SECTION 4. MEASURABLE GOALS

In order to effectively create an implementation plan, it is important to set goals that implementation actions will target. RLRW goals include a specific, measurable 10-year goal that is the object of this plan as well as a more descriptive ideal long-term goal.

There are 10 goals for the RLRW (summarized on the following page) that address each issue set in Section 3. Goals were developed through review of the 2017 RLRW Plan and Advisory Committee discussion on how those prioritization statements and goals could be simplified and established to build consistency with neighboring watershed's CWMPs.

Each goal is summarized in a three-page factsheet that can stand alone after the plan is completed. The goal is described in Figure 4.1 to the right including the short-term goal, what has already been accomplished, the long-term goal, and the big picture story.

Each goal page also includes the following supporting information:

- A description of the goal and why it matters,
- Which issues are addressed by the goal,
- Stacked benefits of pollution reduction, carbon sequestration, habitat improvement, and water storage made through the goal, and
- A map showing priority areas.

SHORT-TERM GOAL

10 year goal for the plan.

ALREADY ACCOMPLISHED

What has been accomplished by local partners since 2017 when the original plan began implementation.

LONG-TERM GOAL

The desired future condition with no specific timeframe; the eventual condition resource managers hope to achieve.

Figure 4.1. Summary and definition of plan goals

Progress towards goals will be made through actions described in Section 5. Progress will be evaluated via the metric specified for each goal, such as the number of projects or number of acres treated.

Photo: Red Lake River Watershed District

Red Lake River Short-Term Measurable Goals

Goal	Priority Issues Addressed	10-Year Goal
Upland Erosion and Nutrients	• Nutrient Loading • Upland Erosion and Soil Health • Unstable River and Stream Channels	Reduce overland sediment loading by 1.7% watershed wide, or **4,200 tons/year.** Reduction by Planning Region: • Upper **252 tons/year or 0.9%** • Middle **2,259 tons/year or 2.9%** • Lower **1,387 tons/year or 1.6%** • Grand Marais **302 tons/year or 0.5%**
Soil Health	• Nutrient Loading • Upland Erosion and Soil Health • Upland and Wildlife Habitat	Implement **17,155 acres** of soil health practices
Flooding	• Flood Damage Reduction and Resiliency • Drainage System Inadequacy	Reduce likelihood of flooding and improve groundwater recharge by adding **4,000 ac-ft of storage** to the landscape
Groundwater	• Groundwater Contaminants	Protect groundwater from contamination by sealing (on average) **5 wells per year** (or 50 wells over 10 years)
Bacteria	• Nutrient Loading • Groundwater Contaminants • Source Water Protection • Excess Bacteria	Upgrade **100 SSTS** to reduce bacteria and nutrients and protect groundwater Implement **4 manure management** practices to reduce bacteria from livestock
Stormwater	• Stormwater Runoff • Excess Bacteria • Nutrient Loading	Implement **3 stormwater projects** to improve surface water quality
Streambank Stabilization	• Unstable River and Stream Channels • Nutrient Loading • Shoreland and Riparian Management	Implement stream channel and shoreline stabilization to prevent **1,860 tons/year** of sediment loss through bank erosion
Riparian Management	• Unstable River and Stream Channels • Nutrient Loading • Shoreland and Riparian Management	Establish, or improve quality, of **3,200 acres** of perennial vegetation within riparian corridor area
Drainage Management	• Altered Hydrology • Drainage System Instability • Drainage System Inadequacy	Identify inadequate drainage systems, including outlets, and stabilize or repair **12 miles**

Goal	Priority Issues Addressed	10-Year Goal
Land Protection	• Wetland and Upland Habitat • Flood Damage Reduction and Resiliency • Groundwater Supplies	**30,200 acres** of land are protected through new enrollment into conservation easements or re-enrollment of temporary easements; Complete **25 forest stewardship plans**, managing **1,000 acres**

UPLAND EROSION & NUTRIENTS

Sediment loading to rivers can be a source of phosphorus, lead to turbidity impairments, and degrade aquatic habitat. Nutrients such as nitrogen and phosphorus are essential to life in low concentrations but pollute water when in excess. Trend analysis found that phosphorus has been increasing watershed wide, while TSS is increasing in the Red Lake River in Grand Forks and Fisher but has no trend watershed wide (1992-2014).

The largest source of nutrients in the RLRW is from cropland runoff (phosphorus). There are six turbidity impairments in RLRW streams, of which upland erosion, streambank erosion, and stormwater runoff are all contributors. HSPF modeling found TSS sources to be 50% from streambank erosion, 25% from cropland, and <20% from upstream watersheds.

The city of Thief River Falls and East Grand Forks source drinking water from the Red Lake River. Improvements in sediment loading to the river will directly benefit water treatment.

Sediment and nutrient loading can be addressed through upland conservation practices as well as stabilizing streambanks. This goal and the Soil Health goal focus on upland sediment loss and nutrient loading. The Streambank Stabilization and Riparian Management goals focus on streambank erosion and riparian buffers that reduce erosion.

PRIORITY ISSUES ADDRESSED

- Nutrient Loading
- Upland Erosion and Soil Health
- Unstable River and Stream Channels

A water and sediment control basin (RL SWCD).

SHORT-TERM GOAL

Reduce overland sediment loading 1.7% watershed-wide, or 4,200 tons/year

Metric: PTMApp, edge of field benefits

ALREADY ACCOMPLISHED (2017-2022)

- 5,362 tons/yr sediment reduction
- 363 Grade Stabilizations
- 10 Water & Sediment Control Basins
- 9 acres of Filter Strips

LONG-TERM GOAL

All waters support aquatic life and recreation thresholds for sediment levels.

MEASURING

Progress toward the watershed-wide Upland Erosion & Nutrients measurable goal will be measured in each planning region, as summarized in the table below.

Planning Region	10 Year Goal (tons/yr sediment reduced)
Upper	252
Middle	2,259
Lower	1,387
Grand Marais	302

FOCUS AREAS

The Prioritize, Target, and Measure Application (PTMApp) locates where on the landscape overland sediment is occurring and targets the best places for actions. Subwatersheds (HUC-12) that contribute the highest yield of sediment will be the focus of initial implementation efforts related to this goal (Figure 4.1).

Other resources that will be the focus of implementation efforts are sediment-impaired streams, streams that are nearly or barely impaired for sediment, and source water assessment areas. These resources are shown in Figure 4.1.

Stacking Benefits

Work toward implementing structural and non-structural practices makes progress towards reductions in phosphorus, sediment, and nitrogen to surface and groundwater; stores water in the soil; and sequesters carbon.

Surface Water Quality Benefits	Phosphorus = 3,032 lbs/yr
	Nitrogen = 37,419 lbs/yr
Climate Resiliency Benefits	Acre-feet water stored
	Carbon sequestered

Implementation Spotlight

Red Lake Watershed District

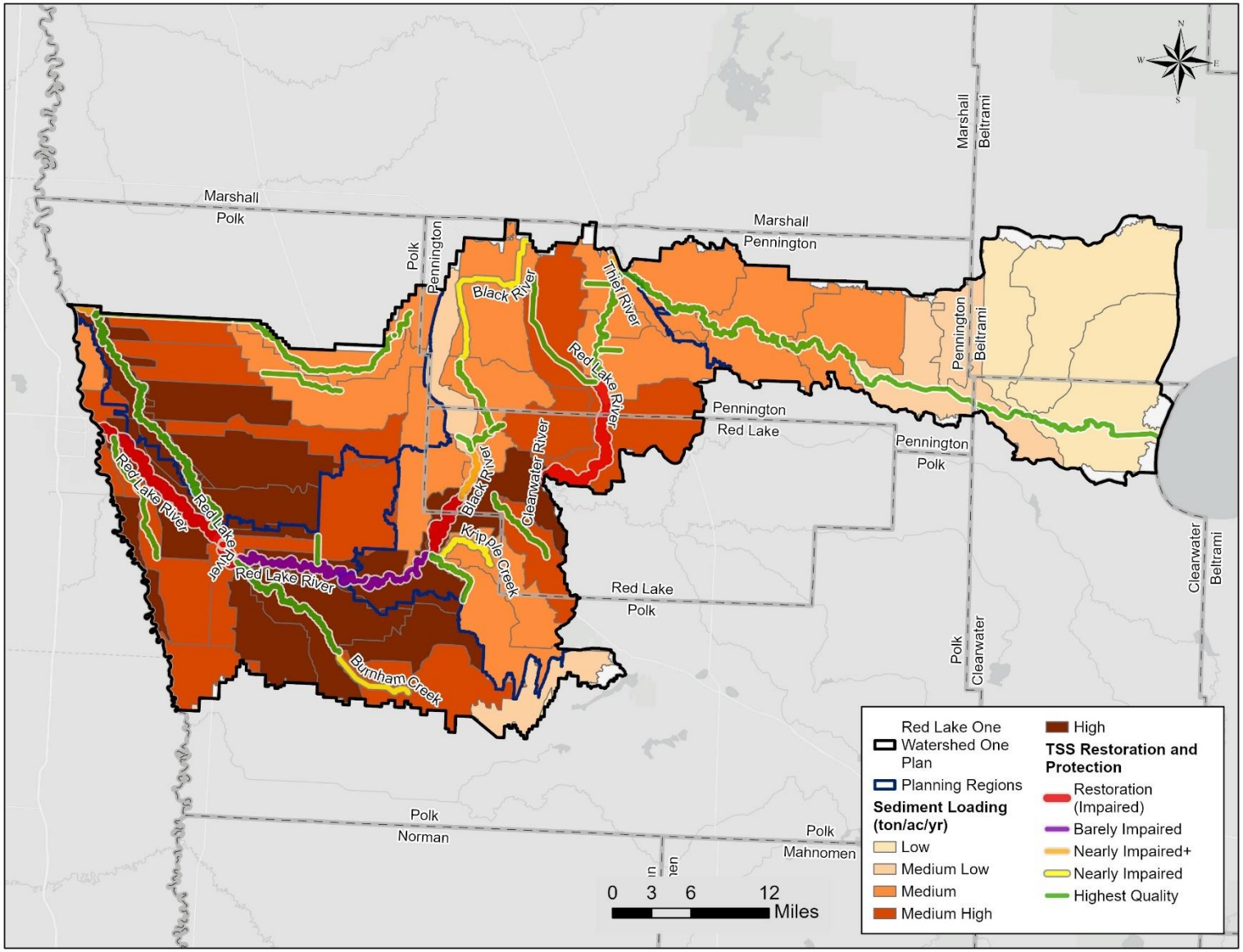


Figure 4.1. Subwatershed prioritization based on sediment loading (source: PTMApp).

SOIL HEALTH

Soil health is defined by the Natural Resource Conservation Service (NRCS) as the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans. Healthy soils provide valuable benefits, including cycling nutrients so less fertilizer is needed, creating good soil structure that reduces erosion, sequestering carbon, and storing water.

In many cases, modern agricultural practices based on monocultures have degraded soil quality, leading to less water storage, and soil erosion and nutrient loss. Cropland is the largest source of nitrogen and phosphorus loading in the RLRW (MPCA, 2019). In the RLRW, SWCDs work with producers to provide cost share for soil health practices.

There are many ways to improve soil health. Key soil management actions include maximizing soil cover and residue, increasing biodiversity, minimizing soil disturbance, and supporting live root systems. RLRW soil health BMPs can include cover crops, conservation tillage, nutrient management, and many more.

PRIORITY ISSUES ADDRESSED

- Nutrient Loading
- Upland Erosion and Soil Health
- Upland and Wildlife Habitat

Agricultural field (RL SWCD)

SHORT-TERM GOAL

Implement 17,155 acres of soil health practices

Metric: total # of acres

ALREADY ACCOMPLISHED (2017-2022)

- 7,200 feet of Conservation Cover
- 69 acres of Forage & Biomass Planting
- 1,926 acres of Cooperative Weed Management

LONG-TERM GOAL

Soil health practices are implemented annually on 25% of cropland to promote productivity and prevent wind and water erosion.

MEASURING

Progress toward the watershed-wide Soil Health measurable goal will be measured in each planning region, as summarized in the table below.

Planning Region	10-Year Goal (Acres of Soil Health)
Upper	920
Middle	9,200
Lower	5,610
Grand Marais	1,425

FOCUS AREAS

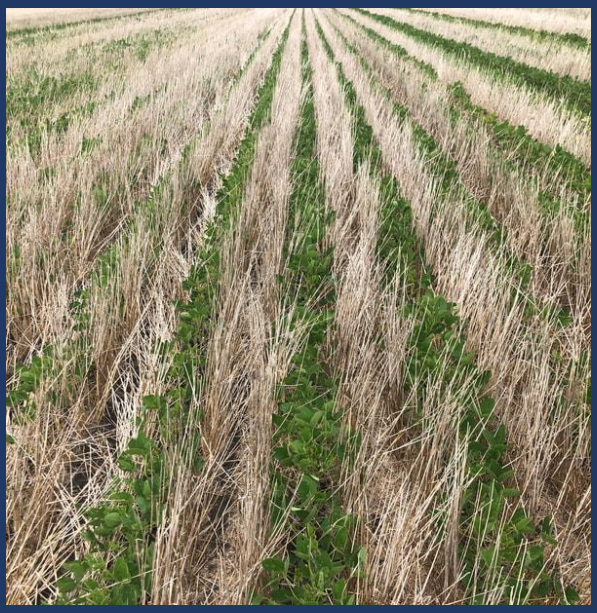
The Prioritize, Target, and Measure Application (PTMApp) locates where on the landscape overland sediment is occurring and targets the best places for actions. Subwatersheds (HUC-12) that contribute the highest yield of sediment will be the focus of initial implementation efforts related to this goal. These areas are shown in Figure 4.2.

Stacking Benefits

Work toward implementing structural and soil health practices makes progress towards reductions in phosphorus, sediment, and nitrogen to surface and groundwater; stores water in the soil; and sequesters carbon.

Surface Water Quality Benefits	Phosphorus = 3,032 lbs/yr
	Sediment = 4,200 tons/yr
	Nitrogen = 37,419 lbs/yr
Climate Resiliency Benefits	Water stored in soils
	Carbon = 16,000 metric tons CO2e/year) sequestered

Implementation Spotlight



West Polk SWCD

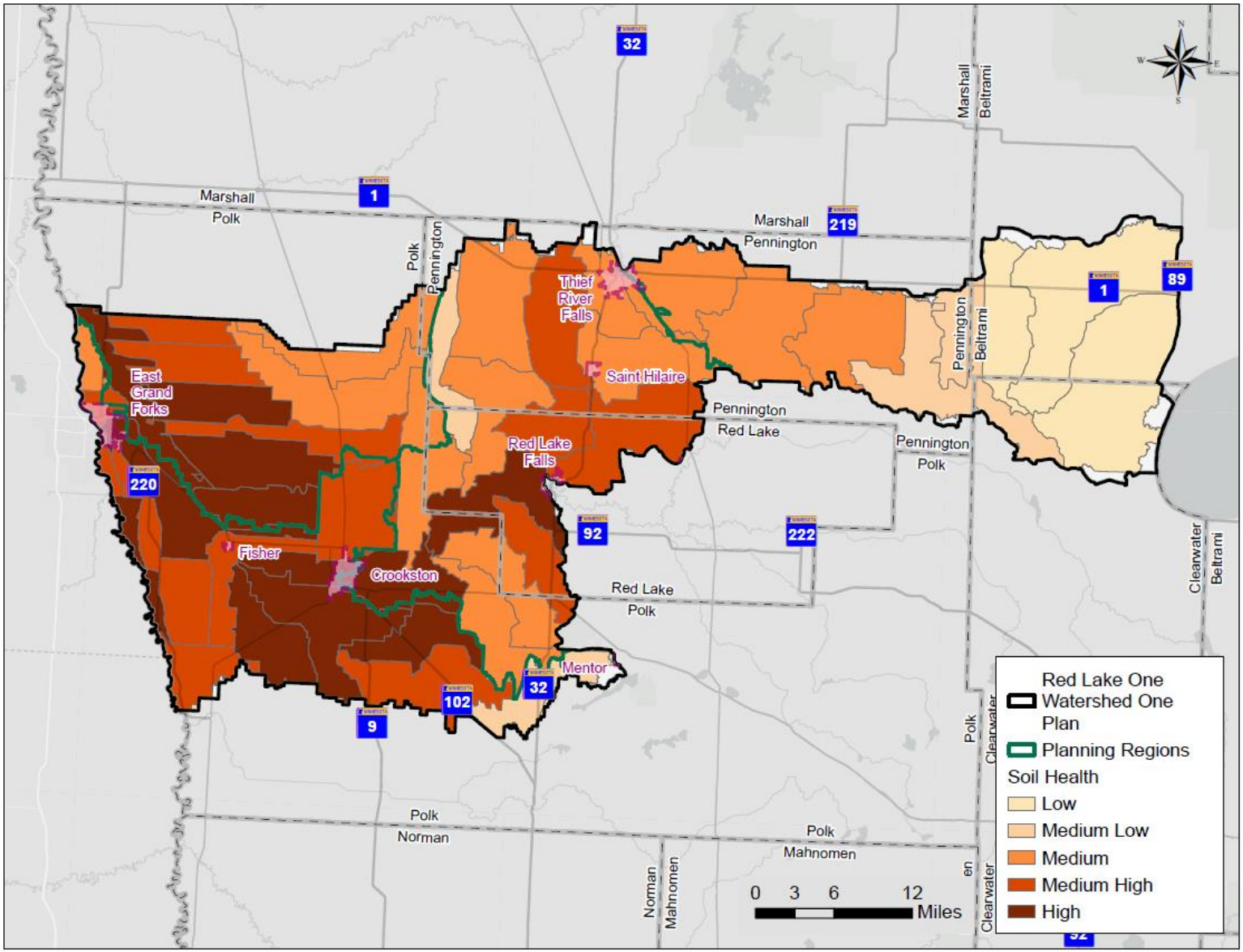


Figure 4.2. Subwatershed (HUC12) prioritization for soil health practices (source: PTMApp).

FLOODING

Flooding is an issue facing the entire Red River Basin that causes significant streambank erosion, damage to riparian landowners, and stresses infrastructure. It has both an environmental and economic impact. The region is naturally prone to flooding due to its flat topography with minimal basins to hold water, and Minnesota has seen an increase in annual precipitation.

Land use conversion that alters the ability of the soils to infiltrate precipitation combined with drainage of agricultural fields has increased the likelihood of flooding. Less water is stored in soils, reducing groundwater recharge, and more water is delivered to streams via overland flow or drainage pathways. The RLRW is also experiencing an increase in annual precipitation and heavy rain events, which compounds the impacts of altered hydrology and results in high flow regimes.

Flooding is alleviated in the watershed through practices that increase water storage in the land as well as impoundments. The 10-year goal to address flooding is to add 4,000 ac-ft of storage.

PRIORITY ISSUES ADDRESSED

- Flood Damage Reduction and Resiliency
- Drainage System Inadequacy

Grand Marais Creek flooding (RLWD)

SHORT-TERM GOAL

Reduce likelihood of flooding and improve groundwater recharge by adding 4,000 ac-ft of storage to the landscape

Metric: Acre-feet of storage calculated through BEAST or BWSR

ALREADY ACCOMPLISHED (2017-2022)

- 6 Structures for Water Control
- 10 Water & Sediment Control Basins
- Black River Impoundment

LONG-TERM GOAL

Meet the 270,000 acre-feet water storage goal established by the RRBC Long Term Flood Solutions report basin-wide flow reduction strategy (20% flow reduction).

MEASURING

Progress toward the watershed-wide Flooding measurable goal will be measured in each planning region, as summarized in the table below.

Planning Region	10-Year Goal (Ac-ft)
Upper	500
Middle	1,000
Lower	1,000
Grand Marais	500

Stacking Benefits

Work toward this goal also makes progress towards reducing phosphorus, sediment, and nitrogen that is in the runoff from flooding. Those benefits will be calculated from feasibility studies during implementation.

Surface Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction

FOCUS AREAS

The Red River Basin Flood Damage Reduction Framework Technical Paper No. 11 (Anderson, C., Kean, Al. 2004) defines three regions in the Red River Basin that contribute peak flows to the Red River of the North during a flood. These regions are based on timing, with waters reaching the Red River of the North either *early* (before the mainstem flood peak), *middle* (during the peak), or *early* (after the peak). In the RLRW, implementing agricultural and storage conservation practices in the **middle** and **late** areas will reduce downstream flood impacts the most, and are therefore prioritized areas for implementation to address flooding (Figure 4.3).

Implementation Spotlight

Black River Impoundment

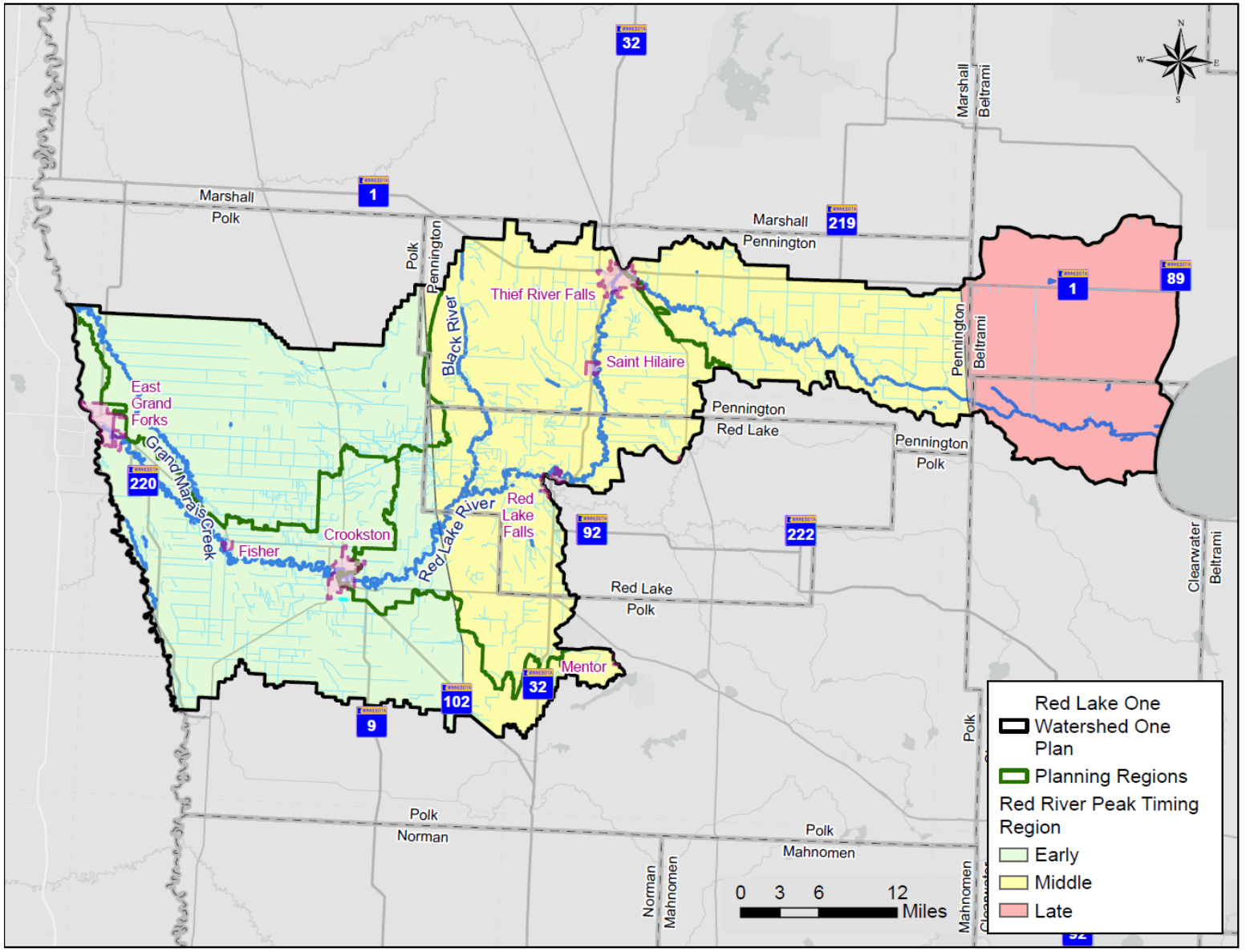


Figure 4.3. Red River peak timing regions. Storage projects are prioritized for middle and late timing regions.

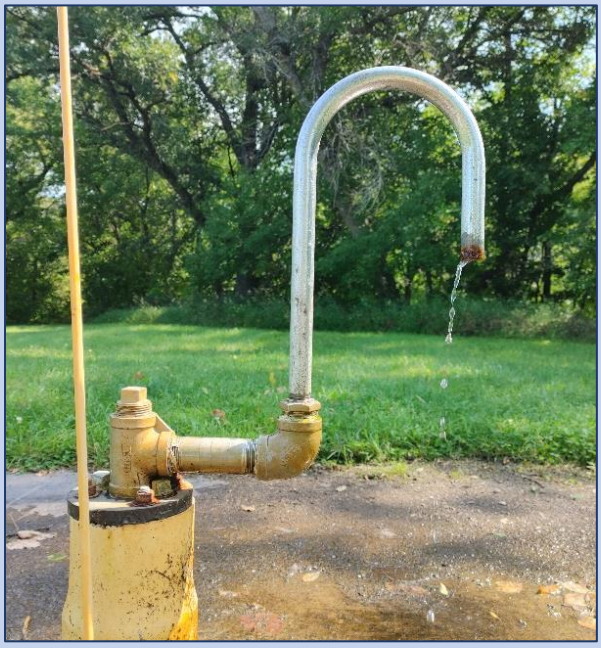
GROUNDWATER

Groundwater is a valuable resource that is recharged via slow infiltration of precipitation through soils. Groundwater supplies streams via baseflow and is a drinking water source for some in the RLRW through water stored in cretaceous, buried sand and gravel, or surficial sand and gravel aquifers. It is important to manage the groundwater supply well into the future, as land use conversion and the development of drainage systems have reduced the volume of water previously infiltrating into groundwater supplies. Diminished groundwater supplies produce low or intermittent baseflow to streams, and low baseflow is a stressor to aquatic life in the RLRW.

Groundwater can be contaminated via surface pollutants, and connections between groundwater and surface water such as abandoned wells are a conduit to groundwater. MDA testing did not find pesticides in the Northwest MN region but did find some samples that exceeded the drinking water standard of 10 mg/L of nitrate. Another common groundwater contaminant in Minnesota is arsenic, which is naturally occurring. Both arsenic and nitrate are a concern in drinking water because of health impacts.

PRIORITY ISSUES ADDRESSED

- Groundwater Contaminants



Well in Huot Park. (RLWD)

SHORT-TERM GOAL

Protect groundwater from contamination by sealing (on average) 5 wells per year (or 50 wells over 10 years)

Metric: # wells sealed

ALREADY ACCOMPLISHED (2017-2022)

- 11 wells decommissioned

LONG-TERM GOAL

All abandoned and unused wells are sealed, and all citizens have access to safe and sustainable groundwater supplies throughout the plan area.

MEASURING

Progress toward the watershed-wide Groundwater measurable goal will be measured in each planning region, as summarized in the table below.

Management Zone	10-Year Goal (# of wells sealed)
Upper	15
Middle	25
Lower	5
Grand Marais	5

FOCUS AREAS

Sealing unused wells is a priority watershed-wide, because wells are a direct conduit to the aquifer.

Beach ridges are special features in the region that are highly sensitive to groundwater contamination due to the depth from the surface to the water table. Prioritizing areas of high pollution sensitivity for groundwater actions will help protect the watershed overall (Figure 4.4).

Drinking Water Supply Management Areas (DWSMAs) are additional regions where plan actions can address groundwater quality issues. DWSMAs protect drinking water by identifying and designating areas surrounding a public water supply well that contributes groundwater to the well Figure 4.4.

Stacking Benefits

Other goals in this plan also aim to enhance and protect groundwater and drinking water:

The **Soil Health** goal includes implementing nutrient management and cover crops to reduce nitrate reaching the groundwater.

The **Land Protection** goal includes protection in high groundwater recharge areas to protect groundwater and base flows.

Implementation Spotlight

Minnesota Department of Health

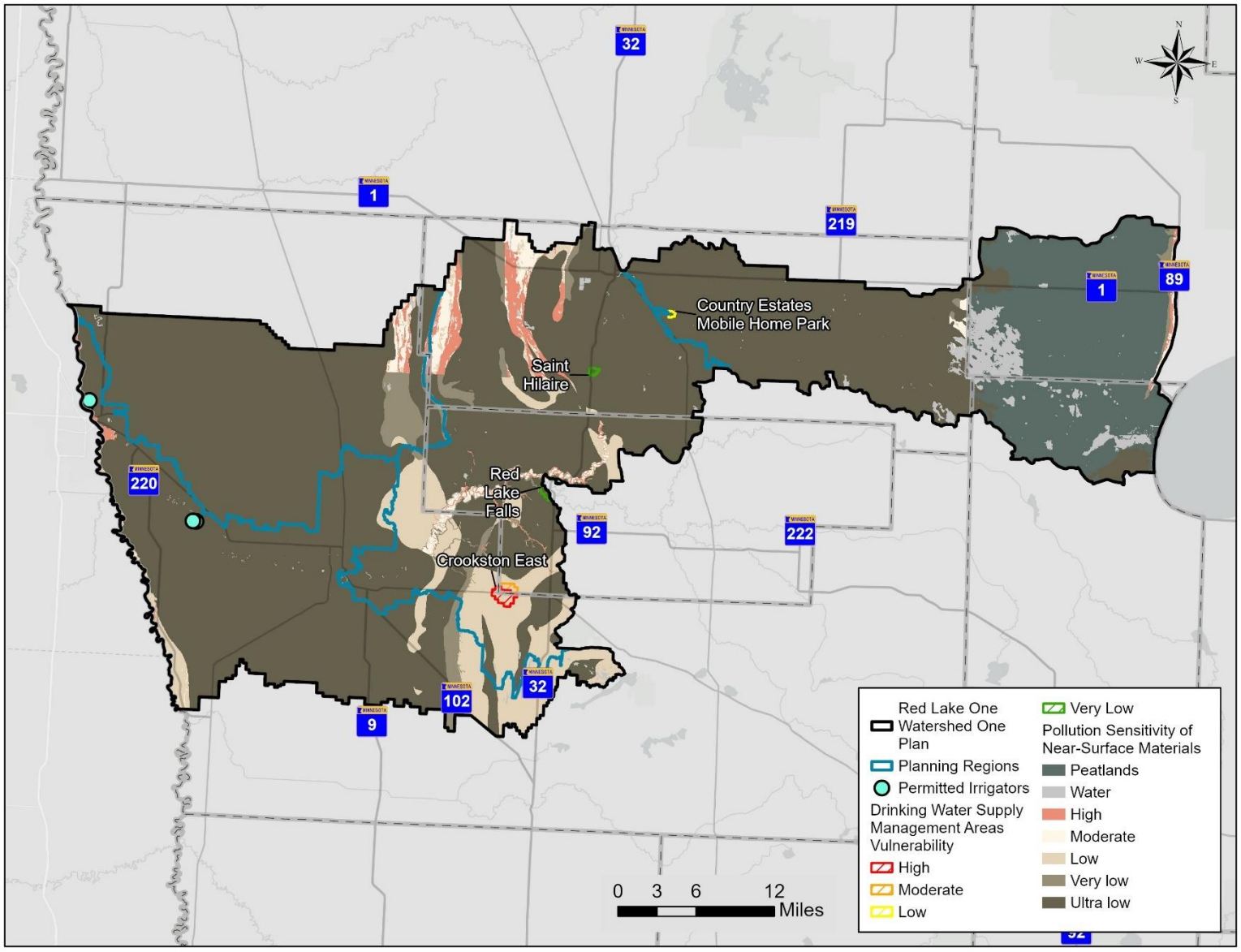


Figure 4.4. Groundwater sensitivity and Drinking Water Supply Management Area vulnerability.

BACTERIA

Bacteria are ubiquitous in the environment- they are in the air, water, and people. However, some strains make people sick. *E. coli* is used as an indicator of potential pathogens because it is found in the gut of humans and animals. Its presence in water is therefore an indication of fecal contamination and potential pathogens.

Bacteria in the RLRW has been worsening in recent years, as demonstrated by an MPCA trend analysis which found a strong downward trend from 2000-2014 in water quality due to *E. coli*. Sources of bacteria include feedlots, natural sources from wildlife, failing septics or subsurface sewage treatment systems (SSTS), or under-sewered communities. There are about 110 feedlots in the RLRW and only one concentrated animal feeding operation (CAFO) in the Upper Planning Region. Eighteen of these feedlots are in the shoreland. The bacteria short-term goal is to upgrade failing SSTSs and implement manure management practices. Septic systems can be a source of bacteria when they are not designed, installed, or maintained properly. Failing SSTSs are not likely to be the primary source of the annual bacteria load but can be a significant source in communities with many failing SSTSs or during low flow periods. Manure management practices such as feedlot BMPs, fencing, and waste storage reduce opportunity for bacteria loading to surface waters.

PRIORITY ISSUES ADDRESSED

- Nutrient Loading
- Groundwater Contamination
- Source Water Protection
- Excess Bacteria

SHORT-TERM GOAL

Upgrade 100 SSTS to reduce bacteria and nutrients and protect groundwater

Implement 4 manure management practices to reduce bacteria from livestock

Metrics: # SSTS upgrades and # manure practices

ALREADY ACCOMPLISHED (2017-2022)

- 16 Septic System Improvements

LONG-TERM GOAL

All waters support aquatic recreation thresholds for *E. coli* concentrations and sources of fecal contamination have been identified.

MEASURING

Progress toward the watershed-wide Bacteria measurable goal will be measured in each planning region, as summarized in the table below. SSTS upgrades will be addressed watershed-wide.

Management Zone	10-Year Goal (# of manure management projects)
Upper	2
Middle	2
Lower	N/A
Grand Marais	N/A

FOCUS AREAS

There are six impairments due to excessive *E. coli* in the watershed. These streams will be the focus of implementation efforts addressing fecal contamination, as shown in Figure 4.5.

SSTS upgrades will be prioritized nearest to surface water resources and areas of highest groundwater sensitivity (Figure 4.4).

Stacking Benefits

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

Surface Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction

Implementation Spotlight

Septics (MPCA)

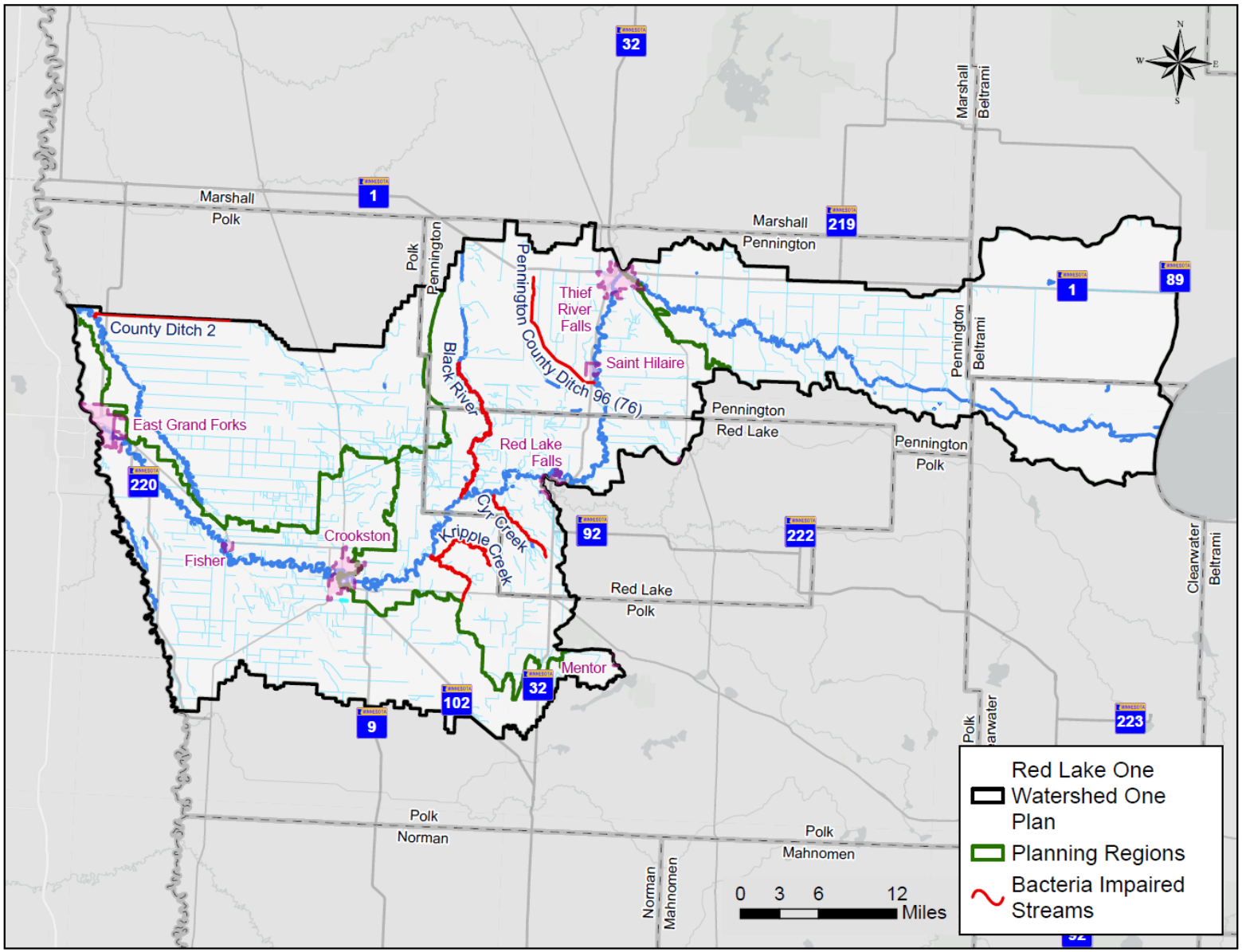


Figure 4.5. Streams impaired for recreational use due to elevated levels of bacteria.

STORMWATER

Stormwater is created as precipitation falls on urban areas, where it cannot infiltrate and picks up pollutants as it runs over roads, lawns, and roofs. Stormwater can be a source of nutrients, sediment, metals, chloride, and debris to receiving waters. It is discharged into streams and ditches, making it important to treat stormwater through BMPs.

Towns in the RLRW include East Grand Forks, Fisher, Crookston, Red Lake Falls, St. Hilaire, and Thief River Falls. Small BMPs can include projects like rain gardens or rain barrels, while larger stormwater BMPs can be infiltration basins or street sweeping. Stormwater treatment can also help store water during rain events.

An important aspect of stormwater management is education and outreach, as homeowners, businesses, and individuals can have an impact on stormwater quality. An education program is required of MS4s (municipal storm sewer system), of which East Grand Forks is the only one in the RLRW. MS4s are required to be permitted through MPCA to reduce stormwater pollution from large cities. The RLRW stormwater goal is to implement 3 BMPs in areas such as Red Lake Falls or Thief River Falls. A water quality study for the City of Thief River Falls was completed in 2019 and identified 15 projects to improve stormwater runoff.

PRIORITY ISSUES ADDRESSED

- Stormwater Runoff
- Excess Bacteria
- Nutrient Loading

Oxbow restoration (RLWD)

SHORT-TERM GOAL

Implement 3 stormwater BMPs to improve surface water quality

Metric: # of BMPs

ALREADY ACCOMPLISHED (2017-2022)

- 1 acre Stormwater Retention Basin
- Thief River Falls Oxbow Restoration (Stormwater Detention)

LONG-TERM GOAL

Major stormwater inputs to surface water running through cities have stormwater management BMPs.

MEASURING

Progress toward the Stormwater watershed-wide measurable goal will be measured in each planning region, as summarized in the table below. projects in East Grand Forks, Fisher, Crookston, Red Lake Falls, Thief River Falls, and Saint Hilaire will be considered on a case-by-case basis.

Planning Region	10-Year Goal (# of projects)
Upper	N/A
Middle	2
Lower	1
Grand Marais	N/A

Stacking Benefits

Work toward this goal also makes progress towards reductions in phosphorus, sediment, and nitrogen to surface and groundwater; and retains water runoff to surface water. Actual pollutant reductions will be estimated per project designed during implementation.

Surface Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction
Climate Resiliency Benefits	Increased water storage

FOCUS AREAS

The Thief River Falls Water Quality Study prioritizes stormwater BMPs and will be utilized to prioritize project implementation. Projects in East Grand Forks, Fisher, Crookston, Red Lake Falls, and Saint Hilaire will be considered on a case-by-case basis (Figure 4.6).

Implementation Spotlight

Thief River Falls Water Quality Study

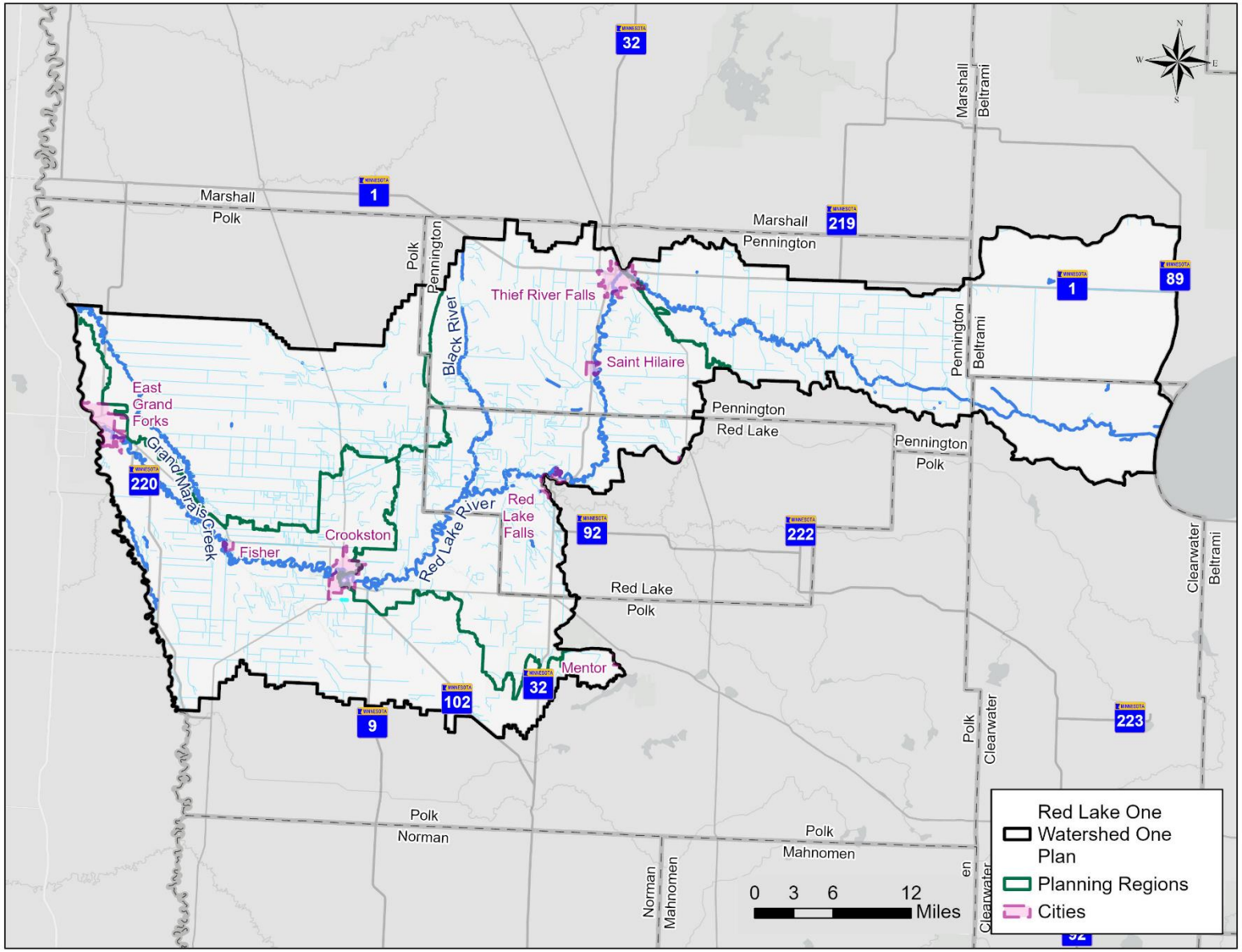


Figure 4.6. Cities in the RLRW.

STREAMBANK STABILIZATION

While altered hydrology and a lack of riparian buffers play a role in streambank erosion, natural features of the watershed also contribute to bank erosion. Most of the landscape is flat, and streams have a low gradient. This means that streambanks, or in some places steep ravines, are vulnerable to bank erosion under high flow conditions. Additionally, the soils are often clay or silty-clay, with little structure when wet. Without a dense root system holding riparian soils in place, mass wasting and downcutting occurs throughout the Red Lake River. Incised streams then are more likely to become unstable as during high flows the stream cannot access the floodplain. Ditch outlets can be a source of erosion as well as high flows erode soil around the outlet. This can be managed via energy dissipation such as rip rap or concrete aprons.

Local entities in the RLRW have done many streambank stabilization projects in recent years. Projects often must get the cooperation of the landowner, which can add a layer of complexity to the project. The short-term goal for the RLRW is to implement streambank stabilization projects to reduce bank erosion by 1,860 tons/year.

PRIORITY ISSUES ADDRESSED

- Unstable River and Stream Channels
- Nutrient Loading
- Shoreland and Riparian Management

Above: Outlet stabilization project (RLWD).
Below: Pre-streambank stabilization project (BWSR)

SHORT-TERM GOAL

Implement stream channel stabilization to prevent 1,860 tons/year of sediment loss through bank erosion

Metric: tons/year stabilized

ALREADY ACCOMPLISHED (2017-2022)

- 3,785 linear feet of Stream Channel Stabilization

LONG-TERM GOAL

All public waters are stable or enhanced, providing improved riparian habitat and water quality conditions.

MEASURING

Progress toward the watershed-wide Streambank Stabilization measurable goal will be measured in each planning region, as summarized in the table below. Stabilizing 1,000 feet of streambank is anticipated to reduce on average 200 tons of sediment, but project benefits will be estimated on a case by case basis.

Management Zone	10-Year Goal (ft. of streambank stabilized)
Upper	300
Middle	5,000
Lower	3,000
Grand Marais	1,000

FOCUS AREAS

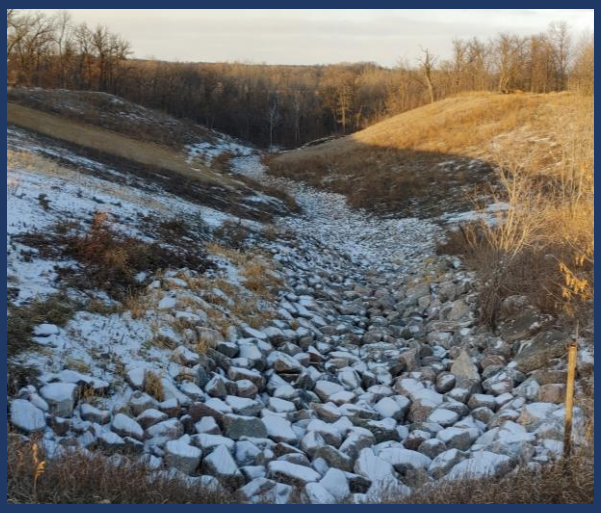
The Middle Planning Region is the highest priority for streambank stabilization efforts (Figure 4.7). Bank Erosion Hazard Index (BEHI) ratings will be utilized for the implementation of projects.

Stacking Benefits

Work toward this goal also makes progress towards reductions in phosphorus, sediment, and nitrogen to surface water, and enhances aquatic and riparian habitat. Surface water quality benefits will be calculated during project design and implementation.

Surface Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction
Habitat Benefits	1.76 miles of aquatic and riparian habitat

Implementation Spotlight



Demarais-Hanson Stabilization (RLWD)

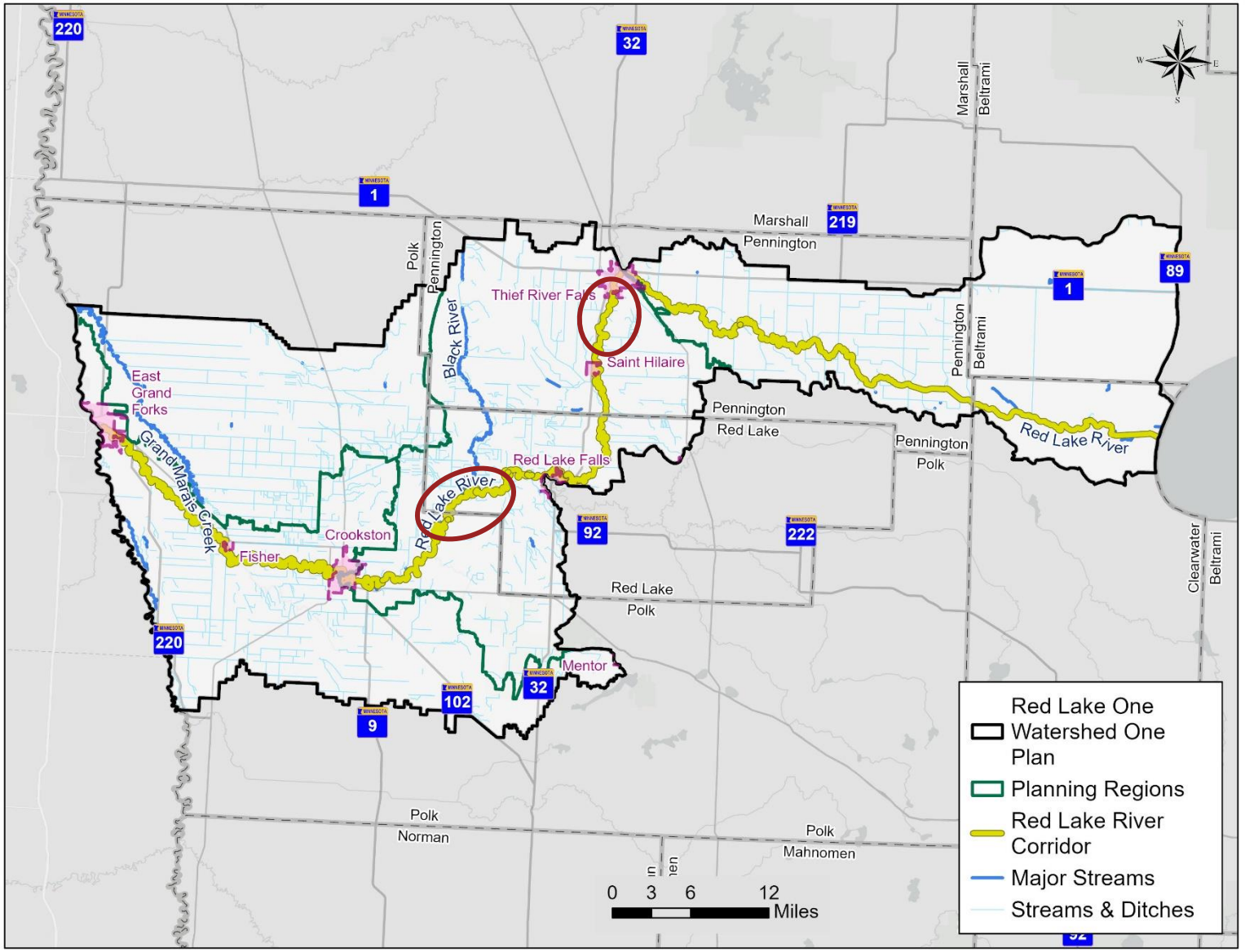


Figure 4.7. Priority stream channels for stabilization.

RIPARIAN MANAGEMENT

The area along a stream or river is known as the riparian zone, and this area is a key location for action because the quality of the vegetative buffer has a large impact on water quality. From RLRW conservation staff observation, the worst locations for streambank erosion are those without perennial vegetation. Trees and vegetation with deep roots provide stability to soils and prevent slumping.

Minnesota law requires buffers along streams, but some buffers are not adequate. As of September 2024, RLRW counties have 99-100% buffer law compliance for public waters. Polk, Beltrami, and Clearwater Counties have >99% compliance for public ditches, and Pennington and Red Lake Counties have 84% compliance for public ditches (BWSR, 2024). Even buffers that are compliant can be worked on, as buffer enhancement can further stabilize streambanks and filter overland pollutants. The short-term goal for the RLRW is to improve buffer quality along 3,200 acres of riparian land through voluntary conservation action.

PRIORITY ISSUES ADDRESSED

- Shoreland and riparian management
- Unstable river and stream channels
- Nutrient loading

Buffer (RL SWCD)

SHORT-TERM GOAL

Improve quality of 3,200 acres of perennial vegetation within riparian corridor area

Metric: acres of improvements/plantings

ALREADY ACCOMPLISHED (2017-2022)

- 2,145 linear feet of Streambank and Shoreline Protection

LONG-TERM GOAL

All riparian buffers on public waters are improved, providing improved habitat and water quality conditions.

MEASURING

Progress toward the watershed-wide Riparian Management measurable goal will be measured in each planning region, as summarized in the table below.

Planning Region	10-Year Goal (acres of riparian mgmt.)
Upper	480
Middle	1,280
Lower	540
Grand Marais	900

Stacking Benefits

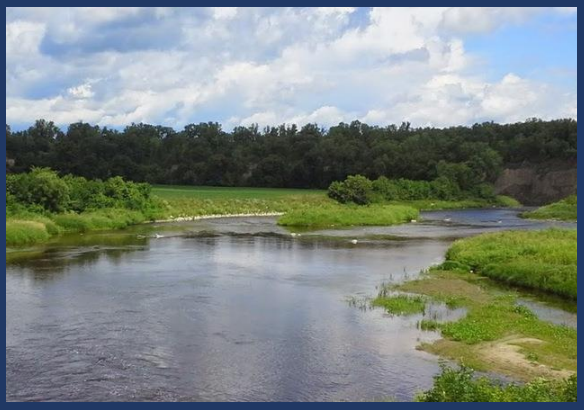
Work toward this goal also makes progress towards reductions in phosphorus, sediment, and nitrogen to surface water, and enhances aquatic and riparian habitat. Surface water quality benefits will be calculated during project design and implementation.

Surface Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction
Habitat Benefits	1.76 miles of aquatic and riparian habitat

FOCUS AREAS

The riparian corridor of the Red Lake River has been delineated and generally extends from the top of the bank to the nearest parallel road. The Planning Work Group will utilize the riparian corridor map to prioritize implementation for Riparian Management (Figure 4.8).

Implementation Spotlight



Red Lake River (RLWD)

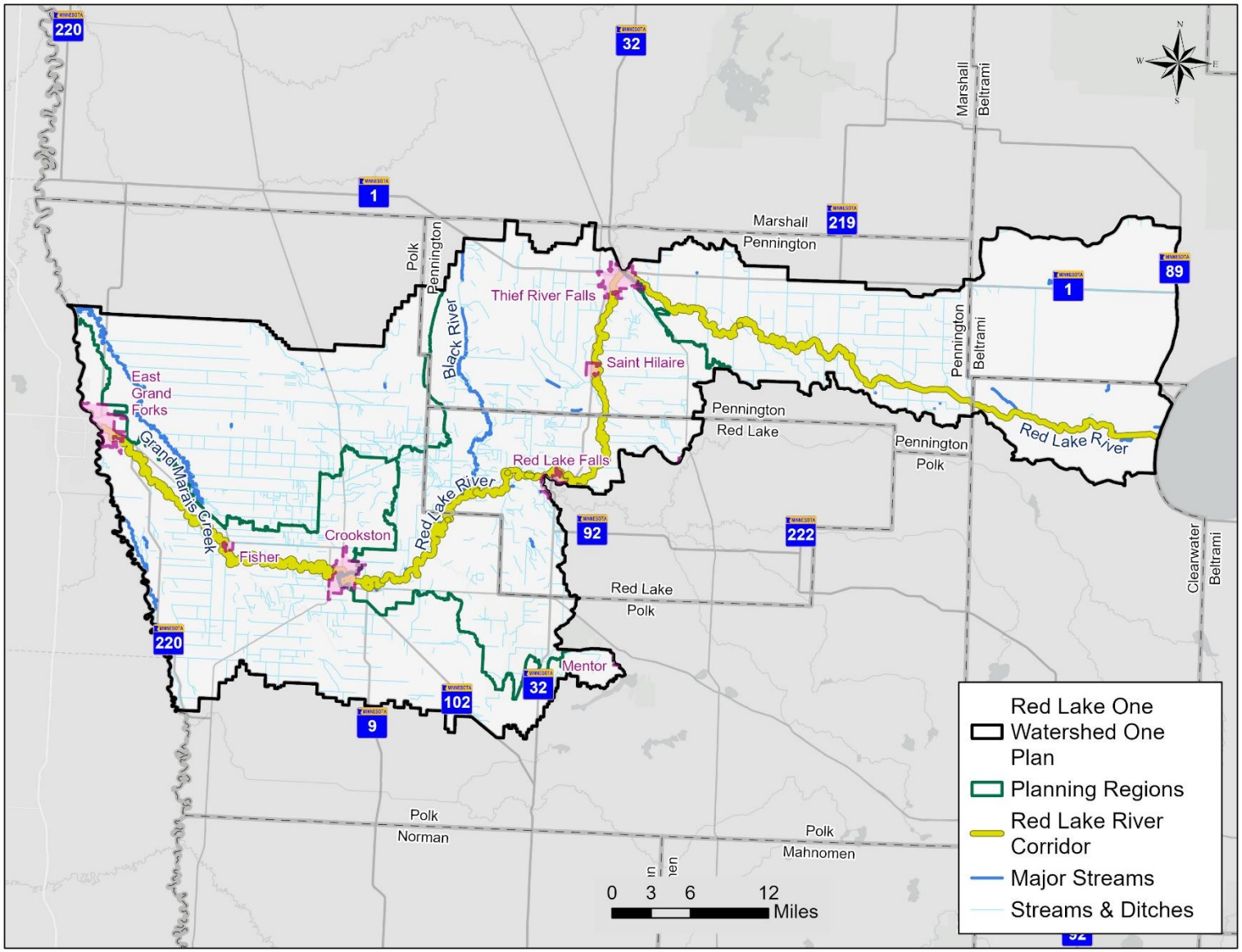


Figure 4.8. Priority areas for Riparian Management

DRAINAGE MANAGEMENT

In the early 1900s farmers constructed a network of drainage systems and straightened stream channels to keep fields from flooding. Drain tiles were installed later in the century. While the drainage network does maintain good conditions for agriculture, the altered hydrology of the RLRW has contributed to unstable banks and bank failure. 71% of RLRW streams have been modified, including systems where there was not originally a stream.

A drain tile study in the RLRW found drain tiles contribute less sediment and phosphorus to streams, but more nitrogen and overall runoff volume (Hansen, 2009). Some ditch outlets are in a state of disrepair and are a significant source of erosion to streams. In 2015, it became required to obtain a permit in the RLWD for tile drainage installation, primarily to address outlet erosion concerns.

The short-term goal for the RLRW is to stabilize or repair 12 miles of ditches, with a focus on multipurpose drainage management, unstable ditch outlets, partnering with landowners, ensuring systems are in compliance with current rules, and the intention of improving water quality as a result of a project.

PRIORITY ISSUES ADDRESSED

- Altered Hydrology
- Drainage System Instability
- Drainage System Inadequacy

Above: Pennington County side water inlet project to reduce erosion (BWSR). Below: Turbid ditch water (RLWD)

SHORT-TERM GOAL

Identify inadequate drainage systems, including outlets, and stabilize or repair 12 miles

Metric: Miles of drainage projects

ALREADY ACCOMPLISHED (2017-2022)

- 1,100 linear feet of Lined Waterway or Outlet

LONG-TERM GOAL

All public drainage systems are stable and have the capacity to convey the event the system was designed for.

MEASURING

Progress toward the watershed-wide Drainage Management measurable goal will be measured in each planning region, as summarized in the table below.

Management Zone	10-Year Goal (# of miles)
Upper	1
Middle	5
Lower	5
Grand Marais	1

FOCUS AREAS

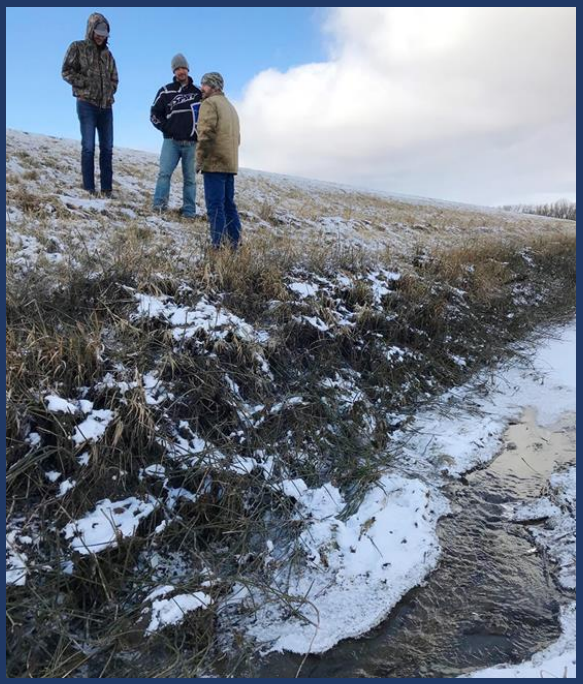
Ditch outlets in the Middle and Lower Planning Regions will be further prioritized with LiDAR analysis. The Pennington SWCD partnered with Northland Community and Technical College to identify priority ditch outlets for stabilization projects. This project was completed in 2021, and the *Drainage System Outlet Analysis Report* will be used to assist with prioritization (Figure 4.9).

Stacking Benefits

Work toward this goal also makes progress towards reductions in phosphorus, sediment, and nitrogen to surface water. Surface water quality benefits will be calculated during project design and implementation.

Surface Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction

Implementation Spotlight



Side-Water Inlet Work (BWSR)

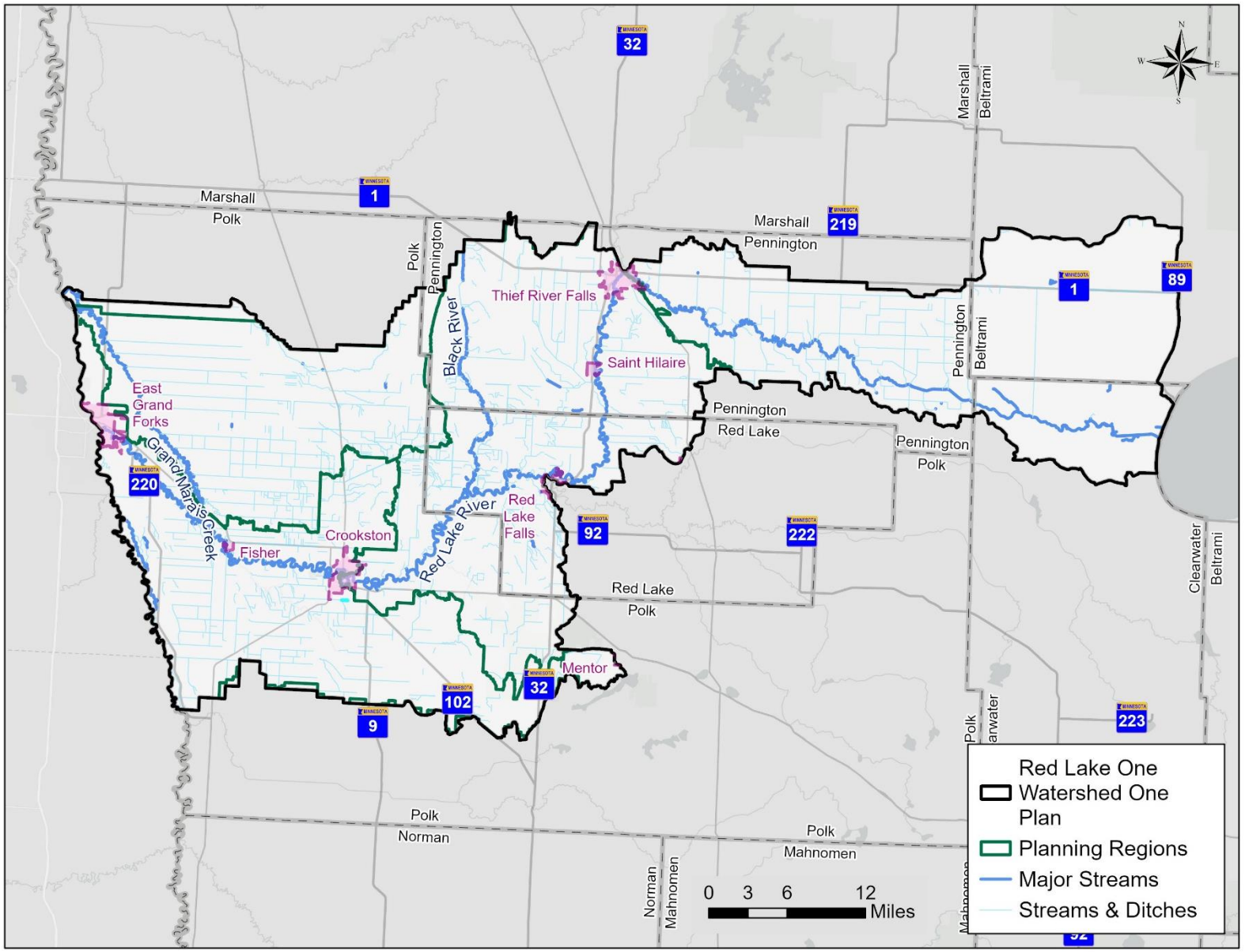


Figure 4.9. Priority areas for Drainage Management.

LAND PROTECTION

The nine previous goals discussed in the RLRW deal with issues degrading the quality of the water or environment. However, the RLRW still has numerous high-quality resources that are meeting quality standards or provide habitat for wildlife and recreational opportunities for people. There are pockets of remaining prairie and wetland, largely along the Middle Planning Region. Communities of native and rare plant species can be found scattered throughout the watershed, particularly in riparian areas. While a large focus of this CWMP is improving watershed conditions, it is also important to protect resources that are in good condition.

The land protection goal involves adding new land or reenrolling existing land in 30,200 acres of conservation easements and writing 25 forest stewardship plans. Conservation easements are through state or federal programs like RIM, CRP, ACEP, and WRE. Setting aside land in easements and managing forests provides habitat for wildlife and pollinators, adds water storage, and improves water quality. Education and outreach activities will assist in land protection.

PRIORITY ISSUES ADDRESSED

- Wetland and Upland Habitat
- Flood Damage Reduction and Resiliency
- Groundwater Supplies

Pollinator habitat (RL SWCD)

SHORT-TERM GOAL

30,200 acres of land are protected through new enrollment into conservation easements or reenrollment of temporary easements and / or wetlands

Complete 25 forest stewardship plans, managing 1,000 acres.

Metric: # of acres and # forest plans

ALREADY ACCOMPLISHED

- 421 acres of upland wildlife habitat management (NRCS)
- 101 acres of wetland restoration and wetland wildlife habitat management (NRCS)

LONG-TERM GOAL

Maintain all current acres in protection programs, and meet the goals of the Minnesota Prairie Plan for this watershed.

MEASURING

Progress toward the watershed-wide Land Protection measurable goal will be measured in each planning region, as summarized in the table below.

Planning Region	10-Year Goal (acres protected)
Upper	4,700
Middle	12,500
Lower	5,300
Grand Marais	8,700

FOCUS AREAS

The Minnesota Prairie Conservation Plan (Prairie Plan) is a habitat plan that prescribes management strategies for prairies and wetlands in the region. Within the Prairie Plan, Core Areas were identified as important places to retain or restore high concentrations of native prairie and grasslands, wetlands, and shallow lakes. Habitat Corridors connect Core Areas to allow for connectivity between habitats for plants and wildlife, which is especially important for biodiversity and species continuity. Prairie Plan Core Areas and Habitat Corridors will be prioritized for actions in this CWMP to address habitat and keep protected areas of land under protection (Figure 4.10).

Stacking Benefits

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

Habitat Benefits	31,200 acres of protected habitat
Climate Resiliency Benefits	Additional water stored in soil
	Carbon = 33,450 Metric tons (CO_2e/year)
Surface Water Quality Benefits	Phosphorus reduction
	Sediment reduction
	Nitrogen reduction

Implementation Spotlight

Pennington SWCD

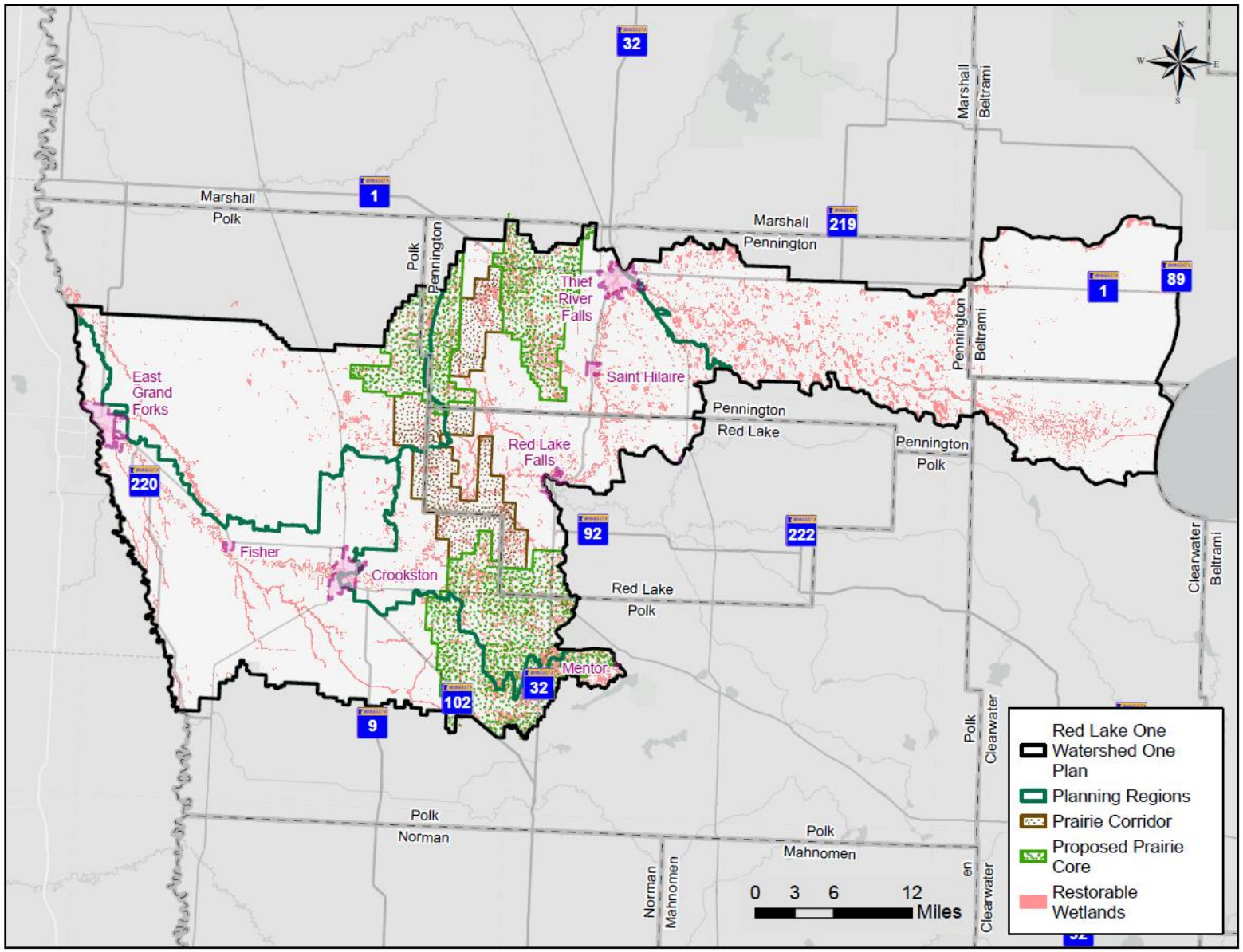


Figure 4.10. Land protection priorities in the RLRW.