



**RAINY-RAPID  
WATERSHED**



# Comprehensive Watershed Management Plan





## ACKNOWLEDGEMENTS

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## WATERSHED VISION

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### WHO WE ARE

*We are an international watershed, sharing a border with Canada.*

*We support a world class fishery in the Rainy River and downstream Lake of the Woods.*

*We treasure vast peatlands that host an array of flora and fauna.*

*Past scars from ditching and pollution are showing signs of healing through lake sturgeon and Rainy River water quality recovery.*

### OUR VISION

*We envision a watershed where past scars have healed; where protection of peatlands, forests, and streams are balanced with sustainably managed agricultural land, timber, fisheries, economy and tourism, providing opportunities for all.*







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# Section 1. Executive Summary





# SECTION 1. EXECUTIVE SUMMARY

## Introduction

In 2021-2022, the Rainy-Rapid Watershed (R-RW) planning partners developed the Rainy-Rapid Comprehensive Watershed Management Plan (R-RCWMP) through the One Watershed One Plan (1W1P) 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 and soil and water conservation districts) as they work to manage the watershed's resources for the enjoyment of future generations and for maintaining a healthy local economy.

The R-RW, located along Minnesota's border with Canada, is a unique and wild area with vast peatlands and a patchwork of forests and agricultural lands. With almost no water quality impairments and 81% public land ownership, the R-RCWMP focuses on **nondegredation**.

## Plan Area

The R-RW is towards the end of the Rainy River Basin, which encompasses a total area of 27,114 square miles, 41% of which are in the United States and 59% are in Canada.

There are two major watersheds that comprise the R-RCWMP planning area in Minnesota: the Rapid River (HUC 9030007), and the western lobe of the Lower Rainy River (HUC 9030008) (Figure 1.1). The Lower Rainy River is a flow-through watershed of the Rainy River, and the Rapid River is a tributary watershed that flows into the Rainy River just east of Baudette at Clementson Rapids. The R-RW drains west into Lake of the Woods.

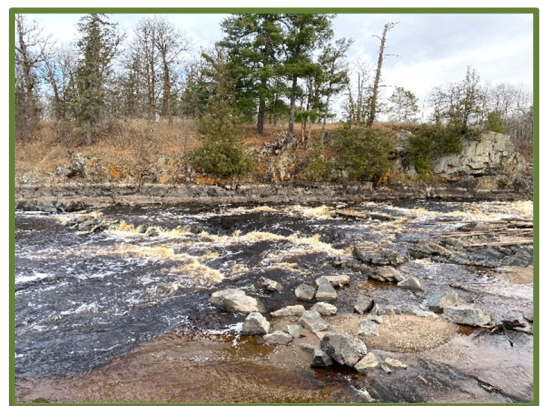
The planning area spans three counties, Lake of the Woods (65% of plan area), Koochiching (18%), and Beltrami (18%), and the Red Lake Nation (7%). The only town is Baudette, with a population of 991.

## nondegredation

non.deg.ra.da.tion

*noun*

1. Prevention of a significant change that lowers the condition of high-quality land and waters.





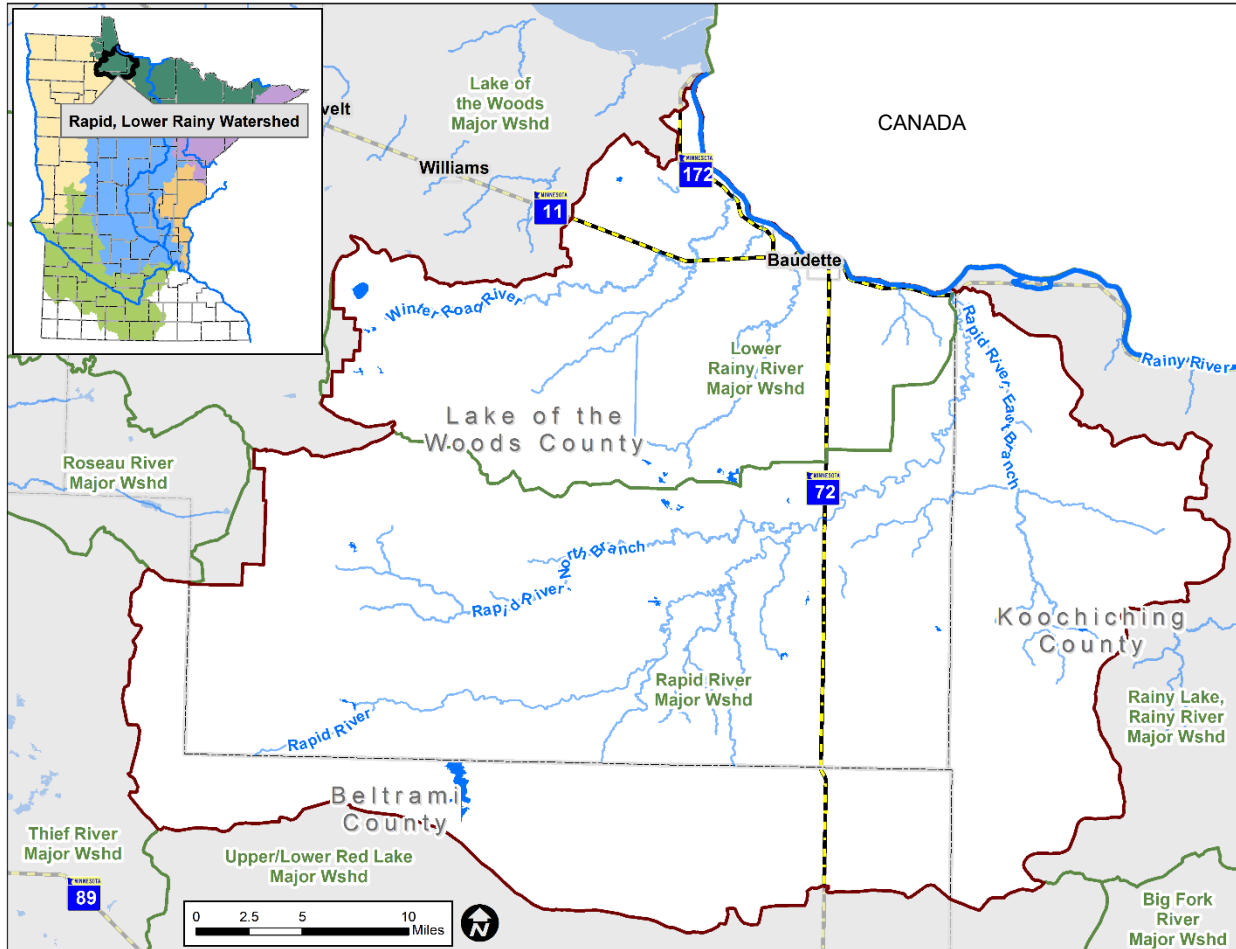


Figure 1.1. R-RW Planning Area.

## Roles and Responsibilities

The R-RCWMP was developed under a Memorandum of Agreement (MOA) between Lake of the Woods County and Lake of the Woods Soil and Water Conservation District (SWCD). Koochiching and Beltrami counties and SWCDs declined to participate because the majority of their land in this watershed is state-owned (<10% private land). The Red Lake Nation declined to participate as well.

The 1W1P process uses existing authorities, therefore two representatives from the Lake of the Woods County Board and two representatives from the Lake of the Woods SWCD Board were appointed by their respective boards to serve on the Policy Committee, the decision-making body for this plan. Lake of the Woods SWCD was the fiscal agent and plan coordinator for this project.

The plan content was developed by the Advisory Committee, which consisted of the staff from the MOA governmental units, Koochiching County, Red Lake Nation, state agencies, City of Baudette, and the Natural Resource Conservation Service (NRCS). The Steering Committee,

made up of staff from the MOA governmental units, BWSR, and consultants guided the planning process and timeline and produced the final plan.

## Public Participation

Public input was gathered to support developing the priorities determined in this plan. At the start of the planning effort in spring of 2022, an online survey was distributed, and a public open house event was held in Baudette. The online survey received 53 responses; the full report can be found in Appendix B.

The survey responses show that the public values the unique and high-quality natural resources in the watershed (Figure 1.2).

### What is the largest potential opportunity that could be fixed in your area?

1. Development pressure on rivers
2. Habitat quality for fish and wildlife
3. Unstable and degraded drainage ditches
4. Protection of unique and high-quality resources (peatlands, sturgeon, wild rice)

Figure 1.2. Responses to a public survey question in the R-RW.

## Plan Process

The R-RCWMP was developed by the planning committees throughout 2022. In the spring, subject meetings were held with the Advisory Committee and Subject Matter experts to develop the issues and brainstorm actions to address the issues. The four subjects were: 1) water quality, 2) water quantity, 3) groundwater, 4) habitat and forestry.

In the summer, the Steering Committee developed measurable goals based on the issues. In the fall, the Advisory Committee reviewed and further developed the goals and actions of the plan (Figure 1.3). The Policy Committee approved the plan content along each step.

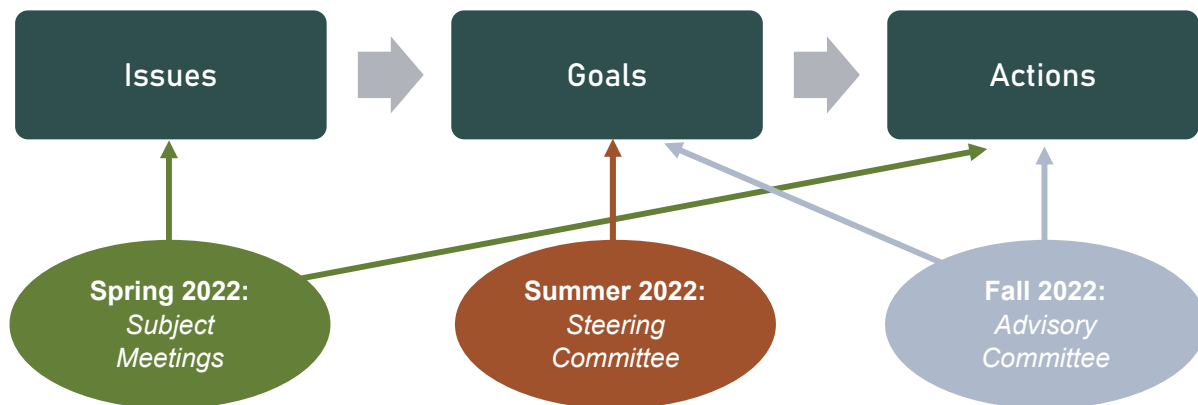








Figure 1.3. Plan development process.



## Priority Issues

Using input from the public and existing plans and studies in the watershed, the Advisory Committee and Subject Matter Experts developed issue statements at a series of subject-based meetings in spring of 2022. After the subject meetings were complete, the Steering Committee met to evaluate all the issues that were developed at the subject meetings. Some issues were combined for clarity and simplicity. The revised issues were then reviewed by the Policy Committee and approved. The finalized issues are presented in Table 1.1 and are detailed in Section 3 of this plan.

Table 1.1. Priority issues in the R-RW.

Subject	Issue Theme	Description
 Water Quantity	Altered Hydrology	Historical ditching and stream straightening altered the natural flow of surface water and groundwater, increasing flashiness and erosion, and degrading habitat.
 Water Quality	Sediment	Streambank and ditch erosion increases sediment loading and reduces water and habitat quality.
 Groundwater	Protect Groundwater from Contaminants	Groundwater needs protection.
 Water Quality	Protect Surface Water from Contaminants	Nutrient, bacteria, and chloride runoff has the potential to decrease water quality and impact aquatic recreation and aquatic life.
 Habitat & Forestry	Protection, management, and improvement of aquatic and riparian habitat	Fish and wildlife habitat needs sufficient protection and connectivity maintained in order for species to thrive and water quality to be maintained.
 Habitat & Forestry	Terrestrial Land Management	Targeted land and forest management is needed to improve forest health and habitat and provide resilience to invasive species and climate variability.



## Measurable Goals

In the summer of 2022, Measurable Goals were developed by the Steering Committee to address the priority issues. The five goals are summarized below and are detailed in Section 4 of this plan.

### Restore Hydrology

*Explore ways to reduce peak flows and restore hydrologic function of peatlands.*

Measures	Issues addressed	Example actions
No net increase in water discharge while building resiliency into projects	Altered Hydrology, Sediment, Protect Surface Water from Contaminants	Feasibility studies for ditch plug/restoration, wetland restoration, floodplain restoration

### Protect Groundwater & Drinking Water from Contaminants

*Seal unused wells and implement groundwater protection at landfills.*

Measures	Issues addressed	Example actions
Five groundwater BMPs per year	Protect Groundwater from Contaminants	Seal unused wells, BMPs at closed landfills

### Protect Surface Water from Contaminants

*Protect water bodies from contaminants such as nutrients, chloride, and bacteria.*

Measures	Issues addressed	Example actions
No net increase in pounds of phosphorus (progress towards Lake of the Woods phosphorus TMDL)	Protect Surface Water from Contaminants, Sediment	Agricultural BMPs, septic system improvements, street sweeping, stormwater management

### Protect, Manage, and Improve Habitat

*Maintain and increase habitat protection and increase forest management to improve forest health and provide resilience to invasive species and climate variability.*

Measures	Issues addressed	Example actions
1,255 acres of land protection and 30 Forest Stewardship Plans	Protection, management, and improvement of aquatic and riparian habitat, Terrestrial Land Management, Protect Surface Water from Contaminants, Protect Groundwater from Contaminants, Sediment	Forest management plans, Sustainable Forest Incentive Act, conservation easements, fish passage, habitat planting, forest stand improvement, brush management

### Stabilize Streambank, Ditch & Riparian Lands

*Stabilize streambanks and ditch banks to reduce erosion. Plant vegetative buffers adjacent to stream and ditches to further protect against erosion.*

Measures	Issues addressed	Example actions
10 miles of stream/ditch stabilized or restored	Altered Hydrology, Sediment, Protect Surface Water from Contaminants	Stream and ditch stabilization, infrastructure fixes, stabilize tile outlets, shoreline restorations



The goals of this plan have multiple benefits and are interrelated. These connections are shown in Figure 1.4.

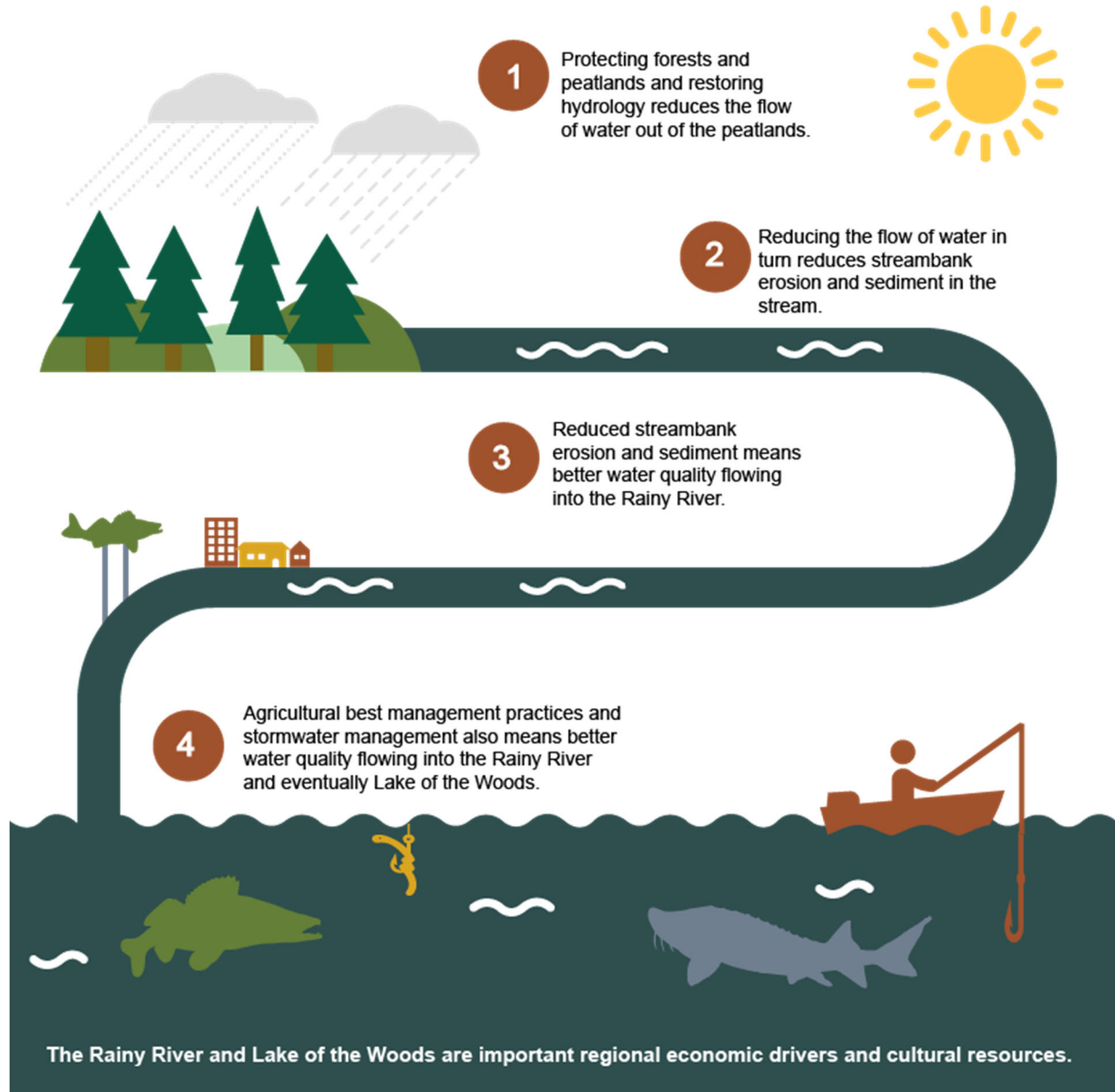


Figure 1.4. Graphic illustrating how all the plan goals are related.



## Implementation

Implementation activities and costs are presented in Section 4 of this plan. The implementation focus of the R-RCWMP is to encourage additional best management practices (BMPs) in priority areas to reach the goals. Plan practices are voluntary on private lands and will be implemented through a variety of cost-share programs, grants, and state and federal funding programs.

To implement the full extent of this plan, additional funding and capacity over current levels will be necessary. The implementation tables label actions as funding Level 2 or 3 (Table 1.2). Level 1 is the current amount of baseline funding (noncompetitive) being spent on protection, enhancement, and restoration practices and programs in the watershed. After the plan is complete, watershed partners will be eligible for Watershed-Based Implementation Funding (WBIF) administered through BWSR. This funding is noncompetitive and can be requested biennially by watershed partners to implement this plan. Level 2 includes Level 1 funding plus the WBIF and is the new operating level of the watershed after this plan is completed. Level 3 describes partner-sponsored projects or other funding sources that will help achieve plan goals.

Table 1.2. Funding levels for the R-RCWMP.

Funding Level	Description	Annual Total	10 Year Total
1	Baseline	\$260,000	\$2,600,000
2	Baseline + Watershed-Based Implementation Funding (~\$310,000/Biennium)	\$415,000	\$4,150,000
3	Other Sources (SFIA, NRCS, DNR, Lessard-Sams, etc.)	\$577,000	\$5,770,000

Existing programs will be utilized for implementing plan actions and are organized into four categories: Planned Landscape Management (“Manage It”), Protected Lands Maintenance (“Keep It”), Constructed Environmental Enhancements (“Fix It”), and Data Collection and Outreach (“Know It”) (Figure 1.5).

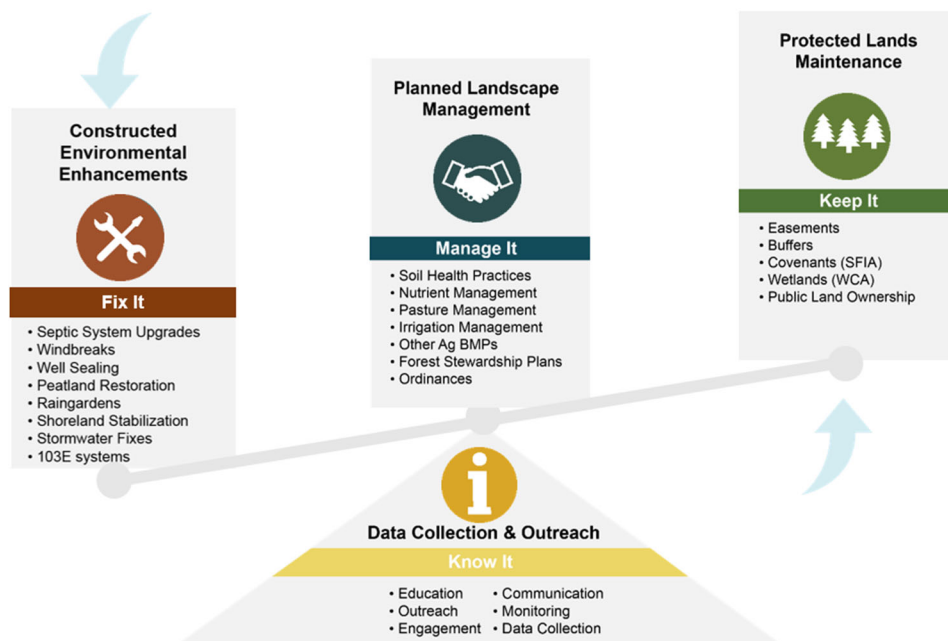


Figure 1.5. Implementation programs in the R-RW.



## Plan Administration and Coordination

The Rainy-Rapid Partnership is a collaboration of LOW County and LOW SWCD. These entities previously entered into a Memorandum of Agreement (MOA) for planning the One Watershed, One Plan to form a Policy Committee for R-RW (Appendix E). The entities will enter into a new memorandum of agreement for purposes of implementing this plan (Figure 1.6). Koochiching and Beltrami counties and SWCDs declined to participate because the majority of their land in this watershed is state-owned. The same committees that were established for planning will also continue throughout implementation.

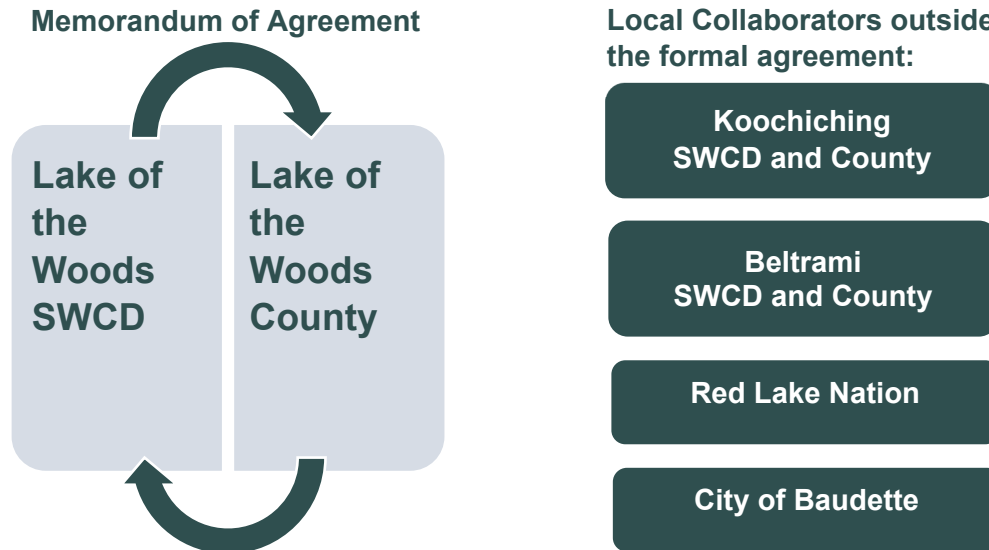


Figure 1.6. Implementation agreements and collaborators for the R-RCWMP.



# Section 2. Land and Water Resource Narrative





## SECTION 2.

# LAND & WATER RESOURCE NARRATIVE

## Introduction

The R-RW encompasses features not only unique to North America, but to the world – the vast peatlands, an international border, and world class fisheries in the Rainy River and downstream Lake of the Woods. This watershed has a lot to protect, while posing some challenges for management because of its unique topography and history.

Located in northern Minnesota, two major watersheds comprise the R-RW: the Rapid River, and the western lobe of the Lower Rainy River. The R-RW drains 1,251 square miles, and includes parts of Lake of the Woods, Koochiching, and Beltrami Counties (Figure 2.1). The main city in the watershed is Baudette.



Figure 2.1. R-RW boundary and location.



## Topography, Soils, and Geology

The R-RW was shaped extensively by repeated glaciations, and most notably the presence of Glacial Lake Agassiz, which occupied northwestern Minnesota about 11,000 years before present (Figure 2.2). Glacial lake sediment forms the base of landscapes in the region – much of these sediments then developed peat after the retreat of the glaciers. Other than peat, sand and gravel beach ridges from Lake Agassiz are common, as is glacial till from the western-sourced Des Moines Lobe glacier that has been re-worked by Lake Agassiz, either through the coating and lamination of multiple layers of lake sediment, or re-working via wave action. Thus, topography is very flat in the region, and soils are mostly organic, followed by clay lacustrine deposits and sandy beach-ridge deposits.



Figure 2.2. Glacial Lake Agassiz and remnant lakes (DNR 1997).

## Human History

The first people entered the region about 10,000 years ago, after the glaciers receded. Several cultures existed in the region from the time of the glacial retreat. In the late 17th century, the Rainy River area was home to Cree, Assiniboine, and Dakota peoples. Wild rice, waterfowl, fish (including lake sturgeon), and wildlife formed a substantial portion of the diet of local Indigenous peoples. The Ojibwe people migrated west into northern Minnesota throughout the 17th and 18th century and were the primary inhabitants of the R-RW before widespread colonization by Euro-American settlers. The first people of European descent in the areas were primarily fur trappers and traders pursuing beaver to sell in the European market.

Widespread logging of the region started in the late 19th century. In 1910, a large fire cleared much of the land. In 1908 the Volstad Act created a system whereby local citizens could force the county to dig ditches to drain their land was created through law, so more settlers came to the area to farm the region (Figure 2.3). However, the ditches did not drain the land adequately due to low slopes and the vast quantities of water, and much of the land is unsuitable for upland row-crop farming. Thus, the cost of ditching that could not be reassessed on profitable agricultural land caused a financial crisis in the region. Settlers paid for land that could not grow crops to support their households, and they would lose the land to the county. The county would then lose that tax revenue that had paid for the ditching and was left with large debts that could not be repaid. By 1927, tax delinquency in the area had reached 77% (Alsop, 2009). This is the mechanism by which the state assumed ownership of much of the land in the region as state forest; the state would pay the ditch debt, and receive a wildlife preserve in return. The legacy of the ditches continues to this day, impacting the region’s water resources and water quality, and



**19th Century**  
widespread logging  
begins.

the amount of state land located in Beltrami, Lake of the Woods, and Koochiching Counties (Figure 2.4). It is said that if this ditching was more successful, they could have drained the Red Lakes north into Lake of the Woods (local communication).

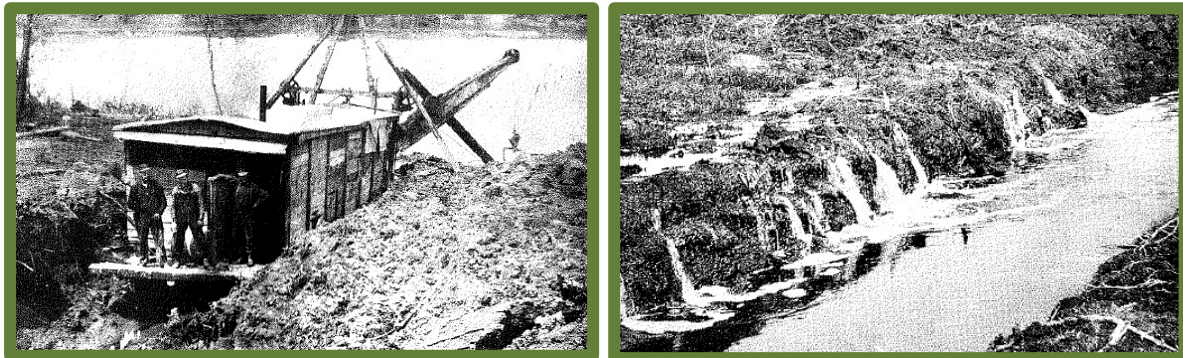


Figure 2.3. Ditch dredging in 1918 and water spilling back into a newly dug ditch (photos by Adolph Gjelhaug, source: Alsop, 2009).

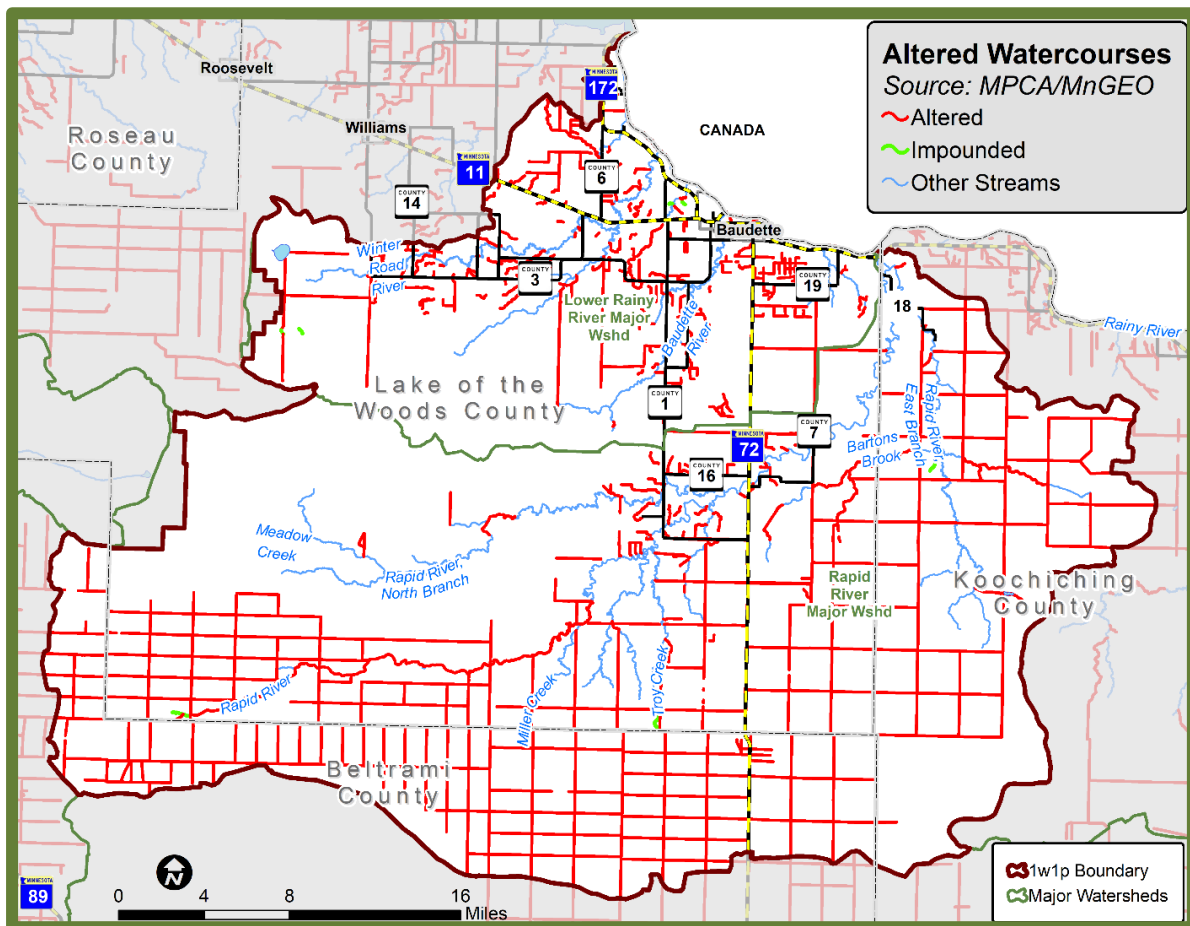


Figure 2.4. Altered watercourses in the R-RW. Red lines show the legacy of extensive ditching of the Red Lake peatlands.

## Precipitation

The R-RW receives an annual average precipitation of 25.2 inches (1991-2020), of which 5.8 inches (~23%) occurs between November and April, corresponding roughly to winter precipitation. Streamflow in the area is heavily influenced by winter precipitation dynamics. Total precipitation has increased about 0.08 inches per decade since 1895, or a total of approximately one inch (DNR 2022). As these trends continue, by 2070 the climate will look more like Osage, Iowa in terms of temperature, precipitation patterns, and seasonality. Temperatures will increase in summer and winter and precipitation will increase in winter, but decrease in summer, resulting in a hotter, drier climate (National Geographic 2022). This climate trend not only impacts native plant, tree, and animal species, but also stream flows.



## Land Cover

The R-RW is largely defined by its extensive peatlands that show up as both emergent herbaceous wetlands and woody wetlands in Figure 2.5, covering 93% of the watershed area.

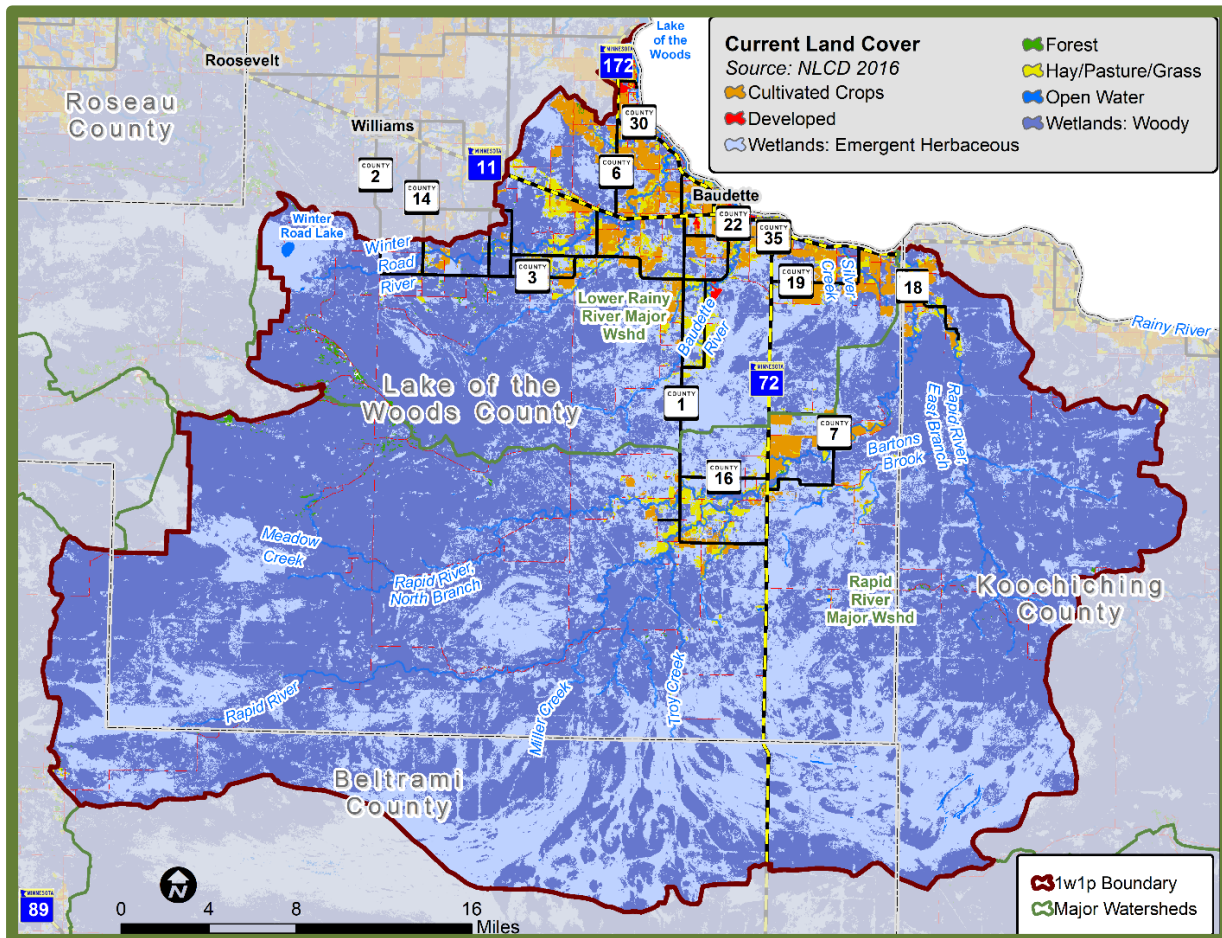


Figure 2.5. Land cover in the R-RW (NLCD 2016).



## Forests and Wetlands

Larger than Rhode Island, peatlands stretch out as an expanse of partially decayed vegetation, organic matter, and sphagnum moss. Though these peatlands are considered unproductive economically, they are ecologically unique for fish, bird and wildlife habitat, water storage, and carbon storage. The peatlands are a patterned complex unique to North America and is one of the largest continuous boreal peatlands in the contiguous United States. The slope in this area is less than 1 meter per kilometer, and 1.5-3 meters of peat lie under the surface. Past surveys have shown that this area is rich with diversity including 193 species of vascular plants and 72 bryophytes (mosses and liverworts) (Glaser et. al., 1981). Both bog and fen communities exist and are defined by their plant species, water source, and water chemistry. Along the ditches and higher ground, trees that thrive in wet soils abound including Tamarack, Black Spruce, and Cedar. Peatlands act as a large sponge, storing mass quantities of water, and are thought to be a sink for carbon due to the accumulation of peat (Rivers et al. 1998). Only 1% of the watershed area is upland forest.



**Peatlands** contain sphagnum moss, organic matter, Tamarac, Black Spruce, and Cedar trees.



Figure 2.6. Peatlands in the Red Lake Scenic and Natural Area.

## Development and Agriculture

Development is scarce in the R-RW, with only 0.6% impervious development, such as roads, homesteads, and towns (NLCD 2016). Due to the peatlands and short growing season, only 4.2% of the watershed is in agriculture, with the main crops including pasture, hay fields, soybeans, small grains, and cultivated perennials (WHAF 2022).

## Water Resources

In the R-RW, the primary streams draining to the Rainy River are the Rapid River, Baudette River, Peppermint Creek, and Winter Road River. In the Rapid River Watershed, tributaries include the Rapid River branches, Miller Creek, Chase Brook, and Troy Creek. There are no notable named lakes in the watershed, except for Winter Road Lake which was created by a dam on the Winter Road River in the headwaters of that watershed. The watershed drains northwest to Wheeler’s Point where the Rainy River reaches Lake of the Woods.

Extensive peatlands stain the surface water in the region tannin-brown but water quality is still generally high-quality water with few pollutants. The ditch network has greatly impacted the hydrology of the watershed (Figure 2.4). The fill that resulted in the ditch digging was usually deposited along the ditch bank, creating a berm, and disconnecting the diffuse water exchange. DNR studies showed that during low water levels the ditches have more impact on the





surrounding hydrology as the hydraulic gradient between the ditch channels and the surrounding peatlands is increased. This increased gradient allows for an increased discharge of water from the peatlands into the ditch channel. The spoil piles, placed alongside the ditch channels, have compacted the peat soil in some places which has in turn created a low-permeable barrier and can also disrupt the natural flow of shallow groundwater and cause upswelling on the back side of those spoil piles. Fixing these legacy ditches has proved difficult as full restoration is nearly impossible, and the introduction of clay soils as ditch plugs can bring along plants that aren't native to peatlands such as cattails (DNR 2011).

There are only three impairments in the R-RW (Figure 2.7).

- The Baudette River exceeds the Dissolved Oxygen (DO) standard, but it has been determined that the low DO readings are due to a poor site selection for monitoring and not due to land use; thus, the Baudette River is in the process of recategorization by MPCA with the EPA (MPCA 2022a). Baudette Bay is considered a sensitive resource.
- In the Rapid River, there is one impairment listed: total suspended solids (TSS) in the lower reach of the Rapid River. It has been determined that the TSS impairment is due to increased bed and bank erosion, likely attributable to the historical ditching practices (MPCA 2022b). The ditches flush an unnatural amount of water into the river, and the larger flow is erosive to the stream bed and bank. The sediment from the bank erosion builds up as it flows downstream and contributes to high TSS loads in the lower reach of the river.
- The Rainy River is impaired for mercury, which affects fish consumption, not water quality.

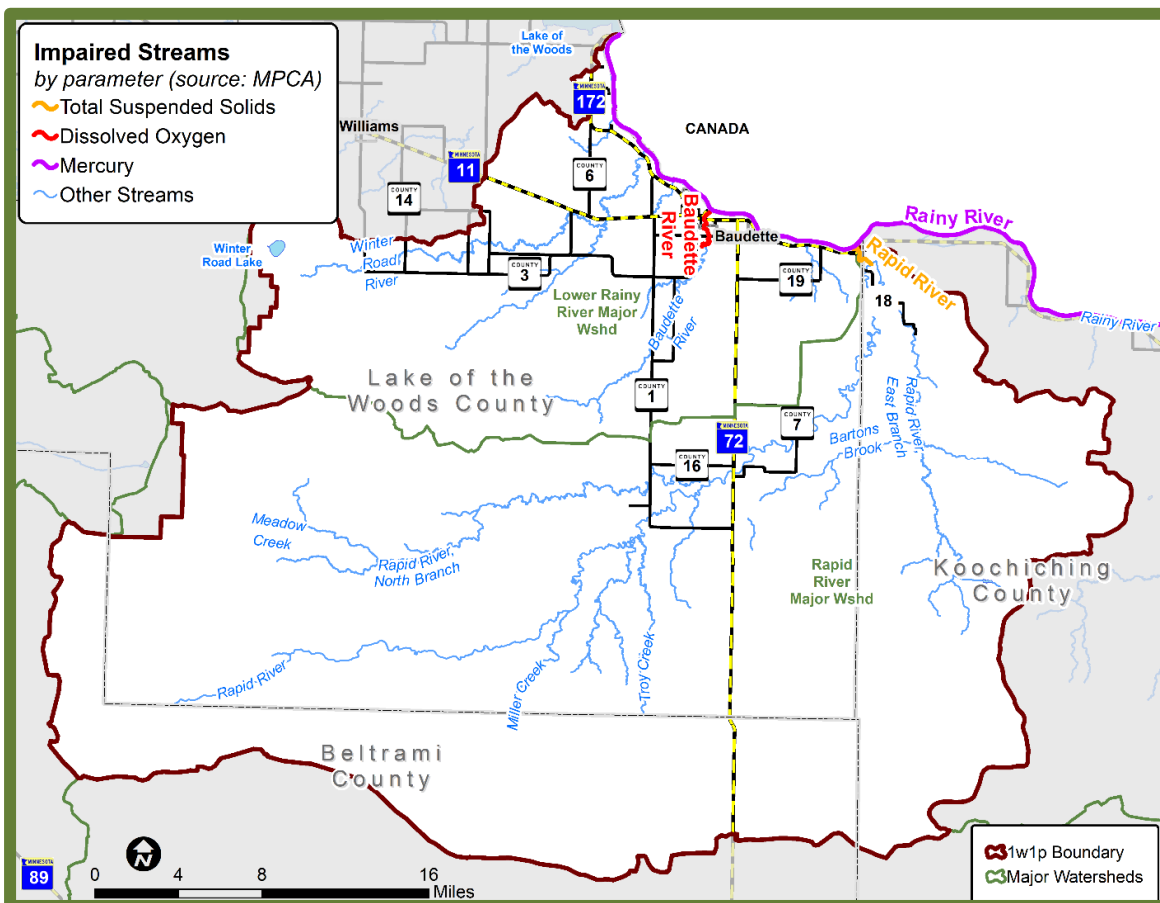


Figure 2.7. Impaired Waters in the R-RW.

Although sources of pollutants such as total phosphorus, inorganic nitrogen, and total suspended solids vary, nonpoint and point source pollution both contribute to total loads. There are five permitted point sources, defined as facilities that discharge stormwater or wastewater into a lake or stream under the National Pollutant Discharge Elimination System/State Disposal System (NPDES) permit—two in the Rapid River Watershed, and three in the Lower Rainy. There are no NPDES permitted point source feedlots in the watershed; however, there are numerous small animal operations that are not large enough to be permitted within formal systems, but still are sources of pollutants such as *E. Coli*. Sources of *E. Coli* can be a direct deposition from cattle that have access to streams, pasture runoff during storm events, and wildlife, not point sources (MPCA 2022a and MPCA 2022b).

All point sources are meeting their permitted loads for total phosphorus, although the watershed-wide estimate of phosphorus sources are 58% point sources and 42% nonpoint sources (MPCA 2022a and MPCA 2022b).

**58%** point sources.

**42%** nonpoint sources.

The Rainy River is a story of remarkable recovery. Industrial pollution from paper mills and raw sewage from cities once marred the river, hurting its fish, aquatic insects, and recreational potential. Since the Clean Water Act, pollution and sewage to the river have dramatically dropped, and the Rainy River’s water quality has greatly improved. A conduit between Rainy Lake and Lake of the Woods, the river also forms part of the border between the United States and Canada (Figure 2.8). These two countries partner to restore and protect water quality, important to the river life and the people who treasure the Rainy (MPCA 2020) (Figure 2.9).



Figure 2.8. Land area draining to the Rainy River (MPCA 2020).

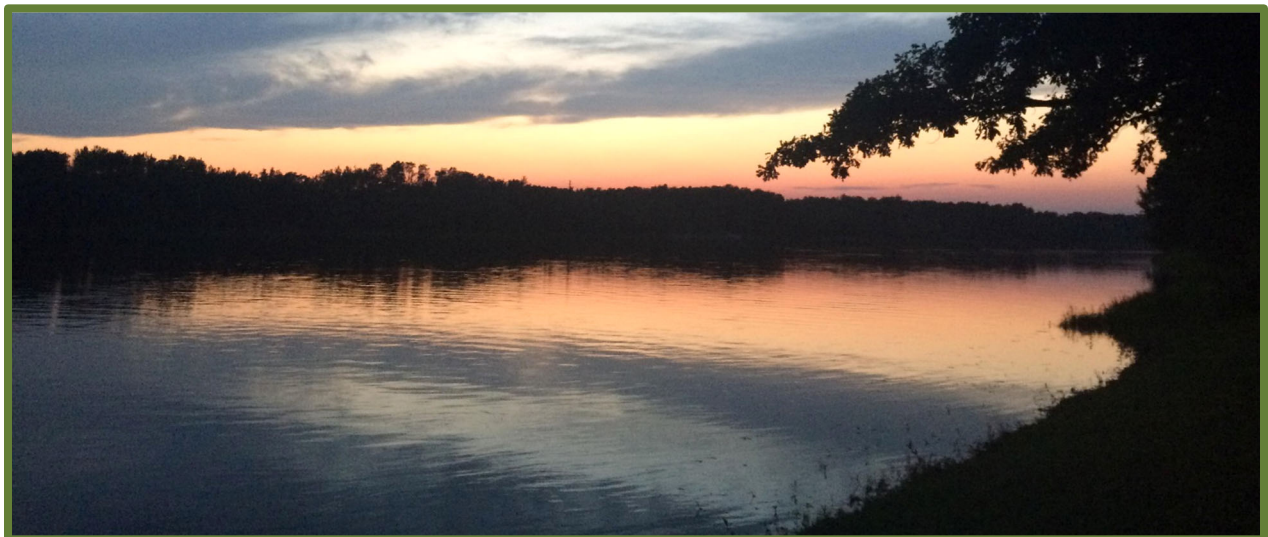


Figure 2.9. Rainy River sunset.



## Groundwater and Drinking Water

Groundwater in the region is a prominent portion of the water budget, and surface water is well-connected with groundwater. The Itasca Moraine and Beltrami Island areas act as a groundwater recharge area for regional flow, and much of the water that recharges groundwater in the Itasca Moraine either ends up in the Red Lakes or in the Rapid River and tributaries. Within the Red Lake Peatlands, most groundwater flow systems were local, and not stretched across broadly regional flow paths. This indicates that groundwater recharge to local peatlands is likely local to the peatlands, but that river flow is influenced by regional groundwater flow that is recharged elsewhere (Reeve et al., 2001).

R-RW residents in the USA obtain their drinking water from groundwater sources, and there are 32 public wells and 539 known private wells in the watershed. There are two Drinking Water Supply Management Areas (DWSMAs), and both have low vulnerability – City of Baudette and Anchor Bay Park (Figure 2.10). Nitrates in wells, which can be an indicator of land use impacts on groundwater, is not a significant issue in this watershed, however, water quality testing results indicate some private wells have nitrate levels that can impact human health. Arsenic is naturally occurring and has been found in wells in the watershed; it can be addressed by education to homeowners to get their well tested and to install arsenic reduction units in their homes. (MDH 2022).

drinking water is from **Groundwater** sources in the USA



Canadians source **drinking water** from the Rainy River

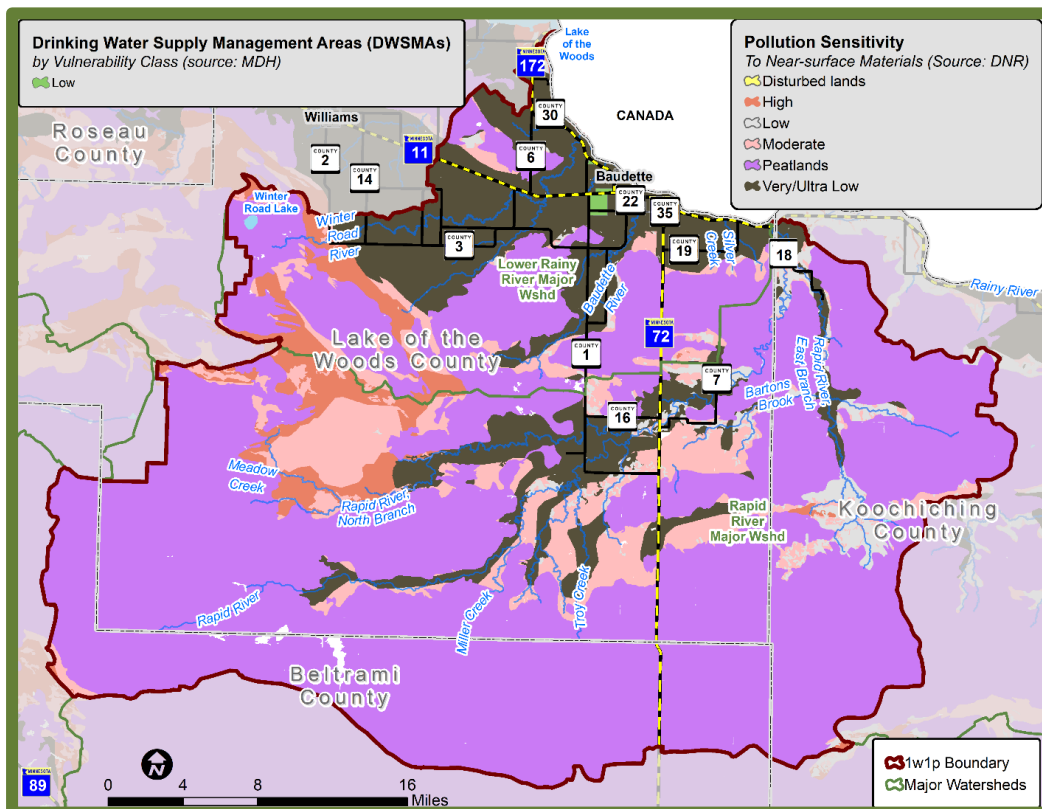


Figure 2.10. Pollution sensitivity of near-shore materials and Drinking Water Supply Management Area vulnerabilities (MDH).

## Habitat

There are a variety of unique habitats in the region, many of which are protected and open to public recreation. There are four Scientific and Natural Areas (SNAs), and parts of Pine Island, Lake of the Woods, and Beltrami Island State Forest within the Watershed. Additionally, state forest land, which is managed by the DNR, comprises a large portion of the public ownership in the region. Not only are there large mammals such as moose, white-tailed deer, and timber wolves, but also a myriad of unique species such as the short-eared owl, Wilson’s phalarope, yellow rail, and sandhill crane. The Red Lake SNA is also within the Big Bog Important Bird Area, in which 289 species of birds have been documented (DNR 2022). There is only one federally threatened species in the watershed – the Northern Long-Eared Bat. There are 41 state-listed endangered, threatened, and special concern species in the watershed: this includes 34 “special concern” species, five state threatened species, and two state-endangered species: the A Caddisfly (an insect), and the Upswept Moonwort (vascular plant).

There are numerous sites in the watersheds that are classified as “Outstanding” biodiversity significance by the Minnesota Biological Survey (Figure 2.11). Outstanding biodiversity sites contain the best occurrences of the rarest species, native plant communities and/or ecologically intact, functional landscapes.

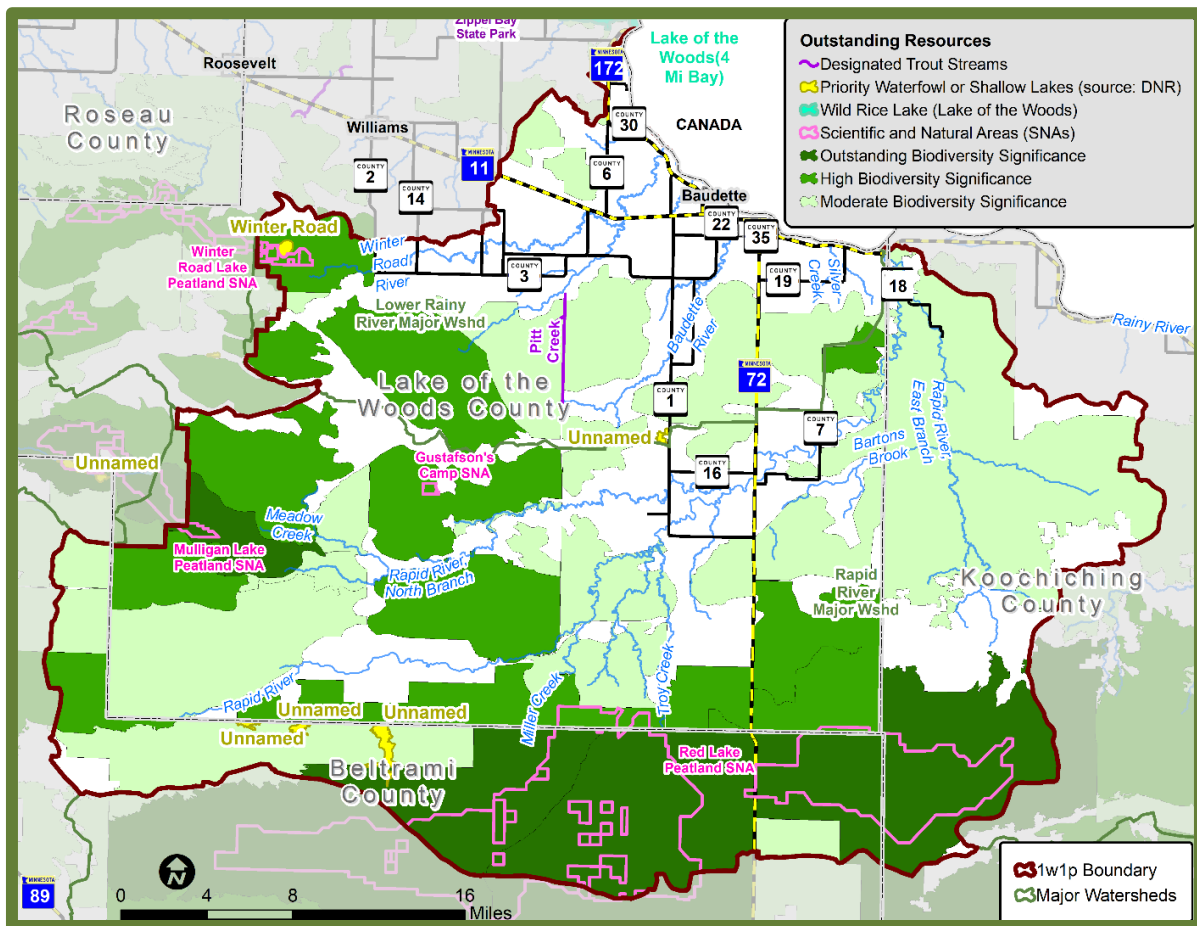


Figure 2.11. Outstanding resources and protected areas in the R-RW.



Lake sturgeon (*Acipenser fulvescens*) have historical significance in the Lake of the Woods – Rainy River region as a food source and traded commodity between the local fur traders and the Ojibwe and the Hudson’s Bay Company during the 18th and 19th centuries.

**Lake Sturgeon**  
are recovering



Establishment of a commercial fishery in 1888 caused the population to decline. By 1941, lake sturgeon were almost extinct from Lake of the Woods, and Minnesota closed the commercial fishery after this season (Carlander 1942). While the commercial fishery reduced the population, the sturgeon couldn’t recover due to pollution in the primary spawning and nursery habitat in the Rainy River (Schypp and Macins 1977). Water and habitat quality improved as effective water pollution control laws were enacted through the 1960s and into the 1970s. These improvements, along with light fishing harvests, worked in concert to allow the lake sturgeon population to begin to recover. In April 2012, monitoring results suggested the lake sturgeon population had reached short-term (5-10 year) recovery goals. The Clementson Rapids at the Mouth of the Rapid River is a unique feature for Sturgeon spawning. This continuing recovery is a major success story in the region (Heinrich & Friday 2014).

## Socio-Economic Conditions

Much of the land in the R-RW is publicly owned (81%), by state, local, or federal entities (Figure 2.12). State forest land, managed by the Minnesota Department of Natural Resources (DNR), comprises a large portion of public ownership in the region. Further, there are substantial portions of Tribal land in the Watershed owned by the Red Lake Band of Chippewa, especially in the North Branch Rapid River subwatershed.



**81%** percent of publicly owned land in the watershed.

There has been very little change in population in the R-RW, and the population in 2010 was 4,147. However, recreational properties continue to expand on the Rainy River, a popular fishing destination. Populations are generally not expected to increase significantly watershed-wide because of the publicly owned land and the peatlands, which are unable to be farmed or developed. Approximately 93% of the population is white (non-hispanic), 1% are Native American, and the remaining are multiracial, Asian, and African American (DATAUSA 2022).



**4,147** total watershed population in 2010.

The economy in the region has several industries, with manufacturing, material moving, recreation, services, healthcare and education, and forestry being large industries in the area. The median household income in Lake of the Woods, Koochiching, and Beltrami counties is around \$50,000, which is less than the Minnesota median of \$71,000. (DATAUSA 2022). Land use is not expected to change substantially in the future due to economic or other pressures.



**\$50,000** median household income.

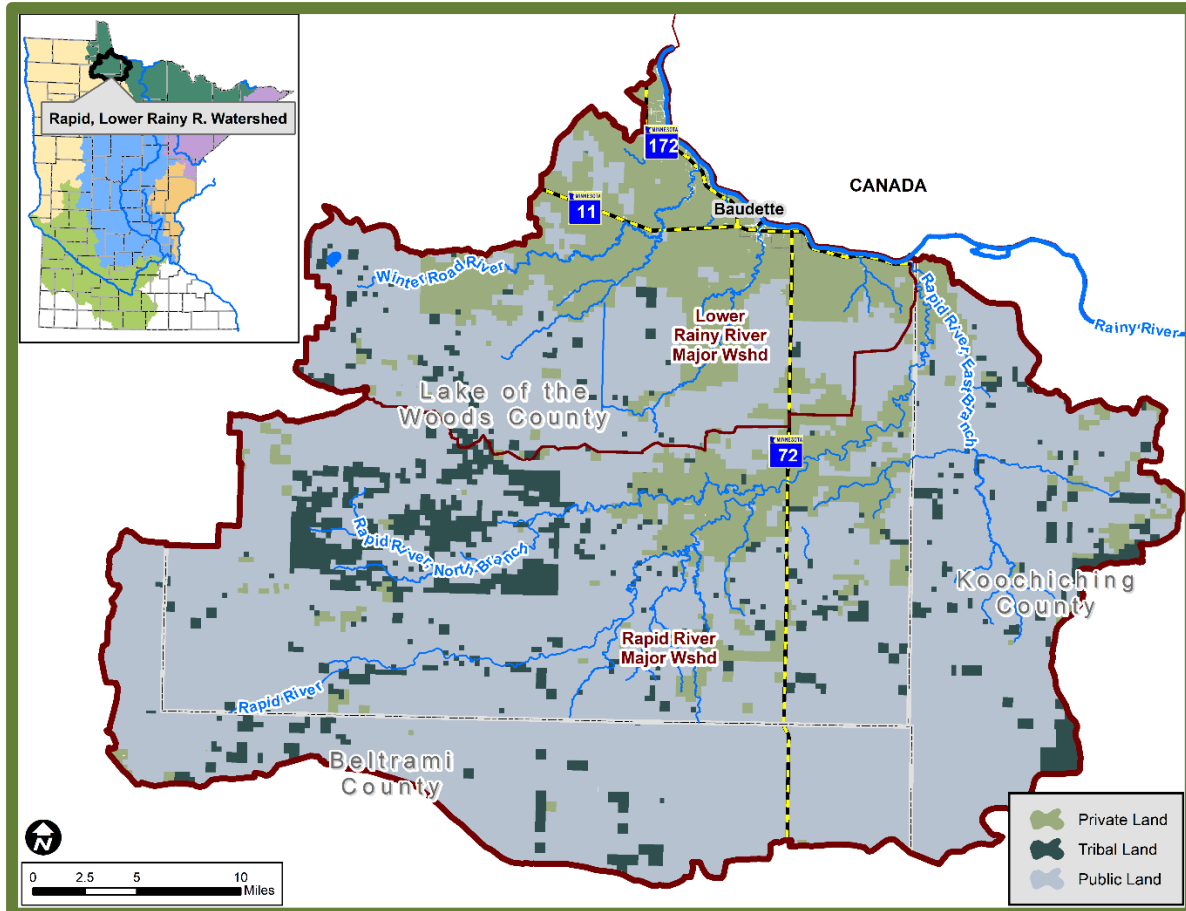


Figure 2.12. Land ownership in the R-RW.

## Conclusion

Overall, the focus for this unique and wild watershed is protection. Although legacy scars in the R-RW remain in extensive ditching of peatlands and pollutants in the Rainy River, the recovery of the sturgeon fishery in the region and improvements to Rainy River water quality are signs that past scars are healing.

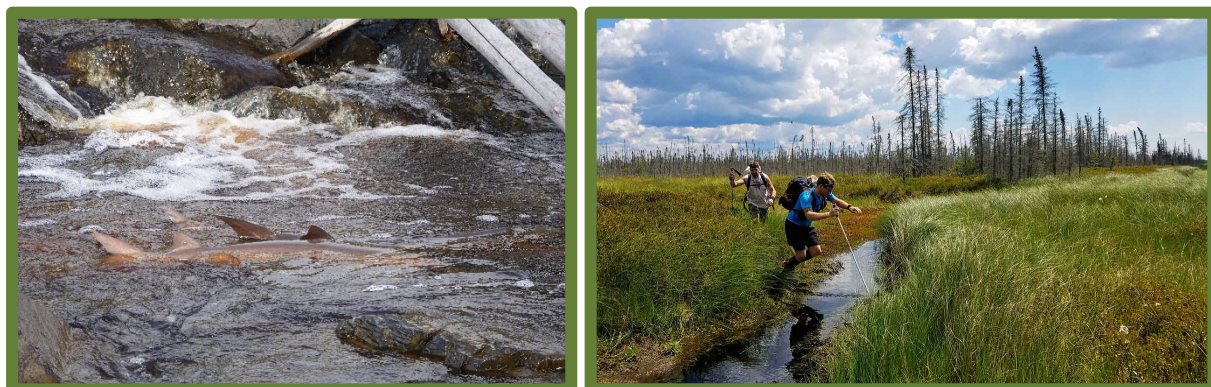


Figure 2.13. Sturgeon spawning (credit: Joyce Palm) and a ditch through the Red Lake Peatlands (credit: Gear Junkie).



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# Section 3. Priority Issues







## SECTION 3. PRIORITY ISSUES

“Issues” are concerns or opportunities that can be addressed to protect or restore natural resources in the watershed. The issues for this watershed were developed thoughtfully over the course of five months by compiling issues in existing plans and studies, gathering public input, holding subject meetings with the Advisory Committee and Subject Matter Experts, and then finalizing the issues for this plan (Figure 3.1). This plan section describes the issue gathering and prioritization process in detail.

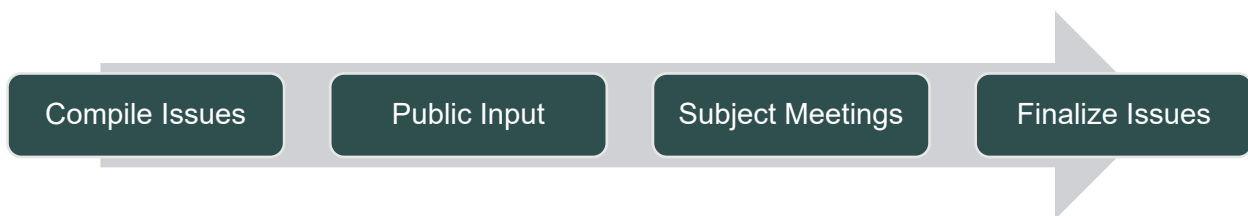


Figure 3.1. Issue gathering and prioritization process.

### Compile Issues

This planning process did not start with a blank slate, as there are numerous local and regional plans and studies that already exist for this planning area. These plans and studies provide a rich backdrop of history and data for developing this plan.

First, issues were compiled from the following published sources:

- ◆ Rapid River and Lower Rainy River Watershed Restoration and Protection Strategy reports and associated documents (Stressor Identification Report, Monitoring and Assessment Report, and Total Maximum Daily Load Report)
- ◆ The Rainy River: Study of a river’s health (MPCA)
- ◆ Lake of the Woods County Local Water Management Plan
- ◆ Koochiching County Comprehensive Local Water Management Plan
- ◆ Beltrami County Comprehensive Local Water Management Plan
- ◆ Numerous studies on local peatland dynamics (see Appendix E. References for a full list)
- ◆ Numerous studies on local sturgeon recovery (see Appendix E. References for a full list)

Additionally, issues were compiled from information gathered at the beginning of the planning process including state agency priority concern letters (MPCA, BWSR, MDA, MDH, and DNR), and a brainstorming exercise at the first Advisory Committee meeting in February 2022.

Common themes began to emerge from these diverse sources. The compiled issues were grouped into four resource categories to help frame the concerns: Water Quality, Water Quantity, Groundwater, and Habitat & Forestry.



## Resource Categories



### Water Quality

The quality of rivers, streams, and downstream resources such as Lake of the Woods.



### Water Quantity

The effects of historical human alteration of the landscape, such as ditching and channelization, and its impact on water movement.



### Groundwater

The quality and quantity of groundwater as a resource and a drinking water source.



### Habitat & Forestry

The quality and quantity of habitat for fish, wildlife, birds, and human recreation.

## Public Input

Public input was gathered from an open house in Baudette in April 2022, and an online survey.

### Open House

The open house included attendance from 20 local citizens and seven local SWCD and county staff. At the open house, participants were invited to vote with pennies on which resource category they would spend time and funding resources. The highest priority was water quality, followed by water quantity, habitat, and groundwater. Attendees were also welcomed to note any specific concern areas on maps.



### Public Survey

The public survey was another method for receiving public input on watershed issues. There were 53 responses, and a full summary report can be found in Appendix B. The top ranked issues in the public survey were development pressure on rivers, habitat quality for fish and wildlife, and unstable and degraded drainage ditches.

## Subject Meetings

In March through June 2022, subject-based meetings were held for each of the four resource categories. These meetings were attended by the Advisory Committee and subject matter experts. For example, at the Water Quantity meeting representatives from the City of Baudette, Lake of the Woods County, and Minnesota Department of Transportation attended as subject-matter experts to discuss stormwater runoff. At these meetings, participants developed the priority issues for the specific subject (resource category), and brainstormed actions that could be implemented to address the issue. Figure 3.2 outlines the full process and products for these meetings.

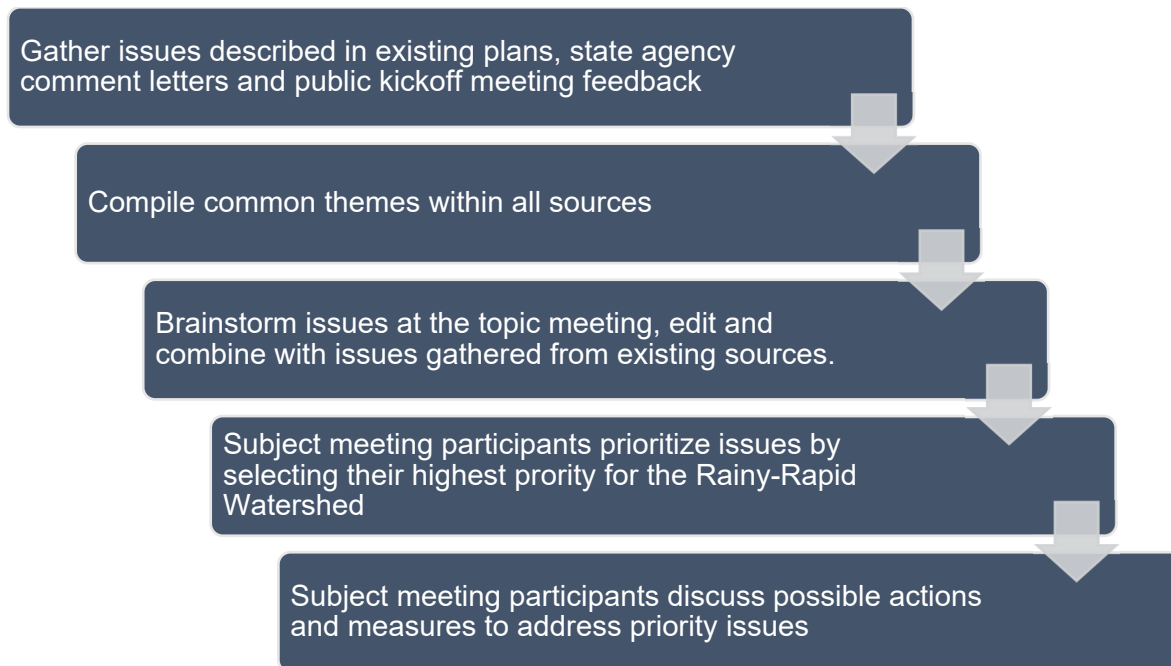


Figure 3.2. Process for subject-based meetings.






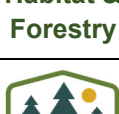
After the subject meetings were complete, the Steering Committee met in the summer of 2022 to evaluate all the issues that were developed at the subject meetings. Some issues were combined for clarity and simplicity. For example, stormwater was included in the issue addressing protection from contaminants, since stormwater can carry contaminants to surface waters. The revised issues were then reviewed by the Policy Committee and approved. The finalized issues are presented on the next page (Table 3.1).



## Finalize Issues

The final issues, covering all four resource categories, will be the focus for implementation of this plan.

Table 3.1. Priority issues for the R-RW.

Resource Category	Issue Theme	Description
 Water Quantity	<b>Altered Hydrology</b>	Historical ditching and stream straightening altered the natural flow of surface water and groundwater, increasing flashiness and erosion, and degrading habitat.
 Water Quality	<b>Sediment</b>	Streambank and ditch erosion increases sediment loading and reduces water and habitat quality.
 Groundwater	<b>Protect Groundwater from Contaminants</b>	Groundwater needs protection.
 Water Quality	<b>Protect Surface Water from Contaminants</b>	Nutrient, bacteria, and chloride runoff has the potential to decrease water quality and impact aquatic recreation and aquatic life.
 Habitat & Forestry	<b>Protection, management, and improvement of aquatic and riparian habitat</b>	Fish and wildlife habitat needs sufficient protection and connectivity maintained in order for species to thrive and water quality to be maintained.
 Habitat & Forestry	<b>Terrestrial Land Management</b>	Targeted land and forest management is needed to improve forest health and habitat and provide resilience to invasive species and climate variability.



## Emerging Issues

Resources in the R-RW are affected by many variables, including concerns that lack detail or have unknown effects on natural resources. These concerns are outlined in this section along with how the plan will address them. Due to their uncertain nature, actions to address them will vary from monitoring to accounting for benefits of other planned actions.

### Climate Variability

Temperature and rainfall are increasing throughout Minnesota and long-term planning efforts should address these changes locally. The BWSR Climate Change Trends and Action Plan outlines the most visible changes for the state:

- ◆ *Warming during winter and at night.* Minnesota has warmed overall by 2.9°F between 1895 and 2017.
- ◆ *Increased precipitation and heavier downpours.* Long-term observation sites have seen increases in 1-inch rains, 3-inch rains, and the size of the heaviest rainfall of the year.

In the R-RW weather patterns have become increasingly variable. The summer of 2021 was marked by extreme and exceptional droughts by late summer of 2021, as rated by the US drought monitor. Spring of 2022 has brought high water levels across the Rainy River Basin, exceeding the historic 2014 flood levels upstream in Rainy Lake (Figure 3.3).

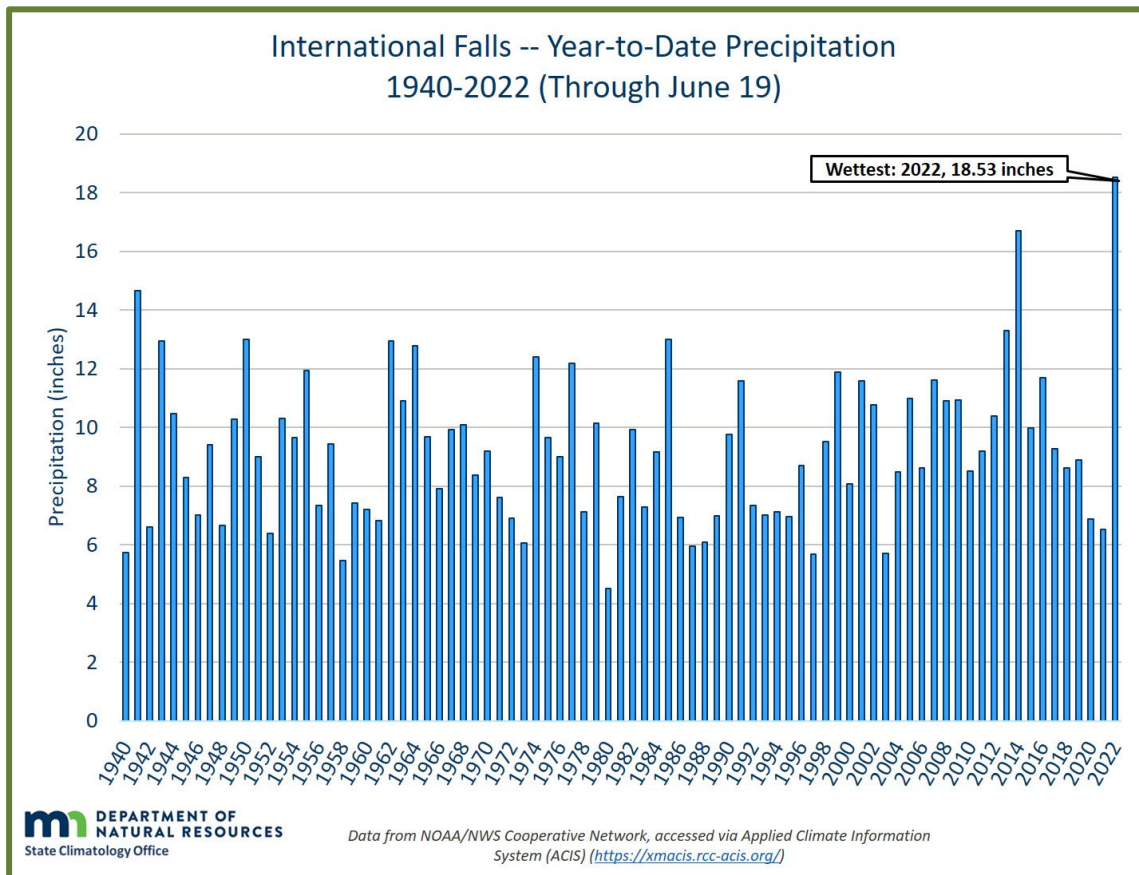


Figure 3.3. Annual precipitation in International Falls, MN.

In addition to this variability, annual average precipitation and annual average temperature are increasing across the Rapid River Watershed (Figure 3.4).

Increasing temperature and changing precipitation patterns can greatly affect water resources and other natural resources on the landscape. Increasing variability can increase erosion of upland and streambanks due to changes in vegetation and the sudden influx of water. Peak flow and baseflow conditions often happen sooner in the year with increasing temperatures as snowmelt begins earlier. These changes can create difficult conditions for native plants and animals, both terrestrial and aquatic. Warmer temperatures also mean an increased risk of invasive species migrating north, such as emerald ash borer and Eastern Larch Beetle.

Other actions in this plan will help to address and mitigate changes in temperature and precipitation. Increasing storage in the watershed and increasing carbon storage are examples of practices that can mitigate and improve the resiliency of the watershed to future increases in temperature and precipitation. Plan goals related to hydrologic restoration and stream and ditch bank stabilization are described in Section 4.

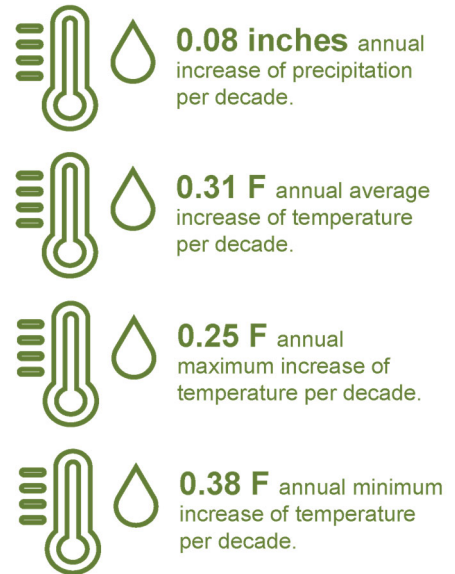


Figure 3.4. Precipitation and temperature trends in the watershed.

### Peatlands and Carbon Dynamics in the R-RW

Peatland is an extremely valuable land type, as it covers 3% percent of the land on Earth yet stores 30% of soil carbon. Most of Minnesota’s peatlands occur in the northern part of the state, which account for 12% of the peatland in the United States (Krause, 2021) (Figure 3.5).

Peatlands are a valued ecosystem due to their role in the global carbon cycle and the unique habitat that supports many rare species. Colder temperatures and wet soils slow decomposition of organic matter, so carbon is stored in peatlands over time. However, the critical role of peatlands was not always understood, in fact the saturated land was seen as a barrier to agriculture and extensive drainage efforts occurred in early 20th century. These ditches in peatlands largely failed to create land suitable for agriculture while altering its ability to store carbon (Krause, 2021).

Draining peat allows anaerobic environments to be exposed to oxygen, allowing for

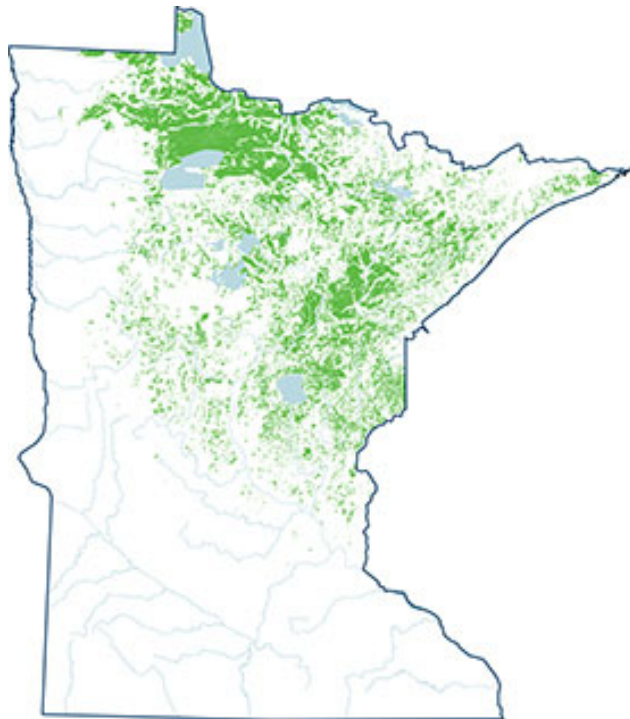


Figure 3.5. Peatland in Minnesota (DNR).

decomposition and release of carbon stored in the peat soil into the air as CO<sub>2</sub>. We now have a better understanding of the ecosystem services that peatlands offer in providing habitat, storing water, cycling nutrients, and filtering contaminants (Figure 3.6). Restoration and protection of peatland is a priority, given that the changing climate is creating conditions that may alter the balance of peatlands from storing carbon to releasing it.

As temperatures rise, the wet surface of the peat begins to dry out, reversing the anerobic conditions that stored carbon. Aerobic decomposition of peatland can turn the land from a sink of carbon to a source.

A study on the Glacial Lake Agassiz Peatland located in the R-RW reported that bogs and fens in the watershed were likely a carbon sink, storing about 12 g C/m<sup>2</sup>/year, or 19,000

kg C stored in the watershed annually (Rivers et al., 1998). However, the article acknowledges that the peatland serving as a carbon source is within the uncertainty of the model, and particularly notes the role of the water table elevation in maintaining an anaerobic environment to store carbon. If water table elevation lowers, carbon fixed from photosynthesis can be released into the atmosphere via aerobic decomposition.

A study in the Northern MN Bog Lake Peatland (south of R-RW) measured carbon dioxide flux and photosynthesis rates over 2 years and found that the peatland was a source of carbon during the first dry year, and a sink of carbon over the following year which had sufficient precipitation. The authors conclude that higher temperatures decreased photosynthesis (and therefore carbon fixation) and warned that climate change may make the carbon dynamics of the first year (peatland releasing carbon) more likely (Shurpali et al., 1995).

Research shows that peatlands in Northern Minnesota (and a specific study on the R-RW) are generally a carbon sink, but they need cold and wet conditions to maintain this carbon storage. An understanding of the key role that peatlands have in sequestering carbon and the fine balance of peatland turning from a carbon sink to source should inform management decisions in the watershed.

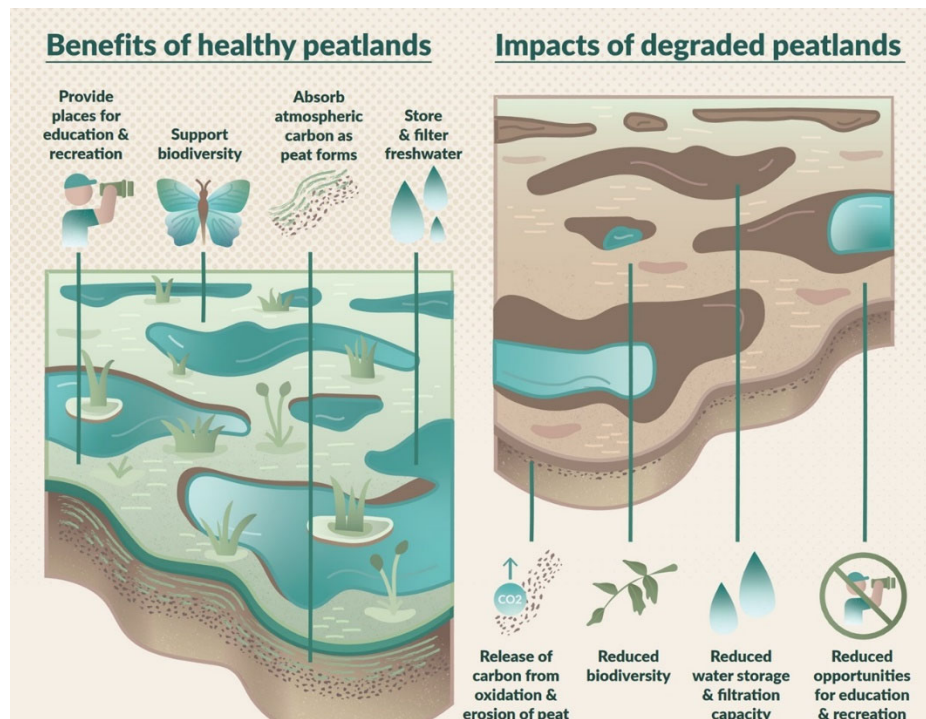


Figure 3.6. Peatland benefits and impacts of degradation.



### Invasive species

Invasive species are any non-native species that have the potential to cause ecological or economic harm, including both terrestrial and aquatic species. The biggest invasive species threats are from forest pests that may invade parts of the watershed, partly due to increasing temperatures. These potentially include new or worsening infestations of Eastern Larch Beetle, Spruce budworm, pine bark beetles, and Emerald ash borer (Figure 3.7). Wilts,



Figure 3.7. Eastern larch beetle devastating northern Minnesota tamaracks (DNR).

rusts, and other diseases may become more common, too. Other terrestrial invasive species may have localized concerns and County Ag Inspectors will continue to enforce the Minnesota Noxious Weed Law (MN Statutes 18.75-18.91). Noxious weeds are defined as any annual, biennial, or perennial plant that the Commissioner of Agriculture designates to be injurious to public health, the environment, public roads, crops, livestock, or other property. Buckthorn, wild parsnip, garlic mustard, spotted knapweed, and other invasive species are of the greatest concern in this watershed. See below for links to county ag inspector information.

- <https://www.co.lake-of-the-woods.mn.us/land-water/additional-resources/>
- <http://www.co.beltrami.mn.us/departments/esd/Noxious%20Weed%20Program.html>
- <https://www.co.koochiching.mn.us/301/Invasive-SpeciesNoxious-Weeds>

Regarding aquatic invasive species in the planning area, the Rapid River and Winter Road River are infested with Spiny water flea. In addition, Lake of the Woods downstream and Rainy Lake upstream have infestations of Zebra mussels and Spiny waterflea. Other species of concern include Starry Stonewort and Faucet Snails. Lake of the Woods, Koochiching, and Beltrami SWCDs all have their own aquatic invasive species programs in place, with a dedicated funding source. These programs will remain and this plan will aim to supplement those efforts as needed.

- <https://lakeofthewoodsswcd.org/aquatic-invasive-species/>
- <https://www.co.beltrami.mn.us/departments/ESD/Aquatic%20Invasive%20Species.html>
- <https://koochichingswcd.org/ais/>





## Mining

Mining is an important industry in Northern Minnesota with an outsized economic impact, contributing over 11,000 jobs and injecting over \$4.0 billion into the state's economy (University of Minnesota Duluth, 2020). It also can have an ecological impact particularly with high water use, as well as water quality and forest health concerns from mine drainage and tailings ponds (Frelich, 2019). Better understanding the potential impacts on aquatic and terrestrial ecosystems in the R-RW watershed is important and should be monitored closely.

## Water Level Management

Due to the R-RW's proximity to the USA-Canada border, much of the hydrology is managed by the International Joint Commission (IJC), an agency established by the two countries to best protect the area surrounding the border (MPCA 2022a). The IJC and the International Rainy-Lake of the Woods Watershed Board manage upstream hydrology, while downstream hydrology is managed by the Lake of the Woods Control Board (Canada-based). The IJC established water level regulation procedures to help best regulate water levels in the region. This includes the potential for dam modification, replacement, or removal and overall changes in water level management. These changes along the Rainy River could impact water levels throughout the region, including in the R-RW. Communication and coordination between different water level management organizations will be necessary to maintain proper water levels in the R-RW.

## Parcelization

Increased parcelization (land division) of woodlands is expected to occur in the Rainy River Basin due to increased development. This has the potential to present difficulties, as more active management will be required to complete the goals set out in this plan. Additionally, parcelization reduces biodiversity and has the ability to affect the economic and ecological health of Northern Minnesota's forests (Block-Torgerson et al., 2010). As parcelization occurs, it will become more difficult to manage these lands and developments, as well as create a dynamic, changing landscape with more uncertainty.

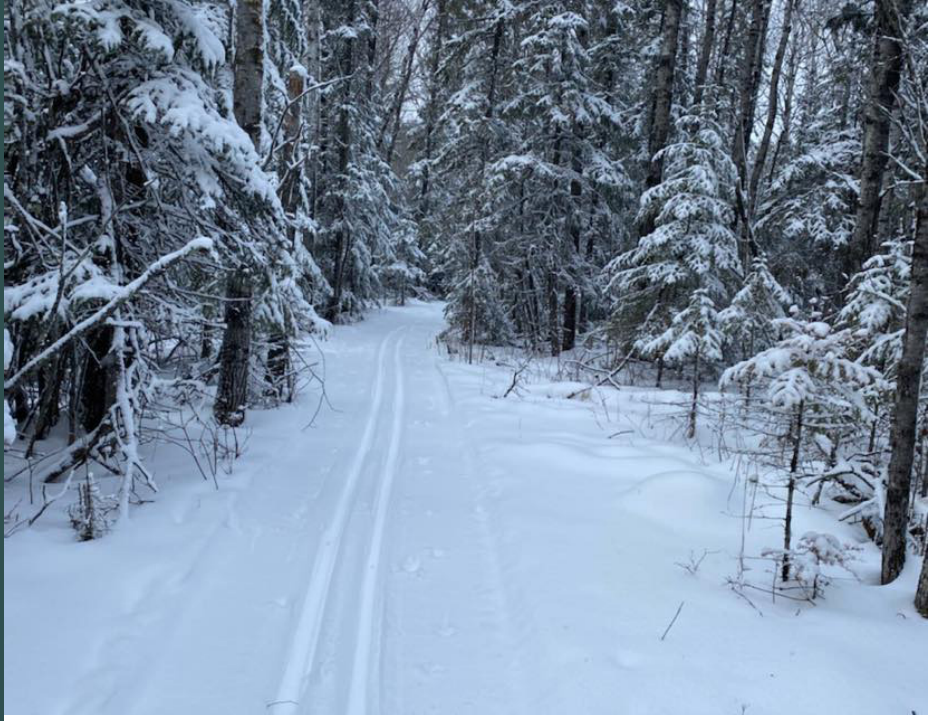
## Keep It Clean

A common concern during ice fishing season is the cleanliness of water resources and shorelines resulting from litter and human waste left on water bodies. Keep It Clean is an organization jointly created by the Lake of the Woods Tourism Bureau, the MN DNR, Lake of the Woods Soil and Water Conservation District, Roseau County Soil and Water Conservation District, and The Friends of Zippel Bay State Park to promote cleanliness at Lake of the Woods, a common spot for anglers in the winter months. The campaign has also spread to other lakes such as Upper Red Lake and Mille Lacs. As winter use of the Rainy River and Lake of the Woods continues to grow, increased numbers of anglers may increase the amount of garbage to be left on the ice. Continuing to support the Keep It Clean program and monitor increased use of these water bodies during winter will be important moving forward.

## Rainer Port and Rail Traffic Through Watershed

The rail traffic port at the Rainer Railroad Bridge is one of the busiest ports for rail freight imports in the United States. These trains have the potential to carry hazardous materials and oil, and with it, a potential for spills that could impact the Rainy River. This area should have greater planning for potential spills at the port that may have an impact downstream.

# Section 4. Goals and Implementation





## SECTION 4. GOALS AND IMPLEMENTATION

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Goals and Implementation are the culmination of the planning process, bringing together the identification of issues in the watershed, the goals that planning partners created to make progress towards addressing the issues, and implementing the actions to achieve the goals. In this plan, the actions are organized by goal, so this section combines the goals and actions with the following format:

1. Measurable Goal fact sheet;
2. Map showing where implementation will be targeted; and
3. Targeted Implementation Schedule including actions, timelines, responsibilities, and costs.

### Measurable Goals

Measurable Goals identify the desired change in the resource of concern and indicate how progress will be measured. Goals are developed to address all the issues, although it is not a one-to-one process as a single goal can address multiple issues. The quantity of how much progress implementation can make toward goals and changes to the resource condition are determined with models and data analysis. Some goals such as *Protect Groundwater and Drinking Water from Contaminants* were determined by measuring past accomplishments. Other goals such as *Restore Hydrology* and *Protect Surface Water from Contaminants* were determined using a computer model simulation (Hydrological Simulation Program – FORTRAN Scenario Application Manager [HSPF SAM]).

The measurable goals were developed by the Steering Committee during the summer of 2022, using information developed at the Advisory Committee meetings in the spring. They started with general concepts, and then became measurable when data and analyses were agreed upon for measuring the goals.

This section describes each goal along with the following items.

- ◆ **Description:** The basis for the goal and how it will be addressed in implementation.
- ◆ **Issues Addressed:** Which issues this goal addresses.
- ◆ **Metrics:** How progress towards this goal will be measured.
- ◆ **Outcomes:** The big picture outcomes achieved by this goal in laymen's terms.
- ◆ **Priority Subwatersheds:** A map showing the general area where work for this goal will be focused (highlighted in navy blue).
- ◆ **Goals:** The short-term goal is the quantity of how much progress will be achieved during the 10-year plan. The desired future condition is the long-term outcome we are striving to attain in the resource, regardless of the time frame.
- ◆ **Targeting Map:** The specific locations that actions will be targeted for achieving the goal.



There are five measurable goals in this plan, and they are outlined below:

### Restore Hydrology

*Explore ways to reduce peak flows and restore hydrologic function of peatlands.*

Measures	Issues addressed	Example actions
No net increase in water discharge while building resiliency into projects	Altered Hydrology, Sediment, Protect Surface Water from Contaminants	Feasibility studies for ditch plug/restoration, wetland restoration, floodplain restoration

### Protect Groundwater & Drinking Water from Contaminants

*Seal unused wells and implement groundwater protection at landfills.*

Measures	Issues addressed	Example actions
Five groundwater BMPs per year	Protect Groundwater from Contaminants	Seal unused wells, BMPs at closed landfills

### Protect Surface Water from Contaminants

*Protect water bodies from contaminants such as nutrients, chloride, and bacteria.*

Measures	Issues addressed	Example actions
No net increase in pounds of phosphorus (progress towards Lake of the Woods phosphorus TMDL)	Protect Surface Water from Contaminants, Sediment	Agricultural BMPs, septic system improvements, street sweeping, stormwater management

### Protect, Manage, and Improve Habitat

*Maintain and increase habitat protection and increase forest management to improve forest health and provide resilience to invasive species and climate variability.*

Measures	Issues addressed	Example actions
1,255 acres of land protection and 30 Forest Stewardship Plans	Protection, management, and improvement of aquatic and riparian habitat, Terrestrial Land Management, Protect Surface Water from Contaminants, Protect Groundwater from Contaminants, Sediment	Forest management plans, Sustainable Forest Incentive Act, conservation easements, fish passage, habitat planting, forest stand improvement, brush management

### Stabilize Streambank, Ditch & Riparian Lands

*Stabilize streambanks and ditch banks to reduce erosion. Plant vegetative buffers adjacent to stream and ditches to further protect against erosion.*

Measures	Issues addressed	Example actions
10 miles of stream/ditch stabilized or restored	Altered Hydrology, Sediment, Protect Surface Water from Contaminants	Stream and ditch stabilization, infrastructure fixes, stabilize tile outlets, shoreline restorations





## Targeted Implementation Schedule

The Targeted Implementation Schedule outlines the actions that will be taken during implementation of the plan to achieve each goal, who will do them, where they will be targeted, and how much it will cost. Funding is summarized in three categories (Table 4.1). Each action in the Targeted Implementation Schedule has a funding level associated with it. Sometimes an action has two funding levels. An example of two funding levels is if the project is funded with both state and federal funding sources.

Table 4.1. Funding levels in the R-RW.

Funding Level	Description	Annual Total
1	Baseline	\$260,000
2	Baseline + Watershed-Based Implementation Funding (~\$310,000/Biennium)	\$415,000
3	Other Sources (SFIA, NRCS, DNR, Lessard Sams, etc)	\$577,000

The implementation of this plan will take coordination between watershed partners and multiple funding sources. Implementation is a balancing act between planned landscape management (“Manage It”), protected lands maintenance (“Keep It”), constructed environmental enhancements (“Fix It”) and data collection and outreach (“Know It”). Each action in the Targeted Implementation Schedule has an Implementation Program associated with it (Figure 4.1).

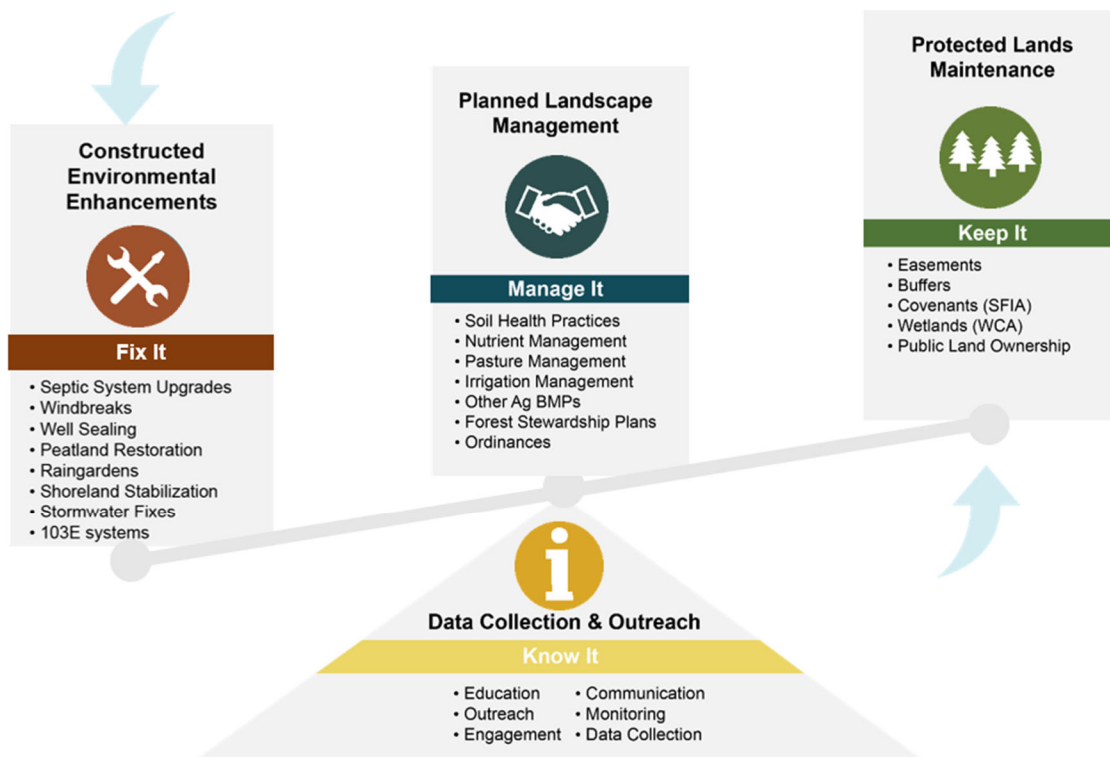
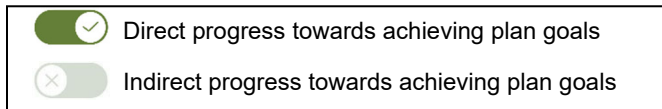


Figure 4.1. Implementation Programs in the R-RW.

Each action in the Targeted Implementation Schedule has a 10-year output associated with it. Some actions make direct progress towards goals and some actions make indirect progress. For example, a hydrologic restoration project makes direct progress towards the Restore Hydrology goal, which is measured in acre-feet of water volume. The feasibility study to implement a hydrologic restoration project does not make direct progress towards the goal but is necessary for achieving the goal. Direct and indirect progress is noted in the Targeted Implementation Schedule with toggle bars shown below.



The number of practices, costs, and locations in the Targeted Implementation Schedule represent a best-case scenario for planning. Due to voluntary participation, field verification, and funding availability, prioritized projects may not be feasible, in which case the next highest priority project will be targeted. In addition, projects may emerge that were not identified in the Targeted Implementation Schedule. These projects will still be pursued if environmental and economic benefits are comparable to those identified in the Targeted Implementation Schedule.

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

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



## Multiple Benefits

The goals of this plan have multiple benefits and are interrelated (Figure 4.2). Work in the upstream peatlands, agricultural lands, and City of Baudette contribute to better water quality and habitat for important fisheries such as Lake Sturgeon and Walleye in the Rainy River and Lake of the Woods. In addition, management of forests and public lands enhances wildlife and bird habitat, landscape resilience, and carbon storage.

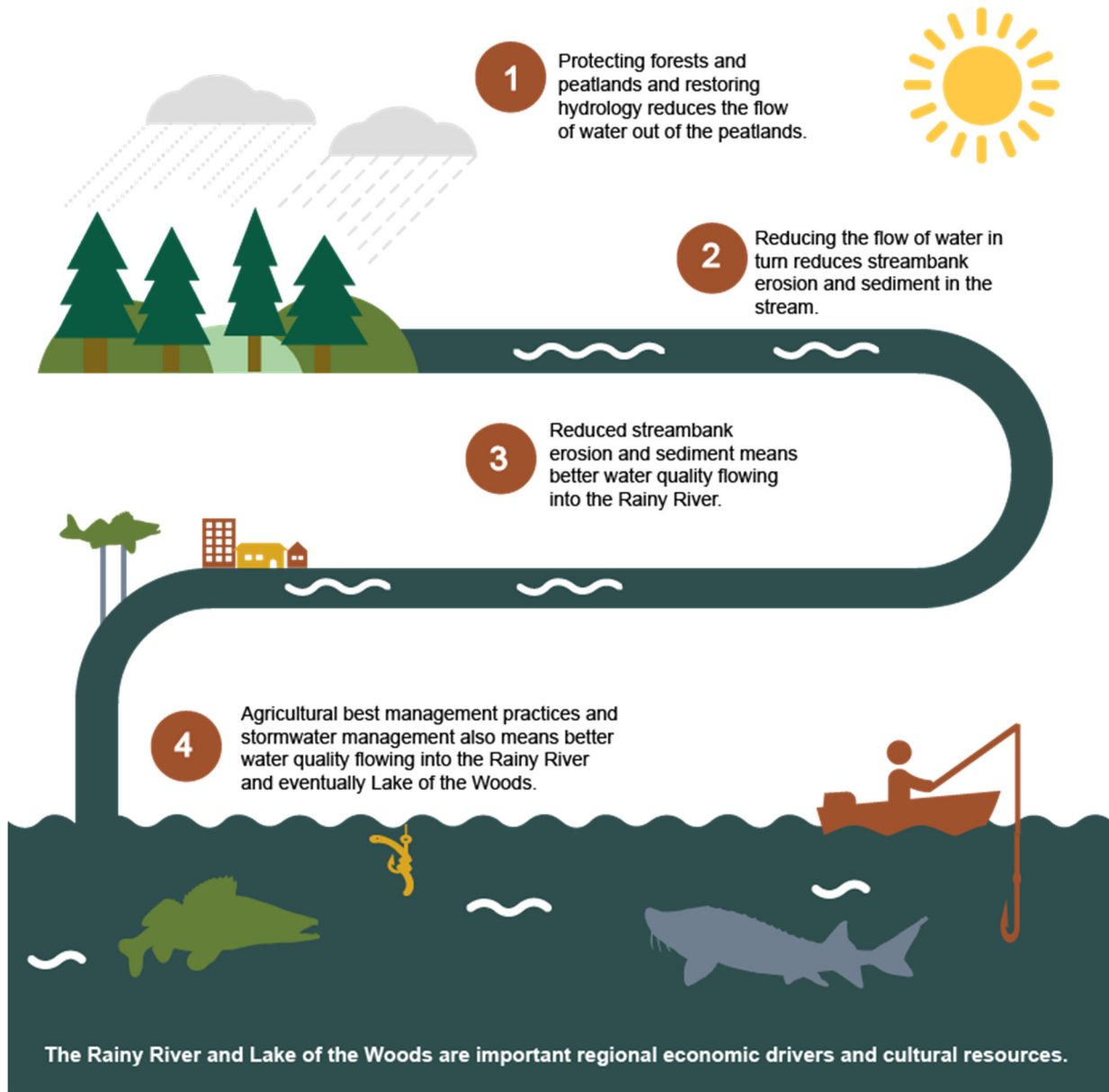


Figure 4.2. Infographic of how the plan goals are related.



## GOAL: RESTORE HYDROLOGY

*Explore ways to reduce peak flows and store more water in the peatlands.*



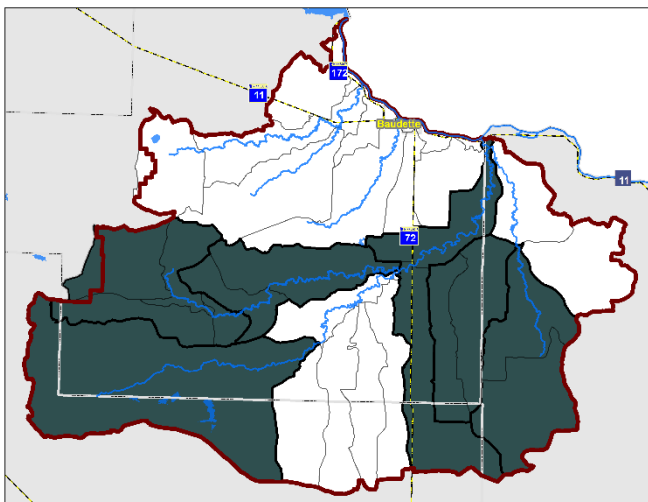
### Description

The prolific ditching efforts that took place in the early 1900's failed to create lands conducive to agriculture, however the scars of those ditches remain to this day. While they did not create conditions for agriculture production, they did cause altered hydrology within the watershed, including partially drained and degraded wetlands, altering the natural flow of water, increased flashiness within the system after rain events, and erosion and sedimentation due to increased inputs into streams and ditches.

Restoring the altered hydrology may include a number of activities, including strategic ditch filling or ditch plugging to remove the channel influence and stream re-meanders to slow the transmission of water movement in the system. This will create areas of increased water storage and retention within restored wetland areas and wildlife habitat improvements to the watershed.

### Priority Subwatersheds

Priority subwatersheds shown in navy blue were determined using HSPF SAM Model (see Figure 4.3).



### Issues Addressed

- ◆ Altered Hydrology
- ◆ Sediment
- ◆ Protect Surface Water from contaminants

### Metrics

- ◆ Acres of restored peatland
- ◆ Acre-feet of increased water storage within the watershed

### Outcomes

- ◆ Healthy wetlands that retain more water for longer
- ◆ Healthy streams with reduced peak flows
- ◆ Improved wildlife habitats
- ◆ Decreased erosion
- ◆ Increased carbon storage

### Goals

#### Short Term Goal

300 acre-feet of temporary storage to reduce peak flows through peatland restoration in the Rapid River Major Watershed.

#### Desired Future Condition

1,000 acre-feet of temporary storage to reduce peak flows through peatland restoration and no increase in discharge while building resilience into future projects.





## Targeting Map

Priority subwatersheds for hydrologic restoration were determined using the HSPF SAM model to find out which subwatersheds contribute the most flow to the Rapid River outlet (Figure 4.3). Then a modeling scenario simulating restoration projects (disconnecting 5% of the area of each subwatershed) showed that the Upper Rapid River and Middle East Fork subwatersheds resulted in the best hydrologic benefits (Tier 1, Table 4.2). The full modeling scenario can be found in Appendix C. Targeted focus areas for peatland restoration potential are highlighted in red. These areas need additional ground truthing for project feasibility and land ownership.

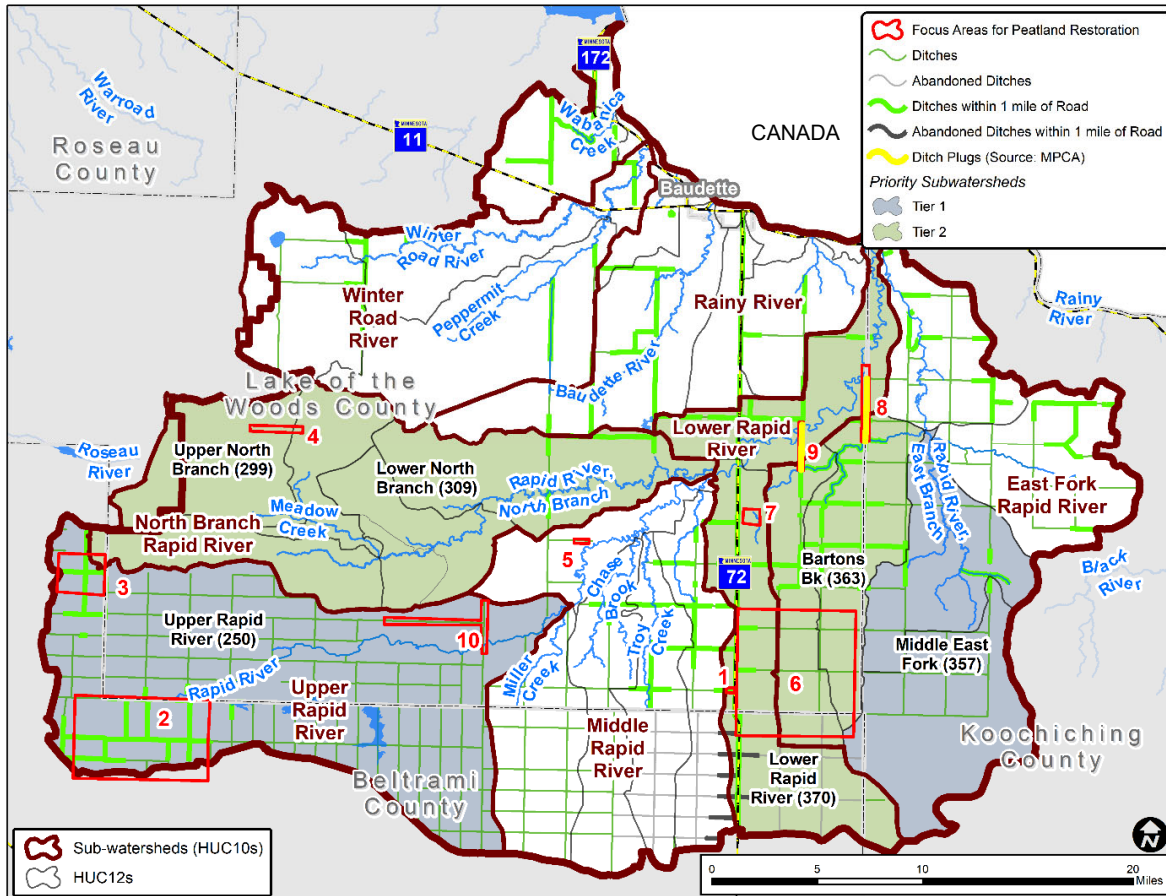












Figure 4.3. Priority subwatersheds for hydrologic restoration.

Table 4.2. Storage benefits and peak flow reductions for restoring 5% of the area in each subwatershed (disconnecting 5% of the area of each subwatershed that would disable the ditch and return the hydrology to more natural conditions). Full scenarios are detailed in Appendix C.

Subwatershed	Potential Storage Benefit	Peak Flow Reduction (%)
<b>Upper Rapid River</b>	<b>1,281 acre-feet</b>	<b>0.6%</b>
<b>Middle East Fork</b>	<b>1,062 acre-feet</b>	<b>0.6%</b>
Lower Rapid River	682 acre-feet	0.4%
Upper North Branch	675 acre-feet	0.4%
Barton's Brook	562 acre-feet	0.4%
Lower North Branch	402 acre-feet	0.2%

# GOAL: RESTORE HYDROLOGY

What			Where	Who	When					Tracking	Cost	
Action	Program	10-year Outcome	Priority Areas	Lead/ Supporting Entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Output for goal tracking	Funding Level	Total 10-year Cost
<b>Target areas for peatland or hydrologic restoration</b> through feasibility studies.		One feasibility study	Figure 4.3	<b>County, DNR, SWCD</b>	●	●	●				2	\$80,000
<b>Conduct a pilot project</b> to restore peatlands and/or hydrology based on feasibility studies.		Implement a pilot project that restores 300 acre-feet of temporary storage to reduce peak flows.	Figure 4.3	<b>County, DNR, SWCD</b>			●	●	●		2	\$400,000
<b>Evaluate the feasibility of re-meandering channelized stream reaches</b> through floodplain reconnection, stream and oxbow restoration.		One feasibility study	Rapid River Watershed	<b>DNR, SWCD, County</b>				●	●		3	\$80,000
<b>Target flow monitoring</b> in priority areas for hydrologic restoration.		Obtain data needed to track progress	Watershed-wide	<b>MPCA, DNR, SWCD, County</b>	●	●	●	●	●		3	\$10,000
<b>Level 2 Funding Sources: County, SWCDs, City, BWSR</b>											<b>Total</b>	<b>\$480,000</b>
<b>Level 3 Funding Sources: DNR, MPCA, Lessard Sams, LCCMR</b>											<b>Total</b>	<b>\$90,000</b>

-  Direct progress towards achieving plan goals
-  Indirect progress towards achieving plan goals





# GOAL: PROTECT GROUNDWATER AND DRINKING WATER FROM CONTAMINANTS



*Seal unused wells and implement groundwater protection at landfills.*

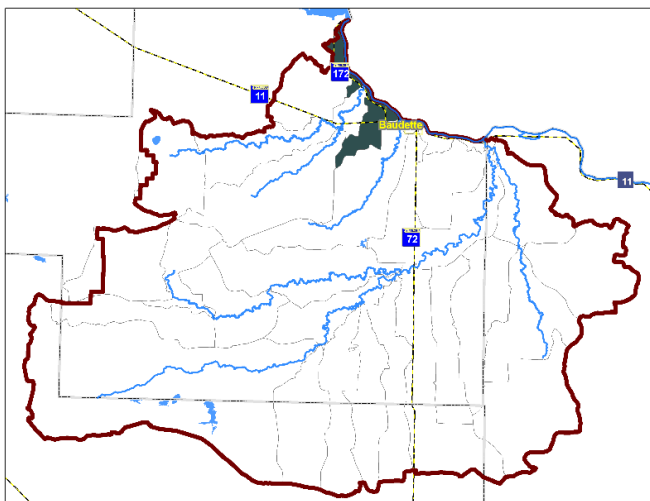
## Description

Groundwater is vulnerable to contamination from many sources, including agricultural runoff, stormwater, and landfill contaminations.

The interface of surface water and groundwater in the R-RW is highly intertwined due to the presence of the high water table in the peatlands. An additional contributor is the expansive networks of ditching that likely disturbed the barrier between the surface water and groundwater. Groundwater sources can be protected by implementing best management practices within and adjacent to landfills and sealing unused wells within the watershed.

## Priority Subwatersheds

Priority subwatersheds shown in navy blue are where the greatest risk of groundwater contamination exists. They were determined using MDH and county data (Figure 4.4).



## Issues Addressed

- ◆ Protect Groundwater from Contaminants

## Metrics

- ◆ Unused wells sealed
- ◆ Number of groundwater BMPs

## Outcomes

- ◆ Eliminate contaminations from entering groundwater
- ◆ Safe drinking water

## Goals

### Short Term Goal

Five groundwater BMPs per year, such as sealing unused wells and BMPs at closed landfills.

### Desired Future Condition

All unused wells sealed and landfills eliminating all risks to groundwater.



## Targeting Map

Sealing unused wells will be implemented watershed wide. Other groundwater and drinking water best management practices will be targeted in the DWSMAs and landfills (Figure 4.4). The DWSMAs in this planning area are classified by the MDH as low vulnerability because they are protected by geology.

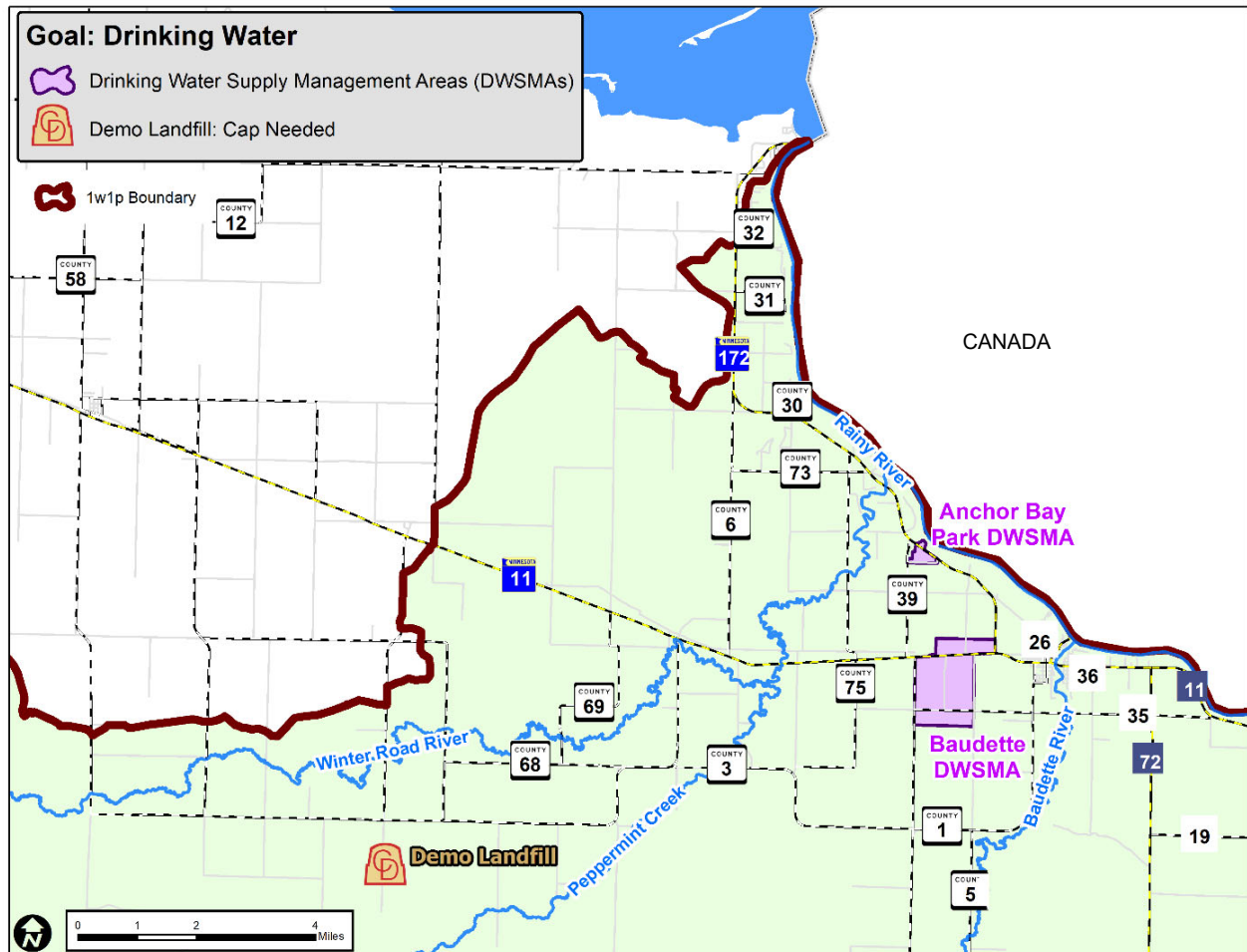














Figure 4.4. Targeted areas for drinking water protection.



## GOAL: PROTECT GROUNDWATER AND DRINKING WATER FROM CONTAMINANTS

What			Where	Who	When					Tracking	Cost	
Action	Program	10-year Outcome	Priority Areas	Lead/ Supporting Entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Output for goal tracking	Funding Level	Total 10-year Cost
<b>Seal unused wells</b> by continuing the SWCD's existing cost share program and finding ways to increase participation.		Five wells sealed per year average (50 total)	Watershed-Wide	SWCD, MDH	●	●	●	●	●		2	\$30,000
<b>Screen private wells for contaminants</b> - continue current annual bacteria/nitrate clinic and add contaminants of concern such as arsenic.		Sponsor one well testing clinic per year, provide testing kits at SWCD	Watershed-Wide	SWCD, MDH	●	●	●	●	●		2	\$10,000
<b>Implement landfill BMPs</b> to reduce volatile organic carbons, boron, magnesium, and nitrate levels in groundwater.		Complete demolition landfill cap	Demo Landfill (Figure 4.4)	County, MPCA		●	●				2 3	\$225,000 \$425,000
<b>Remediate contaminated groundwater and soil</b>		Complete projects	Demo Landfill (Figure 4.4)	County, MPCA		●	●				2 3	\$50,000 \$50,000
<b>Implement BMPs in DWSMAs</b> that will protect drinking water and groundwater.		Two BMPs	DWSMAs	City of Baudette, MPCA, SWCD, NRCS				●	●		2 3	\$50,000 \$50,000
<b>Fill data gaps</b> in groundwater in the watershed by completing the Groundwater Restoration and Protection Strategies and Geologic Atlas.		GRAPS: complete R-RW Geologic Atlas: complete LOW Co. and start Koochiching Co.	Watershed-Wide	MDH, U of MN		●	●				3	Costs not available
<b>Level 2 Funding Sources: County, SWCDs, City, BWSR</b>											<b>Total</b>	<b>\$365,000</b>
<b>Level 3 Funding Sources: NRCS, DNR, MPCA, MDA, MNDOT</b>											<b>Total</b>	<b>\$525,000</b>





# GOAL: PROTECT SURFACE WATER FROM CONTAMINANTS

*Protect waterbodies from contaminants such as nutrients, chloride, and bacteria.*



## Description

Contaminated runoff, including nutrients, bacteria, and chloride, has the potential to decrease water quality, impact recreation, and impact aquatic life. Contaminated runoff can come from any human land management practices including agriculture and development.

In addition, the R-RW flows into Lake of the Woods, which is impaired for eutrophication and has a TMDL study (2021). Any pollutant reductions in the R-RW also have the potential to improve Lake of the Woods.

Management strategies to reduce contaminated runoff can include agricultural best management practices, shoreline restoration projects, septic system improvements, stormwater management plans, regular street sweeping schedules, and precision salt application programs.

## Issues Addressed

- ◆ Protect Surface Water from Contaminants
- ◆ Sediment

## Metrics

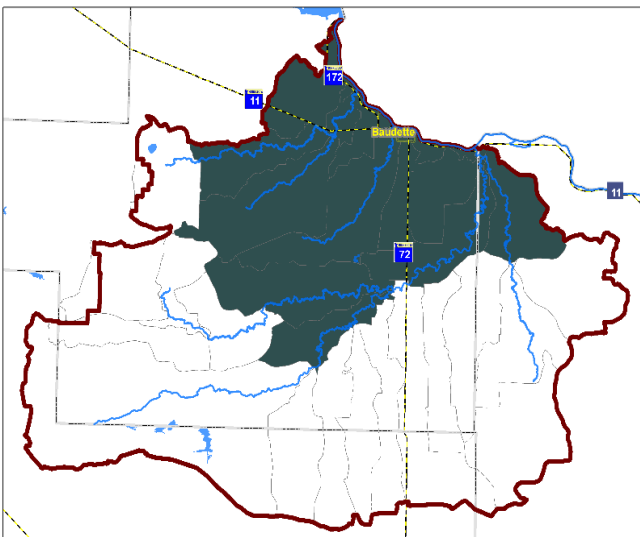
- ◆ Agricultural acres with best management practices
- ◆ Pounds of phosphorus reduction (Progress towards Lake of the Woods phosphorus TMDL 2021)

## Outcomes

- ◆ Eliminate contamination from entering surface water.
- ◆ Improvement of Lake of the Woods water quality.
- ◆ Improvement of soil health.

## Priority Subwatersheds

Priority subwatersheds shown in navy blue are where the agricultural and urban land is.



## Goals

### Short Term Goal

10% of cultivated lands and 10% of pasture lands with best management practices.

227 pounds/year phosphorus reduction to watershed outlet.

### Desired Future Condition

Lake of the Woods TMDL is accomplished.

- Rapid River = no net increase
- Baudette River = 715 lbs/year reduction
- Miller Creek = 452 lbs/year reduction
- Winter Road River = 311 lbs/year reduction
- Silver Creek = 1,065 lbs/year reduction
- Unnamed (391) = 231 lbs/year reduction
- Wabanica Creek = 1,475 lbs/year reduction



## Targeting Maps

Stormwater and street sweeping practices will be targeted in the Baudette area and growth corridor along the Rainy River (Figure 4.5). Agricultural BMPs will be targeted on all agricultural lands (Figure 4.6).

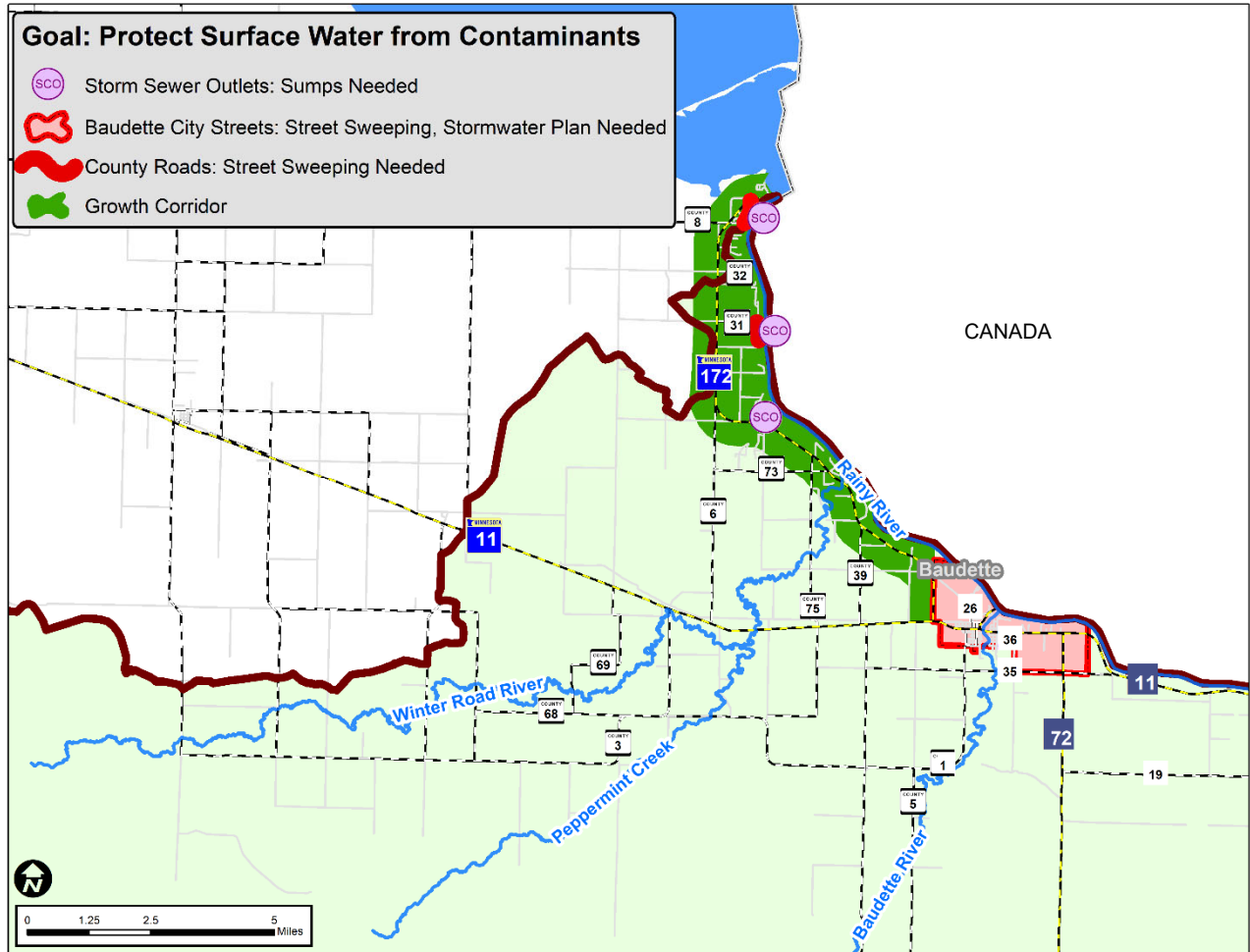


Figure 4.5. Street, sewer, and growth corridor targeted areas.



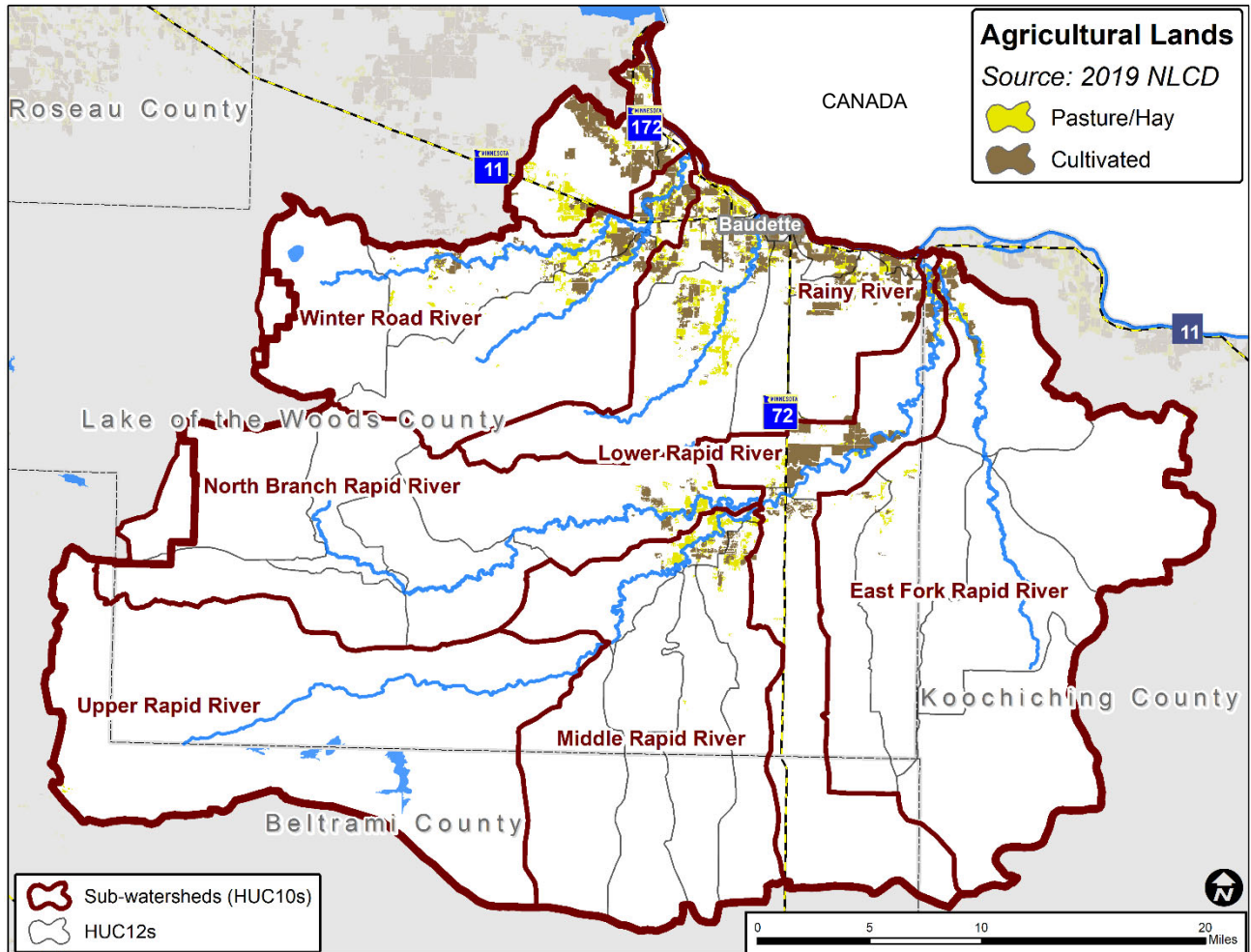


Figure 4.6. Cultivated and pasture/hay lands in the watershed.













A modeling scenario was run to determine the phosphorus reductions achieved when the short-term goal was met (10% of the cropland and pastureland with BMPs). Reductions in reaches with TMDLs are shown in Table 4.3.







Table 4.3. Progress towards LOW TMDL achieved with the R-RCWMP short-term goal (modeled in HSPF SAM); see Appendix C.

Subwatershed	Lake of the Woods (LOW) TMDL Reduction (MPCA 2021)	Progress made by achieving Short-term Goal (HSPF SAM) (lbs phosphorus/year)
Rapid River HUC8	0% reduction to LOW	47 lbs/yr ( <i>protective</i> )
Baudette River	20.1% (715.4 lbs/yr)	10.8 lbs/yr ( <i>1.5% progress towards TMDL</i> )
Miller Creek	48.8 % (451.9 lbs/yr)	7.5 lbs/yr ( <i>1.7% progress towards TMDL</i> )
Winter Road River	4.3% (310.6 lbs/yr)	23.9 lbs/yr ( <i>7.7% progress towards TMDL</i> )
Silver Creek	45% (310.6 lbs/yr)	18.9 lbs/yr ( <i>1.7% progress towards TMDL</i> )
Unnamed (391)	23.7% (239 lbs/yr)	3.8 lbs/yr ( <i>1.6% progress towards TMDL</i> )
Wabanica Creek	50.4% (1,517 lbs/yr)	27.8 lbs/yr ( <i>1.8% progress towards TMDL</i> )



# GOAL: PROTECT SURFACE WATER FROM CONTAMINANTS

What			Where	Who	When					Tracking	Cost	
Action	Program	10-year Outcome	Priority Areas	Lead/ Supporting Entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Output for goal tracking	Funding Level	Total 10-year Cost
<b>Implement non-structural agricultural practices</b> to reduce nutrient runoff.		1,853 acres 227 lbs/year phosphorus reduction	Cultivated crop land (Figure 4.6)	<b>SWCD, NRCS</b>	●	●	●	●	●		2 3	\$140,000 \$140,000
<b>Implement livestock BMPs</b> to reduce bacteria and nutrient runoff.		670 acres	Pasture/Hay land (Figure 4.6)	<b>SWCD, NRCS</b>	●	●	●	●	●		2 3	\$95,500 \$95,500
<b>Increase enrollment in Ag Certification program</b> and other existing programs including farm planning within the watershed.		Add two producers	Agricultural Lands (Figure 4.6)	<b>MDA, NRCS, SWCD</b>	●	●	●	●	●		3	Costs dependent on programs
<b>Inventory and implement stormwater management</b> within developed areas of the watershed.		One project to reduce pollutants from reaching the Rainy River.	Baudette	<b>City of Baudette, SWCD, County, MPCA</b>			●	●	●		2	\$100,000
<b>Implement chloride management best management practices</b> through trainings, equipment or environmentally friendly alternatives		At least one new precision salt application training, new equipment purchased	Baudette Bay (sensitive estuary)	<b>City of Baudette, County, MNDOT, SWCD, MPCA</b>			●	●	●		2	\$150,000
<b>Implement a targeted street sweeping program</b> to reduce contaminated stormwater runoff reaching bays and river.		Initiate program	Figure 4.5	<b>City of Baudette, County, SWCD, MNDOT</b>			●	●	●		2 3	\$50,000 \$50,000

What			Where	Who	When					Tracking	Cost	
Action	Program	10-year Outcome	Priority Areas	Lead/ Supporting Entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Output for goal tracking	Funding Level	Total 10-year Cost
<b>Utilize existing zoning and ordinances</b> that protect water quality and consider adoption of new zoning ordinances		Continue current program, review regulatory program once/year	Watershed-Wide	<b>County,</b> City of Baudette, MPCA	●	●	●	●	●		2	\$1,122,700
<b>Explore feasibility of cluster/community waste treatment systems</b> to reduce nutrient and bacteria loading.		One feasibility study	HWY 11-Baudette to Clementson, Growth corridor	<b>County,</b> MPCA, City of Baudette				●	●		3	\$100,000
<b>Assist landowners in upgrading noncompliant SSTS.</b>		Replace six failing systems/year	Watershed-Wide	<b>County,</b> MPCA, City of Baudette	●	●	●	●	●		2/3	\$720,000
<b>Level 2 Funding Sources: County, SWCDs, City, BWSR</b>											<b>Total</b>	<b>\$1,658,200</b>
<b>Level 3 Funding Sources: NRCS, DNR, MPCA, MDA, MNDOT</b>											<b>Total</b>	<b>\$1,105,500</b>



# GOAL: PROTECT, MANAGE, AND IMPROVE HABITAT

*Maintain and increase habitat protection and increase forest management to improve forest health and provide resilience to invasive species and climate variability.*



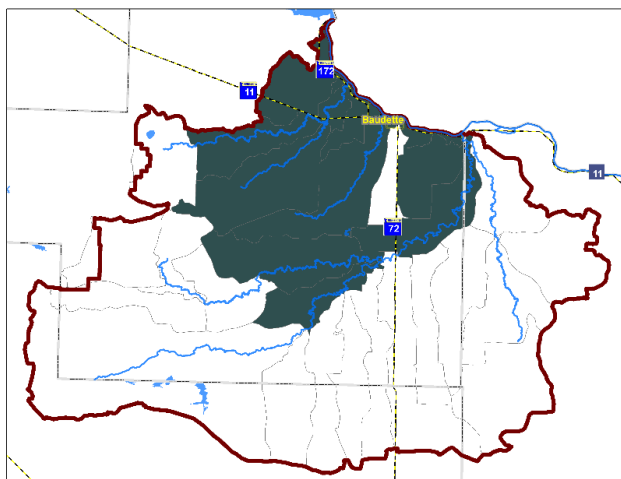
## Description

The impacts of humans on the landscape have altered terrestrial, aquatic and forest wildlife habitats in many ways. Efforts to restore these landscapes to their pre-alteration condition will greatly improve the habitat, biodiversity and climate resiliency of the watershed, along with surface and groundwater quality.

Fish and wildlife habitat need sufficient protection and connectivity maintained for species to thrive. This can be achieved in many ways, including permanent protection, targeted forest management, and restoration of ecological connectivity. Permanent protection means the land is in public ownership or has a conservation easement. Forest Stewardship Plans can be developed for private landowners to manage their forests. A Landscape Stewardship Plan (LSP) was developed in 2022 and provides numbers, targeted locations, and costs for this goal.

## Priority Subwatersheds

Priority subwatersheds shown in navy blue are from the LSP developed in 2022.



## Issues Addressed

- ◆ Protection, management, and improvement of aquatic and riparian habitat
- ◆ Terrestrial Land Management
- ◆ Protect Surface Water from Contaminants
- ◆ Protect Groundwater from Contaminants

## Metrics

- ◆ Acres of land protected
- ◆ Acres of private forest management
- ◆ Number of Forest Stewardship Plans

## Outcomes

- ◆ Protect and improve habitat for fish and wildlife species
- ◆ Protect water quality
- ◆ Improve forest health and resilience to invasive species and climate variability
- ◆ Protect carbon storage in trees and peatlands

## Goals

### Short Term Goal

Achieve LSP goal for land protection (1,255 acres protected).

25% progress towards LSP goal for forest management (7,040 acres, 30 Forest Stewardship Plans).

### Desired Future Condition

Maintain protected lands.

28,163 acres of forest management and 122 Forest Stewardship Plans (LSP).



## Targeting Map

The parcels in red and orange are the highest priority for land protection (Figure 4.7). These are privately owned forested parcels over 20 acres in size.

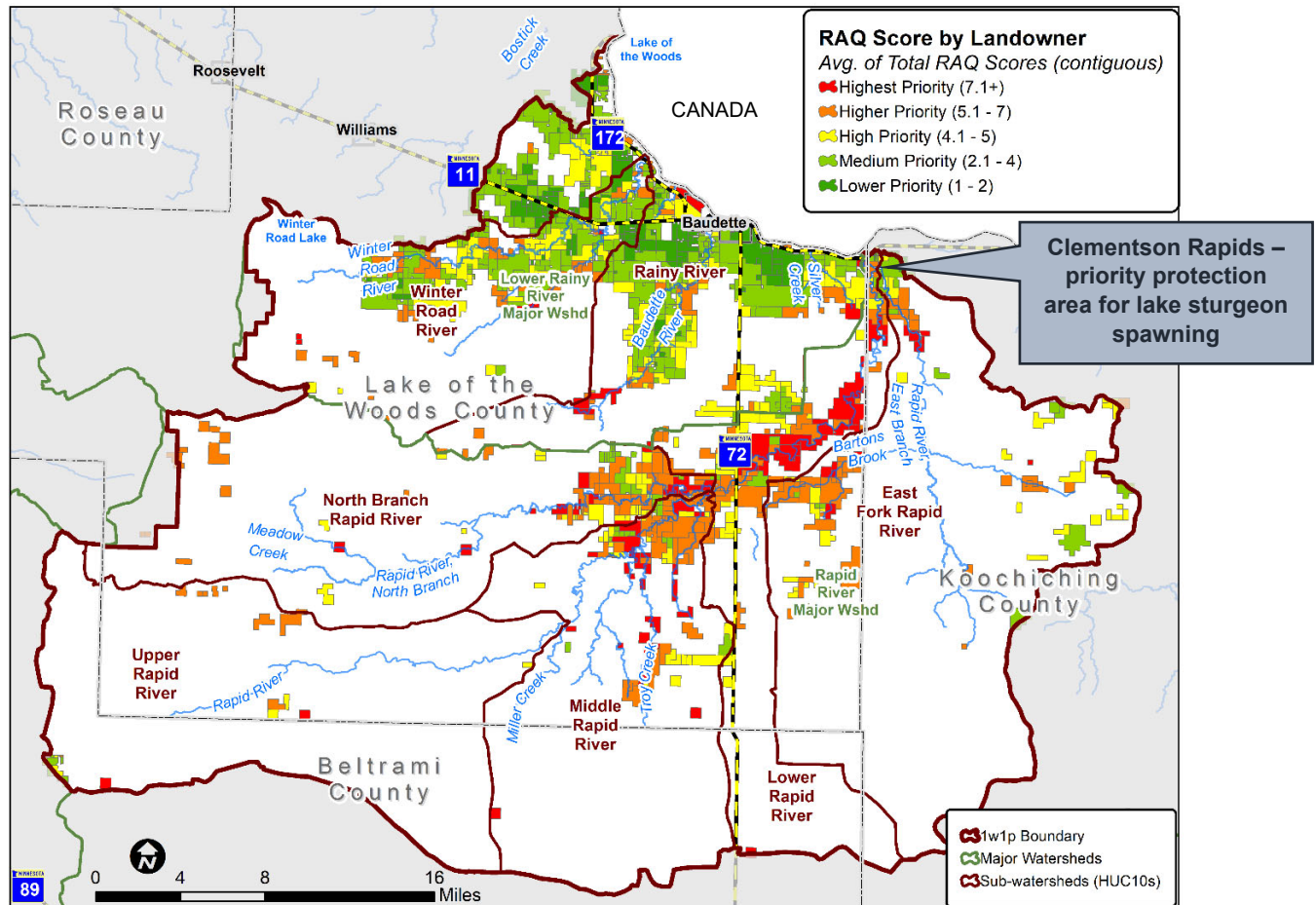


Figure 4.7. Riparian, Adjacency, Quality scoring at the parcel level.

## Carbon Benefits















The forests and peatlands in the R-RW already store tremendous amounts of carbon. Protecting forest and peatland from land use conversion protects this carbon storage (Table 4.4). A U.S. Forest Service tool (EVALIDator) was used to determine the estimated amount of protected carbon storage in the existing upland (Aspen, Black Ash, Maple) and wetland (Black Spruce, Tamarack, White Cedar) forests of the Rainy-Rapid watershed. This is large-scale planning level data provided as a multiple benefit of plan goals, and not to be used in tracking at the parcel or subwatershed level.





Table 4.4. Protected carbon storage achieved by reaching the short-term land protection goal.

	Tree Carbon	Forest Carbon (Includes dead wood, litter, soil organic matter)
Carbon storage protected by protecting 1,255 acres of forest from land use conversion:	21,500 tons	150,800 tons
Equivalency of cars removed from the road:	15,380 cars	108,082 cars



## GOAL: PROTECT, MANAGE, AND IMPROVE HABITAT

What			Where	Who	When					Tracking	Cost	
Action	Program	10-year Outcome	Priority Areas	Lead/ Supporting Entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Output for goal tracking	Funding Level	Total 10-year Cost
<b>Implement the Landscape Stewardship Plan to guide the protection</b> of private lands within the watershed.		1,255 new acres	Private forest parcels >20 acres (Figure 4.7)	<b>SWCD,</b> DNR, BWSR	●	●	●	●	●		3	\$1,182,743
<b>Implement the Landscape Stewardship Plan to guide the management</b> of private forests within the watershed.		30 plans (7,040 acres)	Private forest parcels >20 acres (Figure 4.7)	<b>SWCD,</b> DNR	●	●	●	●	●		2	\$24,400
<b>Manage private forest lands</b> through forest stand improvement and brush management.		7,040 acres managed	Private forest lands	<b>NRCS, DNR,</b> SWCD	●	●	●	●	●		3	Costs not available
<b>Manage Beaver Dams</b> where affecting public infrastructure and county ditches.		Ongoing management	Watershed-Wide	<b>County</b>	●	●	●	●	●		3	Costs not available
<b>Expand terrestrial habitat</b> by planting trees, pollinator habitat, and conservation cover.		100 acres of planting	Watershed-Wide	<b>NRCS, SWCD,</b> DNR	●	●					2	\$5,000
<b>Manage terrestrial invasive species</b> by exploring support for a cooperative weed management program.		Feasibility of cooperative weed management area completed.	Watershed-Wide	<b>County,</b> NRCS				●	●		2	\$10,000
Continue to implement a local <b>Aquatic Invasive Species</b> Program		Ongoing programs implemented	Rainy River accesses, Resort community, City of Baudette	<b>SWCD,</b> County, DNR, Resorts	●	●	●	●	●		3	\$337,000

What		Where	Who	When					Tracking	Cost		
Action	Program	10-year Outcome	Priority Areas	Lead/ Supporting Entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Output for goal tracking	Funding Level	Total 10-year Cost
Use new LiDAR data to <b>assess lateral connectivity</b> needs on tributaries, bridges, and culverts.		LiDAR completed; priority areas identified	Watershed-Wide	<b>DNR Fisheries</b>			●	●			3	<b>Costs not available</b>
<b>Enhance connectivity of streams</b> and maintain fish passage through log jam removal and coordinating with DNR on culvert repair and replacement.		Two culverts replaced for fish passage	Winter Road River, Rapid River (Appendix D)	<b>County, DNR, MNDOT, SWCD</b>			●	●	●		2 3	\$2,000 \$8,000
<b>Level 2 Funding Sources: County, SWCDs, City, BWSR</b>											<b>Total</b>	<b>\$41,400</b>
<b>Level 3 Funding Sources: SFIA, Lessard Sams, NRCS, DNR, MNDOT</b>											<b>Total</b>	<b>\$1,527,743</b>



# GOAL: STABILIZE STREAMBANK, DITCH, AND RIPARIAN LANDS



*Stabilize streambanks and ditch banks to reduce erosion. Plant vegetative buffers adjacent to stream and ditches to further protect against erosion.*

## Description

Restoration of streams, ditches and riparian areas is integral to achieving water quality and pollution protection goals of the entire watershed. Some of the area’s natural channels have been historically straightened, or increased precipitation events have caused damage to the stream banks which further contributes to water quality issues. Streambank erosion and loss of riparian vegetation and habitat increases sediment loading and reduces water and habitat quality.

This goal includes several activities, including in-channel stabilization, ditch outlet stabilization, bank vegetation and armoring, culvert and other infrastructure repairs, and the reconnection and restoration of riparian areas adjacent to channels.

## Issues Addressed

- Sediment
- Altered Hydrology
- Protection from contaminants

## Metrics

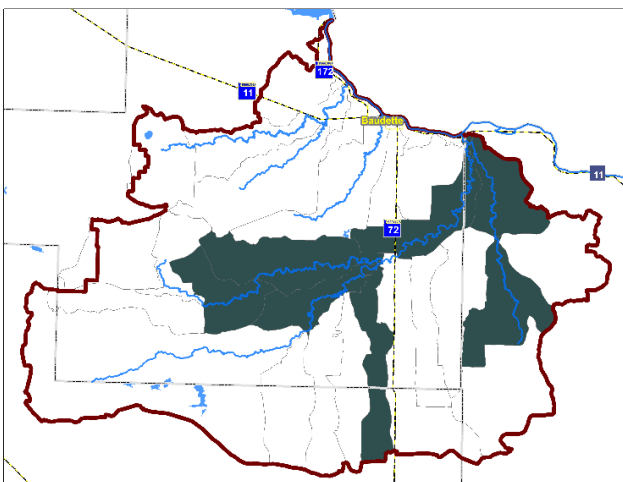
- Length of stream / ditch stabilized and restored
- Length of shoreline restored

## Outcomes

- Water quality improvements throughout the watershed
- Decreased bank erosion
- Improvement in wildlife habitat in streams and downstream waters

## Priority Subwatersheds

Priority subwatersheds shown in navy blue are where there is the highest bank sediment erosion (HSPF SAM).



## Goals

### Short Term Goal

10 miles of stream bank, ditch bank, or shoreline stabilization.

### Desired Future Condition

12 miles of stream bank, ditch bank, or shoreline stabilization.

The associated sediment reductions from the stabilization projects achieve the Rapid River TSS, TMDL reduction goal of 59% (MPCA 2022).



## Targeting Maps

Subwatersheds with the most streambank sediment yield are a priority for projects (Figure 4.8). Projects will be targeted with local information provided by the county and SWCD in Figure 4.9.

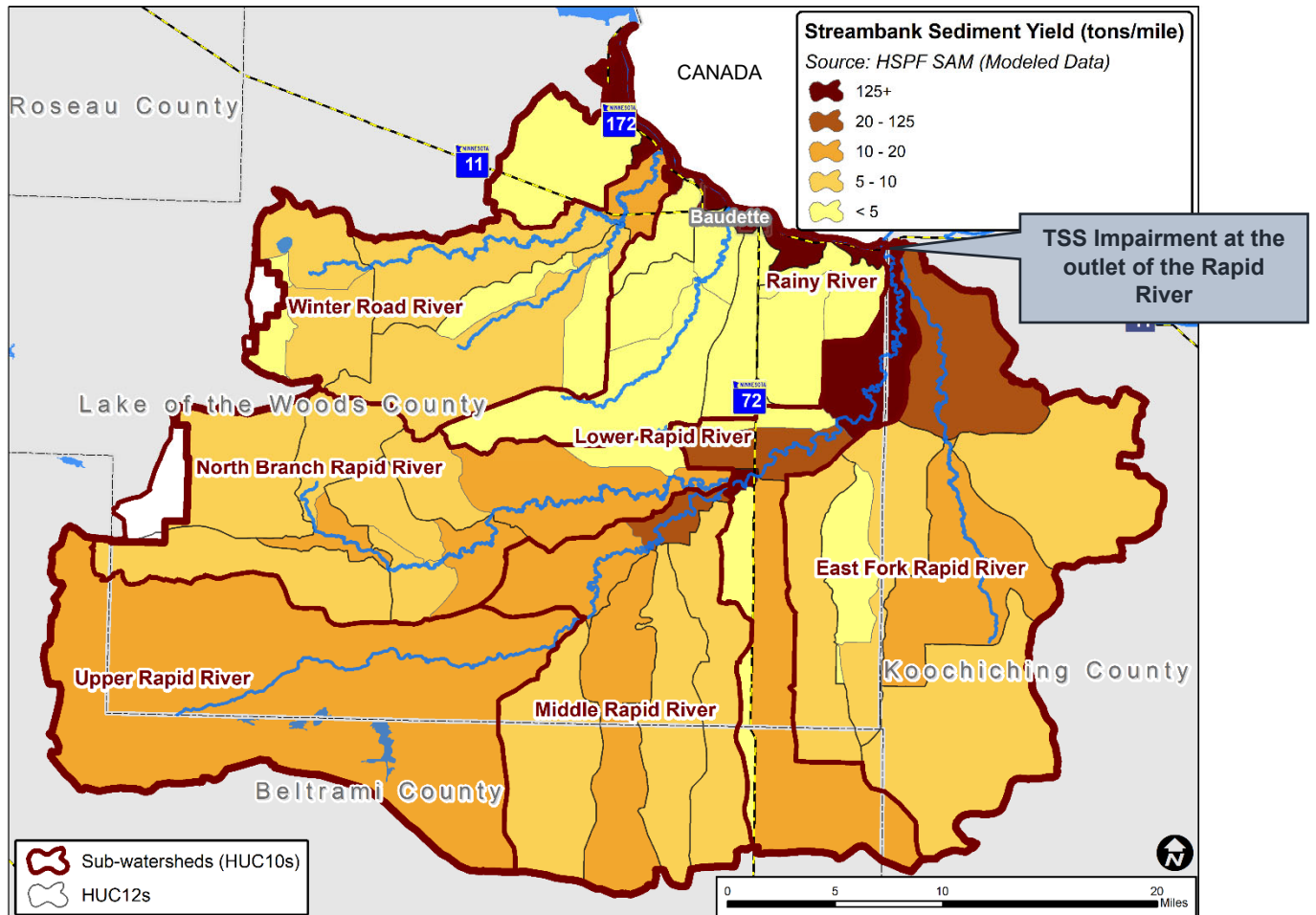


Figure 4.8. HSPF-modeled subbasin sediment yield from streambanks (tons/ac/yr) in the Rapid River Watershed.



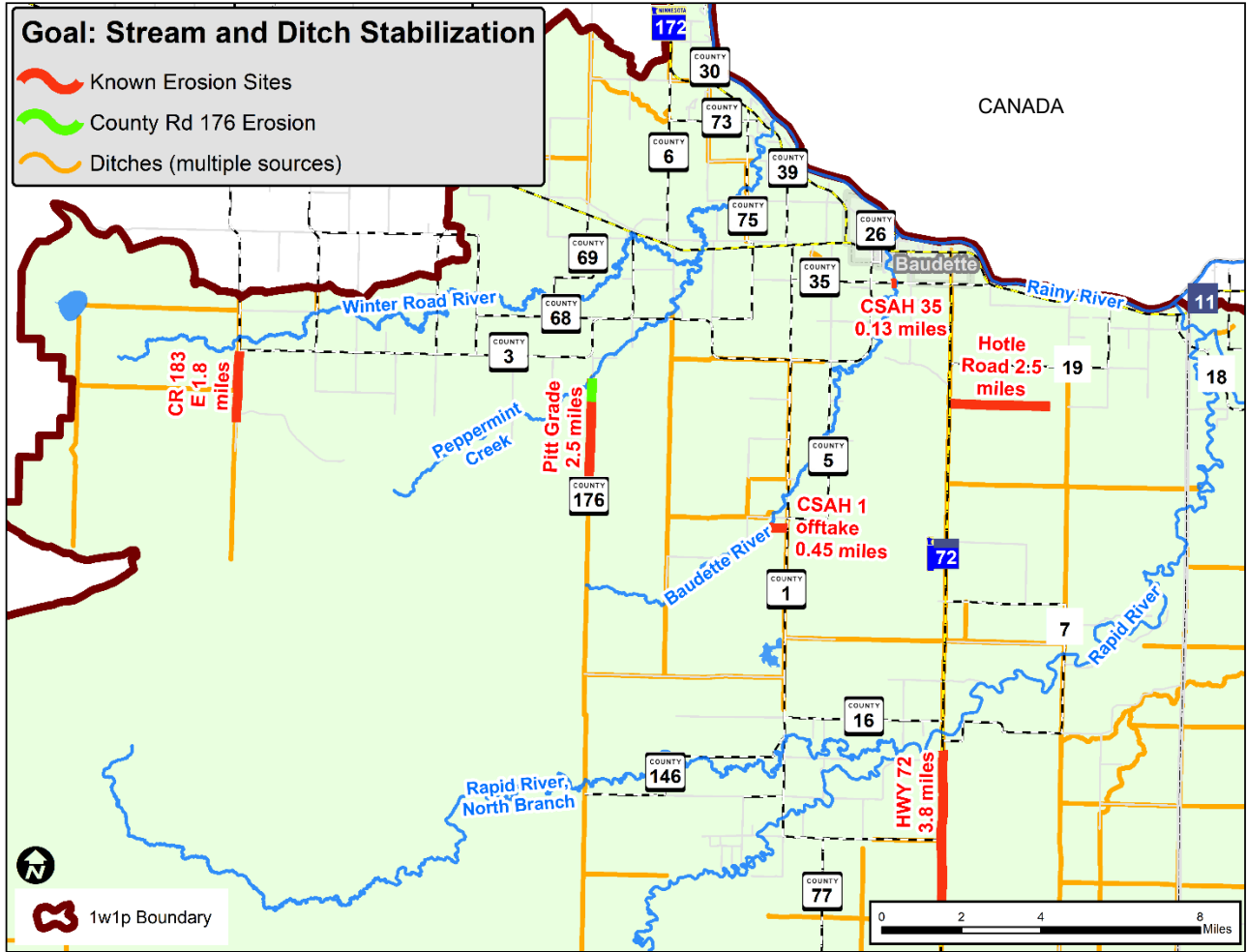












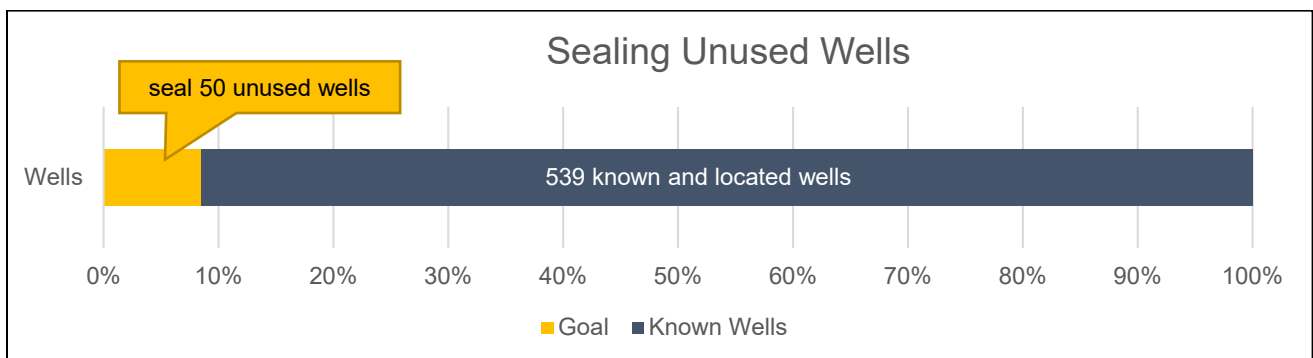
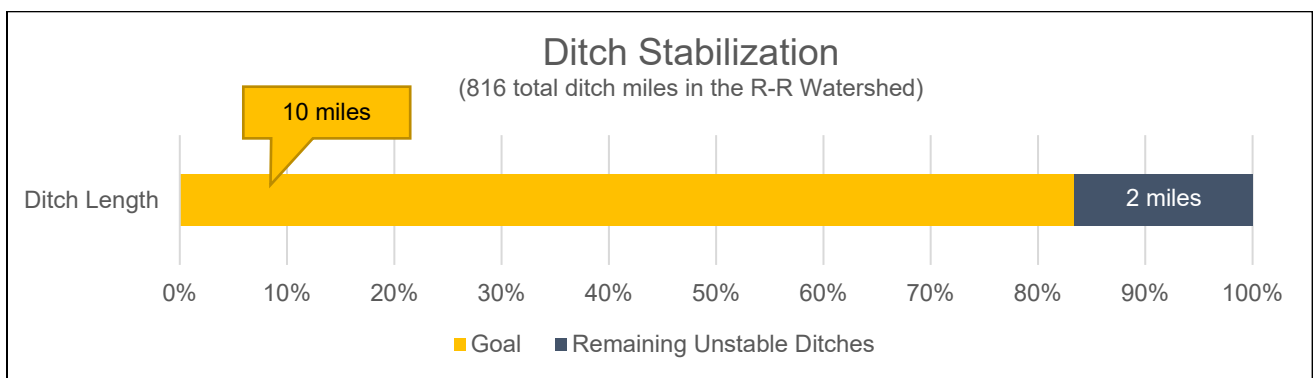
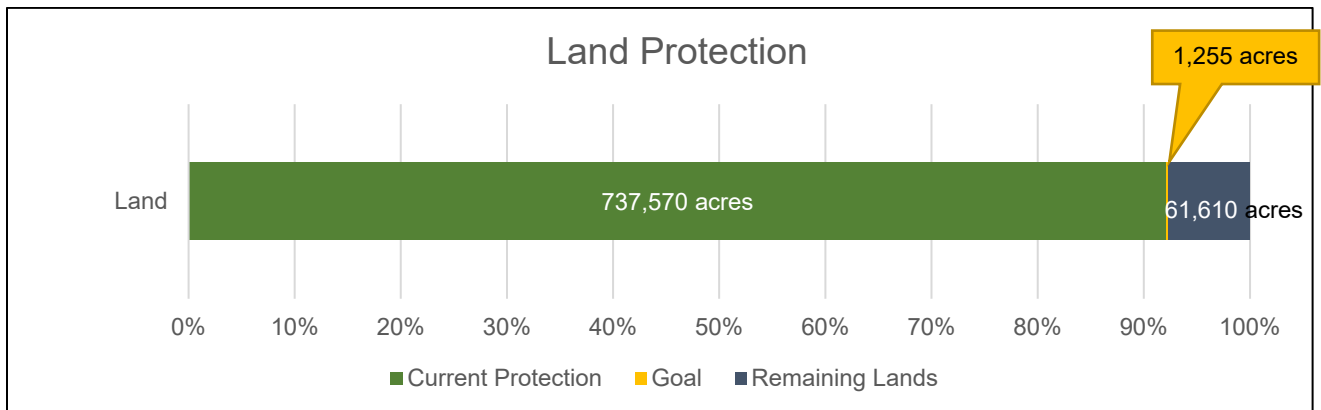
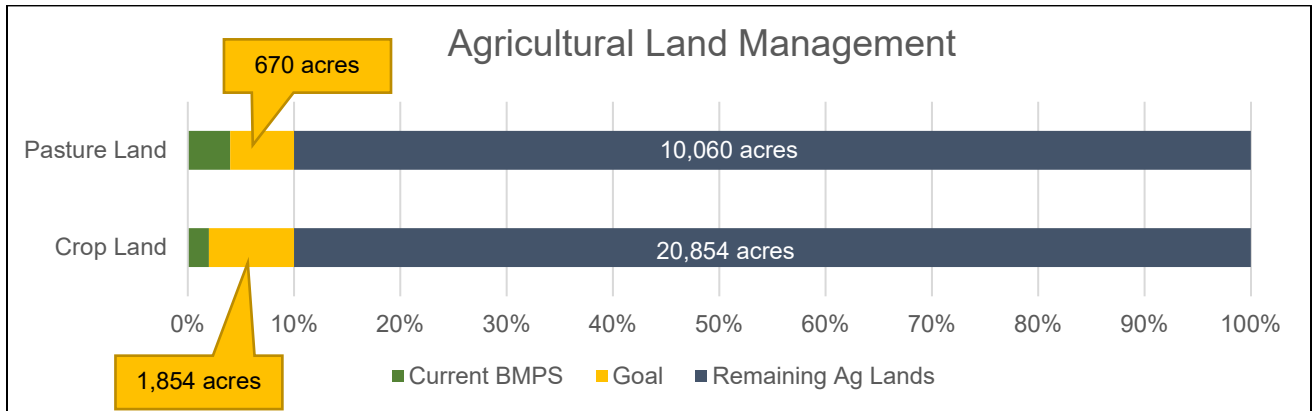
Figure 4.9. Priority sites for stream and ditch stabilization (LOW County).

# GOAL: STABILIZE STREAMBANK, DITCH, AND RIPARIAN LANDS

What			Where	Who	When					Tracking	Cost	
Action	Program	10-year Outcome	Priority Areas	Lead/ Supporting Entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Output for goal tracking	Funding Level	Total 10-year Cost
<b>Conduct in-channel projects to stabilize streams and drainages.</b>		10 miles stabilized	Rapid River, Pitt Grade, HWY 72, Holte Road (Figure 4.9)	<b>SWCD, County,</b> DNR, MNDOT	●	●	●	●	●		2 3	\$500,000 \$2.5 million
<b>Conduct stabilization projects of tile outlets and gullies.</b>		10 projects to reduce sediment	Rapid River	<b>SWCD, County,</b> DNR	●	●	●	●	●		2 3	\$100,000 \$100,000
<b>Protect and restore shoreline and riparian areas.</b>		500 feet restored	Rainy River	<b>County, SWCD,</b> DNR	●	●	●	●	●		2	\$100,000
<b>Coordinate with County and MNDOT on projects to implement water quality BMPS on road, ditch and culvert replacement projects.</b>		Meet annually at minimum to discuss upcoming projects.	Rapid River	<b>County, MNDOT,</b> SWCD, DNR	●	●	●	●	●		2	Costs included in projects
<b>Ground-truthing and survey of areas that need stream and ditch stabilization</b>		Ground-truth the 10 miles indicated in the goal.	Rapid River	<b>County, SWCD,</b> DNR		●	●	●	●		2	\$50,000
<b>Level 2 Funding Sources: County, SWCDs, BWSR</b>											<b>Total</b>	<b>\$750,000</b>
<b>Level 3 Funding Sources: MNDOT, State Aid, DNR</b>											<b>Total</b>	<b>\$2,600,000</b>

## Moving the Needle/Telling the Story

The big picture progress for numerous plan goals is highlighted below. These graphics can be used to demonstrate plan progress during implementation.







## Achieving Plan Goals

Overall plan progress towards goals will be tracked by watershed partners. The Steering Committee will develop ranking criteria to rank projects during work planning, with the assumption that projects identified in this plan will be prioritized for funding.

Table 4.5 summarizes the different levels of measuring progress and how it will be implemented in this plan. Projects will be tracked during plan implementation using a system set up for the watershed.

Table 4.5. Description of how different activities will be measured during plan implementation.

Level	Description	Timeframe	R-RW Application
<b>Tracking</b> 	Gathering and compiling numbers about the practices, acres, and miles of river achieved in plan implementation.	Ongoing	Outputs in Targeted Implementation Schedule (Section 4). Projects will be tracked with a system and reported in eLINK during implementation.
<b>Reflecting</b> 	Comparing the work activities completed to the work activities in the plan to evaluate progress.	Annual or Biennial	Modeled benefits (Section 4). Staff capacity. Programs implemented.
<b>Evaluating</b> 	Comparing the resource results associated projects, practices, or programs to the stated resource goals and outcomes in the plan.	Mid-point evaluation	Analysis of loading at WPLMN sites, WRAPS Cycle 2 in 2028.
<b>Sharing</b> 	Maintain support for local work through communications about local watershed implementation geared toward the public and specific stakeholders.	Ongoing	Stakeholder and public engagement and support.





# Section 5. Implementation Programs





# IMPLEMENTATION PROGRAMS

This section describes the programs that will be used for implementing this plan. Programs have been grouped into four main categories: Planned Landscape Management (“Manage It”), Protected Lands Maintenance (“Keep It”), Constructed Environmental Enhancements (“Fix It”) and Data Collection and Outreach (“Know It”). For the R-RW, the scale is tipped towards “Fix It” and “Manage It” programs. It is important to note that the majority of the “Fix It” and “Manage It” programs are being spent on nondegradation practices, not fixing impairments. There is already a lot of permanent protection in this watershed (92%), so the “Keep It” program will be used less than the others. These programs all balance on Data Collection and Outreach (“Know It”) (Figure 5.1). Through implementation of each program, planning partners are encouraged to focus on building watershed resiliency and addressing equity (page 70).

## Implementation: A Balancing Act

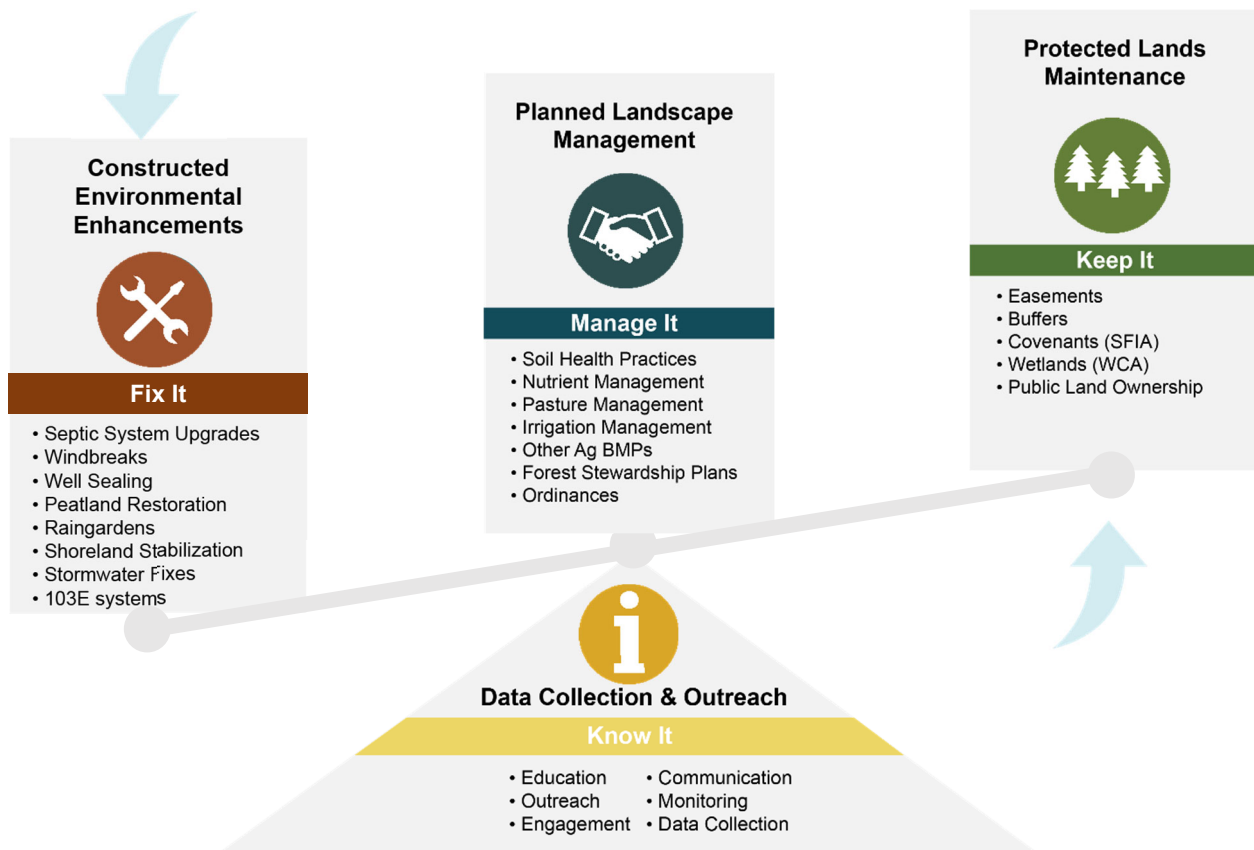


Figure 5.1. Implementation Programs for the R-RW.





## Manage It: Planned Landscape Management

“Manage It” programs involve continual management of the landscape including soil health practices such as cover crops and reduced tillage, pasture management, forest stewardship plans, zoning, and ordinances. Implementation of this plan will involve programs that will be actively targeted to prioritized areas for management (Section 4). Non-priority areas will be considered on an opportunity basis.

### Cost-Share Programs

Cost-share programs or projects are those where the cost of installing a project is shared with the landowner(s). Implementing soil health practices such as cover crops and reduced tillage, or forest enhancement are applicable examples that meet plan goals.

### Private Forest Management

#### *Forest Stewardship Plans*

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

#### *Forest 2C Designation*

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



**Baudette Bay**



## Regulatory Programs

Counties and cities will meet once a year to discuss ordinances and counties will notify each other of any proposed ordinance amendments. Activities will be tracked by the individual counties. An effort will be made to compile the information watershed-wide. Watershed partners will explore ways to better integrate this watershed management plan into all of the county comprehensive land use plans. In the watershed area, Lake of the Woods has county-wide zoning and Koochiching County does not.

### **Aggregate Management**

The MPCA oversees air permits, hazardous waste licenses, stormwater and wastewater management, and storage tanks for aggregate mining (<https://www.pca.state.mn.us/regulations/aggregate-sand-and-gravel>). Local ordinances are in place in Beltrami County that include additional guidelines for aggregate management.

- ◆ *Regulations: Minnesota Statutes 298.75, 394.25*

### **Bluffland Protection**

Within the shoreland zone, bluff protection is a requirement. The Statewide shoreland program includes land within 1,000 feet of any public water body, 300 feet of any public water river or stream, or the landward extent of their floodplains. Only land around public waters with a shoreland classification are regulated.

### **Construction Soil Erosion**

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

- ◆ *Regulations: Minnesota Rules, chapter 7090*

### **Feedlots**

MPCA rules govern the collection, transportation, storage, processing, and land application of animal manure and other livestock operation wastes. Lake of the Woods SWCD has delegated authority from Lake of the Woods County to administer the feedlot program. Beltrami County allows feedlots without permits given certain conditions are met (outlined in the Beltrami County Shoreland Management Ordinance). The state has jurisdiction over the feedlot enforcement in Koochiching County.

- ◆ *Regulations: Minnesota Rules Chapter 7020*

### **Groundwater Use**

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

- ◆ *Regulations: Minnesota Statute 103G and Minnesota Rule 6115 for appropriation; 103H, 1989 Groundwater Act,*





### ***Hazard Management***

Hazard mitigation may be defined as any action taken to eliminate or reduce the future risk to human life and property from natural and human-caused hazards. Climate change adaptation also plays a part in hazard management. These requirements direct the state to administer cost-sharing. Hazard Mitigation Local Emergency Management Programs are deployed in each of the contributing counties within the planning boundary.

- ◆ *Regulations: Minnesota Statute, chapter 12*

### ***Invasive Species***

Aquatic and terrestrial invasive species can cause ecological and economic damage to water resources and forests. The DNR has regulatory authority over aquatic plants and animals as well as terrestrial animals. For aquatic species, permits are required by the general public for transporting lake water and invasive species and for treating invasive species. In Beltrami, the Environmental Services Department in the county oversees the AIS program. In Lake of the Woods the SWCD oversees the AIS program. In Koochiching the SWCD and County Environmental Services Department partner to manage AIS.

- ◆ *Regulations: Minnesota Statute 84D*

### ***Noxious Weed Law***

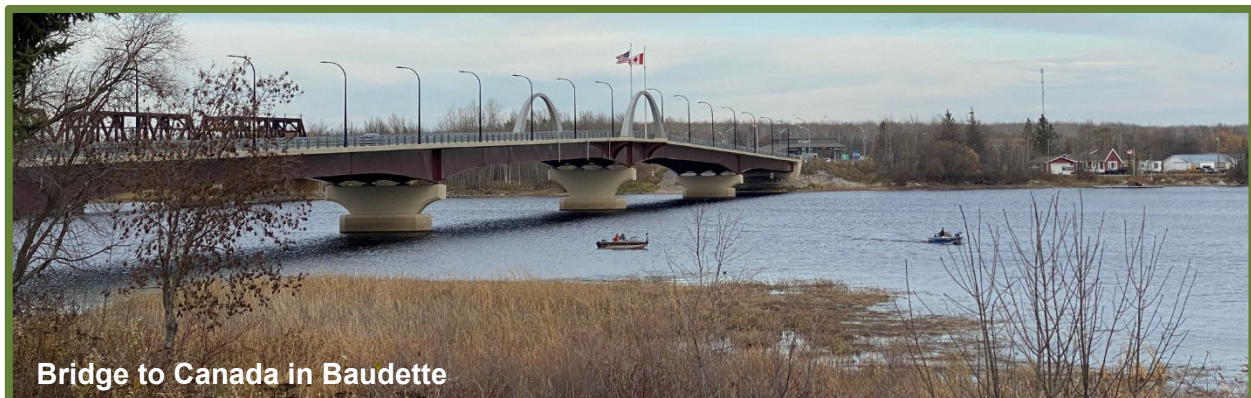
Noxious weeds affect the natural, native balance of ecological functions. The Noxious Weed Law in Minnesota is administered through the county but can be delegated to SWCDs. The State maintains noxious weed lists of those species to eradicate, control, restrict, and specially regulated plants.

- ◆ *Regulations: Minnesota Statutes 18.75-18.91*

### ***Public Drainage Systems: Establishment, Improvement, Re-routing, Repairs, and Impoundments***

Minnesota Drainage Law enables multiple landowners to collectively construct, improve, repair, and abandon drainage systems across property boundaries and governmental boundaries. These drainage systems can be open ditches and/or subsurface tile. Drainage systems have their own laws and requirements that LGUs must uphold. These ditches are managed by the drainage authority for the benefit of the landowners.

- ◆ *Regulations: Minnesota Statute 103E*



**Bridge to Canada in Baudette**



### **Shoreland Management**

Minnesota has shoreland management rules that are administered by the DNR. LGUs are required to have land use controls that protect shorelands along lakes and rivers, and they can adopt more strict ordinances than the state's, if desired. The DNR published an Innovative Shoreland Standards Showcase website that may be helpful to local governments as they implement this plan: [https://www.dnr.state.mn.us/waters/watermgmt\\_section/shoreland/innovative-standards.html](https://www.dnr.state.mn.us/waters/watermgmt_section/shoreland/innovative-standards.html).

- ◆ *Regulations: Minnesota Statute 103F and Minnesota Rules 6120.2500-3900*

### **Subsurface Sewage Treatment Systems**

The Subsurface Sewage Treatment System (SSTS) Programs are required by Minnesota State Statute in order to protect the public health and environment. Counties are required to have an ordinance that regulates SSTS enforced at the county level. Cities and townships may administer their own programs but must be as strict as their county's ordinance. Low-interest loans and low-income grants for upgrades may be available through the SWCD and county.

- ◆ *Regulations: Minnesota Statutes 115.55 and 115.56; Minnesota Rules Chapters 7080, 7081, 7082, and 7083*

### **Waste Management**

Each county has a Solid Waste Management Plan (10-year Plan) that is approved by the MPCA. Solid Waste Management in Minnesota is managed at the county level and includes programs related to mixed municipal solid waste, industrial waste, and non-landfill programs such as recycling to include paper, plastics, metal, tires, electronics, appliances, and other recyclable items. As part of this plan, each county manages a household hazardous waste programs (HHW) that receives some state funding to implement. Counties also received SCORE funds from the state to help cover some of the cost of recycling.

- ◆ *Regulations: Minnesota Statutes 115.55; Minnesota Rules Chapters 7001, 7035, 7045, 7150, 7151, 9215, and 9220*

### **Wellhead Protection**

The purpose of the Wellhead Protection Program is to prevent contamination of public drinking water supplies by identifying water supply recharge areas and implementing management practices for potential pollution sources found within those areas. The program has since expanded to Source Water Protection to include supplies that rely on surface water. Wellhead Protection is mostly administered at the city level.

- ◆ *Regulations: Minnesota Statutes, chapter 103I; Minnesota Rules, chapter 4720; Federal Safe Drinking Water Act, US Code, Title 42, Chapter 6A, Subchapter XII, Part E, Section 300j-13; Minnesota Rules, chapter 4725*

### **Well Construction Standards**

Well construction standards are a Minnesota Department of Health Program.

- ◆ *Regulations: Minnesota Well Code/ Minnesota Rules Chapter 4725*

## Comprehensive Plans

County/City comprehensive plans are required to implement land use regulatory ordinances and provide the framework of the ordinance requirements. It is recommended that when a County/City updates its comprehensive plan, that at a minimum the County/City adopt all comprehensive watershed management plans within the County/City by reference. One step further would be for the County/City to utilize specific goals and strategies from the R-RCWMP when developing a comprehensive plan.

### **Current Water Plans in the R-RW**

- ◆ Lake of the Woods County Local Water Management Plan (2010-2020)
- ◆ Koochiching County Comprehensive Local Water Management Plan (2018-2028)
- ◆ Beltrami County Comprehensive Local Water Management Plan (2017-2027)

### **Current Comprehensive Land Use Plans in the R-RW**

- ◆ Lake of the Woods County Comprehensive Plan (2000)
- ◆ Lake of the Woods County Land Use Addendum (2011)
- ◆ Koochiching County Comprehensive Plan (2002)
- ◆ Beltrami County Comprehensive Plan (2002)
- ◆ City of Baudette Comprehensive Plan (2005)

### **Other Plans in the R-RW**

- ◆ Rainy River Basin Plan (2004), *MPCA*
- ◆ Local Management Plan for the Rainy and Rapid Rivers (1991), *Rainy/Rapid River Board*



## Keep It: Protected Lands Maintenance

“Keep It” programs are those that involve permanent landscape protection, such as Sustainable Forest Incentive Act covenant lands, conservation easements, and public land acquisition. Projects will be actively targeted to prioritized areas for protection (Section 4). Non-priority areas will be considered on an opportunity basis.

## Conservation Easements

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

## Sustainable Forest Incentive Act

SFIA provides annual incentive payments for the landowner recording a covenant taking away some of the rights of the land (development and farming, for example). Private landowners can receive a payment for each acre of qualifying forest land they enroll in SFIA. In return, they follow



the covenant for a set period of time: either 8, 20, or 50 years. Data on current enrollees shows that landowners who start with an 8-year covenant commonly move up to a 50-year covenant (DNR), which is why this program is considered under “Keep It.”

## Wetlands

Wetlands are protected by the Minnesota Wetland Conservation Act (WCA). The overall goal of the act is no net loss of wetlands. Draining, filling, and in some cases excavating in wetlands is prohibited unless (a) the drain, fill, or excavation activity is exempt from requiring replacement or (b) wetlands are replaced by restoring or creating wetland areas of at least equal public value. Replacement can be buying credits or creating/restoring a wetland (usually credits are encouraged over an on-site replacement). Lake of the Woods County Land & Water Planning Office, Beltrami County Environmental Services Department, and Koochiching SWCD serve as the local LGU for implementing WCA.

- ◆ *Regulations: Minnesota Rules, part 8420.0105*

## Buffers

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

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

## Land Acquisition

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

## Conservation Reserve Program (CRP)

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





## Fix It: Constructed Environment Enhancement

“Fix It” programs include installation of on the ground, usually permanent or long-term constructed enhancements, including septic system upgrades, stormwater control, stream stabilization, peatland restoration, and sealing unused wells.

### Low-Interest Loans

Low-interest loans may be made available for septic system replacement, small community wastewater treatment systems, agricultural BMPs, and other projects that meet eligibility criteria for funding.

### Cost-Share Programs

Cost-share programs can also be used for structural practices. Implementing fencing and water sources for grazing cattle away from streams, shoreline restorations, and well sealing are applicable examples that meet the goals of this plan. Implementation of this plan will involve cost-share programs that will be actively targeted to prioritized areas for projects. Non-priority areas will be considered on an opportunity basis.

### Capital Improvements

Capital improvements are large projects that require significant investment and have a longer lifespan than cost-share programs. These types of projects and activities often require feasibility studies before design and construction can proceed. Capital improvement projects often involve collaboration amongst multiple public and private organizations or governmental departments and are often good candidates for state or federal grant funding. Stormwater control projects are an example of capital improvement projects within the plan boundary.

### Operations and Maintenance

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

Conservation practice with a minimum effective life of 10 years:

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



*Projects in the Watershed*





## Know It: Data Collection and Outreach



































### Data Collection

Data collection, inventories, and monitoring are crucial for determining where projects are needed, investigating problems, and tracking progress towards the measurable goals of this plan. Current data collection and monitoring efforts are described, along with data gaps that have actions for implementation, in this plan.

#### Current Data Collection and Monitoring Efforts

Currently, a wide variety of monitoring is carried out on multiple government and local organization levels (Table 5.1). These existing data helped determine the current conditions of surface water, groundwater, and habitat in this plan and developed a starting point for measuring goals moving forward.

*Table 5.1. Summary of ongoing water quality and quantity monitoring programs. The text following this table describes these roles in greater detail (pages 65-66).*

	 Streams	 Wetlands	 Groundwater		
Parameters	MPCA	DNR	MDH	MDA	County & SWCD
Nutrients					
Suspended Solids					
Productivity					
Pesticides					
Bacteria					
Biology					
Water level/Flow					
Invasive Species					
Fish Contaminants					
Chlorides					
Sulfates					



### Surface Water

- As part of the Intensive Watershed Approach, the MPCA conducts lake and stream monitoring in each watershed on a 10-year cycle. This assessment includes water chemistry and biological parameters, any TMDL needed, and results in comprehensive reports. The R-RW was first assessed in 2017 and is scheduled for Cycle 2 to begin in 2028 (Figure 5.2).
- The MPCA Watershed Pollutant Load Monitoring Network (WPLMN) provides funding to local partners to assist with intensive water quality monitoring at long-term sites. Monitoring at these sites can be used to track progress towards reduction of phosphorus, sediment, nitrogen, and water outflow during plan implementation (Figure 5.2).
- The US Geological Service (USGS) has a gage station on the Rapid River at Highway 72 that measures water level.

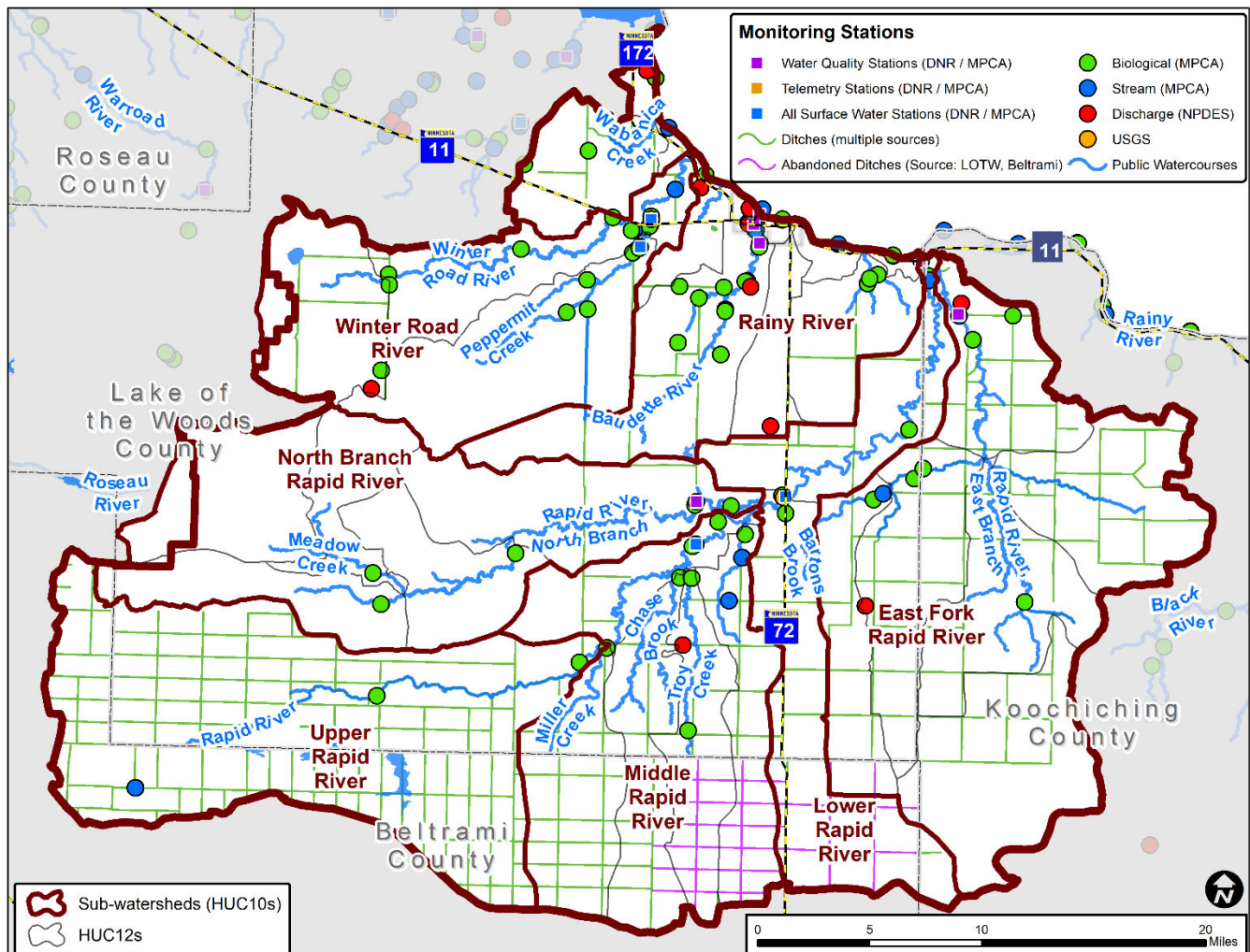


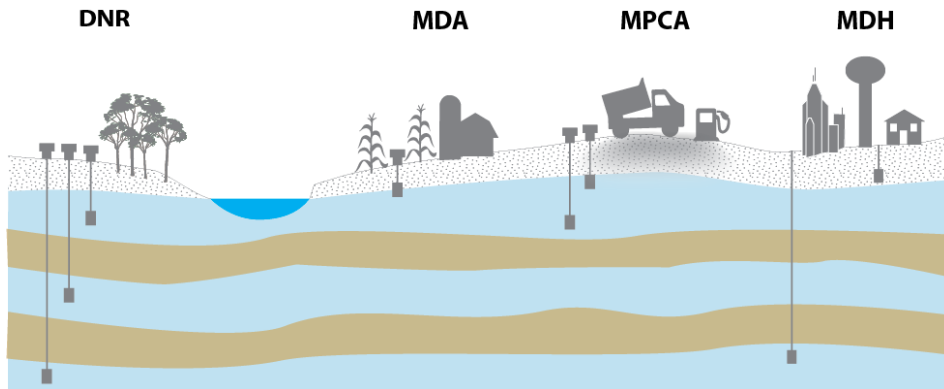
Figure 5.2. Surface water monitoring sites in the R-R Watershed.





## Groundwater

- ◆ The roles in groundwater monitoring in Minnesota are spread between four agencies:



*Image credit: DNR*

- ◆ The DNR monitors groundwater availability and ecological impacts through the Cooperative Groundwater Monitoring network. There are no monitoring observation wells in the R-RW.
- ◆ The MDA monitors groundwater for agricultural chemicals and fertilizer contamination.
- ◆ The MPCA monitors groundwater for industrial contamination.
- ◆ The MDH monitors wells and drinking water supplies for public health, including bacteria, nitrates, and arsenic.

## Habitat

- ◆ During the MPCA's intensive monitoring cycle, the rivers in the watershed are tested for biological parameters, including fish and macroinvertebrate habitat (Figure 5.2). Any biological impairments are assigned a stressor that is likely causing the reduction in diversity. Stressors include loss of habitat, loss of connectivity, sediment, dissolved oxygen, and altered hydrology.
- ◆ The Minnesota Infested Waters list is a list of water bodies infested with aquatic invasive species. This list is managed by the DNR.
- ◆ Forest habitat is described in the R-RW Landscape Stewardship Plan (LSP). The LSP provides the current number of protected acres in each minor watershed, the potential acres for additional protection, and a per minor watershed protection goal. These numbers were used in this plan in the Protect, Manage, and Improve Habitat Goal, and as these statistics get updated in the future it will show progress toward this goal. In addition, areas for restoration and enhancement and recommended species assemblages are outlined in the plan.










### Filling Data Gaps

This planning process has identified data gaps to be filled through implementation of this plan or further into the future (Table 5.2). The following inventory and study activities were developed by the Advisory Committee and the associated Plan Goal (Section 4) is noted. See the associated action tables for each goal in Section 4 for more information about how plan implementation will occur for each data gap.

Table 5.2. Data gaps identified in the R-RW.

	Data Gap	Associated Plan Goal(s)
 <b>Water Quality</b>	<ul style="list-style-type: none"> <li>Explore feasibility of cluster/community waste treatment systems to reduce nutrient and bacteria loading.</li> <li>Inventory and implement stormwater management within developed areas of the watershed.</li> <li>Implement chloride management best management practices through trainings, equipment or environmentally friendly alternatives</li> </ul>	Protect Surface Water from Contaminants
 <b>Water Quantity</b>	<ul style="list-style-type: none"> <li>Target areas for peatland or hydrologic restoration through feasibility studies.</li> <li>Evaluate the feasibility of re-meandering channelized stream reaches through floodplain reconnection, stream and oxbow restoration.</li> </ul>	Restore Hydrology
 <b>Groundwater</b>	<ul style="list-style-type: none"> <li>Complete Geologic Atlas for all counties in the watershed.</li> <li>Complete the Groundwater Restoration and Protection Strategy for the watershed.</li> <li>Screen private wells for contaminants - continue current annual bacteria/nitrate clinic and add contaminants of concern such as arsenic.</li> </ul>	Protect Groundwater and Drinking Water from Contaminants
 <b>Habitat &amp; Forestry</b>	<ul style="list-style-type: none"> <li>Use new LiDAR data to assess lateral connectivity needs on tributaries, bridges, and culverts.</li> </ul>	Protect, Manage, and Improve Habitat
 <b>Water Quality</b>	<ul style="list-style-type: none"> <li>Ground-truthing and survey of areas that need stream and ditch stabilization.</li> </ul>	Stabilize Streambank, Ditch, and Riparian Lands



## Outreach

Public participation and engagement are essential for successfully implementing this plan. The implementation of actions in this plan is voluntary and require willing landowner participation.

Landowners have varying levels of understanding of conservation practices, programs, and funding opportunities available. Many times, the first step towards adopting conservation practices is outreach. Outreach can be conducted in a variety of ways, including mailings, workshops, and social media. It can be targeted to landowners in priority areas to help target conservation practices in those areas to reach plan goals.


The second step is project development, including site visits and technical assistance. Sometimes the outreach and project development can take years before landowners adopt the practices. Once the landowner is interested in adopting practices, incentives and cost-share programs can help them get started. For example, incentives for farmers to adopt no till from the SWCD or the EQIP program can help them implement the practice for a few years to ensure profitability. Examples of both outreach and project development in the area are shown below.



Watershed partners already implement numerous outreach and project development strategies. Current and future strategies are outlined in Table 5.3 along with their planned frequency.


Table 5.3. Outreach and Project Development Actions.

Outreach Actions	Frequency
<b>Displays at county fairs.</b>	Annually
<b>Social Media outreach.</b>	Monthly
<b>Tree sale.</b>	Annually
<b>School outreach (Envirothon).</b>	Annually
<b>Field Days.</b>	Annually
Project Development Actions	Frequency
<b>Promote conservation programs that recognize and/or provide incentives to landowners for multiple benefits</b> resulting from implementation of BMPs that improve water quality, resilience to climate variability, and protect/enhance fish and wildlife habitat. Targeted programs and types of media utilized will be decided on a biennial basis.	Contact 30 landowners annually
<b>Provide site visits and technical assistance</b> for implementing the actions of this plan on private lands.	As requested
<b>Continued communication and cooperation between NRCS and SWCDs</b> in developing projects.	Meet quarterly
<b>Host a well testing clinic</b> or provide resources to well users to have their water tested.	One well clinic annually, provide well testing kits at the SWCD
Implement an education and outreach campaign for the responsible use, storage, and disposal of <b>household hazardous wastes</b> .	One campaign annually
<b>Ensure technical capacity exists to implement 1W1P actions</b> by continuing education of local staff and sharing of TSA, SWCD, and county staff to capitalize on trained staff in the planning area and minimize staff duplication.	One training annually
<b>Total Estimated 10 Year Cost</b>	
<b>\$450,000</b>	



**Outreach Effectiveness can be tracked by:**

- Number of participants at each event
- Number of events and meetings
- Number of people reached
- Hours spent on outreach



**Project Development can be tracked by:**

- Number of projects implemented
- Number of people reached
- Number of people that adopted practices
- Number of people that adopted practices by word of mouth (neighbors, newspaper, social media, etc.)





## Water, Equity, and Resiliency

### Water

Water is a universal, free-flowing entity and a requirement for all life. Water is therefore not only its material, chemical composition; water shapes and is also shaped by humans and embedded in social, cultural, and political practices. The R-RW is part of the larger Rainy River Basin, which encompasses the Boundary Waters Canoe Area Wilderness, Quetico Provincial Park, Voyageurs National Park, Superior National Forest, and other significant natural areas. This region of North America, along the United States – Canadian border, has been important for humans ecologically, economically, and culturally since the glaciers retreated. It is important to continue a nondegradation focus to ensure these areas remain for future generations.

*The water belongs to everyone, so the work belongs to everyone.*

### Equity

Equity throughout communities and in larger geographies is important because of increasing temperature and precipitation trends and the development of sustainable and resilient communities. Addressing equity at a watershed scale is a way of exploring, delineating, and prescribing actions for addressing the equitable management of natural resources for the welfare of all people in those communities within the plan boundaries. Though particular goals or actions directly addressing equity are not specifically prescribed in this plan, it is encouraged to be considered during plan implementation.

### Resiliency

Resilience is the ability of a system to experience change but not be affected. Resilience can be social, ecological, and economic (MGLP, 2021). Social resilience is organization and regulation. For example, having county ordinances build social framework to protect natural resources. Ecological resilience includes landscape diversity, water retention, and fixing past hydrological alterations. For example, restoring ditching in peatlands provide resilience to increasing precipitation trends and provide carbon storage. Economic resilience includes providing cost share for private landowners to adapt practices that increase ecological resilience.

**This plan includes actions and programs that build social, economic, and ecological resilience.**

#### **Social resilience programs and actions:**

- ◆ Regulatory program
- ◆ Outreach and education program
- ◆ Cost share incentives for practices

#### **Ecological resilience programs and actions:**

- ◆ Forest management and protection
- ◆ Cover crops and no till
- ◆ Peatland restoration
- ◆ Stormwater management

#### **Economic resilience programs and actions:**

- ◆ Cost share incentives for practices
- ◆ New state funding for local projects, which also supports local staff capacity and local contractors and service providers.





# Section 6. Plan Administration





## SECTION 6. PLAN ADMINISTRATION

Plan Administration describes how the plan will be implemented, how the watershed partners will work together, how the funding will move between them, and who will handle the administrative duties.

### Formal Agreements

The Rainy-Rapid Partnership is a collaboration of LOW County and LOW SWCD (Figure 6.1). These entities previously entered into a Memorandum of Agreement (MOA) for planning the One Watershed, One Plan to form a Policy Committee for R-RW (Appendix E). The entities will enter into a new memorandum of agreement for purposes of implementing this plan. The Policy Committee is advisory to the individual county and SWCD boards under the umbrella of the MOA.

Koochiching and Beltrami counties and SWCDs declined to participate because the majority of their land in this watershed is state-owned. The Red Lake Nation declined to participate as well. These entities could still be a partner on project implementation. Other local collaborators include the City of Baudette (Figure 6.).

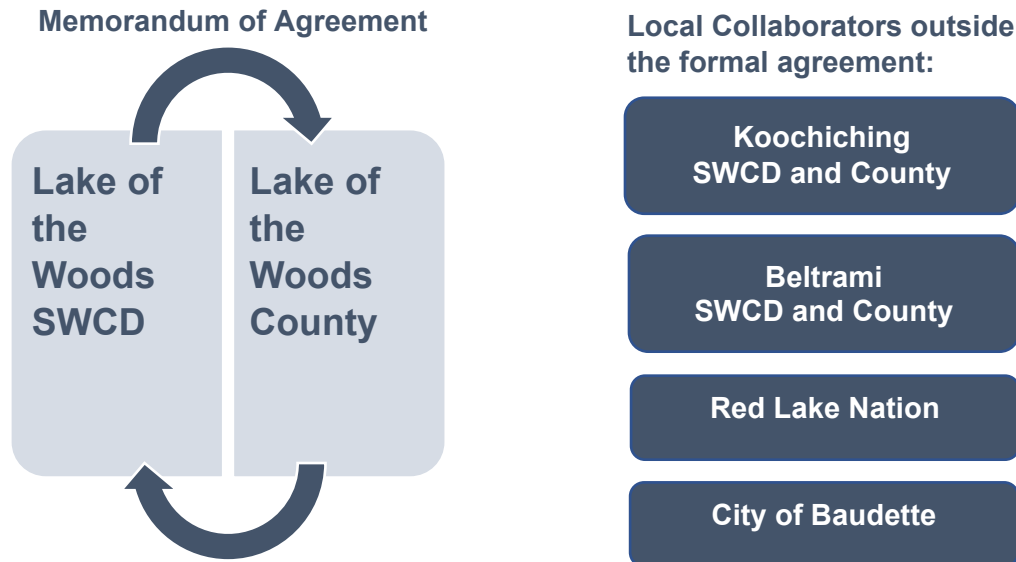


Figure 6.1. Implementation Agreements for the R-RW.



## Decision-making and Staffing

Implementation of the R-RCWMP will require increased capacity of plan partners, including increased staffing, funding, and coordination from current levels. Successful plan implementation will depend on generating active interest and partnerships within the watershed.

The decision-making and staffing for implementing the R-RCWMP will be conducted based on the concepts outlined in this section of the plan. The probable roles and functions related to plan implementation are outlined in Table 6.1. Expectations are that the roles of each committee will shift and change during implementation to best meet the needs of the Rainy-Rapid Partnership. Fiscal and administrative duties for plan implementation will be assigned to an LGU through a Policy Committee decision as outlined in the formal agreement. Responsibilities for work planning and serving as the central fiscal agent will be revisited by the Policy Committee on a biennial basis.



Table 6.1. Roles for R-RCWMP Implementation. The LGUs will be collectively referred to as the Rainy-Rapid Partnership.

Committee Name	Description	Primary Implementation Role and Functions
<b>Policy Committee</b>	Two Board members from each MOA entity.	<ul style="list-style-type: none"> <li>◆ Meet twice a year or as needed</li> <li>◆ Annual review and confirmation of Steering and Advisory Committee recommendations</li> <li>◆ Direction to Steering Committee on addressing emerging issues</li> <li>◆ Recommend approval of the biennial work plan by the individual boards of the MOA members</li> <li>◆ Review the implementation funds from plan participants</li> </ul>
<b>Local Fiscal Agent and Coordinator</b>	Lake of the Woods SWCD	<ul style="list-style-type: none"> <li>◆ Convene committee meetings</li> <li>◆ Prepare the biennial work plan</li> <li>◆ Prepare and submit grant applications/funding requests</li> <li>◆ Research opportunities for collaborative grants</li> <li>◆ Report on how funds were used</li> <li>◆ Compile annual results for annual assessment</li> </ul>
<b>Steering Committee</b>	Staff members from each MOA entity and local BWSR Board Conservationist.	<ul style="list-style-type: none"> <li>◆ Meet monthly or as needed to review projects</li> <li>◆ Review the status of available implementation funds from plan participants</li> <li>◆ Review opportunities for collaborative grants</li> <li>◆ Review annual fiscal reports</li> <li>◆ Review annual reports submitted to BWSR</li> <li>◆ Biennial review and confirmation of priority issues</li> <li>◆ Evaluate and recommend response to emerging issues</li> <li>◆ Prepare plan amendments</li> <li>◆ Implement the targeted implementation schedule</li> </ul>
<b>Advisory Committee</b>	State Agencies and local stakeholders appointed by the Policy Committee.	<ul style="list-style-type: none"> <li>◆ Meet annually or as needed</li> <li>◆ Review and provide input for the annual work plan</li> <li>◆ Review and identify collaborative funding opportunities</li> <li>◆ Assist with execution of the targeted implementation schedule</li> <li>◆ Provide input for the biennial work plan</li> <li>◆ Be a local supporter for the plan</li> </ul>





## Collaboration

### Collaboration between Planning Partners

The Rainy-Rapid Partnership acknowledges the value of collaboration between planning partners to achieve successful plan implementation. Benefits of successful collaboration for the Rainy-Rapid Partnership include consistent implementation of actions watershed-wide, increased likelihood of funding, and resource efficiencies gained.

There is already some collaboration between the LGUs of the Rainy-Rapid Partnership. There is currently a memorandum of agreement between LOW County and SWCD for the County Land and Water Director to serve as the director of the SWCD. Where possible and feasible, the Rainy-Rapid Partnership will pursue opportunities for collaboration with other LGUs in the watershed to gain program efficiencies, pursue collaborative grants, and provide technical assistance. The Rainy-Rapid Partnership will also review similarities and differences in local regulatory administration to identify local successes and identify changes needed in the future to make progress towards goals outlined in this plan.

### Collaboration with Other Units of Government

The Rainy-Rapid Partnership will continue to coordinate and cooperate with other governmental units at all levels. Coordination with state agencies will continue as they are experts in many of the topic areas included in this plan, have been participating members of the planning Advisory Committee, and will be members of the implementation Advisory Committee. Cooperation with units of government such as NRCS, City of Baudette, and other water management authorities are a practical necessity to facilitate watershed-wide activities. Examples of collaborative programs in the watershed include EQIP (NRCS), CRP (FSA), Minnesota Agriculture Water Quality Certification (MDA), Wellhead Protection for Community Water Supply DWSMAs (MRWA and MDH), and Minnesota Forest Resource Council and WRAPS (MPCA).

The North Central Technical Service Area 8 (TSA8) is a Joint Powers Entity between SWCDs in the region. The TSA8 manages funding from the state to SWCDs for engineering, GIS mapping, and marketing and communications assistance for implementing conservation practices (Figure 6.2). They will be instrumental in assisting in R-RCWMP plan implementation.

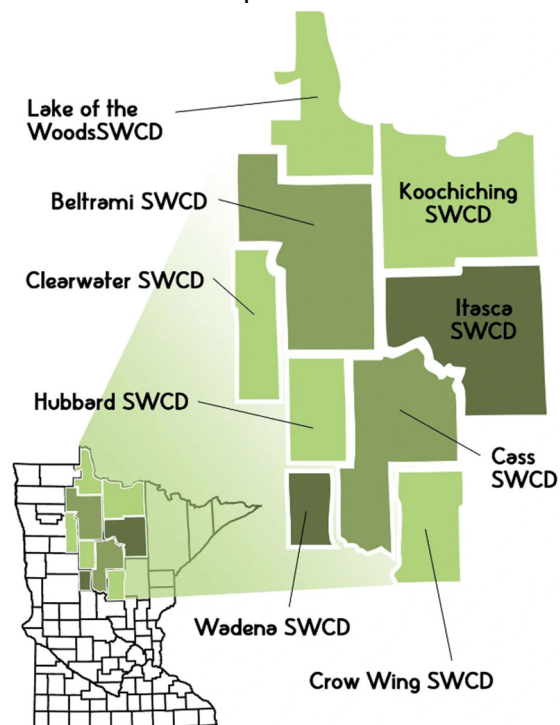


Figure 6.2. TSA8 service area and counties served.

Other collaborations between units of government in the R-RW are summarized in Table 6.2

Table 6.2. Examples of current collaboration activities with other units of government.

Collaboration with other units of government in the R-RW							
DNR collaborates with USFWS on land management Land Utilization Plan Lands (federal lands part of NWR system leased to State of MN [DNR] to be managed for habitat).	MNDOT collaborates with the drainage authority on road ditch projects.	Rainy-Rapid board: Koochiching and LOW Counties collaborate on ordinances.	NRCS collaborates with SWCD on Agricultural BMPs.	MPCA is doing a large study with USGS (funded by LCCMR) for sediment & phosphorus in LOW and Rainy River.	Lake of the Woods Control Board covers LOW and Rainy River.	International Rainy-Lake of the Woods Watershed Board	Technical Service Area 8 (JPB between SWCDs)

### Collaboration with Others

Local support and partnerships will drive the success of final outcomes of the actions prescribed for implementing this plan. Because this plan’s focus is voluntary land stewardship practices, collaborations and engagement with landowners in the watershed is essential for successful plan implementation. There are many actions in the plan that describe working with individual landowners and providing cost share and technical assistance for implementing land stewardship practices (Section 4). Many of the existing collaborations in the watershed have been involved in the development of this plan and are committed to protecting and enhancing the watershed resources. Partners for these collaborations include, but are not limited to, Ducks Unlimited, Sportsman’s Clubs, L.O.W Whitetails Unlimited, civic groups, private businesses, individuals, and foundations. There are co-sponsored partnerships with Canadian researchers from various universities and colleges, as well as provincial governments. The Rainy-Rapid Partnership collaborates with these groups for education, outreach, monitoring, and project implementation.



## Funding

The Rainy-Rapid Partnership will pursue funding opportunities in order to implement the activities prescribed in the targeted implementation schedule (Section 4). Current programs and baseline funding (Level 1) will not be enough to meet the full targeted implementation schedule. The success of plan implementation will hinge on reliable non-competitive watershed based funding being available for plan implementation in addition to competitive state, federal, and private grant dollars. The Rainy-Rapid Partnership acknowledges that additional staffing may be necessary to meet plan goals. Existing local government units in the watershed would be responsible for hiring additional staff.

The baseline funding level (Level 1) is based on the annual revenue and expenditures for Lake of the Woods and Koochiching counties and SWCDs. The current level of investment by each local government unit is expected to remain the same during the R-RCWMP 10-year time period. It includes local funds such as county allocations for SWCD support, and state funds such as conservation delivery grants, the Natural Resources Block Grant and SWCD Local Capacity Building Grants.

Table 6.3. Level 1 funding for the R-RW.

Funding Level	Annual Local Estimate	Annual State Estimate	Annual Federal Estimate	Annual Total Estimate
1	\$51,300 (20%)	\$208,700 (48%)	0 (0%)	<b>\$260,000</b>

Level 2 funding describes the baseline funding plus additional funding that could be obtained to implement the plan, including noncompetitive watershed-based funding (Table 6.3). The total estimated funding for Level 2, which is just the funding that is administered by the Rainy-Rapid Partnership, is \$415,000 annually and \$4,150,000 over the 10-year life of the R-RCWMP (Table 6.4). Administration costs are assumed to be at 10% of the Watershed-Based Funding Grant biennially (~\$31,000).

Level 3 funding consists of funding that is administered outside of the Rainy-Rapid Partnership, including projects implemented by NRCS and state agencies. There is likely much more project funding occurring in the watershed in addition to these totals as it is difficult to document projects by all entities, including private landowners.

Table 6.4: Estimated implementation funding for the R-RCWMP (per Levels 1-3)

Funding Level	Description	Estimated Annual Average	Estimated Plan Total (10 years)
1	Baseline	\$260,000	\$2,600,000
2	Baseline + Watershed-Based Implementation Funding (~\$310,000/Biennium)	\$415,000	\$4,150,000
3	Other Sources (SFIA, NRCS, DNR, Lessard-Sams, etc.)	\$577,000	\$5,770,000





The total funding can also be broken out by Implementation Programs (Figure 6.). The majority of the funding is going towards “Fix It” and “Manage It” programs, but in this watershed these fixes are mainly for protection since there is only one minor impairment. Nearly 100% of the total funding is going towards nondegradation practices. The “Keep It” program is smaller because 92% of the watershed is already permanently protected. Overall, 88% of the plan funding is being used for implementing conservation and 12% for outreach, monitoring, feasibility studies, and data collection (“Know It” program).

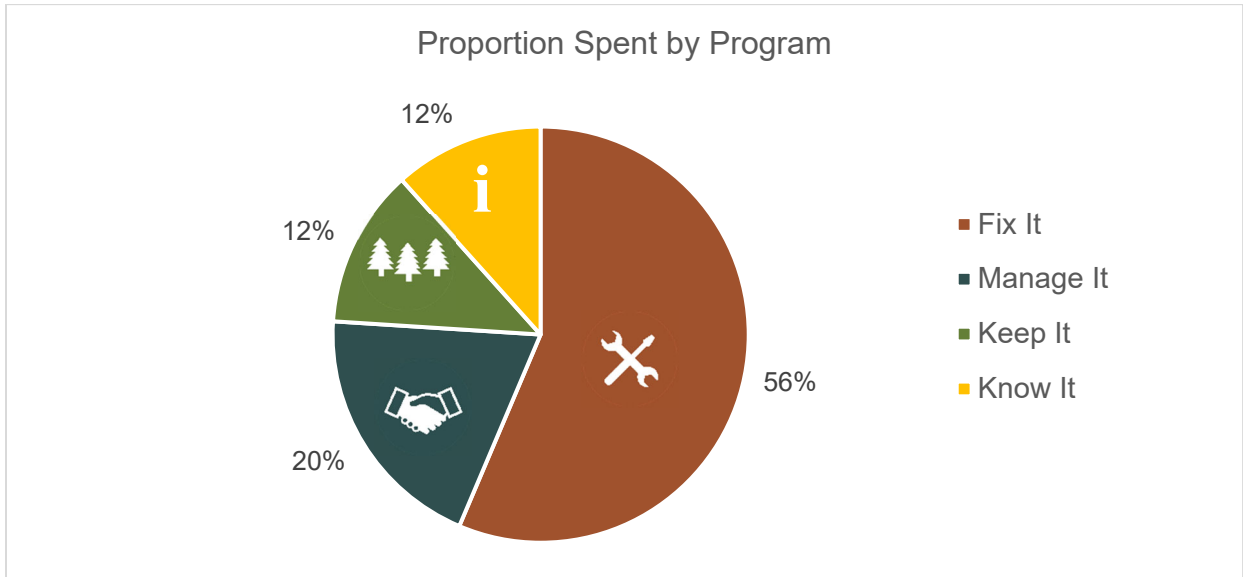


Figure 6.3. Funding spent per program (Level 2 and 3) for the 10-year plan.






Examples of SWCD staff implementing projects









Table 6. lists the most used programs and grants for executing the implementation programs described by this plan and used within the targeted implementation schedule. The funding grants and programs are cross-referenced to plan implementation programs, thereby showing potential sources of revenue for implementation. Programs will be coordinated uniformly throughout the watershed where possible.

Table 6.5: Funding sources available for implementing the R-RCWMP

Source	Agency	Program/Fund Name	Type of Assistance	Form of Assistance				
STATE FUNDING	BWSR	Clean Water Fund	Financial	Grant	●	●	●	●
	BWSR	Natural Resources Block Grant	Financial	Grant	●	●		
	BWSR	SWCD Local Capacity Service Grants	Financial	Grant	●	●	●	●
	BWSR	Erosion Control & Management Program	Financial	Grant	●	●		●
	DNR	Conservation Partners Legacy	Financial	Grant	●		●	
	DNR	Aquatic Invasive Species Control	Financial/ Technical	Grant		●		
	DNR	Forest Stewardship Program	Technical	Cost Share		●	●	
	DNR	Aquatic Management Area, Wildlife Management Area	Financial	Fee Title Acquisition			●	
	DNR/Revenue	Sustainable Forest Incentive Act	Financial	Incentive payment			●	
	MPCA	Clean Water Partnership and Section 319 Grant Program	Financial	Grant	●			
	MPCA	State-Revolving Fund	Financial	Grant	●			
	MPCA	Surface Water Assessment Grant	Financial	Grant				●
	MDH	Source Water Protection Grant	Financial	Grant	●	●	●	
	MDA	Nitrate Testing	Technical	Monitoring				●
	MDA	Agricultural BMP Loan Program	Financial	Loan	●	●		
	LSOHC	Outdoor Heritage Funds	Financial	Grant			●	
	LCCMR	Environmental Trust Fund	Financial	Grant	●		●	
	Legislature	Bonding	Financial	Bond	●			
FEDERAL FUNDING	FSA	Conservation Reserve Program	Financial	Cost Share		●	●	
	NRCS	Conservation Innovation Grant	Financial	Grant	●			
	NRCS	EQIP	Financial	Cost Share	●	●		
	USGS	Stream Gaging Network	Technical	Monitoring				●



Source	Agency	Program/Fund Name	Type of Assistance	Form of Assistance				
	USACE	Planning Assistance	Technical	Planning		●		
	EPA	State Revolving Fund	Financial	Loan	●			
<b>OTHER FUNDING</b>	Ducks Unlimited		Financial/ Technical	Easement/Cost Share	●		●	
	L.O.W. Whitetails		Financial/ Technical	Easement/Cost Share	●		●	
	The Nature Conservancy		Financial	Easement			●	
	Minnesota Land Trust		Financial	Easement			●	

## Local Funding

Funding derived from either the local property tax base or in-kind services of any personnel funded from the local tax base is local revenue. Local funding excludes general operating funds obtained from BWSR, fees for service and grants, or partnership agreements with the federal government or other conservation organizations.

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

### **Water Planning Authority for Special Projects (Minnesota Statute 103B.355):**

- Counties have the authority to levy funds for priority projects and assist SWCDs with program implementation.

### **Road Authorities:**

- Counties can provide limited local funding to assist with the local share of road retention and other floodwater-retention projects.

### **Drainage System Costs (Minnesota Statute 103E):**

- Funding of all costs related to construction, maintenance, and improvement of drainage systems is apportioned to property owners within the drainage system based on the benefits received from the improved drainage.
- A drainage authority can accept and use funds from sources other than assessments from benefitted landowners for the purposes of flood control, wetland restoration, or water quality improvements. Minnesota Statutes Chapter 103E, Section 15, subdivision 1a requires drainage authorities to investigate the potential use of external funding for the purposes identified in Minnesota Statutes Chapter 103E, Section 11, subdivision 5.



## State Funding

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

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

State funding includes funds derived from the State tax base for state cost-share and regulatory purposes. State funding excludes general operating funds obtained from BWSR, counties, fees for service and grants, or partnership agreements with the federal government or other conservation organizations.

## Collaborative Grants

The fiscal agent will apply for collaborative grants on behalf of the Rainy-Rapid Partnership, which may be competitive or non-competitive. The assumption is that future base support for implementation will be provided to the R-RCWMP as one or more non-competitive implementation watershed-based funding allocations. Where the purpose of an initiative aligns with the objectives of various state, local, non-profit, or private programs, these dollars will be used to help fund the implementation programs described by this plan. Funding sources that are currently available at the time of developing this plan are listed in Table 6.5.

## Federal Funding

Federal funding includes all funds derived from the federal tax base. This includes programs such as the EQIP administered by NRCS. Federal funding does not include general operating funds obtained from BWSR, counties, fees for service and grants or partnership agreements with state government or other conservation organizations.

Federal agencies can be engaged following the approval of this plan and prior to implementation, to create an avenue to access federal resources for implementation. Opportunity may exist to leverage state dollars through some form of federal cost-share program. Where the purpose of an implementation program aligns with the objectives of various federal agencies, federal dollars will be used to help fund the implementation programs described by this plan. For example, the NRCS will likely provide support for agricultural best management practices, while the FSA may provide land-retirement program funds such as CRP.

## Other Funding Sources

Foundations, nonprofit organizations, and private contributions (including landowners and corporate entities) will be sought for plan implementation activities. Local foundations may fund

education, civic engagement, and other local priority efforts. There are conservation organizations active in the watershed, such as Ducks Unlimited, L.O.W Whitetails and Sportsman's Clubs. These organizations acquire funding of their own and may have project dollars and technical assistance that can be leveraged. Major cooperators and funding sources are private landowners who typically contribute 25% of project costs and many donate land, services, or equipment for projects or programs.

## Work Planning

This plan envisions collaborative implementation. Biennial work planning will be completed to align with the priority issues addressed, the availability of funds, and the roles and responsibilities for implementation.

### Local Work Plan

The Rainy-Rapid Partnership will be responsible for completing a biennial work plan based on the targeted implementation schedule. The process for approval of work plans will be explained in the MOA between the partners and adopted bylaws. The purpose of these biennial work plans is to obtain BWSR watershed-based implementation funding, maintain collaborative progress towards completing the targeted implementation schedule, and reach the outcomes prescribed in the plan.

### Funding Request

The Rainy-Rapid Partnership will collaboratively develop, review, and submit a watershed-based funding request from this biennial work plan. The partnership will approve of this request as per their MOA and bylaws prior to submittal to BWSR. The watershed-based funding request will be developed based on the 2023-2024 priority projects outlined in the targeted implementation schedule and any adjustments made through self-assessments.





## Assessment, Evaluation, and Reporting

### Accomplishment Assessment

The Steering Committee will provide the Policy Committee with an annual update on the progress of the plan's implementation. For example, any additional acres of land BMPs will be tracked so that each year the Steering Committee will report how many additional acres were managed in the watershed. A tracking system will be used to measure progress based on measurable goals and will serve as a platform for plan constituents and the public. Tracking these metrics will also make them available for supporting future work plan development, progress evaluation, and reporting.

### Partnership Assessment

Biennially, the Steering Committee, with the help of the Advisory Committee, will review the R-RCWMP goals and progress toward implementation, including fulfillment of committee purposes and roles, efficiencies in service delivery, collaboration with other units of government, and success in securing funding. During this review process, feedback will be solicited from the boards, Policy Committee, and partners such as state agencies and non-governmental organizations. This feedback will be presented to the Policy Committee to set the coming biennium's priorities for achieving the plan's goals and to decide on the direction for grant submittals. Also, this feedback will be documented and incorporated into the 5-year evaluation. The Rainy-Rapid Partnership intends to pursue watershed-based funding to meet goals and plan implementation schedules.

### Mid-Point Evaluation

Beginning in 2023, this plan will be in effect for 10 years. Over the course of the plan's life cycle, progress toward reaching goals and completing the implementation schedule may vary. New issues may emerge as the plan progresses, and/or new monitoring data, models, or research may become available. Therefore, in 2028-2029, a mid-point evaluation will be undertaken. This plan will determine if the current course of actions is sufficient to reach the goals of the plan, or if a change in the course of actions is necessary.

### Reporting

LGUs have several annual reporting requirements. Some of these reporting requirements will remain a responsibility of the LGUs. Reporting related to grants and programs developed collaboratively and administered under this plan will be reported by the plan's fiscal agent (Table 6.1). In addition to annual reporting, the Steering Committee will also develop a biennial *Watershed Report* to present to the Policy Committee and the Rainy-Rapid Partnership. This report will document progress toward reaching goals and completing the targeted implementation schedule and will describe any new emerging issues of priorities. The information needed to biennially update the *Watershed Report* will be developed through the annual evaluation process.

The fiscal agent is responsible for submitting all required reports and completing annual reporting requirements for R-RCWMP as required by state law and policy. The Steering

Committee will assist in developing the required reports and roles and responsibilities will be defined in the MOA Bylaws.

## Plan Amendments

The R-RCWMP is effective through 2033 per the BWSR Order approving it. Activities described in this plan are voluntary, not prescriptive, and are meant to allow flexibility in implementation. An amendment will not be required for addition, substitution, or deletion of any of the actions, initiatives, and projects if those changes will still produce outcomes that are consistent with the plan priority issues and goals.

During the time this plan is in effect, it is likely that new data giving a better understanding of watershed issues and solutions will be generated, especially with MPCA's Watershed Restoration and Protection Strategy (WRAPS) Cycle 2. Administrative authorities, state policies, and resource concerns may also change. New information from sources such as the updated WRAPS; significant changes to the projects, programs, or funding in the plan; or the potential impact of emerging concerns and issues may require activities to be added to the plan. If revisions are required or requested, the Policy Committee will initiate a plan amendment process consistent with Minnesota Statute 103B.314, Subd. 6.

