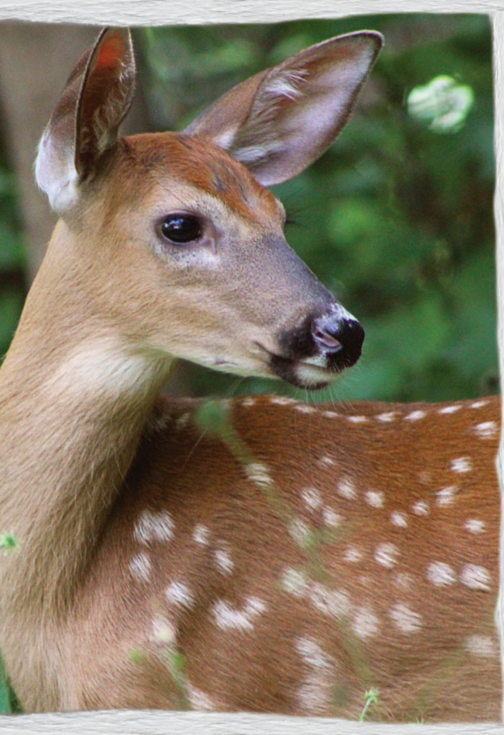
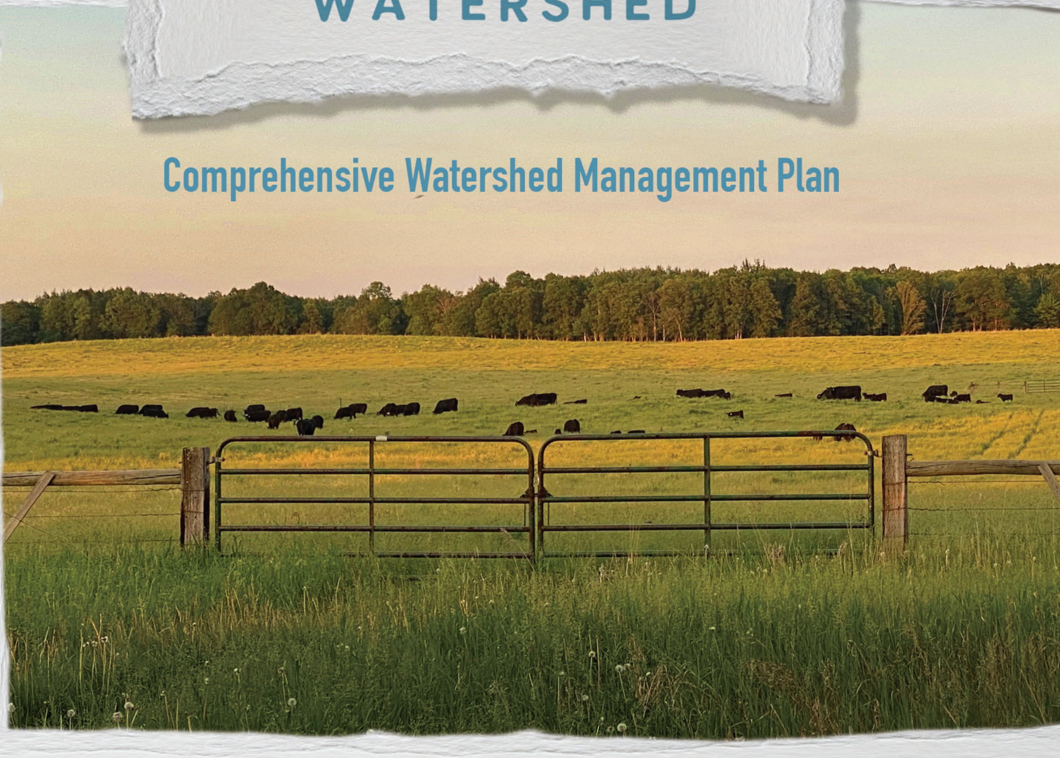
Clearwater River WATERSHED

Comprehensive Watershed Management Plan





CLEAN WATER LAND & LEGACY AMENDMENT

ACKNOWLEDGEMENTS

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Funded by

CLEAN WATER LAND & LEGACY AMENDMENT

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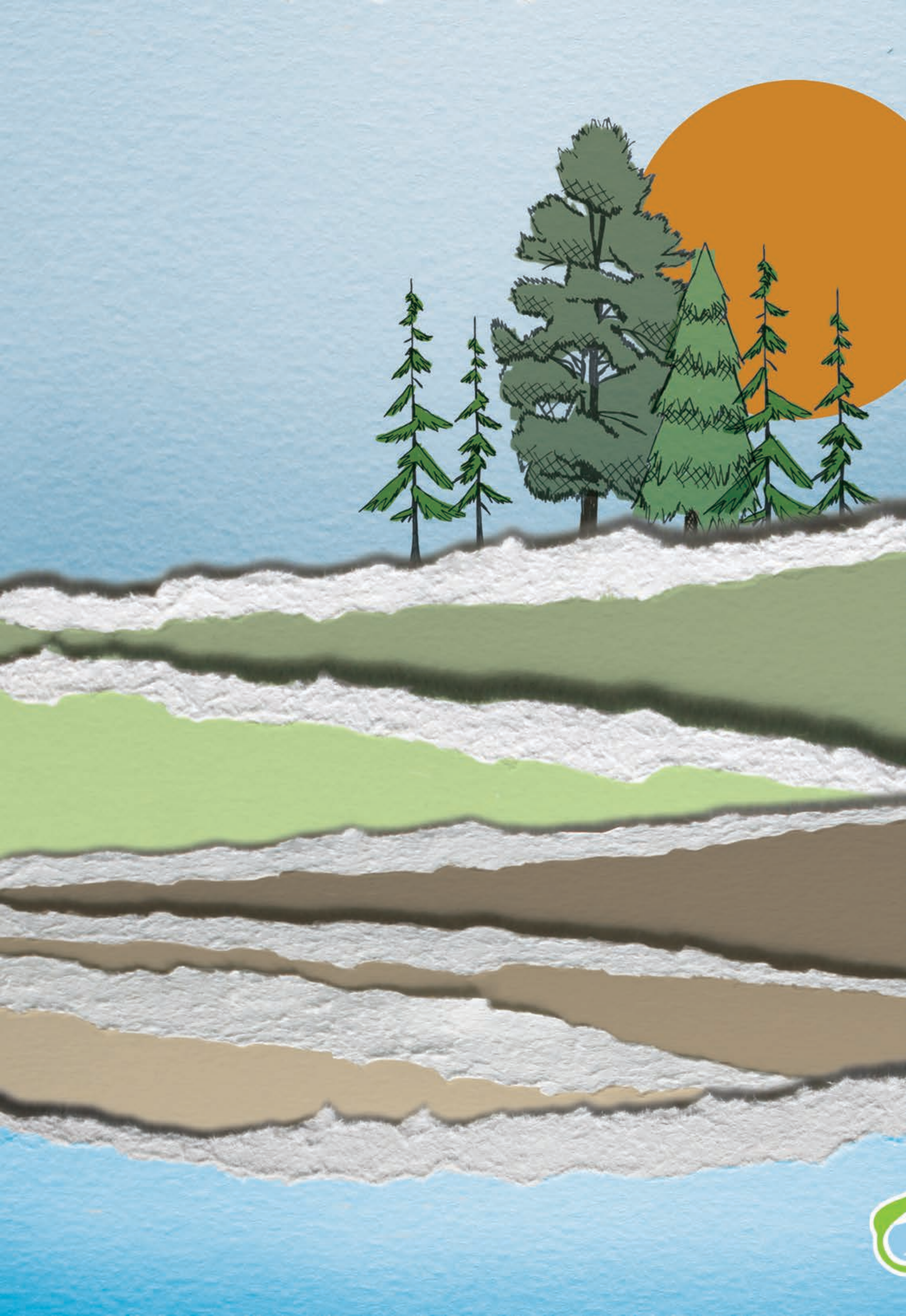


Executive Summary

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.

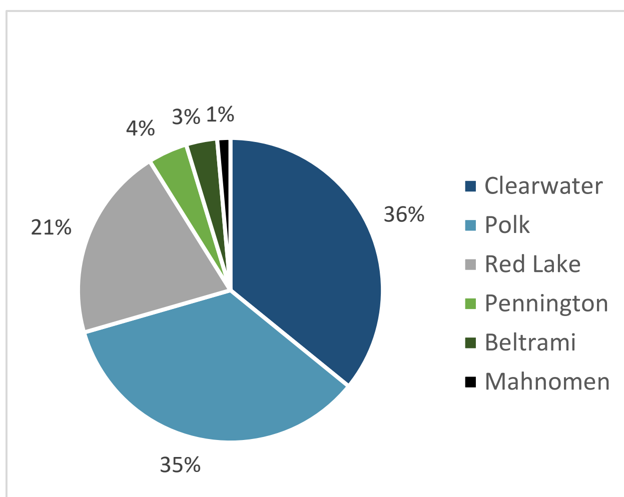


Figure 1.1. Percent of each county in the plan area.

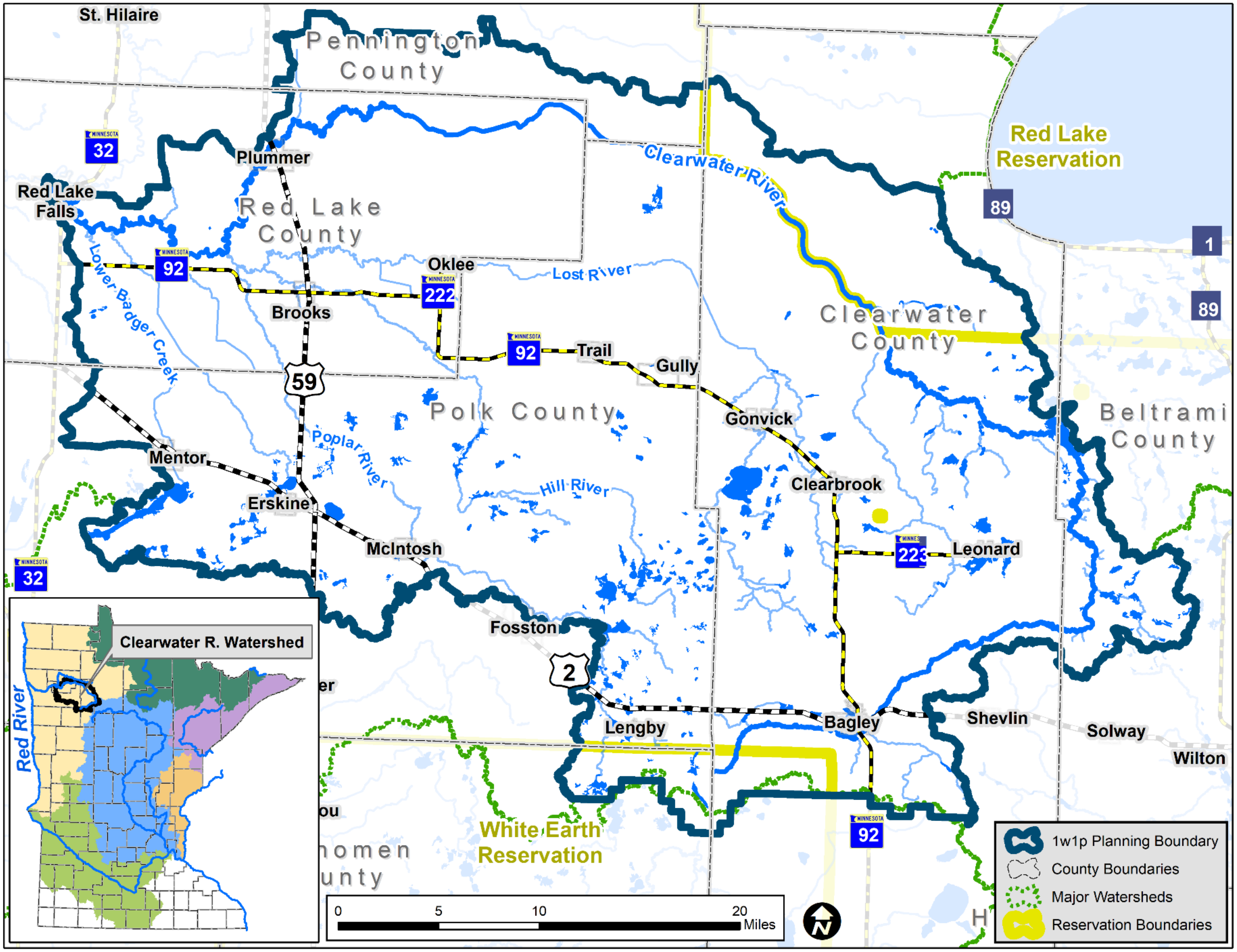


Figure 1.2. Map of plan area.

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).

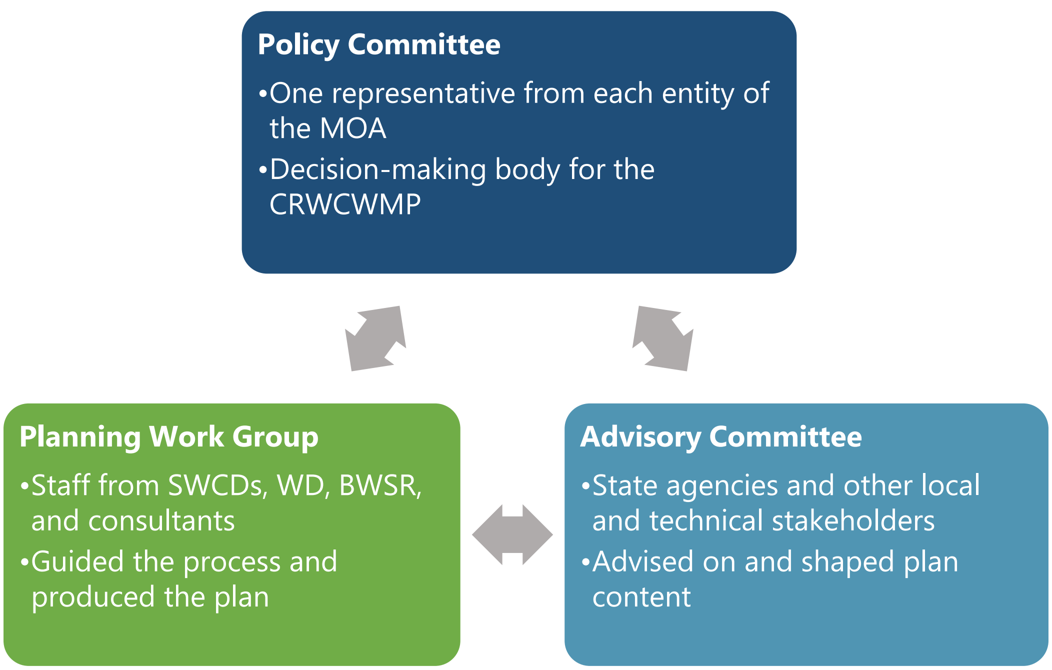


Figure 1.3. Committees formed for the CRCWMP.

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
Surface Water	Streams	**Unstable stream channels** and loss of riparian vegetation increases sediment loading and reduces habitat quality.
Surface Water	Drainage Systems	**Drainage system bank instability and inadequacy** affects agricultural productivity and increases erosion and sedimentation.
Surface Water	Streams, Drainage Systems	**Altered hydrology** causes variability of flows affecting timing, water quantity, water quality, and erosion.
Surface Water	Lakes, Streams	**Sediment loading** from wind and water erosion of croplands, uplands, and lakeshore impacts water quality.
Surface Water	Lakes, Streams	**Phosphorus loading** contributes to elevated concentrations in lakes and streams, causing eutrophication.
Surface Water	Streams	**Bacteria loading** impacts aquatic recreation and human health.
Land Management	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
Groundwater	Drinking Water	**Groundwater** is vulnerable to **contamination** from numerous sources.
Surface Water	Wetlands	**Wetlands** are in continued need of protection and restoration which helps with precipitation storage and provides habitat.
Groundwater	Aquifer	**Groundwater sustainability** is vulnerable to overuse and loss of recharge.
Surface Water	Lakes, Streams	**Stormwater runoff** from developed areas and roads causes contamination of lakes and streams.
Habitat	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	**10 wells/year** sealed	**20,450 acres** soil health practices in 10 years	**17,227 acres** forest and prairie protection in 10 years
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			

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

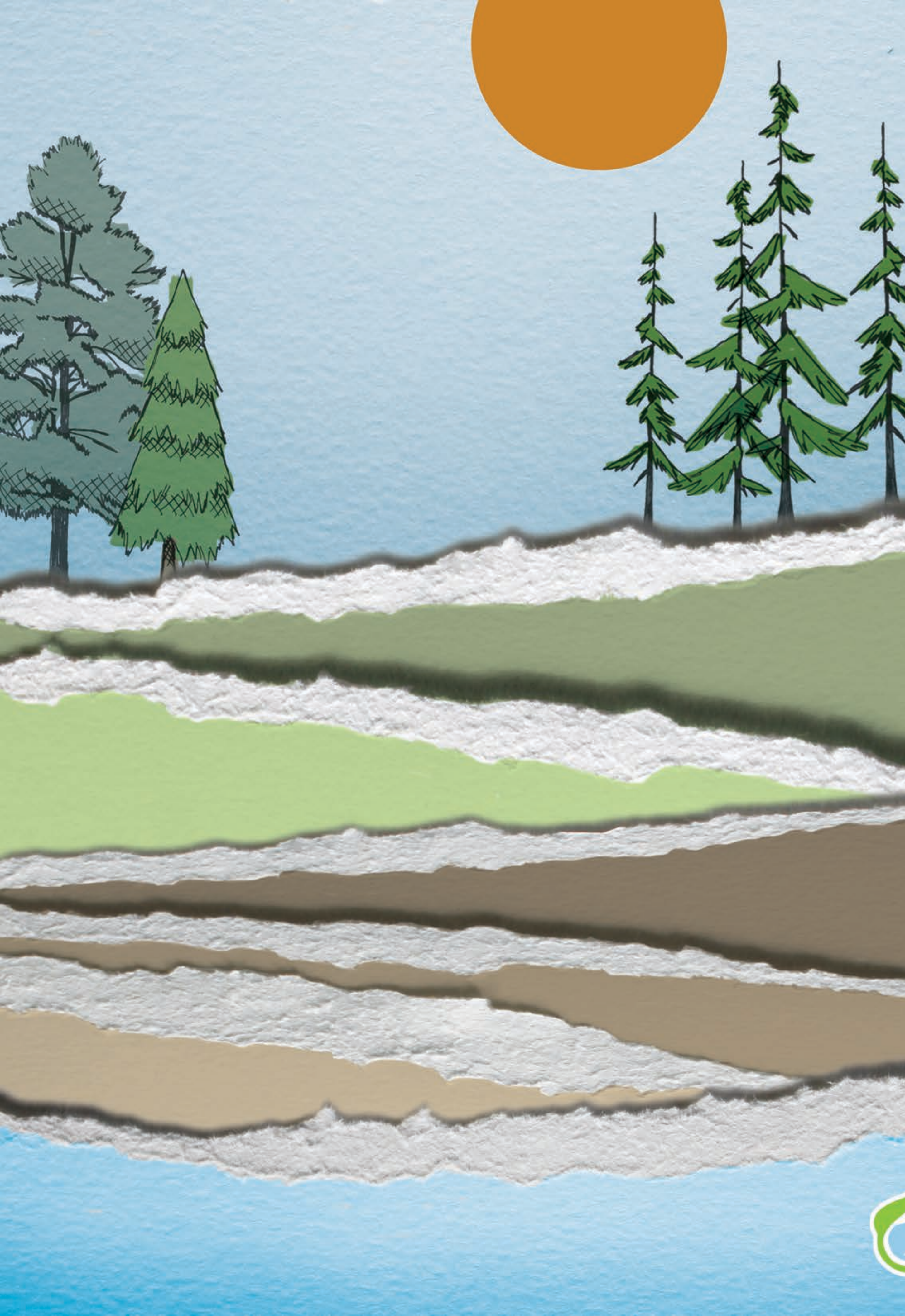
The CRCWMP will be implemented by the Clearwater River Watershed Planning Work Group. The CRCWMP is a coalition of the following partners:

- 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.

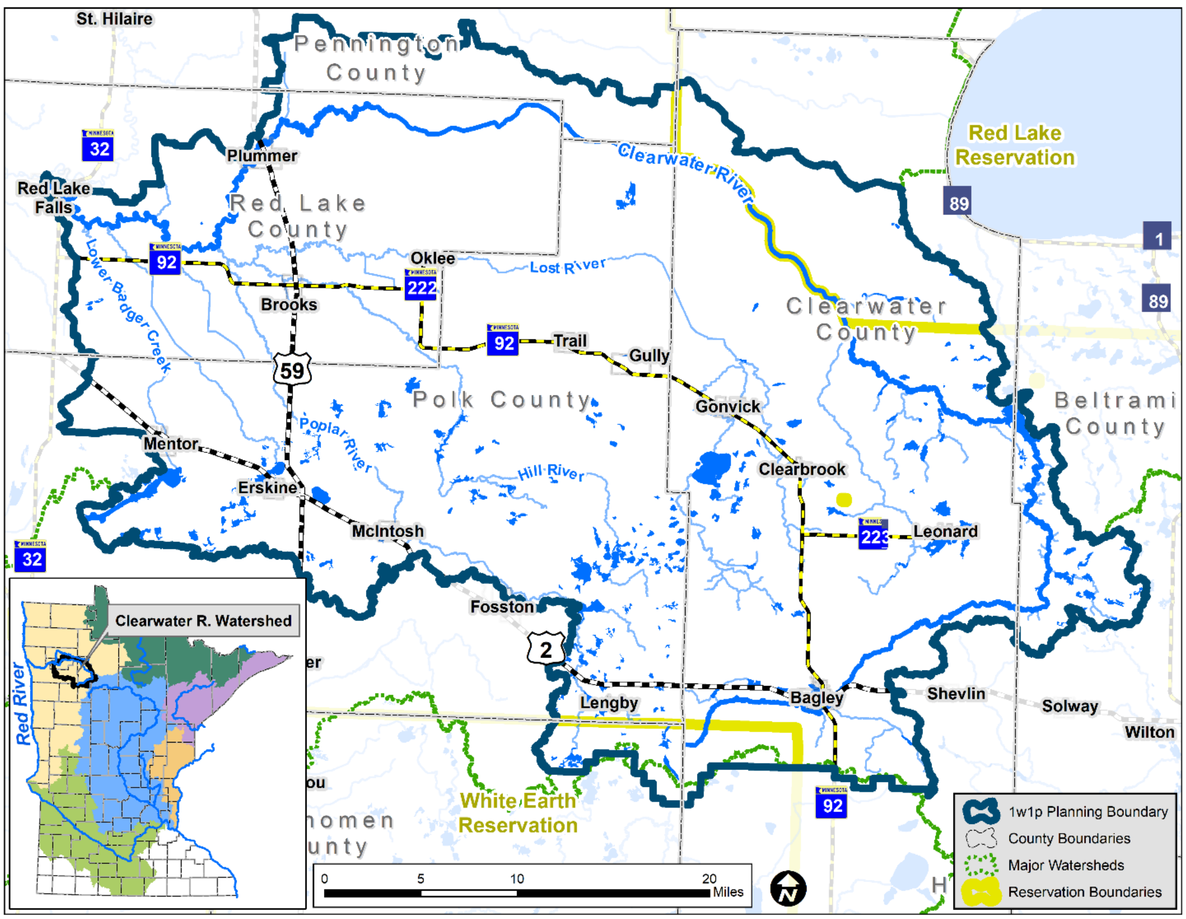


Figure 2.1 Clearwater River Watershed.

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).

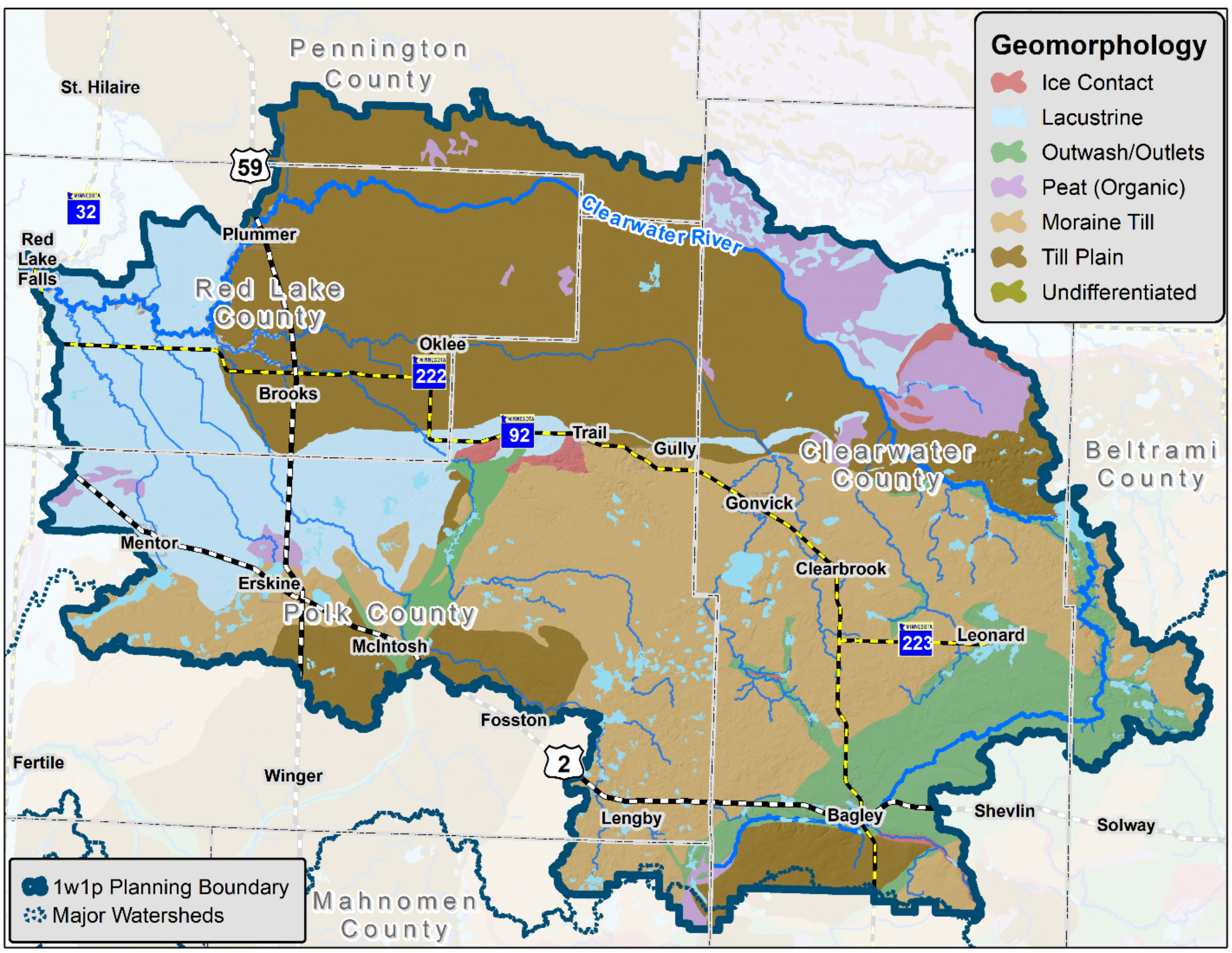


Figure 2.2 The geomorphology of the Clearwater River Watershed.

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).

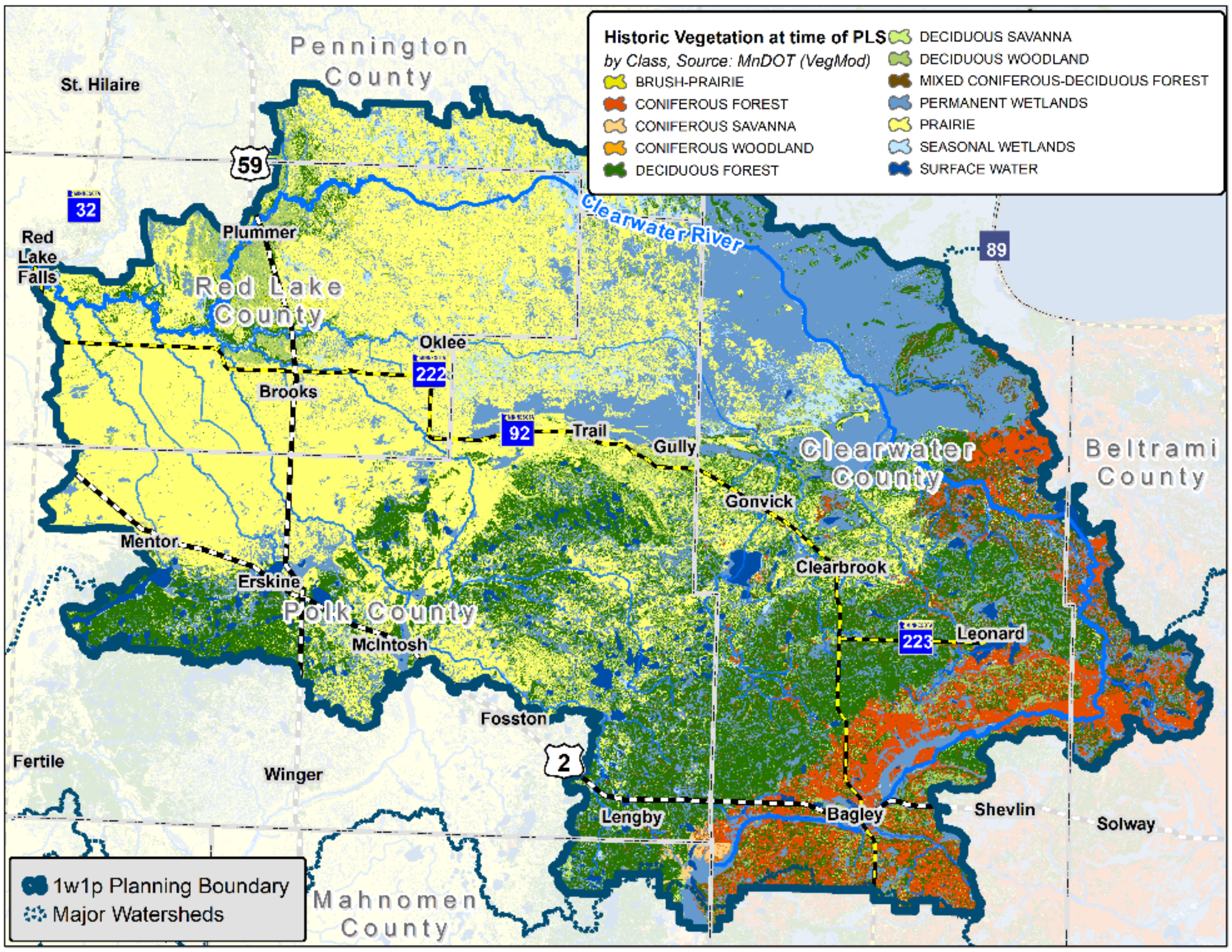


Figure 2.3 Historic vegetation in the Clearwater River Watershed (MNDOT, 2019).

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

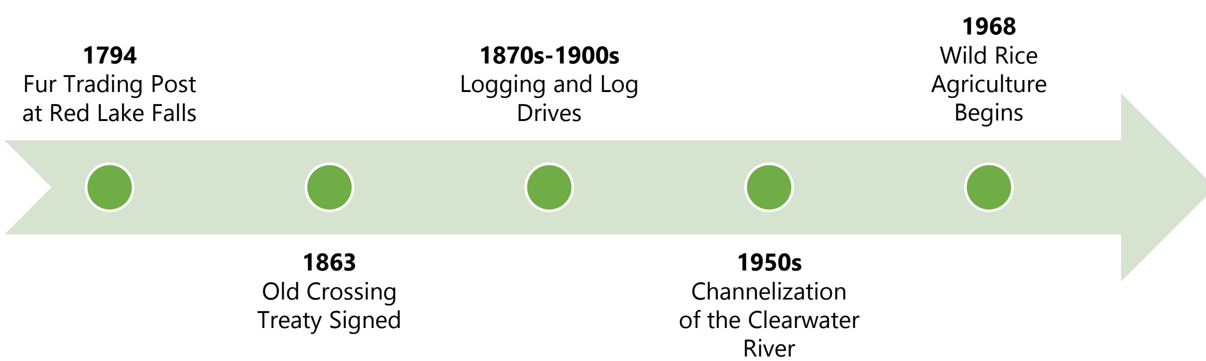


Figure 2.5 Watershed timeline post-European settlement.

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).

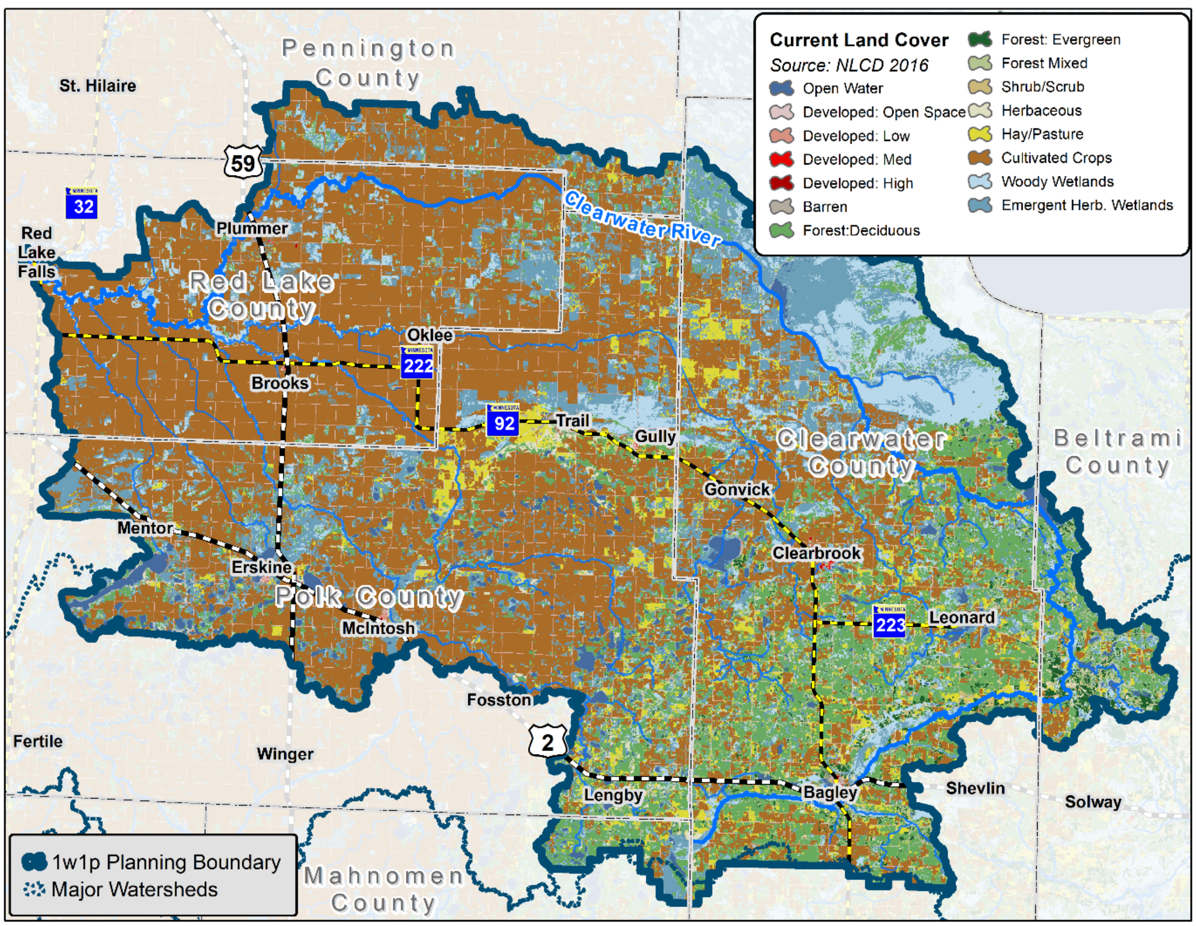


Figure 2.7 Current land use in the Clearwater River Watershed (USGS, 2016).

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.

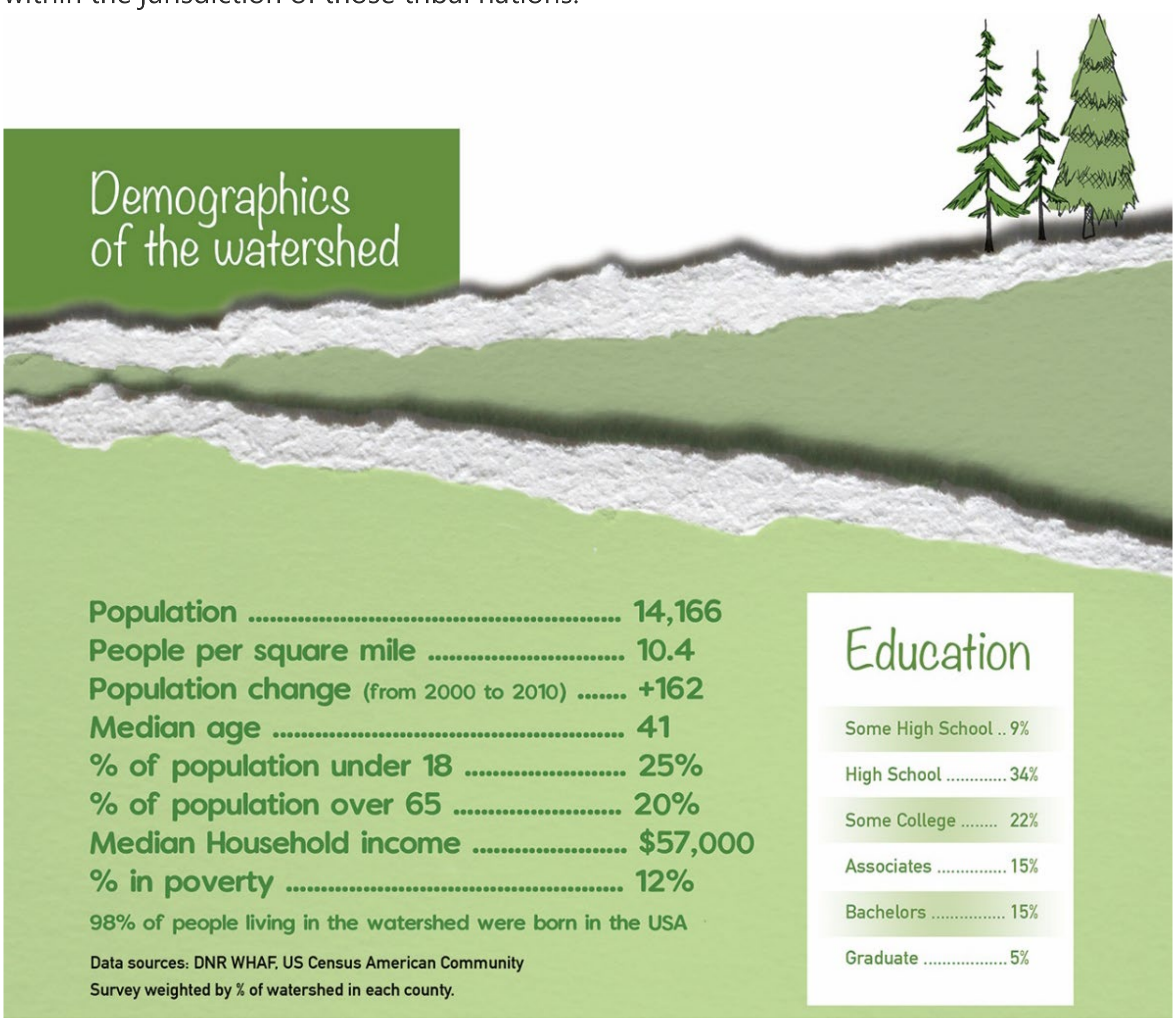


Figure 2.8 Demographics of the Clearwater River Watershed (DNR WHAF)

Surface Water

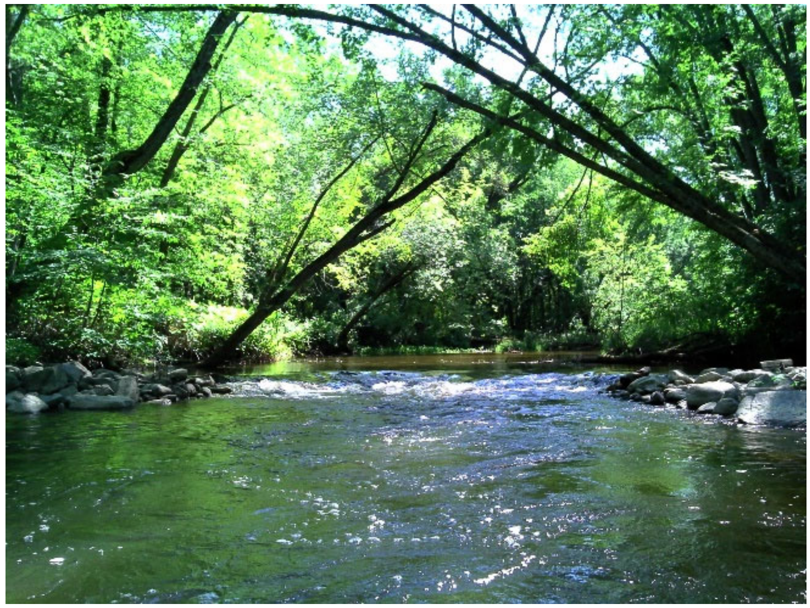


Figure 2.9 Clearwater River (credit: RLWD).

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).

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.

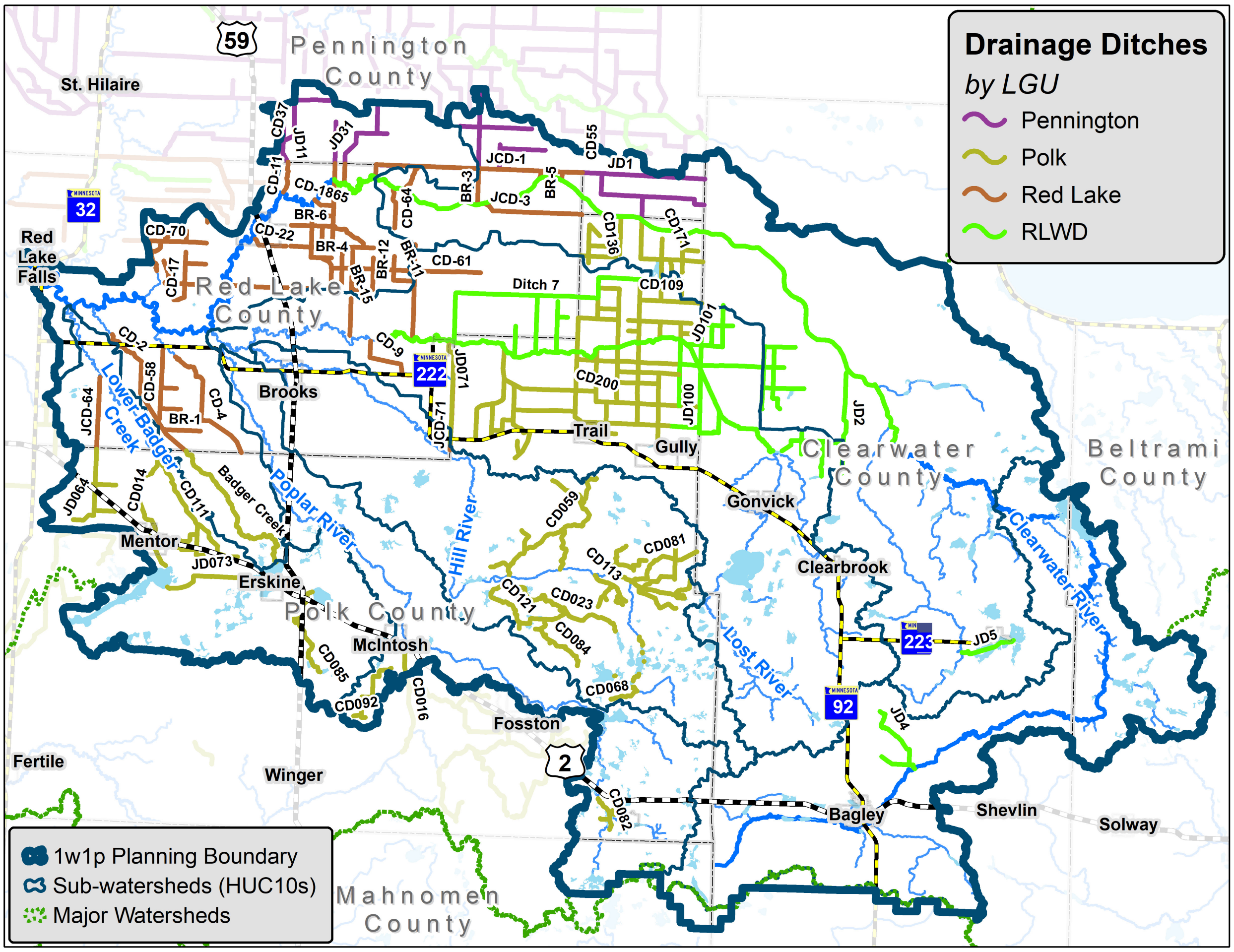


Figure 2.10 Drainage systems in the Clearwater River Watershed.

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).

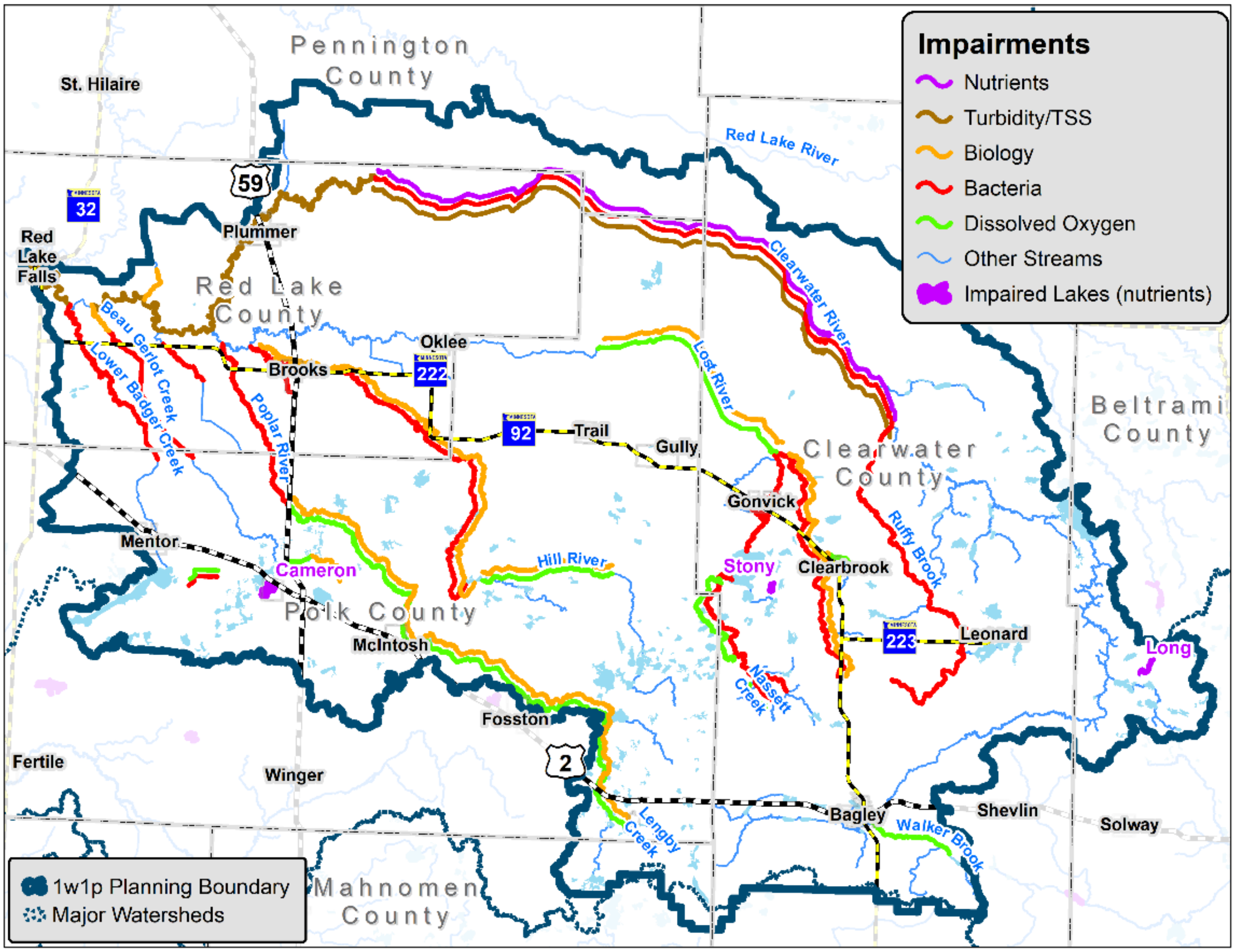


Figure 2.12 Water Quality Impairments in the Clearwater River Watershed (MPCA 2021).

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).

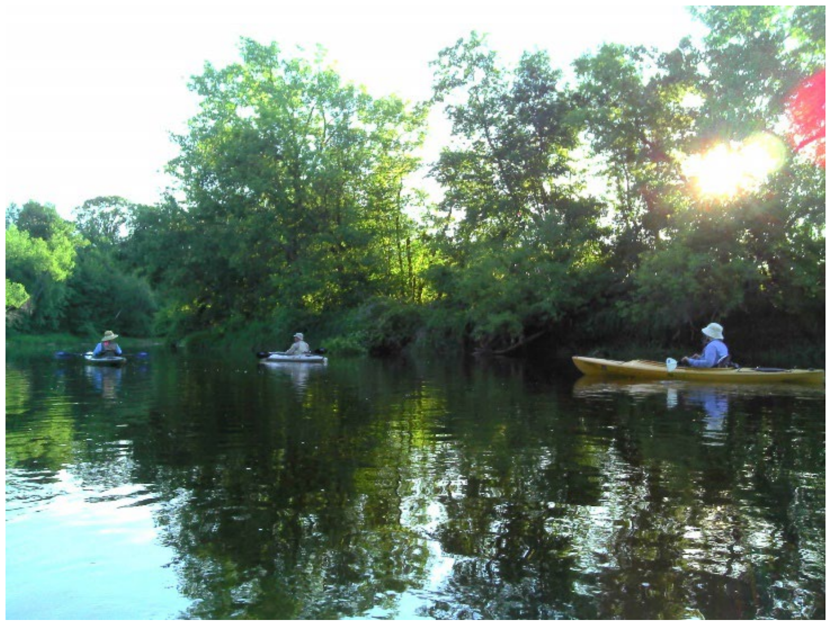


Figure 2.13. Clearwater River (credit: RLWD).

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

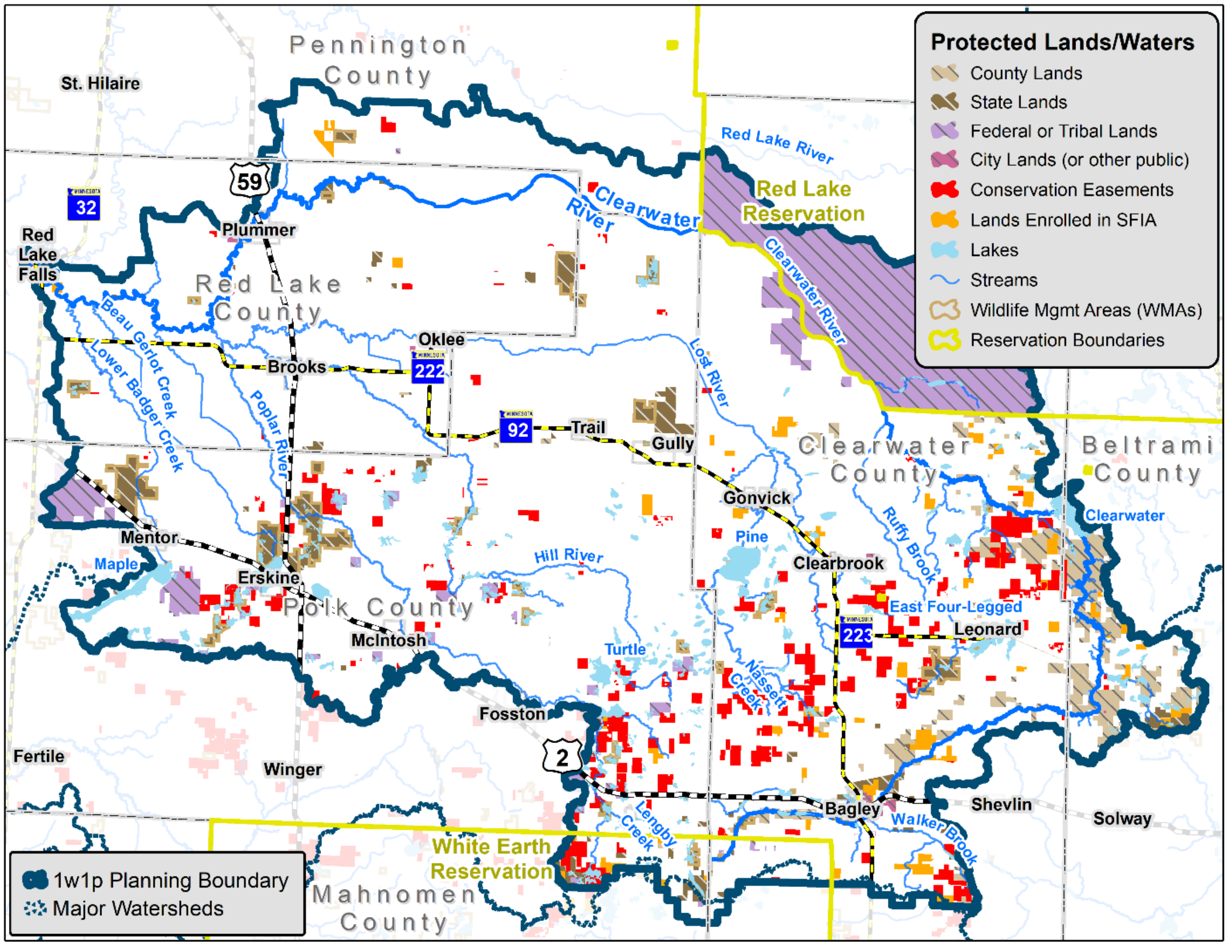


Figure 2.14 Protected areas in the Clearwater River Watershed.

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.

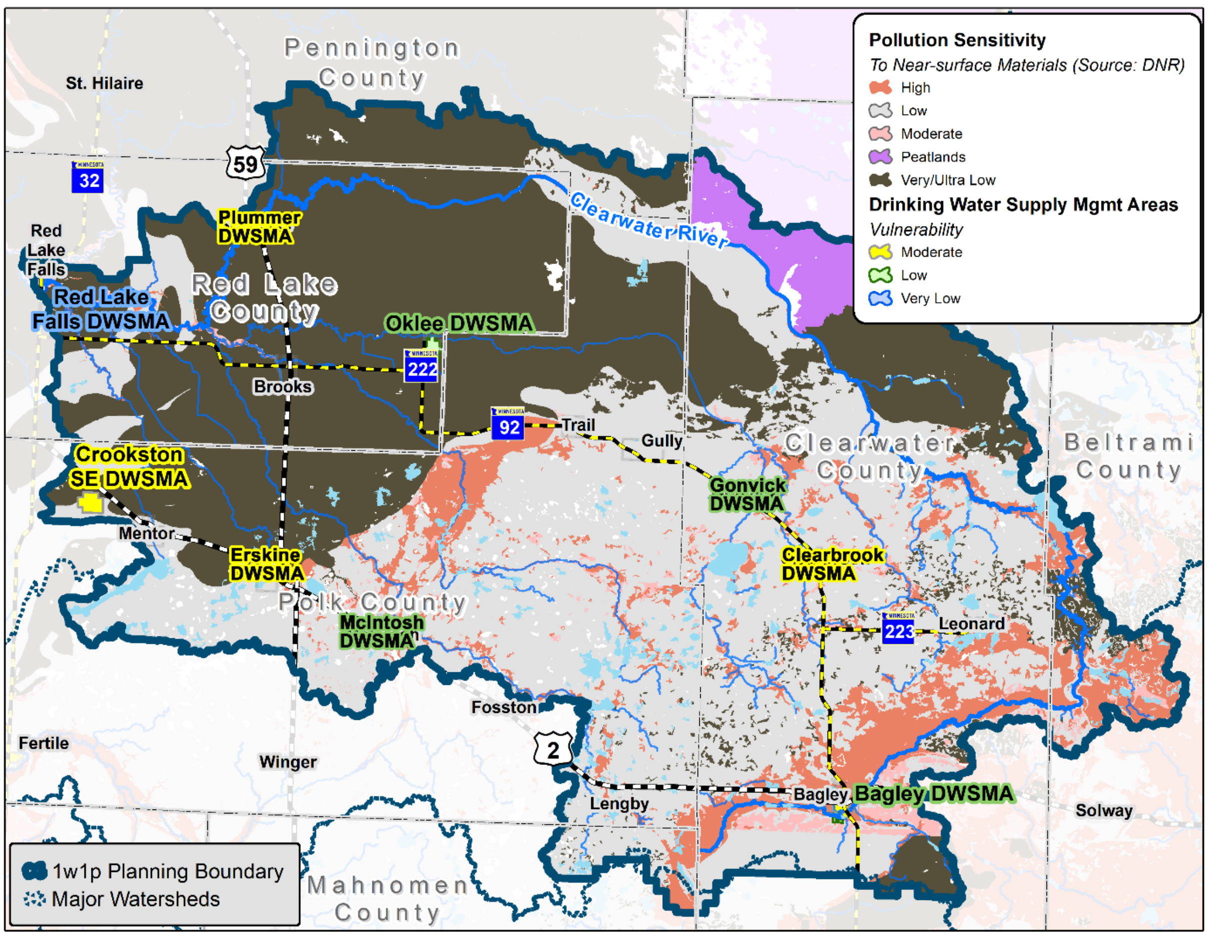


Figure 2.15. Groundwater sensitivity to surface pollution.

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.

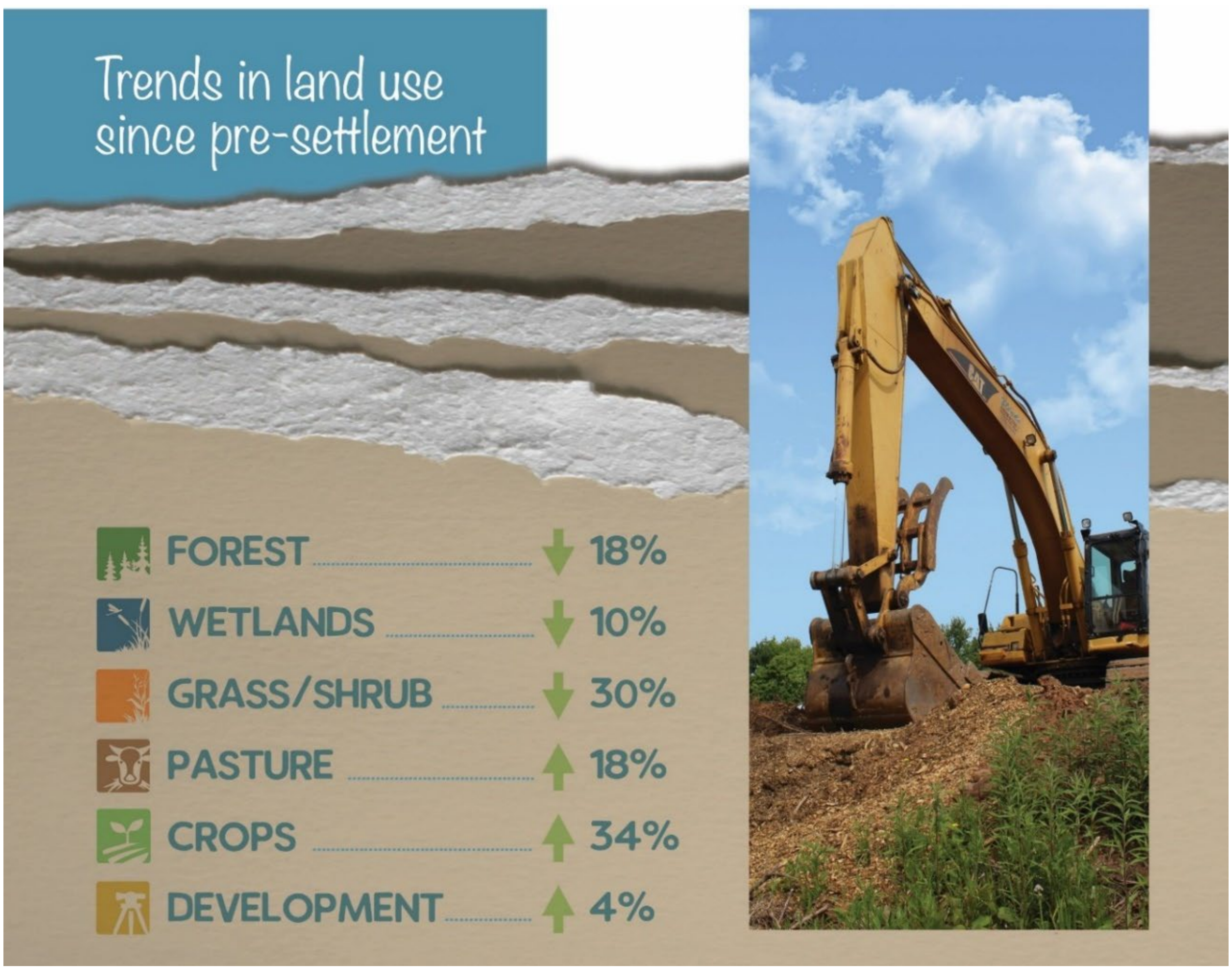


Figure 2.16 Trends summarized from the MPCA WRAPS, 2021

Priority Issues

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.**

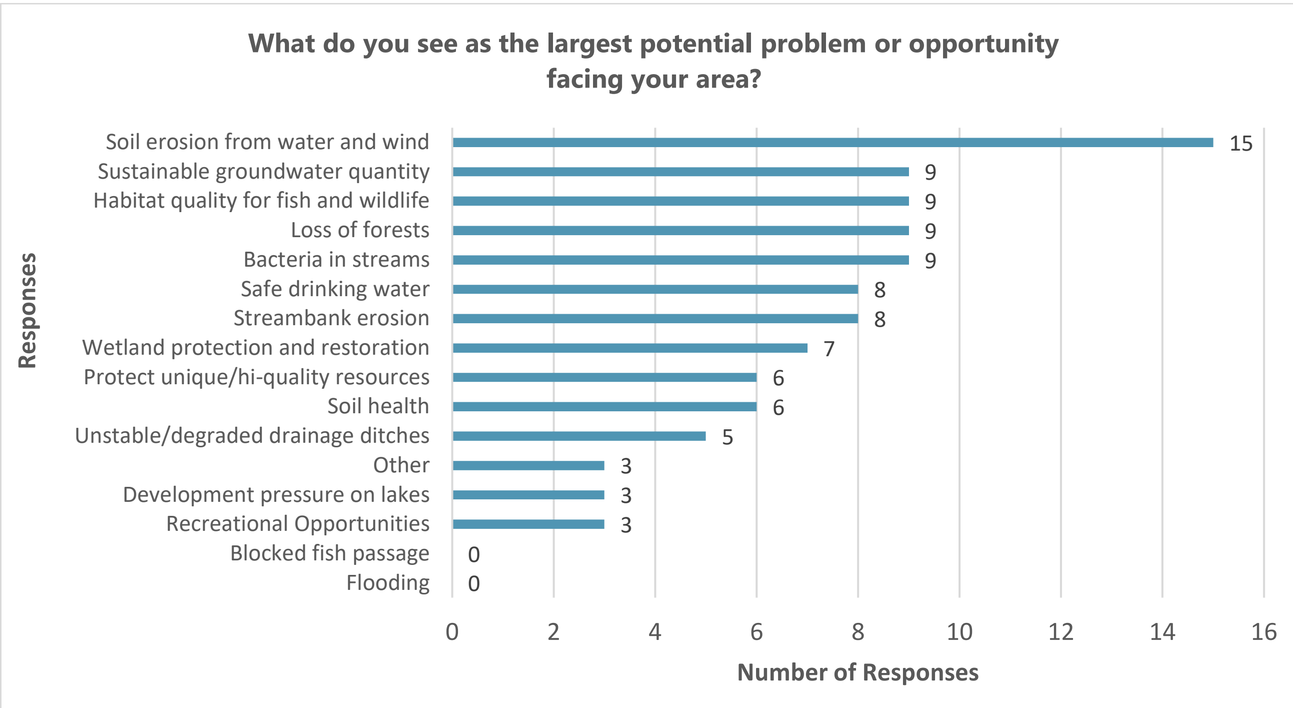


Figure 3.1. Public survey responses rating the largest potential problem or opportunity facing their area.

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).

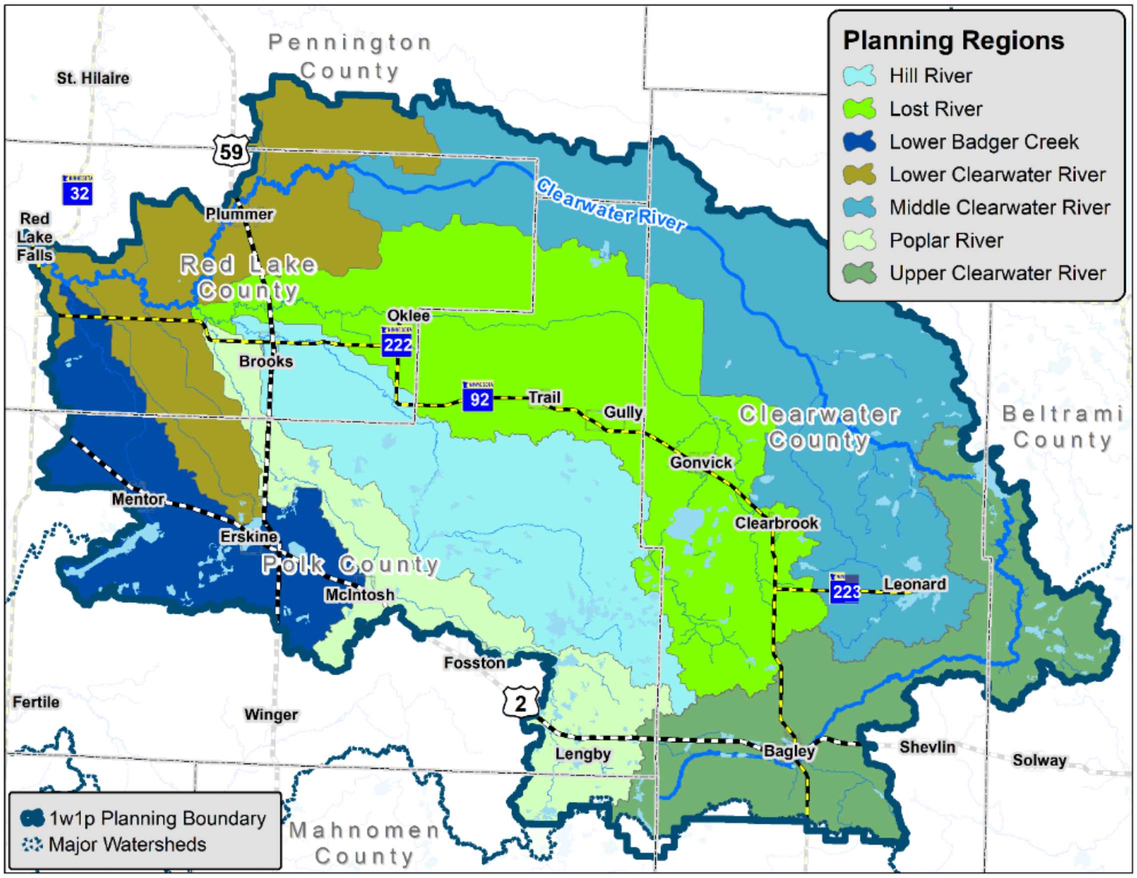


Figure 3.2. Planning Regions in the Clearwater River Watershed (based on HUC-10s).

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.

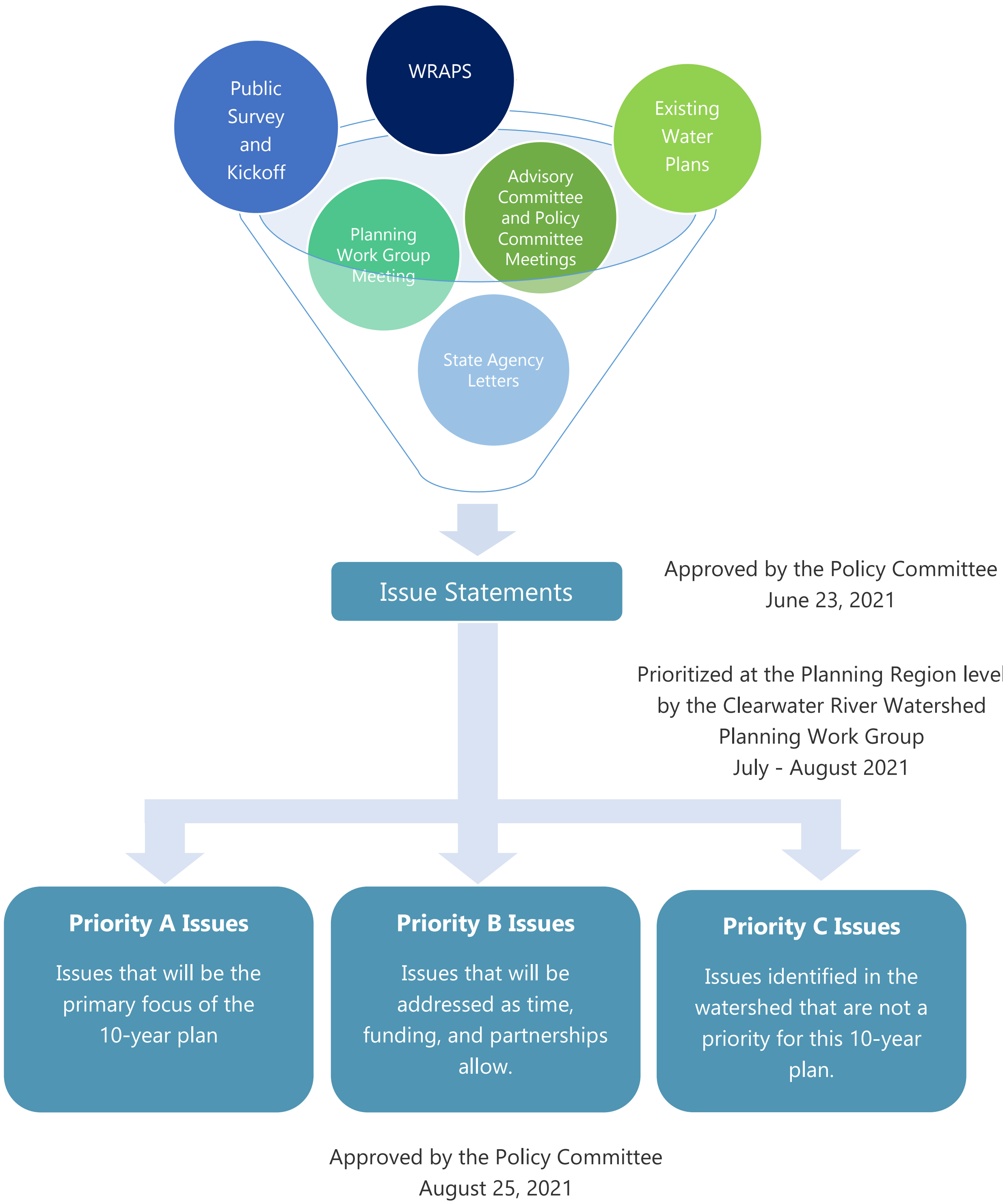
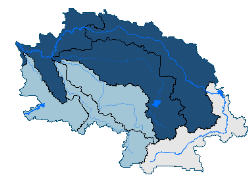
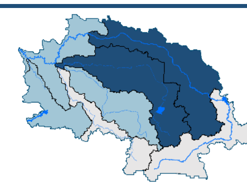
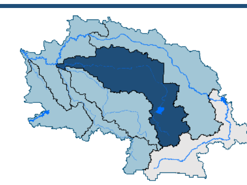
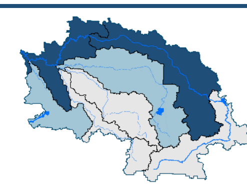
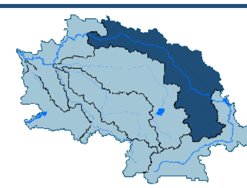
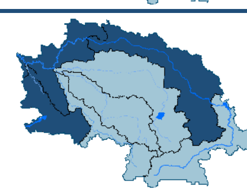


Figure 3.4. Issue prioritization process for the Clearwater River Watershed.

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.

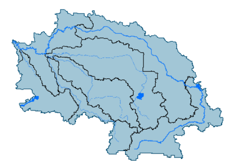
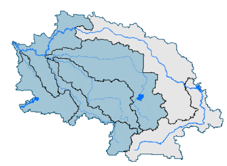
Planning Region Prioritization Key: ● = high priority ● = medium priority ○ = low priority

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.

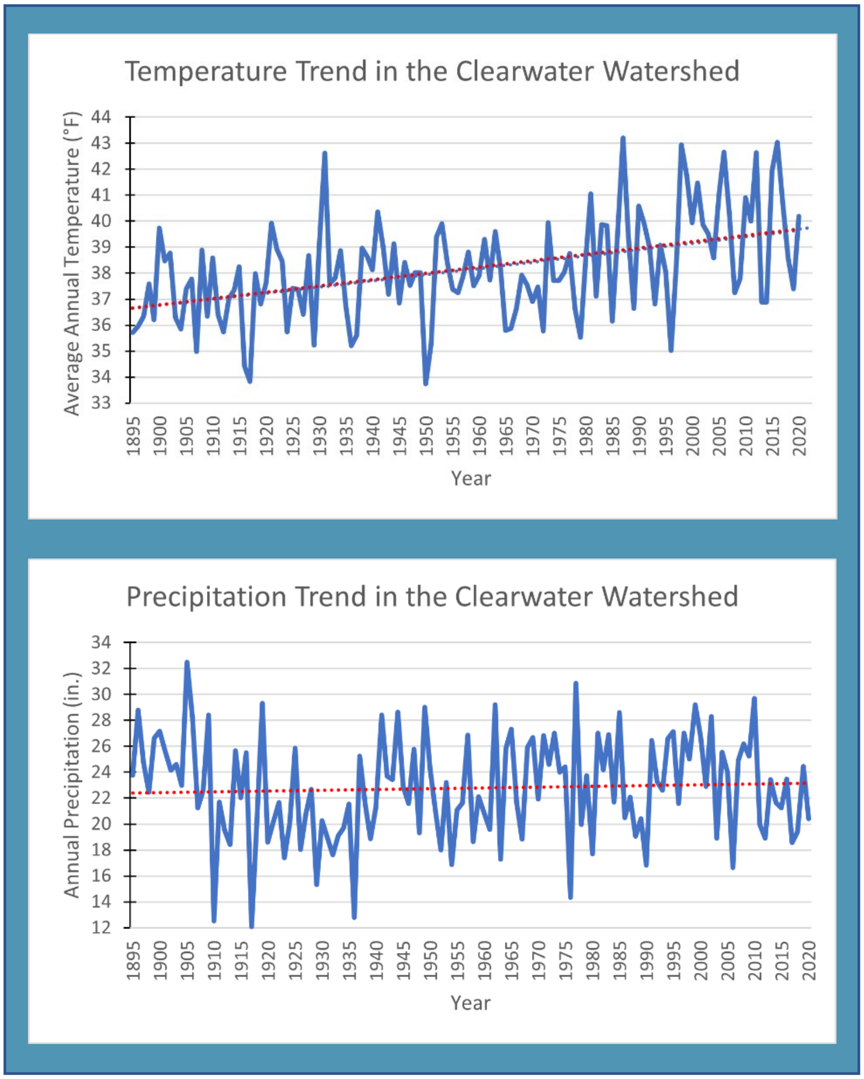
Contaminants of Emerging Concern

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*

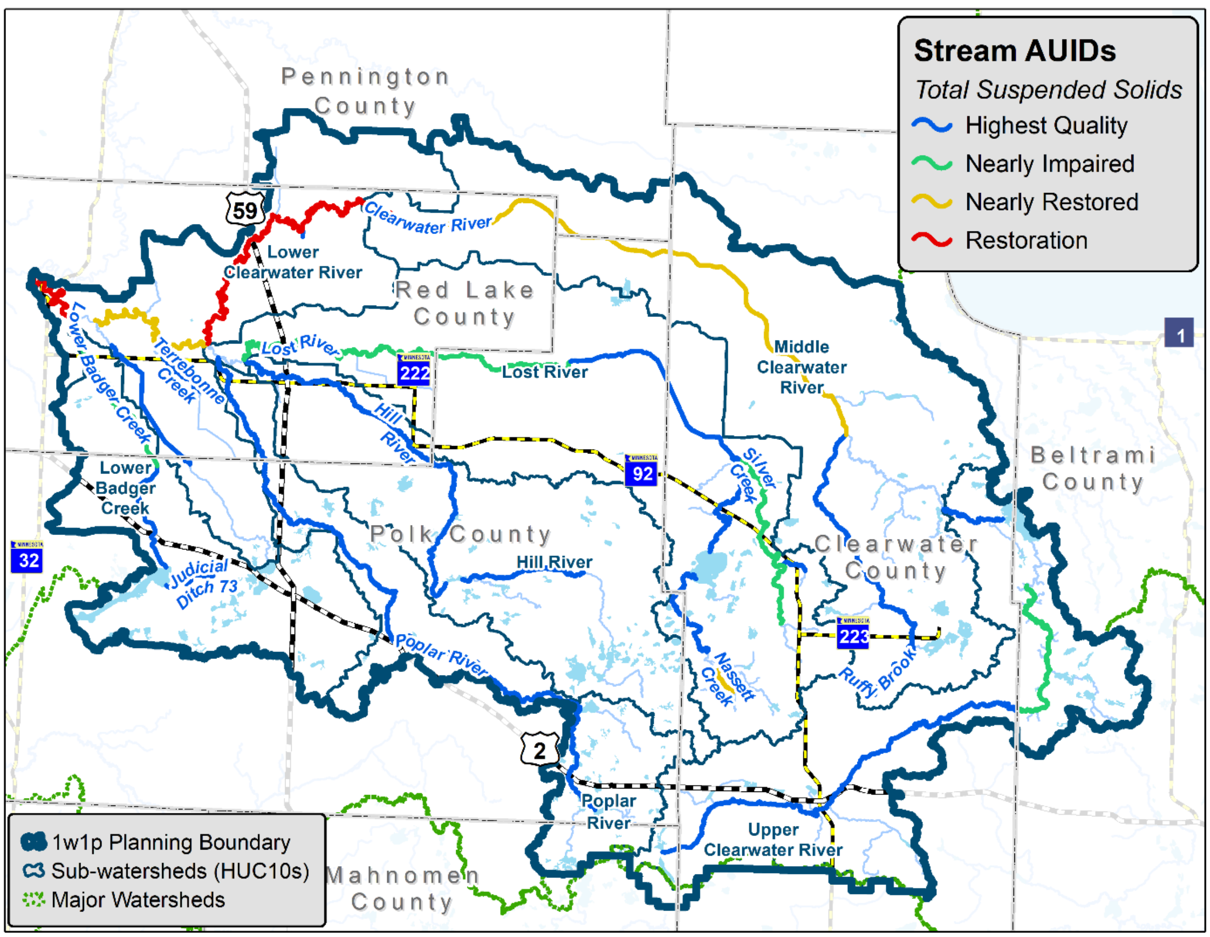


Figure 4.1. Resource categories based on sediment (WRAPS).

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.

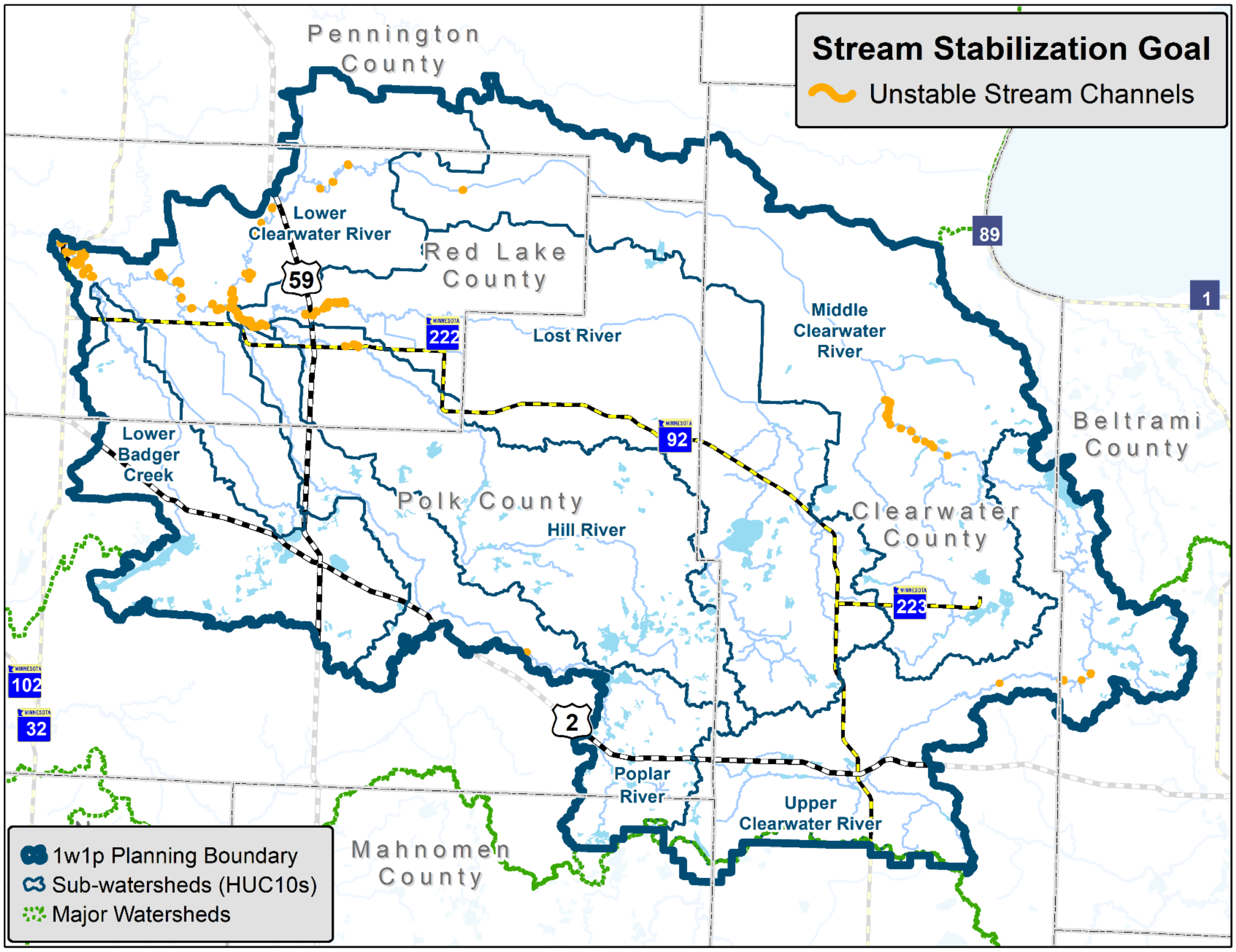


Figure 4.2. Locations for stream stabilization identified by RLWD.

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.)

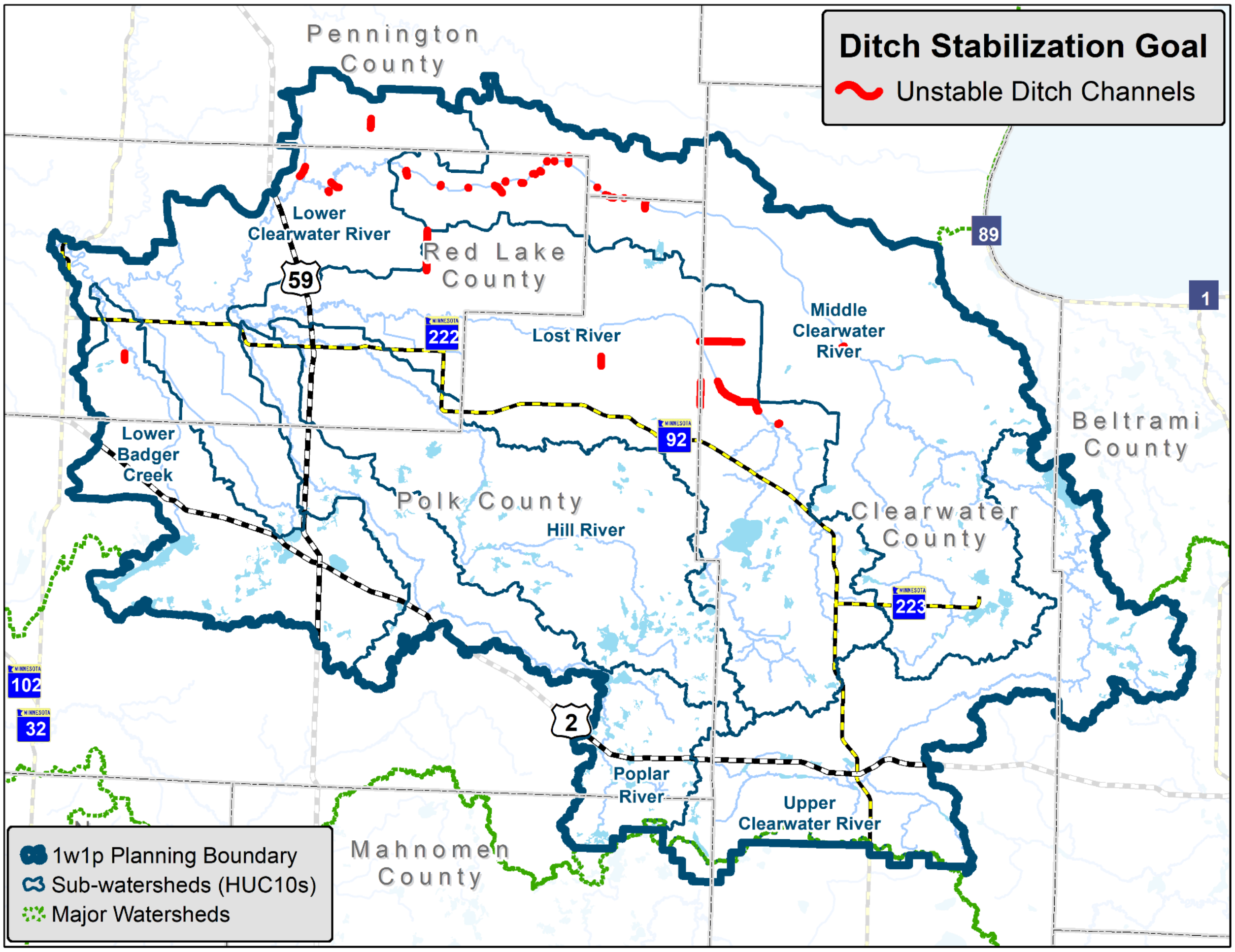


Figure 4.3. Unstable ditch channels and outlets identified by RLWD.

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.

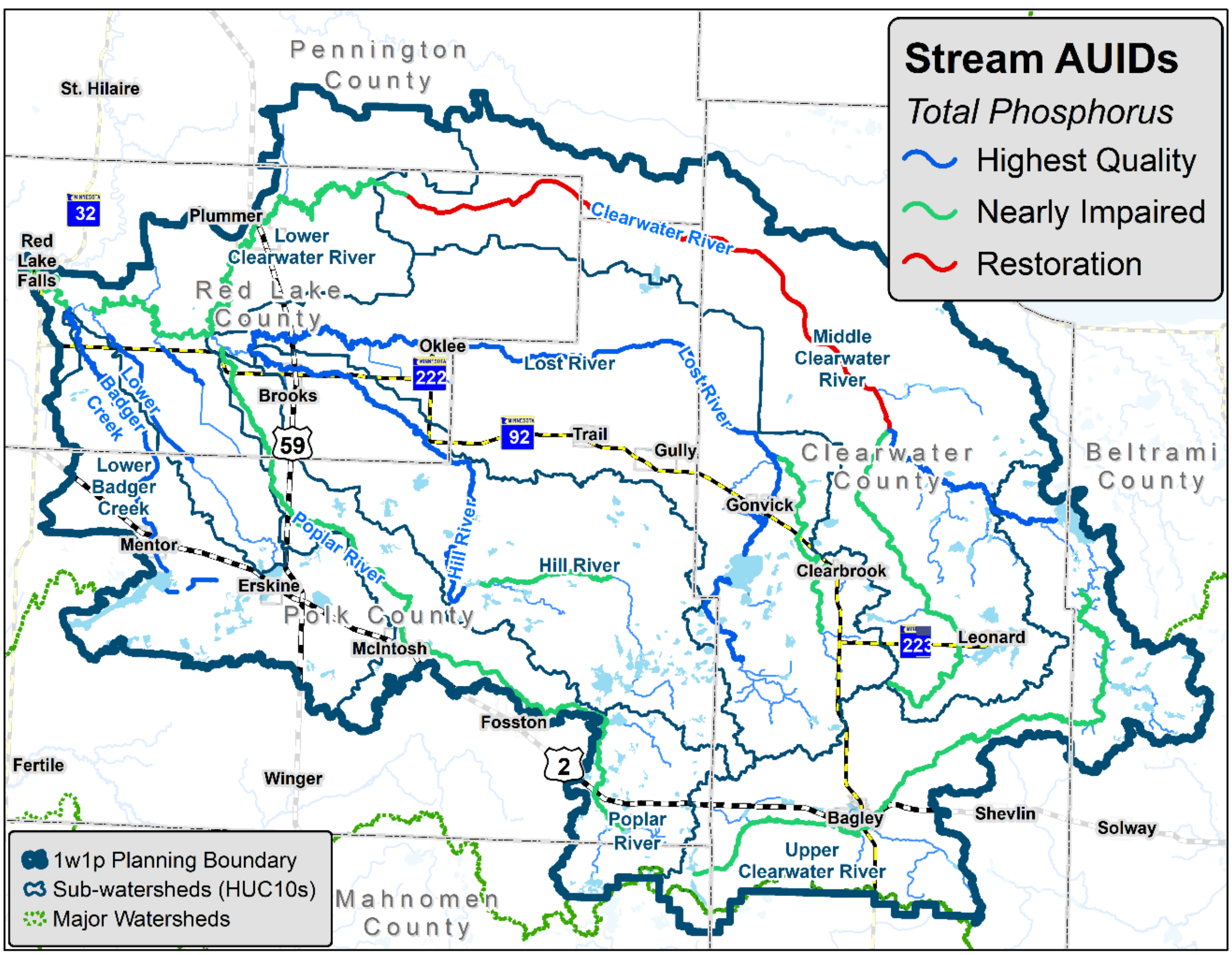


Figure 4.4. Resource categories based on phosphorus (WRAPS).

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.

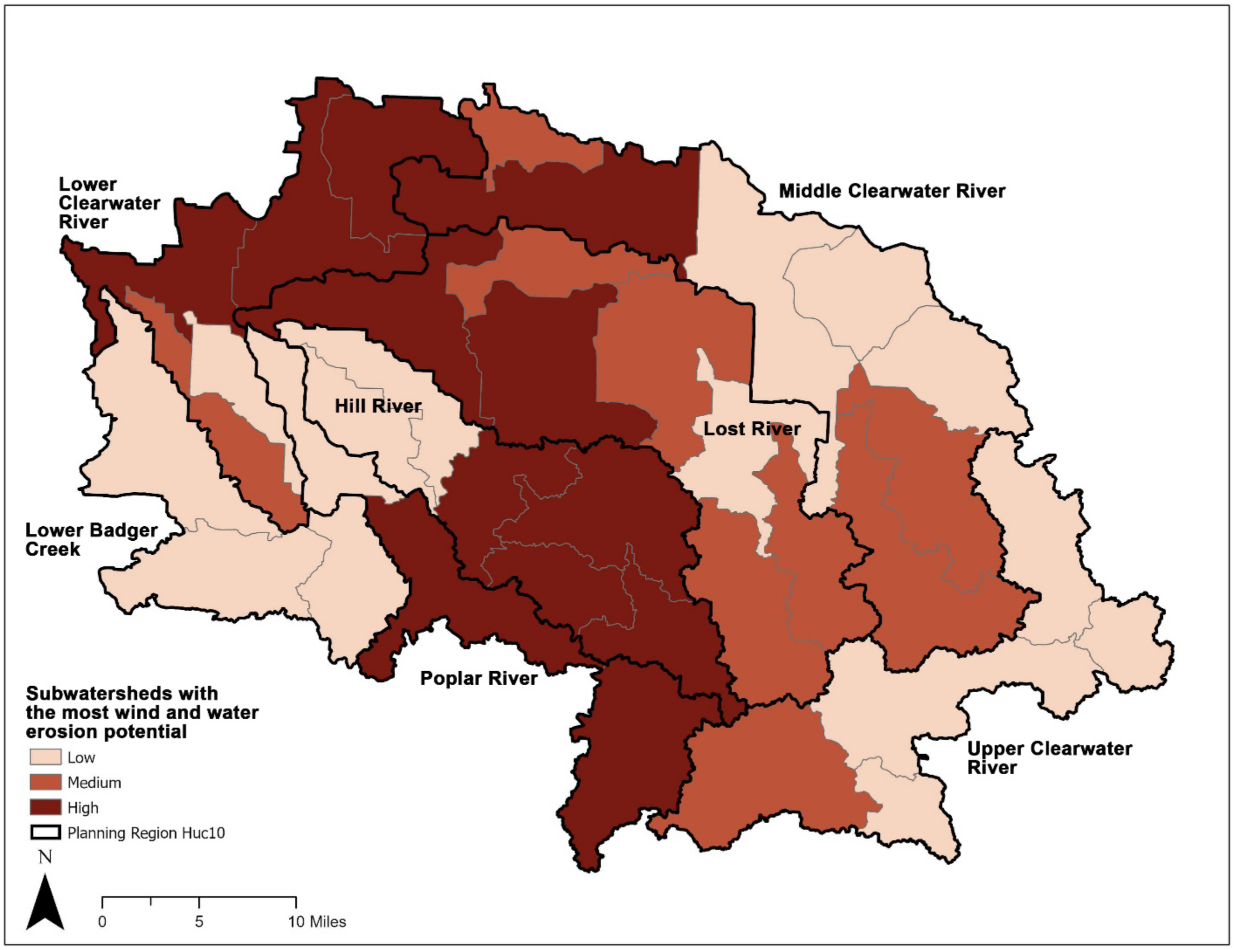


Figure 4.5. Priority areas for soil health practices in the Clearwater River Watershed.

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.

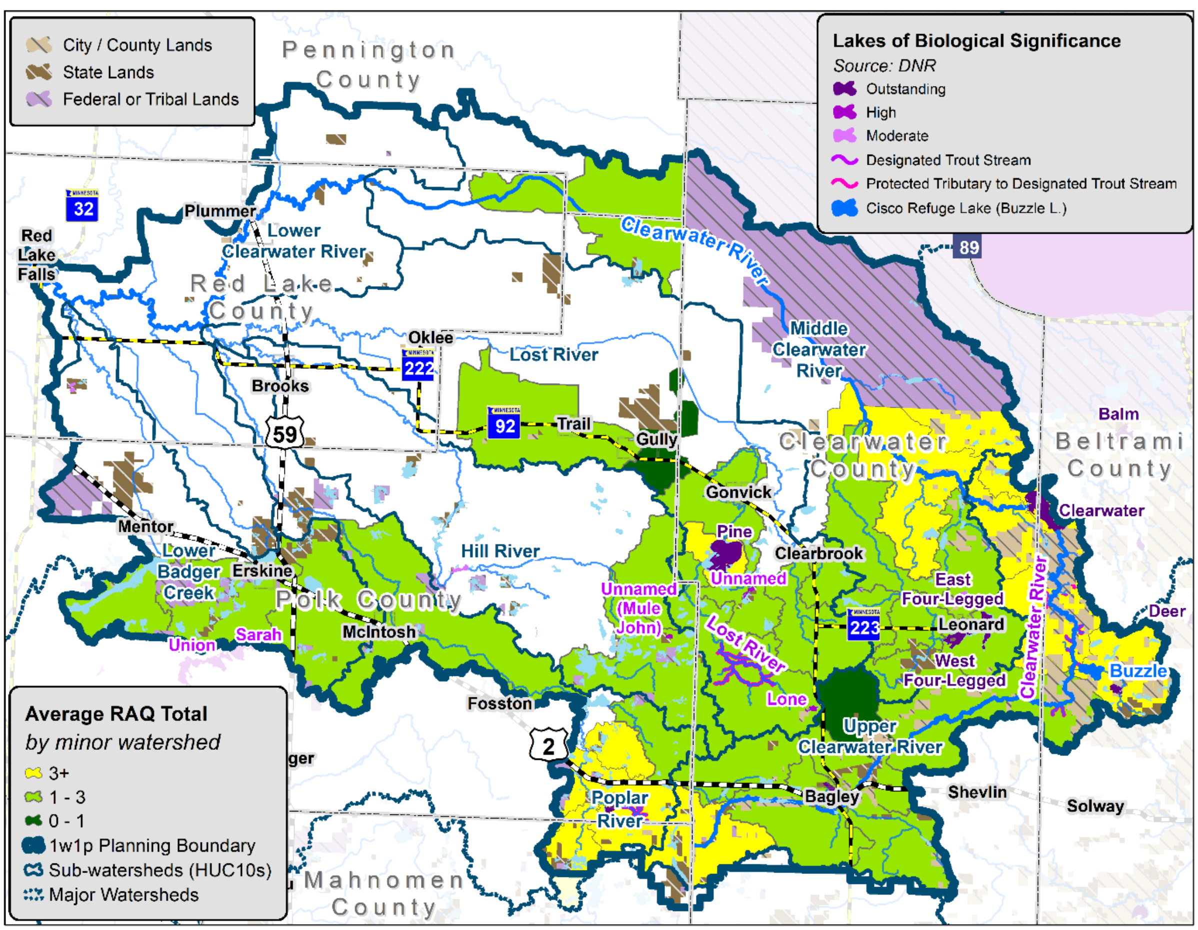


Figure 4.6. Priority areas for land protection (Tier 1 priority is yellow and Tier 2 priority is green).

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).

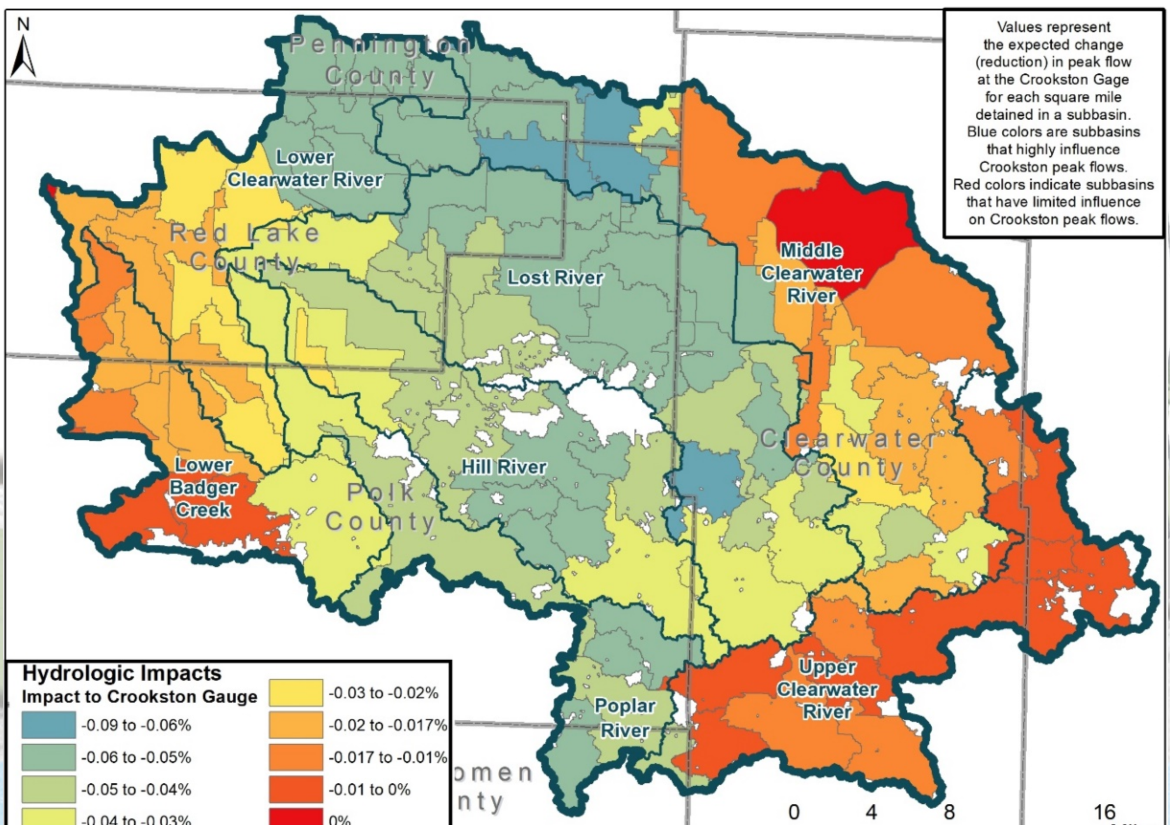


Figure 4.7. Priority areas for storage practices in the Clearwater River Watershed.

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.

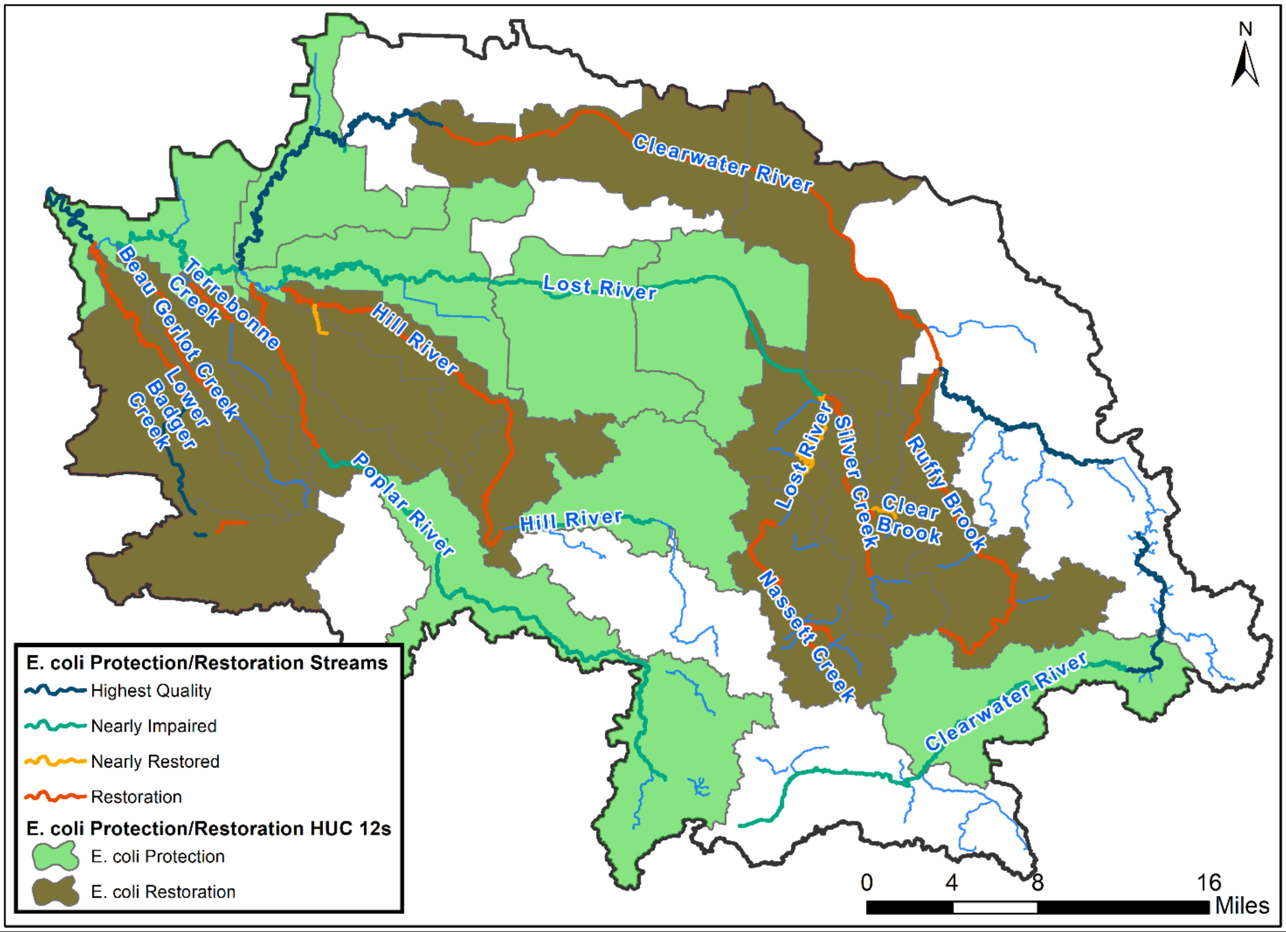


Figure 4.8. Prioritized areas for bacteria reduction practices.

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.

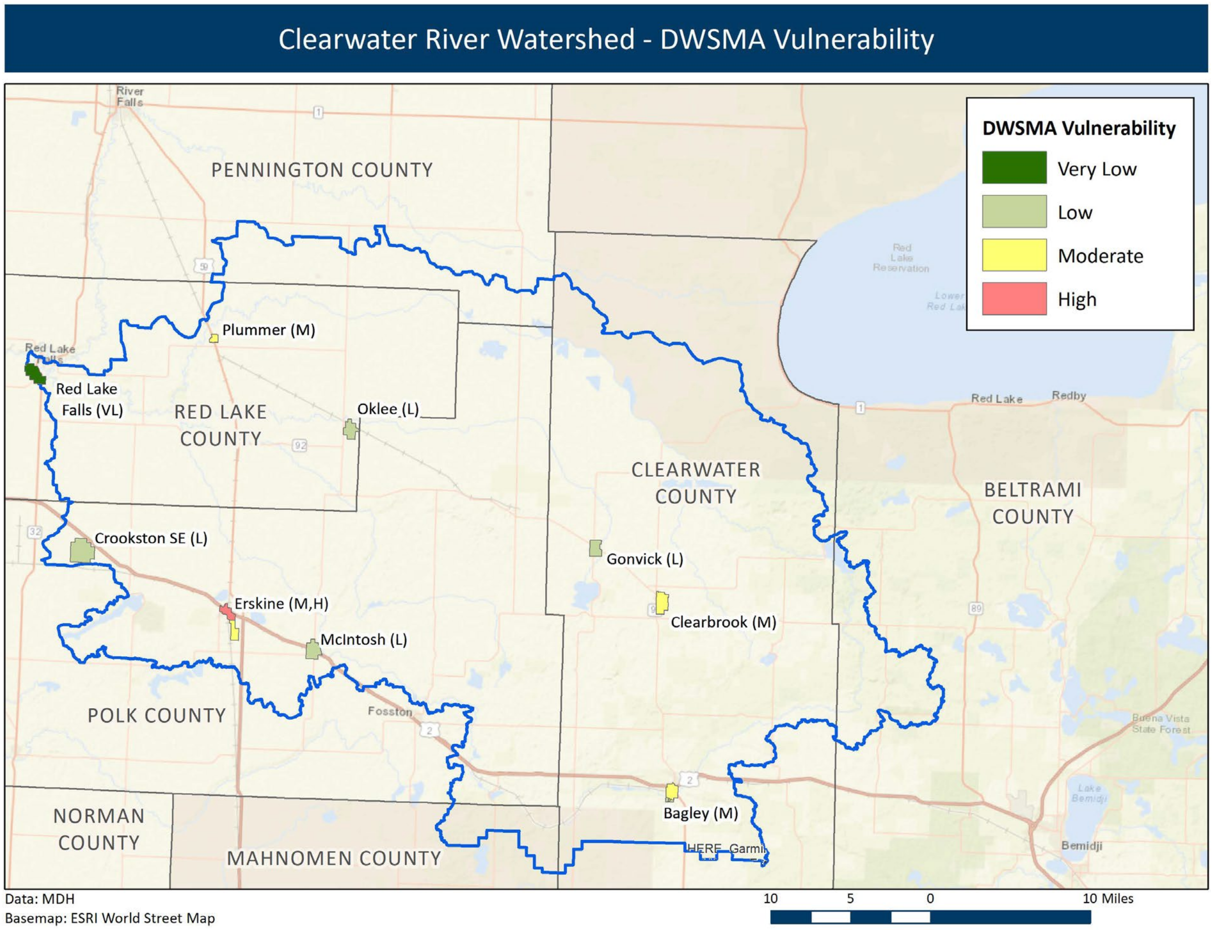


Figure 4.9. Drinking Water Supply Management Area (DWSMA) vulnerability.

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).

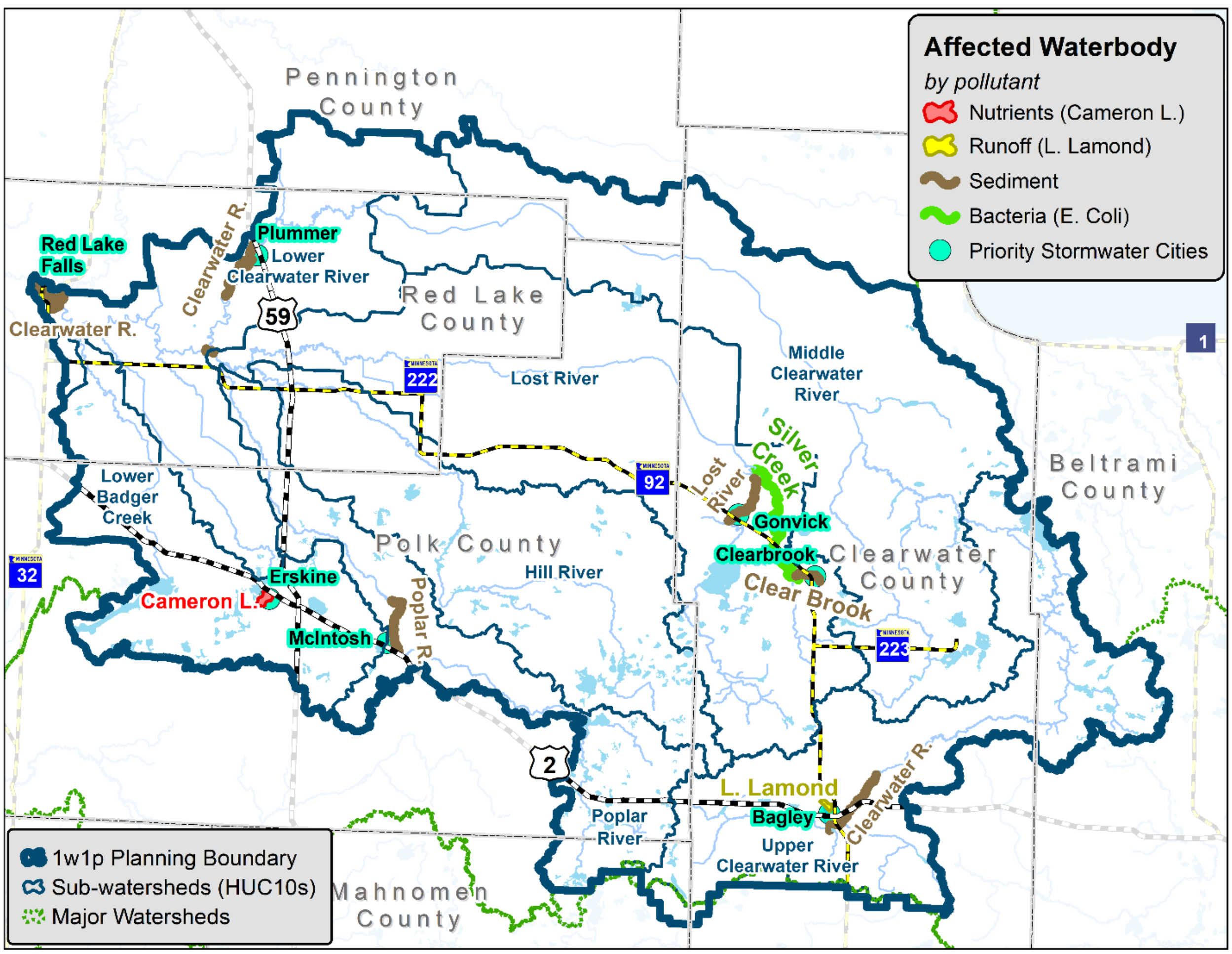


Figure 4.10. Urban areas with downstream stormwater-related impairments.

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).

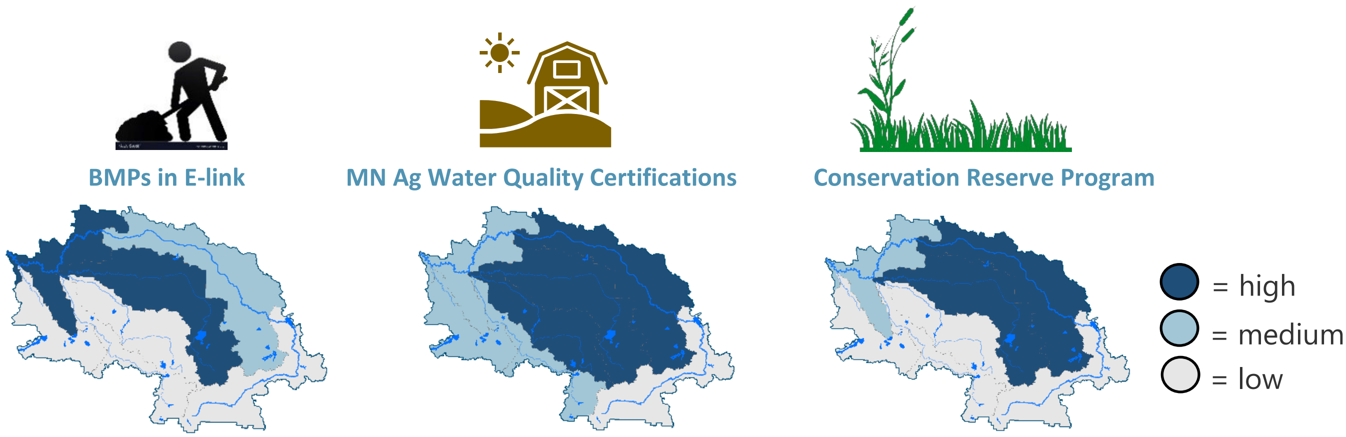


Figure 5.1. Known stewardship in the Clearwater River Watershed.

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