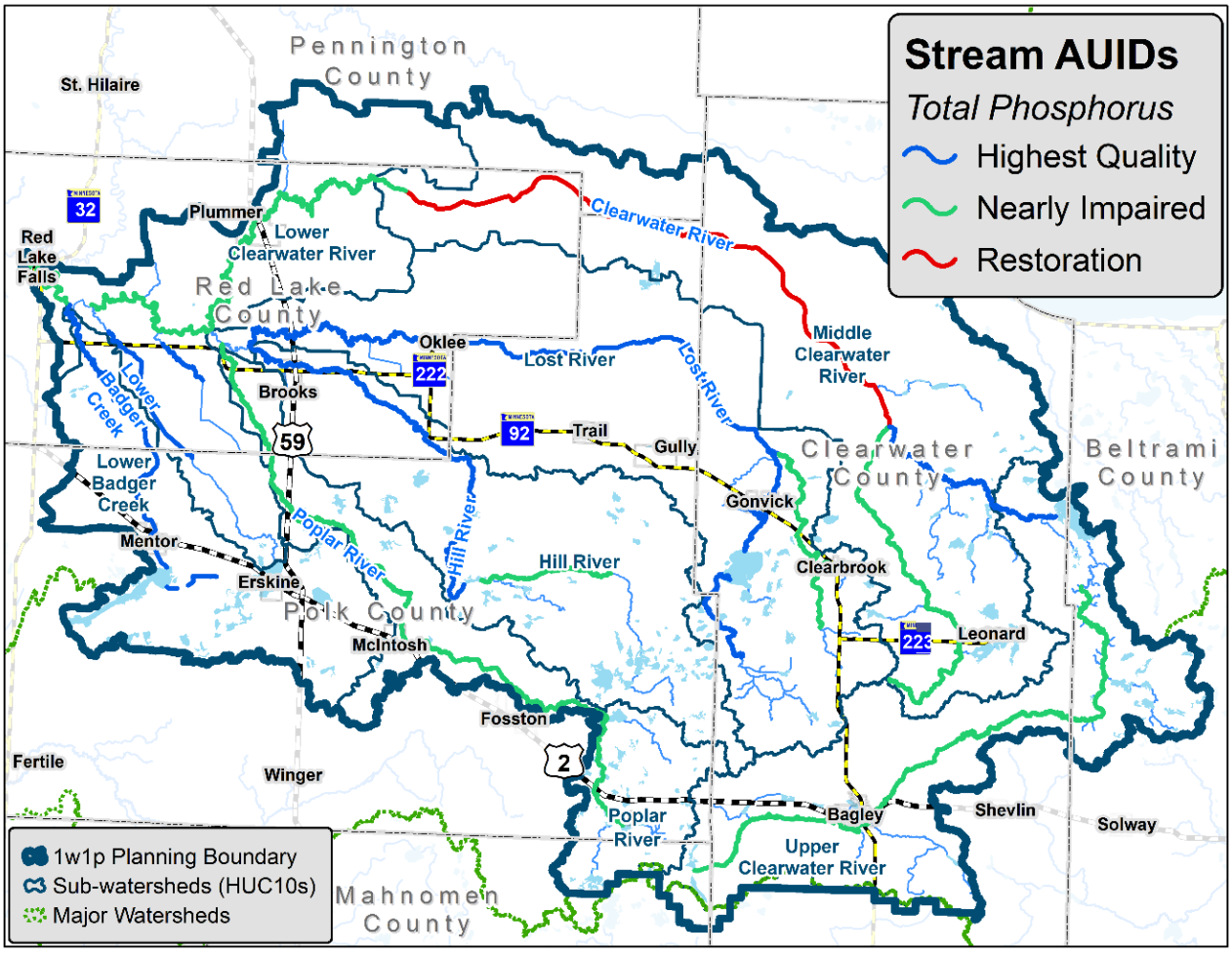


Figure 4.4. Resource categories based on phosphorus (WRAPS).

MEASURABLE GOAL: SOIL HEALTH

Implement regenerative practices on cultivated cropland with the highest wind and water erosion potential to increase soil health.

Description

Healthy soils provide a multitude of benefits for farmers and downstream neighbors. Soil health is the capacity of soil to function as a living ecosystem that sustains plants and animals, including humans (USDA-NRCS, 2021). Healthy soils regulate water, filter, and buffer pollutants, cycle nutrients, and stabilize plant roots and buildings. As soils degrade, or lose nutrients, microorganisms, and the ability to hold water, they are susceptible to erosion, causing sedimentation in fields and downstream. Soil health practices such as cover crops, perennial crops, reduced tillage, and rotational grazing improve soil organic matter and structure, carbon storage, and water and nutrient holding capacity.

Issues Addressed

- Soil Health
- Sediment Loading
- Phosphorus Loading
- Groundwater Sustainability
- Groundwater Contamination

Goals

Short-Term Goal:

Implement soil health practices on 10% of the land that is susceptible to water and wind erosion (18,780 acres) (Figure 4.5).

Long-Term Goal:

Soil health practices are implemented on all the land that is susceptible to water and wind erosion (187,801 acres) (Figure 4.5).

Planning Region	Short-Term Goal (acres)	Long-term Goal (acres)	Annual Pace of Progress (acres)
Lower Clearwater River	1,670	16,701	167
Lower Badger Creek	1,954	19,543	195
Lost River	4,642	46,417	464
Hill River	2,828	28,275	282
Poplar River	1,984	19,838	198
Middle Clearwater River	3,463	34,630	346
Upper Clearwater River	2,240	22,397	223
Total	**18,780**	**187,801**	**1,875**

Measuring

Progress on this goal will be measured by the number of acres of soil health practices implemented such as cover crops, no till, grazing management, perennial crops, and conservation crop rotation.

Stacking Additional Benefits

Work toward this goal also makes progress towards reductions in phosphorus, sediment, and nitrogen, stores water in the soil, and sequesters carbon.

Water Quality Reductions at field edge	Phosphorus = 4,669 lbs/yr
	Sediment = 16,482 tons/yr
	Nitrogen = 88,166 lbs/yr
Climate Resiliency Benefits	Carbon Sequestration = 1,550 tonnes*

*tonnes are metric tons, equivalent to 1.1 US tons

Prioritization

A critical soil loss analysis was conducted in the Clearwater River Watershed to find the top 25% of parcels with the highest wind and water erosion potential (Appendix D), and these areas were summarized on a subwatershed (HUC-12) scale (Figure 4.5). Watershed partners will provide technical and financial assistance to farmers interested in implementing best management practices.

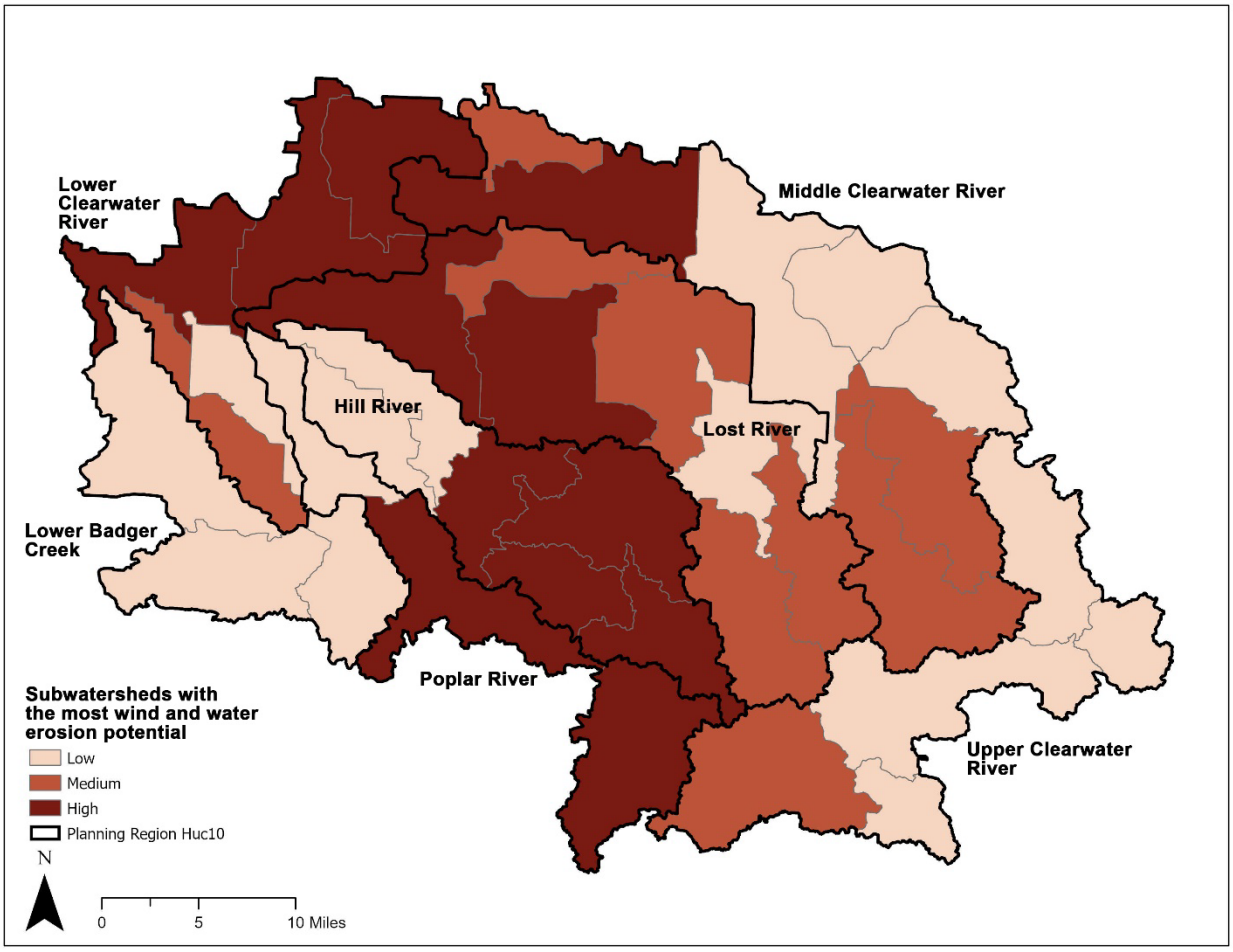


Figure 4.5. Priority areas for soil health practices in the Clearwater River Watershed.

MEASURABLE GOAL: HIGH VALUE RESOURCE PROTECTION

Protect and enhance forest cover, native prairies, water quality, habitat, and groundwater by promoting land protection in priority minor watersheds.

Description

Protecting high value resources in prioritized locations can help preserve the areas in the Clearwater River Watershed that are less disturbed by humans. High value resources include Lakes of Biological Significance (MN DNR, 2015), cisco lakes, wild rice, trout streams, calcareous fens, forests, and prairies. Native plant communities such as those found within forests and prairies provide services such as groundwater recharge, pollutant filtration, water flow regulation, and wildlife habitat. The south and eastern portions of the watershed are also home to the headwaters of the Clearwater, Poplar, Lost, and Hill Rivers, along with Lower Badger Creek. Protecting these headwaters can prevent erosion and other problems downstream to the Red Lake River. Resource protection involves providing incentives for practices such as putting land into conservation easements, creating forest stewardship plans, and enrolling in tax incentive programs such as the Sustainable Forest Incentive Act (SFIA).

Issues Addressed

- Land Use Change and Resource Protection
- Groundwater Contamination
- Groundwater Sustainability
- Wetland Degradation
- Sediment Loading
- Phosphorus Loading
- Altered Hydrology

Goals

Short-Term Goal: 50% progress towards Long-Term Goal in Tier 1 and 10% progress towards Long-Term Goal in Tier 2 minor watersheds.

Long-Term Goal: 75% protection in all priority minor watersheds (Figure 4.6).

Planning Region	Short-term Goal (acres)	Long-term Goal (acres)
Upper Clearwater River	7,603	37,284
Middle Clearwater River	3,852	20,394
Lost River	2,052	20,490
Hill River	531	8,463
Poplar River	2,969	8,225
Lower Badger Creek	220	2,881
Lower Clearwater River	0	1,470
Total	**17,227**	**99,207**

Measuring

Progress will be measured by acres of protection added. Protection in forested lands is defined as enrollment in SFIA, a conservation easement on private lands, or public land acquisition. Forest Stewardship Plans will be implemented on private lands as well. Protection in prairie lands is defined as CRP contracts, conservation easements on private lands or public land acquisition.

Stacking Additional Benefits

Work towards this goal also makes progress towards protecting water storage in the forest soils, protecting carbon storage in the trees, and providing habitat.

Habitat Benefits	Contiguous Habitat = 17,227 acres
Climate Resiliency Benefits	Protected Storage = 7,050 acre-feet
	Protected Carbon Storage = 240,000 tonnes*

*tonnes are metric tons, equivalent to 1.1 US tons

Prioritization

The Riparian, Adjacency, Quality (RAQ) Index was developed to target private lands for resource protection. The RAQ considers Riparian areas on lakes and streams, Quality (high ecological value resources), and Adjacency (connectivity) to other protected lands to form larger habitat blocks. The GIS-based analysis targets resources at the parcel level to target implementation. Areas with the highest RAQ scores are prioritized for protection: Tier 1 priority is yellow (including Pine, Clearwater, Buzzle lakes, and trout streams), Tier 2 priority is green in Figure 4.6.

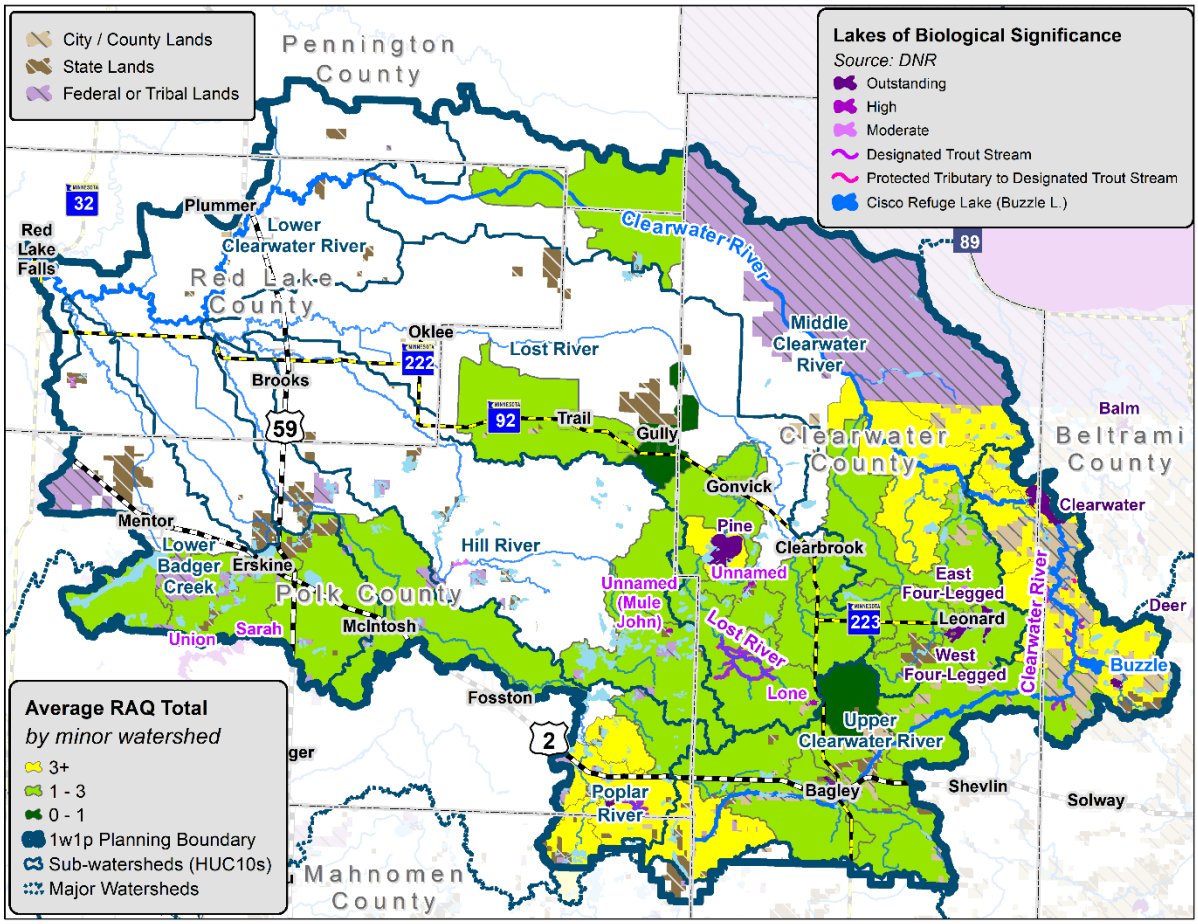


Figure 4.6. Priority areas for land protection (Tier 1 priority is yellow and Tier 2 priority is green).

MEASURABLE GOAL: RUNOFF REDUCTION

Reduce runoff volume to address altered hydrology and reduce flood damage downstream by increasing storage in the watershed.

Description

Changes to hydrology over time can increase the rates at which water flows across the land and into streams and ditches, causing flooding, erosion, and aquatic habitat loss. Hydrologic alteration involves changes to the duration, magnitude, frequency, speed, or timing of water flowing through a watershed (American Rivers, 2017). Common causes of altered hydrology include dams, groundwater withdrawals, impervious surface, and channelization. Runoff occurs when precipitation accumulates faster than the ground can absorb it, flowing over the land and into streams, ditches, lakes, and wetlands. When enough of a watershed has been altered, flood water moves through channels faster than it historically would, bringing along excess sediment. Increased discharges can also scour stream beds, making them inhospitable for aquatic life. A healthy watershed allows for precipitation to infiltrate into the ground, stalled by vegetation and topography.

This goal aims to reduce the volume of runoff reaching the watershed outlet by providing storage such as wetland restorations, detention basins, retention ponds, impoundments, or floodplain restorations. Storage in the Clearwater River Watershed also benefits the Red Lake River Watershed directly downstream.

Issues Addressed

- Altered Hydrology
- Wetland Degradation
- Sediment Loading
- Phosphorus Loading

Goals

Short-Term Goal: Attain 9,060 acre-feet of additional water storage in the watershed, making 4% progress toward the long-term goal.

Long-Term Goal: Attain 226,500 acre-feet of additional water storage to meet the RLWD's goal for the Clearwater River Watershed established by the Long-Term Flow Reduction Strategy.

Measuring

The short-term goal will be measured using a percentage of progress towards the long-term goal through implementing wetland restorations, detention basins, retention ponds, impoundments, floodplain restorations, or capital improvement projects. The long-term goal is a set amount of acre-feet of storage based on the prioritization below.

Stacking Additional Benefits

Reducing runoff in the watershed also reduces the amount of sediment, phosphorus, and nitrogen reaching streams and lakes. In addition, keeping forested areas forested protects current water storage in the soil. This protected storage is the amount that would be lost if forest was cleared for development or agriculture in this watershed.

Climate Resiliency Benefits	Protected Storage from the Protection Goal = 7,050 ac-ft

Prioritization

The Long-Term Flow Reduction Strategy (LTFS) is a collaborative effort in the Red River Basin to set goals to increase storage and decrease the impact of altered hydrology and flooding (20% reduction basin-wide). As part of this effort, watershed districts created their own Distributed Detention Strategies (DDS) to determine individual contributions to the larger goal. The RLWD DDS goal for the Clearwater River Watershed is 226,500 acre-feet of storage, or 30 off-channel storage sites and 3 on-channel storage sites, either gated or ungated. On-channel impoundments will in ditch channels, not be on public watercourses. The central region of the Clearwater River Watershed is generally prioritized for projects in this study (Figure 4.7).

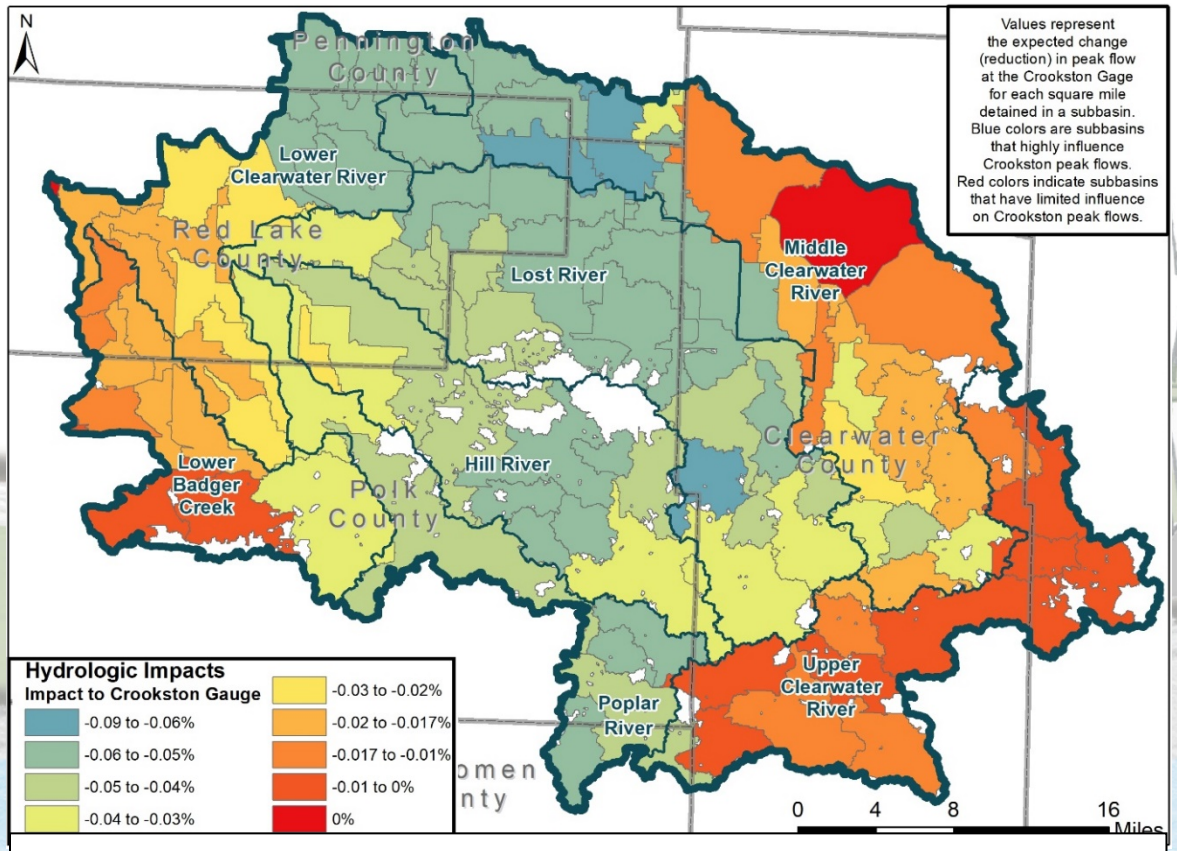


Figure 4.7. Priority areas for storage practices in the Clearwater River Watershed.

MEASURABLE GOAL: BACTERIA (*E. COLI*) REDUCTION

Develop and implement bacteria management projects to address sources of *E. coli* bacteria and make progress towards delisting impairments.

Description

Escherichia coli (E. coli) exists in the gut of warm-blooded animals such as humans, livestock, birds, and pets. When it reaches high levels in the environment, it can make humans sick. Sources of bacteria include feedlots, WWTF, SSTS, and excessive wildlife and domesticated animal populations near streams. Water quality monitoring has identified *E. coli* impairments in the watershed (over the state standard). Practices such as feedlot BMPs, manure management, cattle fencing and watering facilities, and septic system inspections and upgrades can reduce bacterial contributions to streams.

Issues Addressed

Bacteria Loading Sediment Loading Phosphorus Loading Streambank and Riparian Stabilization Ditch Stabilization

Goals

Short-Term Goal: Implement 20 bacteria management projects in 10 years to make progress toward delisting impairments.

Long-Term Goal: Implement bacteria management practices at all known sources of bacteria to make progress towards delisting impairments.

Planning Region	Short-term Goal (# projects)
Upper Clearwater River	2
Middle Clearwater River	5
Lost River	5
Hill River	2
Poplar River	2
Lower Badger Creek	2
Lower Clearwater River	2
Total	**20**

Measuring

Bacteria reduction will be measured based on the number of bacteria management projects implemented in the watershed. BWSR's eLINK tracks conservation practices that are implemented across the state. This data was used to estimate the number of bacteria management projects that are feasible on an annual basis for local entities based on historical progress.

Stacking Additional Benefits

Work toward this goal also makes progress towards reductions in phosphorus, sediment, and nitrogen to surface and groundwater.

Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction

Prioritization

The Clearwater River WRAPS identified impaired waters for *E. coli* Restoration and Protection, which are prioritized for bacteria management projects. Projects are targeted first in HUC 12 subwatersheds which contain streams in the Restoration category (Figure 4.8). Subwatersheds in the Protection category will be targeted with implementation projects to prevent future impairments.

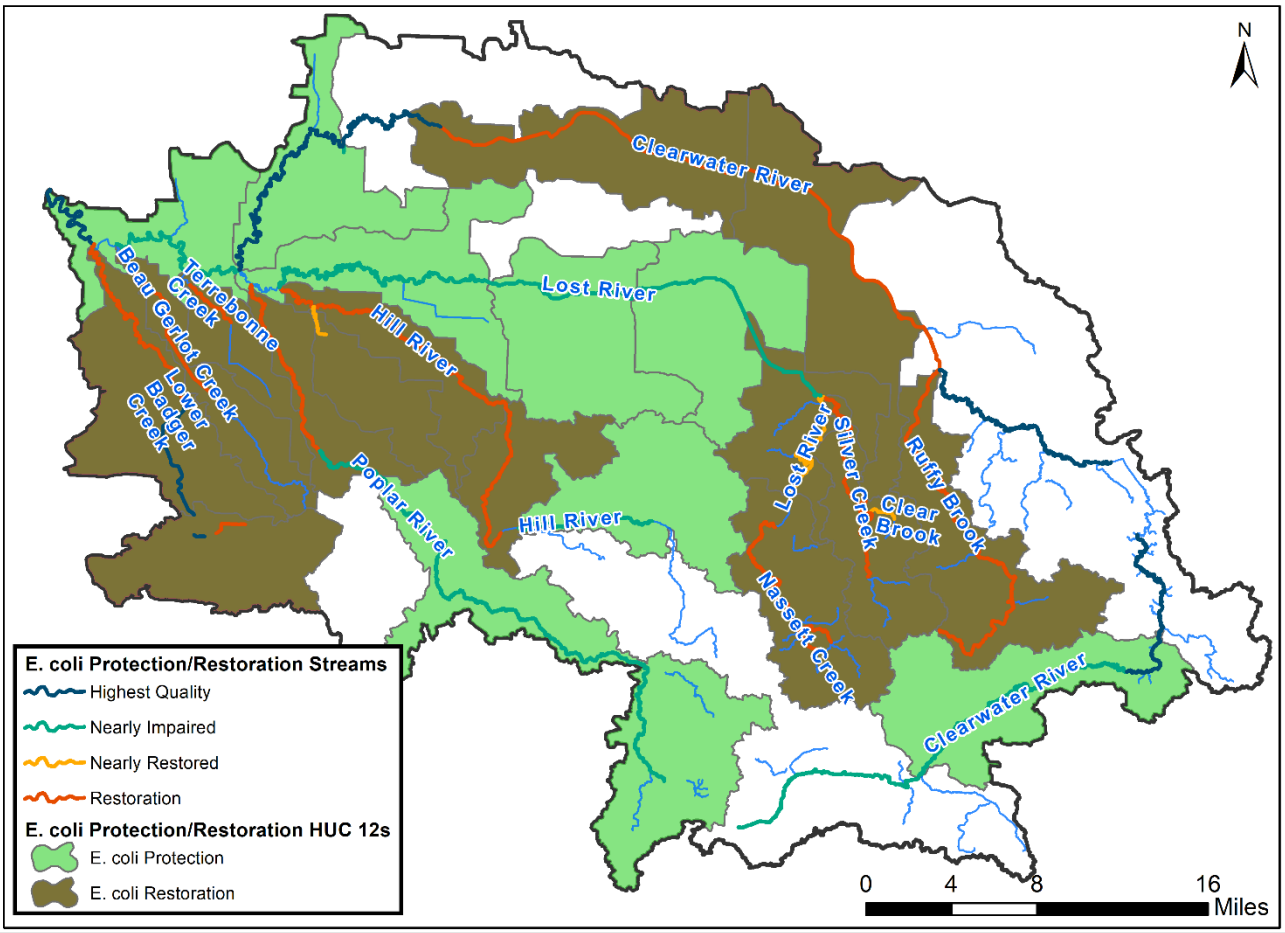


Figure 4.8. Prioritized areas for bacteria reduction practices.

MEASURABLE GOAL: DRINKING WATER PROTECTION

Protect groundwater quality and quantity by sealing unused wells

Description

Unused wells can provide a conduit for contaminants from the land surface to reach drinking water. Therefore, this goal addresses sealing unused wells to protect drinking water quality. Minnesota Department of Health data show that most of Drinking Water Supply Management Areas (DWSMAs) in this watershed show low vulnerability to contamination (Figure 4.9). Vulnerability is based on geologic sensitivity at wells, water monitoring data, and rate of aquifer recharge. Bagley, Clearbrook, and Plummer have moderate vulnerability, and have state highway and rail corridors and gas and oil pipelines running through the DWSMA. Erskine has a mix of high and moderate vulnerability and has state highway and railroad running next to city wells and through the most vulnerable portion of the DWSMA. Those issues can be addressed by having Emergency Response Plans in place in case of leaks or spills.

Groundwater sustainability can be addressed through outreach programs to landowners, well drillers, and agricultural producers.

Issues Addressed

- Groundwater Contamination
- Groundwater Sustainability

Goals

Short-Term Goal: Protect drinking water quality and quantity by sealing 10 wells per year.

Long-Term Goal: Maintain reliable and consistent supply of drinking water and all unused wells sealed.

Measuring

Progress toward this goal will be measured by tracking how many wells are sealed per year.

Prioritization

Well-sealing is a watershed-wide goal. BWSR's eLINK database was used to determine the current pace of wells decommissioned per year and the Clearwater River Watershed Planning Work Group plans to maintain that pace.

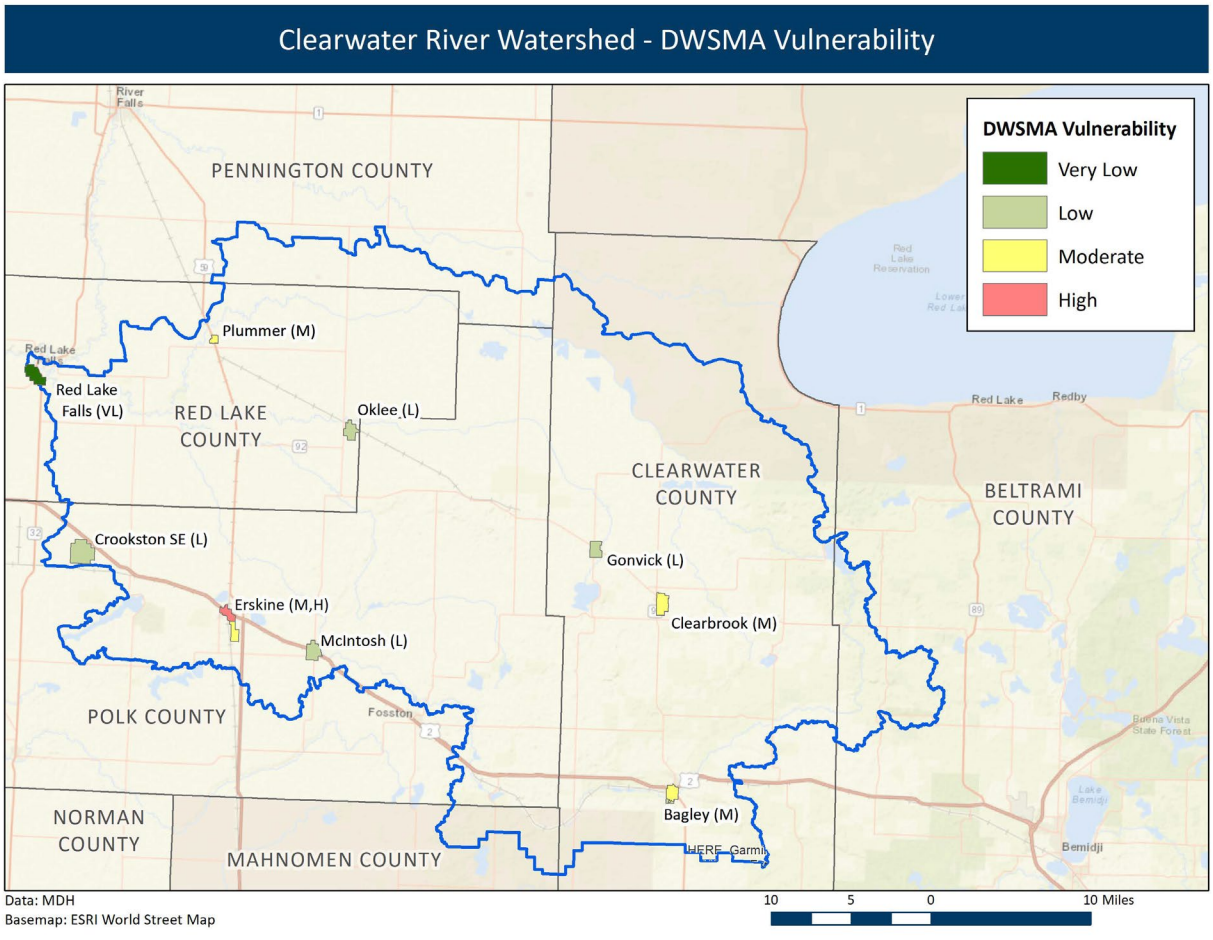


Figure 4.9. Drinking Water Supply Management Area (DWSMA) vulnerability.

MEASURABLE GOAL: STORMWATER REDUCTION

Implement stormwater reduction practices to reduce pollutant loading to water bodies.

Description

While a small portion of the Clearwater River Watershed is developed urban area, towns in the watershed still contribute measurable pollutants to waterbodies in the form of stormwater runoff. Stormwater runoff accumulates on impervious surfaces during a heavy rainfall and washes into local streams because city streets prevent water from infiltrating into the ground.

There are many ways to reduce storm flows to allow for infiltration including small projects on public or private land (rain gardens, permeable parking lots, rain barrels) and larger public projects such as stormwater treatment ponds, biofiltration systems, and drainage system repairs. This plan's goals aim to implement these projects in locally targeted urban areas, defined by planning region in the table at the end of this page.

Issues Addressed

Stormwater Runoff Altered Hydrology Changes in Land Use and Resource Protection Sediment Loading Phosphorus Loading Bacteria Loading

Goals

Short-Term Goal: Stormwater projects are implemented in three targeted urban areas (Gonvick, Erskine, and Red Lake Falls)

Long-Term Goal: Stormwater projects are implemented at all targeted urban areas.

Priority areas for the short-term goal are noted in bold.

Planning Region	Urban Area	Pollutant	Affected Waterbody	Nearby Reach Impaired for Pollutant
Lost River	**Gonvick**	**Sediment**	**Lost River**	**N**
Lower Badger Creek	**Erskine**	**Nutrients**	**Cameron Lake**	**Y**
Lower Clearwater River	**Red Lake Falls**	**Sediment**	**Clearwater River**	**Y**
Upper Clearwater River	Bagley	Runoff	Lake Lomond	N/A
Lost River	Clearbrook	Sediment	Clear Brook	N
Lost River	Clearbrook	E. coli	Silver Creek	Y
Poplar River	McIntosh	Sediment	Poplar River	N
Lower Clearwater River	Plummer	Sediment	Clearwater River	Y
Upper Clearwater River	Bagley	Sediment	Clearwater River	N

Measuring

Stormwater reductions will be tracked by the number of projects implemented near impaired waterbodies. Additionally, stormwater models and/or feasibility studies created for each project will help track acres treated and pollutant reductions.

Stacking Additional Benefits

Work toward this goal also makes progress towards reductions in phosphorus, sediment, and nitrogen to surface and groundwater

Water Quality Benefits*	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction

** As estimated in feasibility studies*

Prioritization

Prioritization for the Stormwater Reduction goal was completed in the WRAPS process. The long-term goal targets projects in urban areas whose affected water body is impaired for the pollutant to which they contribute. The short-term goal focuses on Clear Brook, Cameron Lake, and the Clearwater River at Gonvick, Erskine, and Red Lake Falls, respectively. Projects at these locations have been identified by local experts as greatest in need and highest in feasibility (Figure 4.10).

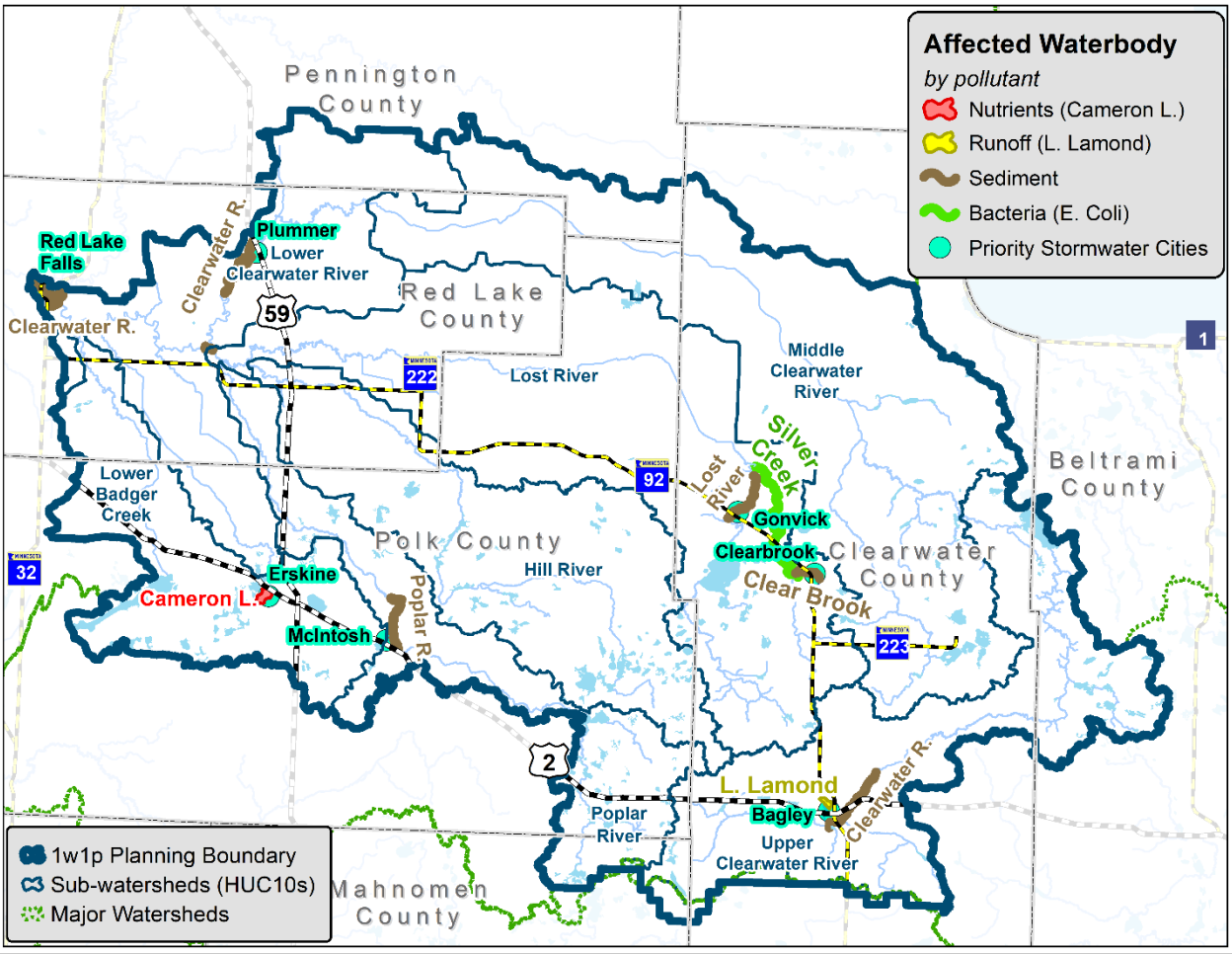


Figure 4.10. Urban areas with downstream stormwater-related impairments.

Targeted Implementation Schedule

SECTION 5. TARGETED IMPLEMENTATION SCHEDULE

The targeted implementation schedule is the culmination of the planning process, bringing together the identification of issues in the watershed, the goals that planning partners created to make progress toward improving the issues, and the funding mechanisms and actions to help achieve those goals. The targeted implementation schedule, or Action Table, lists actions that planning partners and local citizens will take and identifies where, when, and how these actions will be implemented over the course of this 10-year plan.

Progress toward plan goals depends on funding, with a variety of sources available to implement actions in the watershed. The primary purpose of the CRCWMP is to prioritize where actions will occur on the landscape so that they can have the biggest impact based on available funding. As a result, this plan organizes actions into three funding levels (Table 5.1). The Clearwater River Watershed Partnership will be operating at Level 2 funding for the implementation of this plan.

Table 5.1. Funding Levels for the CRCWMP.

Funding Level	Description	Estimated Annual Average
Level 1	Baseline Funding for Current Programs	$927,000
Level 2	**Baseline + Watershed-Based Implementation Funding (WBIF) + Grants (Clean Water Fund)**	**$1,544,300**
Level 3	Partner funding (NRCS, USFWS, SFIA, CRP, Lessard-Sams)	$3,750,046

The actions listed in the tables in this section were determined by considering practices in existing local plans and what's currently being implemented in the watershed (see next page). The Targeted Implementation Schedule identifies who will complete each action, including plan partners, state agencies, federal agencies, and non-governmental organizations (NGOs). It is important to identify actions that other groups will complete, as it clarifies roles and recognizes the work of others: practices implemented by all entities contribute to overall benefits within the watershed.

Known Stewardship

There are already a variety of actions that have been implemented in the watershed including state and federally funded practices, the Conservation Reserve Program (CRP), and the Minnesota Agricultural Water Quality Certification Program. The maps below show the planning regions with the highest concentrations of each of these actions (Figure 5.1, Table 5.2).

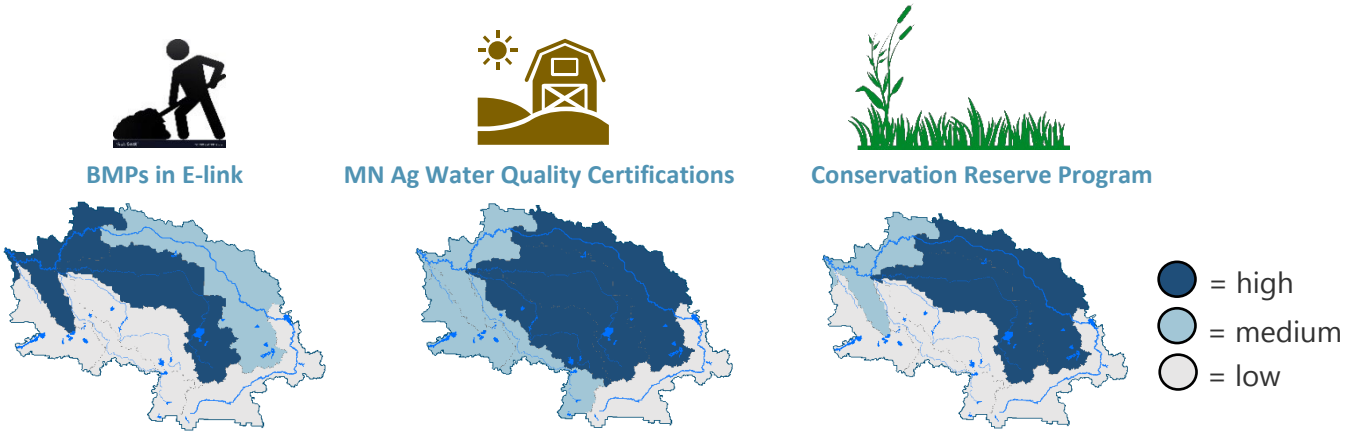


Figure 5.1. Known stewardship in the Clearwater River Watershed.

Table 5.2. Common practices in the Clearwater River Watershed including data from BWSR eLINK, NRCS EQIP, and NRCS CSP 2004-2020 (Source: MPCA Healthier Watersheds).

NRCS Practice Name	Total Number of Practices (2004-2020)	Annual Average
Cover Crop	37,737 acres	2,359 acres/year
Conservation Crop Rotation	1,357 acres	85 acres/year
Fencing	648,123 feet	40,508 feet/year
Field Border	149,810 feet	9,363 feet/year
Forage Harvest Management	3,842 acres	240 acres/year
Forest Management Plan	72 plans	5 plans/year
Grade Stabilization Structure	112 structures	7 structures/year
Filter Strip	142 acres	9 acres/year
Nutrient Management	30,608 acres	1,913 acres/year
Prescribed Grazing	26,883 acres	1,680 acres/year
Riparian Buffer	217 acres	14 acres/year
Septic System Improvement	59 systems	4 systems/year
Windbreak/Shelterbelt Establishment	90,062 feet	5,629 feet/year
Well Decommissioning	81 wells	5 wells/year
WASCOBs	116 structures	7 structures/year

Targeting Practices

Issues are targeted by resource as shown in **Section 4** in a variety of ways to help with forming the Targeted Implementation Schedule in this section. This plan includes both targeted "Restoration" actions and targeted "Protection" actions.

Restoration

"Restoration" actions are targeted to impaired streams, including both the "Nearly Restored/Barely Impaired" Category and "Restoration" Category (**Appendix D**). PTMApp is a Geographic Information Systems (GIS) tool that was used to provide targeting for restoration actions on agricultural lands. PTMApp helps to target actions on the landscape that directly address the plan goals.

This plan leverages PTMApp data to identify where many new practices are feasible, and of these practices how much each will cost, the estimated water quality benefit, and how much progress implementation of that action can make toward planning region goals. PTMApp estimates existing pollutant loads and water quality benefits for a wide range of practices. Practices for this plan that are identified by PTMApp align with voluntary local implementation trends, have the highest cost-benefit ratios, and best sediment reduction as measured at the edge of the field. For more information about how PTMApp was used to inform implementation see **Appendix E.**

Protection

"Protection" actions are targeted to unimpaired streams and high-quality habitat areas. The "Nearly Impaired" waters are a high priority for protection projects that will improve water quality conditions so that the waters do not become impaired in the future. The same projects and practices used to restore water quality in impaired waters can also be used to improve water quality in unimpaired (Nearly Impaired or Highest Quality, **Appendix D**) waters that have been prioritized for protection. The Riparian, Adjacency, Quality (RAQ) targeting method prioritizes areas for land protection, regardless of impairment status. Protecting private forests will benefit all adjacent waters, whether they are impaired, in need of restoration, or unimpaired and in need of protection. The Minnesota Prairie Plan was used to prioritize areas for prairie protection (DNR 2018).

Implementation

The numbers, cost, and locations of practices in the Targeted Implementation Schedule represent a best-case scenario for planning. Due to voluntary participation, field verification, and funding availability, prioritized projects may not be feasible, in which case the next highest priority project will be targeted. In addition, projects may emerge that were not identified in the Targeted Implementation Schedule and supporting maps. These projects will still be pursued if environmental and economic benefits are comparable to those identified in the Targeted Implementation Schedule. Implemented practices need to meet standards, be properly designed, and signed off by the proper authority.

A variety of factors will ultimately determine where implementation occurs, including but not limited to the following:

- Voluntary participation by landowners and residents
- Field verification of practice type and location
- Amount of funding available for implementation
- New data on resource conditions
- Emerging practices
- Practices/projects ready to implement
- Effectiveness of education and outreach and research initiatives

Priority Planning Regions

The long-term goals detailed in **Section 4** represent the desired future condition for the Clearwater River Watershed and its resources given time, funding, and capacity. The short-term goals represent what is possible to accomplish in 10 years, and that means putting efforts and funding toward areas that need it most.

To prioritize where to work first overall, the Clearwater River Watershed Planning Work Group looked at whether the issues from the Priority 'A' table in **Section 3** were considered either high, medium, or low priorities for each planning region by assigning either a 3, 2, or 1 to each issue, respectively. The results were tallied and represent the planning regions that contain the most pressing issues. The outcome is shown below in Figure 2 and indicates where funding will be focused first based on high, medium, and protection priority planning regions.

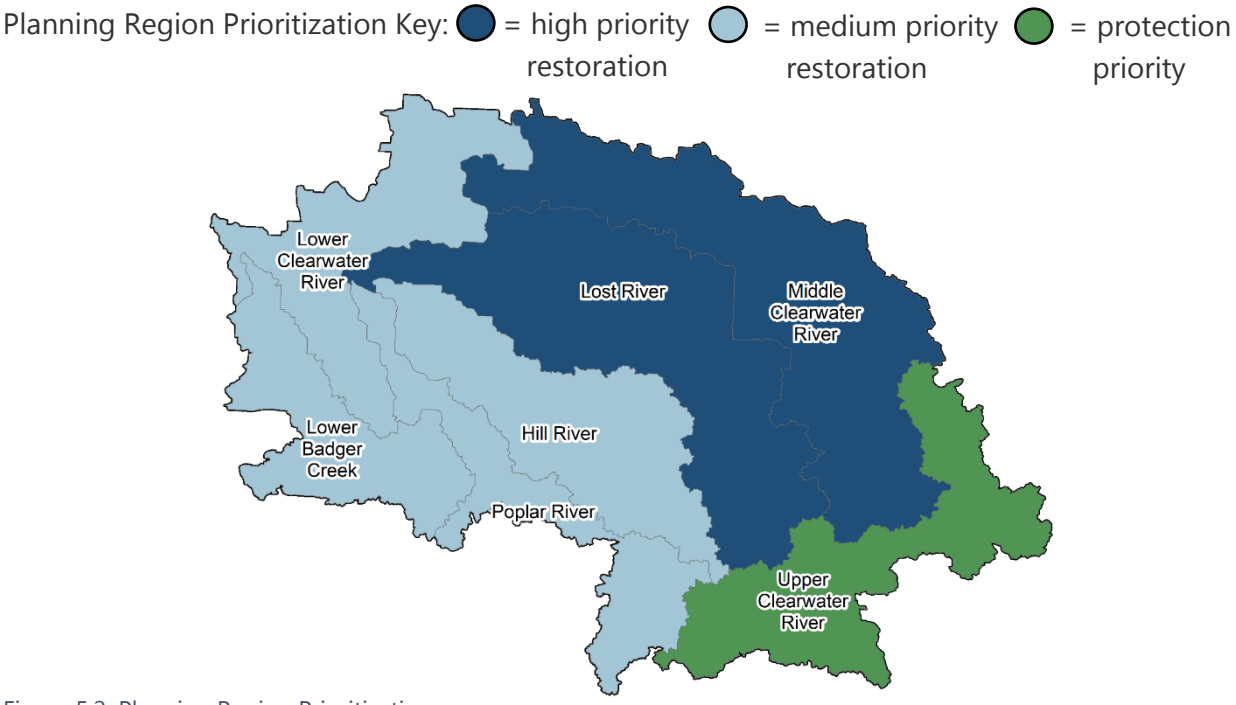


Figure 5.2. Planning Region Prioritization.

Implementation Programs

Implementation programs are the funding mechanism to implement actions in the Targeted Implementation Schedule. Some programs are implemented at a watershed-wide scale because they are applicable to the entire plan area. Projects and Practices are targeted to reflect the different needs and geographies of each planning region. For more details on each of these implementation programs, see **Section 6**: **Plan Implementation Programs**.

The Targeted Implementation Schedule for each program is noted below as to its location in this section and whether it applies to specific Planning Regions or is Watershed-Wide (Figure 5.3).

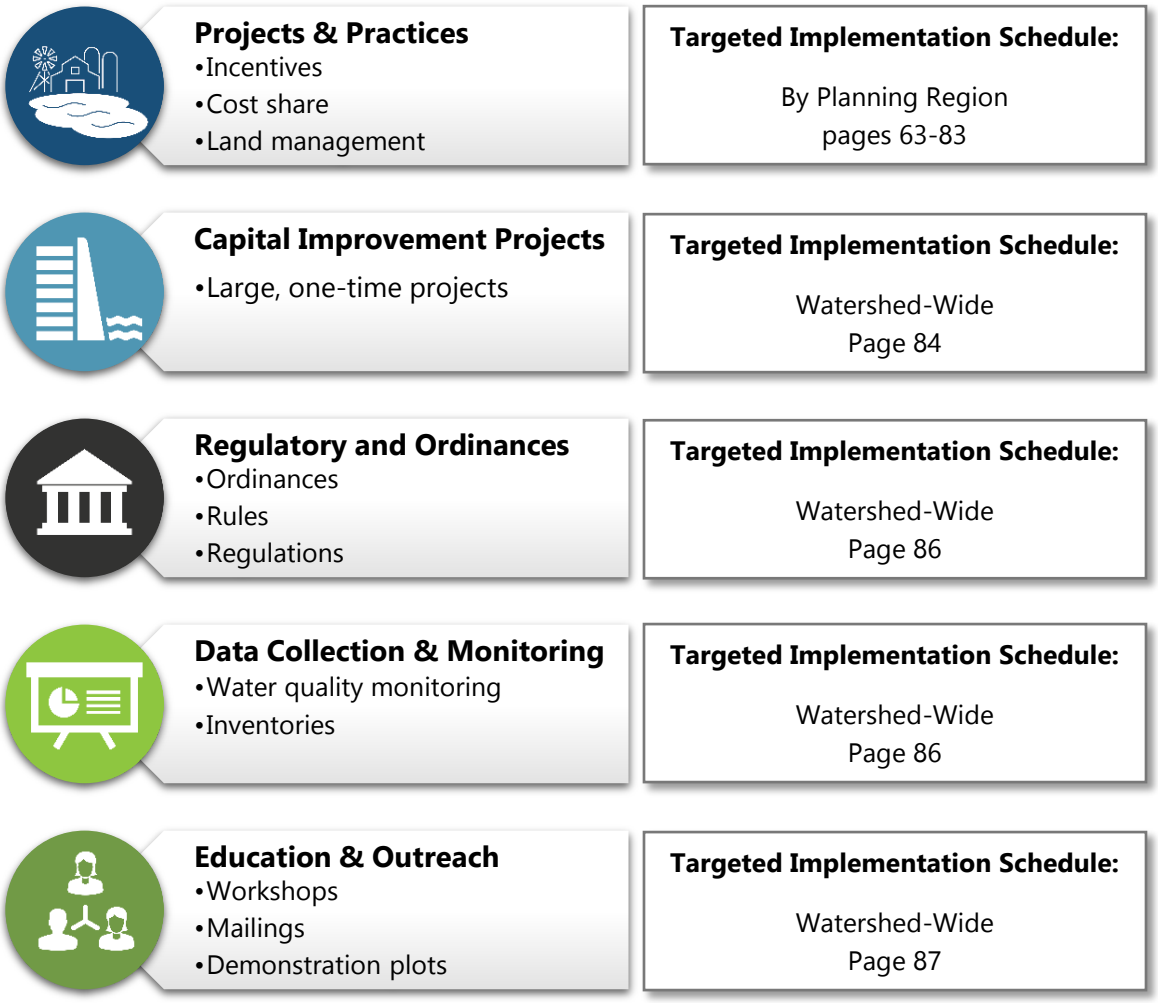
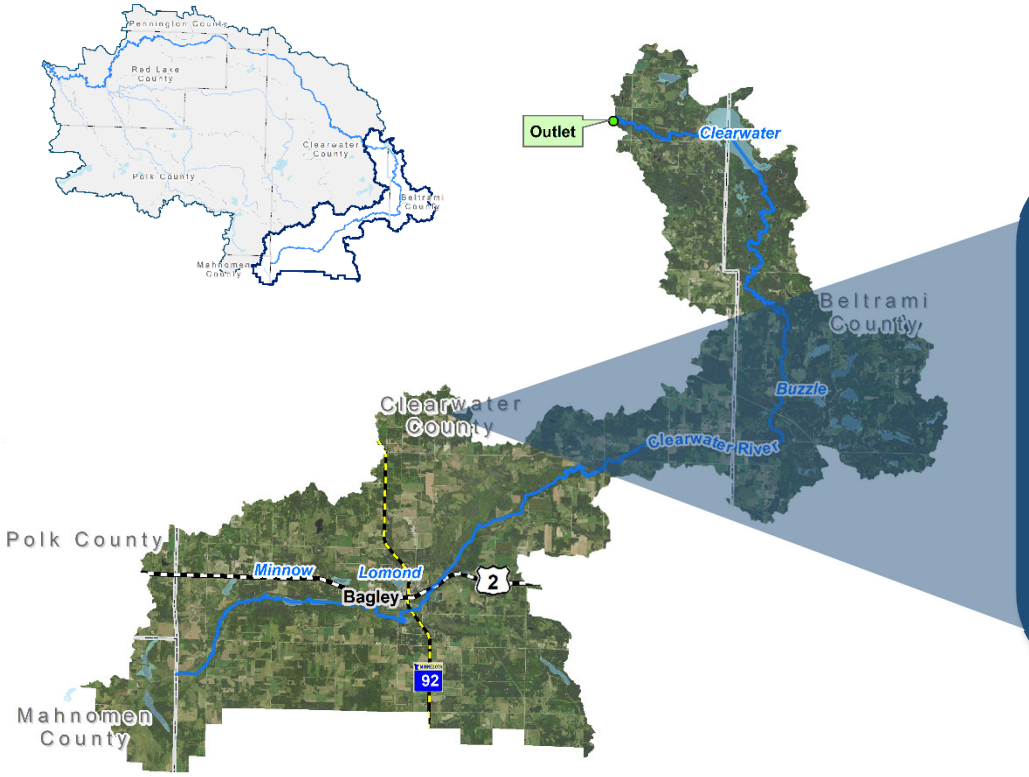


Figure 5.3. Implementation Programs and corresponding Targeted Implementation Schedule.

Upper Clearwater Planning Region



At a Glance

- **13%** of plan area
- Communities include **Bagley**
- Counties include **Clearwater, Beltrami, Mahnomen, Polk**
- Tribal Lands include **White Earth Reservation**

Protection Priority

Upper Clearwater Planning Region Overview

The Upper Clearwater Planning Region serves as the headwaters for the Clearwater River. Resource protection is a primary goal in this region as it contains forests, wetlands, and important lakes such as Buzzle, which is a Cisco Refuge Lake, and Clearwater, which is a DNR Lake with Outstanding Biological Significance. The City of Bagley is located in this planning region, which is the Clearwater County seat.

Upper Clearwater Goals

- High Value Resource Protection
- Soil Health
- Streambank and Riparian Stabilization
- Phosphorus Reduction
- Sediment Reduction
- Drinking Water Protection
- Stormwater Reduction

Upper Clearwater Planning Region Projects and Practices

Action	Targeted Resources	10-Year Measurable Outcome	Measurable Goals: Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility/Partners (Bold = Lead)	Timeline: 2023-24	2025-26	2027-28	2029-30	2031-32	Annual Estimated Cost	Total 10-Year Estimated Cost
Structural Agricultural Practices (sediment basins; grade stabilizations, side water inlets, filter strips, drainage water mgmt)	**Clearwater River**	510 tons sediment/yr. 119 lbs phosphorus/yr. 30 acre-feet storage	●	●	●	○				○	○	○	**SWCDs**, **RLWD,** NRCS, BWSR	●	●	●	●	●	**$21,462**	**$214,623**
Non-structural Agricultural Practices (cover crops, reduced tillage, prescribed grazing, conservation crop rotation, perennial crops)	**Clearwater River**	2,240 acres 1,574 tons sediment/yr. 420 lbs phosphorus/yr.	●	●	○	●							**SWCDs,** RLWD, NRCS, BWSR	●	●	●	●	●	**$19,401**	**$194,854**
Bacteria Reduction Projects (Livestock exclusion and watering facility, waste pit closures)	**Clearwater River**	2 projects	○	○			●		○		○	○	**SWCDs, MPCA,** NRCS, BWSR		●		●		**$1,500**	**$15,000**
Forest Protection Practices (SFIA or Easement)	**Clearwater River, Clearwater Lake**	7,603 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, State of MN	●	●	●	●	●	$179,251	$1,792,509
Forest Stewardship Plans	**Clearwater River, Clearwater Lake**	127 plans, 7,603 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, NCRS	●	●	●	●	●	**$8,617**	**$86,167**
Lake Enhancement Projects (rain gardens, shoreline restoration)	**Clearwater Lake**	233 lbs phosphorus/yr 1 lake project/yr	○	●				○					**SWCDs,** DNR, MPCA, BWSR		●	●	●	●	**$4,000**	**$40,000**
Stream Channel and Bank Stabilization Enhancement Projects (rock structures to stabilize channel bottoms, resloping)	See Figure 5.4	0.4 miles	○	○				○			●		**RLWD**, **SWCDs,** DNR, BWSR, MPCA (319 Grants), ACOE		●	●	●	●	**$2,000**	**$20,000**
Land Retirement Programs (CRP, CREP)	**Clearwater River**	196 acres in 2022 (36 acres expire in 2025)	○	○	○	○	○	●	○				**SWCDs,** RLWD, NRCS, TNC, DNR, BWSR	●	●	●	●	●	$1,411	$14,112
													Total Level 2 Funding Scenario (Current + WBIF)						**$56,980**	**$570,644**
													Total Level 3 Funding (Partner Projects & Other Funding Sources)						$180,662	$1,806,621

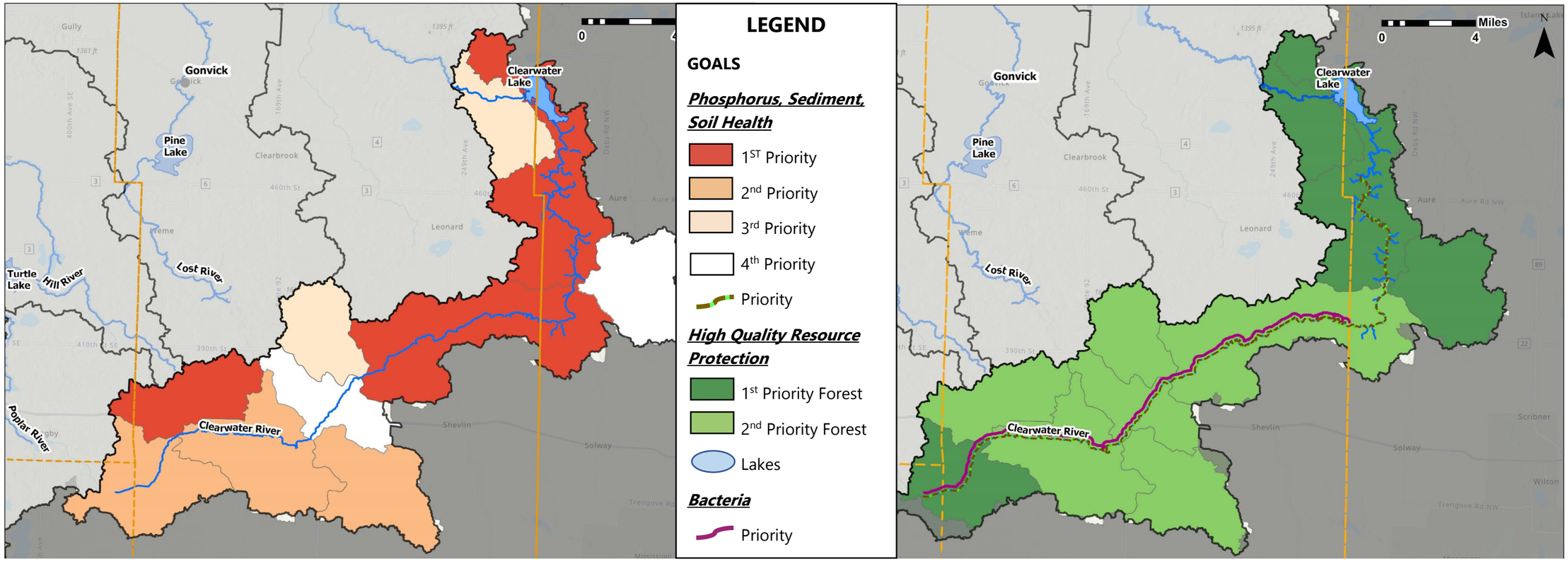
● Primary Goal this action will address

○ Secondary Goal this action will address

Upper Clearwater Planning Region Targeting and Measuring

Restoration Targeting: Projects to reduce sediment and phosphorus and improve soil health were targeted based on where PTMApp identified practices with the best sediment reductions and where there were impairments. The Water Quality Benefits Calculator below can be used to add up reductions to reach the goal in this planning region. Implementation is not limited to just these practices; they are just the most commonly implemented in the watershed.

Protection Targeting: Projects to protect water quality were targeted based on nearly impaired reaches for phosphorus, sediment, or bacteria. Projects to protect habitat and outstanding water quality were targeted based on RAQ scoring (page 59). Benefits are noted below.



Water Quality Benefits Calculator Category	Practice (NRCS Code)	Average Sediment (tons/yr)	Average Phosphorus (lbs/yr)	Average Nitrogen (lbs/yr)	Average Cost
Nonstructural Practices (by acre)	Cover Crops (340)	0.8	0.2	4.6	$50
	No Till (329)	1.0	0.2	4.8	$50
	Perennial Crops (327)	0.4	0.3	2.3	$50
	Forage & Biomass planting (512)	6.7	0.3	2.3	$50
	Prescribed Grazing (528)	0.4	0.1	0.5	$20
	Riparian Buffer (390) – *per practice*	24.8	17.4	321.5	$14,000
Structural Practices (by practice)	Grade Stabilization (410)	3.6	0.4	8.7	$20,000
	Grassed Waterway (412)	11.2	2.6	50.8	$16,300
	WASCOB (638)	43.5	7.9	108.0	$9,000

Habitat Protection Benefits	Water Quality Benefits
Wild Rice Cisco Trout Forest	Clearwater Lake protection • Wild rice lake Buzzle Lake protection • Cisco lake Clearwater River Headwaters protection • Trout stream

Middle Clearwater Planning Region

At a Glance

- **22%** of plan area
- Communities include **Leonard**
- Counties include **Clearwater, Red Lake, Pennington**
- Tribal Lands include **Red Lake Reservation**

High Priority Restoration

Middle Clearwater Planning Region Overview

The Middle Clearwater Planning Region has a diverse landscape, with forested areas in the south, large wetlands and wild rice paddies in the center, and cropland in the northwest. The wetlands and wild rice define the region in terms of its resources and economic production. Leonard is in the lone urban area this planning region with a population of 43.

Middle Clearwater Goals

- Ditch Stabilization
- Streambank and Riparian Stabilization
- Soil Health
- Sediment Reduction
- Runoff Reduction
- Bacteria Reduction
- High Value Resource Protection
- Phosphorus Reduction
- Drinking Water Protection

Middle Clearwater Planning Region Projects and Practices

Action	Targeted Resources	10-Year Measurable Outcome	Measurable Goals: Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility/Partners (Bold = Lead)	Timeline: 2023-24	2025-26	2027-28	2029-30	2031-32	Annual Estimated Cost	Total 10-Year Estimated Cost
Structural Agricultural Practices (sediment basins; grade stabilizations, side water inlets, filter strips, drainage water mgmt)	Ruffy Brook Clearwater River	1,217 tons sediment/yr 261 lbs phosphorus/yr 66 acre-feet storage	●	●	●	○				○	○	○	**SWCDs**, **RLWD,** NRCS, BWSR	●	●	●	●	●	**$53,687**	**$536,872**
Non-structural Agricultural Practices (cover crops, reduced tillage, prescribed grazing, conservation crop rotation, perennial crops)	Ruffy Brook Clearwater River	3,463 acres 1,384 tons sediment/yr 485 lbs phosphorus/yr	●	●	○	●							**SWCDs,** RLWD, NRCS, BWSR	●	●	●	●	●	**$30,103**	**$301,281**
Bacteria Reduction projects (Livestock exclusion and watering facility, waste pit closures)	Ruffy Brook Clearwater River	5 projects	○	○			●		○		○	○	**SWCDs, MPCA,** NRCS, BWSR			●	●	●	**$3,750**	**$37,500**
Forest Protection Practices (SFIA or Easements)	Ruffy Brook Clearwater River	3,852 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, State of MN	●	●	●	●	●	$95,042	$950,417
Forest Stewardship Plans	Ruffy Brook Clearwater River	64 plans, 3,852 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, NCRS	●	●	●	●	●	**$4,366**	**$43,656**
Stream Channel and Bank Stabilization Enhancement Projects (rock structures to stabilize channel bottoms, resloping)	See Figure 5.4	1.8 miles	○	○				○			●		**RLWD**, **SWCDs,** DNR, BWSR, MPCA (319 Grants), ACOE	●	●	●	●	●	**$9,000**	**$90,000**
Ditch System Enhancement Projects (rock and grade stabilization structures in ditch bottom)	See Figure 5.4	2.6 miles	○	○								●	**RLWD**, Counties, SWCDs	●	●	●	●	●	**$10,400**	**$104,000**
Land Retirement Programs (CRP, CREP)	Ruffy Brook Clearwater River	4,890 acres in 2022 (1,179 acres expire in 2025)	○	○	○	○	○	●	○				**SWCDs,** RLWD, NRCS, TNC, DNR, BWSR	●	●	●	●	●	$35,208	$352,080
													Total Level 2 Funding Scenario (Current + WBIF)						**$111,306**	**$1,113,309**
													Total Level 3 Funding (Partner Projects & Other Funding Sources)						$130,250	$1,302,497

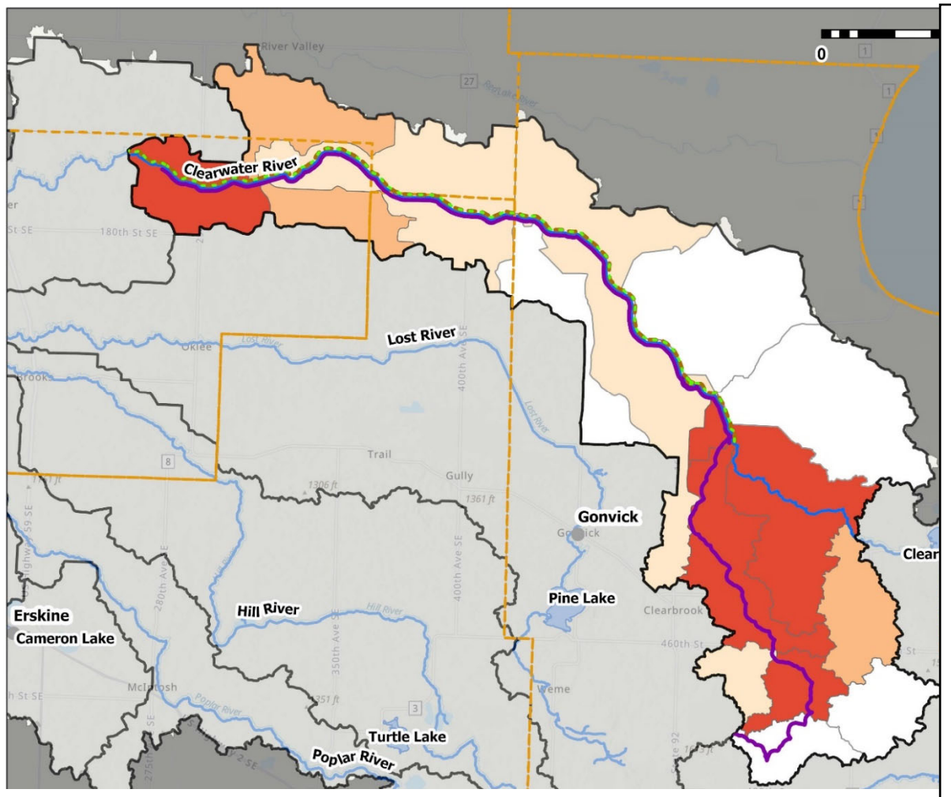
● Primary Goal this action will address

○ Secondary Goal this action will address

Middle Clearwater Planning Region Targeting and Measuring

Restoration Targeting: Projects to reduce sediment and phosphorus and improve soil health were targeted based on where PTMApp identified practices with the best sediment reductions and where there were impairments. The Water Quality Benefits Calculator below can be used to add up reductions to reach the goal in this planning region. Implementation is not limited to just these practices; they are just the most commonly implemented in the watershed.

Protection Targeting: Projects to protect water quality were targeted based on nearly impaired reaches for phosphorus, sediment, or bacteria. Projects to protect habitat and outstanding water quality were targeted based on RAQ scoring (page 59). Benefits are noted below.



LEGEND

GOALS

Phosphorus, Sediment, Soil Health

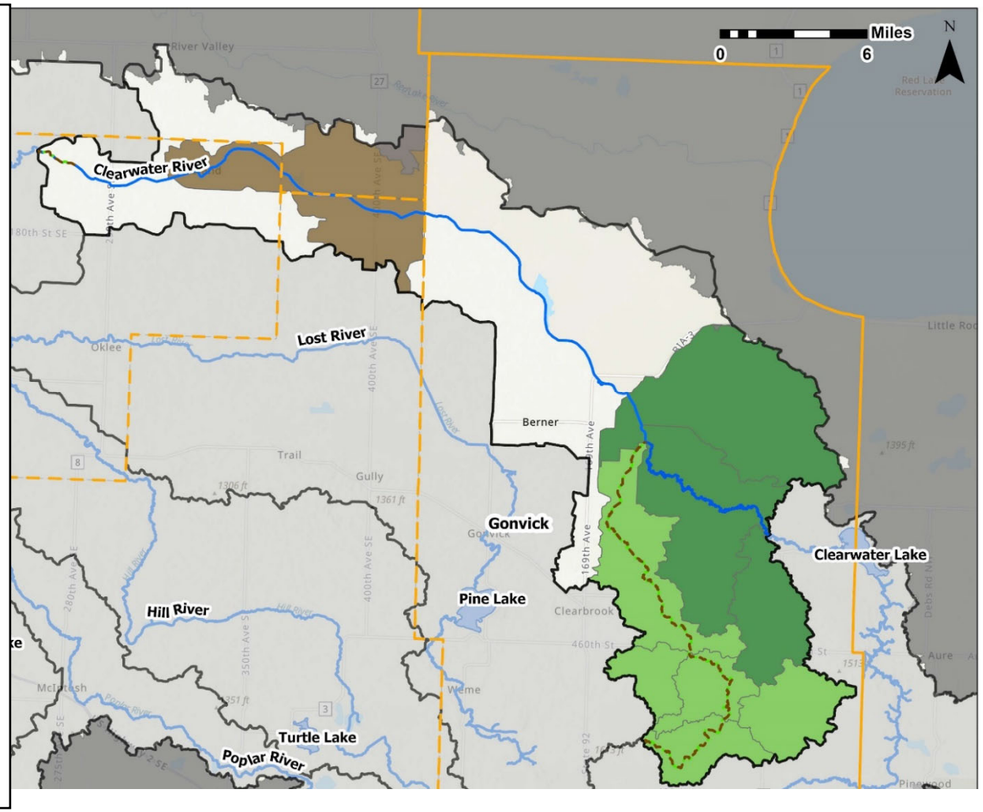
- 1ST Priority
- 2nd Priority
- 3rd Priority
- 4th Priority
- Priority reaches

High Quality Resource Protection

- 1st Priority Forest
- 2nd Priority Forest
- Priority Prairie & Wetlands

Bacteria

- Priority reaches



Water Quality Benefits Calculator Category	Practice (NRCS Code)	Average Sediment (tons/yr)	Average Phosphorus (lbs/yr)	Average Nitrogen (lbs/yr)	Average Cost
Nonstructural Practices (by acre)	Cover Crops (340)	0.6	0.2	4.6	$50
	No Till (329)	0.7	0.3	4.8	$50
	Perennial Crops (327)	0.5	0.3	2.3	$50
	Forage & Biomass planting (512)	7.7	0.3	2.3	$50
	Prescribed Grazing (528)	0.4	0.1	0.5	$20
	Riparian Buffer (390) – *per practice*	15.8	4.9	97.2	$3,900
Structural Practices (by acre)	Grade Stabilization (410)	15.7	1.0	20.1	$20,000
	Grassed Waterway (412)	20.4	1.7	30.9	$9,800
	WASCOB (638)	30.7	7.5	107.7	$9,000

Habitat Benefits		Water Quality Benefits
Wild Rice Forest Prairie Pollinators Wetlands	Waterfowl Migration	Ruffy Brook protection Clearwater River protection Wetland protection Water storage

Lower Clearwater Planning Region

At a Glance

- **12%** of plan area
- Communities include **Plummer, Red Lake Falls**
- Counties include **Red Lake, Polk, Pennington**

Medium Priority Restoration

Lower Clearwater Planning Region Overview

The Lower Clearwater Planning Region forms the mouth of the Clearwater River as the forests and wetlands of the Upper and Middle Clearwater have transitioned to flat plains and cropland. Beau Gerlot Creek and Terrebonne Creek are also included in this planning region. The Lower Clearwater contains the cities of Plummer and most of Red Lake Falls, where the Clearwater joins the Red Lake River.

Lower Clearwater Goals

- Ditch Stabilization
- Streambank and Riparian Stabilization
- Sediment Reduction
- Phosphorus Reduction
- Stormwater Reduction
- Soil Health
- Drinking Water Protection
- Runoff reduction

Lower Clearwater Planning Region Projects and Practices

Action	Targeted Resources	10-Year Measurable Outcome	Measurable Goals: Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility/Partners (Bold = Lead)	Timeline: 2023-24	2025-26	2027-28	2029-30	2031-32	Annual Estimated Cost	Total 10-Year Estimated Cost
Structural Agricultural Practices (sediment basins; grade stabilizations, side water inlets, filter strips, drainage water mgmt)	**Clearwater River, Beau Gerlot Creek, Terrebonne Creek**	1,271 tons sediment/yr 337 lbs phosphorus/yr 51 acre-feet storage	●	●	●	○				○	○	○	**SWCDs**, **RLWD,** NRCS, BWSR	●	●	●	●	●	**$61,383**	**$613,831**
Non-structural Agricultural Practices (cover crops, reduced tillage, prescribed grazing, conservation crop rotation, perennial crops)	**Clearwater River, Beau Gerlot Creek, Terrebonne Creek**	1,670 acres 1,630 tons sediment/yr 539 lbs phosphorus/yr	●	●	○	●							**SWCDs, NRCS**, RLWD, BWSR		●	●	●	●	**$14,529**	**$145,299**
Bacteria Reduction projects (Livestock exclusion and watering facility, waste pit closures)	**Clearwater River**	2 projects	○	○			●		○		○	○	**SWCDs, MPCA,** NRCS, BWSR			●	●	●	**$1,500**	**$15,000**
Stream Channel Enhancement Projects (rock structures to stabilize channel bottoms, resloping)	See Figure 5.4	4.7 miles	○	○				○			●		**RLWD**, **SWCDs,** DNR, BWSR, MPCA (319 Grants), ACOE		●	●	●	●	**$23,500**	**$235,000**
Ditch System Enhancement Projects (rock and grade stabilization structures in ditch bottom)	See Figure 5.4, CD/23/17 Drainage Area	1.7 miles	○	○								●	**RLWD**, **Counties**, SWCDs		●	●	●	●	**$6,800**	**$68,000**
Land Retirement Programs (CRP, CREP)	**Clearwater River, Beau Gerlot Creek, Terrebonne Creek**	4,129 acres in 2022 (1,702 acres expire in 2025)	○	○	○	○	○	●	○				**SWCDs,** RLWD, NRCS, TNC, DNR, BWSR	●	●	●	●	●	$29,729	$297,288
													Total Level 2 Funding Scenario (Current + WBIF)						**$107,712**	**$1,077,130**
													Total Level 3 Funding (Partner Projects & Other Funding Sources)						$29,729	$297,288

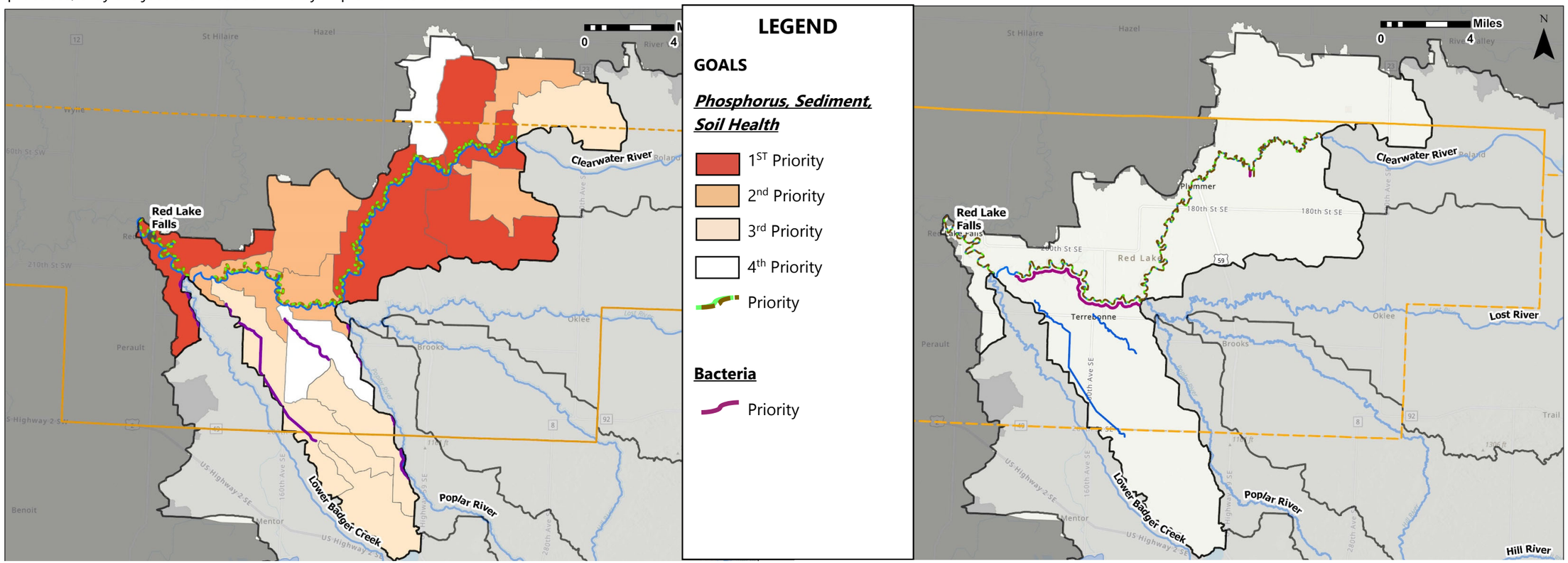
● Primary Goal this action will address

○ Secondary Goal this action will address

Lower Clearwater Planning Region Targeting and Measuring

Restoration Targeting: Projects to reduce sediment and phosphorus and improve soil health were targeted based on where PTMApp identified practices with the best sediment reductions and where there were impairments. The Water Quality Benefits Calculator below can be used to add up reductions to reach the goal in this planning region. Implementation is not limited to just these practices; they are just the most commonly implemented in the watershed.

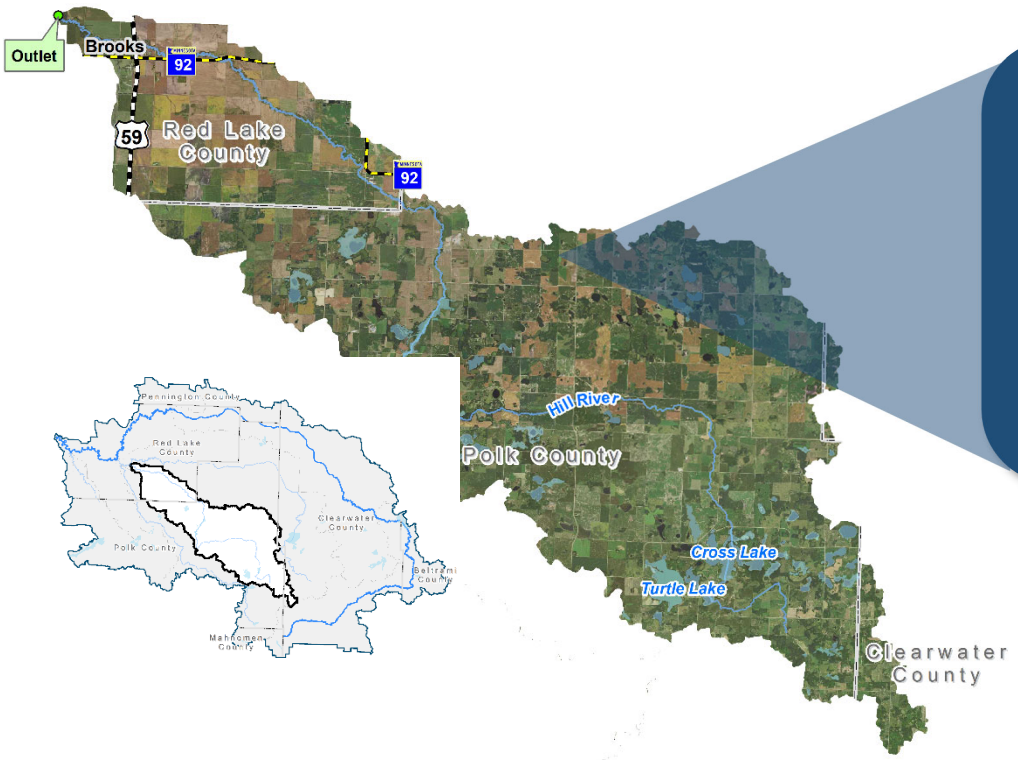
Protection Targeting: Projects to protect water quality were targeted based on nearly impaired reaches for phosphorus, sediment, or bacteria. There are not any forest protection priorities in this Planning Region but protecting existing prairie and wetland habitat is a priority.



Water Quality Benefits Calculator Category	Practice (NRCS Code)	Average Sediment (tons/yr)	Average Phosphorus (lbs/yr)	Average Nitrogen (lbs/yr)	Average Cost
Nonstructural Practices (per acre)	Cover Crops (340)	0.7	0.2	4.6	$50
	No Till (329)	0.8	0.3	4.8	$50
	Perennial Crops (327)	0.4	0.3	2.3	$50
	Forage & Biomass planting (512)	6.7	0.3	2.3	$50
	Prescribed Grazing (528)	0.4	0.1	0.5	$20
	Riparian Buffer (390) – *per practice*	38.5	21.4	453.7	$13,200
Structural Practices (per practice)	Grade Stabilization (410)	16.1	0.7	14.7	$20,000
	Grassed Waterway (412)	34.3	3.2	60.8	$19,200
	WASCOB (638)	29.4	9.1	126.0	$9,000

Habitat Benefits	Water Quality Benefits
Prairie Pollinators Wetlands	Clearwater River protection Wetland protection Water storage

Hill River Planning Region



At a Glance

- **13%** of plan area
- Communities include **Brooks**
- Counties include **Polk, Red Lake, Clearwater**

Medium Priority Restoration

Hill River Planning Region Overview

The Hill River Planning Region encompasses the entire Hill River from the headwaters to its mouth where it empties into the Lost River. The city of Brooks is located in this planning region. The Hill River watershed is mostly agricultural with some forested areas in the headwaters.

Hill River Goals

- Soil Health
- Streambank and Riparian Stabilization
- Runoff Reduction
- Bacteria Reduction
- Sediment Reduction
- Phosphorus Reduction
- High Value Resource Protection
- Drinking Water Protection

Hill River Planning Region Projects and Practices

			Measurable Goals											Timeline						
Action	Targeted Resources	10-Year Measurable Outcome	Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility (Bold = Lead)	2023-24	2025-26	2027-28	2029-30	2031-32	Annual Estimated Cost	Total 10-Year Estimated Cost
Structural Agricultural Practices (sediment basins; grade stabilizations, side water inlets, filter strips, drainage water mgmt)	Hill River	1,424 tons sediment/yr 215 lbs phosphorus/yr 86 acre-feet storage	●	●	●	○				○	○	○	**SWCDs**, **RLWD,** NRCS, BWSR	●	●	●	●	●	**$43,029**	**$430,294**
Non-structural Agricultural Practices (cover crops, reduced tillage, prescribed grazing, conservation crop rotation, perennial crops)	Hill River	2,828 acres 3,247 tons sediment/yr 698 lbs phosphorus/yr	●	●	○	●							**SWCDs, NRCS**, RLWD, BWSR	●	●	●	●	●	**$74,665**	**$747,245**
Bacteria Reduction projects (Livestock exclusion and watering facility, waste pit closures)	Hill River	2 projects	○	○			●		○		○	○	**SWCDs, MPCA**, NRCS, BWSR			●	●	●	**$1,500**	**$15,000**
Forest Protection Practices (SFIA or Easements)	Hill River	531 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR	●	●	●	●	●	$7,276	$72,760
Forest Stewardship Plans	Hill River	9 plans, 531 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, NCRS	●	●	●	●	●	**$602**	**$6,018**
Lake Enhancement Projects (rain gardens, shoreline restoration)	Turtle Lake	17 lbs phosphorus/yr 1 lake project/2 yrs	○	●				○					**SWCDs,** DNR, BWSR		●	●	●	●	**$2,000**	**$20,000**
Stream Channel Enhancement Projects (rock structures to stabilize channel bottoms, resloping)	See Figure 5.4.	0.6 miles	○	○				○			●		**RLWD**, **SWCDs,** DNR, BWSR, MPCA (319 Grants), ACOE		●	●	●	●	**$3,000**	**$30,000**
Land Retirement Programs (CRP, CREP)	Hill River	6,079 acres in 2022 (724 acres expire in 2025)	○	○	○	○	○	●	○				**SWCDs,** RLWD, NRCS, TNC, DNR, BWSR	●	●	●	●	●	$43,769	$437,688
													Total Level 2 Funding Scenario (Current + WBIF)						**$56,215**	**$562,153**
													Total Level 3 Funding (Partner Projects & Other Funding Sources)						$51,045	$510,448

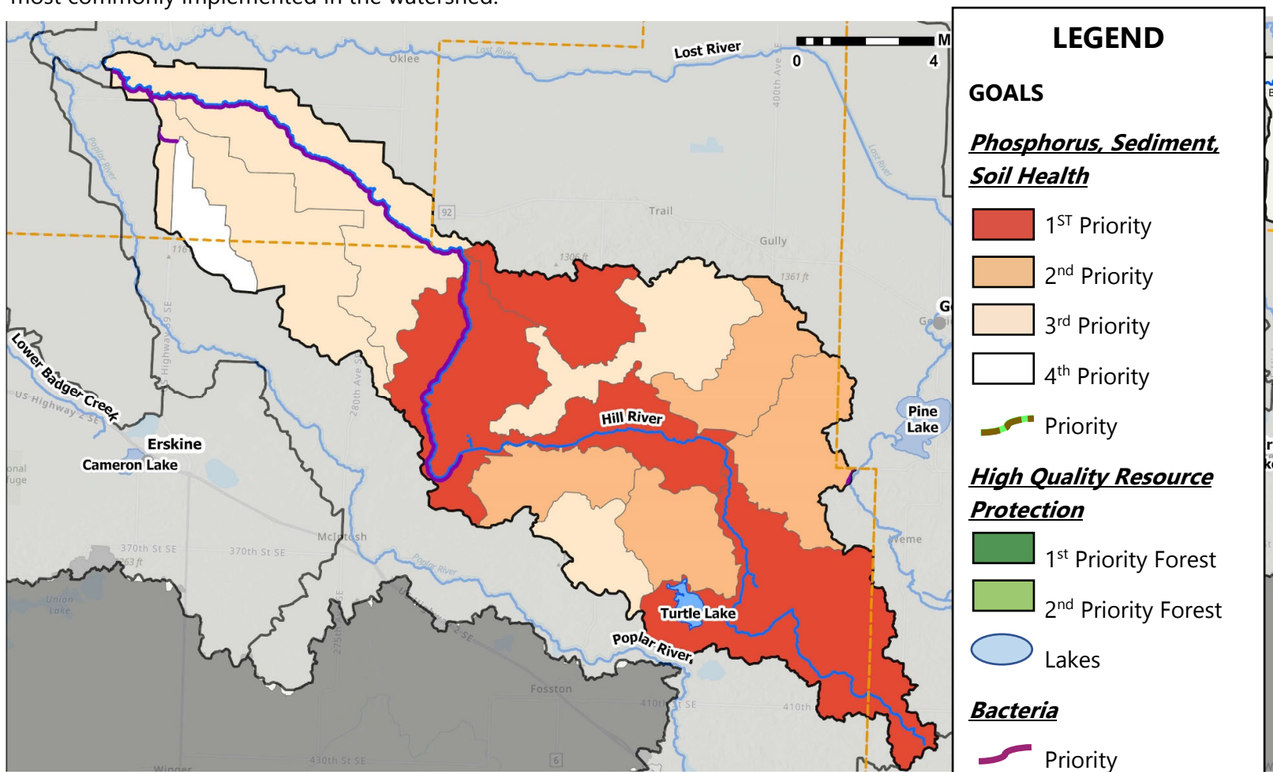
● Primary Goal this action will address

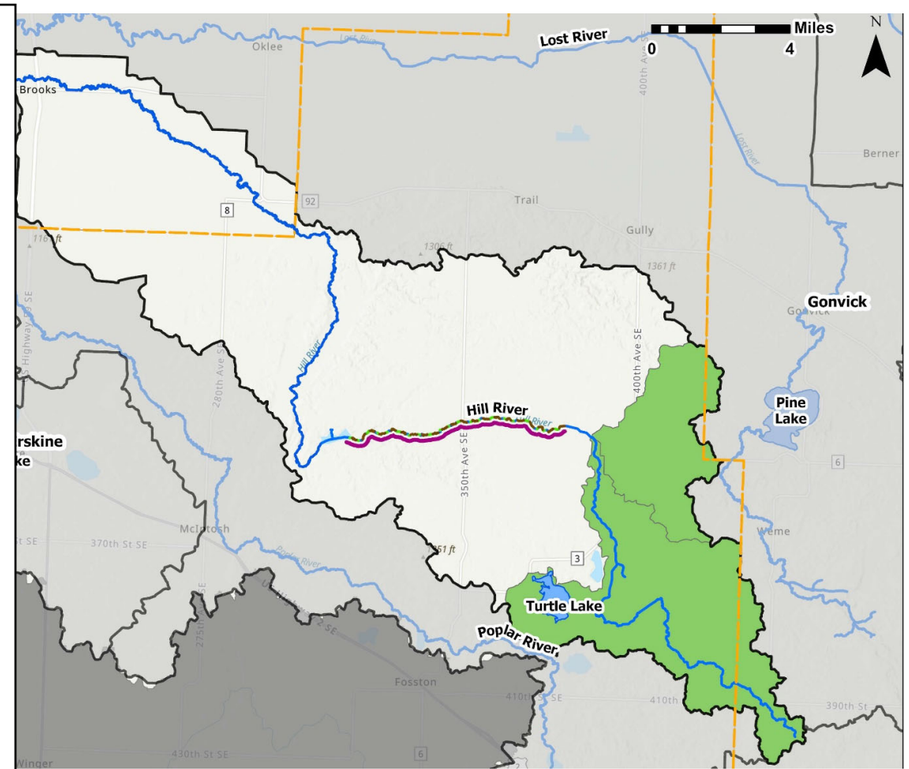
○ Secondary Goal this action will address

Hill River Planning Region Targeting and Measuring

Restoration Targeting: Projects to reduce sediment and phosphorus and improve soil health were targeted based on where PTMApp identified practices with the best sediment reductions and where there were impairments. The Water Quality Benefits Calculator below can be used to add up reductions to reach the goal in this planning region. Implementation is not limited to just these practices; they are just the most commonly implemented in the watershed.

Protection Targeting: Projects to protect water quality were targeted based on nearly impaired reaches for phosphorus, sediment, or bacteria. Projects to protect habitat and outstanding water quality were targeted based on RAQ scoring (page 59). Benefits are noted below.

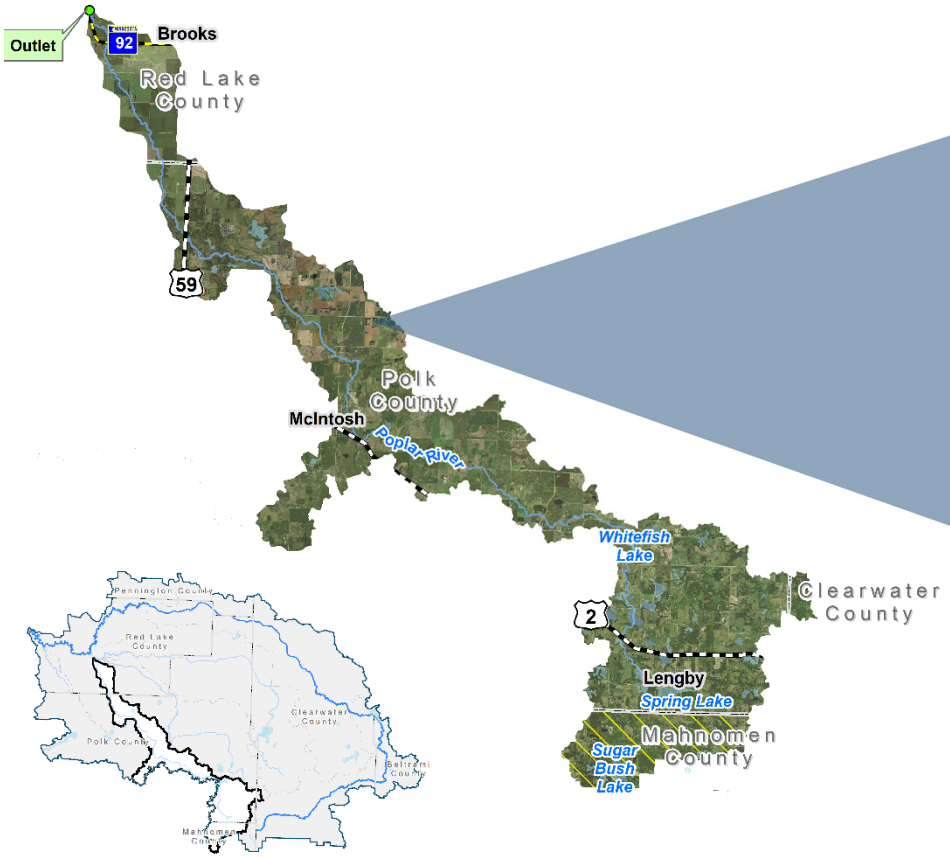




Water Quality Benefits Calculator Category	Practice (NRCS Code)	Average Sediment (tons/yr)	Average Phosphorus (lbs/yr)	Average Nitrogen (lbs/yr)	Average Cost
Nonstructural Practices (per acre)	Cover Crops (340)	1.0	0.2	4.6	$50
	No Till (329)	1.2	0.3	4.8	$50
	Perennial Crops (327)	0.7	0.3	2.3	$50
	Forage & Biomass planting (512)	8.9	0.3	2.3	$50
	Prescribed Grazing (528)	0.4	0.1	0.5	$20
	Riparian Buffer (390) – *per practice*	44.5	10.7	221.3	$8,414
Structural Practices (by practice)	Grade Stabilization (410)	23.6	1.2	25.0	$20,000
	Grassed Waterway (412)	33.4	2.9	58.8	$18,319
	WASCOB (638)	48.3	7.7	113.3	$9,000

Habitat Benefits	Water Quality Benefits
Forest Waterfowl Migration Prairie Wetlands	Turtle Lake Protection • Migratory waterfowl feeding/resting area • Priority waterfowl/shallow lake Hill River Protection

Poplar River Planning Region



At a Glance

- **9%** of plan area
- Communities include **Lengby, McIntosh**
- Counties include **Polk, Red Lake, Mahnomen, Clearwater**
- Tribal Lands include **White Earth Reservation**

Medium Priority Restoration

Poplar River Planning Region Overview

The Poplar River Planning Region contains the entirety of the Poplar River from the headwaters to the mouth, where it empties into the Lost River. The Poplar River Planning Region contains a mix of cropland, wetland, and forested areas at the headwaters with a prime opportunity for high value resource protection. The cities of Lengby and McIntosh are located here, with McIntosh straddling both Poplar River and Lower Badger Creek.

Poplar River Goals

- Soil Health
- Sediment Reduction
- Bacteria Reduction
- High Value Resource Protection
- Phosphorus Reduction
- Drinking Water Protection
- Stormwater Reduction
- Runoff Reduction

Poplar River Planning Region Projects and Practices

Action	Targeted Resources	10-Year Measurable Outcome	Measurable Goals: Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility/Partners (Bold = Lead)	Timeline: 2023-24	2025-26	2027-28	2029-30	2031-32	Annual Estimated Cost	Total 10-Year Estimated Cost
Structural Agricultural Practices (sediment basins; grade stabilizations, side water inlets, filter strips, drainage water mgmt)	Poplar River	1,096 tons sediment/yr 180 lbs phosphorus/yr 60 acre-feet storage	●	●	●	○				○	○	○	**SWCDs**, **RLWD, NRCS**, BWSR	●	●	●	●	●	**$43,175**	**$431,746**
Non-structural Agricultural Practices (cover crops, reduced tillage, prescribed grazing, conservation crop rotation, perennial crops)	Poplar River	1,984 acres 2,255 tons sediment/yr 501 lbs phosphorus/yr	●	●	○	●							**SWCDs, NRCS**, RLWD, BWSR		●	●	●	●	**$17,226**	**$172,591**
Bacteria Reduction projects (Livestock exclusion and watering facility, waste pit closures)	Poplar River	2 projects	○	○			●		○		○	○	**SWCDs, MPCA,** NRCS, BWSR				●		**$1,500**	**$15,000**
Forest Protection Practices (SFIA or Easements)	Poplar River	2,969 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, State of MN			●	●	●	$71,617	$716,172
Forest Stewardship Plans	Poplar River	49 plans, 2969 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, NCRS			●	●	●	**$3,365**	**$33,649**
Land Retirement Programs (CRP, CREP)	Poplar River, Shallow Lakes	2,479 acres in 2022 (588 acres expire in 2025)	○	○	○	○	○	●	○				**SWCDs,** RLWD, NRCS, TNC, DNR, BWSR	●	●	●	●	●	$17,849	$178,488
													Total Level 2 Funding Scenario (Current + WBIF)						**$65,266**	**$652,986**
													Total Level 3 Funding (Partner Projects & Other Funding Sources)						$89,466	$894,660

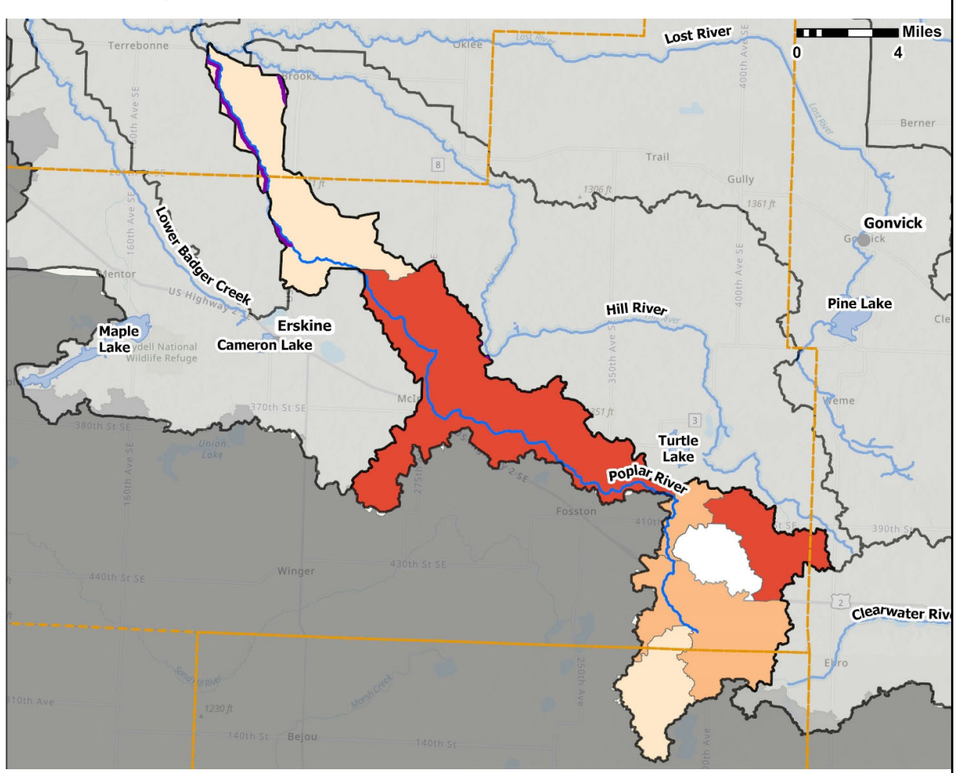
● Primary Goal this action will address

○ Secondary Goal this action will address

Poplar River Planning Region Targeting and Measuring

Restoration Targeting: Projects to reduce sediment and phosphorus and improve soil health were targeted based on where PTMApp identified practices with the best sediment reductions and where there were impairments. The Water Quality Benefits Calculator below can be used to add up reductions to reach the goal in this planning region. Implementation is not limited to just these practices; they are just the most commonly implemented in the watershed.

Protection Targeting: Projects to protect water quality were targeted based on nearly impaired reaches for phosphorus, sediment, or bacteria. Projects to protect habitat and outstanding water quality were targeted based on RAQ scoring (page 59). Benefits are noted below.



LEGEND

GOALS

Phosphorus, Sediment, Soil Health

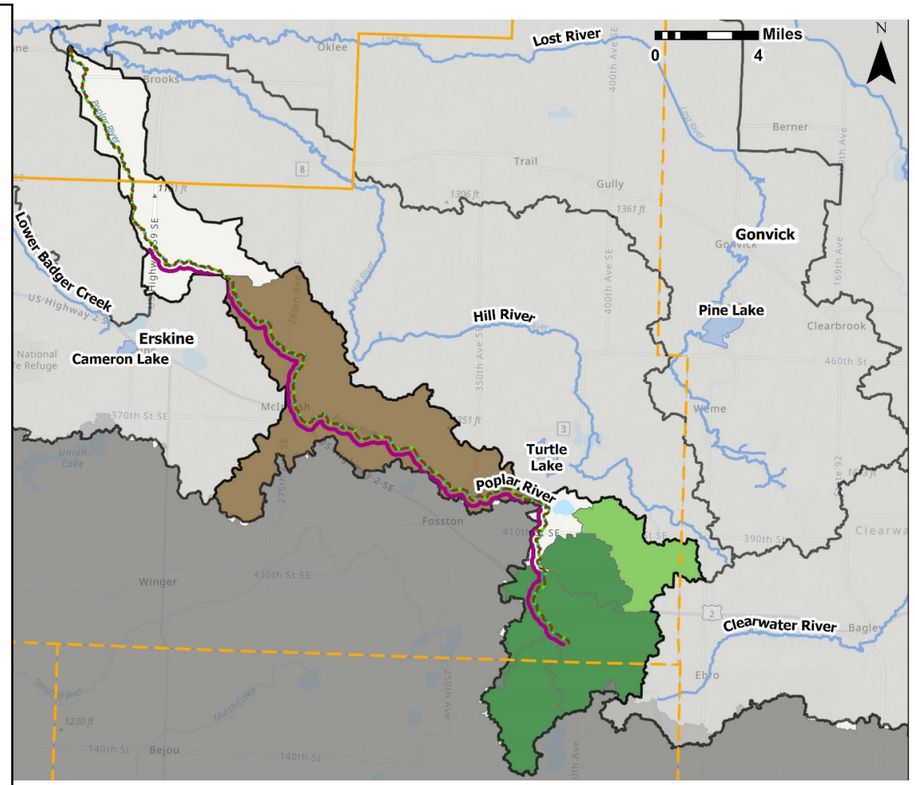
- 1ST Priority
- 2nd Priority
- 3rd Priority
- 4th Priority
- Priority

High Quality Resource Protection

- 1st Priority Forest
- 2nd Priority Forest
- Priority Prairie & Wetlands

Bacteria

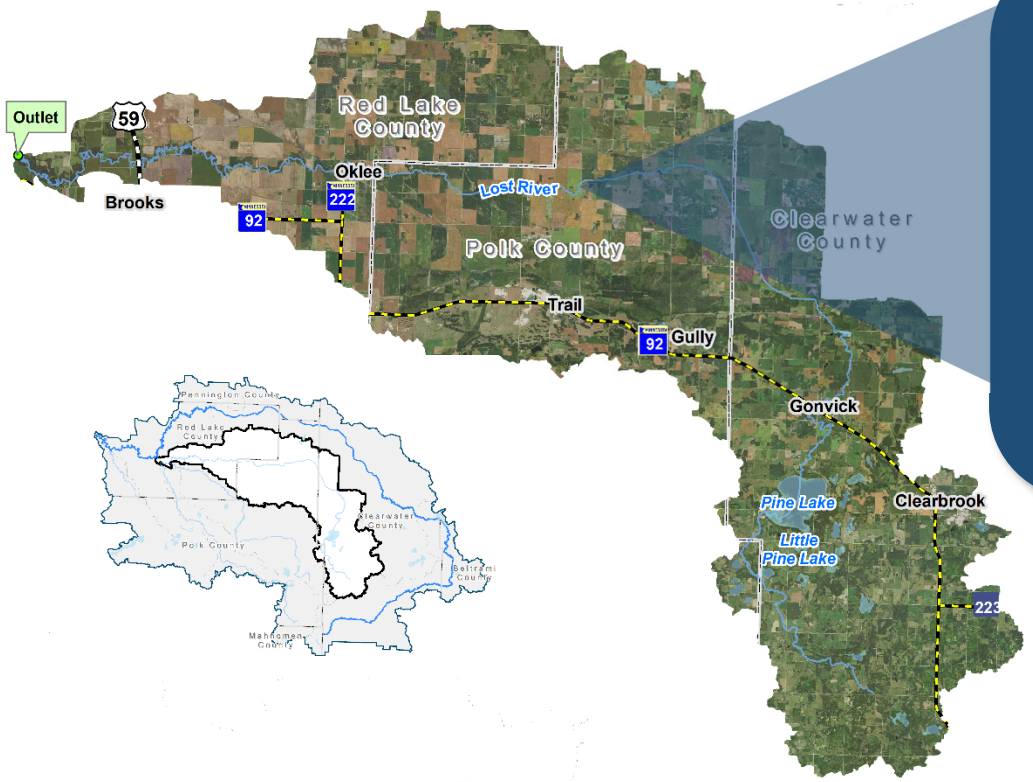
- Priority



Water Quality Benefits Calculator Category	Practice (NRCS Code)	Average Sediment (tons/yr)	Average Phosphorus (lbs/yr)	Average Nitrogen (lbs/yr)	Average Cost
Nonstructural Practices (per acre)	Cover Crops (340)	1.0	0.2	4.6	$50
	No Till (329)	1.1	0.3	4.8	$50
	Perennial Crops (327)	0.8	0.3	2.3	$50
	Forage & Biomass planting (512)	7.4	0.3	2.3	$50
	Prescribed Grazing (528)	0.4	0.1	0.5	$20
	Riparian Buffer (390) – *per practice*	28.1	16.6	334.6	$12,500
Structural Practices (per practice)	Grade Stabilization (410)	14.4	0.8	16.6	$9,000
	Grassed Waterway (412)	23.8	2.0	40.9	$34,229
	WASCOB (638)	43.3	7.5	107.5	$20,000

Habitat Benefits		Water Quality Benefits
Trout	Waterfowl	Priority Waterfowl/Shallow Lakes protection
Forest	Migration	Lengby Creek Protection
Prairie		• Trout stream
Pollinators		Poplar River protection
Wetlands		Wetland protection

Lost River Planning Region



At a Glance

- **22%** of plan area
- Communities include **Oklee, Trail, Gully, Gonvick, Clearbrook**
- Counties include **Clearwater, Beltrami, Mahnomen, Polk**

High Priority Restoration

Lost River Planning Region Overview

The Lost River Planning Region encompasses the entire Lost River, including the outlets of the Poplar and Hill rivers, where it then empties into the Clearwater River. This planning region is a mix of cropland, wetlands, lakes, and forested areas at the headwaters. Pine Lake, a popular recreational lake is located here. Clearbrook, Gonvick, Gully, Trail, and Oklee follow State Highway 92 from east to west.

Lost River Goals

- Ditch Stabilization
- Soil Health
- Phosphorus Reduction
- Streambank and Riparian Stabilization
- High Value Resource Protection
- Runoff Reduction
- Bacteria Reduction
- Stormwater Reduction
- Drinking Water Protection
- Sediment Reduction

Lost River Planning Region Projects and Practices

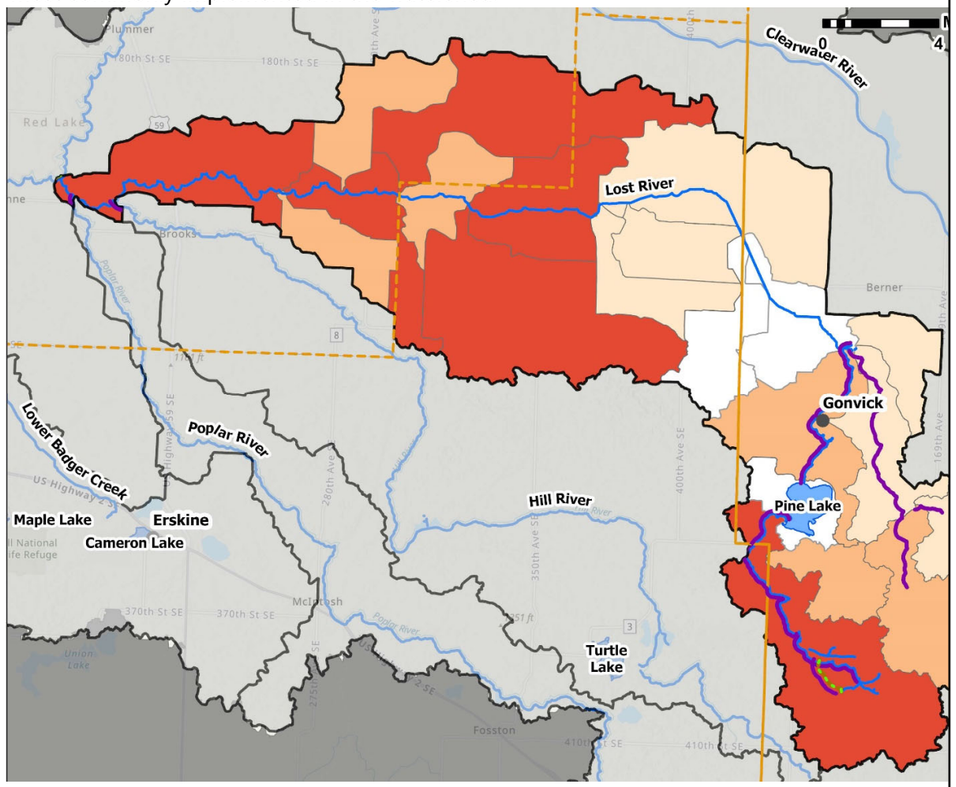
Action	Targeted Resources	10-Year Measurable Outcome	Measurable Goals: Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility/Partners (Bold = Lead)	Timeline: 2023-24	2025-26	2027-28	2029-30	2031-32	Annual Estimated Cost	Total 10-Year Estimated Cost
Structural Agricultural Practices (PTMApp) (sediment basins; grade stabilizations, side water inlets, filter strips, drainage water mgmt)	Lost River Pine Lake	2,064 tons sediment/yr 350 lbs phosphorus/yr 101 acre-feet storage	●	●	●	○				○	○	○	**SWCDs**, **RLWD,** NRCS, BWSR	●	●	●	●	●	**$74,612**	**$746,115**
Non-structural Agricultural Practices (cover crops, reduced tillage, prescribed grazing, conservation crop rotation, perennial crops)	Lost River Pine Lake	4,642 acres 3,656 tons sediment/yr 1,152 lbs phosphorus/yr	●	●	○	●							**SWCDs,** RLWD, NRCS, BWSR		●	●	●	●	**$40,368**	**$403,828**
Bacteria Reduction projects (Livestock exclusion and watering facility, waste pit closures)	Lost River	5 projects	○	○			●		○		○	○	**SWCDs, MPCA,** NRCS, BWSR			●	●	●	**$3,750**	**$37,500**
Forest Protection Practices (SFIA or Easements)	Lost River Pine Lake	2,052 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, State of MN	●	●	●	●	●	$47,882	$478,815
Forest Stewardship Plans	Lost River Pine Lake	34 plans, 2,052 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, NCRS	●	●	●	●	●	**$2,326**	**$23,256**
Lake Enhancement Projects (rain gardens, shoreline restoration)	Pine Lake	153 lbs phosphorus/yr 1 lake project/yr	○	●				○					**SWCDs,** DNR, BWSR		●	●	●	●	**$4,000**	**$40,000**
Stream Channel Enhancement Projects (rock structures to stabilize channel bottoms, resloping)	See Figure 5.4.	5 miles	○	○				○			●		**RLWD**, **SWCDs,** DNR, BWSR, MPCA (319 Grants), ACOE			●	●	●	**$25,000**	**$250,000**
Ditch System Enhancement Projects (rock and grade stabilization structures in ditch bottom)	See Figure 5.4.	8.9 miles	○	○								●	**RLWD**, Counties, SWCDs			●	●	●	**$35,600**	**$356,000**
Land Retirement Programs (CRP, CREP)	Lost River Pine Lake	6,309 acres in 2022 (1,007 acres expire in 2025)	○	○	○	○	○	●	○				**SWCDs,** RLWD, NRCS, TNC, DNR, BWSR	●	●	●	●	●	$45,425	$454,248
													Total Level 2 Funding Scenario (Current + WBIF)						**$185,656**	**$1,856,699**
													Total Level 3 Funding (Partner Projects & Other Funding Sources)						$93,307	$933,063

● Primary Goal this action will address

○ Secondary Goal this action will address

Lost River Planning Region Targeting and Measuring

Restoration Targeting: Projects to reduce sediment and phosphorus and improve soil health were targeted based on where PTMApp identified practices with the best sediment reductions and where there were impairments. The Water Quality Benefits Calculator below can be used to add up reductions to reach the goal in this planning region. Implementation is not limited to just these practices; they are just the most commonly implemented in the watershed.



LEGEND

GOALS

Phosphorus, Sediment, Soil Health

- 1ST Priority
- 2nd Priority
- 3rd Priority
- 4th Priority
- Priority

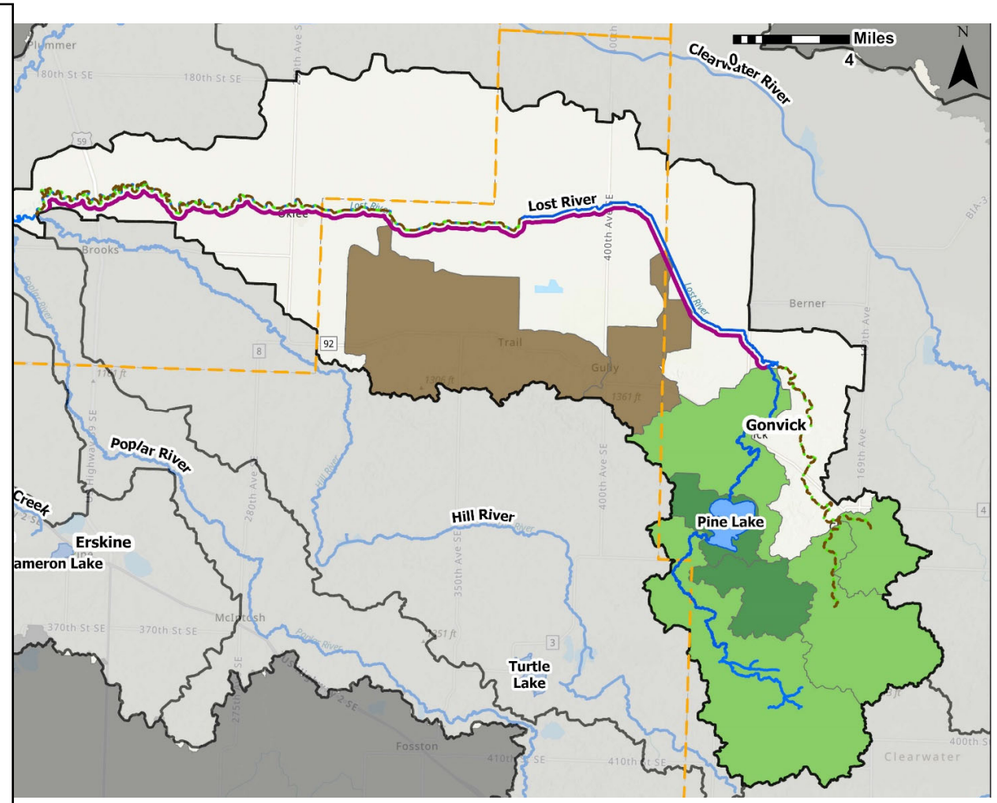
High Quality Resource Protection

- 1st Priority Forest
- 2nd Priority Forest
- Priority Prairie & Wetlands
- Lakes

Bacteria

- Priority

Protection Targeting: Projects to protect water quality were targeted based on nearly impaired reaches for phosphorus, sediment, or bacteria. Projects to protect habitat and outstanding water quality were targeted based on RAQ scoring (page 59). Benefits are noted below.

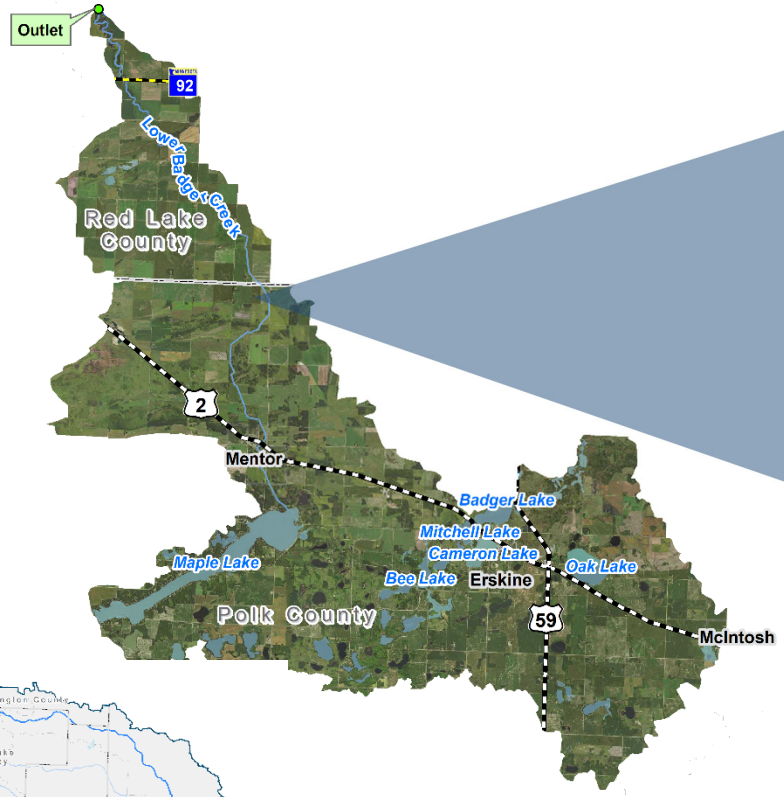


Water Quality Benefits Calculator Category	Practice (NRCS Code)	Average Sediment (tons/yr)	Average Phosphorus (lbs/yr)	Average Nitrogen (lbs/yr)	Average Cost
Nonstructural Practices (per acre)	Cover Crops (340)	0.7	0.2	4.6	$50
	No Till (329)	0.8	0.3	4.8	$50
	Perennial Crops (327)	0.5	0.3	2.3	$50
	Forage & Biomass planting (512)	6.8	0.3	2.3	$50
	Prescribed Grazing (528)	0.4	0.1	0.5	$20
	Riparian Buffer (390) – *per practice*	43.2	12.9	267.2	$13,220
Structural Practices (by practice)	Grade Stabilization (410)	21.2	0.9	18.0	$20,000
	Grassed Waterway (412)	30.1	2.6	49.7	$15,600
	WASCOB (638)	40.6	7.7	110.8	$9,000

Habitat Benefits		Water Quality Benefits
Wild Rice Trout Forest Prairie Pollinators Wetlands	Waterfowl Migration	Lost River protection • Trout Stream Pine Lake protection • Wild Rice Lake Calcareous Fen protection Wetland protection

Lower Badger Creek Planning Region

Medium Priority Restoration



Lower Badger Creek Planning Region Overview

The Lower Badger Creek Planning Region contains the entirety of Lower Badger Creek, from its headwaters to the mouth where it outlets to the Lower Clearwater River. The cities of Mentor, Erskine, and McIntosh are located here, with McIntosh straddling both Poplar River and Lower Badger Creek. This planning region is largely agricultural, with some larger wetlands and lakes. Maple Lake is a popular recreational lake near Mentor.

Upper Clearwater Goals

- Ditch Stabilization
- Phosphorus Reduction
- Soil Health
- Bacteria Reduction
- High Value Resource Protection
- Drinking Water Protection
- Sediment Reduction
- Stormwater Reduction

At a Glance

- **9%** of plan area
- Communities include **Mentor, Erskine, McIntosh**
- Counties include **Polk, Red Lake**

Lower Badger Creek Planning Region Projects and Practices

Action	Targeted Resources	10-Year Measurable Outcome	Measurable Goals: Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility/Partners (Bold = Lead)	Timeline: 2023-24	2025-26	2027-28	2029-30	2031-32	Annual Estimated Cost	Total 10-Year Estimated Cost
Structural Agricultural Practices (PTMApp) (sediment basins; grade stabilizations, side water inlets, filter strips, drainage water mgmt)	**Lower Badger Creek Maple Lake Cameron Lake**	1,344 tons sediment/yr 363 lbs phosphorus/yr 56 acre-feet storage	●	●	●	○				○	○	○	**SWCDs**, **RLWD,** NRCS, BWSR		●	●	●	●	**$77,569**	**$775,685**
Non-structural Agricultural Practices (cover crops, reduced tillage, prescribed grazing, conservation crop rotation, perennial crops)	**Lower Badger Creek Maple Lake Cameron Lake**	1,954 acres 2,736 tons sediment/yr 874 lbs phosphorus/yr	●	●	○	●							**SWCDs,** RLWD, NRCS, BWSR		●	●	●	●	**$16,965**	**$170,024**
Bacteria Reduction projects (Livestock exclusion and watering facility, waste pit closures)	**Lower Badger Creek**	2 projects	○	○			●		○		○	○	**SWCDs, MPCA,** NRCS, BWSR			●	●		**$1,500**	**$15,000**
Forest Protection Practices (SFIA or Easements)	**Lower Badger Creek Maple Lake Cameron Lake**	220 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, State of MN			●	●	●	$4,888	$48,883
Forest Stewardship Plans	**Lower Badger Creek Maple Lake Cameron Lake**	4 plans, 220 acres	○	○	○			●	○		○	○	**SWCDs,** DNR, BWSR, NCRS			●	●	●	**$249**	**$2,493**
Lake Enhancement Projects (rain gardens, shoreline restoration)	**Maple Lake Cameron Lake**	217 lbs phosphorus/yr 19 lbs phosphorus/yr 1 lake project/yr	○	●				○					**SWCDs,** DNR, BWSR	●	●	●	●	●	**$4,000**	**$40,000**
Ditch System Enhancement Projects (rock and grade stabilization structures in ditch bottom)	See Figure 5.4	0.4 miles	○	○								●	**RLWD**, Counties, SWCDs			●	●	●	**$1,600**	**$16,000**
Land Retirement Programs (CRP, CREP)	**Lower Badger Creek Maple Lake Cameron Lake**	2,875 acres (218 acres expire in 2025)	○	○	○	○	○	●	○	○	○	○	**SWCDs,** RLWD, NRCS, TNC, DNR, BWSR	●	●	●	●	●	$20,700	$207,000
													Total Level 2 Funding Scenario (Current + WBIF)						**$101,883**	**$1,019,202**
													Total Level 3 Funding (Partner Projects & Other Funding Sources)						$25,588	$255,883

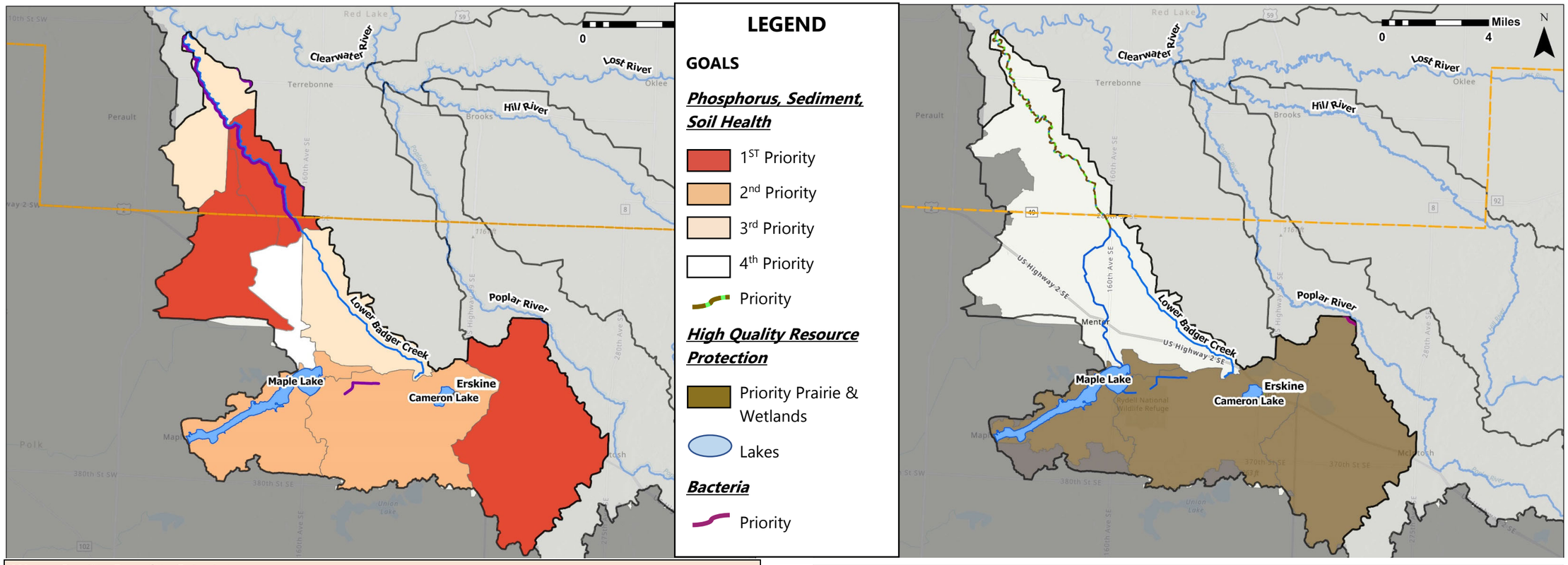
● Primary Goal this action will address

○ Secondary Goal this action will address

Lower Badger Creek Planning Region Targeting and Measuring

Restoration Targeting: Projects to reduce sediment and phosphorus and improve soil health were targeted based on where PTMApp identified practices with the best sediment reductions and where there were impairments. The Water Quality Benefits Calculator below can be used to add up reductions to reach the goal in this planning region. Implementation is not limited to just these practices; they are just the most commonly implemented in the watershed.

Protection Targeting: Projects to protect water quality were targeted based on nearly impaired reaches for phosphorus, sediment, or bacteria. Projects to protect habitat and outstanding water quality were targeted based on RAQ scoring (page 59). Benefits are noted below.



Water Quality Benefits Calculator Category	Practice (NRCS Code)	Average Sediment (tons/yr)	Average Phosphorus (lbs/yr)	Average Nitrogen (lbs/yr)	Average Cost
Nonstructural Practices (per acre)	Cover Crops (340)	0.7	0.2	4.6	$50
	No Till (329)	0.8	0.3	4.8	$50
	Perennial Crops (327)	0.4	0.3	2.3	$50
	Forage & Biomass planting (512)	7.3	0.3	2.3	$50
	Prescribed Grazing (528)	0.4	0.1	0.5	$20
	Riparian Buffer (390) – *per practice*	40.3	21.1	421.0	$23,400
Structural Practices (per practice)	Grade Stabilization (410)	13.8	1.0	18.7	$20,000
	Grassed Waterway (412)	18.6	3.1	55.6	$17,600
	WASCOB (638)	30.8	8.8	123.8	$9,000

Habitat Benefits	Water Quality Benefits
Waterfowl Migration Prairie Pollinators Wetlands	Maple Lake protection Cameron Lake protection Priority Waterfowl/Shallow Lake protection Wetland protection

Capital Improvement Projects

The Capital Improvement Projects Action Table summarizes actions for the construction, repair, retrofit, or increased utility or function of physical facilities, infrastructure, or environmental features. Capital Improvements require external funding. These actions will be implemented watershed-wide, as project footprints and benefits span planning region boundaries. They will be implemented through the Capital Improvement Projects Implementation Program, described further in Section 6. The Planning Partners intend to use approximately 30% of the watershed-based implementation funds (WBIF) (~$146,000/year) to support implementation of these projects.

			Measurable Goals											Timeline					
Action	**Targeted Resources**	**10-Year Measurable Outcome**	**Sediment**	**Phosphorus**	**Storage**	**Soil Health**	**Bacteria**	**Resource Protection**	**Drinking Water**	**Stormwater**	**Stream Stabilization**	**Ditch Stabilization**	**Responsibility** (Bold = Lead)	**2023-24**	**2025-26**	**2027-28**	**2029-30**	**2031-32**	**Estimated Total 10-Year Cost**
Stream Restoration and Channel/Bank Stabilization	See Figure 5.4.	12.5 miles stabilized	●	●	●						●		**RLWD,** SWCDs, DNR, BWSR, ACOE, MPCA	●	●	●	●	●	~ 12,500,000
Stormwater Control Projects	Clear Brook (Gonvick) Cameron Lake (Erskine) Clearwater River (Red Lake Falls)	3 projects	○	○	○		○			●			**Cities**, RLWD, SWCDs, MPCA			●	●	●	*NA*
Water Retention Projects	See Figure 4.7, Section 4. (storage map)	9,060 acre-ft	○	○	●				○				**RLWD, RRWMB**			●	●	●	~ 18,000,000
Dam modification for fish passage	Clearwater Lake outlet, Sooline Trestle @ Upper Clearwater trout reach	2 projects	○					○			●		**DNR**, RLWD, SWCDs				●	●	~ $1,000,000
Ditch Stabilization	JCD 64 outlet, JD 31, JCD 3, JD 2 Br A, JD 2 Br 5, Winsor Hangaard, JD 100, JD 101, PCD 200	13.5 miles stabilized	●	●								●	**RLWD, Counties,** MPCA	●	●	●	●	●	**$540,000**
Wetland Restoration for Flood Damage Reduction	See Figure 4.7, Section 4. (storage map)	Included in water retention projects goal	○	○	●				○				**RLWD,** DNR, ACOE, USFWS		●	●	●	●	*Included in water retention projects cost*
Small community wastewater systems	Explore opportunities for communities.	Explore 1 system	○	●			●	○	○				**Cities, MPCA, Counties**				●	●	*NA*

Potential Ditch and Stream Stabilization Project Locations

The ditch and stream stabilization projects in the Projects and Practices table and the Capital Improvements Table are based on ground-truthing done by the Red Lake Watershed District shown on this map (Figure 5.4). Project opportunities include grade stabilizations, bank stabilizations, side water inlets (SWI), and buffer enhancement.

Disclaimer

The erosion problems shown in this map were identified through the hydroconditioning groundtruthing effort, WRAPS pollutant source investigation, the Clearwater River Watershed Fluvial Geomorphology Study, examination of aerial photos, and ditch inspections. This is not an all-inclusive map, as it only represents areas that have been explored by RLWD and Pennington SWCD staff. Other than a scoring system used for streambank erosion during the geomorphology study, the identification of multiple stabilization needs in some locations, there has not been any prioritization applied to the specific locations identified in this map. Prioritization of work will primarily be based on the priority subwatersheds that are identified in the Targeted Implementation Schedule.

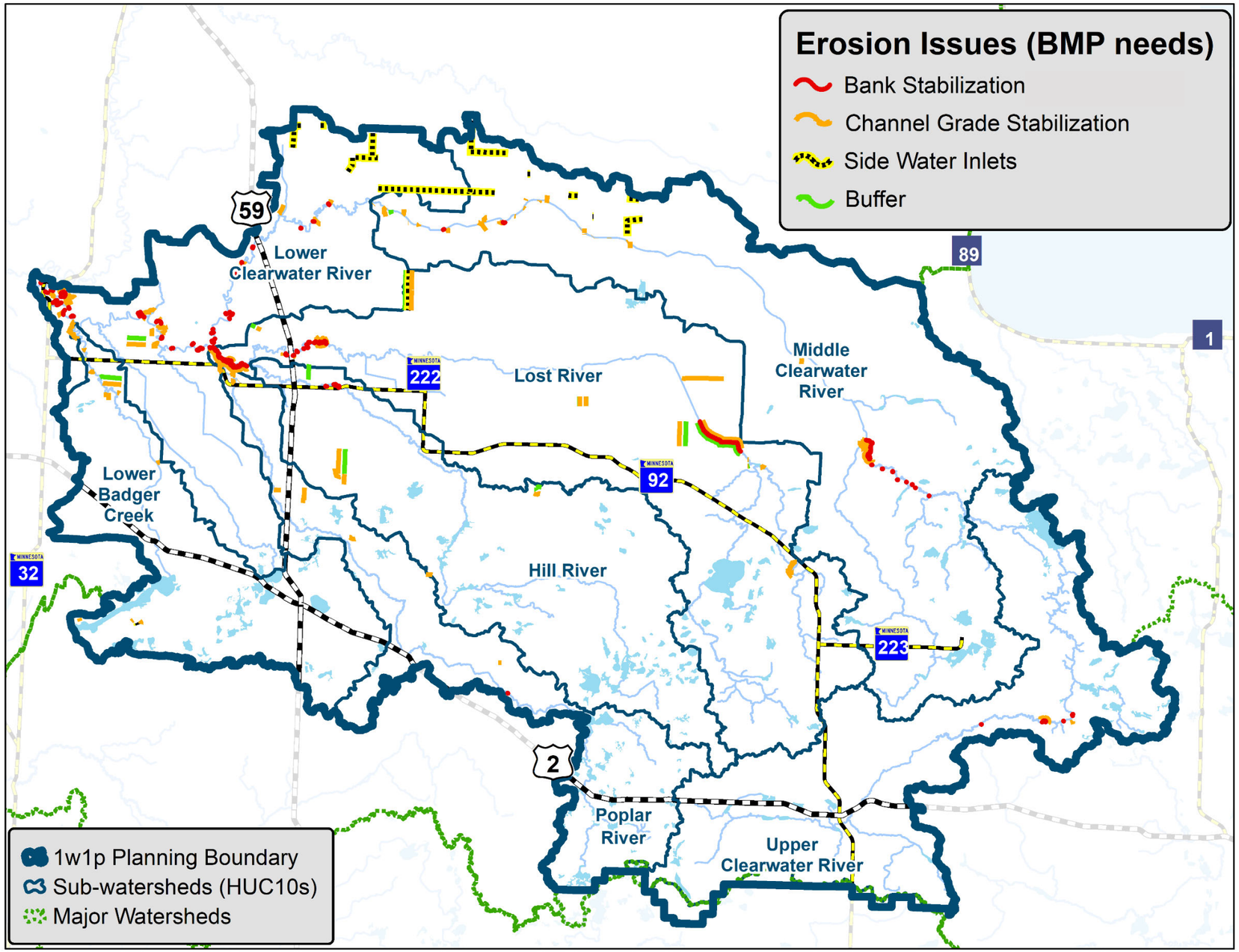


Figure 5.4. Potential stream and ditch project locations (source: RLWD ground-truthing, Pennington SWCD prioritization).

Watershed Wide Actions

The Watershed-Wide Action Table summarizes actions that will be implemented throughout the watershed as current programs (Regulatory and Monitoring) and as opportunities arise (sealing abandoned wells, replacing failing septic systems).

				Measurable Goals										Responsibility/Partners (Bold = Lead)	Timeline						
Action	**Program**	**Targeted Resources**	**10-Year Measurable Outcome**	**Sediment**	**Phosphorus**	**Storage**	**Soil Health**	**Bacteria**	**Resource Protection**	**Drinking Water**	**Stormwater**	**Stream Stabilization**	**Ditch Stabilization**		**2023-24**	**2025-26**	**2027-28**	**2029-30**	**2031-32**	**Estimated Annual Cost**	**Estimated Total 10-Year Cost**
Land Use and Regulatory Program (See Appendix G)		Watershed-Wide	Continue current program	●	●	●	●	○	●	●	●	○	○	**Counties, RLWD, SWCDs**	●	●	●	●	●	**$75,682**	**$756,820**
Monitoring Program (See Section 7)		Watershed-Wide	Continue current program	○	○			○		○				**MPCA, RLWD**, SWCDs, IWI, DNR, MDH	●	●	●	●		**$140,192** Level 3	**$140,192** Level 3
Replace Failing Septic Systems		Watershed-Wide	Continue current program		○			○		○				**Counties**, **SWCDs**, MPCA	●	●	●	●	●	Level 3	Level 3
Seal Abandoned Wells		Watershed-Wide	10 wells/year							●				**SWCDs, MDH**	●	●	●	●	●	**$6,000**	**$60,000**
Improve connectivity with properly sized and placed culverts on road crossings		Watershed-Wide	10 culverts	○		○								**Counties**, SWCDs, RLWD, Townships			●	●	●	Level 3	Level 3
Acquisition of riparian corridors		Watershed-Wide	As opportunities arise	○	○			○	●			○		RLWD, BWSR, SWCDs, Lessard Sams			●	●	●	Level 3	Level 3
Windbreaks, shelterbelts, and tree planting		Watershed-Wide	As opportunities arise				○		○					**SWCDs**, **NRCS**, BWSR	●	●	●	●	●	Included in Soil Health, non-structural ag practices	
Noxious weed management		Watershed-Wide	Continue local program				○		○					**SWCDs, Counties**	●	●	●	●	●	Included in Regulatory Program	
AIS management and prevention		Lakes and Streams	Continue county program						○					**Counties**, **SWCDs**, RLWD, DNR, Lake Associations	●	●	●	●	●	$70,648	$706,480
Protect DWSMAs – Integrate plans, participate in planning		Drinking Water	Continue current program							●				**Cities**, **SWCDs**, **MDH**, SWCDs			●	●	●	Level 3	Level 3
														Total Level 2 Funding Scenario (Current + WBIF)						**$95,701**	**$957,012**
														Total Level 3 Funding (Partner Projects & Other Funding Sources)						$70,648	$706,480

Outreach Program

Action	Planning Region	10-Year Measurable Outcome	Measurable Goals: Sediment	Phosphorus	Storage	Soil Health	Bacteria	Resource Protection	Drinking Water	Stormwater	Stream Stabilization	Ditch Stabilization	Responsibility (Bold = Lead)	Timeline: 2023-24	2025-26	2027-28	2029-30	2031-32
Develop and implement a coordinated education and outreach plan among watershed partners to promote consistent strategies, materials, social media and messaging.	Watershed-wide	1 program	○	○	○	○	○	○	○	○	○	○	**SWCDs, RLWD,** NRCS, DNR, BWSR	●				
Continue general education and outreach activities by jurisdictional area.	Watershed-wide	Annual Implementation	○	○	○	○	○	○	○	○	○	○	**SWCDs**, **RLWD**, NRCS	●	●	●	●	●
Participate in existing environmental education programs for youth such as the Envirothon, county fairs, conservation days, ag-in-the-classroom, Trout in the Classroom, Northwest Minnesota Soil Contest, Water Fest, River Watch, River of Dreams, sponsor conservation camps for kids, poster contests, science fair judging, Arbor Day tree planting, FFA, 4-H.	Watershed-wide	Annual Program Implementation	○	○	○	○	○	○	○	○	○	○	**SWCDs**, Extension, NRCS, Trout Unlimited, International Water Institute, RLWD	●	●	●	●	●
Promote proper management of wells, i.e., setback distances, construction standards, private well inventory, and education on irrigation interference.	Watershed-wide	Annual Program Implementation							○				**SWCDs, Counties,** RLWD		●	●	●	●
Promote and showcase soil health demonstration sites using conservation farming practices and outreach workshops, project tours, (tillage management, cover crops, etc.).	Watershed-wide	1 forum/year	○	○		○							**SWCDs**, MDA, Extension, NRCS		●	●	●	●
Conduct outreach to the general public and local elected officials on environmental and urban contaminants, including salt, fertilizers, pesticides, household waste, prescription drugs, and legacy contaminants (e.g., PFAS and PCBs), and promote rain barrels and water conservation education.	Watershed-wide	Complete watershed outreach strategy							○	○			**Counties**, **Cities**, SWCDs, RLWD, MDH		●	●	●	●
Develop and implement a lake outreach program to better understand issues and inform the public on management measures to protect or improve lake water quality.	Watershed-wide	1 program		○				○					**SWCDs**, RLWD, Lake Associations, DNR, MPCA, Extension		●	●	●	●
Conduct arsenic and nitrate testing clinics and provide testing kits for private drinking water. Provide well testing kits at LGU offices year-round.	Watershed-wide	1 clinic/year							○				**SWCDs**, MDH	●	●	●	●	●
Outreach to landowners with expiring CRP contracts	Watershed-wide	Maintain current CRP acreage	○	○		○		○					SWCDs, NRCS, FSA		●	●	●	●
Education for developers, realtors, planners, mayors, county boards and other decision makers about the effects that development and land use have upon water quality.	Watershed-wide	Complete watershed outreach strategy	○	○		○	○	○	○				Counties, SWCDs, Cities, RLWD		●	●	●	●
Conduct Aquatic Invasive Species outreach and activities following county AIS Plans.	Watershed-wide	Continue county program						○					**Counties**, SWCDs	●	●	●	●	●
Increase participation in the MN Agricultural Water Quality Certification Program (MAWQCP).	Watershed-wide	1 producer/year	○	○	○	○	○		○				**MDA**, SWCDs	●	●	●	●	●
Complete the Geologic Atlas project in all counties in the watershed.	Watershed-wide	Completed data set							○				**U of MN**, SWCDs			●	●	●

	Annual Cost	Total 10-Year Cost
Total Level 2 Funding Scenario (Current + WBIF)	**$64,662**	**$646,620**
Total Level 3 Funding (Partner Projects & Other Funding Sources)	*NA*	*NA*

Estimated Plan Costs

Below are the estimated costs for implementing actions in the plan. Costs are also included for the operations and maintenance of natural and artificial waterways at or near their current levels, for regulatory action, and for plan administration and administrative costs related to implementation. This plan assumes local, state, and/or federal fiscal support remains unchanged.

	Level 1 Baseline		Level 2 Baseline +WBIF		Level 3 Other/Partner Funding	
Implementation Program*	Annual	10-Year Total	Annual	10-Year Total	Annual	10-Year Total
Capital Projects	$413,759	$4,137,590	**$504,000**	**$5,040,000**	$3,150,000	$31,500,000
Data Collection & Monitoring	$140,192	$1,401,920	**$140,000**	**$1,400,000**		
Education & Outreach	$40,312	$403,120	**$64,600**	**$646,000**		
Projects & Practices	$256,781	$2,567,810	**$703,700**	**$7,037,000**	$600,046	$6,000,460
Regulatory	$75,682	$756,820	**$76,000**	**$760,000**		
Operations and Maintenance	$55,758	$557,580	**$56,000**	**$560,000**		
Total	$926,726	$9,267,260	**$1,544,300**	**$15,443,000**	$3,750,046	$37,500,460

Operating level after this plan is adopted and WBIF is received.

Funding notes:

- Project development is included in the Capital Projects and Projects and Practices program costs and is assumed to be 5% of the practice cost.
- Technical assistance is included in the Capital Projects and Projects and Practices program costs and is assumed to be 20% of the practice cost.
- Plan Administration is estimated to be 10% of the watershed-based funding (~ $48,736 annually).

SECTION 6. IMPLEMENTATION PROGRAMS

Implementation programs are the funding mechanism to implement actions in the targeted implementation schedule. This plan establishes common implementation programs within the plan area and describes them conceptually in this section. There are five main programs: Projects and Practices, Capital Improvements, Regulatory, Data Collection and Monitoring, and Outreach and Communication (Figure 6.1).

Figure 6.1. Implementation programs for the CR1W1P.

Projects and Practices Implementation Program

Dollars used to implement projects and practices on the landscape are funded by the Projects and Practices Implementation Program. This implementation is broken into a variety of subprograms, as shown on the next few pages. These programs are typically administered by the SWCDs in the watershed and apply to most of the plan goals.

Applicable Plan Goals (Section 4):

- Ditch Stabilization
- Bacteria Reduction
- Sediment Reduction
- Streambank and Riparian Stabilization
- Drinking Water Protection
- Phosphorus Reduction
- Runoff Reduction
- Soil Health
- High Value Resource Protection
- Stormwater Reduction

Figure 6.2. Clearwater River and wild rice. Credit: RLWD.

Cost Share Programs

Cost-share programs or projects are those where the cost of installing a project is shared with the landowner(s). Implementing soil health practices such as cover crops and no till, or forest enhancement are applicable examples that meet plan goals.

Cost-share programs can also be used for structural practices. Implementing fencing and water sources for grazing cattle away from streams, water and sediment control basins, grade stabilizations, shoreline restorations on lakeshore, and well sealing are applicable examples that meet the goals of this plan.

Land Protection

Conservation Easements

Conservation easements are voluntary legal agreements between a landowner and governmental or nonprofit organization, whereby land use and development are limited on a property while conserving natural values that reside upon that landscape. The easements are individually tailored agreements with an organization such as the BWSR, DNR, Minnesota Land Trust, or the Nature Conservancy.

Reinvest in Minnesota (RIM) Wild Rice Conservation Easement Program

The RIM Wild Rice Conservation Easement Program protects wild rice lakes through permanent conservation easements on privately owned lands in Minnesota's Northern Forest region. This program is available in Beltrami and Clearwater counties.

Reinvest in Minnesota (RIM) Grassland Reserve Easement Program

RIM Grassland Reserve easements protect current grasslands or buffer native prairie within wildlife habitat complexes through permanent conservation easements on privately owned lands. This project aims to enroll and protect remnant prairie grasslands by focusing on Minnesota Prairie Plan-identified landscapes. This program has been popular in the Clearwater River Watershed.

Land Acquisition

For areas with unique and important resources that meet state goals, the DNR, USFWS, counties, cities, townships, and other entities may purchase and manage the land. Examples include Aquatic Management Areas (AMA) that are used for fish spawning habitat and Wildlife Management Areas (WMA) that are used for small game hunting and waterfowl migration.

Land Retirement Programs

Conservation Reserve Program (CRP)

CRP is administered by the Farm Service Agency (FSA) of the USDA. It is a voluntary program that contracts with agricultural producers so that environmentally sensitive agricultural land is not farmed or ranched, but instead devoted to conservation benefits. CRP participants establish long-term, resource-conserving plant species to control soil erosion, improve water quality and develop wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance. Contract duration is 10-15 years.

Wetlands Reserve Program (WRP)

The Wetlands Reserve Program (WRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The NRCS provides technical and financial support to help landowners with their wetland restoration efforts. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection.

Lands eligible for WRP are wetlands farmed under natural conditions; farmed wetlands; prior converted cropland; farmed wetland pasture; certain lands that have the potential to become a wetland as a result of flooding; rangeland, pasture, or forest production lands where the hydrology has been significantly degraded and can be restored; riparian areas which link protected wetlands; lands adjacent to protected wetlands that contribute significantly to wetland functions and values; and wetlands previously restored under a local, State, or Federal Program that need long-term protection.

Low-Interest Loans

Low-Interest Loans (AgBMP Loan Program) may be made available for septic system replacement, small community wastewater treatment systems, agricultural best management practices, and other projects that meet eligibility criteria for funding.

Private Forest Management

There are many different options for managing forests on privately-owned lands. These can range from permanent protection to management plans described in this section.

Forest Stewardship Plans

Forest owners can manage their woods through Woodland Stewardship Plans in coordination with the Minnesota DNR's Forest Stewardship Program. Forest goals can be developed in coordination with trained foresters to create wildlife habitat, increase natural beauty, enhance environmental benefits, or harvest timber. Plans must be prepared by a DNR-approved plan writer, which may include SWCD staff and private foresters.

Forest 2C Designation

Landowners with DNR-registered Woodland Stewardship Plans are eligible for 2C Classification, which is a state program that provides a reduced tax rate to forested property of 20 acres or more. This is an annual program.

The Sustainable Forest Incentive Act (SFIA)

The SFIA provides annual incentive payments for the landowner recording a covenant taking away some of the rights of the land (development and farming, for example). Private landowners can receive a payment for each acre of qualifying forest land they enroll in SFIA. In return, they follow the covenant for a set period of time: either 8, 20, or 50 years. Data on current enrollees shows that landowners who start with an 8-year covenant commonly move up to a 50-year covenant (DNR).

Operations and Maintenance

After projects are installed, regular on-site inspections and maintenance to ensure the project's continued function and success is required by the BWSR Grants Administration Manual (GAM), for projects funded through BWSR grants. These details, along with records including notes and photos should be included with each project's Operations and Maintenance Plan. BWSR's recommended inspection plans, according to the GAM, include the following:

Conservation practice with a minimum effective life of 10 years:

- The ends of Years 1, 3, and 9 after the certified completion are recommended.

Capital Improvement Implementation Program

A capital improvement project 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. Capital improvements are beyond the "normal" financial means of the Partnership and therefore require external funding.

Applicable Plan Goals (Section 4):

- Sediment Reduction
- Phosphorus Reduction
- Runoff Reduction
- Ditch Stabilization
- Streambank and Riparian Stabilization
- Stormwater Reduction

Section 5 shows general proposed capital improvement project types within the plan area, and Table 6.1 shows a list of possible projects. Additional discussions are needed among plan participants to develop the specific process for implementing capital improvements with base funding. Specifically, members of the Policy Committee or the Clearwater River Watershed Planning Work Group's individual and representative Boards are expected to discuss the means and methods for funding new capital improvements with potential funding partners before an implementation timeline can be established.

Capital improvement projects completed through this plan will be operated and maintained by the owner of the project for the lifespan of the project as specified in **Section 5**.

As highlighted throughout this plan, public drainage systems are prevalent throughout much of the plan area. As such, planning partners will engage drainage authorities about plan efforts and goals. Drainage authorities will be highly encouraged to coordinate and be involved during implementation of the targeted implementation schedule to make progress towards measurable goals, including sediment delivery, private and public flood risk reduction, and ditch stability. Based on this two-way engagement, drainage authorities could access implementation funds to

adopt drainage actions in the targeted implementation schedule (Section 5) during 103D and 103E processes and procedures when the opportunity arises within the planning area.

Table 6.1. Capital Improvement Project ideas developed by the Clearwater River Watershed Planning Work Group.

Capital Improvement Project	Planning Region	Description	Lead Entity
Judicial Ditch 2 outlet stabilization	Middle Clearwater River	Stabilize the outlet of JD2 where it enters the Clearwater River near the CSAH 5 crossing	RLWD
Grade Stabilization in the Clearwater River	Middle Clearwater River	Continue to stabilize a headcutting portion of the Clearwater River along the transition from the natural channel to channelization. Begin downstream of previous work done for the "Greenwood 27" project and construct a series of additional grade stabilization structures (cross-vein rock weirs) to step-down and stabilize the gradient of the channel.	RLWD
Dam retrofit and fish passage at the Spike Lake outlet	Upper Clearwater River	The outlet of Spike Lake is an old dam. Look into the possibility of retrofitting the dam for safety and/or fish passage	DNR
Clearwater River Trout Stream fish passage restoration	Upper Clearwater River	The culvert under the old railroad trestle along Nelson Dam Rd NW is often perched. This limits the success of DNR trout stocking efforts. Local residents have noted that entrapment of fish in the plunge pool of the culvert makes them overly susceptible to harvest. The project will require a large-scale excavation that may not be feasible with local funds, but can be accomplished with state grant funding, and replacement/ rerouting of an ATV trail.	DNR
Lost River Restoration	Lost River	Stabilize or restore a section of the Lost River (RLWD Project 4 legal ditch) between CSAH 7 and 500th Street.	RLWD and Clearwater SWCD
Poplar River Diversion Wetland Restoration	Lower Badger Creek	Restore wetlands along the Poplar River Diversion channel between the Poplar River and Badger Lake. If possible, incorporate FDR benefits.	TBD
Flood Damage Reduction Projects	Hill River, Lower Badger Creek, Lost River, Poplar River	As opportunities arise. Some wetland restoration opportunities are listed in Table 3-13 of the WRAPS.	TBD
Stormwater treatment project – City of Erskine	Lower Badger Creek	Reduce nutrient loading to Cameron Lake by treating stormwater runoff at its source or before it enters the lake.	East Polk SWCD, RLWD, City of Erskine

Capital Improvement Project	Planning Region	Description	Lead Entity
Stormwater treatment project – City of Clearbrook	Lost River	Reduce pollutant runoff to Clear Brook. Work with landowners to construct another of the treatment ponds that were identified by the Clearbrook Stormwater Study	TBD
Stormwater treatment project – City of Red Lake Falls	Lower Clearwater River	Reduce sediment loading to the Red Lake River in Red Lake Falls by treating stormwater upstream of stormwater outlets.	TBD
Ditch outlet stabilization	Lost River	Stabilization of ditch outlets along the Lost River	TBD
Ditch outlet stabilization	Middle Clearwater River, Lower Clearwater River	Stabilization of tributary and ditch outlets along the Clearwater River	TBD
Ditch outlet stabilization	Lower Badger Creek	JCD 64 outlet stabilization	TBD
Hill River Restoration	Hill River	Restore a meandering channel along the channelized portion of the river near CSAH 92	TBD
Stream restoration	Hill River	Stream and wetland restoration along the CD 68 portion of the Hill River	TBD
Lost River Stabilization	Lost River	Stabilize the lower portion of the Lost River, neat CR 118	TBD
Anderson Lake restoration and FDR project	Lost River	Create flood storage at Anderson Lake while also creating water quality and habitat improvements	TBD
Beau Gerlot Creek Channel Restoration	Lower Clearwater River	Restore meanders and riparian cover to a channelized portion of Beau Gerlot Creek.	TBD

Operations and Maintenance

Entities within the plan area are engaged in the inspection, operation, and maintenance of capital projects, stormwater infrastructure, public works, facilities, natural and artificial watercourses, and legal drainage systems. Operation and maintenance of natural watercourses, legal ditches, impoundments, and small dams will continue under regular operations and maintenance plans of the entities with jurisdiction over these systems. These details, along with records including notes and photos should be included with each project's Operations and Maintenance Plan. BWSR's recommended inspection plans for projects funded through BWSR grants, according to the GAM, include the following requirements below. Ditch projects and Watershed District projects funded by other sources are not subject to the GAM.

Capital-improvement projects with a minimum effective life of 25 years:

- The ends of Years 1, 8, 17, and 24 after certified completion is a recommended minimum.

Figure 6.3. Wild rice paddies in the Clearwater River Watershed. Credit: RLWD.

Regulatory and Ordinances Implementation Program

Many plan issues can be addressed in part through the administration of statutory responsibilities and local ordinances. In many cases, local ordinances have been adopted to conform to (or exceed) the standards and requirements of the state statutes. The responsibility for implementing these programs will remain with the respective counties or appointed LGUs. The RLWD has rule making authority per MS 103D.341 and permitting authority per 103D.345. Current rules were adopted in 2015 and could periodically change per life of this plan. The RLWD Rules are available by reference in **Appendix F**. To review current rules, please see the RLWD website (http://www.redlakewatershed.org/).

Counties and the watershed district will aim to meet approximately once a year to discuss ordinances and counties will notify each other of any proposed ordinance amendments. A full comparison of how local ordinances are used to administer statutory responsibilities is provided in **Appendix G**.

Applicable Plan Goals (Section 4):

- Sediment Reduction
- Phosphorus Reduction
- Ditch Stabilization
- Bacteria Reduction
- Streambank and Riparian Stabilization
- Drinking Water Protection
- High Value Resource Protection

Figure 6.4. Forests in the Clearwater River Watershed.

Aggregate Management

Individual counties manage the development of and extraction of aggregate resources through local zoning and ordinances. The MPCA has regulatory authority at these facilities for industrial stormwater and wastewater. Aggregate extraction facilities must obtain a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit from the MPCA for stormwater and wastewater discharges.

Aquatic Invasive Species

Aquatic invasive species can cause ecological and economic damage to water resources. The DNR has regulatory authority over aquatic plants and animals. Permits are required by the general public for transporting lake water, invasive species, and for treating invasive species. In Polk and Beltrami counties, the county oversees aquatic invasive species programs, whereas in Clearwater, Mahnomen, Pennington, and Red Lake counties, the SWCDs fill that role.

Bluffland Protection

MN State Statute (Section 103F.201) requires that local municipalities and counties with shoreland within their jurisdictional boundaries manage development of shoreland areas using ordinances to reduce the negative impacts of development. Many counties specifically target bluffland areas due to their disproportionate impact on sediment erosion when the bluff becomes unstable. Buffland protection is part of county shoreland ordinances.

- Regulations: Minnesota Statute 103F.201

Buffers

The Riparian Protection and Water Quality Practices statute (Minnesota Statue Section 103F.48, commonly referred to as the Buffer Law) requires a 50-foot average continuous buffer of perennial vegetation with a 30-foot minimum width along all public waters and a 16.5-foot minimum width continuous buffer of perennial vegetation along all public drainage systems. Beltrami, Clearwater, Mahnomen, Red Lake, and Pennington counties administer the Buffer Law under specific local ordinances while Polk County administers the law through Section 25 of their zoning ordinance. Public drainage systems within the RLWD are administered by the RLWD through their Drainage Rule. In most situations, landowners have the option of working with their SWCD to determine if other alternative practices aimed at protecting water quality can be used in lieu of (or in combination with) a buffer.

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

Construction Erosion Control

Temporary construction erosion control is the practice of preventing and/or reducing the movement of sediment from a site during construction. Projects disturbing one acre or more of land will require a National Pollutant Discharge Elimination System (NPDES) Permit from the MPCA. Clearwater County has regulations within their shoreline ordinance that addresses construction erosion control. The RLWD regulates construction erosion control through their Rules.

- Regulations: Minnesota Rules, Chapter 7090

Feedlots

Feedlot rules, regulations, and programs were established under MN Rules 7020 to govern the collection, transportation, storage, processing, and land application of animal manure and other livestock operation wastes. The program is administered through the MPCA, but local counties may accept delegation of this authority. Pennington, Polk, and Red Lake counties have accepted this delegation, whereas Clearwater and Mahnomen counties have not.

- **Regulations: Minnesota Rules, Chapter 7020**

Floodplain Management

Floodplain zoning regulations are intended to guide development in the floodplain consistent with the magnitude of the flood threat to minimize loss of life and property, disruption of commerce and governmental services, extraordinary public expenditure for public protection and relief, and interruption of transportation and communication. The DNR and FEMA are in the process of updating floodplain maps on a county basis. Current flood maps can be found on the DNR website at https://www.dnr.state.mn.us/waters/watermgmt_section/floodplain/access-flood-maps.html. Floodplain zoning regulations are enforced through local ordinances by Mahnomen, Pennington, Polk, and Red Lake counties, and RLWD Rules.

- **Regulations: Minnesota Statutes 103F, 104, 394**

Groundwater Protection Rule

The MDA administers the Groundwater Protection Rule, which went into effect on June 24, 2019. The rule has two parts: Part 1 restricts the application of nitrogen fertilizer in the fall and on frozen soils; Part 2 responds to public water supply wells and elevated nitrate. Part 1 applies to the far southern portion of the watershed in Clearwater County. A map of specific restrictions can be found here: https://mnag.maps.arcgis.com/apps/webappviewer/index.html?id=47a342afe6654640b935c8e76023da92

- **Regulations: Minnesota Statute 14.16**

Groundwater Use

The DNR administers groundwater appropriation permits for all users who withdraw more than 10,000 gallons of water per day or 1 million gallons per year. SWCDs, counties, and municipalities cooperate with the state and are offered the opportunity to comment on landowners' permit applications.

- **Regulations: Minnesota Statute 103G for appropriation; 103H, 1989 Groundwater Act**

Hazard Management

Hazard management may be defined as any action taken to eliminate or reduce the future risk to human life and property from natural- and human-caused hazards. Extreme weather events and infrastructure resilience also play a part in hazard management. Local emergency management departments are deployed in each of the contributing counties within the 1W1P boundary.

- **Regulations: Minnesota Statute 12**

Noxious Weed Law

Noxious weeds affect the natural, native balance of ecological functions. The Noxious Weed Law in Minnesota is administered by the MDA through SWCDs with the exception of Pennington County in which the Pennington County Highway Department administers noxious weed laws. The state maintains noxious weed lists of those species to eradicate, control, restrict, and specially regulated plants. The Pennington and Red Lake SWCDs organized Cooperative Weed Management Areas to inventory county noxious weeds, provide weed management outreach, and develop cost-share programs. Red Lake SWCD has a cost-share program and Pennington SWCD will be developing one.

- Regulations: Minnesota Statute 18

Public Drainage Systems

Drainage authority is granted to counties and watershed districts through MN Statute Chapter 103E to establish, construct, and in perpetuity maintain public drainage systems. County boards serve as the drainage authorities for public drainage systems in Beltrami, Mahnomen, Pennington, Polk, and Red Lake counties. The RLWD is the drainage authority for Clearwater County. The RLWD has a system of rules and regulations for the management of water within the district, and a list of actions which require a permit to proceed with work in any public drainage system in the RLWD (Appendix F).

- Regulations: Minnesota Statute 103E

Shoreland Management

The Minnesota Legislature has delegated responsibility to LGUs to regulate the subdivision, use, and development of shorelands along public waters to preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shorelands, and provide for the wise use of waters and related land resources. This statute is administered and enforced as a shoreland ordinance for Beltrami, Clearwater, Mahnomen, and Red Lake, and as a county zoning ordinance for Polk County. The Pennington SWCD and Red Lake SWCD administer the shoreland ordinance in their respective counties.

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

Solid Waste Management

Minnesota's Waste Management Act has been in place since 1980 and establishes criteria for the management of all types of solid waste including mixed municipal solid waste, construction and demolition waste, and industrial waste. In order to receive annual grant funding to assist in implementing waste management programs, each county must have a MPCA approved Solid Waste Management Plan. All counties in the plan area have approved plans. Counties can also adopt Solid Waste Ordinances to use as a supplement in enforcing MPCA Rules. All participating 1W1P counties have a solid waste ordinance that is administered by the county.

- Regulations: Minnesota Statutes 115A, 400

Subsurface Sewage Treatment Systems (SSTS)

The Subsurface Sewage Treatment System (SSTS) Program is administered by the MPCA to protect the public health and environment. SSTS Ordinances are adopted and enforced at the county level to meet state requirements. The Pennington SWCD administers the SSTS Ordinance for the county. All participating counties administer Minnesota Rules Chapter 7080 through 7083 for SSTSs through local ordinances.

- **Regulations: Minnesota Rules, chapters 7080 through 7083**

Well Code

The MDH administers the well code, which includes well construction standards to protect groundwater resources and requirements to seal unused wells.

- **Regulations: Minnesota Rules 4725**

Wellhead Protection

The Minnesota Department of Health (MDH) administers the state wellhead protection rule that sets standards for wellhead protection planning. Municipalities within the watersheds have completed wellhead protection plans. A map identifying completed wellhead protection plans can be found at: https://mdh.maps.arcgis.com/apps/View/index.html?appid=5051b7d910234421b0728c40a1433baa.

- **Regulations: Minnesota Rules, Chapter 4720.5100 – 4720.5590**

Wetland Conservation Act

The Minnesota Legislature passed the Wetland Conservation Act (WCA) of 1991 to achieve no net loss of, increase the quantity, quality, and biological diversity of, and avoid direct or indirect impacts to Minnesota's wetlands. LGUs are responsible for administering, regulating, and educating landowners on WCA. The county serves as the WCA LGU for Clearwater County. In Mahnomen, Polk, Pennington, and Red Lake counties, the SWCD serves as the WCA LGU.

- **Regulations: Minnesota Rules, Chapter 8420**

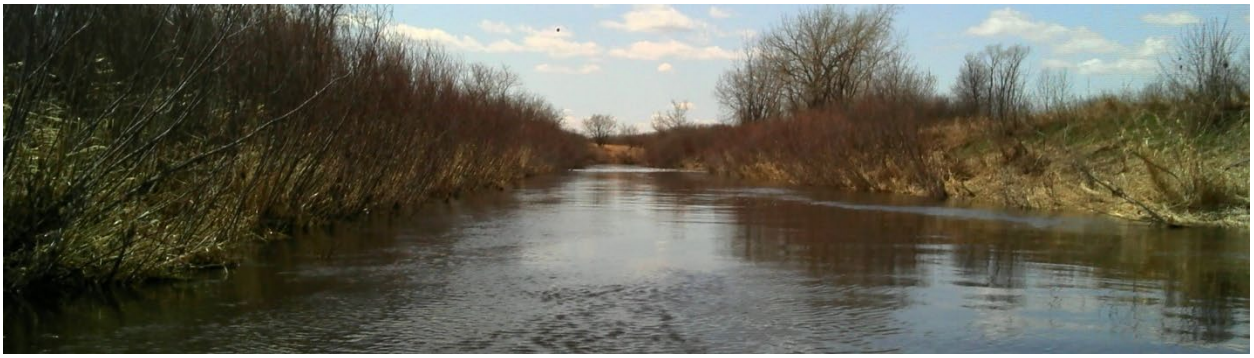


Figure 6.5. Clearwater Watershed, credit: RLWD.

Comprehensive or Land Use Plans

Counties and municipalities within the Clearwater River Watershed are responsible for land use planning, which is administered through local zoning ordinances. Comprehensive or land use plans have been adopted by the local governmental units within the watershed. From a regulatory perspective, management of lands and resources may overlap with the local government entities listed below. Therefore, meeting goals and strategies of local planning may also involve other governmental or non-governmental entities. Local government units within the Clearwater River Watershed that have comprehensive and/or land use plans are provided in Table 6.2. Please note this is not intended to be all-inclusive.

Table 6.2. Comprehensive and Land Use Management Plans adopted within the Clearwater River 1W1P planning area.

Local Governmental Unit (LGU)	Comprehensive or Land Use Management Plan (Year adopted/Revised)
Beltrami County	Beltrami County Local Water Management Plan (2017)
Clearwater County	Clearwater County Comprehensive Plan (1999) Clearwater County Local Water Management Plan (2010)
Pennington County	Pennington County Local Water Management Plan (2010)
Polk County	Polk County Sustainable Development Comprehensive Plan (1997/2008) Polk County Water Plan (2012)
Red Lake County	Red Lake County Comprehensive Local Water Management Plan (2010)
Red Lake Nation	Red Lake Band of Chippewa Indians Integrated Resource Management Plan (2011)
White Earth Nation	White Earth Strategic Plan (2001)
City of Bagley	The City of Bagley Land Use Plan (2014)
Red Lake Watershed District	Red Lake Watershed District Comprehensive Plan (2006/2018)

Figure 6.6. Farm field near Trail, MN.

Data Collection and Monitoring Implementation Program

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

Ongoing surface water monitoring programs are led by local and state entities. The MPCA's Watershed Pollutant Load Monitoring Network (WPLMN) provides continuous monitoring of water quality conditions, with three WPLMN sites in the Clearwater River Watershed:

- Clearwater River at Plummer, MN (USGS ID 05078000)
- Clearwater River at Red Lake Falls, MN (USGS ID 05078500; MPCA ID S002-118)
- Lost River nr Brooks, CR119 (MPCA ID S002-133)

Figure 6.7. Hill River water quality sampling.

The DNR Cooperative Stream Gaging (CSG) database is a shared repository of monitoring data between the DNR, MPCA, United States Geological Survey (USGS), and National Weather Service (NWS). Two additional monitoring sites from the CSG database include:

- Judicial Ditch 64 nr Mentor, MN (DNR ID 66052001; USGS ID 05078470)
- Lost River at Oklee, MN (DNR ID 66062001; USGS ID 05078230)

Local entities that monitor water quality include SWCDs, the RLWD, River Watch, International Water Institute, and other citizen organizations such as lake associations (Figure 6.8) (MPCA, 2021a). Some macroinvertebrate sampling occurs in the watershed by groups such as River Watch, SWCDs, and the 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. For example, the MPCA plans to assess the Clearwater River Watershed once every 10 years (MPCA, 2021a). The Clearwater WRAPS recommends additional monitoring for TMDL and other planning purposes, including that related to geomorphology, ditch inventories, erosion, and AIS.

Citizen volunteers monitor many sites in the watershed, especially lakes, including Pine, Lone, Walker Brook, Clearwater, Bagley, Whitefish, Bee, and Maple lakes. The Clearwater SWCD and East Polk SWCD conduct lake monitoring on lakes in their counties. In addition, the White Earth Natural Resource Department monitors lakes and streams for water quality, aquatic invasive species, and biological health (macroinvertebrates). The Red Lake Nation monitors the Clearwater River for water quality and stream habitat assessments and samples fish and invertebrate populations.

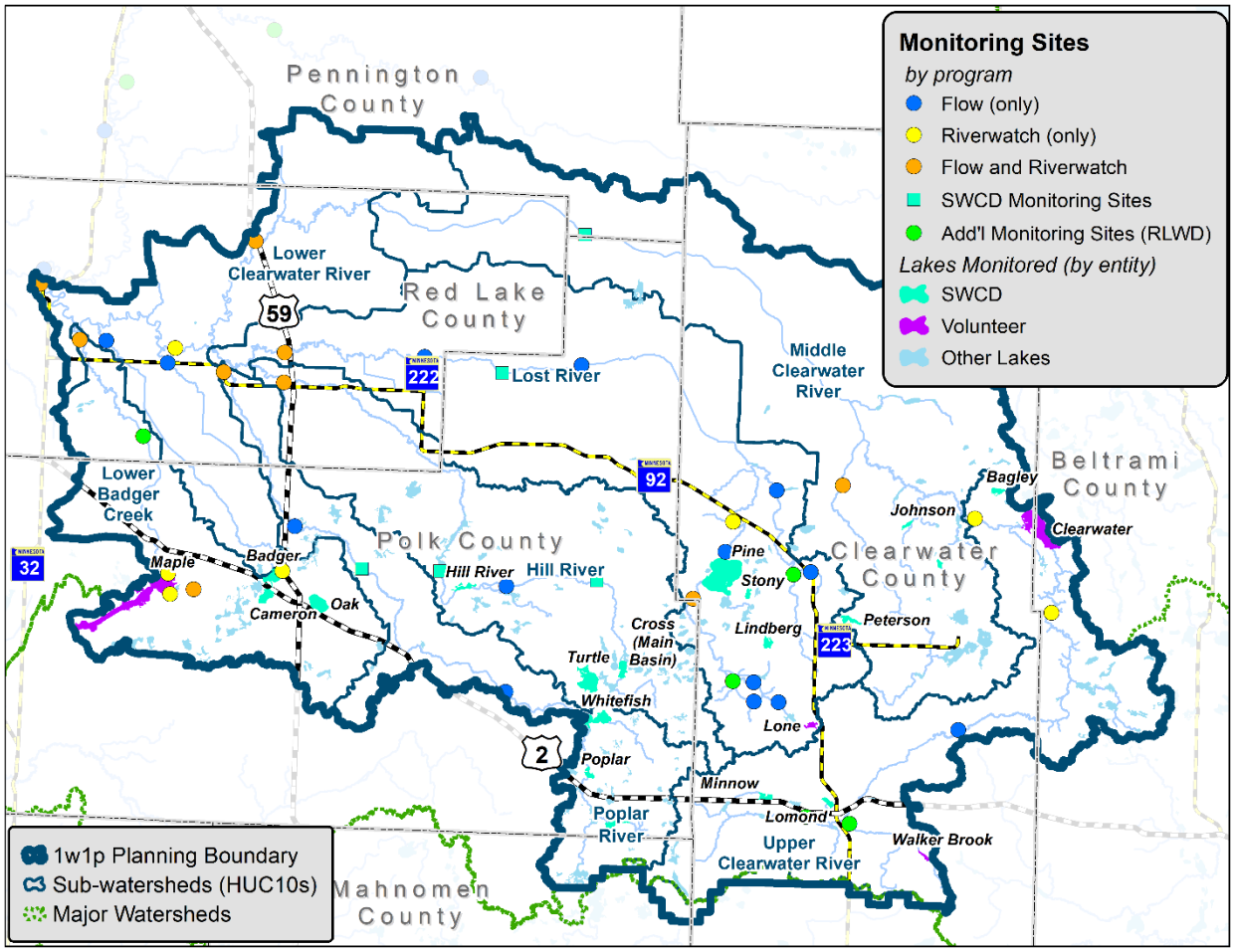


Figure 6.8. Monitoring sites in the Clearwater River Watershed.

Ongoing monitoring efforts also track groundwater supply quantity and quality trends (Figure 6.9). Current programs include Public Water Supplier Monitoring, MPCA's Ambient Groundwater Monitoring Program, DNR high-capacity permitting program, and the DNR Observation Well Network (monitored by SWCDs). These programs have provided valuable information but are not yet extensive enough to fully assess the state of groundwater in the region.

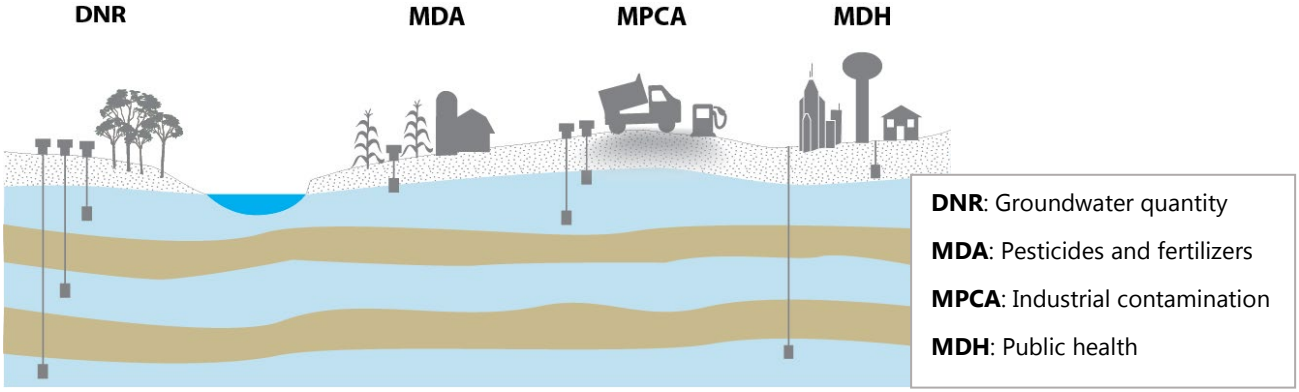


Figure 6.9. Roles of groundwater monitoring in Minnesota. Credit: DNR.

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

Education and Outreach Implementation Program

The Education and Outreach Implementation Program funds actions to increase engagement and understanding to make progress toward plan goals. The program is operated through sharing of services. Expectations are that a common set of template education and outreach materials will be developed for use across the watersheds but delivered by the staff within each county and/or planning region. Engaging landowners is critical for understanding issues impacting residents and solutions that are viable. Activities designed for engaging landowners include the following items below. These activities will continue and be built upon as part of the Education and Outreach Program (detailed in Section 5).

Figure 6.10. Soil health field day held in Red Lake County in 2019.

- Farm tours
- Soil demonstration plots
- Field days
- Community education meetings (e.g. Minnesota Agricultural Water Quality Certification meetings and weed management workshops).

This program is also dedicated to engaging area youth in natural resource management, building upon current efforts. These example activities center around educating youth on the importance of natural landscape and the environmental issues that impact it.

- River Watch
- River of Dreams
- Water Fest
- Conservation Day
- Family Fun Night at the Lake
- Envirothon
- FFA, 4-H
- Arbor Day Trees
- County Fairs
- Ag in the Classroom
- Trout in the Classroom
- Northwest Minnesota Soil Contest
- Sponsor Conservation Camps for kids
- Poster contests
- Science Fair Judging

In addition, this program will continue to support general public education and outreach. Actions may include development of educational materials, newsletters, coordination of

volunteer activities, and public meetings to raise awareness and gain a better understanding of the consequences of individual decisions on water management. Also included are general media campaigns, citizen and LGU surveys, private well water testing clinics, and municipal training.

There are also virtual educational opportunities. Many local government staff use social media (e.g. Facebook, Twitter, and YouTube) to educate and inform the general public on local resource issues and upcoming events. E-mail, website updates, newsletters, news articles, and other releases are also a priority for communicating water quality, quantity, and conservation issues with local citizens. These platforms serve to easily and effectively communicate important watershed information in a timely manner.

Achieving Plan Goals

This plan focuses both on restoration and protection activities. Table 6.3 below summarizes the different levels of measuring progress and how it will be implemented in this plan. Projects will be tracked during plan implementation using a system set up for the watershed.

Table 6.3. Description of how different activities will be measured during plan implementation.

Level	Description		Clearwater Application
Tracking	Practices, acres, pounds of phosphorus.	→	Outputs in Targeted Implementation Schedule (Section 5). Projects will be tracked with a system and reported in eLINK during implementation.
Estimating	Using lower resolution calculators and tools to give a sense of the collective impacts of projects.	→	PTMApp benefits calculator per Planning Region (Section 5).
Modeling	Incorporating landscape factors and project information to predict future conditions.	→	HSPF in WRAPS Cycle 2 starting in 2025.
Measuring	Using field-collected information to assess the condition of the water.	→	Lake Monitoring, Pollutant Load Monitoring Network stream monitoring at watershed pour point (S002-118), WRAPS Cycle 2 in 2025.
Proving	Having enough measurements to compare with standards and decide if it's improved.	→	Analysis of lake water quality trends, Analysis of loading at watershed pour point (S002-118), WRAPS Cycle 2 in 2025.

Resiliency

Resilience is the ability of a system to experience change but not be affected. Resilience can be both social and ecological (MGLP, 2021). Social resilience is organization and regulation. For example, having a Lake Association or Lake Improvement District build social framework to implement lake projects. Ecological resilience includes landscape diversity, water retention, and fixing past hydrological alterations. For example, protecting forests and restoring wetlands at the watershed and landscape scale provide resilience to increasing precipitation trends.

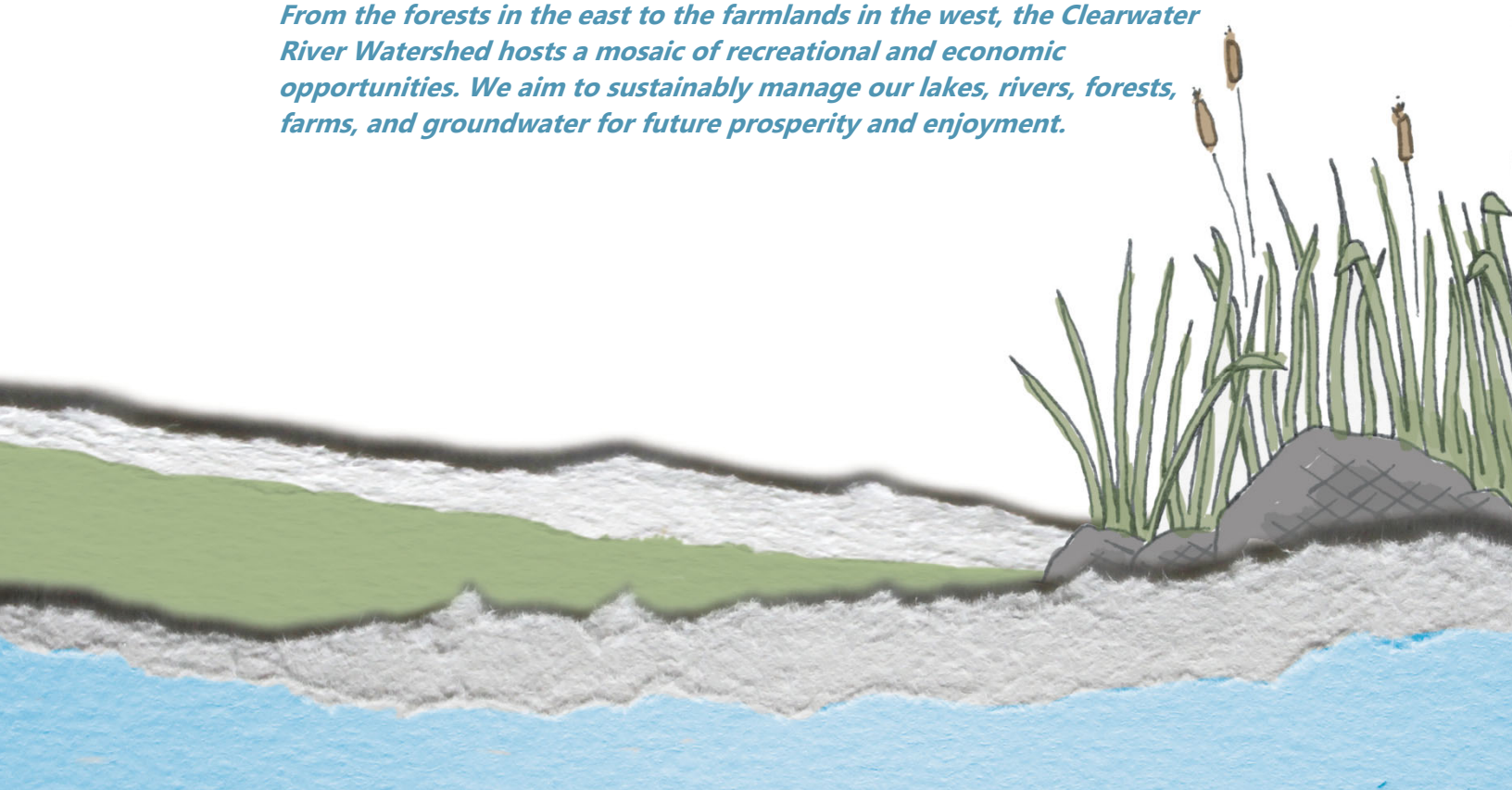
This plan includes actions and programs that build both social and ecological resilience.

- Social resilience programs and actions:
  - Regulatory program
  - Outreach and education program
  - Cost share incentives for best management practices

- Ecological resilience programs and actions:
  - Forest management and protection
  - Soil Health practices
  - Wetland restoration
  - Stormwater retention
  - Streambank stabilization
  - Restoring floodplain connectivity

By managing the watershed holistically including resilience and water and land stewardship, the Clearwater River Watershed partners can work towards achieving the vision of the watershed.

From the forests in the east to the farmlands in the west, the Clearwater River Watershed hosts a mosaic of recreational and economic opportunities. We aim to sustainably manage our lakes, rivers, forests, farms, and groundwater for future prosperity and enjoyment.



Plan Administration and Coordination

SECTION 7. PLAN ADMINISTRATION AND COORDINATION

Plan Administration and Coordination describes how the plan will be implemented, how the watershed partners will work together, how the funding will move between them, and who will handle the administrative duties. The CRCWMP will be implemented through a MOA between the following entities:

- Clearwater County and SWCD
- Pennington County and SWCD
- Red Lake County and SWCD
- Polk County and East Polk SWCD
- Red Lake Watershed District

The Implementation MOA will be very similar to the Planning MOA (Appendix I), with refinements clarifying roles for implementing the plan.

Decision-Making and Staffing

Implementation of the CRCWMP will require increased capacity of plan partners, including increased staffing, 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.

Three committees will serve this plan during implementation:

- **Policy Committee:** Comprised of Policy Committee members from the planning process (one county commissioner and one SWCD board supervisor appointed from each of the participating counties in the watershed, plus a manager from the RLWD).
- **Advisory Committee:** Comprised of Clearwater River Watershed Planning Work Group and Advisory Committee members from the planning process (local stakeholders including state agencies).
- **Planning Work Group:** Comprised of SWCD and RLWD Staff and the BWSR Board Conservationist.

Table 7.1 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 will be assigned to a member LGU through a Policy Committee decision as outlined in the formal agreement. Responsibilities for annual work planning and serving as the fiscal agent can be revisited by the Policy Committee in the future if needed.

Table 7.1. Anticipated roles for CRCWMP Implementation.

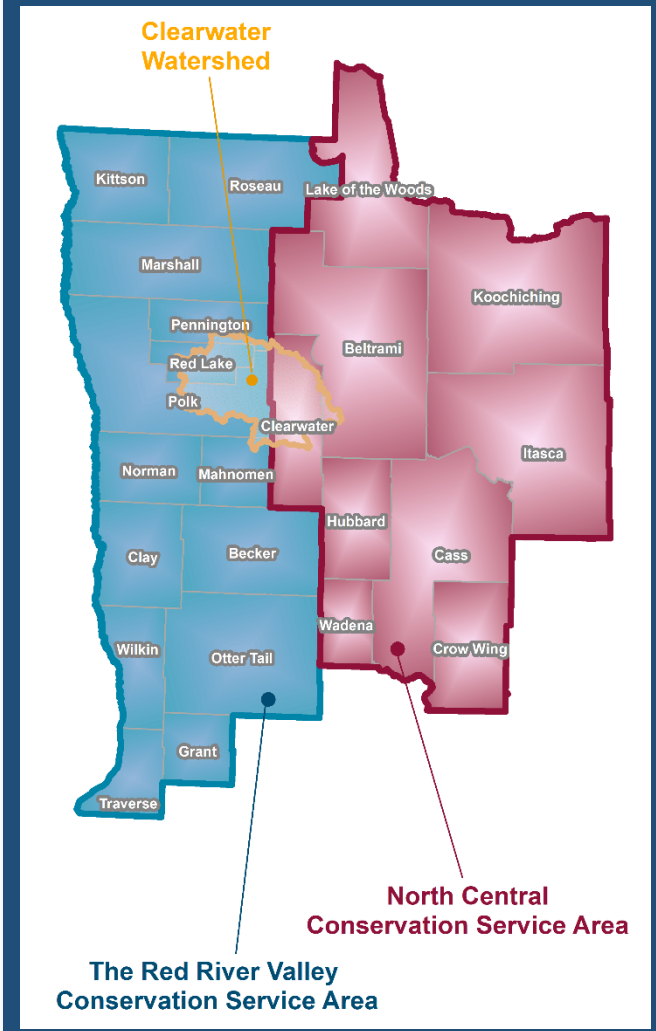
Committee Name	Primary Implementation Roles/Functions
Policy Committee	▪ Meet two to four times a year or as needed ▪ Review the implementation funds from plan participants ▪ Approve the annual work plan ▪ Approve annual fiscal reports ▪ Approve annual reports submitted to BWSR ▪ Annual review and confirmation of Advisory Committee priority issue recommendations ▪ Direction to Advisory Committee on addressing emerging issues ▪ Approve plan amendments ▪ Implement county ordinances and state statutory responsibilities separately from plan implementation ▪ Approve grant applications ▪ Approve annual assessment
Advisory Committee	▪ Meet annually or as needed ▪ Review and provide input for the annual work plan ▪ Review and identify collaborative funding opportunities ▪ Recommendations to Clearwater River Watershed Planning Work Group on program adjustments ▪ Assist with execution of the targeted implementation schedule
Planning Work Group	▪ Meet monthly or as needed to review projects ▪ Review the status of available implementation funds from plan participants ▪ Review annual fiscal reports ▪ Review annual reports submitted to BWSR ▪ Biennial review and confirmation of priority issues ▪ Evaluate and recommend response to emerging issues ▪ Prepare plan amendments ▪ Prepare the annual work plan ▪ Prepare and submit grant applications/funding requests ▪ Research opportunities for collaborative grants ▪ Implement the targeted implementation schedule
Local Fiscal/Administrative Agent and Coordinator	▪ Convene committee meetings ▪ Report on how funds were used ▪ Compile annual results for annual assessment

Collaboration

Collaboration Between Planning Partners

The benefits of successful collaboration between planning partners include consistent implementation of actions watershed-wide, increased likelihood of funding, and resource efficiencies gained. The planning partners will pursue opportunities for collaboration with fellow planning partners to gain administrative and program efficiencies, pursue collaborative grants, and provide technical assistance. The planning partners will also review similarities and differences in local regulatory administration to identify local successes and identify changes needed in the future to make progress towards goals outlined in this plan. The planning partners already collaborate on technical services in the Red River Valley Conservation Service Area (RRVCSA) and the North Central Conservation Service Area (NCCSA).

Collaboration in the Technical Service Areas (TSA)



Purpose:
To provide engineering assistance to private landowners, via Soil and Water Conservation Districts, for a variety of non-point water quality management practices.

Program Description:
This program was established in 1994 in conjunction with the Agricultural Best Management Practices and Clean Water Partnership Loan Programs and established an engineering assistance program for SWCDs to provide engineering assistance to landowners for conservation practices. Eight joint powers groups of soil and water conservation districts were created statewide in early 1995 to employ professional engineer and technician teams to provide technical assistance in cooperation with member SWCDs. The associated joint powers boards are composed of a supervisor from each of the member SWCDs. One of the member SWCDs serves as the host district and manager for the engineer and technician team employed by the joint powers boards. The Becker SWCD serves in this capacity for the RRVCSA (TSA 1) and the Crow Wing SWCD fills this role for the NCCSA (TSA 8).

Non-point Engineering Assistance teams provide technical assistance through member soil and water conservation districts and in cooperation with the NRCS and other local, state, and federal agencies. BWSR provides policy, training, administrative, and technical consultation to the joint powers boards and their staff.

Collaboration with Other Units of Government

The Clearwater River Watershed Planning Work Group will continue coordination with other governmental units. This cooperation and coordination occur at the local, state, federal, and or tribal level. At the state/federal level, coordination between the Partnership and agencies such as BWSR, US Army Corps of Engineers (USACE), DNR, MDH, and the MPCA occur through legislative and permit requirements. Local coordination between the Partnership and comparable units of government such as municipalities, city councils, township boards, county boards, and the RLWD board are a practical necessity to facilitate watershed-wide activities. Examples of collaborative programs in the watershed include EQIP (NRCS), CRP (FSA), Minnesota Agriculture Water Quality Certification (MDA), Farm Bill Biologist (MDA), Wellhead Protection for city DWSMAS (MRWA and MDH), Minnesota Forest Resource Council and WRAPS (MPCA). Collaboration with Tribal Nations can occur on projects, monitoring, and outreach. Any potential project collaborations would be subject to Tribal Council approval.

The Clearwater River Watershed Planning Work Group will exercise intergovernmental coordination and cooperation as an absolute necessity for it to perform its required functions. The Red River Basin already has a high level of collaboration on a basin-wide scale as outlined below. The Clearwater River Watershed Planning Work Group will continue to foster an environment that enhances coordination and cooperation to the maximum extent possible throughout the implementation of this plan.

Collaboration within the Red River Basin

Due to the long history of flooding in the Red River Basin, there has been a significant effort to collaborate basin-wide on projects including studies, flood damage reduction, retention, and administration. This collaboration crosses state lines with North Dakota and International borders with Canada.

Red River Basin Commission (RRBC)
The RRBC is a charitable, not-for-profit organization designed to help facilitate a cooperative approach to water management within the Basin and is a well-established forum for identifying, developing, and implementing solutions to cross-boundary issues. The RRBC is comprised of local, state, provincial, and First Nation government representation, the environmental community, and at-large members.

Red River Watershed Management Board (RRWMB)
The RRWMB's jurisdiction and authority encompasses the area managed by the individual watershed districts that have membership on the board. The RLWD is a member of the RRWMB.

Red River Retention Authority (RRRA)
The RRRA is comprised of members of the Red River Joint Water Resource District, a North Dakota political subdivision, and the Red River Watershed Management Board, a Minnesota political subdivision. The primary objective of the RRRA is to ensure joint, comprehensive, and strategic coordination of retention projects in the Red River of the North watershed and facilitation implementation and construction of retention in the Red River Valley.

International Water Institute (IWI)
The IWI is a non-profit organization that works with basin partners on research, monitoring and outreach.

Collaboration with Others

Local support and partnerships will drive the success of final outcomes of the actions prescribed for implementing this plan. Because this plan's focus is voluntary land stewardship practices, collaborations with landowners in the watershed is of utmost importance. There are many actions in the plan that describe working with individual landowners on providing cost share and technical assistance for implementing land stewardship practices.

The CRCWMP expects to continue and build upon 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. Partners for these collaborations include, but are not limited to, lake associations, International Water Institute, The Nature Conservancy, Ducks Unlimited, MN Deer Hunters Association, Pheasants Forever, Sportsman's Clubs, National Wild Turkey Federation, local co-ops, University of Minnesota Extension, civic groups, private businesses, individuals, and foundations.

Funding

This section describes how the plan will be funded and how that funding will be used. The majority of the plan funds (80%) will be used for implementing projects on the landscape through the Projects and Practices Program and the Capital Improvements Program (Figure 7.1). These two programs also include the technical assistance and administration required to implement them.

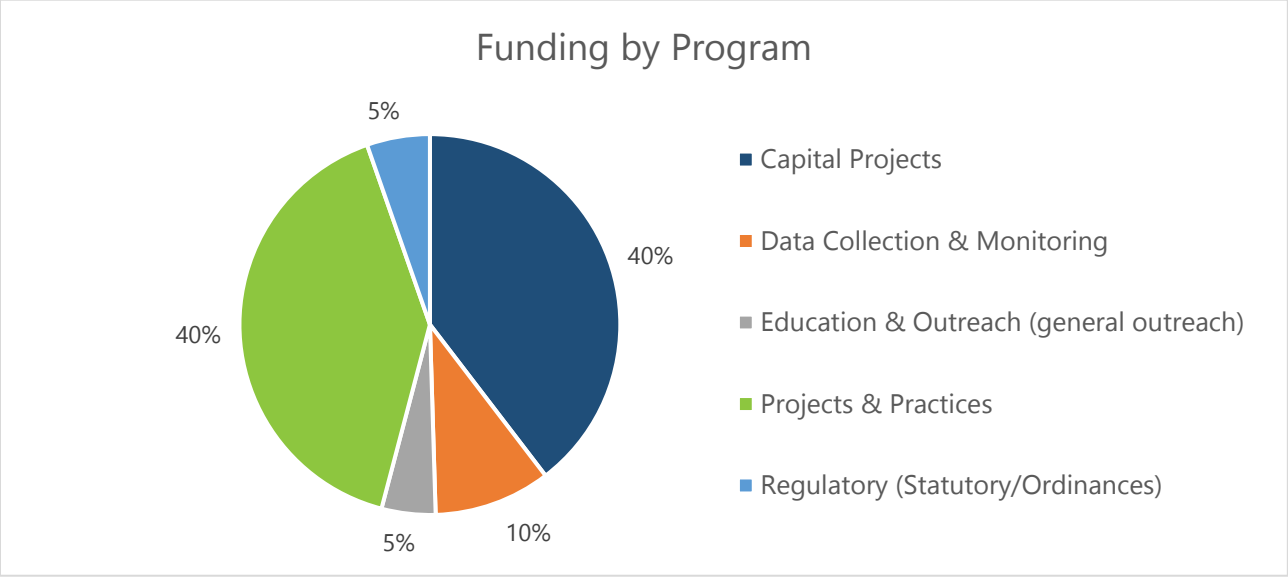


Figure 7.1. Percentage of funding for each implementation program, Level 2.

The current funding level (Level 1) 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 Clearwater River Watershed. Level 1 funding includes local, state, and federal funding, as explained in the following sections. Level 2 funding is Level 1 funding plus

the new watershed-based funding (state funding) that will be available upon completion of this plan. Level 3 funding summarizes projects that help make progress to plan goals, but that are not administered by planning partners (counties, SWCDs, and RLWD). Level 3 funding mostly consists of the Conservation Reserve Program (CRP) and Sustainable Forest Incentive Act (SFIA).

Throughout the implementation of the CRCWMP, the Clearwater River Watershed Planning Work Group expects to operate at Level 2 funding. The totals for each level are summarized in Table 7.2).

Table 7.2. Estimated implementation funding for the CRCWMP.

Funding Level	Description	Estimated Annual Average	Estimated Plan Total (10 years)
Level 1	Baseline Funding for Current Programs	$927,000	$9,270,000
Level 2	**Baseline + Watershed-Based Implementation Funding (WBIF) + Grants (CWF)**	**$1,544,300**	**$15,443,000**
Level 3	Partner funding (NRCS, USFWS, SFIA, TNC, CRP, Lessard-Sams)	$3,750,046	$37,500,460
	Total*	**$5,294,346**	**$52,943,460**

**This total does not include Level 1 because Level 2 is additive with Level 1.*

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 I**). Watershed districts can establish water management districts (WMD) to fund projects under current law (103D). These WMDs must be included in watershed plans adopted by watershed districts.

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.

Figure 7.2. Sunset in Clearwater County.

Water Management Districts

This funding option can only be used to collect charges to pay costs for projects initiated under MS 103D.601, 103D.605, 103D.611, or 103D.730. To use this funding method, Minnesota law (MS 103D.729) requires that the area to be included in the WMD be described, the amount to be charged identified, the methods used to determine the charges be described, and the length of time the WMD is expected to remain in force specified.

Description of WMDs

This plan establishes the seven planning regions as WMDs. The RLWD may create different WMDs under future plan amendments.

- Upper Clearwater River
- Middle Clearwater River
- Lower Clearwater River
- Hill River
- Poplar River
- Lost River
- Lower Badger Creek

Duration of Existence of WMDs

The Policy Committee anticipates that the WMDs will provide funding to assist with the implementation of a variety of runoff, bank stabilization, flood damage reduction, and/or water quality related projects. The WMDs will remain in existence in perpetuity. Annual assessment of charges could vary from no charges to the maximum WMD revenue limit of the planning region.

Use of Funds

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

Annual Charge Amount

The maximum WMD revenue limit within each WMD is based on 0.10% of the taxable market value within each planning region. This value will change each year as property values increase or decrease over time.

Method to Determine Charges

The methods proposed to establish the charges will be based upon the proportion of the total annual runoff volume and/or solids load contributed by a parcel or may be based on the drainage area of the parcel within a WMD.

Option 1: The runoff volume method will:

- use soils and land use data to determine the existing curve number for each parcel within a WMD;
- use the curve number for each parcel and the annual average precipitation depth to compute the annual runoff volume for each parcel;
- sum the annual average runoff volumes for all parcels within a WMD to determine the total annual runoff volume; and

- compute the percentage of the annual runoff volume from each parcel as the ratio of the annual average runoff volume from the parcel and the total annual average runoff volume for the WMD (i.e., the "runoff ratio").

Option 2: The solids load contribution method will:

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

Option 3: The combination runoff volume and solids load method will:

- consider both runoff volume and solids load contribution and would follow the methodologies listed above for both solids contribution and runoff volume;
- add the runoff ratio and/or the sediment ratio to compute the charge ratio for each parcel within the WMD. The amount charged to a specific parcel is the sum of the runoff ratio and the sediment ratio for the parcel divided by the sum of the runoff ratio and the sediment ratio for all parcels within the WMD; and
- apply the charge ratio to the total amount of revenue needed for the WMD to carry out the stormwater related projects, programs, and activities described by the plan to achieve the stormwater related goals within that WMD.

Option 4: The drainage area method will:

- determine the drainage area of each parcel of land within the planning region;
- compute the charge based on the charge ratio which is determined by taking the drainage area of that parcel within the planning region divided by the total area of the planning region; and
- apply the charge ratio to the total amount of revenue needed for the WMD to carry out the stormwater related projects and programs described by the plan to achieve the stormwater related goals within that WMD.

Selection of the appropriate process of determining charges will be established and further refined in Step 3 of the process described in the next section.

Process to be Used to Create WMDs

BWSR has provided guidance as to the process of creating a WMD. The process involves eight steps. The first two steps are addressed through this CWMP developed according to the BWSR 1W1P Operating Procedures (March 23, 2016). Steps 3 through 8 must be completed prior to any collection of charges in any WMD.

Step 1. Amend CRCWMP to create a WMD
Amendment must include:

- Description of area to be in the WMD
- The amount to be raised by charges (total amount is necessary if fixed time for WMD to be in force, otherwise annual maximum (cap) amount)
- The method that will be used to determine the charges
- The length of time the WMD will be in force (perpetuity is acceptable)

Step 2. Approval of plan amendment under M.S. § 103D.411 or as part of a revised plan under M.S. § 103D.405

- Revised plan, or petition and amendment, sent to BWSR
- BWSR gives legal notice, and holds hearing if requested
- BWSR orders approval or prescribes plan or amendment
- BWSR notifies Watershed District managers, counties, cities, SWCDs

Step 3. Watershed District establishes project(s) in the WMD

- Project(s) implemented must be ordered by the WD managers
- Order for project(s) must specify funding method(s)
- WD must notify counties, cities, and townships within the affected area at least 10 days prior to hearing or decision on projects(s) implemented under this section of statute

Step 4. Watershed District refines methodology for computing charges based on final project scope

Step 5. Watershed District determines and sets charges for all properties within the WMD after identifying scope of project and deciding method(s) of funding

Step 6. Watershed District develops collection mechanism

- Request county or counties to collect,
- Contract with a private vendor (e.g. electric cooperative), or
- Billing and collection by WD

Step 7. Watershed District establishes a separate fund for proceeds collected from the fee or stormwater utility charges

Step 8. Resolution of Disputes
Local governments may request BWSR to resolve disputes pursuant to M.S. § 103D.729, Subd. 4, except a local appeal process must be completed first for disputes involving WMDs established in perpetuity

Local Appeal

Local Appeal Procedure

Because WMDs established under this plan are proposed to be perpetual, the following local appeal procedure is established from the resolution adopting the plan establishing a WMD:

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

State Funding

State funding includes all funds derived from the State tax base. Examples of state funding includes conservation delivery, state cost share, Natural Resources Block Grants, Clean Water Funds, and SWCD Local Capacity Building Grants.

Leadership from the state agencies that are tasked with protection and restoration of Minnesota's water resources came together and agreed on a set of high-level state priorities that align their programs and activities working to reduce nonpoint source pollution. The resulting Nonpoint Priority Funding Plan outlines a criteria-based process to prioritize Clean Water Fund investments. These high-level state priority criteria include:

- Restoring those waters that are closest to meeting state water quality standards
- Protecting those high-quality unimpaired waters at the greatest risk of becoming impaired
- Restoring and protecting water resources for public use and public health, including drinking water

The Clearwater River Watershed Planning Work Group will 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 Clearwater River Watershed as one or more non-competitive watershed-based implementation funding grants (Level 2). Where the purpose of an implementation program aligns with the objectives of various state, local, non-profit, or

private programs, these dollars will be used to help fund the implementation programs described by this plan.

Federal Funding

Federal funding includes all funds derived from the Federal tax base. For example, this includes programs such as the Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), and Conservation Stewardship Program (CSP).

Partnerships with federal agencies are an important resource for ensuring implementation success. An opportunity may exist to leverage state dollars through some form of federal cost-share program. Where the purpose of an implementation program aligns with the objectives of various federal agencies, federal dollars will be used to help fund the implementation programs described by this plan. For example, the NRCS will likely provide support for agricultural best management practices, while the FSA may provide land-retirement program funds such as CRP (Table 7.3).

Additional Funding Sources

Current programs and funding (Level 1) will not be enough to implement the full targeted implementation schedule. As such, the success of implementing the plan will depend on collaboratively sought competitive state, federal, and private grant dollars as well as increased capacity.

Plan participants may pursue grant opportunities collaboratively or individually to fund implementation of the targeted implementation schedule. Within the targeted implementation schedule, 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 targeted implementation schedule. This plan should be provided to all non-governmental organizations as a means of exploring opportunities to fund specific aspects of the targeted implementation schedule.

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

Table 7.3. Implementation programs and related funding sources for the Clearwater River Watershed. Note: List is not all-inclusive.

Program/Grant		Primary Assistance Type	Projects & Practices	Capital Improvement Projects	Data Collection & Monitoring	Education & Outreach
Federal Programs/Grants						
NRCS	Conservation Innovation Grant (CIG)	Financial	•			
	Conservation Stewardship Program (CSP)	Financial	•			
	Environmental Quality Incentives Program (EQIP)	Financial	•			
	Agricultural Conservation Easement Program (ACEP)	Easement	•			
FSA	Conservation Reserve Program (CRP)	Easement	•	•		
	Conservation Reserve Enhancement Program (CREP)	Easement	•	•		
	Farmable Wetlands Program (FWP)	Easement	•			
	Grasslands Reserve Program (GRP)	Easement	•			
	Wetland Reserve Program (WRP)	Easement	•	•		
FSA/ USDA/ NRWA	Source Water Protection Program (SWPP)	Technical				•
USFWS	Partners for Fish and Wildlife Program	Financial/ Technical	•			
FEMA	Hazard Mitigation Grant Program (HMGP)	Financial	•	•		
	Pre-Disaster Mitigation (PDM)	Financial	•	•		
	Flood Mitigation Assistance (FMA)	Financial	•	•		
	Risk Mapping, Assessment, and Planning	Technical	•	•		
EPA	Water Pollution Control Program Grants (Section 106)	Financial				•
	State Revolving Fund (SRF)	Loan	•			
	Drinking Water State Revolving Fund (DWSRF)	Loan	•			
	Section 319 Grant Program	Financial	•		•	•
State Programs/Grants						
OHF	Lessard Sams Outdoor Heritage Fund	Financial	•	•	•	•
DNR	Aquatic Invasive Species Control Grant Program	Financial/ Technical	•			•
	Conservation Partners Legacy Grant Program	Financial	•	•		
	Pheasant Habitat Improvement Program (PHIP)	Financial	•			

Program/Grant		Primary Assistance Type	Projects & Practices	Capital Improvement Projects	Data Collection & Monitoring	Education & Outreach
	Flood Hazard Mitigation Grant Assistance	Financial	•	•	•	•
	Forest Stewardship Program	Technical	•			
	Aquatic Management Area Program	Acquisitions	•			
	Wetland Tax Exemption Program	Financial	•			
BWSR	Clean Water Fund Grants	Financial	•	•		•
	Erosion Control and Management Program	Financial	•			
	SWCD Capacity Funding	Financial	•		•	•
	Natural Resources Block Grant (NRBG)	Financial	•			•
	Reinvest in Minnesota (RIM)	Financial	•	•		•
MPCA	Surface Water Assessment Grants (SWAG)	Financial			•	•
	Clean Water Partnership	Loan	•			
MDH	Source Water Protection Grant Program	Financial	•		•	•
MDA	Agriculture BMP Loan Program	Financial	•			
	Minnesota Agricultural Water Quality Certification Program	Financial	•			•
PFA	Public Facilities Authority (PFA) Small Community Wastewater Treatment Program	Financial	•	•		
Other Funding Sources						
Red River Watershed Management Board		Financial/ Technical	•	•	•	•
Ducks Unlimited		Financial/ Technical	•	•	•	•
Trout Unlimited		Financial/ Technical	•	•	•	•
Muskies, Inc		Financial/ Technical	•	•	•	•
The Nature Conservancy		Financial	•	•	•	•
Minnesota Land Trust		Financial	•	•	•	•

Work Planning

Local Work Plan

Work planning is envisioned to align the priority issues, availability of funds, and roles and responsibilities for implementation. A biennial work plan will be developed by the Clearwater River Watershed Planning Work Group based on the targeted implementation schedule and any adjustments made through self-assessments. The work plan will then be presented to the Policy Committee, who will ultimately be responsible for approval. The intent of these work plans will be to maintain collaborative progress toward completing the targeted implementation schedule.

State Funding Request

The Clearwater River Watershed Planning Work Group will collaboratively develop, review, and submit a biennial watershed-based funding request from this plan to BWSR. This request will be submitted to and ultimately approved by the Policy Committee, prior to submittal to BWSR. The request will be developed based on the targeted implementation schedule and any adjustments made through self-assessments.

Assessment, Evaluation, and Reporting

Accomplishment Assessment

The Clearwater River Watershed Planning Work Group will provide the Policy Committee with an annual update on the progress of the plan's implementation, with input from the Advisory Committee. For example, any new projects will be tracked against their goal metrics such as acres of forest management, number of bacteria reduction projects, and tons of sediment reduced. A tracking system will be used to measure progress and will serve as a platform for plan constituents. Tracking these metrics will also make them available for supporting future work plan development, progress evaluation, and reporting.

Partnership Assessment

Biennially, the Clearwater River Watershed Planning Work Group will review the CRCWMP goals and progress toward implementation, including fulfillment of committee purposes and roles, efficiencies in service delivery, collaboration with other units of government, and success in securing funding. During this review process, feedback will be solicited from the Advisory Committee, SWCD and county boards, RLWD, and partners such as state agencies and non-governmental organizations. This feedback will be presented to the Policy Committee to set the coming biennium's priorities for achieving the plan's goals and to decide on the direction for grant submittals. Also, this feedback will be documented and incorporated into the five-year evaluation. Plan partners intend to pursue watershed-based funding to meet goals and plan implementation schedules.

Five-year Evaluation

This plan has a ten-year life cycle beginning in 2023. To meet statutory requirements, this plan will be updated and/or revised every 10 years. Over the course of the plan life cycle, progress towards reaching goals and completing the implementation schedule may vary. In addition, new issues may emerge and/or new monitoring data, models, or research may become available. As such, in 2028-29 and at every 5-year midpoint of a plan life cycle, an evaluation will be

undertaken to determine if the current course of actions is sufficient to reach the goals of the plan, or if a change in the course of actions is necessary.

Reporting

LGUs have several annual reporting requirements. A number of these reporting requirements will remain a responsibility of the LGUs. The Plan Coordinator, with the assistance of the Clearwater River Watershed Planning Work Group, will be responsible for reporting related to grants and programs developed collaboratively and administered under this plan. In addition to annual reports, the Clearwater River Watershed Planning Work Group, with input from the Advisory Committee, may also develop a State of the Watershed Report. This report will document progress toward reaching goals and completing the targeted implementation schedule and will describe any new emerging issues or priorities. The information needed to annually update the State of the Watershed Report will be developed through the annual evaluation process.

The fiscal agent is responsible for submitting all required reports and completing annual reporting requirements for CRCWMP as required by state law and policy. The Clearwater River Watershed Planning Work Group will assist in developing the required reports and roles and responsibilities will be defined in the MOA Bylaws.

Plan Amendments

This plan extends through 2033 per the BWSR order approving it. Activities described in this plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation. An amendment will not be required for addition, substitution, or deletion of any of the actions, initiatives, and projects if those changes will still produce outcomes that are consistent with achieving the plan goals. This provision for flexibility includes changes to the activities except for those of capital improvement projects (CIPs).

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

Plan amendments may be proposed by any agency, person, city, county, or WD to the Policy Committee, but only the Policy Committee can initiate the amendment process. All recommended plan amendments must be submitted to the Policy Committee along with a statement of the problem and need, the rationale for the amendment, and an estimate of the cost to complete the amendment. However, the existing authorities of each LGU within the Clearwater River Watershed is still maintained. As such, CIPs need only be approved by a local board to be amended to the plan if implementation of the CIP is funded by the local board, with notification to the Policy Committee. CIPs implemented with funding from the plan must follow the means and methods for funding new capital improvements as developed by members of the Policy Committee or the individual and representative Boards.

Plan participants recognize the large work effort required to manage water-related issues. The plan provides the framework to implement this work by identifying priority issues, measurable goals, and action items. No amendment will be required for the following situations:

- Any activity implemented through the "normal" statutory authorities of an LGU, unless the activity is deemed contrary to the intent and purpose of this plan;
- The estimated cost of a non-capital improvement project action item is different than the cost shown within this plan;
- The addition or deletion of action items, programs, initiatives or projects, as long as these are generally consistent with the goals this plan, are not capital improvement projects as defined by this plan (nor is contemplated by an implementation program), and will be proposed, discussed and adopted as part of the annual budgeting process which involves public input.

If a plan amendment is needed, the plan amendment process, which is the same as the plan review process, is as follows:

- Submit the amendment to all cities, counties, and conservation districts within the plan boundary, the state review agencies (the DNR, MPCA, MDA, and MDH), and BWSR for a 60-day review
- Respond in writing to any concerns raised by the reviewer
- Policy Committee is to hold a public hearing on the proposed amendment
- Submit the revised amendment to the state review agencies and BWSR for a 45-day review
- The Policy Committee must submit the final revised amendment to BWSR for approval

At the discretion of the Policy Committee, drafts of proposed plan amendments may be sent to all plan review authorities for input before beginning the formal review process. Examples of situations where a plan amendment may be required include:

- Addition of a capital improvement project that is not described by the plan
- Establishment of a water management district(s) to collect revenues and pay for projects initiated through MS 103D. To use this funding method, MS 103D.729 requires that the Clearwater River Watershed Planning Work Group (or equivalent) prepare an amendment to its plan
- Addition of new programs or other initiatives that have the potential to create significant financial impacts or controversy, when inconsistent with the issues, goals, and policies

Plan amendments will be prepared in a format consistent with 103B.314 subd. 6. Unless the entire plan is re-printed, all adopted amendments must be printed in the form of replacement pages for the plan, each page of which must:

- show deleted text as stricken and new text as underlined for draft amendments being considered,
- be renumbered as appropriate, and

- include the effective date of the amendment.

The Policy Committee will maintain a distribution list for copies of the plan and within 30 days of adopting an amendment distribute copies of the amendment to the distribution list. Generally, electronic copies of the amendment will be provided, or documents made available for public access on all participating entity's websites. Printed copies will be made available upon written request and printed at the cost of the requester.

Formal Agreements

The CRCWMP will be implemented by the Clearwater River Planning Work Group. The CRCWMP is a coalition of the following partners:

- Clearwater County and SWCD
- Pennington County and SWCD
- Red Lake County and SWCD
- Polk County and East Polk SWCD
- Red Lake Watershed District

The Partnership previously entered into a formal agreement through an MOA for planning the CRCWMP (Appendix I). The entities will draft an MOA for purposes of implementing this plan. The Policy Committee of the CRCWMP oversees the plan implementation with the advice and consent of the individual county and SWCD boards under the umbrella of the implementation MOA.

Figure 7.3. Pastureland in Clearwater County.