



St. Louis River Watershed Comprehensive Watershed Management Plan
2023 - 2032

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Section 1. Executive Summary

Introduction

The St. Louis River is a large, geographically diverse, and culturally rich watershed in northeastern Minnesota. Its boundary touches five counties and one tribal reservation. The watershed is entirely on ceded tribal land including the 1854 and 1855 treaty areas. Including the Cloquet River watershed and Duluth Urban Area, this plan covers over 3000 square miles and includes over 500 lakes and 2000 miles of streams all flowing to Lake Superior. The watershed provides habitat for many vulnerable resources including wild rice, trout and sturgeon. While most of the watershed is forest or wetlands, many communities make their home here including the Mesabi Range communities, Cloquet and the city of Duluth. Mining, logging, farming and industry are historically and currently part of this watershed and have drastically altered the watershed from its original form. Even so, this area is rich in cultural and natural resources.

The goal of the St. Louis River One Watershed One Plan is to prioritize projects that will protect the watershed's valuable resources and target projects to help solve water quality problems. The result will be protection and restoration of our area's natural resources for future generations.

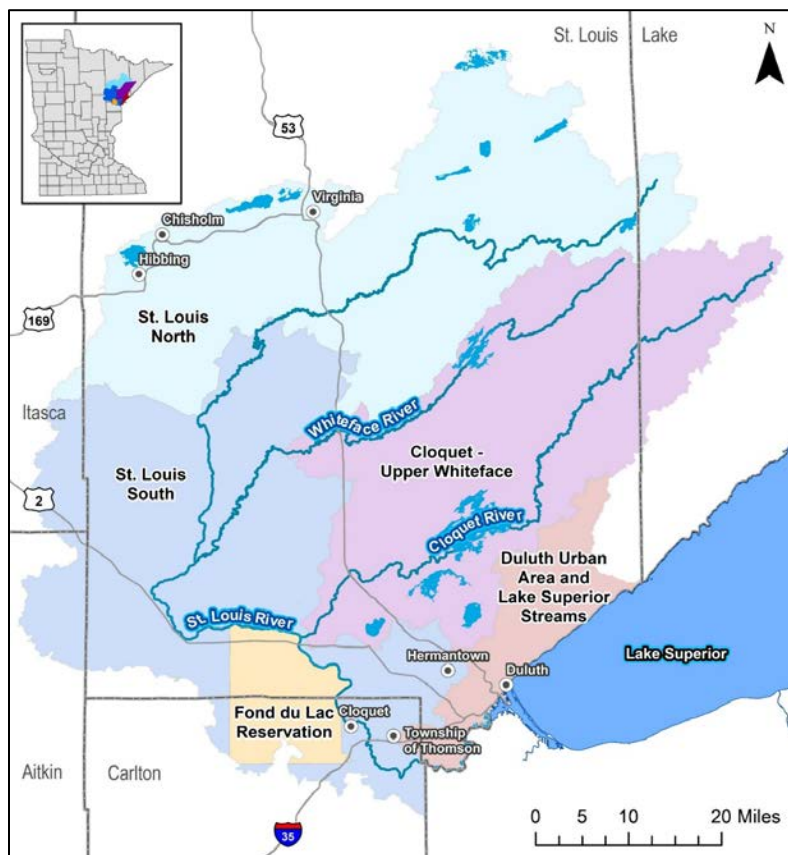


Figure 1-1. The St. Louis River Comprehensive Watershed Management Plan planning area, which includes the St. Louis River Watershed, Cloquet River Watershed and Duluth Urban Area and Lake Superior Streams.

What is a Comprehensive Watershed Management Plan?

The purpose of this Comprehensive Watershed Management Plan is to guide decisions on what and where to complete projects that restore and protect natural resources. The actions of this plan are prioritized, targeted and measurable using current science. The plan relies completely on voluntary conservation. This plan does not create any new rules or ordinances or overrule any existing regulations.

Vision & Mission Statements

The vision statement was developed to describe what the planning committees hope to achieve in the future. A question from a public survey was: "What would you like the watershed to look like in 50 years?" From the responses, we were able to craft our common vision for the watershed.

A watershed where the natural and human communities are sustainable and resilient and economic opportunity is in harmony with ecosystem health

The mission of the plan was developed to provide a guide to what the plan will do. The overarching mission statement for this plan is:

To support, protect and restore the peaceful, beautiful, and unique natural resources of the St. Louis River Watershed

Purpose, Roles and Responsibilities

This Comprehensive Watershed Management Plan was developed following the guidelines established by the Minnesota Board of Water and Soil Resources (BWSR). This voluntary program and planning effort:

- Aligns water planning along watershed boundaries, and enhances existing county water plans
- Uses existing authorities and funding mechanisms
- Is based on the most current information and data available from state agencies
- Charts a course of actions for the next 10 years
- Monitors and tracks progress for achieving measurable goals
- Provides opportunity for bi-annual funding through a non-competitive process regulated by legislature control
- Provides opportunity for biannual funding grant allocations

A Memorandum of Agreement (MOA) between the North and South St. Louis Soil and Water Conservation Districts (SWCD), St. Louis County, Carlton SWCD, Carlton County, and Fond du Lac Band of Lake Superior Chippewa (Appendix A) was established as the first step in the planning process. A representative from each governmental unit was appointed to serve on the Policy Committee, which is the decision-making body for this plan. South St. Louis SWCD was the fiscal agent for this project.

An Advisory Committee was formed to provide valuable input to the planning process. For the St. Louis River Comprehensive Watershed Management Plan, a wide range of stakeholders formed the Advisory Committee and drafted all the major plan content. At each milestone in the process, the Policy Committee provided input and approved the plan's progress (Figure 1-2).

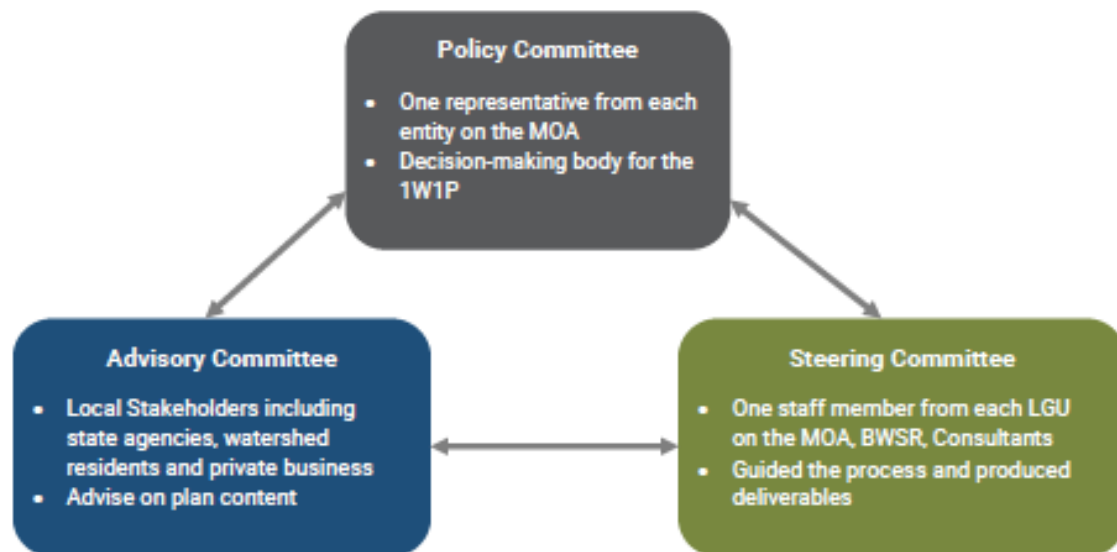


Figure 1-2. Three committees were involved with the planning process, each with unique roles.

Planning Approach

The backbone of this planning effort was over 100 previous studies and reports (see Appendix B for a full list). This data was used in concert with a public survey to help identify issues and opportunities in the watershed. The public kickoff was held virtually due to the Covid 19 pandemic. It included an on-line survey, personal phone calls, press releases, and a project website which included a video and Story Map to orient people to the Planning Area (see appendix C for more information). In addition, a 'notification of planning' was sent to planning partners on April 26, 2020. Partners' input was solicited from state agencies and 74 local governments (counties, cities, townships) regarding issues to be addressed by the Plan. The partners received input from the following entities:

- Board of Water and Soil Resources (BWSR)
- Minnesota Department of Health (MDH)
- Minnesota Department of Natural Resources (MNDNR)
- Minnesota Pollution Control Agency (MPCA)
- Duluth Natural Resource Commission
- City of Duluth
- Duluth Urban Watersheds Advisory Committee (DUWAC)

Prioritization was completed using the latest science including the Watershed Health Assessment Framework along with professional knowledge of the Advisory Committee. Additional tools included

the Social Vulnerability Index and the St. Louis, Cloquet and Duluth Urban Watershed Restoration and Protection Strategies. The planning process for the St. Louis River Comprehensive Watershed Management Plan is outlined in Figure 1-3.

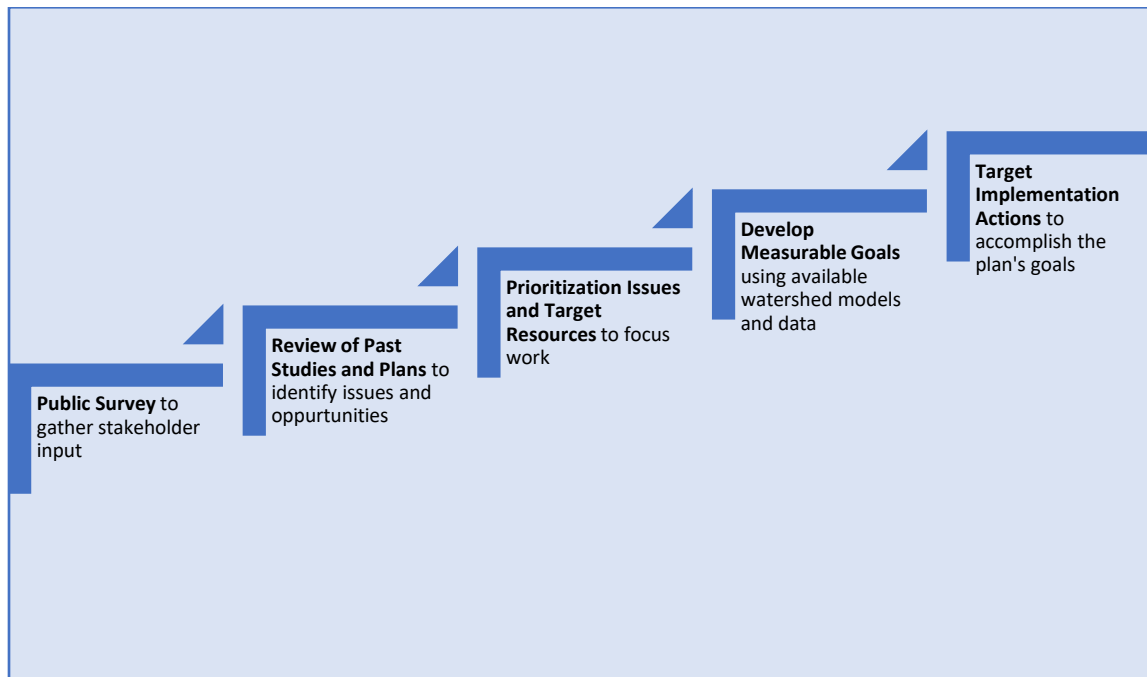


Figure 1-3. Steps in developing the St. Louis River Comprehensive Watershed Management Plan.

Planning Areas

Given the size and range of ecosystems and land uses covered by the planning area, the planning partners split it into five sub-planning areas (see Figure 1-1). These planning areas are described below:

- **St. Louis River North** – The northern half of the St. Louis River watershed contains the second largest urban centers in the Planning Area including Hibbing, Virginia and numerous Mesabi Iron Range communities. This portion of the Planning Area presents unique challenges related to mining activities, economic growth and development pressure. Existing conservation efforts are focused on addressing shoreline impacts and forestry management.
- **St. Louis River South** – The southern half of the St. Louis River watershed includes the most agricultural activities in the planning area and associated ditched and drained resources. This area is influenced by all activities in the St. Louis River North, Cloquet-Upper Whiteface, and Fond du Lac sub-planning areas. There is growth and development pressure as cities expand and people move into this area. Existing conservation efforts include stormwater management planning, wetland restoration and protection, buffers, improved stream connectivity, and agricultural conservation practices.
- **Cloquet-Upper Whiteface** – This portion of the Planning Area is more pristine in nature and includes important recreation areas such as the Island Lake and Boulder Lake reservoirs and the Cloquet River, a state water trail. Most of the current work focuses on protecting the high-quality resources from impacts related to forest management and increasing development pressure. Additionally, both the Cloquet River and the Upper Whiteface River watersheds have

managed reservoirs which may require the same restoration and/or management considerations.

- **Duluth Urban Area and Lake Superior Streams** – This portion of the Planning Area contains the largest urban center, the City of Duluth, along with smaller urbanized communities including Rice Lake, Hermantown, and several townships. This area discharges directly to the St. Louis River Estuary and Lake Superior. This area is subject to increasing growth and development pressure. There is a combination of both high-quality resources that need protection (e.g., 16 urban trout streams in addition to Talmadge, French, and Sucker rivers) as well as resources that need restoration (e.g., Keene, Amity, and Miller Creeks). Existing conservation work in the area includes subwatershed plans, stream assessments, stormwater management practices and projects that increase connectivity.
- **Fond Du Lac Reservation** – The Fond du Lac Band is one of six Chippewa Indian Bands that make up the Minnesota Chippewa Tribe. Most of the Reservation is contained within the St. Louis River watershed, and the resources include Otter Creek, Big Lake, and several wild rice lakes. On-going conservation activities include monitoring, improving stream connectivity, implementing sustainable forestry practices, and maintaining ditches to protect wild rice waters. The Fond du Lac Reservation planning area is a Sovereign Nation, and as such has developed water quality standards and planning documents focused on the unique resources and needs of the Band.

The St. Louis River Comprehensive Watershed Management Plan is unique in that it includes these five smaller sub-planning areas to better articulate and address the issues unique to each area. As this Plan illustrates, this sub-planning area structure is carried through the planning process – from the identification of priority areas and priority issues to the establishment of measurable goals and the identification of implementation activities. A more complete description of the planning area and the sub-planning areas is provided in the Land and Water Resources Narrative.

Priority Issues

A comprehensive list of priority issues was created during the planning process. These issues were divided into four categories:

- **Surface Water Quality** – the ability to recreate in/on, feed ourselves from, and otherwise enjoy healthy water bodies is an essential part of our culture in this region
- **Drinking Water Protection** – we hold water that we drink as particularly valuable—we need it to survive (people consistently name this as their most important connection to water)
- **Land use** – people’s decisions about what to do with and on the land, for economic, practical, or spiritual reasons, impact water and its value
- **Altered Hydrology** – what we want from water (more of it here, less of it there) causes us to move water, which changes its value for others and impacts other things that we value
- **Habitat** – there are particular species and landscapes that we value, and our choices about what (whose home) to protect impacts water

Table 1-1. The prioritized issue statement by category.

Issue Category	Priority Issue
Surface Water Quality	Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic recreational uses.
	Failing septic systems can contaminate groundwater, surface waters and localized drinking water, leading to imminent threats to public health.
Drinking Water Protection	Drinking water quality and quantity from surface water and groundwater sources is threatened by land use activities and water appropriations.
Land Use	Urbanization, development, and road expansion can impact watershed health and increase nutrient and other pollutant loadings when stormwater is not effectively managed.
	Water- and land-based recreational activities can impact the quality of lakes and streams, stress wildlife, degrade habitats, and lead to conflict between different uses.
	Aggregate mining has the potential to alter natural hydrology, impacting baseflows for nearby streams and local and regional aquifers.
Altered Hydrology	Channel instability, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the watershed.
	Loss of water storage, altered flows, and changes in watershed boundaries are the result of land development, drainage, and legacy mining that alter natural hydrologic processes.
	Obsolete and nonfunctioning dams alter natural hydrology, impede fish passage and aquatic organism movement, and affect stream temp.
Habitat	Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality.
	Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incision and floodplain disconnection, impeded fish passage, and fragmentation.
	Aquatic and terrestrial invasive species pose a threat to individual habitats and overall biodiversity.

Goals

The priority issues were then used to develop the plan’s goals. Goals are a guide for what quantifiable changes the plan can accomplish in its 10-year lifespan and are based on calculations linked to water quality improvements and protection from future water quality risks. A series of Stakeholder and Advisory Committee meetings were held in the fall of 2021 to develop the plan’s goals. The approved goals for the plan are listed in table 1-2.

Table 1-2. The goals by issue category.

Issue Category	Goals
Surface Water Quality	Identify and address ground and surface water quality problems stemming from inadequate wastewater treatment by supporting the enforcement of SSTS ordinances and inventory and upgrade 40% of non-compliant systems in priority areas
	Complete farm projects on 50% of properties identified as needing enhancements (e.g., livestock exclusion, manure storage, pasture management) where there are bacteria impairments.
	60% of municipalities with identified bacteria impairments are implementing plans to reduce bacteria in surface waters.
	Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 60% of municipalities have Smart Salt Certified Staff, 60% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.
Drinking Water Protection	Protect groundwater quality by sealing 45 unused, unsealed wells watershed wide
Land Use	Promote the implementation of low impact development techniques to reduce stormwater runoff, volume and rate control in 50% of communities
	Educate, increase stewardship and mitigate the water quality impacts of recreational land users and landowners to natural resources at 5 high-use & high priority recreational areas.
	Evaluate impacts of aggregate mining at 100 % of high priority sites that have the potential to impact sensitive surface and ground water resources.
Altered Hydrology	Reconnect 55 miles of priority streams and tributaries to benefit aquatic life and improve water quality.
	Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 19,000 Linear Feet of high priority streams and tributaries.
	Maintain the current acre/feet of watershed storage by restoring wetlands in identified priority areas where they have been lost and/or altered due to ditching or development activities
Habitat	Protect & manage 16,000 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.
	15,000 feet of shoreline in prioritized lakes and streams have natural buffers and near shore areas are protected and restored to reduce erosion using bank stabilization, bioengineering, etc. techniques.
	Protect/Restore 30% of high priority wild rice stands/populations (water levels, disturbance, shoreland development).
	Identify and manage 20 high priority sites/resources for invasive species.

Implementation Strategies

Implementation strategies were compiled from each sub-planning area from the WRAPS, previous plans and studies, and the state agencies responses to planning. In addition, actions were brainstormed at a series of Steering, Advisory, and Policy Committee meetings, along with a stakeholder meeting focusing on the estuary and urban areas.

The St. Louis River partners are consistently implementing actions to achieve watershed goals through many different efforts, but to fully implement this plan, additional funding and capacity over current levels will be needed. The implementation table displays funding in three different categories (Table 1-3). Funding categories are calculated by the best available estimates, and limitations in funding levels could limit the goals of this plan.

Table 1-3. Funding categories for the plan

Baseline	Other Funding Sources – Competitive Grants, Partner Funding
WBIF	Watershed Based Implementation Funding
Other	Local Baseline Funding

Plan Administration

The St. Louis River Comprehensive Watershed Management Plan planning effort was conducted through a Memorandum of Agreement (MOA) between St. Louis River and Carlton Counties and SWCDs and Fond du Lac Band of Lake Superior Chippewa (Appendix E). The parties plan to form a new Memorandum of Agreement for administering the plan. The committees formed during the planning process (Figure 1.2) will continue into implementation. The Policy Committee is the decision-making body for implementation. They will be the coordinating body of the plan acting on behalf of the partnership members. The Advisory Committee and Steering Committee will continue to meet, review, and identify collaborative funding and project opportunities, complete the annual work plan, identify and apply for additional funding opportunities, update the Policy Committee on what projects are completed and where funding is spent, and implement the targeted implementation schedule. Fiscal and administrative duties for plan implementation will be assigned to an LGU through a Policy Committee decision as outlined in the formal agreement.

Section 2. Land and Water Resources Narrative

Introduction

The St. Louis River Planning Area consists of two Hydrologic Unit Code (HUC) 8 Major Watersheds: The Cloquet River and St. Louis River, as well as the southwestern portion of the Lake Superior South HUC 8 watershed. Nestled in the heart of northeastern Minnesota, the St. Louis River Planning Area is predominantly undeveloped and well known for its abundant water and forest resources.

The St. Louis River Planning Area covers approximately 2,400,000 acres, consisting of almost the entire Fond du Lac band of Lake Superior Chippewa reservation, a large portion of central and southern St. Louis County, the southwestern border of Lake County, the northeastern corners of Aitkin and Carlton County, and the southeastern portion of Itasca County. While urban development is a very small portion of the St. Louis River Planning Area, most of the development is concentrated in the Duluth and the surrounding municipalities. The communities along the Mesabi Iron Range make up the second largest concentration of development in the region. Figure 2-1 is map of the St. Louis River Comprehensive Watershed Management Plan area

The St. Louis River Planning Area has 522 lakes over 10 acres in size and approximately 2,400 miles of streams flowing through it. As the largest tributary to the Great Lakes within the United States, the St. Louis River is the main river that flows through the planning area, meandering for nearly 200 miles. The river originates at the outlet of Seven Beaver Lake located in Bassett Township near the border of Lake and St. Louis counties and terminates in Lake Superior.

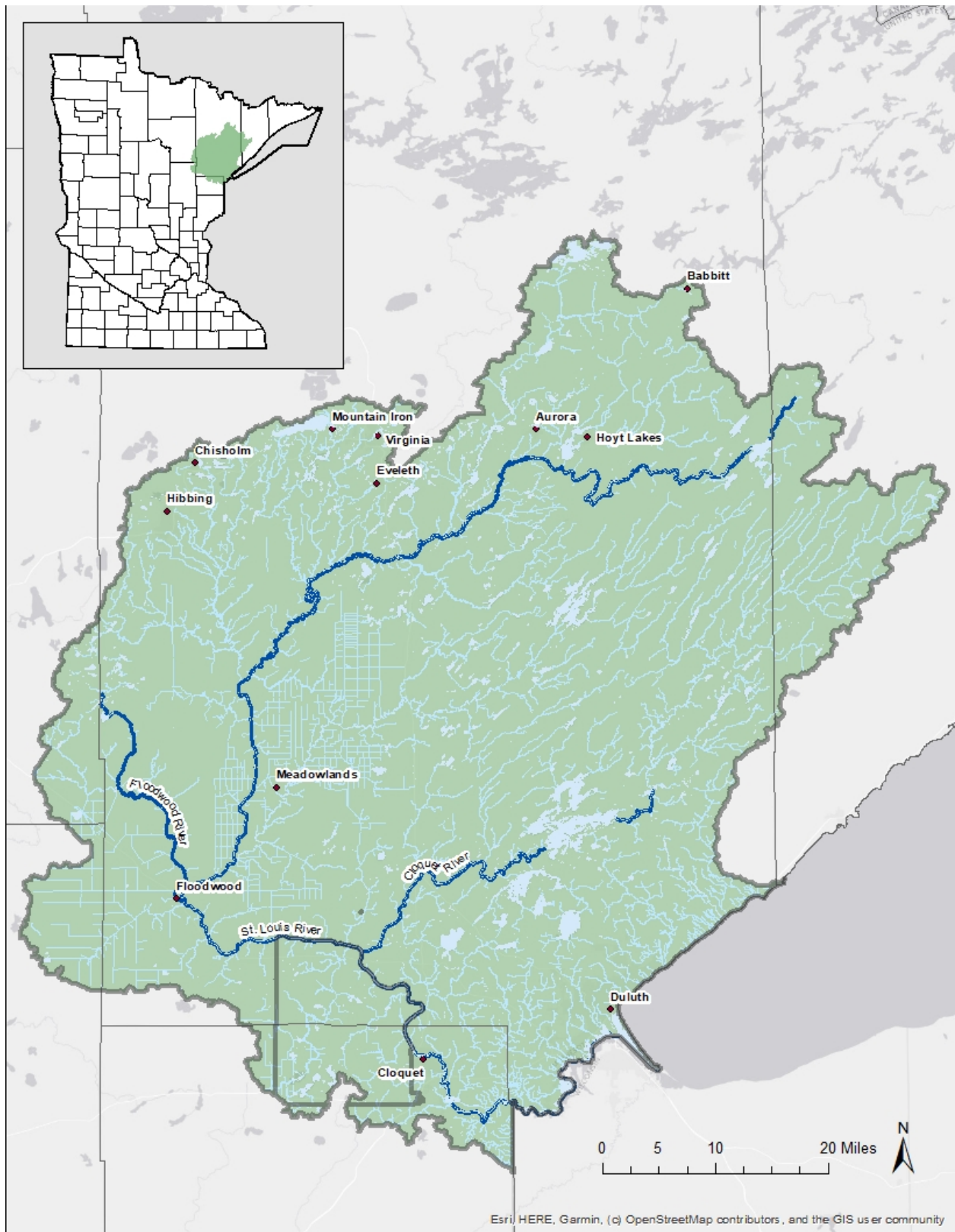


Figure 2-1. Map of the St. Louis River Comprehensive Watershed Management Plan area.

History

Prior to European settlement, the Dakota were the first inhabitants of the St. Louis River Planning Area. In the 1600's, the westward moving Ojibwe (or Chippewa) began to inhabit the area and referred to the St. Louis River as Gichi Gami-ziibi or the Great-lake River. The St. Louis River served as an important route before and after European settlement including the fur trade. Settlers saw the economic opportunity in harvesting old growth forests in the northeastern part of the state, began using the river as a means of floating harvested logs to mills. Iron ore deposits were discovered in the Mesabi Iron Range in the late 1800's; these resources helped contribute to the industrial boom and subsequent settlement of the region. In the Treaty of 1854 of La Pointe, the Chippewa of Lake Superior ceded ownership of their lands of much of the planning area to the United States. The treaty established reservations, including the Fond du Lac Reservation within the St. Louis River Planning Area, for sovereign indigenous use and retained indigenous hunting, fishing, and gathering rights. The treaty allowed for non-indigenous settlement across ceded territory. The Nelson Act of 1889 broke apart reserved lands by mandating that communally held lands be allotted to individual households and band members and making unallotted land available for sale and settlement to European American settlers. The Fond du Lac nation is continuing to work towards recuperating treaty-reserved lands lost during the allotment period.

With growing populations, the need for electricity increased. In the early 1900's, the Thomson hydro-electric dam was built. Eventually three additional dams (Fond du Lac, Scanlon, and Knife Falls) were built on the river as a means of generating electricity. Later, five additional tributaries to the St. Louis River were dammed to provide supplemental water flow to the hydro-electric facilities in the winter months.

Though the soil in the watershed is generally less agriculturally productive than other parts of the state, some immigrants settled on farmsteads and cleared the land for pasture and row crops. Areas like the Sax-Zim bog were ditched in the early 1900's to create more farmable land.

By the 1980's, because of decades of altered land use and industrial impacts, the water quality in the lower portion of the St. Louis River had diminished significantly. As a result, the St. Louis River Area of Concern was designated by the U.S. and Canada. This has resulted in numerous restoration projects and initiatives. As a result of multiple decades of work, the river's water quality has improved significantly.

Current Data

Land Ownership

Approximately 46% of the land is public ownership (land that is in Federal, State, County, Municipal, Tribal, Township or Tax Forfeit ownership) and 54% of the land is private ownership (lands owned by private citizens, corporations or other non-governmental entities).

Population and Demographics

Based on 2018 population estimates, approximately 200,000 people reside in the St. Louis River Planning Area. The median age is approximately 41 years. Approximately 95% of the population has obtained at least a high school diploma, and approximately 30% of the population have obtained a bachelor's degree or higher in continuing education. Some of the largest industries include Health Care & Social Services, Retail Trade, Education Services, and Accommodation & Food Services. Though a smaller portion of the workforce is employed by these industries, Agriculture, Forestry and Mining are

large contributors to the area's economy. The area's median household income is \$52,000 with an area unemployment rate of approximate 3.7%.

Climate

Precipitation in the St. Louis River Planning Area ranges from an annual average of 27 inches to 30 inches with precipitation generally greater closer to Lake Superior. The average summertime temperature is 63.4 degrees Fahrenheit, while the average wintertime temperature is 11.3 degrees Fahrenheit. From 1895-2022 we have experienced a 0.28-degree F trend per decade increase in annual average temperatures. Climate summaries for the watershed can be found at the Minnesota Department of Natural Resources Watershed Health Framework website.

Land Cover

WETLANDS: An estimated 53% of the St. Louis River Planning Area is wetland. Large bogs cover the west-central portion of the planning area and wetlands are found scattered throughout. The St. Louis River Planning Area is in an area where it is estimated that greater than 80% of the wetlands that existed prior to European settlement are still intact today. These wetlands provide an essential role in filtering out pollutants and nutrients from water, retaining water from snow melt or large storms lessening the intensity of peak flow events, and providing habitat to wildlife.

FORESTS: Prior to European settlement, much of the upland forest was aspen-birch and some old growth red and white pine. Logging and milling red and white pine timber into lumber was a regional economic driver from the 1870s through the 1920s. By the 1930s, many sawmills that were originally cutting only pine lumber had started converting to using a broader mix of species and products, including pulpwood products. Today the forests in the area are comprised of approximately 14% coniferous forest, 45% deciduous forest, and 41% mixed forest. Healthy forests play a critical role in water quality by slowing the flow of water by acting like a natural sponge and filter. Forests also stabilize soils and provide habitat for wildlife.

OPEN WATER: Lakes and rivers make up approximately 4% of the St. Louis River Planning Area and are a prized resource for many of Minnesota's residents and visitors. Boating, canoeing, fishing, kayaking, and swimming are a few popular recreational activities. Aquatic resources are important to keep healthy as communities rely on clean water for other needs included but not limited to, residential water uses and water supply for industrial and agricultural production.

DEVELOPMENT: The St. Louis River Planning Area's largest development consists of the Duluth urban area. The cities of Duluth, Cloquet and Hermantown respectively make up the planning area's 1st, 3rd and 4th largest cities. Numerous smaller communities exist in the upper portion of the watershed along the Mesabi Iron Range, including the planning area's second largest city, Hibbing. A few small communities exist throughout the remainder of the planning area, though the majority have a population of less than 1,000.

OTHER: The remaining land covers consist of shrub land, agricultural land, grassland and barren land. Though a relatively small amount of the overall cover type, agricultural land is found in portions of the planning area. Most of the agriculture in the St. Louis River Planning Area consists of Dairy and Livestock production. Areas of barren land primarily consist of active mineral and gravel mining areas.

Water Resources

The St. Louis River originates in Seven Beaver Lake, near the border of Lake and St. Louis counties. Just over 30 miles west into St. Louis County, the river gains its first major tributary, the Partridge River. The Partridge River flows through the municipalities of Aurora and Hoyt Lakes. Colby and Whitewater Lake Reservoirs, both impounded for industrial water supply, contribute flows to the Partridge River.

The St. Louis River flows towards the southwest for approximately 23 miles until it meets up with another large tributary, the Embarrass River. The Embarrass River originates southwest of the community of Babbitt, flowing west to the town of Embarrass and eventually meandering south through the Embarrass chain of lakes including Sabin, Wynne, Embarrass, Cedar Island, and Esquagama Lakes. The Embarrass River flows out of Esquagama Lake for over fourteen miles before meeting up with the St. Louis River.

The St. Louis River flows west for another 20 miles and meets up with the East Two and West Two Rivers. The East Two River originates between the municipalities of Mountain Iron and Virginia. Manganika and Mashkenode Lakes contribute to the flows of the East Two River. The West Two River flows out of the municipality of Mountain Iron. The West Two River was impounded in the mid 1960's, creating the West Two Rivers Reservoir which is used as an industrial water supply.

Meandering southwest for another 23 miles, the Swan River flows into the St. Louis River. The Swan River is a large system of tributaries flowing out of the municipalities of Buhl, Chisholm and Hibbing Minnesota. The East Swan and The West Swan River are the two main flowages. The Swan River watershed is a mix of urban land in the upper portion and forest and pastureland through the central and southern reaches. This stream is the last tributary to the St. Louis River that is originated in the Mesabi Iron Range communities.

The St. Louis River has now doubled in width and continues to flow south towards the town of Meadowlands. After approximately 18 miles the St. Louis meets up with the Whiteface River. The Whiteface River originates only 2.5 miles south of the headwaters of the St. Louis River at Seven Beaver Lake. The watershed is primarily forested and undeveloped. The Whiteface River was dammed to provide winter water storage for hydro-electric facilities in the lower part of the St. Louis River. The Whiteface River flows through the town of Cotton and meets up with the Paleface River 35 miles prior to joining with the St. Louis River.

Continuing 7 more miles towards the southwest, the Floodwood River flows into the St. Louis River. The Floodwood River begins near the border of Itasca and St. Louis counties. The watershed is sparsely developed with large areas of peatland and some agricultural areas. Portions of this area have been historically ditched for agricultural use.

From the municipality of Floodwood the St. Louis River turns towards the east and after 19 miles meets up with the Cloquet River. The Cloquet River originates in Lake County. The Cloquet River watershed, upstream of Island Lake Reservoir is primarily undeveloped and forested in the upper portion of the watershed. The Cloquet River flows for approximately 100 miles to the confluence of the St. Louis River. The Cloquet river is influenced by four large reservoir lakes, Boulder, Fish, Island Lake and Wild Rice Lake Reservoirs, that were impounded for hydro-electric facilities.

The St. Louis River from Brookston flows towards the southeast along the Fond du Lac Reservation through the municipality of Cloquet in Carlton County. The St. Louis River Flows through a series of hydro-electric dams, Knife Falls, Scanlon, Thomson, and Fond du Lac. The Fond du Lac hydro-electric dam is on the eastern border of Jay Cooke State Park. The St. Louis River flows east between the Minnesota and Wisconsin border and meets with Lake Superior between the municipalities of Duluth (Minnesota) and Superior (Wisconsin).

Though not truly a part of the St. Louis River system, streams within the Duluth Urban Area and just north of the city limits directly flow into Lake Superior and have been included in the St. Louis River Planning Area. These Lake Superior streams include the French, Lester, and Talmadge Rivers and are included in this plan; many of which are important stream trout resources.

Water is a significant recreation resource across St. Louis River Planning Area. The Cloquet River and St. Louis River are both state water trails. There are also several state parks and national forest recreation areas from the Whiteface Reservoir to Jay Cook State Park. The lakes across the St. Louis River Planning Area are used for boating, fishing, swimming, summer cabins, and year-round residences. Former mining pits on the Mesabi Iron Range have also become water recreation areas including for fishing, boating, and scuba diving. In addition to recreation, some lakes also provide drinking water for several communities on the Iron Range. Duluth gets its drinking water from Lake Superior.

Water Quality Trends

The Minnesota Pollution Control Agency (MPCA) has collected data on and assessed numerous waterbodies throughout the state of Minnesota. Data generally is collected in 2-year intensive water monitoring' cycles that are completed by major watershed area (HUC 8).

Overall, streams in the St. Louis River major watershed have a decreasing trend for phosphorus and no apparent trend for *Escherichia coli* bacteria (E. Coli), total suspended solids, and nitrate levels. In the Cloquet River and St. Louis River major watersheds 36 of the assessed lakes either display no evidence of a clarity trend or have insufficient data do make a trend determination. 12 lakes show that the water clarity is improving, and 11 lakes have trends that water clarity is diminishing.

High Quality Resources

TROUT LAKES AND STREAMS: Minnesota has two native species of trout: brook and lake trout. Brown and rainbow trout have been introduced and are thriving in numerous lakes and rivers. Trout species all require clean and cold water to survive. Climate change and poor land use activities in the surrounding watersheds of trout waters can threaten the critical habitat of these intolerant species.

There are approximately 744 miles of designated trout streams. 11 lakes are designated trout lakes in the St. Louis River Planning Area and an additional 3 lakes, though not designated, are managed for trout species.

WILD RICE WATERS: Wild rice is an annual grass that grows in shallow lakes and streams. Wild rice is important habitat for numerous waterfowl and a natural food source for humans. Minnesota has the largest amount of naturally growing wild rice in the entire United States. Wild rice is an important cultural and social component of Native American and rural communities. Historical population data was not collected using the same methods that are utilized today, however anecdotal evidence suggests that wild rice populations have declined. Wild rice is susceptible to changes and declines in water quality

and must have pristine conditions to thrive and grow. Altered hydrology, the reduction of upland forest fire, along with chemical changes through European colonization are potential contributing factors to population decline. There are currently 74 identified wild rice waters in the St. Louis River Planning Area. Through EPA actions, 11 water quality impairments to wild rice production due to sulfate were identified and added to Minnesota's 2020 Impaired Waters List (seven lake segments and four stream segments).

IMPAIRMENTS: The MPCA has developed water quality and biological standards for beneficial use classes: aquatic life, aquatic recreation, drinking water, industrial/agricultural uses, wildlife, navigation, and aesthetic enjoyment. Through intensive watershed monitoring, streams and lakes that are assessed are reviewed to determine if they are meeting these water quality standards. Though waterbodies in the St. Louis River Planning Area are generally in good condition, unfortunately a few impairments exist within the planning area.

Fond du Lac Reservation has their own water quality standards that are more stringent than the state of Minnesota standards. Fond du Lac also classifies its waters based on cultural uses, including waters that support wild rice harvesting and waters that support aesthetic uses, which “possess exceptional beauty or are significant to the preservation or exercise of the traditional value system of the Fond du Lac Band, which may include but is not limited to direct contact with water or the preservation of wetlands for the maintenance of traditional medicinal plants.” Fond du Lac has an aquatic life designated use for subsistence fishing and netting, something the state does not have.

In addition, the statewide mercury reductions alone will not be enough to remove the mercury impairment in the St. Louis River. A separate mercury TMDL study is underway, with MPCA working closely with Wisconsin DNR, EPA Region 5 and the Fond du Lac Band (all of whom share jurisdiction for water quality in the St. Louis River) on a partnership approach that recognizes differing water quality standards and seeks concurrence in creating integrated or connected TMDLs.

- *Aquatic recreation:* Aquatic Recreation standards are in place to conserve the ability and safety of recreation in and on Minnesota’s public waters. Recreation generally refers to activities such as: swimming, boating, and fishing. The St. Louis River Planning Area currently has 4 lakes and 2 streams listed as impaired for Aquatic Recreation. Excessive nutrients in a waterbody can lead to an increased production of algae, some of which produce toxins that may cause severe illness to humans and pets. Many streams are listed as impaired for high counts of E. Coli bacteria.
- *Aquatic Life:* Aquatic life water quality standards are aimed at the protection of aquatic communities, such as, fish and invertebrates. Aquatic life standards are assessed from biological and water chemistry data. Collected data is analyzed to determine if the aquatic communities are what would be expected for a body of water with similar chemistry. A total of 32 stream assessment unit identifiers (AUIDs) are listed as impaired for aquatic life in the St. Louis River Planning Area. Aquatic life impairments in the St. Louis River Planning Area consist of low fish and invertebrate index of biological integrity (IBI) scores, high levels of suspended sediment, and low dissolved oxygen.
- *Aquatic Consumption:* Aquatic consumption standards are in place to ensure human safety while consuming fish species and drinking surface water. Pollutants in a body of water can bioaccumulate in fish tissue or cause expensive water treatment prior to human use. Many bodies of water state-wide are listed as impaired for Aquatic Consumption due to mercury

bioaccumulation in fish tissue. While it is important to reduce harmful emissions into the atmosphere locally, mercury as a pollutant is a global issue.

64 lakes and 37 stream AUIDs are currently listed as impaired for aquatic consumption in the St. Louis River Planning Area. Though most aquatic consumption impairments are mercury related, 4 lakes and 8 stream AUIDs are listed for polychlorinated biphenyls (PCBs), dichlorodiphenyltrichloroethane (DDT), perfluorooctane sulfonate (PFOS), dieldrin, dioxin, and toxaphene are all other pollutants that are listed as impairments in portions of the St. Louis River.

ALTERED HYDROLOGY: Hydrology is the study of water as it moves over the land. Humans have changed the naturally hydrology of the watershed in several ways. Dams, culverts, ditching, impervious surfaces, stormwater systems and wetland drainage are all examples of altered hydrology in the St. Louis River Planning Area.

Planning Areas

The St. Louis River Planning Area can be divided into five planning areas based on the unique resources and issues each area faces. There include: North St. Louis River, South St. Louis River, Cloquet River, Fond du Lac Reservation and the Duluth Urban Area.

THE NORTH ST. LOUIS RIVER includes the Masabi Range Communities and several important tributaries including the East and West Swan River, East and West Two River, the Embarrass River and the headwaters to the St. Louis River. The area is known for historic and active mining. In addition, there is increasing development on the lakes within this area.

THE SOUTH ST. LOUIS RIVER includes the communities of Floodwood, Meadowlands, Cloquet, Scanlon, Esko, Carlton and Wrenshall. Important streams include Floodwood, Whiteface, Midway and Pine Rivers, the Sax Zim Bog, Thomson Reservoir and many cold-water tributaries. This area has excellent trout populations near the cities of Cloquet, Scanlon, Esko and Carlton. The area has increasing development pressure, especially near the Midway River and its tributaries.

THE CLOQUET RIVER is a pristine watershed with relatively little development. At the far southern end of the watershed, development pressure increases. The areas high-quality resources include the Cloquet River, Island and Boulder Lake Reservoirs, and Fish, Wild Rice and Grand Lakes. There is increasing development in this area, which is putting pressure on these resources. Although there is little development especially in the upper watershed, resources experience increased recreational use ranging from canoeing to ATV use.

THE FOND DU LAC RESERVATION is almost completely within the St. Louis River Watershed. It includes valuable wild rice lakes including Rice Portage, Deadfish and Perch lakes. Additional important resources include Big Lake and Otter Creek. Protecting the sustainable harvest of wild rice and trout resources is important for band members.

THE DULUTH URBAN AREA is the most developed portion of the watershed. It includes the cities of Duluth, Hermantown and Rice Lake. The area includes 16 urban trout streams and the St. Louis River Estuary, along with the shoreline of Lake Superior. This area has a convergence of high-quality resources and urban threats.

Conclusion

While the landscape of the St. Louis River Planning Area was changed during European settlement for mining, agriculture, and logging, much of the area is now reverted back to natural cover with concentrated areas of impacts. Implementation of this plan focuses on restoring the highest impacted areas along with protecting the many unique and sensitive resources that thrive here.

Section 3: Plan Development Process

The development of the St. Louis River Comprehensive Watershed Management Plan took 22 months, starting with the first Advisory Committee meeting in October 2020. The process included issue identification and prioritization, measurable goal development and creation of a targeted implementation strategy to achieve the plan’s goals. This section describes the process used to develop the plan.

Section 3.1: Issue Identification & Prioritization

The first step in the process was to identify the priority issues and areas of the St. Louis River Comprehensive Watershed Management Plan area. Not every issue can be addressed everywhere in the planning area within 10-years; therefore, the Policy Committee, Advisory Committee, and Steering Team used a multi-step, iterative process for prioritizing resources and targeting areas for implementation during the 10-year timeframe of the Plan. Several tools were used during the issue prioritization process, including review of existing planning documents, the Watershed Health Assessment Framework, other relevant maps and spatial datasets, interactive web-mapping tools (e.g., Minnesota Natural Resource Atlas), and the ranking of issues by Priority Area.

This section of the Plan describes the process used to identify the issues and priorities that will be addressed within the 10-year timeframe of this Plan as illustrated in 3-1-1.

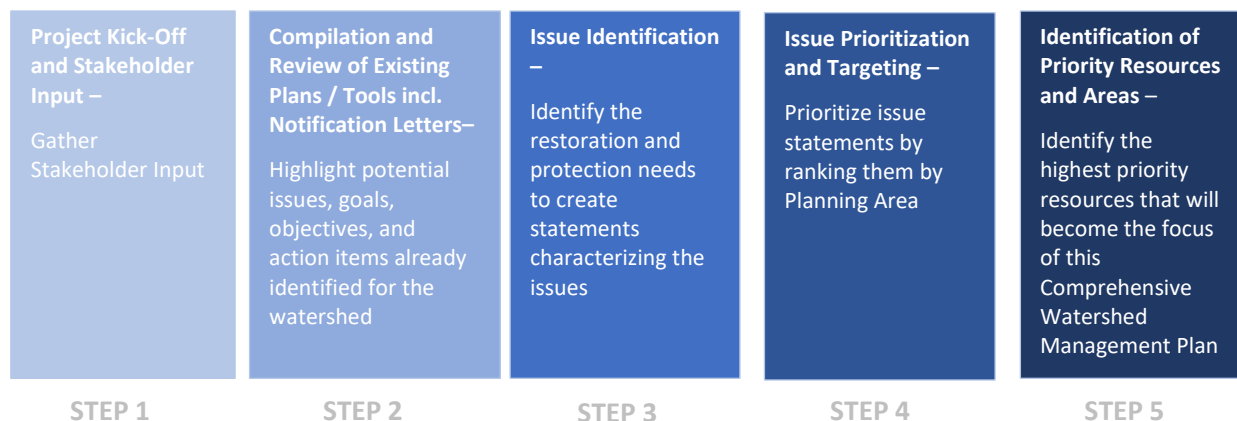


Figure 3.1-1. Process to development of the St. Louis River Comprehensive Watershed Management Plan Priority Issues, Resources and Areas. The process included stakeholder input, compiling data from existing plans and studies, reviewing letters from state agencies and several steps of prioritization.

Step 1: Project Kick-Off and Stakeholder Input

During the plan development process, the planning partners created multiple spaces for communities to engage and share input on the many issues and opportunities that exist within the watershed. Given the Covid-19 pandemic, most of these spaces were virtual. The project kick-off process included an online survey, personal phone calls, press releases, and a project website which included a Story Map to orient people to the planning area. The over-arching goal of this engagement was to capture the local values, experiences, and vision for the plan so that it reflects the needs of the people and communities who live, work and play in the watershed.

The Steering Team designed and conducted a survey of stakeholders that was open from November 12 – December 10, 2020. The survey link was directly emailed to a distribution list of local organizations and individuals who would be likely to fill out the survey if asked, have an interest in the watershed that may be impacted by the Comprehensive Watershed Management Plan effort, or who may be impacted by current environmental conditions. People contacted were then asked to share the link with others in their networks. The survey was also promoted through social media, press releases, and a link on the project website.

A total of 224 people responded to the survey, with 223 online responses and one response on paper. Survey participation was particularly high from young people, with about 41% of responses from individuals identifying as 18-years-old or younger. Most survey respondents (123 respondents) identified as associating most strongly with the St. Louis River watershed, with the second greatest number of respondents associating with the Cloquet River watershed (56 respondents). The Duluth Urban Area and Fond du Lac Reservation were also identified by respondents as areas that they feel a strong association with (37 and 8 respectively).

Comments were summarized in a report that includes themes associated with both participant concerns and suggested strategies for addressing those concerns, illustrated by quotes directly from participants. While most of the questions were open ended, comments were organized into issue areas that emerged from the review of agency comment letters and existing plans and documents that align with the remainder of this plan: Surface water quality, altered hydrology, groundwater, habitat, and land use. Appendix C contains the full stakeholder survey report.

Step 2: Compilation and Review of Existing Documents

Over 100 documents were compiled and reviewed to create a comprehensive list of resources to inform the St. Louis River Comprehensive Watershed Management Plan planning process (Appendix B). Information contained in these plans was entered into a database which was used to highlight potential issues, goals, objectives, and action items already identified for the St. Louis River planning area. The planning documents reviewed can be categorized as follows:

Local water management and land use plans (e.g., [St. Louis County Comprehensive Water Management Plan](#), [Duluth Urbanized Area Growth Impact Study](#))

Surface water management plans (e.g., [St. Louis River Watershed Restoration and Protection Strategy Report](#), [Cloquet River Watershed Restoration and Protection Strategy Report](#))

Groundwater management plans (e.g., [St. Louis River Watershed Groundwater Restoration and Protection Strategies Report](#))

State resources and documents (e.g., [2016 Nonpoint Priority Funding Plan](#), [Watershed Health Assessment Framework](#))

Known pollutant modeling and assessment efforts for local resources (e.g., HSPF)

Natural resources management plans (e.g., [MNDNR Wildlife Action Plan](#); [Planning for the Forests of the Future in a Changing Climate: Updating Northeast Minnesota's Forest Management Strategies](#); [Value of Nature's Benefits in the St. Louis River Watershed](#))

Climate action plans (e.g., [Climate Change Vulnerability Assessment and Adaptation Plan: 1854 Ceded Territory Including the Bois Forte, Fond du Lac, and Grand Portage Reservations](#); [City of Duluth Population Vulnerability Assessment and Climate Adaptation Framework](#))

As part of the local water management process, and pursuant to Minnesota Statutes: 103B.304-103B.355, a notification letter is required to be sent to plan review authorities and other stakeholders of the Comprehensive Watershed Management Plan development process. This notification letter invites plan review authorities and other stakeholders to submit priority issues and concerns for consideration in the plan development process. Issues flagged by the state agencies to be addressed by the Plan were also included in the database.

Step 3: Issue Identification

Information, including the reviewed planning documents, agency comment letters, and results from the kick-off survey were compiled into a table and organized into categories. The following 26 issue categories were identified during this process as overarching concerns for the St. Louis River planning area:

- Aggregate Mining
- Climate Change
- Development Pressure
- Drinking Water
- Equity and Environmental Justice
- Farming and Agriculture
- Forest Management and Health
- Groundwater and Surface Water
- Interactions
- Habitat
- Invasive Species
- Lake and Reservoir Management
- Land Use Planning and Ordinance
- Development
- Governance
- Mercury (and methylated mercury)
- Mining
- Recreation and Tourism
- Septics and Wastewater Treatment
- Stormwater Management
- Streambank Erosion and Channelization
- Stream Connectivity
- Substances of Emerging Concern
- Surface Water Quality
- Tribal Health
- Watershed Impacts to Lake Superior
- Wetland and Peatland Management
- Wild Rice

To further refine the list and identify the highest priority issues for the St. Louis River Comprehensive Watershed Management Plan, the Steering Team, Advisory Committee, and the Policy Committee collectively weighed in on the following:

- Consolidation of similar issue categories
- Differentiation between issue categories, sub-issue statements, the resource being affected by the issue, and key values and considerations
- Drafting a refined list of sub-issue statements that reflects local knowledge and values

At the end of this refinement process, the initial list of 26 issue categories were aggregated into five categories that were then used throughout the planning process. The five categories are: 1) surface water quality, 2) altered hydrology, 3) habitat, 4) land use and 5) drinking water protection. A complete list of these issue categories and issue statements can be found in Appendix D.

Relationship To Other Planning Efforts

St. Louis River Comprehensive Watershed Management Plan charts a course of action that the planning partners can take over the next 10 years. Over a 20-month period, the planning partners took numerous factors into consideration as they decided the scope and scale of what to include in the Comprehensive

Watershed Management Plan. This section identifies other resources and initiatives that are not being directly addressed in this planning effort.

St. Louis River Estuary

The St. Louis River Estuary is the nation's largest freshwater estuary. Due to unregulated industrial dumping, the St. Louis River was one of the most polluted waterways in the United States. The lower St. Louis River and the St. Louis River Estuary are designated as one of the 31 areas of concern on the Great Lakes due to significant historical issues with pollution and degraded habitat. Because of this designation, a great deal of support has been generated for this resource and a significant amount of planning and work has been done to improve it. Given the level of effort currently being directed to the restoration and protection of the St. Louis River Estuary (relative to other portions of the Planning Area), the planning partners have decided to address it as an important downstream receiving water and resource, but not the subject of this Comprehensive Watershed Management Plan. As such, it will be considered throughout the planning process, but it will not be assigned resource-specific issues, goals, or implementation activities.

Estuary remediation and habitat restoration work is currently funded by the Great Lakes Restoration Initiative (GLRI) for the Area of Concern (AOC) program which is expected to sunset in 2030. Some of the Estuary work that will continue after this date may include aquatic habitat work, pollutant loading reductions, addressing emerging concerns, long-term monitoring establishment and addressing concerns with existing impairments under the Clean Water Act authorities and other GLRI programs. The St. Louis River Comprehensive Watershed Management Plan aims to support the work of the estuary where it aligns with the plan's established priorities. Projects in the St. Louis River's tributary sub-watersheds that reduce pollutant loading to the estuary are an example where our priorities overlap.

Lake Superior

Although the entire planning area covered here drains to Lake Superior, this receiving water body was not directly addressed in the comprehensive plan. Lake Superior was considered when setting priorities in the sub-planning, especially in the initial steps of the planning process when priority issues were decided. Although this plan does not directly address Lake Superior work completed upstream will directly improve the health of Lake Superior

The Lake Superior Lakewide Action and Management Plan (LAMP) is a binational ecosystem-based management strategy for protecting and restoring the water quality of Lake Superior. The Lake Superior Partnership, composed of state, tribal, provincial and federal agency staff, is responsible for periodically updating the LAMP, documenting lakewide objectives, prioritizing scientific investigations and monitoring needs, implementing actions and projects to address threats and achieve the lakewide objectives, and reporting out annually on progress made. The Lake Superior LAMP has emphasized reducing bioaccumulative contaminants, conservation of biodiversity, climate change resilience, preventing introductions of new invasive species, preserving habitats, sustainable near-shore and pelagic fish communities, healthy tributaries and hydrologic connectivity. As the St. Louis River is the largest tributary on the US side of Lake Superior, actions taken under this plan are also critical for meeting lakewide objectives. Priority projects or actions in this plan that align with LAMP objectives can be eligible for funding under the Great Lakes Restoration Initiative.

Mercury TMDL for the St. Louis River

The Statewide Mercury TMDL did not directly address some mercury impairments in areas where mercury levels in fish are so high that the TMDL reduction goals won't be enough for these waters to meet the standard. A separate mercury TMDL study is underway, with MPCA working closely with Wisconsin DNR, EPA Region 5 and the Fond du Lac Band (all of whom share jurisdiction for water quality in the St. Louis River) on a partnership approach that recognizes differing water quality standards and seeks concurrence in creating integrated or connected TMDLs. A robust public engagement process is being developed, and a technical advisory team that includes mercury experts from various agencies and academia has been convened to leverage the shared knowledge and expertise around mercury in the watershed. This project is expected to take multiple years to complete.

For more information on the Statewide Mercury TMDL and St. Louis River Mercury TMDL, see:

<https://www.pca.state.mn.us/water/statewide-mercury-tmdl>

<https://www.pca.state.mn.us/business-with-us/st-louis-river-watershed-mercury-tmdl>

This plan does not directly address the mercury impairment because not enough is known to implement activities that have a large impact on the issue. The upcoming study will lead to more direct implementation strategies for addressing mercury and the results will be considered during the 5-year update.

Step 4: Issue Prioritization and Targeting

Recognizing the magnitude of the potential work within the entire planning area, the planning partners focused on areas/resources where restoration or protection work should be prioritized in the next 10 years. They accomplished this prioritization process by taking the steps outlined in figure 3.1-2.

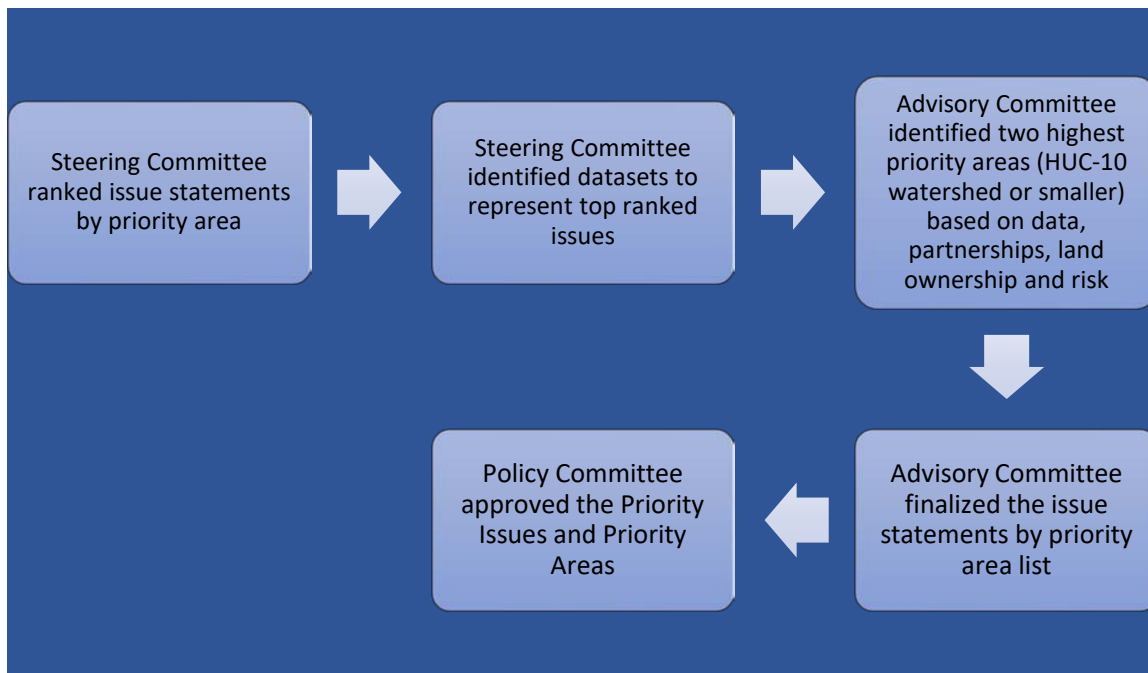


Figure 3.1-2. Issue prioritization and targeting process. During the spring of 2021, a series of meetings were held to prioritize issue statements and priority areas to work during the first 10 years of the plan.

Based on the process and considerations discussed in this section, the issue statements in 3.1-1 were identified as the top priorities to be addressed in the St. Louis River planning area.

Table 3.1-1. Final priority issue statements for the St. Louis River planning area

Surface Water Quality

- Failing septic systems can contaminate groundwater, surface waters and localized drinking water, leading to imminent threats to public health.
- Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic rec. uses.

Drinking Water Quality

- Drinking water quality and quantity from surface water and groundwater sources is threatened by land use activities and water appropriations.

Land Use

- Urbanization, development, and road expansion can impact watershed health and increase nutrient and other pollutant loadings when stormwater is not effectively managed.
- Water- and land-based recreational activities can impact the quality of lakes and streams, stress wildlife, degrade habitats, and lead to conflict between different uses.
- Aggregate mining can alter natural hydrology, impacting baseflows for nearby streams and local and regional aquifers (*Green et al, 2005*).

Altered Hydrology

- Channel instability, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the watershed.
- Loss of water storage, alt. flows, and changes in watershed boundaries are the result of land development, drainage, and legacy mining that alter natural hydrologic processes.
- Obsolete and nonfunctioning dams alter natural hydrology, impede fish passage and aquatic organism movement, and affect stream temperatures.

Habitat

- Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality.
- Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incision and floodplain disconnection, impeded fish passage, and fragmentation.
- Aquatic and terrestrial invasive species pose a threat to individual habitats and overall biodiversity.

Priority Areas

Figure 3.1-3 illustrates the Priority Areas that are the focus of the St. Louis River Comprehensive Watershed Management Plan planning effort. Table 2.1-2 identifies the issue statements identified as the top priorities to be addressed in the St. Louis River planning area and the Priority Areas where each issue statement was prioritized by the Steering Committee.

Other criteria discussed during the identification of priority areas includes:

- Availability of data
- How far from a standard is the impaired water body and how much effort would be needed to delist the water body?
- Cultural and recreational value
- Land ownership
- Priority in other planning documents (WRAPS)
- Efforts being made currently being made by other groups or partners and/or utilizing different resources
- Part of another priority area
- Potential for ecological and physical uplift to the watershed
- Indicator species (coldwater fisheries, wild rice, sturgeon)
- Climate change and resilience
- Equity
- Partnerships
- Social capacity development

Many issues were identified as important in the greater St. Louis River Comprehensive Watershed Management Plan Planning Area but were not identified as top priorities in the Priority Areas and are therefore not brought forward in the planning process. These issue statements are provided in Appendix D.

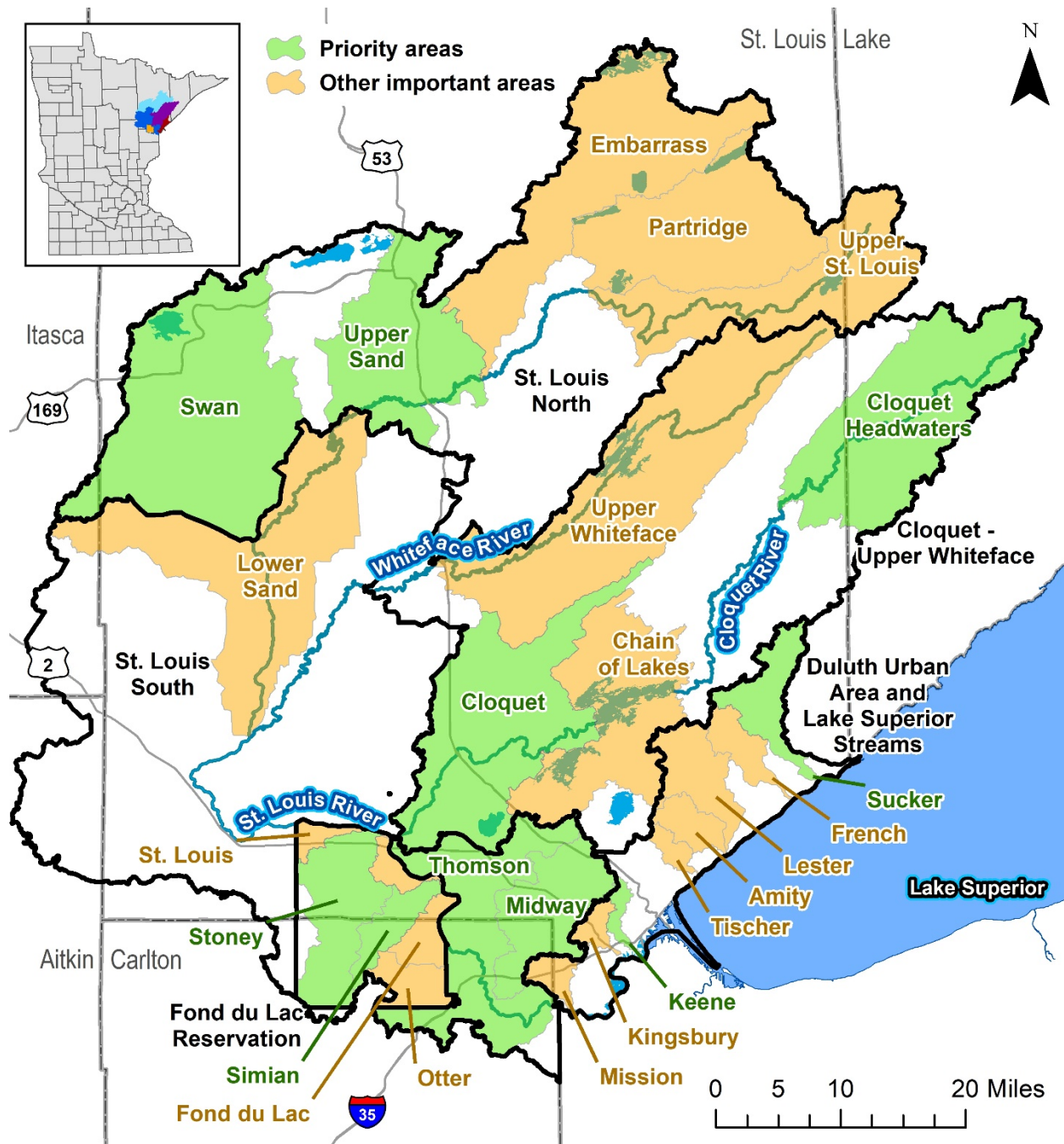


Figure 3.1-3 Priority areas within the St. Louis River Watershed plan. Areas in green (Swan, Upper Sand, Cloquet Headwaters, Cloquet, Simian, Stoney, Thomson, Midway, Keene and Sucker) are the priority areas. Areas in orange are not the primary focus for the first 10 years of the plan.

Table 3.1-2. Priority Issues by Priority Area as identified by Steering and Advisory Committees.

Issue Category	Priority Issue	St. Louis River North		St. Louis River South		Cloquet - Upper Whiteface		Duluth Urban Area		Fond du Lac Reservation	
		Swan River	Upper Sand River	Midway	Thomson	Cloquet River	Cloquet Headwaters	Keene Creek	Sucker River	Stony Brook	Simian Creek
Surface Water Quality	Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic rec. uses.	X	X	X	X	X		X	X	X	X
	Failing septic systems can contaminate groundwater, surface waters and localized drinking water, leading to imminent threats to public health.			X	X	X					X
Drinking Water Protection	Drinking water quality and quantity from surface water and groundwater sources is threatened by land use activities and water appropriations.	X	X	X	X						
Land Use	Urbanization, development, and road expansion can impact watershed health and increase nutrient and other pollutant loadings when stormwater is not effectively managed.	X	X	X	X			X			
	Water- and land-based recreational activities can impact the quality of lakes and streams, stress wildlife, degrade habitats, and lead to conflict between different uses.						X				
	Aggregate mining can alter natural hydrology, impacting baseflows for nearby streams and local and regional aquifers.					X					
Altered Hydrology	Channel instability, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the watershed.	X	X	X	X	X	X	X	X	X	X
	Loss of water storage, alt. flows, and changes in watershed boundaries are the result of land development, drainage, and legacy mining that alter nat. hydrologic processes.	X	X						X	X	X
	Obsolete and nonfunctioning dams alter natural hydrology, impede fish passage and aquatic organism movement, and affect stream temp.						X	X			
Habitat	Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality.			X	X	X	X		X	X	
	Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incision and floodplain disconnection, impeded fish passage, and fragmentation.			X	X	X		X	X	X	X
	Aquatic and terrestrial invasive species pose a threat to individual habitats and overall biodiversity.								X	X	

Important Considerations

While identifying issues that apply across the watershed, four important considerations were utilized as a 'lens' to set geographic, strategic, and funding priorities. These considerations lead us to ask deeper questions and uncover potentially overlooked opportunities --increasing our ability to accomplish the plan's objectives over the long-term.



Climate Change and Resilience

Climate change will make it more difficult to address existing water and environmental concerns, while creating opportunity for new concerns to emerge. Building resilience to climate change impacts will be important for achieving plan goals and ensuring durability of changes made.



Equity

Everyone impacts and—to differing degrees—is impacted by water and the environment. However, benefits and impacts are not equitably distributed. Efforts made through this planning process can reduce historic and current inequities through meaningful involvement, support for cultural ties and heritage, acknowledgement of treaty rights, consideration of economic constraints, protection of public access, and support for human health including food access and consumption, protection from pollution, employment, and water quality.



Social Capacity

Making progress towards plan goals will depend on the ability of individuals, businesses, and organizations to change behaviors or carry out actions for the environment and water. To do this, they need adequate knowledge, skills, relationships and funding/resources. Building capacity for collaboration across individuals and groups with diverse perspectives, yet shared interests, is needed to accomplish collective environmental goals.



Cultural significant Species

Some species play an especially important role in our lives—they connect us, they feed us, they spiritually sustain us. Considering where they are in the watershed and the challenges they face will be useful in targeting and prioritizing efforts in the plan. Examples of these species include wild rice, native trout, other cold-water fish and river sturgeon.

Emerging Concerns

During Advisory Committee meetings, emerging issues were discussed. An emerging issue is a potential problem or opportunity that is in the early stages of development or has not been addressed in the past but may be influential in the future. Each topic's emerging issues were recorded as part of the process.

Section 3.2: Measurable Goals Development

The measurable goals that will guide the implementation of this plan were developed using an iterative process. Starting with high-level goals, the Steering and Advisory Committee made them more measurable and targeted as they evaluated resource specific needs, capacity to do the work, and who would be impacted by the work needed to achieve the goals. In the end, the Steering Team and the Advisory Committee developed a series of Priority Area specific goals which led to the development of Priority Area specific implementation plans. This iterative process included:

- An initial set of draft goals was developed by Steering Committee members based on their local knowledge and a review of previous planning efforts (i.e., WRAPS reports).
- These initial, non-numeric goals were refined through a series of Steering Committee discussions. At these meetings, the Steering Committee identified and discussed potential data, tools, and partners that could support the goal setting process. Meetings with partners were held to collect additional input.
- A variety of tools were used to establish the goal numbers. Calculated measures were developed for each of the draft goals using the previously identified resources and partners. Tools and existing resources used in this process are identified in Table 3.2-1.
- Using their experience, the local partners considered their capacity to reach each goal. This was considered again once all the actions were taken into consideration.
- Analysis was performed to calculate the amount of each goal to be accomplished in the first 10 years of the plan.

Table 3.2-1. Tools and data used to calculate the goals.

Issue Category	Tools		Existing Plans	
Surface Water Quality	Air photo interpretation Near surface pollution mapping MPCA Smart Salt Level 2 Training list Landscape Stewardship Plan	Well/Parcel Estimation Lakes of phosphorous Sensitivity MN DNR Designated Trout Streams	WRAPS Fond du Lac NPS Plan MPCA Midway River Study (not published yet)	
Drinking Water Protection	DWSMA's		GRAPS	
Land Use	GIS Impervious Surface by Parcel (Keene Creek) MS4 Community list Trout Streams		WRAPS	
Altered Hydrology	USGS's "Assessing Hydrologic Changes in the St. Louis River Basin from Past Land Uses" The Evaluation of Hydrologic Change (EHC) for the St. Louis River Watershed (MN DNR)	Geomorphology Studies (MPCA, SWCD) Culvert Inventories (MPCA, DNR, SWCD and County)	WRAPS Fond du Lac NPS Plan Jason Carlson's Analysis	MPCA Midway River Study (not published yet) Keene Creek Study (South St. Louis SWCD)
Habitat	Landscape Stewardship Plan -RAQ Lakes of Phosphorous Sensitivity 1854 Treaty Authority Wild Rice Waters Carlton SWCD Riparian Buffer Targeting		WRAPS Fond du Lac NPS Plan Landscape Stewardship Plan	

Goals were developed in consultation with different stakeholder groups including the Duluth Urban Area Watershed Advisory Committee (DUWAC), MPCA, DNR, MN Agricultural Water Quality Certification Program, County SSTS and Transportation staff. These groups helped to determine how much progress is possible in the next 10 years. Conversations helped the Steering Team understand how much information was available (e.g., riparian restoration and data that has been collected but not yet processed, priority restoration sites). The final list of goals for the entire St. Louis River Planning Area are listed in table 3.2-2. Goals for each planning area can be found in the specific section of the plan for that area.

Based on the MN DNR Evaluation of Hydrologic Change for the St. Louis River Watershed, the watershed hydrology has been relatively stable over the last 80 years. However, the whole system analysis does not show localized impacts, and some metrics may indicate a shift in wetland function with altered base and low flows. The report recommends building climate resilience through forest management and protecting and restoring wetland function. Based on this data, our goal is to maintain the current watershed storage, and increase storage in areas with significant altered hydrology due to ditching and development.

Table 3.2-2 St. Louis River Watershed Goals.

Goal	Issue Category
Develop and implemented stormwater plans in 60% of municipalities with identified bacteria impairments.	Surface Water Quality
Identify and address ground and surface water quality problems stemming from inadequate wastewater treatment by supporting the enforcement of Sub Surface Treatment Systems (SSTS) ordinances and inventory and upgrade 40% of non-compliant systems in priority areas.	Surface Water Quality
Reduce bacteria and other pollutants into streams by completing farm projects on 50% of properties identified as needing enhancements.	Surface Water Quality
Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 60% of municipalities have Smart Salt Certified Staff, 60% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.	Surface Water Quality
Promote the implementation of low impact development techniques to reduce stormwater runoff, volume, and rate control in 50% of communities.	Land Use
Educate, increase stewardship and mitigate the water quality impacts of recreational land users and landowners to natural resources at 5 high use & high priority recreational areas.	Land Use
Evaluate impacts of aggregate mining at 100% of high priority sites that have the potential to impact sensitive surface and ground water resources.	Land Use
Protect groundwater quality by sealing 45 unused, unsealed wells watershed wide.	Drinking Water Protection
Reconnect 55 miles of priority streams and tributaries to benefit aquatic life and improve water quality.	Altered Hydrology
Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 19,000 Linear Feet of high priority streams and tributaries.	Altered Hydrology
Maintain and increase the current acre/feet of watershed storage by restoring wetlands in identified priority areas where they have been lost and/or altered due to ditching or development activities.	Altered Hydrology
Protect & manage 16,000 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.	Habitat
Protect and restore 15,000 feet of shoreline in prioritized lakes and streams for natural buffers and reduced erosion.	Habitat
Protect and Restore 30% of high priority wild rice stands/populations (water levels, disturbance, shoreland development).	Habitat
Identify and manage 20 acres of high priority sites/resources for invasive species.	Habitat

Section 3.3. Implementation Strategies

Brainstorming for implementation strategies started early in the planning process. While discussing issues, goals and priority areas, ideas on what should be done naturally became a part of the conversation. Throughout the planning process, these ideas were cataloged, and became the basis for the implementation table. In addition, implementation strategies from the WRAPS, state agency letters and the public survey input were used.

A series of three advisory committee, three steering committee and one stakeholder meetings were used to brainstorm and prioritize these actions using a collaboration tool called Mural. The committees involved at each step are shown in figure 3.3-1.



Figure 3.3-1. Committee involved in the development of the implementation table

Brainstormed actions were prioritized by four categories: impact to water resources, cost, shovel readiness, and feasibility. Also considered was a project's eligibility for Watershed Based Implementation Funds. To be included in the plan, an action had to fit the criteria outlined in Figure 3.3-2. The Steering Committee then estimated project costs, assigned lead staff and determined each action's timeline.

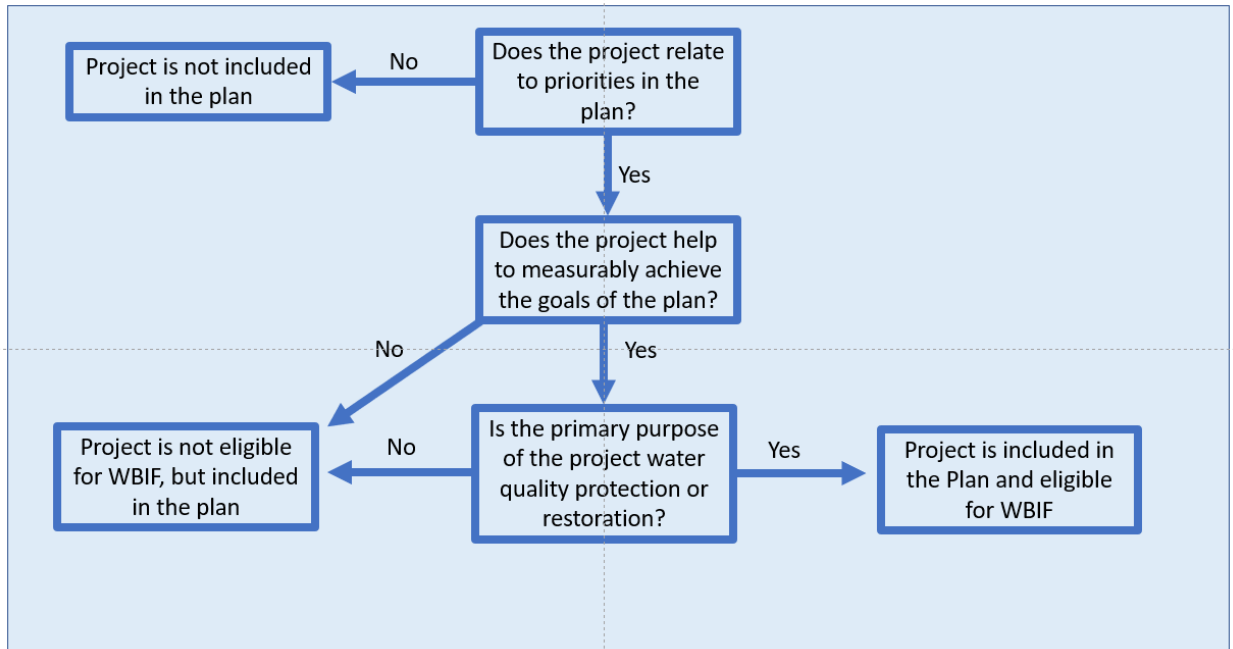


Figure 3.3-2. Decision criteria for brainstormed actions to be included in the final plan.

Actions were categorized into four separate conservation programs: Conservation Programs, Land Use Policy, Education and Outreach and Research, Data Collection and Monitoring (Figure 3.3-3). In addition, funding levels were determined for each action. Funding levels included Watershed Based Implementation Funds (WBIF), baseline funding (current local baseline) and other sources which include competitive grants, partner cost-share among others (Figure 3.3-4).

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
--------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------

Figure 3.3-3. Conservation Programs used in the implementation table. Programs are indicated by the icons in the table above.

WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Figure 3.3-4. Funding sources used in the implementation table. Funding sources are indicated using the words WBIF, baseline or other in the table.

Section 4. St. Louis River North Planning Area

The St. Louis River North planning area includes the headwaters of the St. Louis and Sand Rivers, East and West Swan Rivers, East and West Two Rivers and the Embarrass River. This portion of the watershed has many active and historic mining operations. As a result, there are numerous municipalities scattered throughout the planning area. In addition, there are many lakes with increasing development on lakeshores. However, there are still large portions of this planning area that are rural with either forests, lakes or some agricultural land uses.

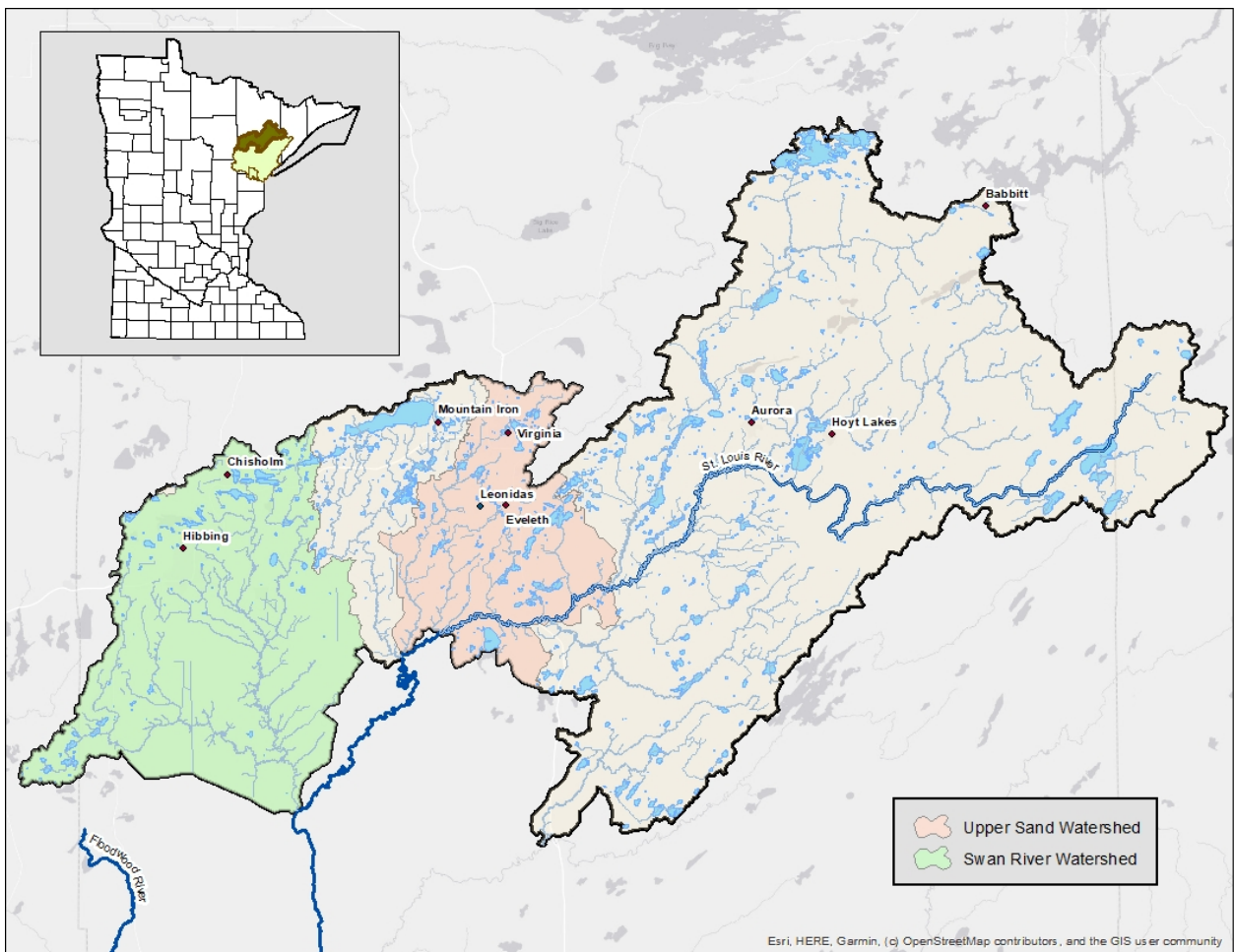







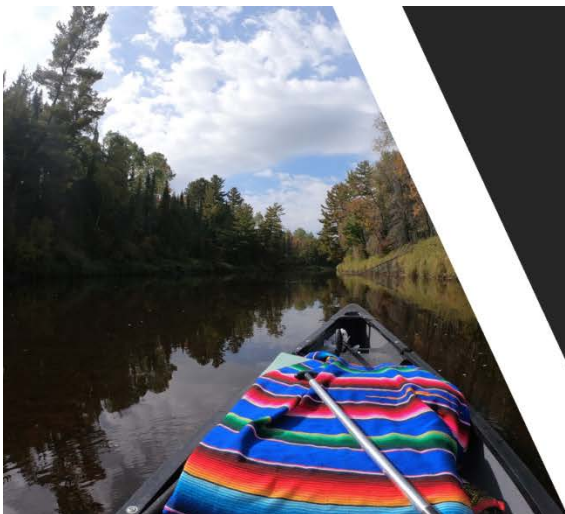
Figure 4-1. The St. Louis River North planning area includes the headwaters of the St. Louis River, the Iron Range Communities, and several important tributaries including the Swan, East Two and Embarrass Rivers.

St. Louis River North Watershed Priority Issues

	Surface Water Quality	<ul style="list-style-type: none">• Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic recreation uses.
	Drinking Water Quality	<ul style="list-style-type: none">• Drinking water quality and quantity from surface water and groundwater sources is threatened by land use activities and water appropriations.
	Land Use	<ul style="list-style-type: none">• Urbanization, development, and road expansion can impact watershed health and increase nutrient and other pollutant loadings when stormwater is not effectively managed.
	Altered Hydrology	<ul style="list-style-type: none">• Channel instability, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the planning area.• Loss of water storage, altered flows, and changes in watershed boundaries are the result of land development, drainage, and legacy mining that alter natural hydrologic processes.
	Habitat	<ul style="list-style-type: none">• Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality.• Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incisement and floodplain disconnection, impeded fish passage, and fragmentation.

Main Planning Area Issues

- Bacteria impaired streams impact water recreation
- Drinking water from surface and ground water sources needs to be protected
- Development in the watershed impacts lakes and streams



Desired Future Condition (Long-Term Goal):

- ***Drinking water quality is protected***
- ***Developed land is well managed to protect lakes and streams***
- ***Streams are safe for aquatic recreation***



Reduce bacteria and other pollutants into streams by completing farm projects on 50% of properties identified as needing enhancements

The two main needs for project success in this region are education and outreach to high priority farmers and increased assistance with design and engineering of best management practices.

There are 9 current bacteria impairments in the planning area where livestock were listed as a stressor (*WRAPS, MPCA 2018*). The goal of this plan is work with farmers to implement best management practices to reduce bacteria, nutrients and sediments into lakes and streams. The main target will be the identified priority areas, but we may implement projects to address bacteria and sediment concerns of new impairments as they are identified.

Priority Area	Long-Term Goal (Sites)	10-Year Goal (Sites)
Swan River	9	4
Upper Sand	0	0
Total	9	4

Targeted Resources
Barber Creek (AUID -641, -569)
Buhl Creek
Dempsey Creek
East Swan River
Penobscot Creek
Unnamed Creek (East Swan Creek, AUID -888)
Unnamed Creek (AUID -542)
Unnamed Creek (AUIS -A22)

Project Outcomes
Waters are safe for recreation
Reduced sediment and nutrient pollutants
Improved habitat

Important Considerations



This goal addresses **equity** by focusing on low-income municipalities. In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). Small streams are often the only water resource available to disadvantaged communities.



Social capacity between producers and local governments in this area through education and outreach.

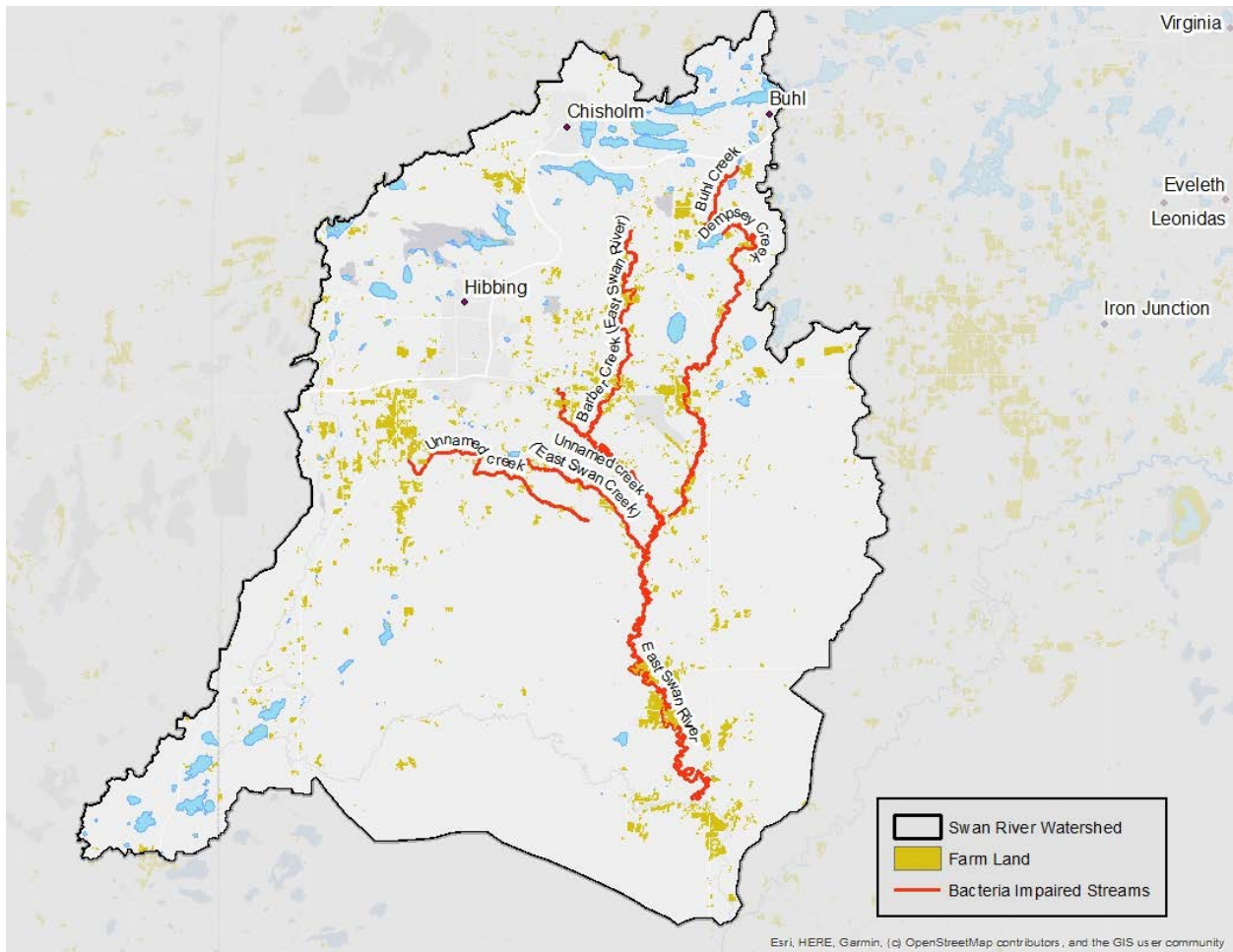




Figure 4-2. Farmland and bacterial impaired streams in the Swan River Subwatershed. Although there is farmland throughout the planning area, there are concentrated farmed areas upstream and adjacent to bacteria impaired streams. Working with farmers to install best management practices that address animal manure management will help reduce bacteria to these streams.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop whole farm plans/comprehensive manure management plans for 4 priority farms		WBIF	4 plans completed	E. coli impaired streams Swan River Watershed	North St. Louis SWCD / MDA, NRCS		✓	✓	✓	✓	\$32,000
		Other									
Implement at least 9 feedlot / pasture management practices that prevent manure runoff		WBIF	9 practices implemented	E. coli impaired streams Swan River Watershed	North St. Louis SWCD / MDA, Extension & NRCS		✓	✓	✓	✓	\$180,000
		Other									

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Develop and implemented stormwater plans in 50% of municipalities with identified bacteria impairments

Developed areas can be sources for bacteria in our waters. Impervious surfaces like roads, parking lots and buildings allow pollutants to be easily washed into lakes and streams. A high concentration of family dwellings can lead to bacteria coming from pet waste and old or non-functioning wastewater conveyance. Stormwater treatment, education and pet waste programs can all be effective ways to reduce bacteria in our waters (*MPCA 2018 d p. 82*).

Priority Area	Long-Term Goal (Communities)	10-Year Goal (Communities)
Swan River	3	2
Upper Sand	6	3
Total	9	5

Targeted Communities
Buhl
Chisholm
Eveleth
Gilbert
Hibbing
Iron
Iron Junction
Leonidas
Mountain
Virginia

Project Outcomes
Protection of lakes and streams
Reduced sediment and nutrient pollutants
Protection of drinking water

Important Considerations



This goal addresses **equity** by protecting streams for recreation. In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). Small streams are often the only water resource available to disadvantaged communities. This goal also protects drinking water for all residents.



Social capacity will be built through education and outreach to build more resilient communities

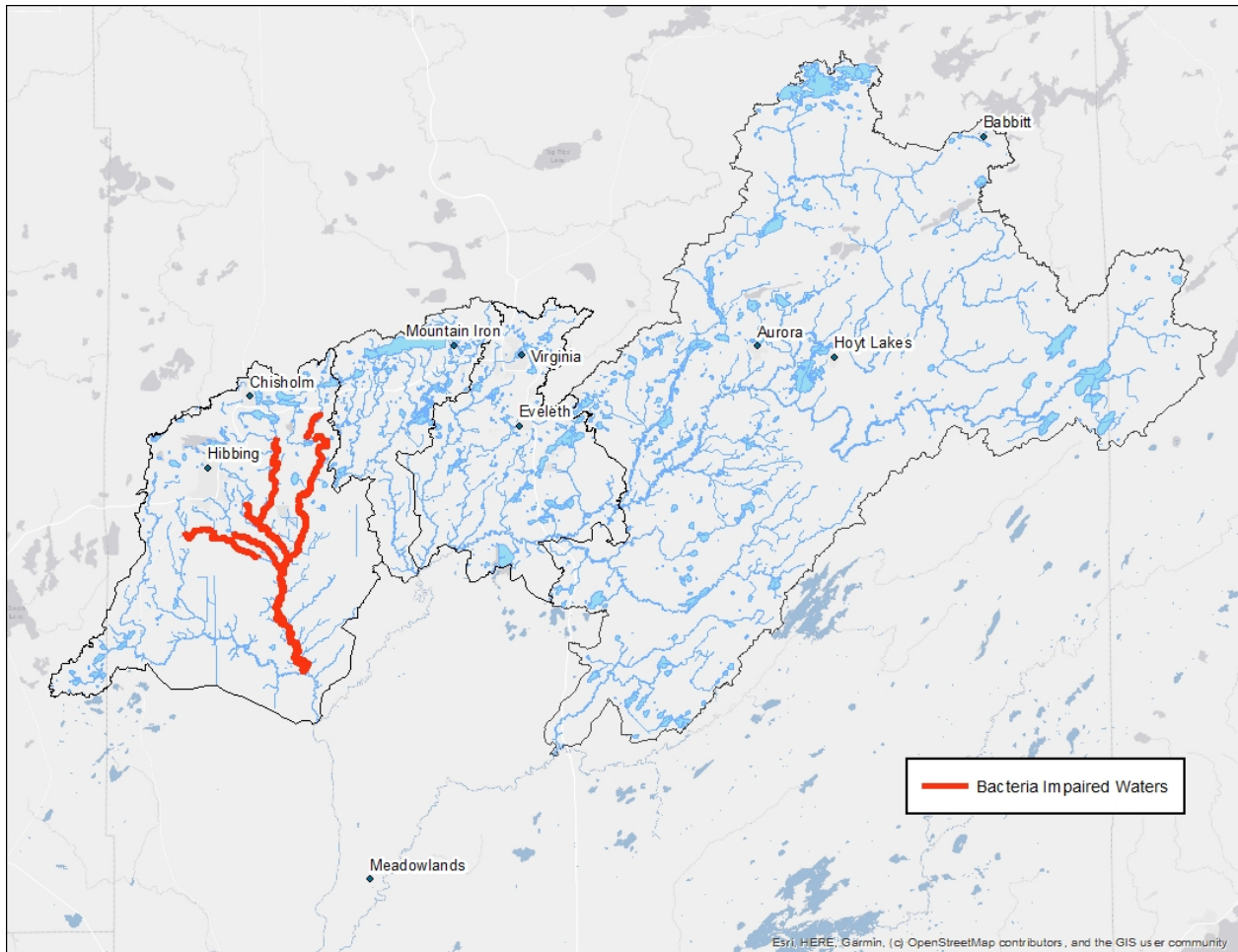










Figure 4-3. Bacteria impaired streams in the St. Louis River North planning area. In addition to impaired streams, several other communities are at risk due to their proximity to water resources.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop and implement a pet waste education program		WBIF	1 program implemented	Municipalities in Swan and Sand Watershed	North St. Louis SWCD / RSPT	✓	✓	✓	✓	✓	\$10,000
Outreach to 9 municipalities		WBIF	9 municipalities contacted	Municipalities in Swan and Sand Watershed	North St. Louis SWCD / RSPT municipalities	✓	✓				\$2500
Implement 5 projects to reduce bacteria to surface waters		WBIF	5 projects implemented	Municipalities in Swan and Sand Watershed	North St. Louis SWCD / Municipalities			✓	✓	✓	\$300,000
Assist with planning for 2 municipalities in Swan River and 3 municipalities in Upper Sand River watershed		WBIF	5 plans	Municipalities in Swan and Sand Watershed	North St. Louis SWCD / Municipalities	✓	✓	✓			\$500,000
Genetic study to identify source of E. coli		Other	1 study completed	E. coli impaired streams Swan River Watershed	MPCA	✓					\$10,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
-----------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 50% of municipalities have Smart Salt Certified Staff, 50% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.

Chloride or road salt is a concern in this region because of the proximity of communities and roads near lakes and streams. Chloride is a concern because once it enters a stream or lake, it cannot be removed. In addition to having negative impacts on habitat, excess salt can also affect drinking water, especially the communities that get their drinking water from surface waters (Aurora, Chisholm, Virginia, Eveleth, Biwabik and Hoyt Lakes).

A total of 9 communities were targeted based on their proximity to water resources and the number of road miles maintained. While Virginia and St. Louis County have Smart Salt Certified Staff, the remaining communities do not. No communities in the region have Level 2 Smart Salt Certified staff.

Priority Area	Long-Term Goal (Communities)	10-Year Goal (Communities)
Swan River	3	2
Upper Sand	6	3
Total	9	5

Targeted Communities
Buhl
Chisholm
Eveleth
Gilbert
Hibbing
Iron Junction
Leonidas
Mountain Iron
Virginia

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Protection of drinking water

Important Considerations



This goal addresses **equity** by protecting streams for recreation. In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). Small streams are often the only water resource available to disadvantaged communities. This goal also protects drinking water for all residents.



Building **social capacity** will be needed to increase local participation in salt reduction. Education on the impacts of salt to water resources will be needed along addressing concerns of snow/ice concerns on roads and sidewalks for people with limited mobility.

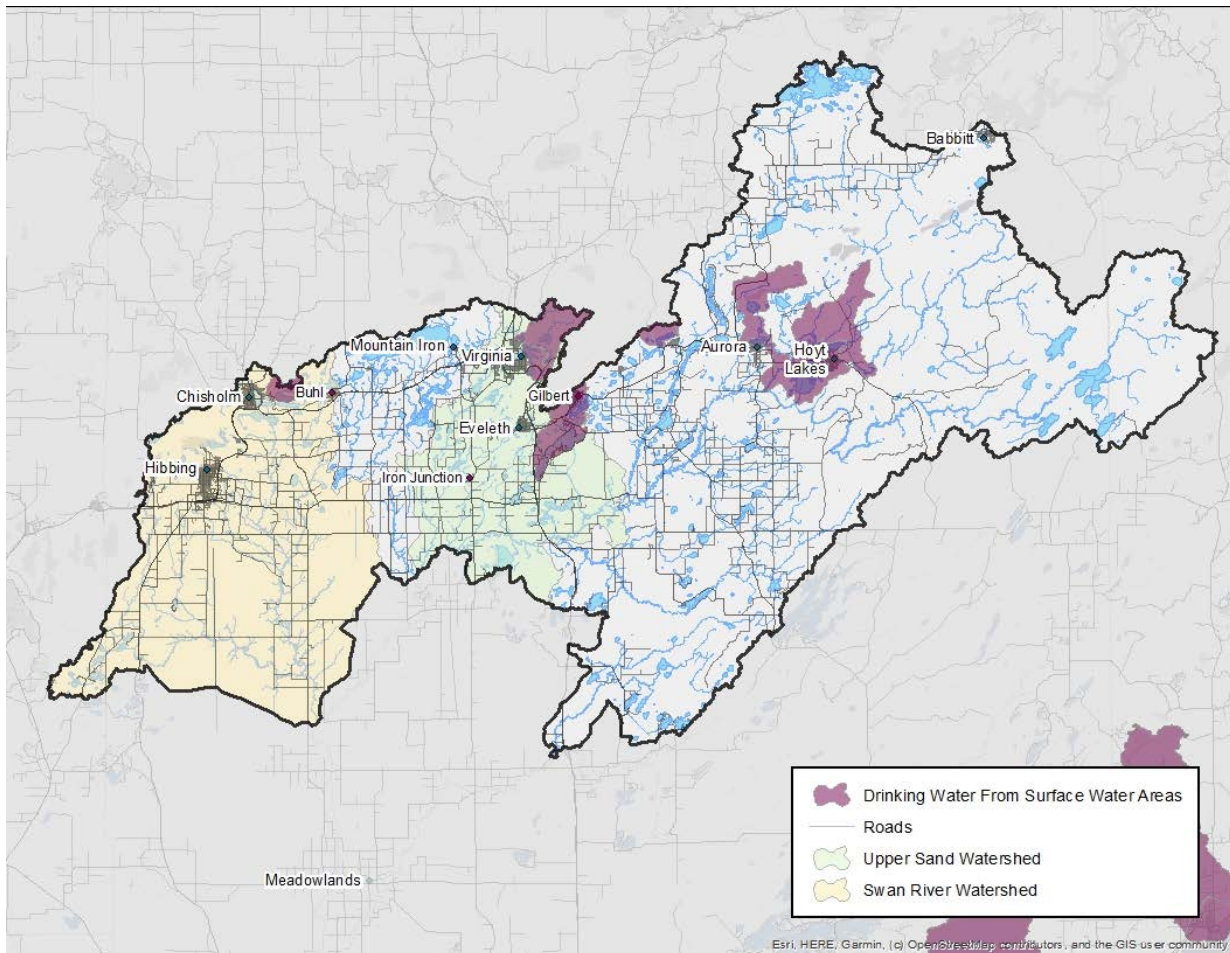










Figure 4-4. St. Louis River North Road and drinking water from surface water communities. Reducing salt use near waterways, especially in communities that obtain drinking water from surface water is a priority for this area.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Outreach to 9 municipalities on municipal salt use.		WBIF	9 municipalities contacted	Municipalities in Swan and Sand Watershed		North St. Louis SWCD / RSPT municipalities	✓	✓	✓			\$25,000
Assist with providing level 2 Smart Salt training for 2 municipalities in Swan River and 3 municipalities in Upper Sand River watershed.		WBIF	Training for 5 municipalities	Municipalities in Swan and Sand Watershed		North St. Louis SWCD / Municipalities, MPCA	✓	✓	✓			\$25,000
		Other										
Cost share to purchase salt reduction equipment and summer chloride alternatives.		WBIF	3 equipment purchases, 1 trial of summer alternatives	Municipalities in Swan and Sand Watershed		North St. Louis SWCD / road authorities		✓	✓	✓		\$300,000
Evaluate County's salt training with Smart Salt training and identify gaps.		WBIF	1 report	Watershed Wide	Watershed Wide	SWCD / RSPT, municipalities	✓					Incorporated into Water Coordinator staff costs
Development & implement a salt use reduction education and outreach campaign. Identify high priority private landowners as part of the process.		WBIF	1 campaign implemented	Municipalities near public waters / Lakeshore owners	Watershed Wide	SWCD / RSPT, municipalities	✓	✓	✓	✓	✓	\$50,000
Track salt use to determine salt trends		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	SWCD / County, Municipalities	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs
Make road salt alternatives (sand, grit) readily available to homeowners		WBIF	1 program developed	Municipalities near public waters	Watershed Wide	SWCD / RSPT, municipalities	✓	✓	✓	✓	✓	\$10,000

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Include better planning for snow storage to keep roads and sidewalks cleared, minimize moving snow and protect stormwater BMPs		WBIF	1 plan developed	Watershed Wide	Watershed Wide	SWCD / RSPT, municipalities	✓	✓				Incorporated into Water Coordinator staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect groundwater quality by sealing 20 unused, unsealed wells watershed wide

Due to the early European settlement of the Iron Range, there is a wide range of well ages in this planning area. Whole communities were moved to support the mining industry, which leaves the risk of unsealed wells. However, there is no current list of unused, unsealed wells, nor is there any current well sealing program. As a result, the goal for the first 10 years of the plan is to survey residents to determine the scope of the problem and seal one well per year in each planning area (*MDH 2020*).

Priority Area	Long-Term Goal (Number of unused/unsealed wells)	10-Year Goal (Number of unused/unsealed wells)
Swan River	Unknown	10
Upper Sand	Unknown	10
Total	Unknown	20

Targeted Areas

Areas with sensitivity to near surface pollution

Project Outcomes

Drinking water is safe and protected

Residents understand how to protect groundwater quality

Important Considerations.



In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). This action will help provide access to safe, clean, affordable drinking water for all.



Education and outreach will be needed to build **social capacity**. A shared understanding of groundwater protection will help build participation in well sealing programs.

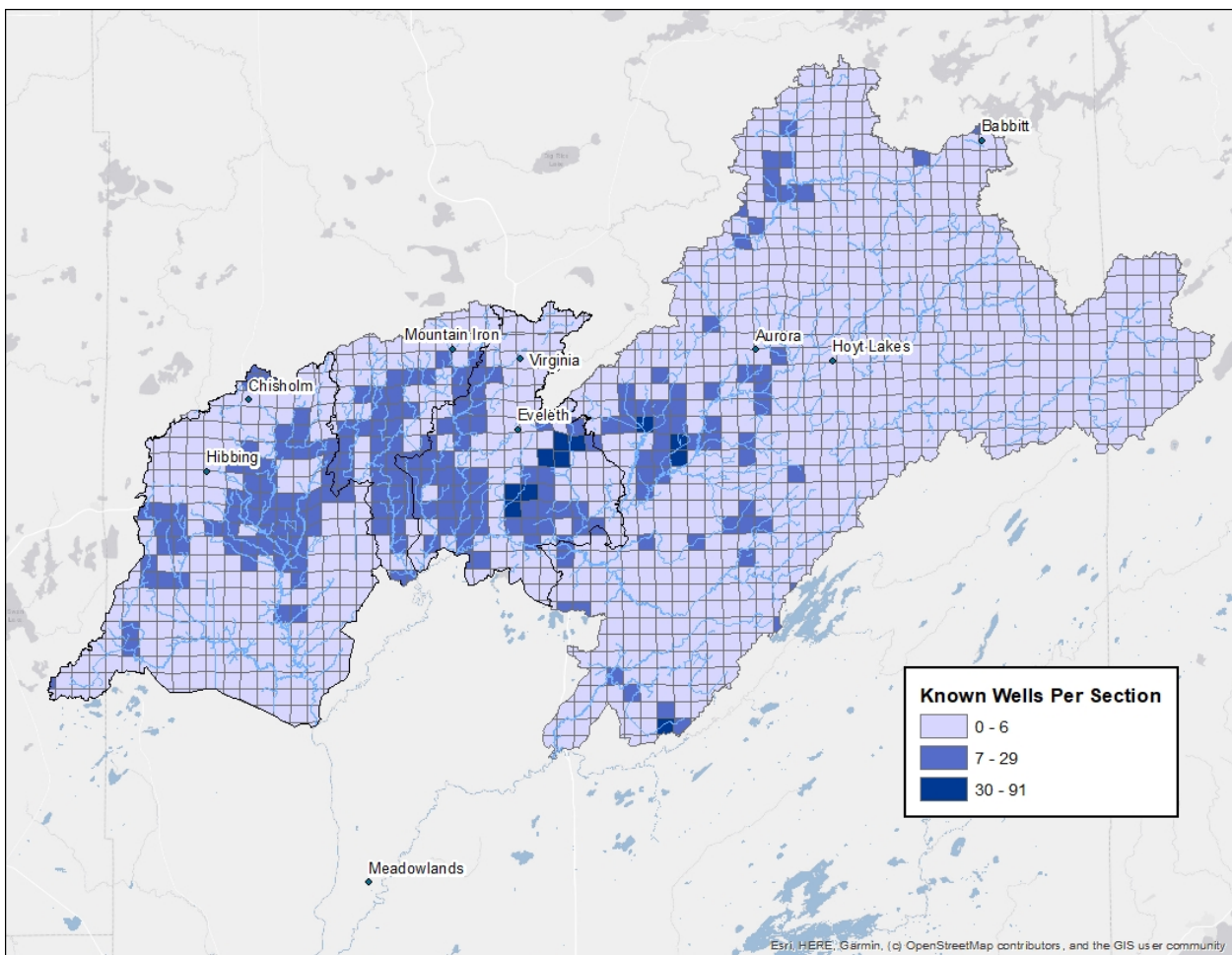






Figure 4-5. St. Louis River North wells per section. Landowner well education will be targeted to areas with the highest density of wells.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Provide cost share to seal 20 unused wells		WBIF	20 sealed wells	1 mile buffer area around DWSMAs		North St. Louis SWCD / MDH	✓	✓	✓	✓	✓	\$10,000
Develop/update surface water source protection plans for municipalities (Virginia, Eveleth, Hoyt Lakes, Biwabik, Aurora & Chisholm)		Other	6 plans updated or developed	Virginia, Eveleth, Hoyt Lakes, Biwabik, Aurora & Chisholm		MDH			✓			\$60,000
Develop and implement an education & outreach campaign to promote drinking water quality		WBIF	1 outreach campaign developed and implemented	Sand, Swan Watersheds, 1 mile buffer DWSMAs	South St. Louis Planning Area	MDH North St. Louis SWCD,	✓	✓	✓	✓	✓	\$5000
Develop and implement a groundwater monitoring program coordinated with DNRs groundwater monitoring program.		Other	1 monitoring developed and implemented	Watershed Wide	Watershed Wide	North St. Louis SWCD / MDH, DNR			✓	✓	✓	\$150,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Promote the implementation of low impact development techniques to reduce stormwater runoff, volume and rate control in 50% of communities

Managing stormwater runoff is a priority in the St. Louis River North watershed for several reasons. Stormwater management reduces pollutants from being washed into lakes and streams. Several communities in this area get their drinking water from lakes or abandoned mine pits (Aurora, Chisholm, Virginia, Eveleth, Biwabik and Hoyt Lakes), and managing stormwater can help protect drinking water quality. Lake and stream habitat are also improved by stormwater management. Stormwater management slows the flow of water during rain events and spreads the runoff over a longer period of time. This results in the reduction of flood risks to these communities (*MPCA 2018 p. 82*).

Priority Area	Long-Term Goal (Communities)	10-Year Goal (Communities)
Swan River	3	2
Upper Sand	6	3
Total	9	5

Targeted Communities
Buhl
Chisholm
Eveleth
Gilbert
Hibbing
Iron Junction
Leonidas
Mountain Iron
Virginia

Project Outcomes
Protection of drinking water resources
Reduce flood risks
Reduced sediment and nutrient pollutants
Improved habitat

Important Considerations



Addressing stormwater can mitigate impacts of **climate change**. Some climate change predictions include a wetter climate and increased rain events of over one inch of precipitation (*Stults, 2016, p 24-26*).



In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). This goal addresses **equity** by protecting drinking water. Stormwater impacts surface waters, and several communities get their drinking water from surface waters.



Social capacity will be built through education and outreach to build more resilient communities.

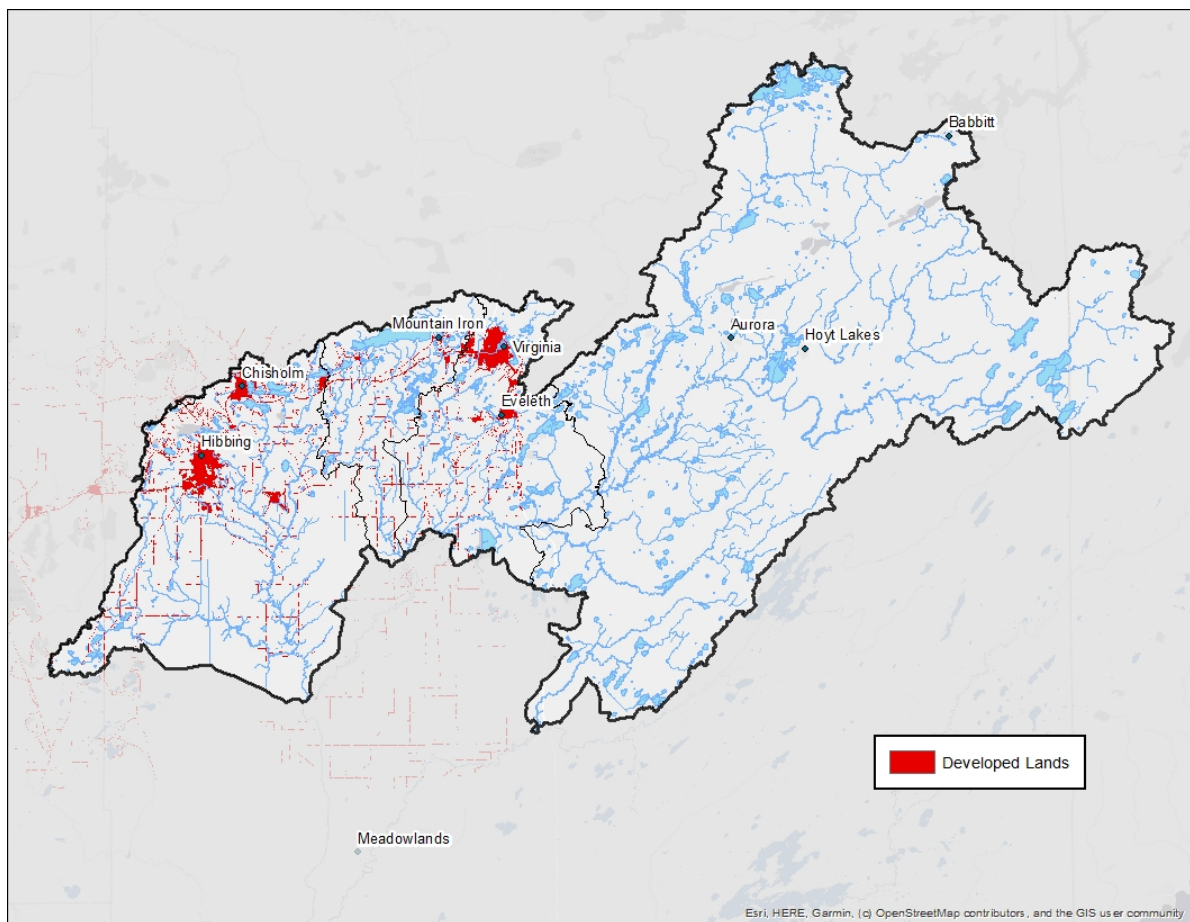







Figure 4-6. St. Louis River North developed areas. Stormwater management actions will be targeted to communities with large amounts of developed land.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Complete stormwater plans for 5 municipalities		WBIF	5 plans completed	Surface Water – Drinking Water supply areas		North St. Louis SWCD / County	✓	✓	✓			\$500,000
Develop and implement a homeowner program for help with design and implementation of BMPs's such as rain gardens and urban forestry		WBIF	1 program implemented	Municipalities in Swan and Sand Watershed	DUA, SLS	North St. Louis SWCD, Municipalities	✓	✓	✓	✓	✓	\$350,000
Design and implement an adopt the storm drain program		WBIF	1 program implemented	Municipalities in Swan and Sand Watershed		North St. Louis SWCD / RSPT, Municipalities	✓	✓	✓	✓	✓	\$25,000
Look for opportunities to reduce flood risk and associated infrastructure damage		Other	5 meetings with municipalities	Municipalities in Swan and Sand Watershed	Watershed Wide	SWCD / St. Louis County, Municipalities & other road authorities	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs
Work with road authorities to educate and implement stormwater BMPs associated with roadside ditches to help slow the flow and minimize will minimize un-vegetated channels and associated erosion		WBIF	5 projects implemented	Municipalities in Swan and Sand Watershed	DUA, SLS	North St. Louis SWCD, St. Louis County, Road Authorities	✓	✓	✓	✓	✓	\$300,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
-----------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Reconnect 3 miles of priority streams and tributaries to benefit aquatic life and improve water quality.

High sediment concentrations in the Swan River watershed have been attributed to altered hydrology in several streams (South St. Louis SWCD 2013 Geomorphic Assessment). A total of 26 culverts were identified as being either too narrow or too wide, changing the natural pattern of the stream and resulting in in-channel erosion (*Swan River Channel Stability and Geomorphic Assessment Technical Memo, SSL SWCD 2013*).

Less information is known about the Upper Sand watershed, and the first step is a culvert inventory to identify structures that are affecting stream health and connectivity. One known issue in the Upper Sand Watershed is the water control structure at the outlet of Ely Lake. A study is needed to determine a solution that will protect the lake during low flow/drought conditions (*MPCA 2018 p. 83*).

Priority Area	Long-Term Goal (culverts/dams altering hydrology)	10-Year Goal (culverts/dams altering hydrology)
Swan River	26	2
Upper Sand	Unknown	0
Total	26	2

Targeted Resources
East Swan River and Tributaries
Ely Lake/Creek

Project Outcomes
Improved habitat
Reduced sediment and nutrient pollutants
Increased road infrastructure resiliency to flood damages

Important Considerations



Correctly sizing culverts can mitigate impacts of **climate change** by reducing washouts and stream erosion during increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



This goal addresses **equity** by improving streams for recreation. In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color (*MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data*). Small streams are often the only water resource available to disadvantaged communities.



Education and outreach will be needed to increase **social capacity** by building trust with road authorities.

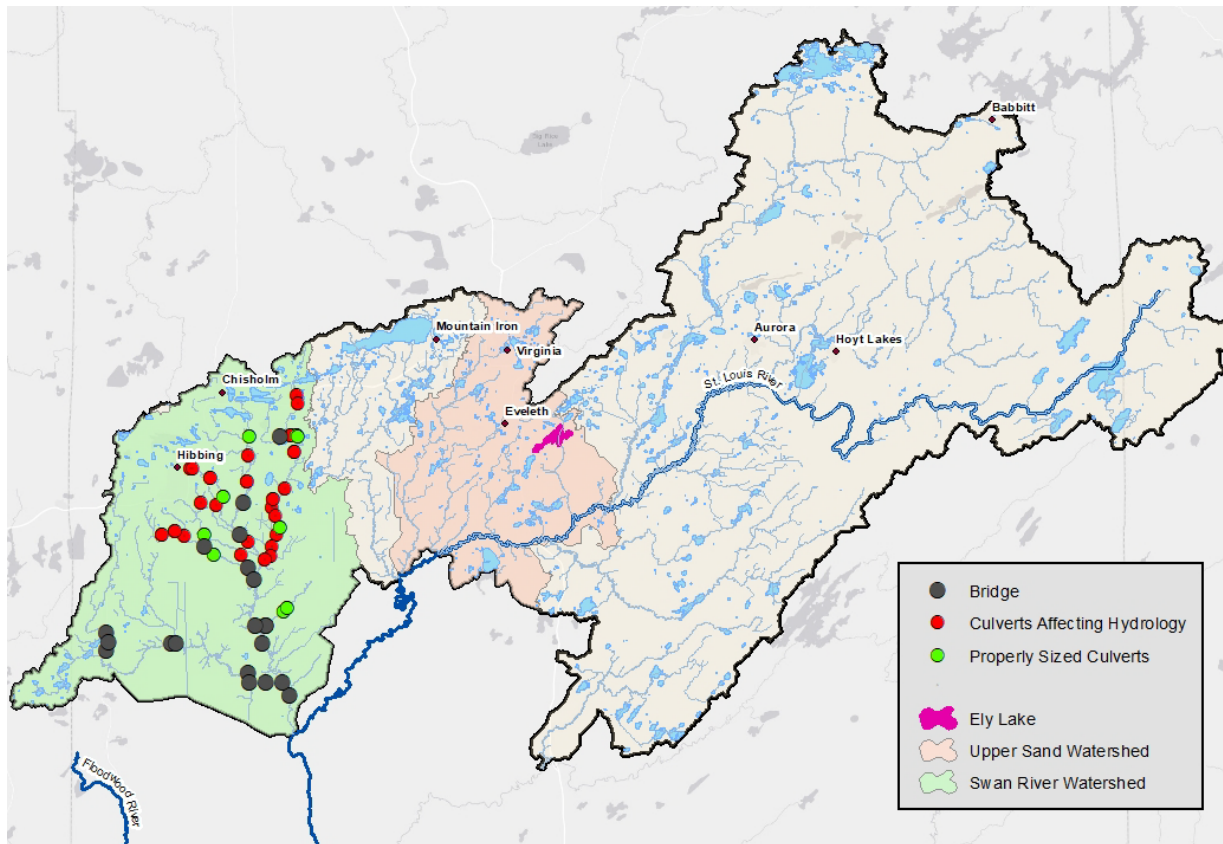








Figure 4-7. St. Louis River North stream connectivity project locations. A culvert inventory was completed for the Swan River Watershed. A total of 26 culverts were identified as being impacting stream hydrology (either too narrow or too wide). In addition, the water control outlet at Ely Lake is a known structure that is altering the hydrology of Ely Creek and impacting fish passage.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Complete fish friendly culvert design for 2 culverts		WBIF	2 designs	Swan River Watershed		North St. Louis SWCD		✓				\$40,000
Install 2 fish friendly culverts		WBIF	2 culverts installed	Swan River Watershed		North St. Louis SWCD, road authorities			✓	✓		\$1,000,000
		Other										
Outreach to road authorities in the Swan River watershed to plan culvert replacements		WBIF	2 meetings with road authorities	Swan River Watershed		North St. Louis SWCD	✓					\$2500
Complete culvert inventory in Upper Sand watershed		WBIF	1 inventory completed	Upper Sand Watershed		North St. Louis SWCD		✓				\$20,000
Evaluate the impact of Ely Lake water level management and develop recommendations for low flow/drought conditions		WBIF	1 study completed	Ely Creek/Ely Lake		North St. Louis SWCD / DNR		✓				\$40,000
Use road authorities 5–10-year plans to coordinate with crossing upgrades		Baseline	Annual Plan Review	Watershed Wide	Watershed Wide	Counties / SWCDs	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 2000 Linear Feet of high priority streams and tributaries.

There are over 300 miles of altered streams in the St. Louis River North planning area (*Altered Watercourse Project, MPCA 2013*). These streams were historically straightened to facilitate farming or logging during European settlement. Many of these land uses are no longer used, but the impacts to streams remain. Restoring these altered stream reaches will improve habitat and reduce pollutants.

Priority Area	Long-Term Goal (miles of altered stream)	10-Year Goal (miles of altered stream)
Swan River	100	0.3 (2000 linear feet)
Upper Sand	47	0
Total	147	0.3

Targeted Resources

Headwaters of the East and West Swan River

Project Outcomes

Improved habitat

Reduce sediment and nutrient pollution

Important Considerations



Stream restorations can mitigate impacts of **climate change** by making streams more resilient to increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (Stults, 2016, p. 26).



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities.

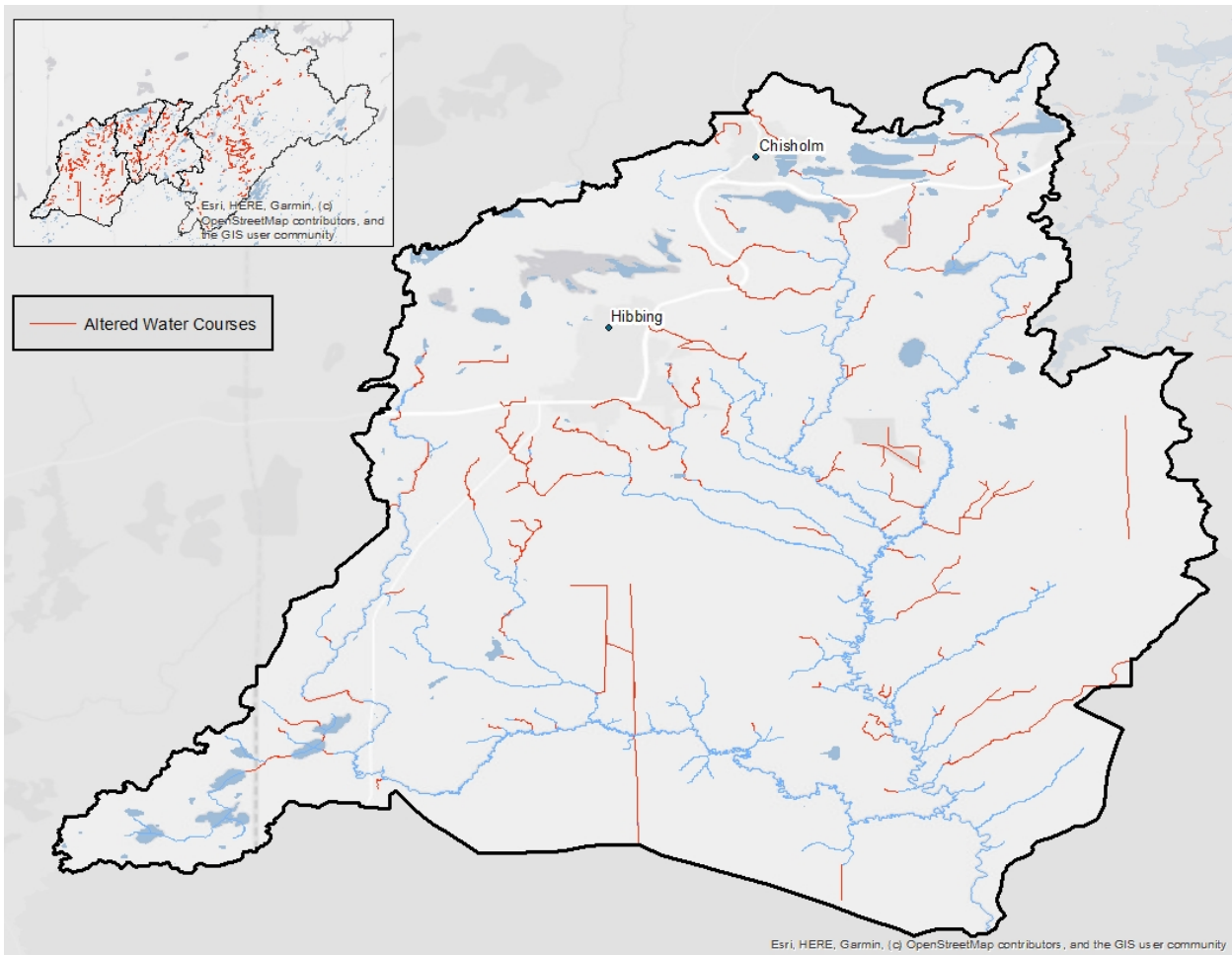




Figure 4-8. St. Louis River North altered water courses. There are over 300 miles of altered water courses watershed wide. The focus of this plan will be tributaries and headwaters within the Swan River watershed.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Inventory priority reaches to prioritize restoration sites including, if possible, info on which restorations would also help reduce costs associated with major flooding		WBIF	1 completed inventory	Swan and Upper Sand Watersheds		North St. Louis SWCD	✓	✓				\$50,000
Restore 2000 linear feet of stream		WBIF	2000 feet restored	Swan and Upper Sand Watersheds		North St. Louis SWCD			✓	✓	✓	\$500,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Maintain and increase the current acre/feet of watershed storage by restoring wetlands in identified priority areas where they have been lost and/or altered due to ditching or development activities.

Many areas of the watershed were ditched during European settlement to drain land for farming. The loss of wetlands and water storage has impacted nearby streams by speeding the flow of water during snowmelt and rainfall events. The result is increased erosion within the stream channel. While some ditches still provide benefits to area farms, others are no longer serving that purpose. More information is needed to determine where ditches could be closed while limiting impacts to surrounding landowners (MPCA 2018 p. 83).

Priority Area	Long-Term Goal (Ditches Evaluated)	10-Year Goal (Ditches Evaluated)
Swan River	26	26
Upper Sand	0	0
Total	26	26

Targeted Resources

East Swan River Altered Tributaries

Project Outcomes

Improved habitat

Reduce sediment and nutrient pollution

Important Considerations



Maintaining watershed storage can mitigate impacts of **climate change** by slowing the flow of water and reducing erosion during increasingly common high rainfall events.



This goal addresses **equity** by protecting streams for recreation. In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). Small streams are often the only water resource available to disadvantaged communities.



Meeting with ditch authorities can increase **social capacity** to make change by building a shared understanding of the opportunities and challenges of wetland restoration.

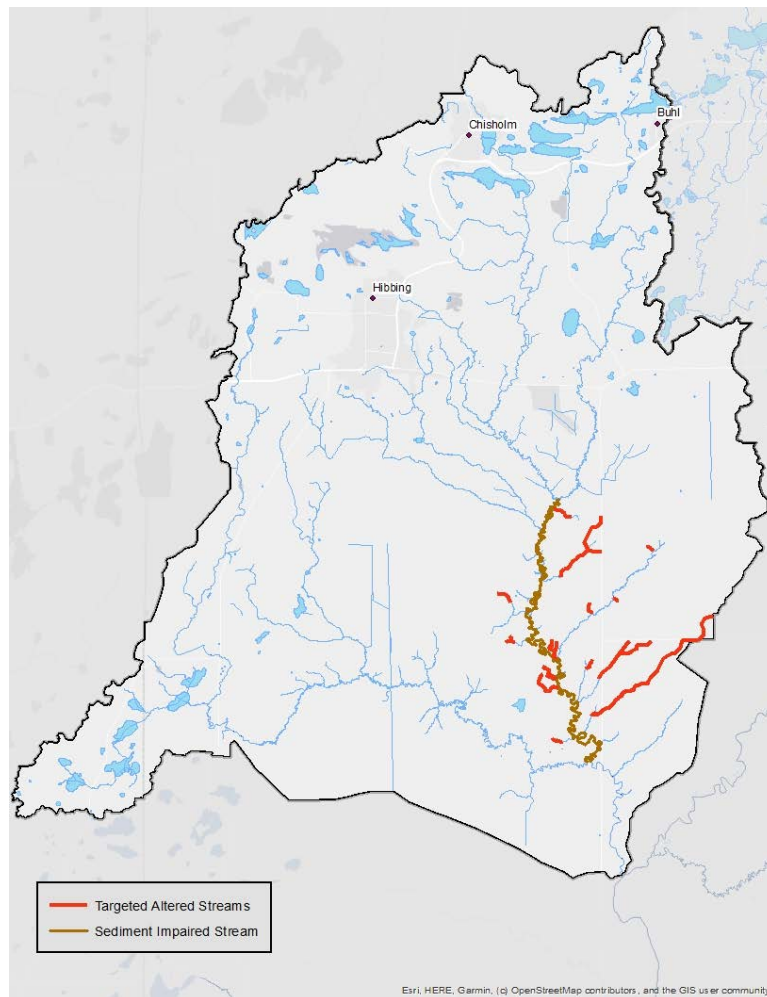





Figure 4-9. St. Louis River North altered streams contributing to Total Suspended Solid or sediment impairments in the Swan River watershed (MPCA). The altered tributaries of the sediment impaired East Swan River will be the focus of this goal.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Coordinate 2 meetings with ditch authorities to discuss possible options for ditch decommissioning/stream restoration		WBIF	2 meetings	Swan and Upper Sand Watersheds		North St. Louis SWCD, St. Louis County		✓		✓		\$2500
Purchase easements for ditch abandonment		WBIF	2 easements	Swan and Upper Sand Watersheds		North St. Louis SWCD / St. Louis County				✓	✓	\$500,000
Perform desktop review of potential restorable wetlands tool (NRRRI) to identify drained wetlands and develop education/outreach to potential landowners		WBIF	1 assessment complete	Swan and Upper Sand Watersheds		North St. Louis SWCD		✓	✓			\$15,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect & manage 4000 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.

Forests in this region play a vital role in protecting lakes, streams and drinking water. They help slow the flow of water on the landscape, reducing erosion and increasing groundwater infiltration. In addition, they provide habitat to countless animal species. The St. Louis River North watershed is largely forested. Protecting these forests from conversion to other land uses will protect water quality.

Forests within this watershed are considered protected when they are at very limited risk of being converted to other, non-forested land use types. This can be through public ownership or enrollment of privately-owned lands in the Sustainable Forests Incentive Act (SFIA) or conservation easement. This watershed has Federal, State, and County managed forests and many acres of privately owned forests. The St. Louis River Landscape Stewardship Plan identifies and gives a high, medium, or low priority for protection rank based upon the proximity to water resources and amount of acreage that could be included in a large block, along with the quality habitat and groundwater protection they provide. There are over 25,000 acres of privately owned forests with a medium or high score (*BWSR 2021 p. 35-36*).

The Landscape Stewardship Plan identifies the West Swan River-East Swan River Subwatershed as High Priority and the Upper Sand, West Two, Mud Hen, Embarrass, and Partridge as Medium Priority for protection work.

Priority Area	Long-Term Goal (acres)	10-Year Goal (acres)
Swan River	13,000	2000
Upper Sand	12,000	2000
Total	26,000	4000

Targeted Resources
East Swan Creek
East Swan River
Elbow Creek
Ely Creek
Long Lake Creek
Penobscot Creek

Project Outcomes
Improved habitat
Reduced sediment and nutrient pollutants
Protected Lakes, Streams and Drinking Water

Important Considerations



Protecting forests can mitigate impacts of **climate change** by reducing peak flows during increasingly common high rainfall events and replenishing groundwater supplies. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*)



This goal addresses **equity** by protecting streams for recreation. In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). Small streams are often the only water resource available to disadvantaged communities.



Education and outreach can increase **social capacity** to increase participation in forest protection activities, including easements.



Protecting forests can protect wild rice lakes. Wild rice is a **culturally significant species**

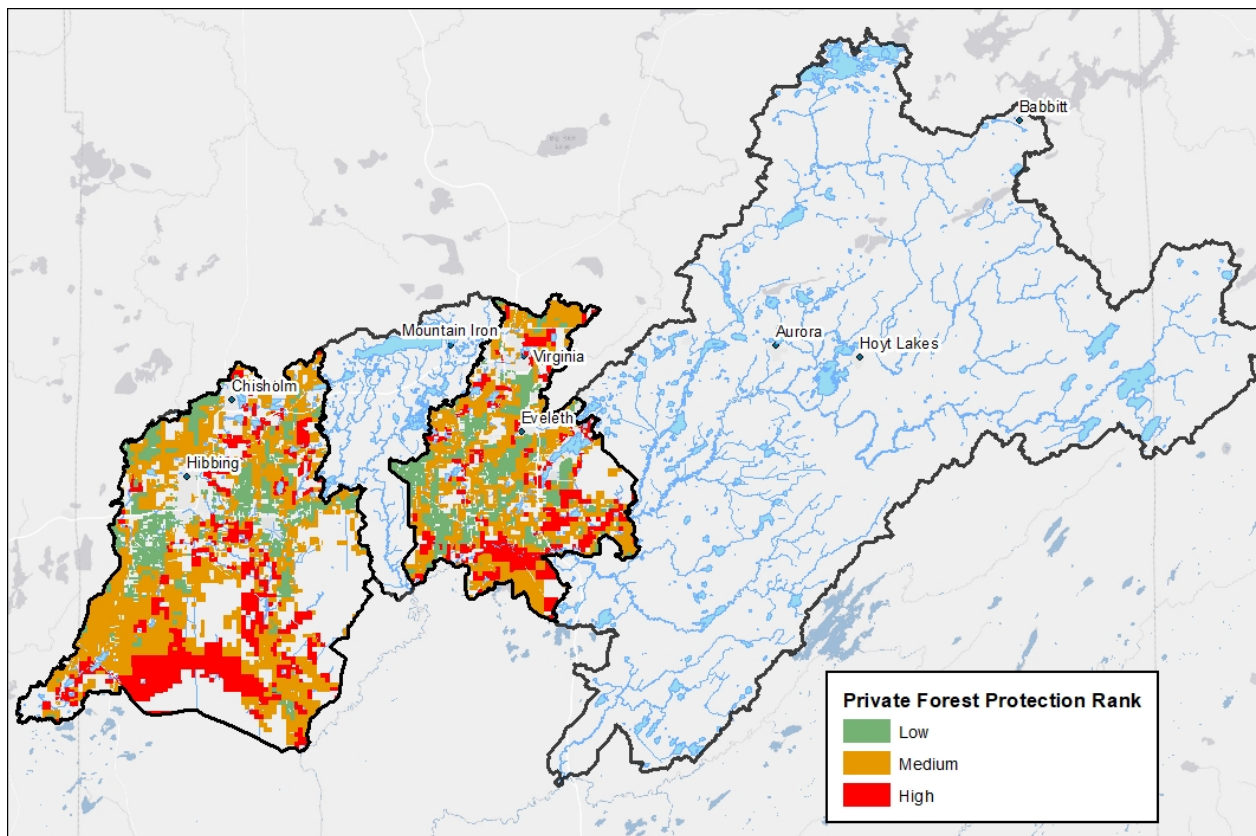






Figure 4-10. St. Louis River North privately owned forest that could be protected (Landscape Stewardship Plan). Privately owned forests were ranked based on their proximity to water resources, adjacency to large blocks of protected forests and quality of benefits the forests provide.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop forest management plans for 4000 acres of privately owned forest (~47 plans)		WBIF	4000 acres planned	High RAQ score parcels		North St. Louis SWCD, Private Foresters, DNR, / NRCS	✓	✓	✓	✓	✓	\$27,000
		Other										
Enroll 4000 acres of privately owned forest in SFIA or conservation easements		Other	4000 acres protected	High RAQ score parcels		North St. Louis SWCD, MN Land Trust, TNC, DNR, BWSR, NRCS		✓	✓	✓	✓	\$550,000
Develop and implement an education and outreach campaign for forest landowners targeting 200 private forest landowners.		WBIF	1 outreach campaign developed and implemented 200 landowners contacted	High RAQ score parcels	Watershed Wide	North St. Louis SWCD	✓	✓	✓	✓	✓	\$15,000
Coordinate forestry activities within the watershed to promote forest health for water quality		WBIF	Ongoing coordination	High RAQ Scored Parcels	Watershed Wide	North St. Louis SWCD, DNR / NRCS	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect and restore 1500 feet of shoreline in prioritized lakes and streams for natural buffers and reduced erosion

There are over 1000 miles of streams in the St. Louis River North planning area, with many miles having relatively natural shorelines. However, some shorelines have been altered for a variety of reasons including land development and farming. Restoring altered shorelines provide a variety of benefits including filtering sediment and other pollutants, providing shade to streams, storing water and reducing flooding and providing valuable habitat. The interface between the water and land, known as the riparian zone, is some of the richest habitat on earth.

The priority for this goal will be to target outreach and restore the shorelines of high development lakes, lakes and streams with impairments and lakes that provide drinking water for communities *MPCA 2018 p. 92*).

Priority Area	Long-Term Goal (targeted lakes and streams)	Long-Term Goal (targeted lakes and streams)
Swan River	9	4
Upper Sand	10	5
Total	19	9

Targeted Resources
Elbow Lake
Ely Lake
Harriett Lake
Long Lake
Mashkenode (Four Mile) Lake
Pleasant Lake
Silver Lake
Sand Lake
St. Mary's Lake
Virginia (Baileys) Lake
East & West Swan Rivers

Project Outcomes
Improved habitat
Reduced sediment and nutrient pollutants
Protected Lakes, Streams, and Drinking Water

Important Considerations



Improving riparian areas can mitigate impacts of **climate change** by providing shade to help cool streams during increasingly warmer summer months (*Stults, 2016, p. 24*).



Because several communities with high percentages of people in poverty get their drinking water from surface water, this action will help provide access to safe, clean, affordable drinking water for all. . In parts of this planning area, as many as 55% of people reported income less than 185% of the poverty level and 12% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Education and outreach are needed to increase **social capacity** and participation in riparian projects.

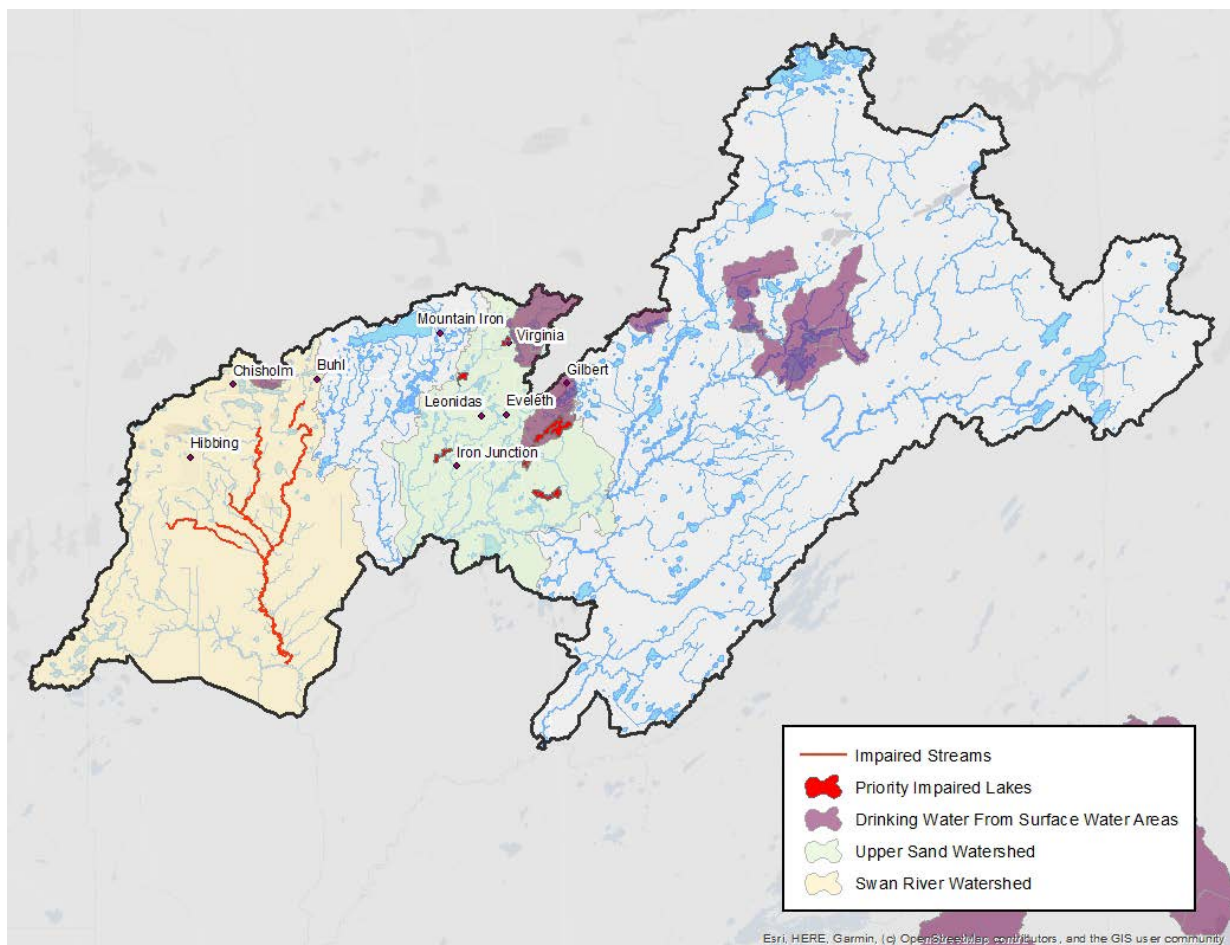







Figure 4-11. Shoreline restoration targets in the St. Louis River North planning area will be impaired lakes and streams and lakes that provide drinking water to communities.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Design and implement a targeted outreach campaign to shoreline owners and operators.		WBIF	1 campaign implemented	Swan & Upper Sand Watershed & Tributaries	Watershed Wide	North St. Louis SWCD	✓	✓	✓	✓	✓	\$10,000
Design and Implement 1500 linear feet of shoreland restoration		WBIF	1500 restored	Swan and Upper Sand Watershed & Tributaries		North St. Louis SWCD	✓	✓	✓	✓	✓	\$100,000
Enforce shoreland setbacks/buffers in all parts of the watershed		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	BWSR, Cities, Townships	✓	✓	✓	✓	✓	\$25,000
Use Reinvest in MN program and other conservation easements programs to protect indicator species habitat.		Other	See Forest Protection Action	Wild Rice Waters, Wood Turtle	Watershed Wide	North St. Louis SWCD, MN Land Trust, TNC, DNR, BWSR, NRCS	✓	✓	✓	✓	✓	\$500,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Section 5. St. Louis River South Planning Area

As the St. Louis River approaches Lake Superior, the landscape changes from forests and wetlands to towns and cities. This planning area has a range of land uses including recreational/forestry, farming and urban/industrial. The lakes and streams in this area are relatively healthy, with few waters listed as impaired by the MPCA. The Midway and Thomson Reservoir subwatersheds provide excellent habitat for native brook trout, especially in the watershed's small spring-fed tributaries. However, these subwatersheds have high population growth and development. Protection of cold-water streams and groundwater are the major goals for this planning area, which is why the Midway River and Thomson Reservoir subwatersheds were selected as the two priority areas.

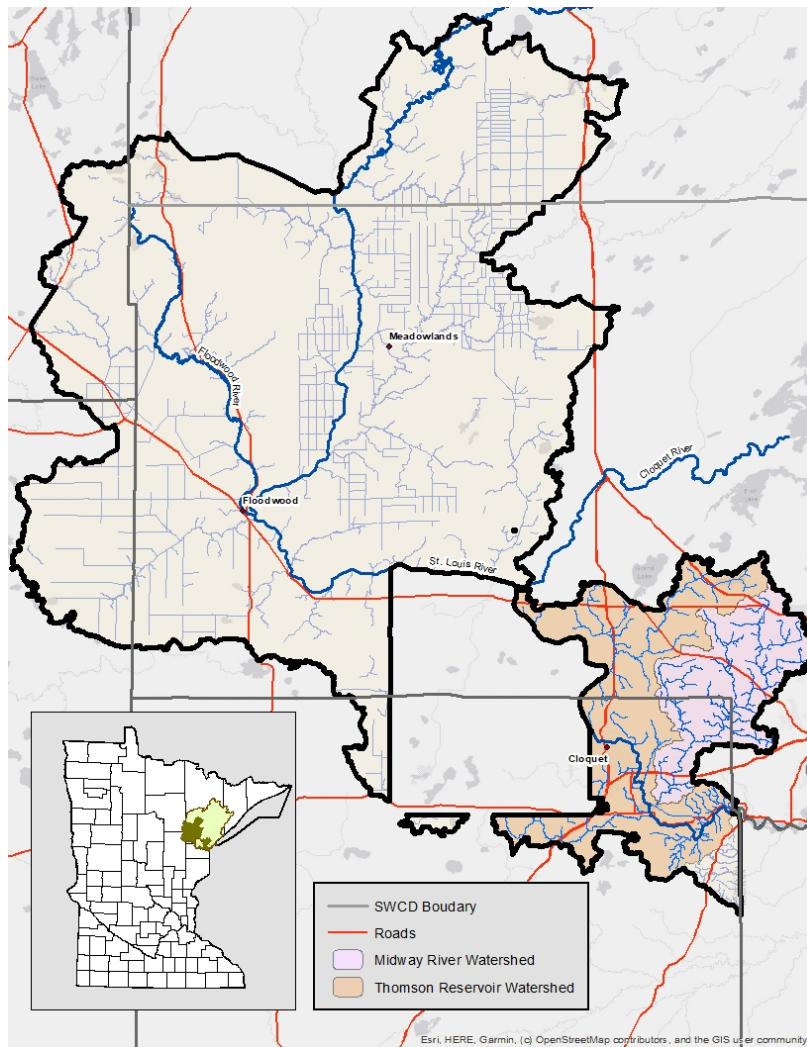







Figure 5-1. The St. Louis River South planning area includes the Lower Sand, Floodwood and Midway Rivers, along with the Thomson Reservoir. Communities include Meadowlands, Floodwood, Cloquet, Hermantown, Wrenshall and Carlton.

St. Louis River South Priority Issues

	Surface Water Quality	<ul style="list-style-type: none">• Failing septic systems can contaminate groundwater, surface waters and localized drinking water, leading to imminent threats to public health.• Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic recreation uses.
	Drinking Water Quality	<ul style="list-style-type: none">• Drinking water quality and quantity from surface water and groundwater sources is threatened by land use activities and water appropriations.
	Land Use	<ul style="list-style-type: none">• Urbanization, development, and road expansion can impact watershed health and increase nutrient and other pollutant loadings when stormwater is not effectively managed.
	Altered Hydrology	<ul style="list-style-type: none">• Channel instability, historic ditching, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the planning area.
	Habitat	<ul style="list-style-type: none">• Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality.• Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incisement and floodplain disconnection, impeded fish passage, and fragmentation.

Main Planning Area Issues

- Five bacteria impairments impact aquatic recreation
- Development in the lower watershed threatens high quality resources
- Groundwater resources need to be protected for drinking water and stream health



Desired Future Condition (Long-Term Goal):

- *Streams are safe for aquatic recreation*
- *Brook trout continue to thrive*
- *Groundwater supplies are safe and continue to provide cold water to streams*



Identify and address ground and surface water quality problems stemming from inadequate wastewater treatment by supporting the enforcement of Sub Surface Treatment Systems (SSTS) ordinances and inventory and upgrade 50% of non-compliant systems in priority areas

A large portion of the St. Louis River South planning area is rural, resulting in the use of sub surface treatment systems (SSTS). When well maintained and installed according to local ordinances, SSTS are effective in treating household wastewater. However, older or non-compliant systems can contaminate ground or surface waters.

The Midway and Thomson Reservoir subwatersheds have the highest concentrations of SSTS in the planning area. Based on the number of wells per section (assuming each well also has a septic system) there are approximately 150 septic systems near the bacteria impaired streams (Minnesota Department of Health - Environmental Health Division - Source Water Protection Unit, 2021). Assuming a four percent rate of systems that are imminent threats to public health and safety (MPCA, 2019, p. 24-27), there are approximately six systems that need to be updated to benefit water quality.

Priority Area	Long Term Goal (SSTS Replacements)	10-Year Goal (SSTS Replacements)
Midway River	4	2
Thomson Reservoir	2	1
Total	6	3

Targeted Resources
Hay Creek
Rocky Run Creek
Pine River (White Pine River)

Project Outcomes
Waters are safe for recreation
Drinking water is protected

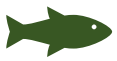
Important Considerations



This goal addresses **equity** by keeping streams safe for recreation and protecting drinking water. In parts of the Thomson Reservoir, as much as 32% of people reported income less than 185% of the poverty level and as much as 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). Replacement assistance is targeted to low-income residents.



Social capacity with residents will need to be strengthened to build trust between regulating agencies and citizens. Low-income residents will need financial assistance to replace septic systems



Addressing septic systems near trout streams can improve critical habitat for **culturally significant species** and ensure fishing is safe for all.

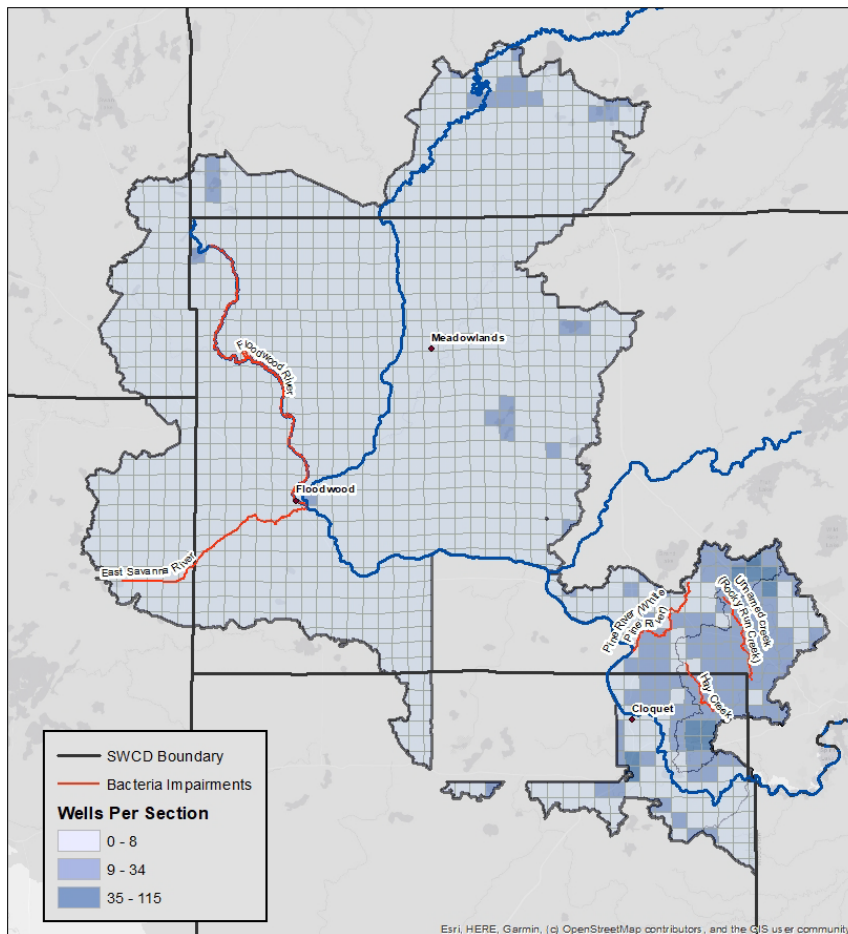


Figure 5-2. Approximate number of septic systems per section can be estimated based on the number of wells per section (MDH, 2021). Bacteria impaired streams in the Midway and Thomson Reservoir subwatershed also have a high-density of septic systems.

What		How Much		Where		Who	When					Cost
Action	Program	Funding Level	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Review septic system records to assess potential risks		WBIF	Completed records review	Bacteria Impaired Waters		St. Louis County, Carlton County	✓	✓				\$5000
Cost share three high priority septic systems for low-income residents.		WBIF	3 systems replaced	Bacteria Impaired Waters		St. Louis County, Carlton County		✓	✓	✓	✓	\$120,000
		Other										
Design and distribute education and outreach to SSTS landowners and SSTS professionals in targeted areas.		WBIF	1 campaign implemented	Bacteria Impaired Waters	Watershed Wide	St. Louis County, Carlton County	✓	✓	✓	✓	✓	\$2000
		Baseline										
Support enforcement follow-up		Baseline	Continued Local Program	Bacteria Impaired Waters	Watershed Wide	St. Louis County, Carlton County	✓	✓	✓	✓	✓	\$50,000
Assist unsewered communities (including lakeshore developments) with securing public financing to install or upgrade sanitary sewer systems		WBIF	2 meetings	Bacteria Impaired Waters	Watershed Wide	St. Louis County, Carlton County			✓		✓	\$10,000
Infrared surveys of septic system runoff into waterways in key areas		Other	1 study completed	Bacteria Impaired Waters	Watershed Wide	MPCA			✓			\$10,000
Work to address the list of imminent public health threats		WBIF	10 systems updated	Bacteria Impaired Waters	Watershed Wide	St. Louis County, Carlton County	✓	✓	✓	✓	✓	\$200,000

Conservation Programs	Land Use Policy	Research, Data Collection and Monitoring	Education and Outreach
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Reduce bacteria and other pollutants into streams by completing farm projects on 50% of properties identified as needing enhancements

Most farming in this area is related to beef production. However, there are some row crops grown near Wrenshall. Because most farms are located near water resources, there can be impacts when livestock have access to streams and lakes, or runoff carries pollutants to water resources. There are many best management practices (BMPs) that can be implemented to mitigate this risk. The two main needs for BMP implementation in this area are education and outreach to high priority farmers and increased assistance with design and engineering of best management practices.

There are currently three known bacteria impairments in the planning area with an additional three proposed bacteria impairments where livestock were listed as a stressor (*MPCA 2018 d, p. 38; J. Jaspersen, MPCA, personal communication*). The goal of this plan is to work with farmers to implement best management practices to reduce bacteria, nutrients and sediments into streams. The main target will be the identified priority areas (Midway and Thomson Subwatersheds), but projects will be considered that address bacteria and sediment concerns of new impairments as they are identified.

Priority Area	Long Term Goal (BMPs Installed)	10-Year Goal (BMPs Installed)
Midway River	7	3
Thomson Reservoir	1	1
New Impaired Waters	8	4
Total	16	8

Targeted Resources
Hay Creek
Rocky Run Creek
Pine River (White Pine River)
East Savanna River
Floodwood River

Project Outcomes
Waters are safe for recreation
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



This goal addresses **equity** by keeping streams healthy for recreation. In parts of the Thomson Reservoir, as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)). Small streams are often the only water resource available to disadvantaged communities.



Social capacity between producers and local governments is needed in the northern portions of this area through education and outreach. Peer to peer outreach using producers in the Wrenshall area where SWCDs have strong relationships could be a useful tool.



Working with farmers near trout streams can improve critical habitat **for culturally significant species** and ensure fishing is safe for all.

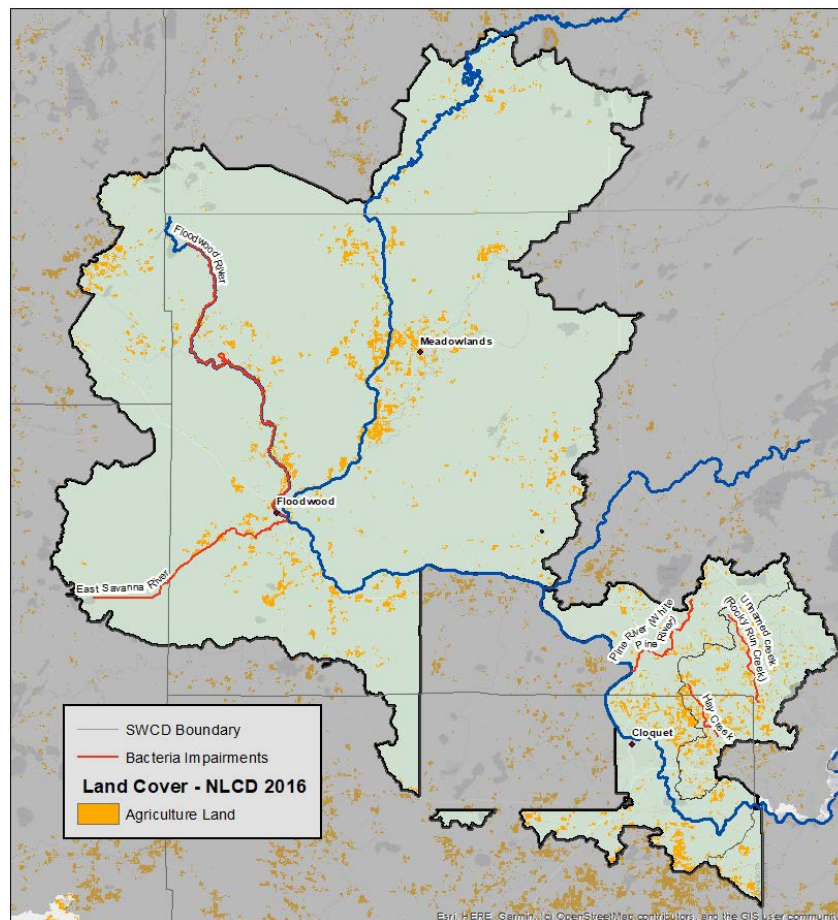








Figure 5-3. Agricultural land cover is spread throughout the planning area, but concentrated farming can be found near bacteria impaired streams in the Floodwood and East Savanna Rivers, along with areas in the Midway and Thomson Reservoir subwatersheds.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop and implement an Education and Outreach campaign to livestock owners in priority areas.		WBIF	Developed and implemented outreach campaign	Bacteria Impaired Waters		St. Louis South & Carlton SWCDs / MDA, Extension & NRCS	✓	✓	✓	✓	✓	\$5000
		Other										
Work with 4 producers to develop and implement rotational grazing plans		WBIF	2 rotational grazing plans	Bacteria Impaired Waters		St. Louis South & Carlton SWCDs / MDA & NRCS		✓	✓	✓	✓	\$10,000
		Other										
Develop comprehensive manure management plans for 8 priority farms		WBIF	4 CNMP developed	Bacteria Impaired Waters		NRCS (SWCD supporting)	✓	✓	✓			\$32,000
		Other										
Implement 8 feedlot practices that store manure in ways that prevent runoff		WBIF	At least 8 practices implemented	Bacteria Impaired Waters		NRCS (SWCD supporting)		✓	✓		✓	\$500,000
		Other										
Review riparian corridor survey for livestock exclusion and implement 4 projects to increase livestock exclusion		WBIF	2 projects implemented	Bacteria Impaired Waters		NRCS (SWCD supporting)	✓	✓				\$2500
		Other										
Continue the enforcement of Open lot runoff management to meet 7020 rules		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	MPCA	✓	✓	✓	✓	✓	MPCA Costs not calculated

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 100% of municipalities have Smart Salt Certified Staff, 20% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.

There are several communities within the planning area that are located near water resources. These areas have higher road densities, making it likely that road salt is washed into streams. Although there are no current chloride impairments in the watershed, there has been limited testing. In addition, chloride is often used on gravel roads for dust reduction, and several township roads within this watershed are gravel.

A total of 22 communities/road authorities are targeted based on their proximity to water resources. Within these communities, high priority landowners will be identified based on their amount of salt treated surfaces (parking lots, walkways). A list of certified individuals and organization can be found at the MPCA Smart Salt training website: <https://www.pca.state.mn.us/water/smart-salting-training>. Outreach will be targeted to commercial landowners with 3 acres of land or more near water resources.

Smart Salt Certified Staff		
Priority Area	Long-Term Goal (Number of Communities)	10-Year Goal ((Number of Communities)
Midway River	3	3
Thomson Reservoir	4	4
Total	7	7

Smart Salt Level 2 Certified		
Priority Area	Long-Term Goal (Number of Communities)	10-Year Goal ((Number of Communities)
Midway River	3	1
Thomson Reservoir	4	1
Total	7	2

Targeted Communities
Carlton
Cloquet
Esko
Hermantown
Scanlon
Thomson
Wrenshall

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities. In parts of the Thomson Reservoir, as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Building **social capacity** will be needed to increase local participation in salt reduction. Education on the impacts of salt to water resources will be needed along addressing concerns of snow/ice concerns on roads and sidewalks for people with limited mobility.



Addressing salt use near trout streams can improve habitat for **culturally significant species**.

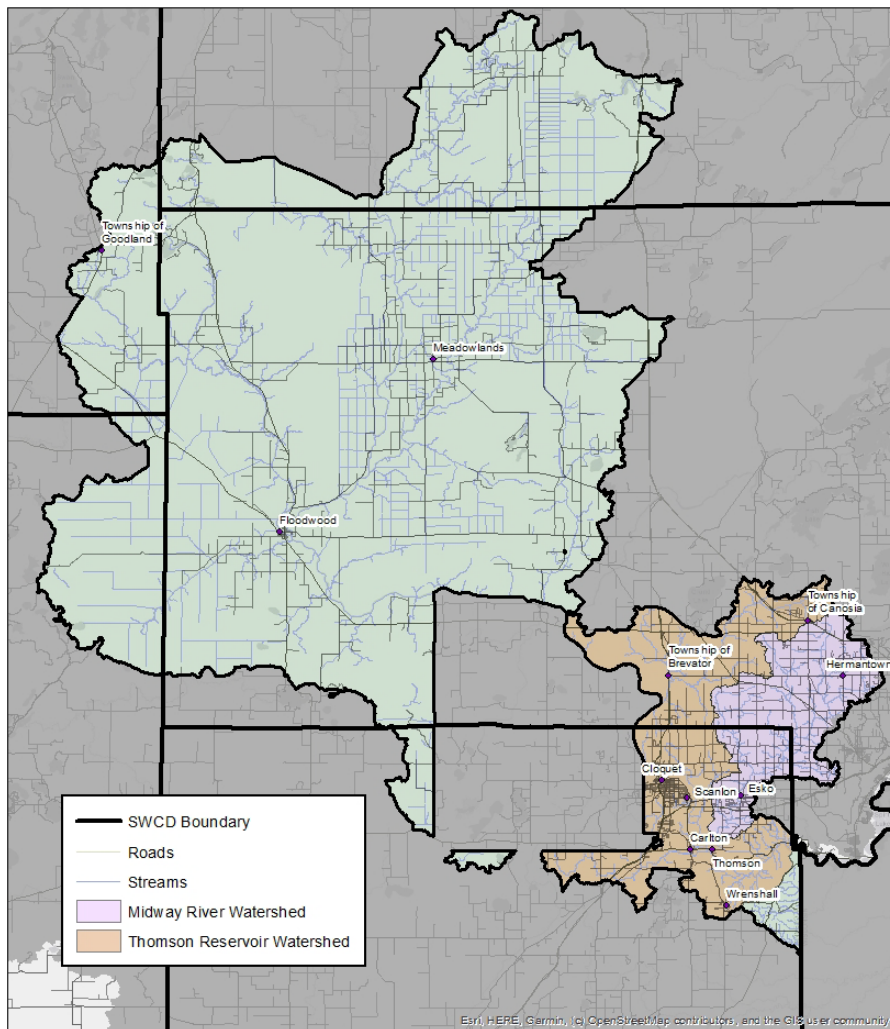










Figure 5-4. Roads are most concentrated in the Midway and Thomson Reservoir subwatersheds, and this risk to chloride (salt) pollutants is highest in these areas.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Identify high priority private landowners (owners with large amounts of impervious surface)		WBIF	1 list developed	Municipalities along Midway and St. Louis River and tributaries		Carlton SWCD / MPCA	✓					\$500
Work with MPCA to provide Level 2 Certification to 2 municipalities; Evaluate St. Louis County's salt training with Smart Salt training and identify gaps; provide cost share for staff to attend smart salt trainings		WBIF	2 Level-2 certified municipalities	Municipalities along Midway and St. Louis River and tributaries		Carlton SWCD / MPCA	✓	✓	✓	✓	✓	\$5000
		Other										
Evaluate County's salt training with Smart Salt training and identify gaps.		WBIF	1 report	Watershed Wide	Watershed Wide	SWCD / County	✓					Incorporated into Water Coordinator staff costs
Provide cost share to purchase salt reduction equipment.		WBIF	1 equipment purchase	Municipalities near public waters / Lakeshore owners	Watershed Wide	SWCD / municipalities		✓				\$50,000
		Other										
Development & implement a salt use reduction education and outreach campaign		WBIF	1 campaign implemented	Municipalities near public waters / Lakeshore owners	Watershed Wide	SWCD / RSPT, municipalities	✓	✓	✓	✓	✓	\$25,000
Track salt use to determine salt trends		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	Counties, Municipalities	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Make road salt alternatives (sand, grit) readily available to homeowners		WBIF	1 program developed	Municipalities near public waters	Watershed Wide	SWCD / municipalities	✓	✓	✓	✓	✓	\$10,000
Include better planning for snow storage to keep roads and sidewalks cleared, minimize moving snow and protect stormwater BMPs		WBIF	1 plan developed	Watershed Wide	Watershed Wide	SWCD / municipalities	✓	✓				Incorporated into Water Coordinator staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect groundwater quality by sealing 25 unused, unsealed wells.

The cities of Cloquet, Carlton, Esko and Wrenshall all have municipal water supplies, but outside those areas, homeowners rely on private wells. Due to the long history of settlement in the St. Louis River South planning area, there are an unknown number of unused, unsealed wells. Unused, unsealed wells can be a direct conduit for pollutants contaminating groundwater, so the goal of this plan is to seal these wells. The goal for the first 10 years of the plan is to survey residents to determine the scope of the problem and seal about two well per year in the planning area.

Priority Area	Long-Term Goal (Number of unused/unsealed wells)	10-Year Goal (Number of unused/unsealed wells)
Midway River	Unknown	10
Thomson Reservoir	Unknown	15
Total	Unknown	25

Targeted Areas

Areas with sensitivity to near surface pollution

Near wellhead protection areas

Project Outcomes

Drinking water is safe and protected

Residents understand how to protect groundwater quality

Important Considerations



This goal effects **equity** by protecting drinking water in low-income areas. Wellhead protection areas in this planning area have as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Education and outreach will be needed to build **social capacity**. A shared understanding of groundwater protection will help build participation in well sealing programs.

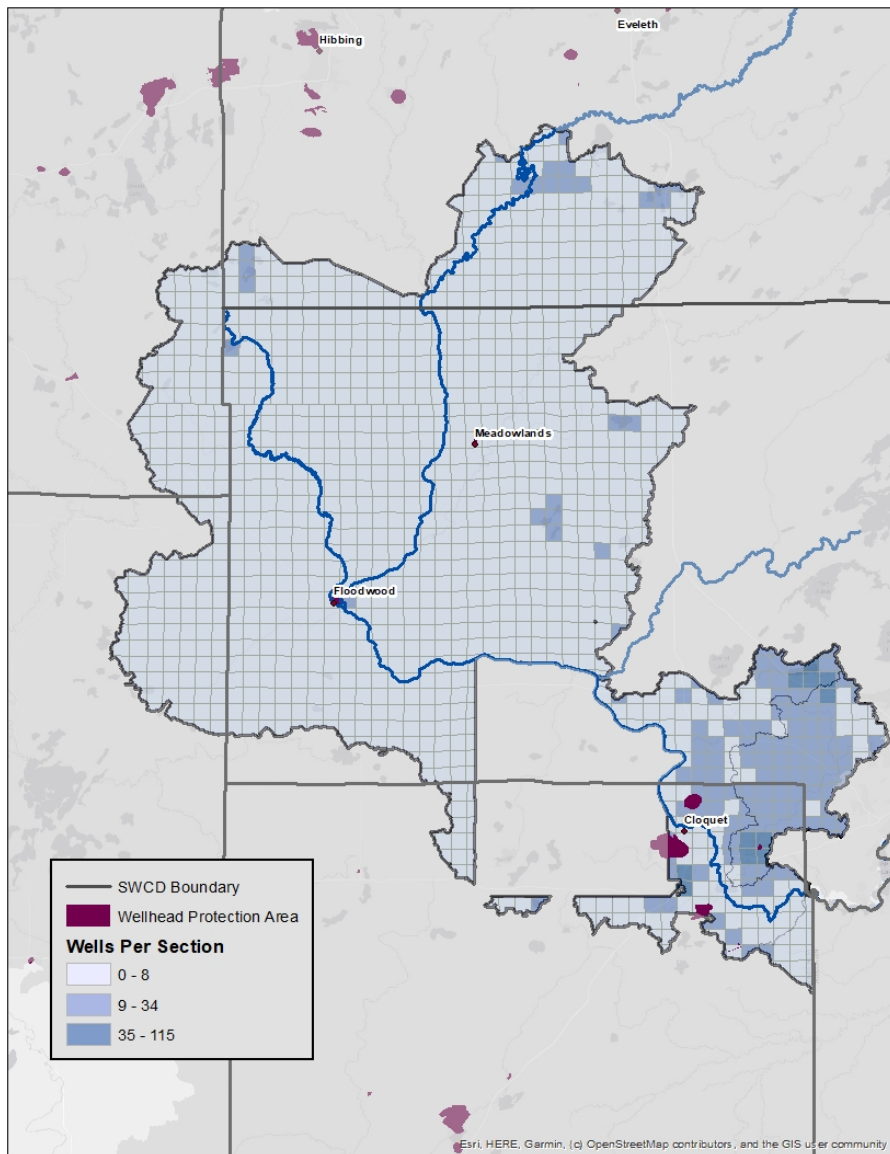





Figure 5-5. Wells per section (MDH) indicates the number of current well in the planning area. These areas are our first target for outreach to help determine the number of unused and unsealed wells.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop and implement an education & outreach campaign to promote drinking water quality		WBIF	1 outreach campaign developed and implemented	Midway, Thomson Watersheds, 1 mile buffer DWSMAs	NSL	MDH St. Louis South & Carlton SWCDs	✓	✓	✓	✓	✓	\$5000
Seal 25 unused, unsealed wells		WBIF	25 wells sealed	Midway, Thomson Watersheds,		St. Louis South & Carlton SWCDs	✓	✓	✓	✓	✓	\$20,000
Develop and implement a groundwater monitoring program		Other	1 monitoring developed and implemented	Watershed Wide	Watershed Wide	St. Louis South & Carlton SWCDs / MDH			✓	✓	✓	\$100,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Promote the implementation of low impact development techniques to reduce stormwater runoff, volume and rate control in 20% of communities

Stormwater runoff is a concern in this area due to the amount of development near high quality trout resources. Stormwater not only impacts these resources by washing pollutants into streams, but it also has the potential to increase water temperature. Coldwater loving species such as trout are stressed when waters get too warm. By reducing stormwater runoff, watersheds benefit by reducing sediment and nutrient pollutants along with helping keep streams cold. An added benefit is that stormwater best management practices (BMPs) can help groundwater recharge, which in turn helps fuel spring fed streams. Stormwater BMPs can also help slow the flow of stormwater runoff, which reduces peak flows and erosion within stream channels.

Priority Area	Long-Term Goal (Number of Communities)	10-Year Goal ((Number of Communities)
Midway River	3	1
Thomson Reservoir	4	1
Total	7	2

Targeted Communities
Carlton
Cloquet
Esko
Hermantown
Scanlon
Thomson
Wrenshall

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



Addressing stormwater can mitigate impacts of **climate change**. Some climate change predictions include a wetter climate and increased rain events of over one inch of precipitation (*Stults, 2016, p 24-26*).



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities. In some areas, as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Social capacity will be built through education and outreach to build more resilient communities



Addressing stormwater can protect urban trout stream habitat. Trout are a **culturally significant species**

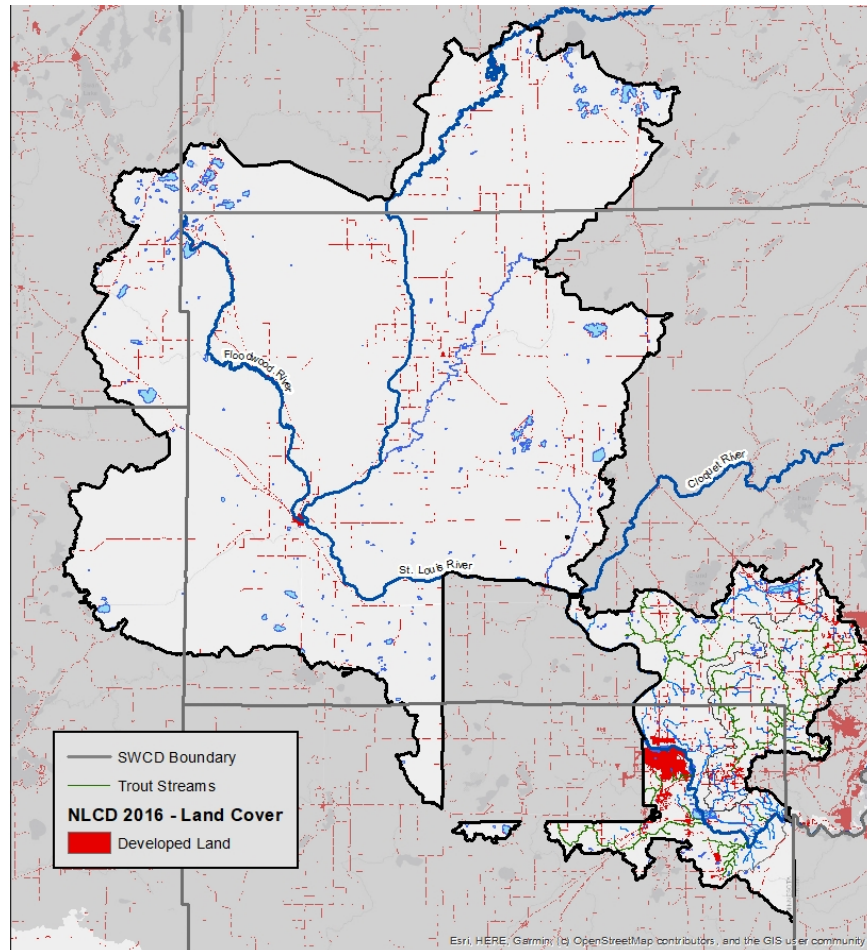










Figure 5-6. Developed land in the planning area is concentrated to the Thomson Reservoir and Midway subwatersheds (National Land Cover Dataset, 2016).

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Implement the City of Carlton Stormwater Plan		WBIF	1 Plan Implemented	Otter Creek, Slaughterhouse Creek, Tributaries		Carlton SWCD	✓	✓				\$700,000
		Other										
Develop an education and outreach campaign to urban landowners and municipalities on stormwater BMPs		WBIF	1 outreach campaign developed and implemented	Municipalities along Midway and St. Louis River and tributaries		Carlton & St. Louis South SWCDs	✓	✓	✓	✓	✓	\$10,000
Install 10 rain gardens/catch basins in priority areas		WBIF	10 raingardens installed	Municipalities along Midway and St. Louis River and tributaries		St. Louis South & Carlton SWCDs	✓	✓				\$100,000
		Other										
Review MS4 plans and look for green infrastructure opportunities; design & implement identified projects		WBIF	2 plans reviewed	Municipalities along Midway and St. Louis River and tributaries		Carlton SWCD	✓	✓	✓			Incorporated into Water Coordinator staff costs
Assist communities to develop stormwater management plans.		WBIF	2 plans developed	Municipalities along Midway and St. Louis River and tributaries		St. Louis South & Carlton SWCDs		✓	✓			\$50,000
Develop and implement a homeowner program for help with design and implementation of BMPS's such as rain gardens and urban forestry		WBIF	1 program implemented	Urban Trout Streams & Tributaries	DUA, North St. Louis	Carlton SWCD, South St. Louis SWCD	✓	✓	✓	✓	✓	\$375,000
Look for opportunities to reduce flood risk and associated infrastructure damage		Other	5 meetings	Watershed Wide	Watershed Wide	SWCD / St. Louis County, Carlton County	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Work with road authorities to educate and implement stormwater BMPs associated with roadside ditches to help slow the flow and minimize will minimize un-vegetated channels and associated erosion		WBIF	5 projects implemented	Midway, Thomson	DUA, North St. Louis	Carlton SWCD / DUWAC, Counties, Townships	✓	✓	✓	✓	✓	\$500,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Reconnect 30 miles of priority streams and tributaries to benefit aquatic life and improve water quality.

The Lower St. Louis River is rich in trout streams and cold-water resources. Trout and other aquatic organisms need to travel within the stream systems during different seasons and periods of their life cycle. Connecting habitats within this watershed is vital to support these species. In addition, replacing undersized culverts has the added benefit of reducing sediment erosion. Undersized culverts not only prevent fish passage, but can also alter the hydrology of the stream, resulting in unwanted sediment pollutants.

Assessments conducted by the MPCA and South St. Louis SWCD documented culverts that were barriers to fish movement in the Midway River. From this inventory, there are 35 culverts that are considered barriers to fish passage (*J. Jaspersen, MPCA, personal communication*). Although there is a less robust dataset for the Thomson Reservoir, there are at least 3 culverts identified as being undersized.

Priority Area	Long-Term Goal (Number of Culverts)	10-Year Goal ((Number of Culverts)
Midway River	35	14
Thomson Reservoir	3	1
Total	37	15

Targeted Resources
Anderson Creek
Elm Creek
Hay Creek
Midway River
Rocky Run Creek
Scanlon Creek
Slaughterhouse Creek

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



Correctly sizing culverts can mitigate impacts of **climate change** by reducing washouts and stream erosion during increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities. In parts of the Thomson Reservoir, as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Education and outreach will be needed to increase **social capacity** by building trust with road authorities and private landowners.



Addressing undersized culverts can protect trout stream habitat. Trout are a **culturally significant species**

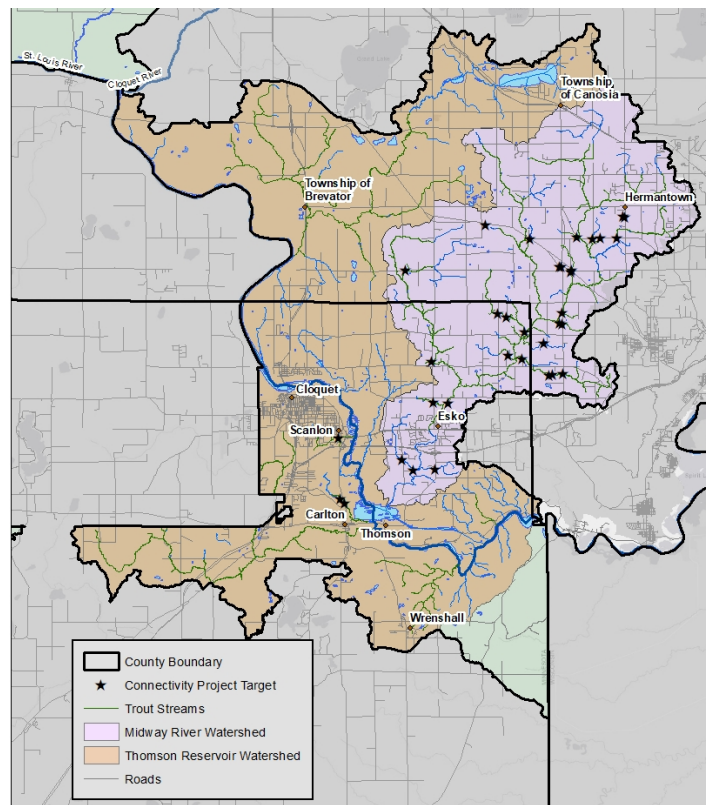






Figure 5-7. Identified connectivity projects in the Midway and Thomson Reservoir subwatersheds. Data was gathered by MPCA, South St. Louis SWCD and Carlton County Transportation Department.

Table 5.1. Identified connectivity projects in the Midway River subwatershed. Data was gathered by the MPCA and South St. Louis SWCD.

Stream	Road
Hay Trib 0.4 (Trib E2)	County Rd 1
Hay Trib 4 (Trib E12)	Mattson Rd
Hay Trib 4 (Trib E12)	Canosia Rd
East Rocky Run Trib 2 (Trib L3)	Five Corners Rd
East Rocky Run Trib 3-3 (Trib L4.2.1)	Lavaque Jct. Rd
East Rocky Run Trib 3-3-1 (Trib L4.2)	Lavaque Jct. Rd
Anderson Creek	Midway Rd
Anderson Trib 1	Lilac Hill Rd
Anderson Trib 1	North Cloquet Rd
Hay Creek	St. Louis River Rd
Hay Creek	Canosia Rd
Midway Trib 2.4 (Trib H)	Larson Lane
Elm Creek	St. Louis River Rd
Elm Creek	Erickson Rd
Elm Creek	Private Rd
Midway River	Midway Rd
Midway River	Hermantown Rd
Midway Trib 1 (Trib B)	I-35
Midway Trib 1 (Trib B)	Korby Rd
Midway Trib 1 (Trib B)	Hautaluoma Rd
Midway Trib 1.2 (Trib C)	Thompson Rd
Midway Trib 1.7 (Trib D)	County Rd 1
Rocky Run Trib 1 (Trib J5)	Hwy 2
Midway Trib 3.1 (Trib Q)	Midway Rd
Midway Trib 3.3 (Trib R)	Private Rd
Midway Trib 3.4 (Trib K)	Railroad 1
Midway Trib 3.4 (Trib K)	Railroad 2
Rocky Run Unmapped Trib (Trib J6.1)	Jeffrey Rd
Rocky Run Unmapped Trib (Trib J6.1)	Hwy 2
Rocky Run Unmapped Trib (Trib J6)	Private Abandoned Rd
Midway Unmapped Trib (Trib AB)	Ugstad Rd
Rocky Run Creek	Maple Grove Rd
Midway Trib 3.4 (Trib K)	Morris Thomas/Old Hwy 2
Midway Unmapped Trib (Trib K2)	Old Hwy 2
Midway Unmapped Trib (Trib K2)	Midway Rd

What		How Much		Where		Who	When					Cost	
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost	
Cost share the replacement of 6 private driveway culverts over high priority trout streams and tributaries		WBIF	6 culverts installed	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs	✓	✓	✓	✓	✓	\$450,000	
Complete fish friendly culvert designs for 14 high priority trout streams and tributaries		WBIF	14 culvert designs	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs / Road Authorities	✓	✓	✓			\$350,000	
Provide cost share to replace high priority township culverts for structures under 10 feet		WBIF	5 culverts installed	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs / Townships		✓	✓	✓	✓	\$400,000	
Work with county transportation staff to seek funding for 3 county owned high priority structures.		WBIF	3 culverts installed	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs & Counties					✓	✓	\$1,000,000
		Other											
Work with road authorities to incorporate stormwater BMPs into ditch design		WBIF	1 education campaign / 3 projects implemented	Midway & St. Louis River & Tributaries		Carlton SWCD / County, Townships		✓	✓	✓	✓	\$300,000	
Use road authorities 5–10-year plans to coordinate with crossing upgrades		Baseline	Annual Plan Review	Trout Streams & Tributaries	Watershed Wide	SWCDs / Counties	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs	

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 3500 Linear Feet of high priority streams and tributaries.

Many tributaries in this watershed have been altered by ditching or impounding the stream. Altering the stream in this way reduces habitat quality, warms waters and increases sediment pollution. Data collected through the MPCA and South St. Louis SWCD has identified nearly 100 potential restoration sites in the Midway Watershed (*J. Jaspersen, MPCA, personal communication*). In addition, a restoration site was identified by DNR Fisheries in the Thomson Reservoir subwatershed.

Restoring these stream reaches will improve habitat quality, water temperatures, and reduce sediment and nutrient pollutants.

Priority Area	Long-Term Goal (Number of stream restoration sites)	10-Year Goal ((Number of stream restoration sites)
Midway River	98	3
Thomson Reservoir	1	1
Total	99	4

Targeted Resources
Anderson Creek
Elm Creek
Hay Creek
Midway River
Rocky Run Creek
Scanlon Creek
Slaughterhouse Creek

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



Stream restorations can mitigate impacts of **climate change** by making streams more resilient to increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (Stults, 2016, p. 26).



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities. In parts of the Thomson Reservoir, as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#))



Restoring streams can improve trout stream habitat. Trout are a **culturally significant species**.

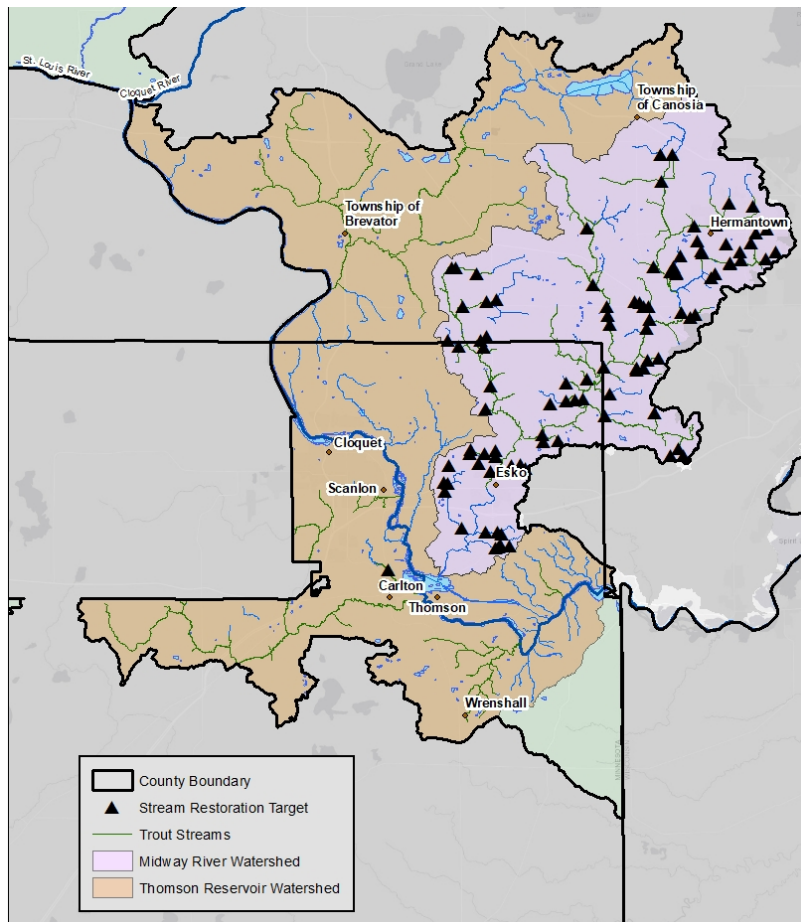






Figure 5-8. Identified stream restoration projects in the Midway River and Thomson Reservoir subwatersheds. Projects were identified by MPCA, South St. Louis SWCD and MN DNR.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Evaluate feasibility of the identified 13 targeted stream restoration sites in the Midway subwatershed and complete preliminary designs		WBIF	13 Feasibility Studies	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs	✓	✓				\$150,000
Develop designs for 3 restorations in the Midway Subwatershed		WBIF	3 restoration designs	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs		✓	✓	✓		\$150,000
Implement 3 stream restoration projects in the Midway Subwatershed		WBIF	3 restorations completed	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs			✓	✓	✓	\$900,000
		Other										
Evaluate, design and restore 1000 feet of Slaughterhouse Creek adjacent to Hwy 45 in Carlton on County owned parcel		WBIF	1000 feet restored	Midway & St. Louis River & Tributaries		St. Louis South & Carlton SWCDs & County	✓	✓	✓			\$500,000
		Other										

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect & manage 4000 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.

Forests play a vital role in protecting water quality in this watershed. They help slow the flow of water on the landscape, reducing peak flows. They protect groundwater quality and quantity by providing natural land cover and enhancing groundwater recharge. They provide habitat for a multitude of species and help maintain cool water temperatures on streams by providing shade. Branches and logs from trees that end up in streams provide valuable habitat for fish and bugs.

Forests within this watershed are considered protected when they are under public ownership, have a conservation easement or are protected by a Sustainable Forests Incentives Act covenant because they are prevented from being converted to other land use types. In this watershed there are State and County owned forests. However, there are over 90,000 acres of privately owned forests within the Midway and Thomson subwatersheds that could be developed into urban or agricultural land uses. [The St. Louis River Landscape Stewardship Plan](#) identifies privately owned parcels that are high value based on their proximity to water resources and large blocks of forests, along with the quality habitat and groundwater protection they provide. Of the 90,000 acres of privately owned forests, over 7500 acres have a medium or high score and are over 20 acres (*MN BWSR, p.43-44*).

Priority Area	Long-Term Goal (Acres/Plans)	10-Year Goal (Acres/Plans)
Midway River	1700 / 100	850 / 50
Thomson Reservoir	7000 / 220	3500 / 120
Total	8700	4000 / 170

Targeted Resources	Project Outcomes
Privately owned forests protecting trout streams	Protection of high-quality streams
Privately owned forests protecting groundwater	Protection of groundwater resources
	Reduced sediment and nutrient pollutants
	Improved habitat for trout

Important Considerations



Protecting forests can mitigate impacts of **climate change** by reducing peak flows during increasingly common high rainfall events and replenishing groundwater supplies. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*)



This goal addresses **equity** by protecting streams for recreation and drinking water supplies. Small streams are often the only water resource available to disadvantaged communities. In parts of the Thomson Reservoir, as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#))



Education and outreach can increase **social capacity** to increase participation in forest protection activities, including easements.



Protecting forests can protect trout stream habitat. Trout are a **culturally significant species**

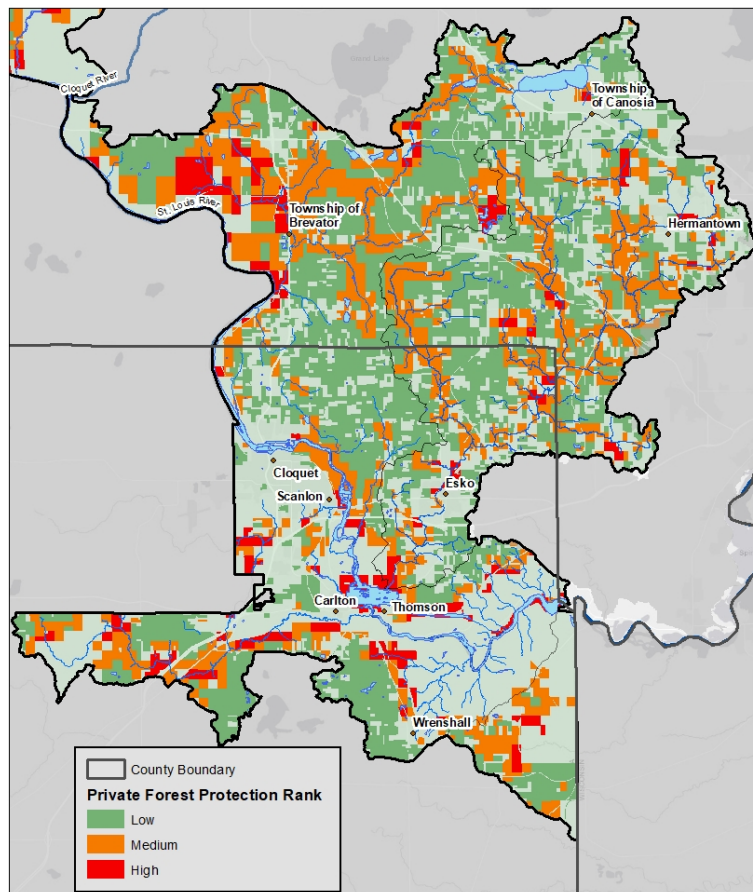






Figure 5-9. Prioritized forest protection map. Parcels were prioritized as part of the St. Louis River Landscape Stewardship Plan (MN BWSR).

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop Forest Management Plans for 4500 acres in the Midway & Thomson Subwatersheds (~17 plans per year)		WBIF	170 forest management plans	Midway & Thomson (RAQ prioritized parcels)		St. Louis South & Carlton SWCDs, Private Foresters /DNR/NRCS	✓	✓	✓	✓	✓	\$10,000
		Other										
Enroll 4500 acres of forest in SFIA or conservation easements in the Midway & Thomson subwatersheds		Other	4500 acres protected	Midway & Thomson (RAQ prioritized parcels)		St. Louis South & Carlton SWCDs, MN Land Trust, TNC, DNR, BWSR, NRCS		✓	✓	✓	✓	\$610,000
Develop and implement an education and outreach campaign for forest landowners.		WBIF	1 outreach campaign developed and implemented	Midway & Thomson (RAQ prioritized parcels)	Watershed Wide	St. Louis South & Carlton SWCDs/DNR/NRCS	✓	✓	✓	✓	✓	\$10,000
Coordinate forestry activities within the watershed to promote forest health for water quality		WBIF	Ongoing coordination	High RAQ Scored Parcels	Watershed Wide	SWCD / DNR & NRCS	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect and restore 1000 feet of shoreline in prioritized lakes and streams for natural buffers and reduced erosion

Healthy shoreline areas are crucial for protecting water quality. There are over 1500 miles of streams in the St. Louis River South planning area, with many miles having relatively natural shorelines. However, some shorelines have been altered for a variety of reasons including land development and farming. Restoring altered shorelines provide a variety of benefits including filtering sediment and other pollutants, providing shade to streams, storing water and reducing flooding and providing valuable habitat.

The MPCA and South St. Louis SWCD have evaluated the Midway River subwatershed and identified 22 riparian sites that need restoration (*J. Jaspersen, MPCA, personal communication*). Although a less robust dataset is available for the Thomson Reservoir subwatershed, there are at least 10 known sites that could benefit from shoreline restorations (*Carlton SWCD, 2018*).

Shoreline ordinances are in place to protect the valuable riparian resource. Multiple local and state governments are responsible for enforcing these ordinances including state, county, city and townships.

Priority Area	Long-Term Goal (Sites)	10-Year Goal (Sites)
Midway River	22	10
Thomson Reservoir	10	5
Total	32	15

Targeted Resources
Anderson Creek
Elm Creek
Hay Creek
Midway River
Rocky Run Creek
Scanlon Creek
Slaughterhouse Creek

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Reduced flooding / increased water storage
Improved habitat for trout & pollinators

Important Considerations



Improving riparian areas can mitigate impacts of **climate change** by providing shade to help cool streams during increasingly warmer summer months (*Stults, 2016, p. 24*).



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities. In parts of the Thomson Reservoir, as many as 32% of people reported income less than 185% of the poverty level and 4% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#))



Education and outreach are needed to increase **social capacity** and participation in riparian projects.



Restoring streamlines can protect urban trout stream habitat. Trout are a **culturally significant species**

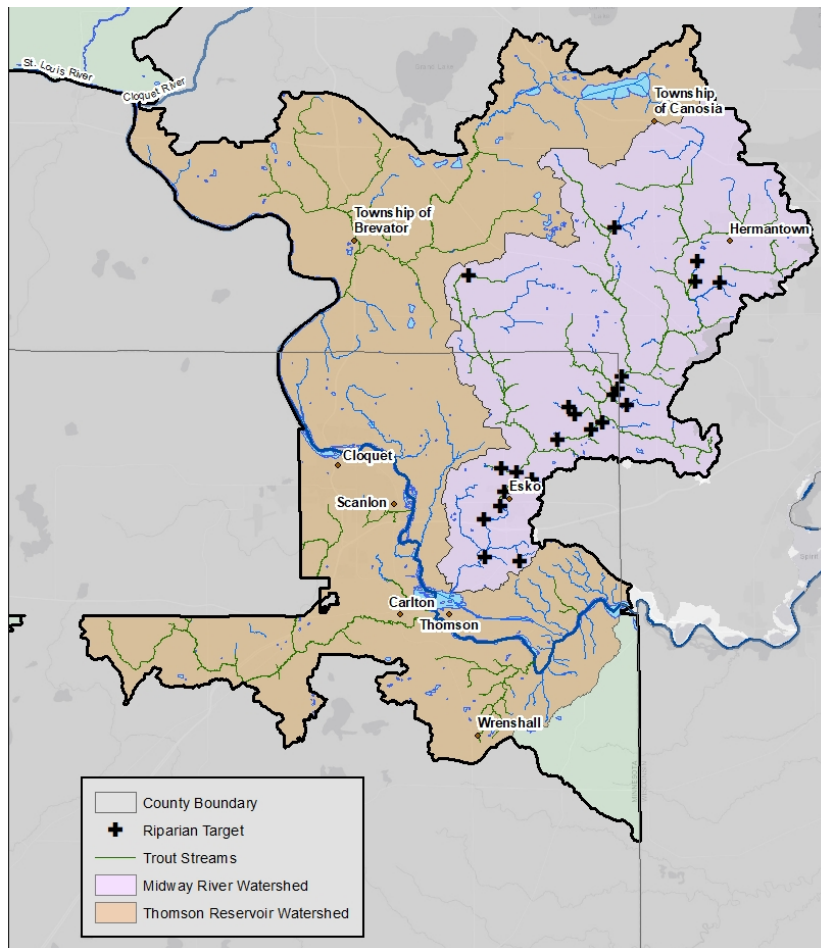









Figure 5-10. Identified shoreland restoration projects in the Midway River Subwatershed. Project locations were identified by the MPCA and South St. Louis SWCD.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop plans and complete riparian restorations for 15 high priority sites, including restoration post invasive species removal		WBIF	15 sites restored	Midway River & Tributaries		St. Louis South & Carlton SWCDs			✓	✓	✓	\$75,000
		Other										
Develop a BMP education and outreach campaign to shoreline and riparian landowners in areas targeted by the Midway Watershed Study.		WBIF	1 outreach campaign developed and implemented	Midway & Thomson		St. Louis South & Carlton SWCDs	✓	✓	✓	✓	✓	\$10,000
Continue to enforce shoreland setbacks/buffers in all parts of the watershed, and assist municipalities develop ordinances where needed		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	St. Louis County, Carlton County Cities, Townships	✓	✓	✓	✓	✓	\$50,000
		WBIF										
Use RIM program and other conservation easements to protect indicator species habitat		Other	See Forest Protection Action	Trout Streams & Tributaries	Watershed Wide	St. Louis South & Carlton SWCDs, MN Land Trust, TNC, DNR, BWSR, NRCS	✓	✓	✓	✓	✓	See forest protection action
Consider wood turtle populations using the DNR Conservation Plan when restoring riparian areas		Other	15 sites considered	Midway River & Tributaries	Watershed Wide	DNR	✓	✓	✓	✓	✓	Incorporated in riparian restoration costs

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Survey municipalities that are not covered under County zoning to determine the status of their shoreline ordinances		WBIF	1 Survey Completed	Midway & Thomson		Carlton SWCD / Carlton County	✓					\$2000
Assist municipalities to develop and enforce shoreland ordinances		WBIF Other	2 ordinances developed	Midway & Thomson		DNR / MN Carlton SWCD & County		✓	✓			\$50,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Section 6. Cloquet Planning Area

The Cloquet planning area is one of the most pristine watersheds within the St. Louis 1W1P planning region with hundreds of acres of local, state, and federal land. Included in this planning area is the Upper Whiteface River which is part of the St. Louis River Watershed. The planning area is rich in trout streams, as well as waters designated as exceptional use for their pristine water quality. In addition, this planning area has several important lakes including Island, Boulder and Fish Lakes. There is relatively little development, but most development is concentrated to lakeshores. Much of the landscape is forests and wetlands, which are a priority for protection and habitat enhancement. Due to the abundant recreational opportunities, this watershed is a destination for all kinds of outdoor activities. Stewardship by recreational land users is vital to protect this area's lakes and streams.

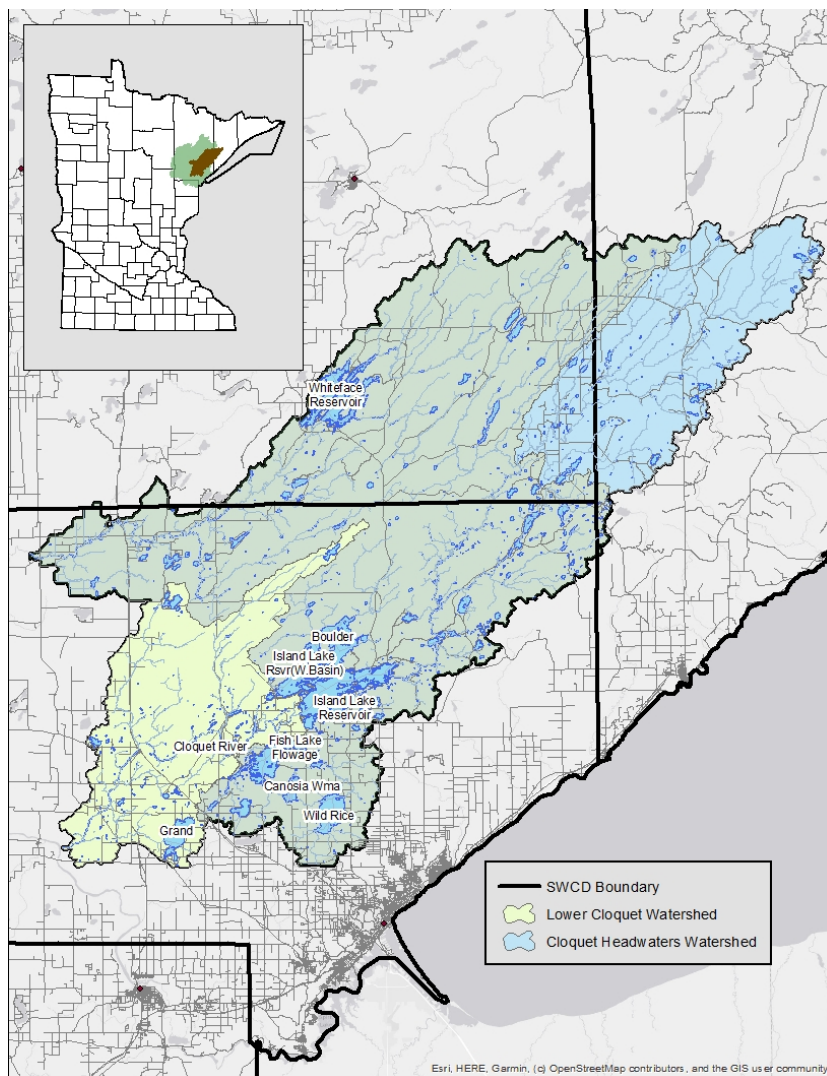






Figure 6-1. The Cloquet planning area includes the Cloquet HUC 8 Watershed and the Whiteface River. The area includes several important lakes including Island, Boulder and Fish Lakes, along with many wild rice lakes and trout streams.

Cloquet Watershed Priority Issues

 Surface Water Quality	<ul style="list-style-type: none">• Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic recreation users.• Failing septic systems can contaminate groundwater, surface waters and localized drinking water, leading to imminent threats to public health.
 Land Use	<ul style="list-style-type: none">• Water- and land-based recreational activities can impact the quality of lakes and streams, stress wildlife, degrade habitats, and lead to conflict between different uses.• Aggregate mining has the potential to alter natural hydrology, impacting baseflows for nearby streams and local and regional aquifers (<i>Green et al. 2006</i>).
 Altered Hydrology	<ul style="list-style-type: none">• Channel instability, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the planning area.• Obsolete and nonfunctioning dams alter natural hydrology, impede fish passage and aquatic organism movement, and affect stream temp.
 Habitat	<ul style="list-style-type: none">• Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality.• Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incisement and floodplain disconnection, impeded fish passage, and fragmentation.

Main Planning Area Issues

- **Recreational land users play a vital role in protecting this pristine watershed**
- **High quality rivers, streams and lakes need restoration and protection from development pressure and connectivity issues**
- **Forests cover must be maintained to enhance habitat and protect high quality rivers, streams and lakes**



Desired Future Condition (Long-Term Goal):

- ***Recreational land uses are good stewards of the watershed***
- ***Pristine lakes and streams are protected for future generations***
- ***Forests continue to provide vital habitat and protect lakes, streams and rivers***



Identify and address ground and surface water quality problems stemming from inadequate wastewater treatment by supporting the enforcement of Sub Surface Treatment Systems (SSTS) ordinances and inventory and upgrade 50% of non-compliant systems in priority areas with a high probability to impact water resources.

The main concern with SSTS in this planning area is systems near phosphorous sensitive lakes. The MPCA identified four lakes with a lakeshed health score that was below average and identified septic systems as a potential pollution source within the Cloquet Watershed (*WRAPS, 2020a*). Two of the lakes are in priority areas: Grand Lake and Kane Lake. Actions in this area will be focused on education and outreach.

Priority Area	Long-Term Goal (sites)	10-Year Goal (Sites)
Cloquet Headwaters	1	1
Lower Cloquet	1	1
Watershed Wide	2	0
Total	4	2

Targeted Resources
Grand Lake
Kane Lake

Project Outcomes
Lake waters are safe for recreation
Drinking water is protected
Habitat is protected

Important Considerations



Social capacity with residents will need to be strengthened to build trust between regulating agencies and citizens. Low-income residents will need financial assistance to replace septic systems

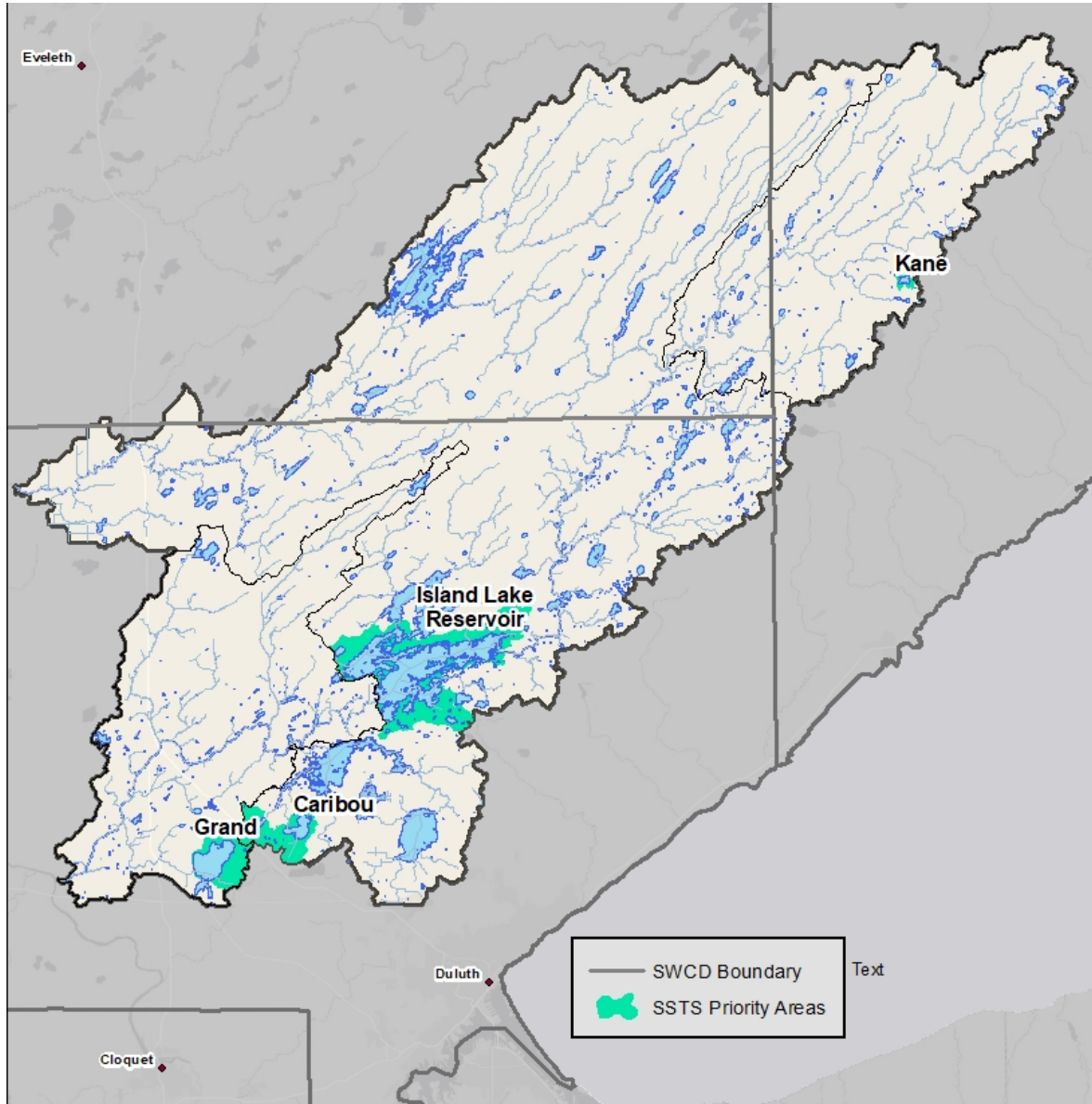









Figure 6-2. SSTS priority areas were determined by the MPCA WRAPS (2020a) process based on lakes with a low watershed health score and identified localized pollution sources from SSTS.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Meet with stakeholders to discuss adding Grand Lake residents to WLSSD or creating community systems		WBIF	2 meetings held	Grand Lake		South St. Louis SWCD, St. Louis County	✓	✓				\$1000
Design and implement an education and outreach campaign to SSTS landowners and SSTS professionals in targeted areas.		WBIF	1 campaign implemented	Lakes with low watershed health score	Watershed Wide	St. Louis & Lake Counties	✓	✓	✓	✓	✓	\$2500
		Baseline										
Support enforcement follow-up		Baseline	Continued Local Program	Lakes with low watershed health score	Watershed Wide	St. Louis & Lake Counties	✓	✓	✓	✓	✓	\$25,000
Assist unsewered communities (including lakeshore developments) with securing public financing to install or upgrade sanitary sewer systems		WBIF	2 meetings	Lakes with low watershed health score	Watershed Wide	St. Louis & Lake Counties	✓	✓				\$1000
Infrared surveys of septic system runoff into waterways in key areas		Other	1 study completed	Lakes with low watershed health score	Watershed Wide	MPCA			✓			\$20,000
Work to address the list of imminent public health threats		WBIF	10 systems updated	Lakes with low watershed health score	Watershed Wide	St. Louis & Lake Counties	✓	✓	✓	✓	✓	\$200,000
Create a GIS database for SSTS location, size and condition.		WBIF	1 web map created	Lakes with low watershed health score	Watershed Wide	St. Louis & Lake Counties	✓	✓				\$10,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 100% of municipalities have Smart Salt Certified Staff, 100% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.

Although the Cloquet planning area is much less developed than other areas of the watershed, the southern portion of the watershed has the greatest number of road miles, and these roads are especially concentrated around lakes. In addition, chlorides could enter lakes through water softening systems. The main road authority in this region is St. Louis County. Within these communities, high priority landowners will be identified based on the amount of salt treated surfaces (parking lots, walkways), acres of land and type of landowner (producer, commercial, private).

Smart Salt Certified Staff & Level 2 Certified Communities		
Priority Area	Long-Term Goal (Main Road Authorities)	10-SmYear Goal (Main Road Authorities)
Cloquet Headwaters	0	0
Lower Cloquet	1	1
Total	1	1

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Improved habitat for trout

Targeted Resources
Grand Lake
Beartrap Creek
Cemetery Creek
Chalberg Creek

Important Considerations



Building **social capacity** will be needed to increase local participation in salt reduction. Education on the impacts of salt to water resources will be needed along addressing concerns of snow/ice concerns on roads and sidewalks for people with limited mobility.



Addressing salt use near trout streams can improve habitat for **culturally significant species**.

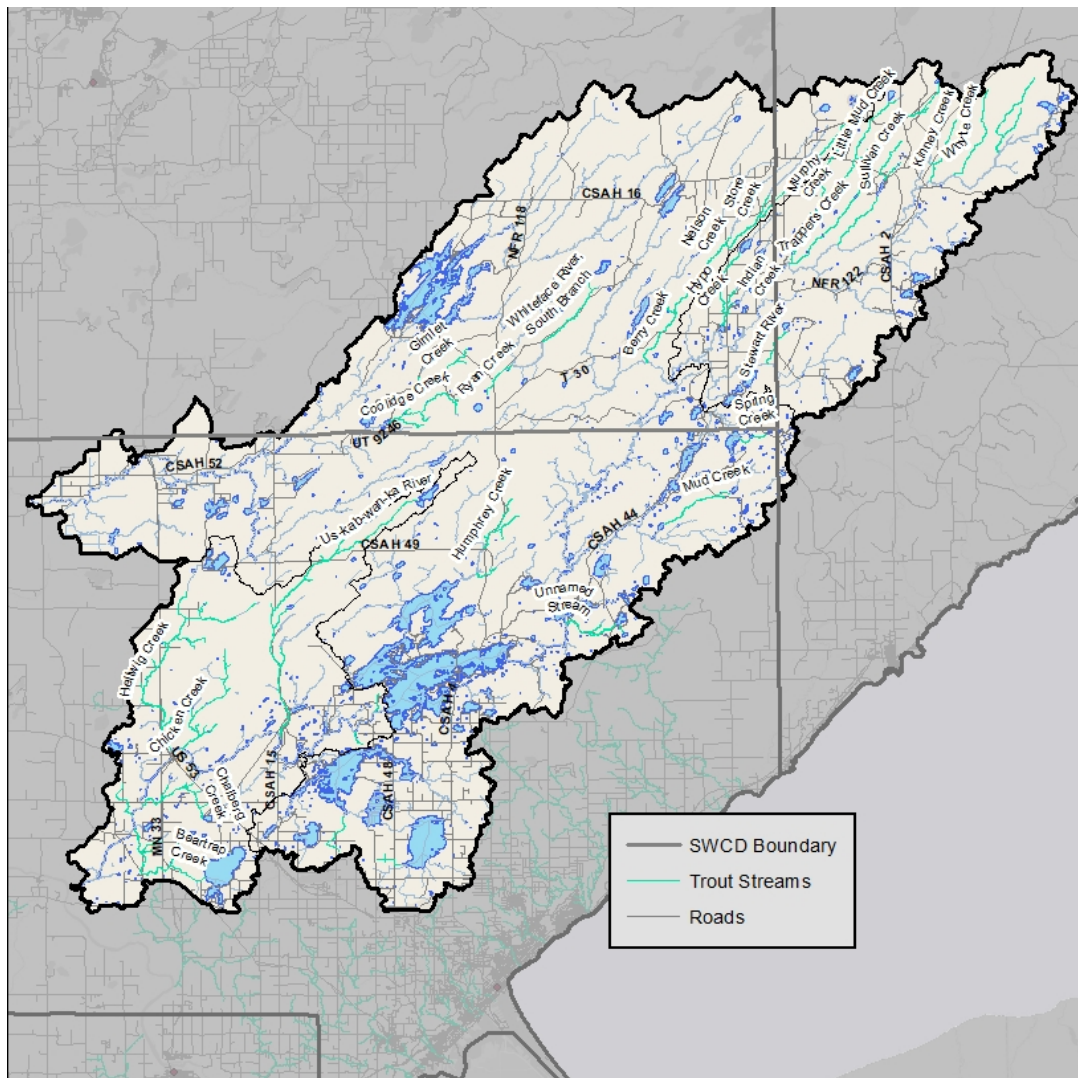








Figure 6-3. Road density in the Cloquet planning area is concentrated to the southern portion, especially surrounding lakes and trout streams.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Coordinate a Smart Salt training for township and county road authorities		WBIF	3 trainings	Cloquet River, Lakes		SWCD / MPCA, municipalities	✓		✓		✓	\$10,000
Evaluate County's salt training with Smart Salt training and identify gaps.		WBIF	1 report	Watershed Wide	Watershed Wide	SWCD / County	✓					Incorporated into Water Coordinator staff costs
Development & implement a salt use reduction education and outreach campaign		WBIF	1 campaign implemented	Municipalities near public waters / Lakeshore owners	Watershed Wide	SWCD / RSPT municipalities	✓	✓	✓	✓	✓	\$25,000
Track salt use to determine salt trends		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	SWCD / Road Authorities	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs
Make road salt alternatives (sand, grit) readily available to homeowners		WBIF	1 program developed	Municipalities near public waters	Watershed Wide	SWCD / municipalities	✓	✓	✓	✓	✓	\$10,000
Include better planning for snow storage to keep roads and sidewalks cleared, minimize moving snow and protect stormwater BMPs		WBIF	1 plan developed	Watershed Wide	Watershed Wide	SWCD / municipalities	✓	✓				Incorporated into Water Coordinator staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Educate, increase stewardship and mitigate the water quality impacts of recreational land users and landowners to natural resources at 5 high-use & high priority recreational areas.

Recreation is the main land use in the Cloquet planning area. From boating and fishing to ATV use, and hunting, the Cloquet area has numerous opportunities to enjoy the outdoors (MPCA, 2020a, p. 40-41, 56-57). Abundant public land provides access to all people, regardless of economic status. However, recreational land use can have impacts including spreading terrestrial and aquatic invasive species and causing erosion of sensitive wetlands and shorelines.

Education is one of the first steps to increasing land and water stewardship. Not all recreational land users may know how their activities impact natural resources or the unique and sensitive plant and animal species that reside in the watershed.

Priority Area	Long-Term Goal (Outreach & Inventory Efforts)	10-Year Goal (Outreach & Inventory Efforts)
Cloquet Headwaters	6	5
Lower Cloquet	0	0
Total	6	5

Targeted Resources
Cloquet Lake
Cloquet River
Indian Lake
Kane Lake
Marble Lake
Thomas Lake
Salo Lake
Sullivan Lake

Project Outcomes
Protection of high-quality streams and wetlands
Reduced sediment and nutrient pollutants
Improved riparian/shoreland habitat
Reduced spread of invasive species

Important Considerations



Education and outreach can increase **social capacity** to increase participation.



Protecting resources near trout streams can improve habitat for **culturally significant species**.

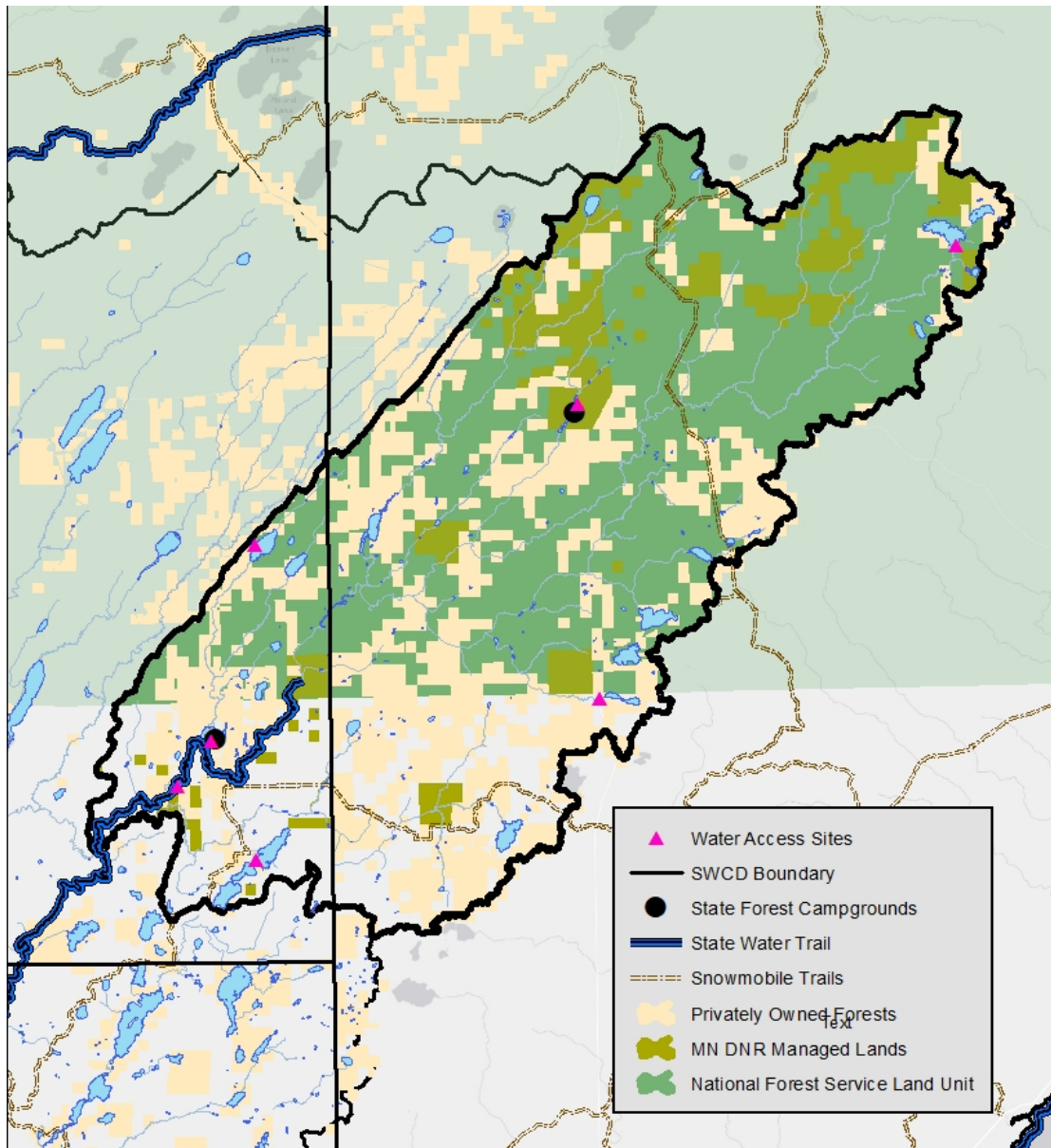





Figure 6-4. Recreational land use in the Cloquet Headwaters subwatershed. Available datasets represent only a small portion of the recreational opportunities available.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Collaborate with recreational land managers to inventory and assess high priority recreational sites		WBIF	5 meetings with stakeholders	Cloquet Headwaters		Lake SWCD, North St. Louis SWCD / DNR, USFS, Counties, User Groups	✓	✓	✓	✓	✓	\$7,500
Develop and implement an education and outreach campaign to recreational land users and landowners		WBIF	1 campaign developed and implemented	Cloquet Headwaters		Lake SWCD, North St. Louis SWCD	✓	✓	✓	✓	✓	\$10,000
Implement projects on 5 locations identified impacted water resources		WBIF	5 projects implemented	Cloquet Headwaters		Lake SWCD, North St. Louis SWCD		✓	✓	✓	✓	\$500,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Evaluate impacts of aggregate mining at 100 % of high priority sites that have the potential to impact sensitive surface and ground water resources.

Aggregate is an important resource for building and maintaining roads and other infrastructure. However, some high value aggregate deposits within the watershed are located near other high value natural features, including coldwater streams (MPCA 2019, 2020a), which rely on groundwater to keep the water cold, affecting the survival of sensitive species like trout. Aggregate mining operations occasionally pump groundwater offsite to access mineral deposits, creating a potential to decrease local groundwater quantity.

Since some aggregate mining activities have the potential to adversely affect local water resources (Green et al. 2005), it is important to identify where these high value features coincide and identify best management practices (BMPs) for the orderly and environmentally sound development of local aggregate deposits. The reclamation of inactive or abandoned aggregate mines can also protect local water resources and enhance wildlife habitat.

More information is needed to understand the location, scope, and scale of existing and undeveloped aggregate resources within the watershed. The Minnesota Geological Survey and the DNR will soon complete studies that will provide a broad range of information about the watershed, its aggregate potential, and the connection of groundwater aquifers to the land surface and surface water resources. The completed studies will help guide BMP development, prioritize reclamation work and identify specific aggregate mining operations or high value aggregate deposits that might require additional management

Priority Area	Long-Term Goal (needed studies)	10-Year Goal (needed studies)
Cloquet Headwaters	0	0
Lower Cloquet	1	1
Total	1	1

Targeted Resources
Uskabwanka River
Hellwig Creek
Beartrap Creek

Project Outcomes
Protection of high-quality streams
Protection of trout habitat
Protection of groundwater / drinking water

Important Considerations



The proposed actions for aggregate mining could mitigate the potential impacts of **climate change** by protecting cold water inputs to streams. Temperatures are predicted to increase during the summer months (*Stults, 2016, p. 24*).

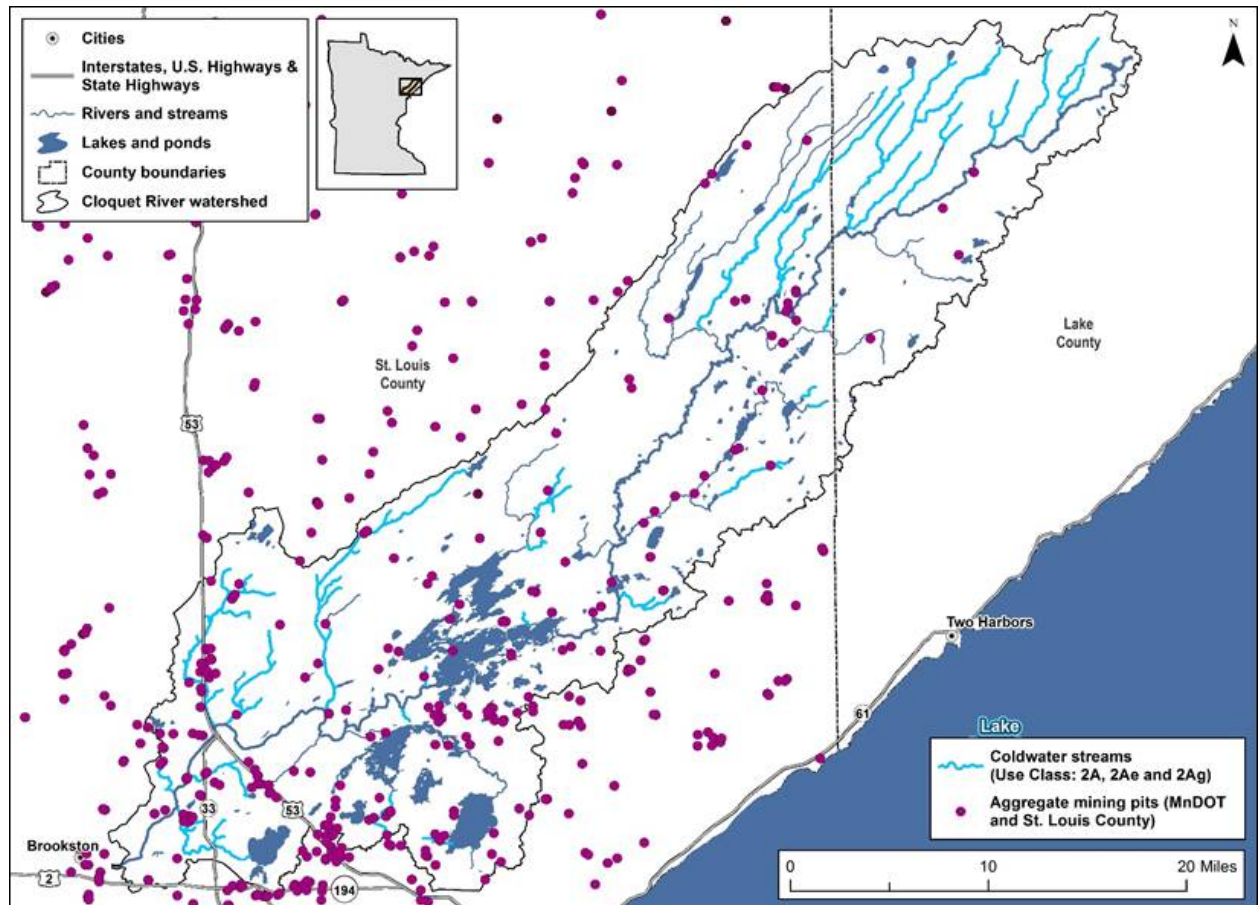





Figure 6-5. Targeted coldwater streams and proximity to gravel pit/aggregate mining. Map courtesy of the MPCA ([Cloquet River Watershed Restoration and Protection Strategy](#)).

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Use St. Louis and Lake County geologic atlases Part A & B to evaluate sand and gravel mining resources, determine additional protections and create a tool for residents and governments to assess the impact of proposed gravel pits*		Other	1 study completed	Watershed Wide		SWCD			✓			\$25,000
Form interagency work group for pilot studies using geologic atlas when it becomes available and include monitoring wells and streamflow to determine impacts.		Other	Work Group Formed	Lower Cloquet		DNR, MPCA / County				✓		See watershed wide staff costs
Continue enforcement of gravel mining ordinances.		Baseline	Continued Local Program	Watershed Wide		St. Louis County, DNR	✓	✓	✓	✓	✓	\$25,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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* Study could include: compile a database for aggregate mine/pit locations within the watershed that identifies data such as active status, size, position relative to water table, dewatering activities, or reclamation efforts; Develop plan for reclamation of identified abandoned aggregate mine sites and make recommendations on county authority to collect an aggregate production tax to help fund reclamation projects; Use the MGS County Atlas and DNR Aggregate Resource Map to identify areas of high aggregate potential that are not proximal to coldwater trout streams and work with local planning departments to protect those undeveloped resources for future use.



Reconnect 40 miles of priority streams and tributaries to benefit aquatic life and improve water quality.

Undersized and poorly aligned culverts impact stream health by altering the stream's natural pattern. This can result in streambank erosion, impacting habitat. In addition, many culverts become barriers for fish and other aquatic life moving up or downstream. Similarly, dams impact the movement of aquatic life. Species such as trout need to access different stream habitats during different parts of their lifecycle, and a culvert barrier can impact their survival.

Culvert inventories were completed in the Cloquet Headwaters and Lower Cloquet subwatersheds. Based on this data, a total of 17 culverts would need to be replaced to improve stream connectivity (SSL SWCD, 2020, p. 23).

Priority Area	Long-Term Goal (needed studies)	10-Year Goal (needed studies)
Cloquet Headwaters	10	3
Lower Cloquet	7	2
Total	17	5

Targeted Resources
Beartrap Creek
Hellwig Creek
Pine Creek & Tributaries

Project Outcomes
Improved habitat
Reduced sediment pollution

Important Considerations



Right sizing culverts can mitigate impacts of **climate change** by making streams more resilient to increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



Education and outreach will be needed to increase **social capacity** by building trust with road authorities and private landowners.



Addressing undersized culverts can protect trout stream habitat. Trout are a **culturally significant species**

Table 6-1. Stream connectivity projects in the Cloquet planning area (SSL SWCD, 2020, p.).

Stream	Subwatershed	Location	Priority
Beartrap Creek	Lower Cloquet	Railroad Upstream of County Road 694	First
Beartrap Creek	Lower Cloquet	State Highway 23	First
Hellwig Creek	Lower Cloquet	Swan Lake Road	First
Pine Creek	Cloquet Headwaters	Wales Road	First
Unnamed Tributary to Pine Creek	Cloquet Headwaters	Drummand Road	First
Pine Creek	Cloquet Headwaters	Abandoned Road	First
Beartrap Creek Tributary	Lower Cloquet	County Road 872	Second
Beartrap Creek Tributary	Lower Cloquet	Industrial Road – County Road 7	Second
Hellwig Creek Tributary	Lower Cloquet	State Highway 53 - Northbound	Second
Hellwig Creek Tributary	Lower Cloquet	State Highway 53 - Southbound	Second

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Replace 2 of 3 priority crossings. Crossings in the Beartrap Creek and Hellwig Creek watersheds (<i>SSL SWCD, 2020 p. 21-24</i>)		WBIF	2 projects completed	Lower Cloquet Watershed		South St. Louis SWCD			✓	✓	✓	\$1,000,000
		Other										
Assess dams on Murphy Lake, Wilson Lake, Sullivan Lake, and Little Stone Lake to determine if they are altering natural hydrology and impeding fish and aquatic organism movement and affecting stream temperature (<i>SSL SWCD, 2020 p. 13-20</i>)		WBIF	4 assessments completed	Cloquet Headwaters		Lake & North St. Louis SWCDs / DNR & USFS		✓	✓			\$10,000
Replace 1 priority crossing: crossings include 2 on Pine Creek and 1 on Pine Creek tributary		WBIF	1 project completed	Cloquet Headwaters		Lake SWCD, North St. Louis SWCD		✓	✓	✓		\$500,000
		Other										
Use assessment data to work with road authorities to prioritize replacement of 3 additional crossings		WBIF	3 assessments	Lower Cloquet Watershed		South St. Louis SWCD and St. Louis County		✓	✓			\$15,000
Use road authorities 5–10-year plans to coordinate with crossing upgrades		Baseline	Annual Plan Review	Trout Streams & Tributaries, IBI Impaired streams	Watershed Wide	SWCDs / Counties	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs



Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 3,000 Linear Feet of high priority streams and tributaries.

Streams have been changed by humans for a variety of reasons. Whether for draining land for agriculture, moving logs during European settlement, or changing waters for transportation, altering streams has consequences for their health, including degraded habitat and less stable channels with increased erosion. Almost 100 miles of stream have been altered in the Cloquet planning area. Stream restorations help protect valuable resources like trout.

The focus for this plan will be restoring trout streams, especially cold-water tributaries (*SSL SWCD, 2020 p. 3-13*).

Priority Area	Long-Term Goal (restoration sites)	10-Year Goal (restoration sites)
Cloquet Headwaters	2 (2 miles)	1 (1500 linear feet)
Lower Cloquet	5 (18 miles)	1 (1500 linear feet)
Total	3 (20 miles)	2 (3000 linear feet)

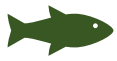
Targeted Resources
Beartrap Creek
Hellwig Creek
Pine Creek & Tributaries
Cloquet River

Project Outcomes
Improved habitat
Reduced sediment pollution

Important Considerations



Stream resorations can mitigate impacts of **climate change** by making streams more resilient to increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



Restoring streams can improve trout stream habitat. Trout are a **culturally significant species**.

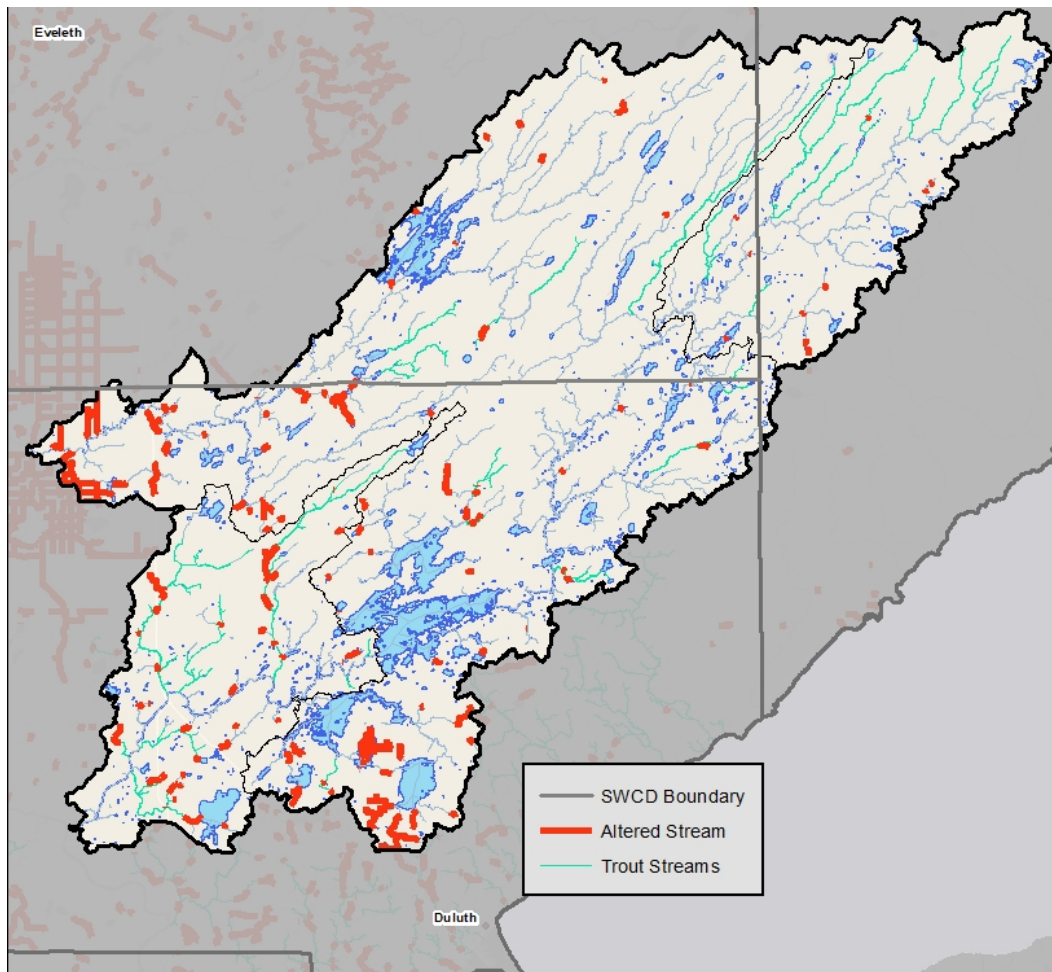






Figure 6-6. Altered streams in the Cloquet planning area. The focus of this plan is restoring the headwaters of altered trout streams.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Geomorphic study of avulsion site on Upper Cloquet River (<i>SSL SWCD, 2020 p. 9-13</i>)		WBIF	1 completed study	Cloquet Headwaters		Lake and North St. Louis SWCD		✓	✓	✓		\$50,000
Restore 2 reaches (3000 linear feet) on Chalberg and Hellwig Creeks (<i>SSL SWCD, 2020 p. 3-9</i>)		WBIF	2 restorations completed	Lower Cloquet Watershed		South St. Louis SWCD		✓	✓			\$100,000
		Other										
Pine River project development to evaluate coldwater trout stream habitat and potential land development.		WBIF	1 completed study	Cloquet Headwaters		Lake and South St. Louis SWCD		✓	✓	✓		\$50,000
Restore 2 stream reaches (3000 linear feet) Cloquet and Cloquet Headwaters		WBIF	2 restorations completed	Cloquet Headwaters and Lower Cloquet Watershed		Lake, South & North St. Louis SWCD		✓	✓	✓		\$500,000
		Other										

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect & manage 6000 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.

Most of the land in this planning area is forested. Forests play a vital role in protecting lake and stream water quality, and this is reflected in the pristine waters of the Cloquet watershed. Protecting valuable forests from being developed or converted to agricultural land is an important goal for this area. There are also potential impacts of runoff rates if excess harvesting occurs. Forests near wild rice waters, trout streams or large blocks of forest habitat are the most valuable for protection.

Forests within this watershed are considered protected when they are under public ownership, conservation easement or have a Sustainable Forest Incentives Act covenant that prevents them from being converted to other land use types. In this watershed there are State, Federal and County owned forests. The [St. Louis River Landscape Stewardship Plan](#) identifies privately owned parcels that are high value based on their proximity to water resources and large blocks of forests, along with the quality habitat and groundwater protection they provide (*MN BWSR*). There are over 81,000 acres of privately owned forests in the Cloquet Headwaters and Lower Cloquet planning areas. Of these, about 22,000 acres have a medium or high score (*MN BWSR, p. 24 and 29*).

Priority Area	Long-Term Goal (acres / plans)	10-Year Goal (acres / plans)
Cloquet Headwaters	14,000 / 400	1800 / 50
Lower Cloquet	8,000 / 160	4200 / 84
Total	22,000	6000

Targeted Resources	
Chalberg Creek	Cloquet River
Cemetery Creek	Indian Creek
Grand Lake	Pine Creek / Stone Lake
Rose Lake	Leora Lake
Dodo Lake	George Lake

Project Outcomes
Improved habitat
Reduced sediment pollution
Protection of lakes, streams and groundwater

Important Considerations



Protecting forests can mitigate impacts of **climate change** by reducing peak flows during increasingly common high rainfall events and replenishing groundwater supplies. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*)



Education and outreach can increase **social capacity** to increase participation in forest protection activities, including easements.



Protecting forests can protect trout stream habitat and wild rice. Trout and wild rice are a **culturally significant species**

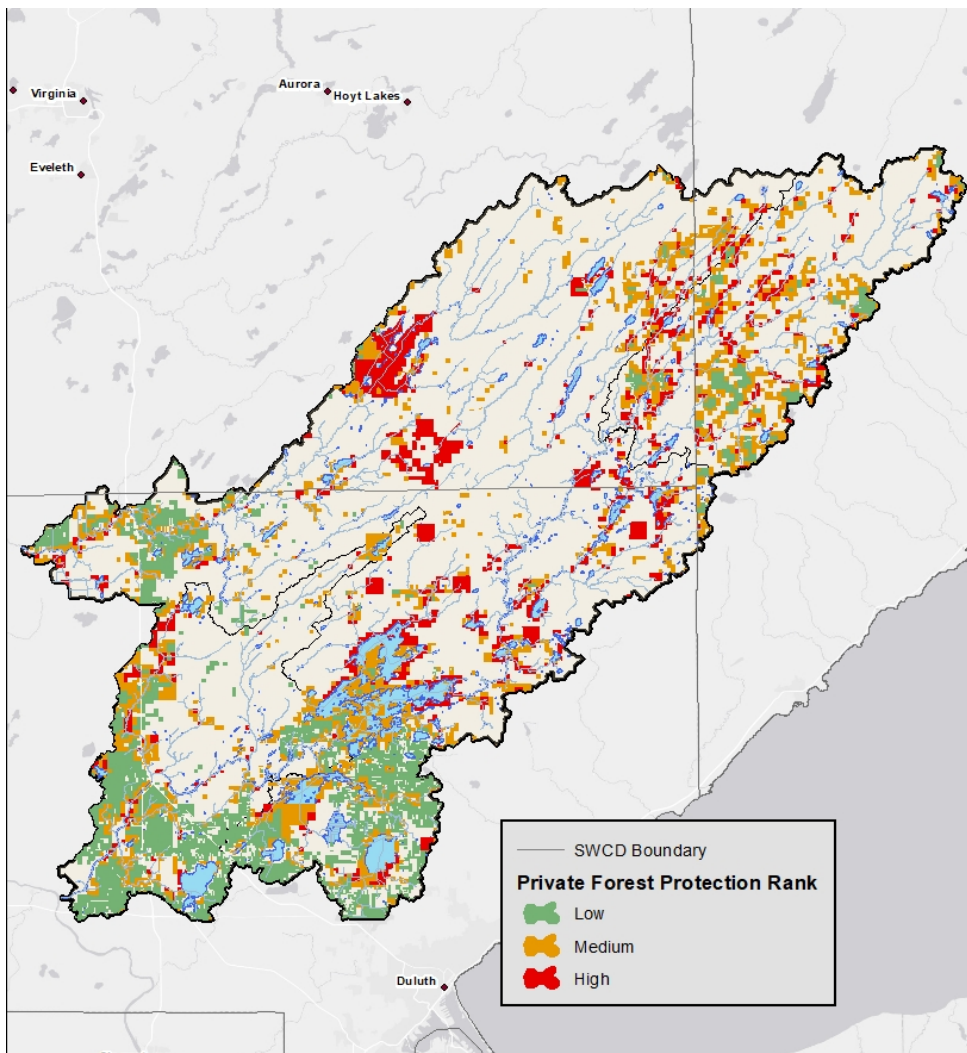









Figure 6-7. Prioritized private forest parcels in the Cloquet planning area. These parcels were prioritized in the Landscape Stewardship Plan (MN BWSR).

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop and implement forest management plans for 4200 acres in the Lower Cloquet Watershed following the Minnesota Forest Resources Council's Forest Management Guidelines		WBIF	4200 acres managed ~84 plans	Lower Cloquet		St. Louis South SWCD, Private Foresters / DNR & NRCS	✓	✓	✓	✓	✓	\$180,000
		Other										
Protect forests with SFIA, conservation easements or acquisitions where they are protecting groundwater recharge areas for trout streams and are at risk for gravel pit development		WBIF	4200 acres protected	Lower Cloquet		St. Louis South SWCD & MN Land Trust, TNC, DNR, BWSR, NRCS	✓	✓	✓	✓	✓	\$550,000
		Other										
Develop and implement forest management plans following the Minnesota Forest Resources Council's Forest Management Guidelines and enroll 1800 acres of forest into SFIA, 2C or Easement in the Cloquet Headwaters Watershed		WBIF	1800 acres protected / ~50 plans	Cloquet Headwaters		Lake, St. Louis North SWCD & Private Foresters / DNR & NRCS	✓	✓	✓	✓	✓	\$80,000
		Other										
Develop an education and outreach campaign for private forest owners		WBIF	1 campaign implemented	High RAQ Scored Parcels	Watershed Wide	St. Louis North, St. Louis South, Lake/ DNR & NRCS	✓	✓	✓	✓	✓	\$25,000
Coordinate forestry activities within the watershed to promote forest health for water quality		WBIF	Ongoing coordination	High RAQ Scored Parcels	Watershed Wide	St. Louis North, St. Louis South, Lake / DNR & NRCS	✓	✓	✓	✓	✓	Incorporated into Water Coordinator staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect and restore 2000 feet of shoreline in prioritized lakes and streams for natural buffers and reduced erosion

Healthy shoreline areas are crucial for protecting water quality. There are over 1000 miles of streams in the Cloquet planning area, with many miles having relatively natural shorelines. However, some shorelines have been altered for a variety of reasons including land development and farming. Restoring altered shorelines provides a variety of benefits including filtering sediment and other pollutants, providing shade to streams, storing water and reducing flooding, and providing valuable habitat.

Trout streams and wild rice lakes are two important resources that need protection in this area. Areas where livestock can access streams are a major target for the Lower Cloquet watershed (*SSL SWCD, 2020 p. 29-30*). During hot summer months, livestock can spend large amounts of time in streams, increasing erosion from hoof action and bacteria and nutrient pollution from animal manure. Our focus will be to restore shorelines in these areas and protect the most vulnerable shorelines from increased development.

Priority Area	Long-Term Goal (projects)	10-Year Goal (projects)
Cloquet Headwaters	6	2
Lower Cloquet	5	5
Total	11	7

Targeted Resources	
Beartrap Creek	Cloquet Lake
Thomas Lake	Katherine Lake
Little Stone Lake	Kane Lake
Salo Lake	Sullivan Lake
Indian Lake & Creek	Cloquet River
Sink Lake	Pine Creek
Langley & Little Langley Rivers	Murphy Creek

Project Outcomes
Improved habitat
Reduced sediment pollution

Important Considerations



Improving riparian areas can mitigate impacts of **climate change** by providing shade to help cool streams during increasingly warmer summer months (*Stults, 2016, p. 24*).



This goal addresses **equity** by protecting wild rice. Wild rice is used for subsistence food production



Education and outreach are needed to increase **social capacity** and participation in riparian projects.



Addressing shorelines can protect wild rice habitat. Wild rice is a **culturally significant species**

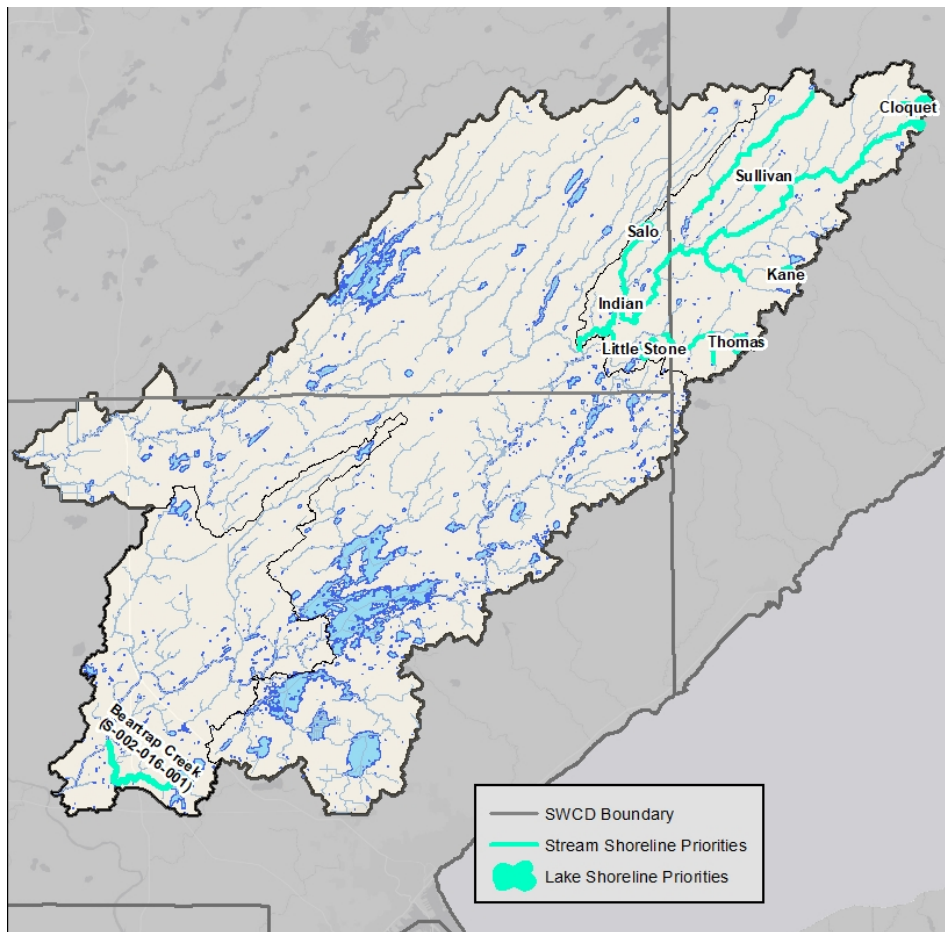









Figure 6-8. Shoreline targets in the Cloquet planning area. The targeted resources include protection stream priorities determined by MPCA, phosphorous sensitive lakes in the Cloquet headwaters subwatershed and Beartrap Creek, a trout stream in the South Cloquet subwatershed.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Work with 1 livestock producer to exclude livestock from Beartrap Creek (SSL SWCD, 2020 p. 29-30)		WBIF	1 project implemented	Beartrap Creek		South St. Louis SWCD / MDA, NRCS		✓				\$5000
		Other										
Outreach to 3 livestock producers in Beartrap Creek (SSL SWCD, 2020 p. 29-30)		WBIF	3 mailings	Beartrap Creek		South St. Louis SWCD / MDA, NRCS	✓		✓		✓	\$5,000
		Other										
Restore/establish 2000 feet of vegetated shoreline in riparian and lakeshore areas		WBIF	2000 feet restored	Cloquet Headwaters		Lake & North St. Louis SWCD	✓	✓	✓	✓	✓	\$200,000
		Other										
Continue to enforce shoreland setbacks/buffers in all parts of the watershed		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	St. Louis County, Lake County, Cities, Townships	✓	✓	✓	✓	✓	\$25,000
Develop and implement a BMP education and outreach campaign to shoreline landowners in targeted areas		WBIF	1 Campaign implemented	Lakes of phosphorous sensitivity, MPCA Stream Protection Priority	Watershed Wide	St. Louis North, St. Louis North, Lake SWCDs	✓	✓	✓	✓	✓	\$30,000
Use RIM program and other conservation easements to protect indicator species habitat		Other	See Forest Protection Action	Trout Streams & Tributaries, Wild Rice Waters, Wood Turtle	Watershed Wide	St. Louis North, St. Louis North, Lake SWCDs, MN Land Trust, TNC, DNR, BWSR, NRCS	✓	✓	✓	✓	✓	\$300,000
Support sturgeon stocking by completing a feasibility study of LKS spawning habitat improvement at specific locations		Other	1 feasibility study	Below Island Lake dam		DNR / Fond du Lac		✓		✓		\$50,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect/Restore 50% of high priority wild rice stands/populations (water levels, disturbance, shoreland development).

For millennia, Minnesota tribes have been physically and spiritually sustained by their harvest and consumption of wild rice (*Zizania palustris*, *Zizania aquatica*), known as manoomin to the Ojibwe and Psíŋ to the Sioux or Dakota people. Manoomin is considered sacred, a gift from the Creator; it is essential to tribal subsistence culture, diet, and traditions. Wild rice is also an important food source for resident and migratory waterfowl, and provides forage and cover for many other wildlife species indigenous to this ecoregion, making it a keystone species in the water-rich landscape of the upper Midwest. The wild rice harvest is still one of the most important annual events on many Native American reservations and across ceded territories, where tribes retain hunting, fishing and gathering rights protected by treaties. This unique and nutritious grain was once widely distributed across much of the United States east of the Rockies. However, most of the specific wetland and aquatic habitat that wild rice requires has been developed, altered or degraded. Today, natural wild rice only grows abundantly in north central and northeastern Minnesota. From historical reports, Band member accounts, and current Minnesota Department of Natural Resources and tribal reports, manoomin has extensively declined throughout Minnesota. Therefore, protecting and restoring wild rice is an important goal of this plan.

The focus for the first 10-years of this plan will be to target education and outreach and shoreline projects on wild rice lakes that are also lakes of phosphorus sensitivity.

Priority Area	Long-Term Goal (projects)	10-Year Goal (projects)
Cloquet Headwaters	6	3
Lower Cloquet	1	1
Total	7	4

Targeted Resources
Grand Lake
Cloquet Lake
Indian Lake
Little Stone Lake

Project Outcomes
Improved habitat
Reduced sediment and nutrient pollution

Important Considerations



This goal addresses **equity** by protecting wild rice for subsistence harvest.



Education and outreach are needed to increase **social capacity** and participation in wild rice projects.



Restoring wild rice can improve a **culturally significant species**

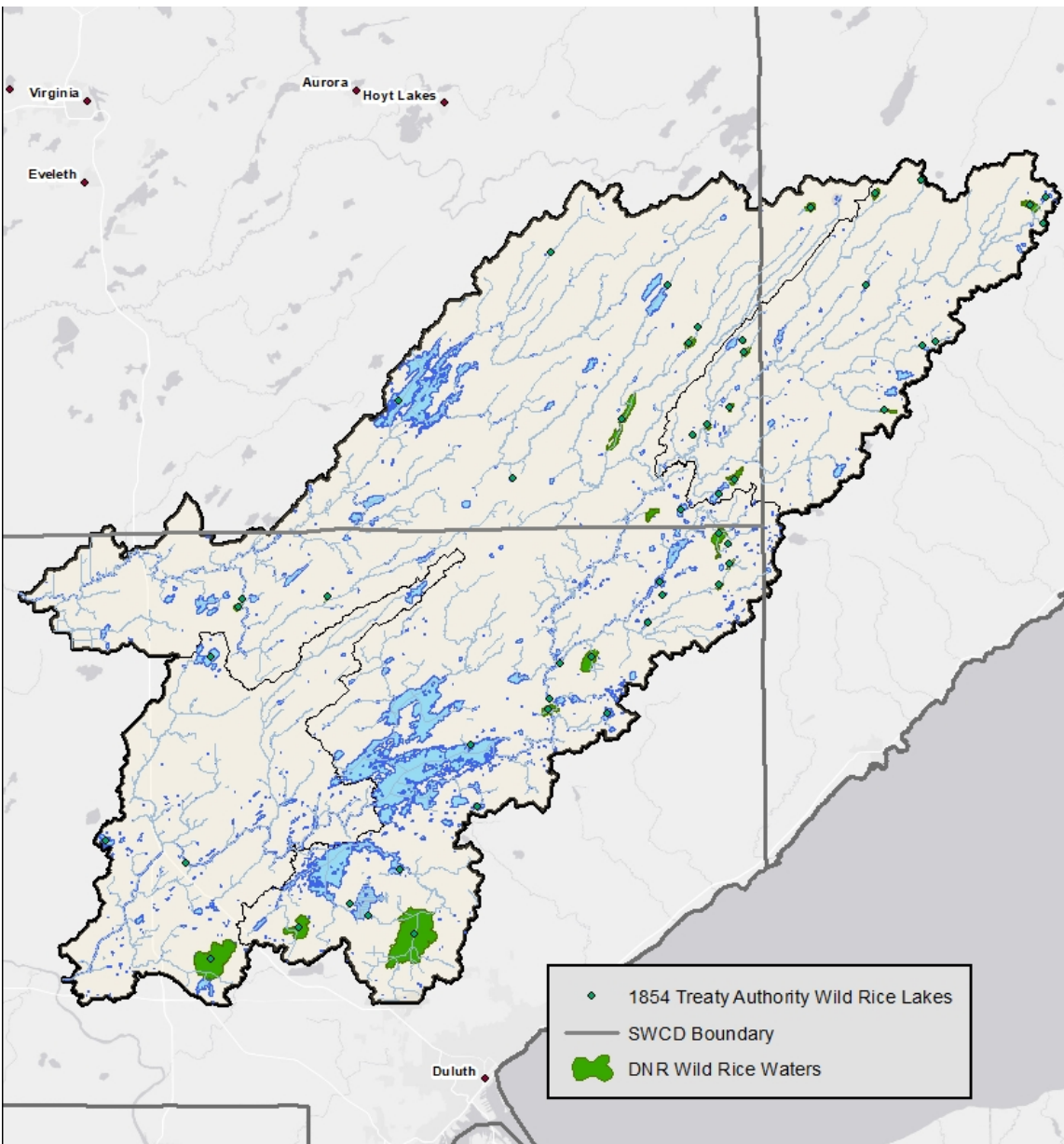





Figure 6-9. Wild rice waters in the Cloquet planning area.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Collaborate with National Forest Service to protect wild rice		WBIF	2 meetings	Cloquet Headwaters		St. Louis North, St. Louis North, Lake SWCDs , NFS & 1854 Treaty Authority, FDL, Bois Forte and Grand Portage bands	✓		✓			\$1000
Work with private landowners to protect shoreline areas on wild rice waters		WBIF	5 projects implemented	Wild Rice Lakes		St. Louis North, St. Louis North, Lake SWCDs,		✓				\$20,000
Develop and implement an education and outreach campaign promoting wild rice protection and value		WBIF	1 campaign developed and implemented	Wild Rice Lakes	FDL, DUA	St. Louis North, St. Louis North, Lake SWCDs,	✓	✓	✓	✓	✓	\$10,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Section 7. Fond du Lac Planning Area

The Fond du Lac Reservation occupies a unique place along the St. Louis River; it is both affected by water quality issues upstream and contributes high-quality water downstream to the estuary. The French name Fond du Lac means “head of the lake” and the Anishinaabe name Nahgahchiwanong means “the place where the water slows or stops.” Both names refer to the St. Louis River estuary, the historic homeland of the people of Fond du Lac. In addition to the Reservation itself, Fond du Lac Band members retain hunting, fishing and gathering rights in several ceded territories. The 1854 Ceded Territory encompasses much of the St. Louis River watershed, and conservation efforts to preserve and restore water quality are essential for Band members to continue their traditional practices, which support community well-being and health. Fond du Lac purchased Spirit Island in the St. Louis River estuary because it is a sacred place, part of the migration story of how the Anishinaabe people moved from the eastern seaboard to the Great Lakes. They were told their seventh stopping place (Spirit Island) would be at the place where food grows out of the water, referring to wild rice. Though the St. Louis River watershed and the estuary once contained abundant, harvestable stands of wild rice, many waters do not now support wild rice because of pollution from mines in the St. Louis River headwaters, and because of landscape practices (e.g., ditching, lakeshore development) that diminish wild rice.

The Fond du Lac Reservation constitutes its own planning area because Fond du Lac is a sovereign nation with water quality standards that are different than the state of Minnesota. Much like the state of Minnesota, Fond du Lac classifies its waters based on designated uses such as fishing and swimming, but it differs from the state by also classifying its waters based on cultural uses, including waters that support wild rice harvesting and waters that support aesthetic uses, which “possess exceptional beauty or are significant to the preservation or exercise of the traditional value system of the Fond du Lac Band, which may include but is not limited to direct contact with water or the preservation of wetlands for the maintenance of traditional medicinal plants.” Fond du Lac has an aquatic life designated use for subsistence fishing and netting, something the state does not have. To support the subsistence fishing and netting designated use, Fond du Lac has mercury standards for water that are more stringent than the state of Minnesota, because Band members consume fish at a subsistence level and are therefore more susceptible to health problems from consuming fish at a high rate. Fond du Lac includes its sulfate water quality standard in its wild rice designated use and assesses wild rice waters based on that standard. Under its aquatic life designated uses, Fond du Lac has lake-specific nutrient standards for its fisheries lakes and has a conductivity standard. In addition, Fond du Lac has narrative standards for wetlands.

Water quality assessments show that Fond du Lac maintains high-quality waters that support aquatic life designated uses and wild rice harvesting. Fond du Lac regularly assesses wetlands and can demonstrate that most wetlands are high functioning, maintaining habitat for wildlife, surface water retention and carbon sequestration. However, all Fond du Lac’s waters (except the north basin of Perch Lake) exceed the water quality standard for mercury. In addition, the St. Louis River exceeds its water quality standard for conductivity. The priority watersheds highlighted in this plan, Stoney Brook and Simian Creek, are impacted by extensive ditch systems that affect hydrologic functioning.

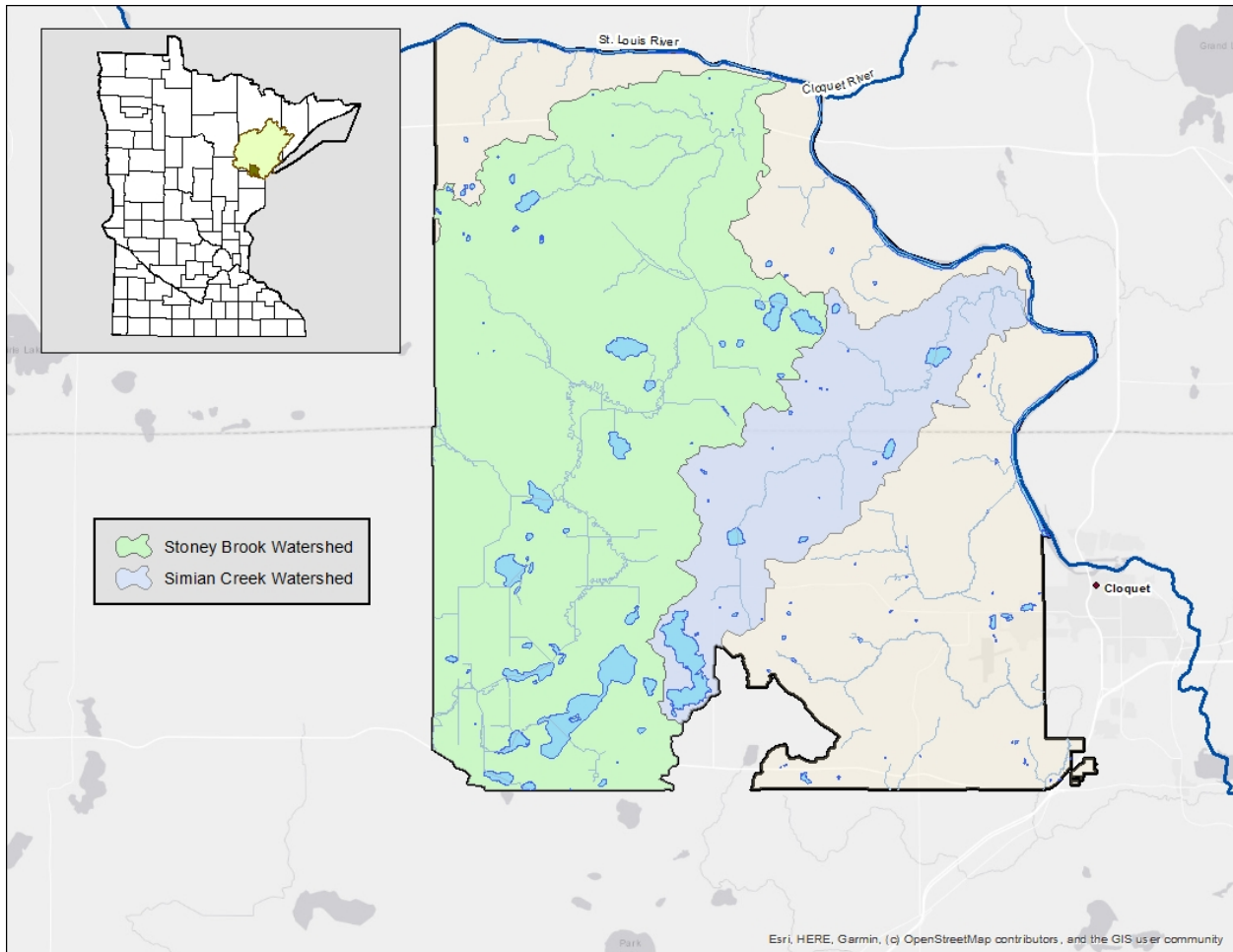


Table 7-1. The Fond du Lac Reservation has its own planning area sovereign nation with water quality standards that are different than the state of Minnesota. The priority areas are Stoney Brook and Simian Creek subwatersheds.

Fond du Lac Priority Issues



Surface Water Quality

- Failing septic systems can contaminate groundwater, surface waters and localized drinking water, leading to imminent threats to public health.
- Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic recreation uses.



Altered Hydrology

- Channel instability, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the Planning Area.
- Loss of water storage, altered flows, and changes in watershed boundaries are the result of land development, drainage, and legacy mining that alter natural hydrologic processes.



Habitat

- Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality.
- Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incisement and floodplain disconnection, impeded fish passage, and fragmentation.
- Aquatic and terrestrial invasive species pose a threat to individual habitats and overall biodiversity.

Main Planning Area Issues

- Septic system management to protect water quality in Big Lake
- Protecting and managing wild rice so Band members can continue traditional harvesting practices
- Enhancing and restoring hydrologic functions in systems heavily impacted by ditching
- Mercury impairments that prevent fish harvesting at subsistence levels.



Desired Future Condition (Long-Term Goal):

- *Safe septic system management at Big Lake*
- *Waters support diverse aquatic life and maintain traditional practices such as fishing and harvesting wild rice*
- *Brook trout continue to thrive*



Identify and address ground and surface water quality problems stemming from inadequate wastewater treatment by supporting the enforcement of Sub Surface Treatment Systems (SSTS) ordinances and inventory and upgrade 50% of non-compliant systems in priority areas

A large portion of the Fond du Lac planning area is rural, resulting in the use of sub surface treatment systems (SSTS). When well maintained and installed according to local ordinances, SSTS are effective in treating household wastewater. However, older or non-compliant systems can contaminate ground or surface waters. This is a big concern along lake shorelines where there are small, subdivided lots, each with its own SSTS. There are about 270 lake lots surrounding Big Lake, and most of them are not big enough to replace a SSTS if it fails, so homeowners must then resort to underground tanks. Assuming a MPCA calculated failure rate of 4%, there could be as many as 10 failing systems.

Priority Area	Long-Term Goal (Lakes)	10-Year Goal (Lakes)
Simian Creek	2	1
Stoney Brook	1	0
Total	3	1

Targeted Resources
Big Lake
Bang Lake
West Twin Lake

Project Outcomes
Waters are safe for recreation
Reduced nutrient pollutants
Improved habitat

Important Considerations



This goal addresses **equity** by keeping lakes safe for recreation and protecting drinking water. Replacement assistance is targeted to low-income residents. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#))



Social capacity with residents will need to be strengthened to build trust between regulating agencies and citizens. Low-income residents will need financial assistance to replace septic systems



Addressing septic systems near wild rice lakes can improve critical habitat for **culturally significant species**.

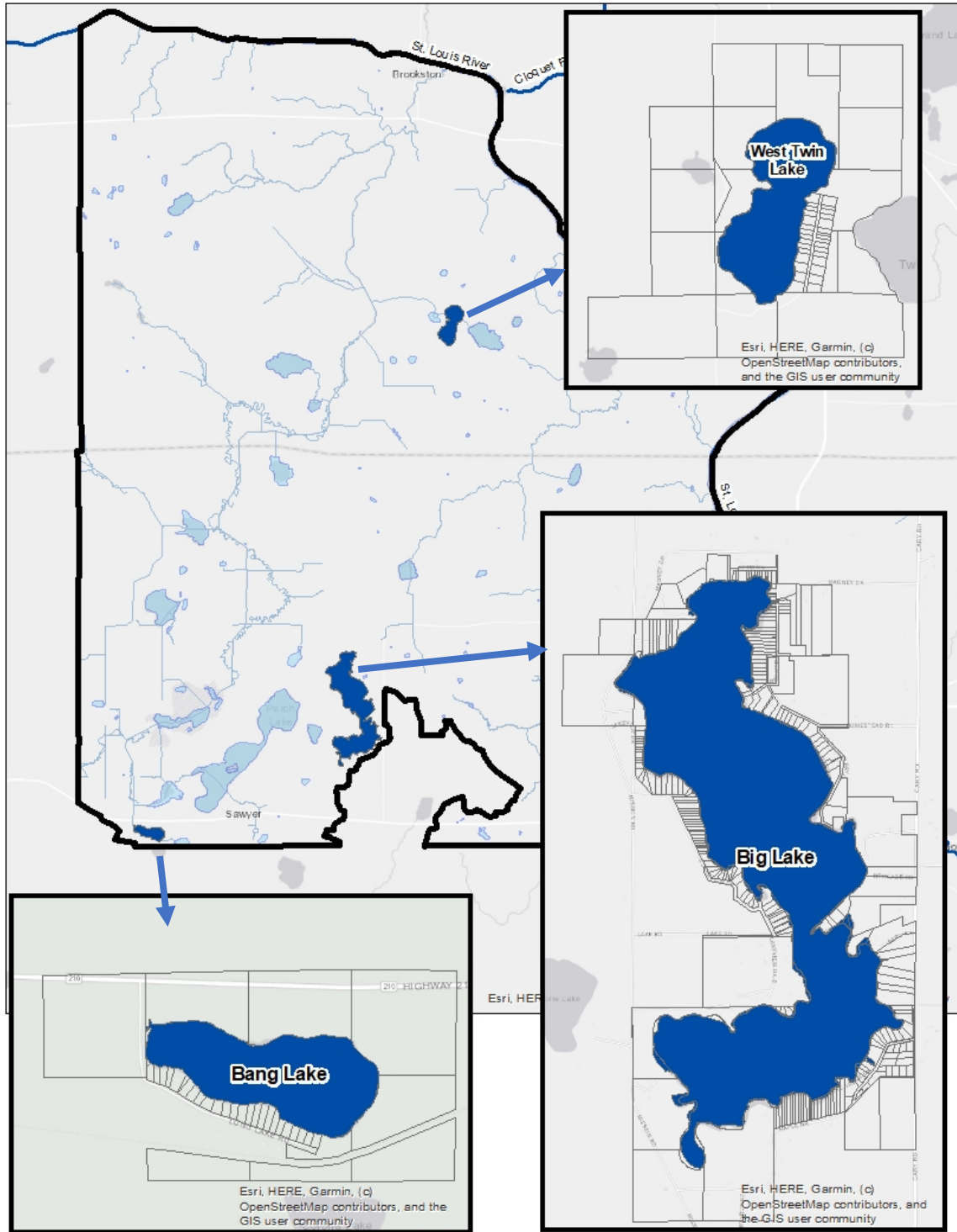








Figure 7-2. Parcels surrounding priority lakes including Big, Bang and West Twin lakes. Lakes with more parcels have increased numbers of SSTs.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Outreach campaign to Big Lake residents on septic system maintenance		WBIF	1 campaign implemented	Big Lake	Fond du Lac / County				✓		\$1000
Provide cost share to low-income residents to replace high priority systems or sewer laterals on Big Lake		WBIF	4 systems / laterals	Big Lake	Fond du Lac / County					✓	\$80,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 100% of municipalities have Smart Salt Certified Staff, 100% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.

While less developed than other parts of the watershed, chloride is still a concern for lakes and streams in the Fond du Lac planning area. Areas near lakes have the most development, making it more likely that road salt is washed into lakes. In addition, water softeners are commonly used in this area and can be a source of salt to lakes and groundwater. Although all of Fond du Lac’s waters are below the chloride standard, chloride concentrations in Big Lake are increasing over time, which is not the case for other lakes on the Reservation. Although still well below the standard, the increase is cause for concern.

Fond du Lac facilities use salt for sidewalk safety; the main facilities include Fond du Lac tribal headquarters in the Fond du Lac Creek watershed, and the Black Bear Casino in the Otter Creek watershed.

Priority Area	Long-Term Goal (Targeted Managers)	10-Year Goal (Targeted Manager)
Planning Area Wide Total	2	2

Targeted Resources
Big Lake
Second Lake

Project Outcomes
Wild rice waters are protected
Protected habitat

Important Considerations



This goal addresses **equity** by protecting trout streams and wild rice lakes. These resources are used for subsistence food production. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#))



Building **social capacity** will be needed to increase local participation in salt reduction. Education on the impacts of salt to water resources will be needed along addressing concerns of snow/ice concerns on roads and sidewalks for people with limited mobility



Addressing salt use near wild rice lakes and trout streams can improve habitat for **culturally significant species**.

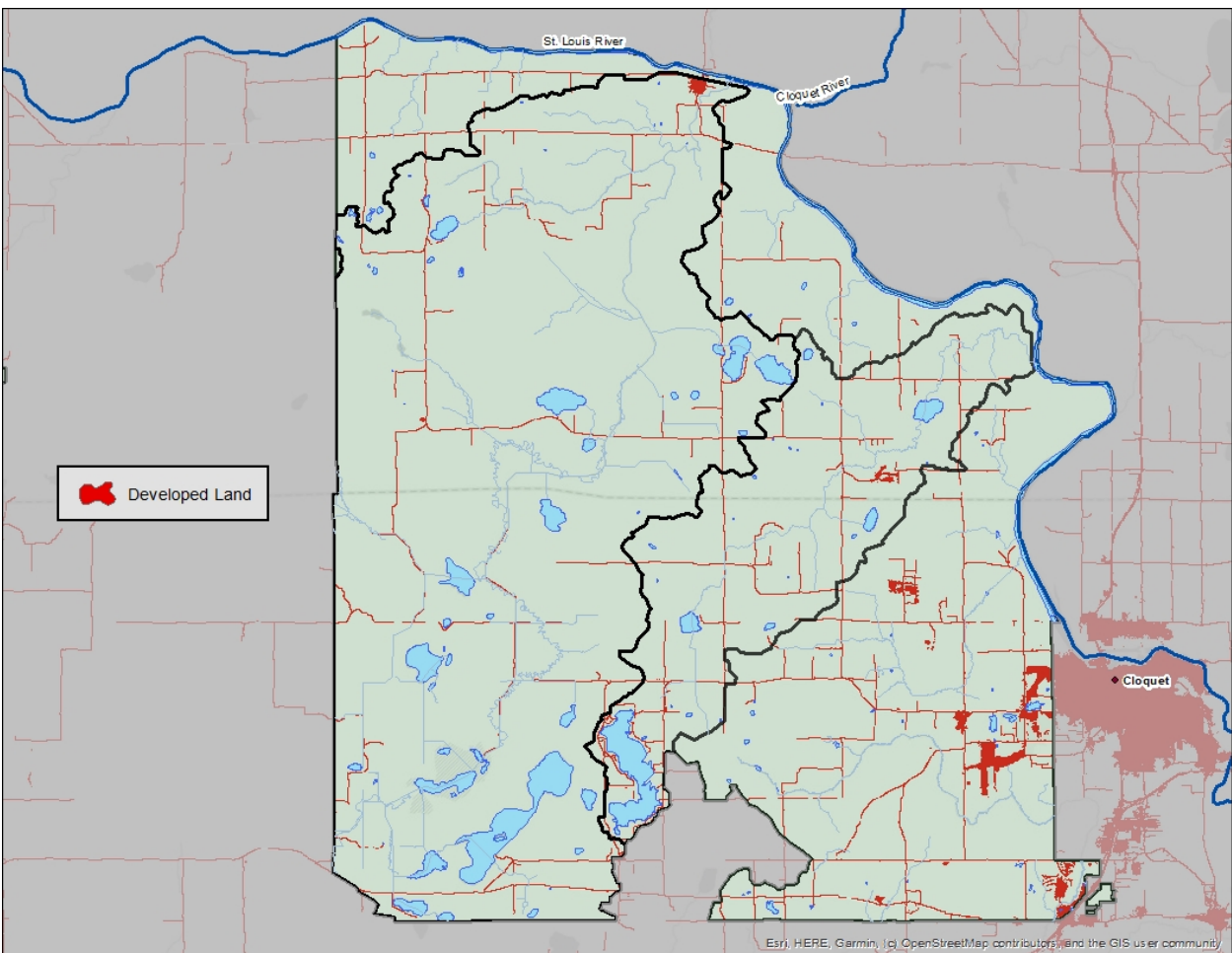





Figure 7-3. Developed land in the Fond du Lac planning area. Areas with increased development are more likely to have parking lots and roads where chlorides (salts) used to keep them ice free.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Provide Smart Salt training to 4 FDL staff		WBIF	4 trained staff	Big Lake, Second Lake	Fond du Lac / MPCA		✓		✓		\$10,000
		Other									
Include better planning for snow storage to keep roads and sidewalks cleared, and protect stormwater BMPs at Min No Aya Win Clinic		WBIF	4 trained staff	Second Lake	Fond du Lac / MPCA		✓		✓		\$15,000
		Other									
Development and implement an education and outreach campaign to Lakeshore residents on road and softener salt use.		WBIF	1 campaign developed and implemented	Big Lake, Second Lake	Fond du Lac		✓		✓		\$5000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Reconnect 2 miles of priority streams and tributaries to benefit aquatic life and improve water quality.

The Fond du Lac planning area has several important trout streams and cool-water resources. Brook trout harvesting is an important component of traditional Anishinaabe lifeways. Trout and other aquatic organisms need to travel within the stream systems during different seasons and periods of their life cycle, and improperly sized or placed culverts are a barrier to fish passage. Connecting habitats within this watershed is vital to support these species. In addition, replacing undersized culverts has the added benefit of reducing sediment erosion. Undersized culverts not only prevent fish passage, but can also alter the hydrology of the stream, resulting in unwanted sediment pollutants.

A culvert on Martin Branch Road was identified as a major barrier to fish passage to important cold-water tributaries on Stoney Brook. Outside the identified priority areas for this plan, two collapsed culverts on unused roads were identified as barriers to trout passage near Jolicoeur Creek. Removing these barriers is a priority in the next 10 years.

Priority Area	Long-Term Goal (Undersized Culverts)	10-Year Goal (Undersized Culverts)
Simian Creek	0	0
Stoney Brook	1	1
Other Areas	1	1
Total	2	2

Targeted Resources
Martin Branch
Jolicoeur Creek

Project Outcomes
Protect brook trout population
Improve habitat
Reduction of sediment pollution

Important Considerations



Correctly sizing culverts can mitigate impacts of **climate change** by reducing washouts and stream erosion during increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



This goal addresses **equity** by protecting streams for recreation and subsistence fishing. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#))



Education and outreach will be needed to increase **social capacity** by building trust with road authorities and private landowners.



Addressing undersized culverts can protect trout stream habitat. Trout are a **culturally significant species**

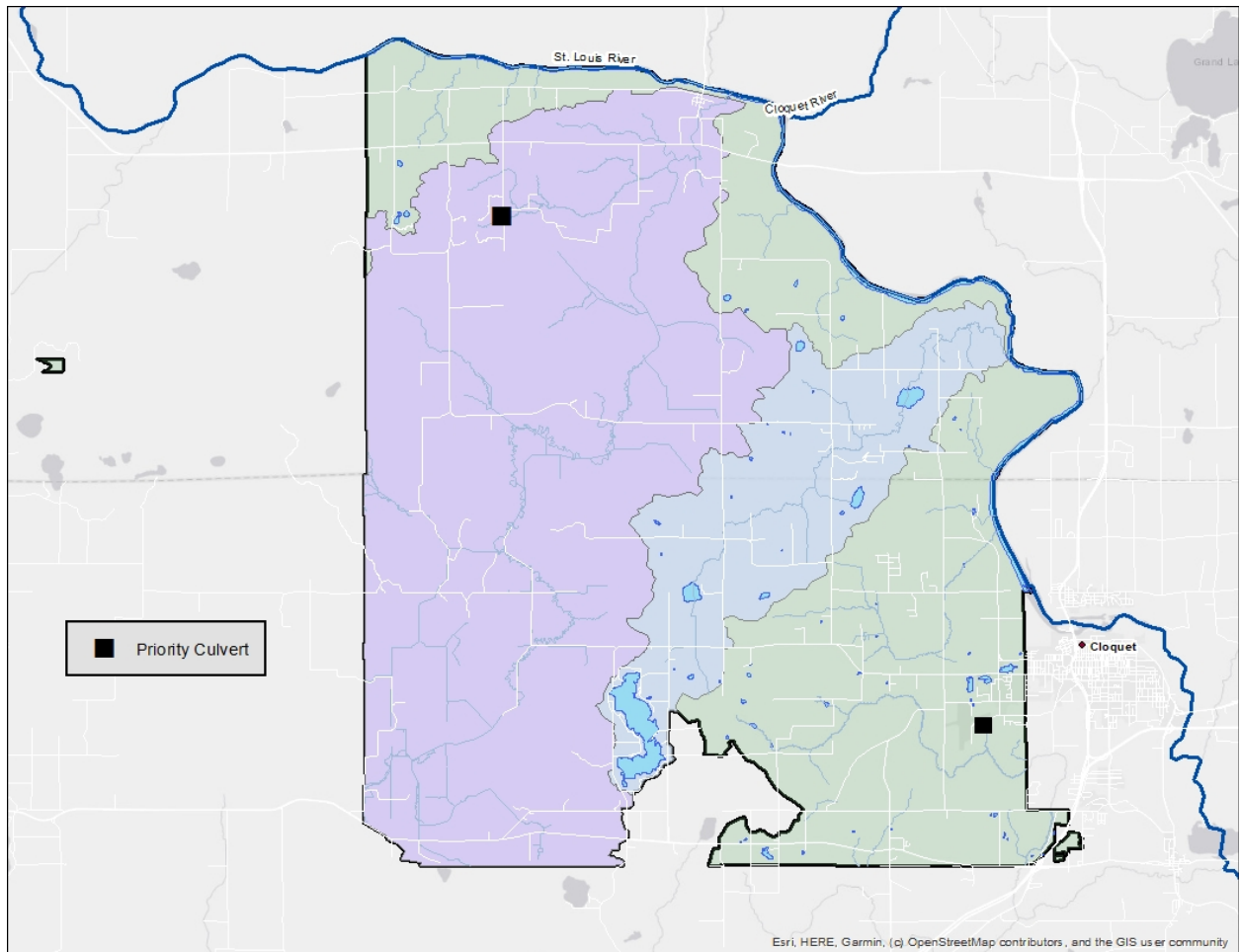




Table 7-4. Priority culvert locations in the Fond du Lac planning area. One culvert is in the Stoney Brook subwatershed. The other culvert is outside the priority areas for this plan.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Design and implement removal of barriers at Martin Branch (Stevens Road) and install an alternative crossing		WBIF	1 project completed	Martin Branch	Fond du Lac/St. Louis County			✓	✓		\$100,000
		Other									
Design and implement removal of barriers on Jolicoeur Creek (near Cloquet Airport).		Other	1 project completed	Jolicoeur Creek	Fond du Lac	✓	✓	✓			\$100,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 2500 Linear Feet of high priority streams and tributaries.

Over half of the Stoney Brook watershed has been altered by extensive ditching, and the headwaters of the Simian Creek watershed includes some ditched tributaries. A large underground pipeline corridor bisects the Stoney Brook watershed and crosses the Simian Creek watershed headwaters. Altering the stream in this way reduces habitat quality, warms waters and increases sediment pollution. Managing hydrologic functions such as water retention and flow are harder in ditched systems than in natural systems, and in the case of the Stoney Brook watershed, hydrologic modification requires extensive water level management to maintain harvestable stands of wild rice. Fond du Lac Resource Management is in the final stages of completing a watershed model, in partnership with USGS, which will identify management actions that can improve hydrologic functioning in this watershed. Recommended actions include plugging obsolete ditch laterals and breaching the ditch in other locations to allow water to access the original floodplain.

In addition to these hydrologic modifications, a sinking bridge on Martin Branch at Stevens Road is negatively impacting brook trout habitat upstream of the road. And on Simian Creek, FDL partnered with the US Army Corps of Engineers to create a watershed model to determine the causes and proposed actions to manage water levels on Cedar Lake. Cedar Lake used to support harvestable stands of wild rice in its littoral zone, but decades of sustained high water have caused a sharp decline in wild rice abundance. The watershed model determined that sedimentation in the lake outlet, coupled with a large beaver dam downstream, are causing backwater effects that prevent the lake level from dropping. Proposed actions include channel clearing at the lake outlet and removing the beaver dam downstream.

Restoring these stream reaches will improve habitat quality and hydrologic functioning and increase water storage during storm events.

Priority Area	Long-Term Goal (Linear Feet Restored)	10-Year Goal (Linear Feet Restored)
Simian Creek	35,000	1500
Stoney Brook	240,000	1000
Total	275,000	2500

Targeted Resources	Project Outcomes
Martin Branch	Protect brook trout population
Stoney Brook	Improve stream/floodplain connection and storage
Wild rice lakes	Maintain harvestable wild rice stands

Important Considerations



Restoring floodplains can mitigate impacts of **climate change** by decreasing stream erosion during increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



This goal addresses **equity** by protecting wild rice stands and trout for subsistence harvest. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Restoring streams can protect trout stream habitat and wild rice stands. Trout and wild rice are a **culturally significant species**

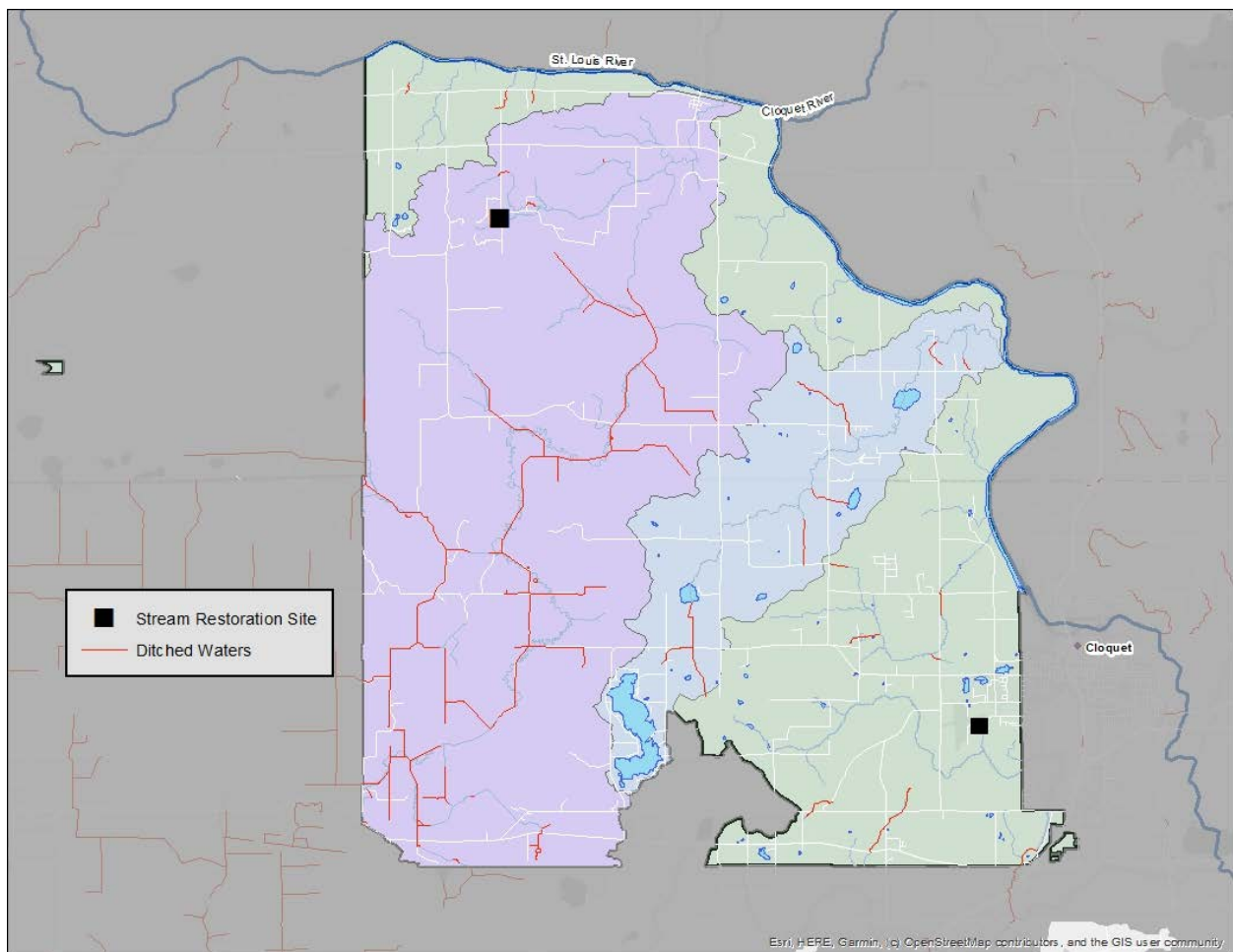


Figure 7-5. Priority stream restoration sites in the Fond du Lac planning area. One site is outside the priority areas for the plan.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-20256	2027-2028	2029-2030	2031-2032	Total 10-year cost
Design and implement 1000 feet of stream channel restoration @ Martin Branch (Stevens Road)		WBIF	1000 feet restored	Martin Branch	Fond du Lac/ contractors			✓	✓	✓	\$50,000
		Other									
Clear and improve 650 ft of Simian Creek at the outlet of Cedar Lake to lower water level to improve wild rice habitat. Widen the channel to 12 ft and increase channel bottom width by 1 ft.		WBIF	650 ft of channel cleared	Simian Creek	Fond du Lac/ contractors		✓	✓			\$200,000
		Other									
Deploy drone to gather footage of beaver dam extent at Simian Creek downstream of Cedar Lake; use footage to create a plan for beaver dam management to lower water levels in Cedar Lake to support wild rice		WBIF	1 management plan completed	Simian Creek	Fond du Lac/ Carlton County	✓					\$5,000
Use the beaver dam management plan to remove the beaver dam downstream of Cedar Lake		WBIF	890 ft of beaver dam removed	Simian Creek	Fond du Lac/ contractors				✓		\$300,000
		Other									
Using the Stoney Brook hydrology model, restore two obsolete ditch laterals to original stream channel		WBIF	2 projects	Stoney Brook	Fond du Lac				✓	✓	\$250,000
		Other									

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Maintain and increase the current acre/feet of watershed storage by restoring wetlands in identified priority areas where they have been lost and/or altered due to ditching or development activities.

Many areas of the watershed were ditched during European settlement to drain land for farming. The loss of wetlands and water storage has impacted nearby streams by speeding the flow of water during snowmelt and rainfall events. The result is increased erosion within the stream channel. Many of these ditches are no longer serving a purpose and are negatively impacting wild rice by increasing lake level fluctuations. Restoring wetland function in these targeted areas will protect wild rice and water quality.

Priority Area	Long-Term Goal (Project Sites)	10-Year Goal (Project Sites)
Simian Creek	3	0
Stoney Brook	12	1
Total	15	1

Targeted Resources
Deadfish Lake

Project Outcomes
Protect wild rice
Improve stream habitat
Reduced sediment pollutants

Important Considerations



Restoring wetlands can mitigate impacts of **climate change** by decreasing stream erosion during increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



This goal addresses **equity** by protecting wild rice stands and trout for subsistence harvest. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Restoring streams can protect trout stream habitat and wild rice stands. Trout and wild rice are a **culturally significant species**

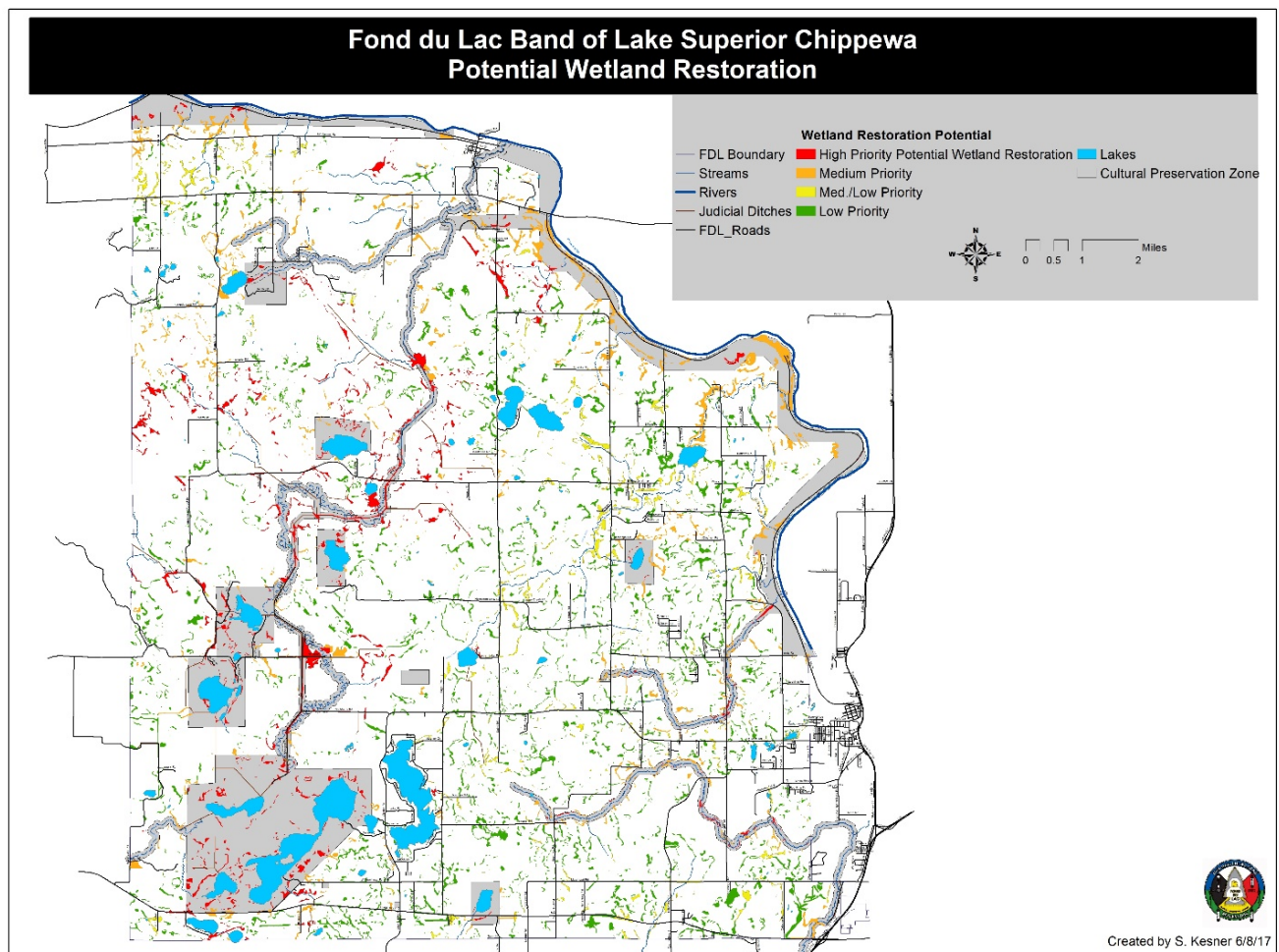



Figure 7-6. Fond du Lac wetland restoration priorities.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Using the Stoney Brook hydrology model, breach the ditched stream channel downstream of Deadfish Lake to allow water to access the original stream channel and floodplain.		WBIF	465 acres of floodplain reconnected, 240 ft of ditch wall breached	Stoney Brook	Fond du Lac/ contractors						\$800,000
		Other					✓	✓	✓		

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect & manage 11 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.

Forests in this region play a vital role in protecting lakes, streams and drinking water. They help slow the flow of water on the landscape, reducing erosion and increasing groundwater infiltration. In addition, they provide habitat to countless animal species. Headwaters tributaries and wetlands are an important focus because they play such an important role in protecting habitat for wild rice and trout.

The biggest focus in the Fond du Lac planning area is to restore white cedar in the headwaters of Martin Branch Road. In addition, there are 4 forest roads in the planning area that are targeted to reduce erosion during and after logging activities.

Priority Area	Long-Term Goal (Forest Projects)	10-Year Goal (Forest Projects)
Simian Creek	0	0
Stoney Brook	5	5
Total	5	5

Targeted Resources
Martin Branch

Project Outcomes
Protect brook trout population
Improve habitat

Important Considerations



Restoring forests can mitigate impacts of **climate change** by reducing the impact of peak flows during increasingly common high rainfall events. Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



This goal addresses **equity** by protecting wild rice stands and trout for subsistence harvest. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Restoring forests can protect trout stream habitat by providing shade. Trout are a **culturally significant species**

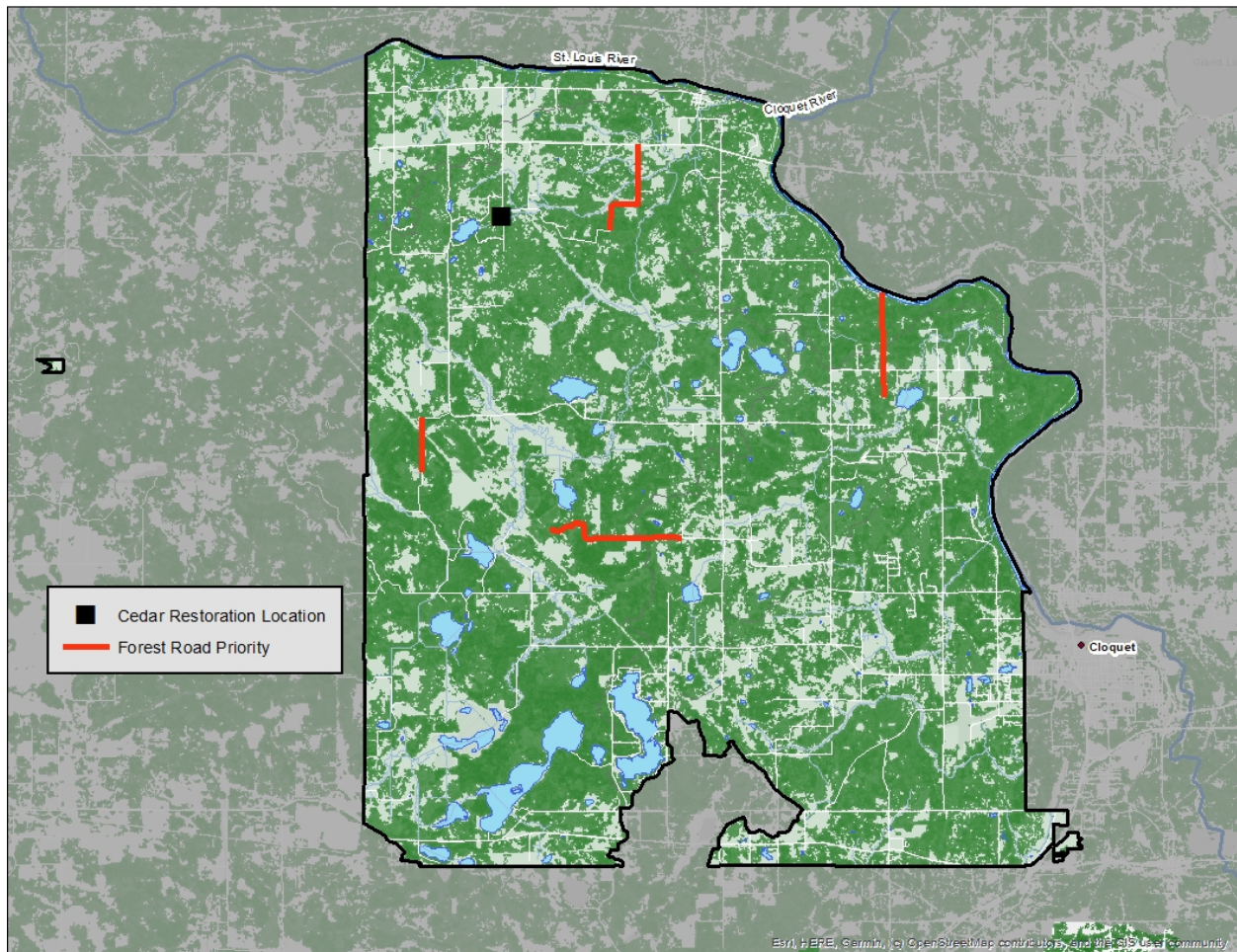




Figure 7-7. Forested land in the Fond du Lac Reservation (indicated in green). The targets for this plan include a cedar restoration project and forest road maintenance.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Restore 11 acres of cedar swamp at Martin Branch (Stevens Road).		WBIF	11 acres restored	Martin Branch	Fond du Lac				✓	✓	See Martin Branch stream channel project costs
		Other									
Prioritize, design and implement forest road management to reduce erosion during and after logging activities		Other	4 forest roads prioritized and managed	Stoney Brook	Fond du Lac, Counties, DNR	✓	✓	✓	✓	✓	\$100,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Identify and manage 10 acres of high priority sites/resources for invasive species.

Most invasive species have some impact on forest or wetland ecosystem health, as they overwhelm populations of native plants, disrupt habitat for wildlife, alter hydrology and nutrient cycling and lead to poor-functioning, less biodiverse systems. These disruptions can lead to water quality issues.

Emerald ash borer, a non-native insect that infests ash trees, is present in cities close to the Reservation, including Cloquet, MN, Duluth, MN and Superior, WI. Emerald ash borer causes almost complete mortality in ash stands. Since ash stands are prevalent on the Reservation, especially black ash in wetland areas, the total loss of ash on the Reservation will cause significant changes in the ecology and natural processes of our forests. Since black ash trees act as major transpiration pumps in wetlands, drawing down groundwater levels in wetlands, ash eradication will likely lead to a higher water table in many wetlands, which will drive changes in wetland type, often resulting in cattail swamps, which are poorly functioning wetlands. These degraded wetlands may have limited ability to detain and retain water, which could lead to increased stormwater runoff to receiving waters, leading to systems that are “flashier” in response to rain events. Since black ash stands exist in headwater areas of the Reservation, upstream of our manoomin lakes, these changes in water mass balance could have deleterious impacts on manoomin by increasing water levels in these lakes. Manoomin has a narrow range of water depths in which it thrives. FDL Office of Water Protection (OWP) and FDL Forestry have partnered in a pilot project to conduct understory planting in existing black ash stands to discover which, if any, tree species could fill the niche that will be vacated by black ash in the coming years.

Chinese mystery snail is an invertebrate that can reproduce and take over areas very quickly. They can survive up to 12 weeks out of water, and once in a new waterbody can quickly displace native snails, out-competing them for resources such as food and habitat. They also are intermediate hosts for many parasites and trematodes that can kill or cause harm to waterfowl and smallmouth bass. They have also been found to be a potential pathway for human flukes. Chinese mystery snails often have large die offs in mid-summer and their shells can litter beaches, becoming a nuisance to recreational users. Once established, they are very difficult to eradicate from any area.

Priority Area	Long-Term Goal (Acres)	10-Year Goal (Acres)
Simian Creek	5	5
Stoney Brook	5	5
Total	10	10

Targeted Resources
Simian Lake
West Twin Lake
Wild Rice Lakes

Project Outcomes
Protect wild rice
Protect fish and waterfowl
Protect watershed storage

Important Considerations



Managing invasive species can mitigate impacts of **climate change** by maintaining wetland functions and reducing peak flows during increasingly common high rainfall events. . Some climate change predictions include increased rain events of over one inch of precipitation (*Stults, 2016, p. 26*).



This goal addresses **equity** by protecting wild rice stands for subsistence harvest. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Managing invasive species can protect wild rice stands. Wild rice is a **culturally significant species**

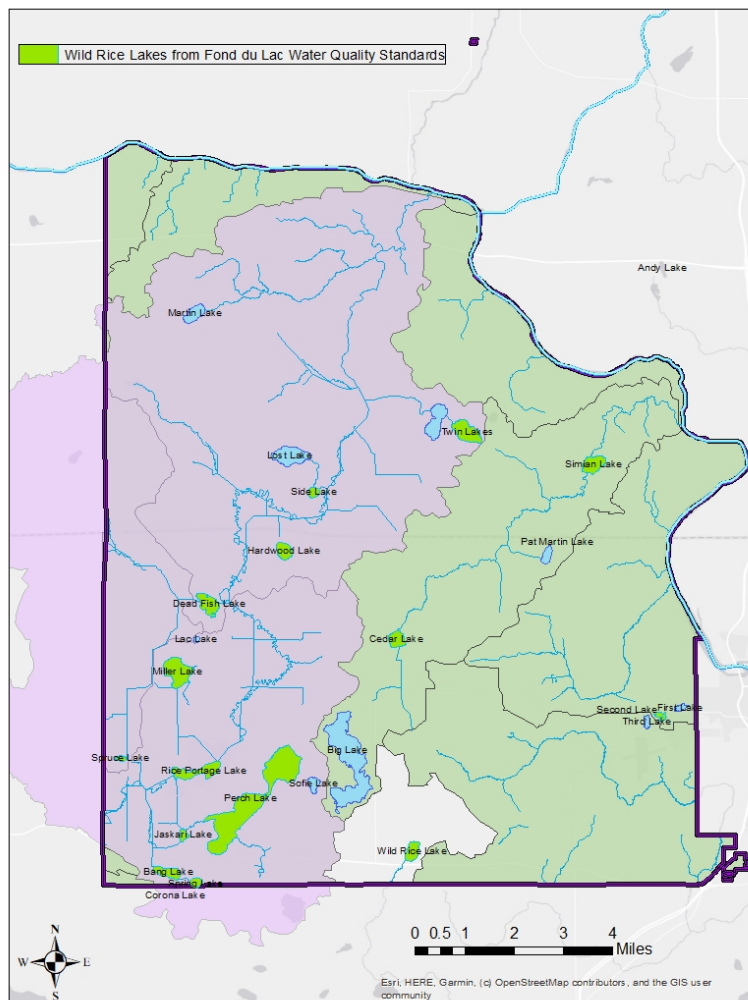





Figure 7-8. Wild rice lakes in the Fond du Lac planning area.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Conduct 5-acre black ash understory planting in wild rice headwaters		WBIF	5 acres planted	Wild rice lakes	Fond du Lac		✓			✓	\$40,000
Conduct buckthorn and Honeysuckle removal on 5 acres near Simian Lake		Other	5 acres of treatment	Simian Lake	Fond du Lac	✓			✓		\$25,000
Complete 2 mailings to Lakeshore landowners about Chinese Mystery Snail @ Simian and West Twin Lake		Other	2 mailings	West Twin Lake	Fond du Lac	✓		✓			\$500

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect and restore 1000 feet of shoreline in prioritized lakes and streams for natural buffers and reduced erosion

There are almost 300 miles of streams in the Fond du Lac planning area, with many miles having relatively natural shorelines. However, some shorelines have been altered for a variety of reasons including land development and farming. Restoring altered shorelines provide a variety of benefits including filtering sediment and other pollutants, providing shade to streams, storing water and reducing flooding and providing valuable habitat.

The largest target of this effort will be Big Lake which has the most developed shoreline in the planning area. Other developed lakes include Bang and West Twin Lakes.

Priority Area	Long-Term Goal (Projects)	10-Year Goal (Projects)
Simian Creek	5	5
Stoney Brook	1	0
Total	6	5

Targeted Resources
Big Lake
Bang Lake
West Twin Lake

Project Outcomes
Protection of wild rice
Improve habitat
Reduced sediment and nutrient pollution
Reduced runoff volumes

Important Considerations



This goal addresses **equity** by protecting lakes safe for recreation and subsistence harvest of fish. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Education and outreach are needed to increase **social capacity** and participation in riparian projects.



Restoring shorelines of wild rice lakes can improve critical habitat for **culturally significant species**.

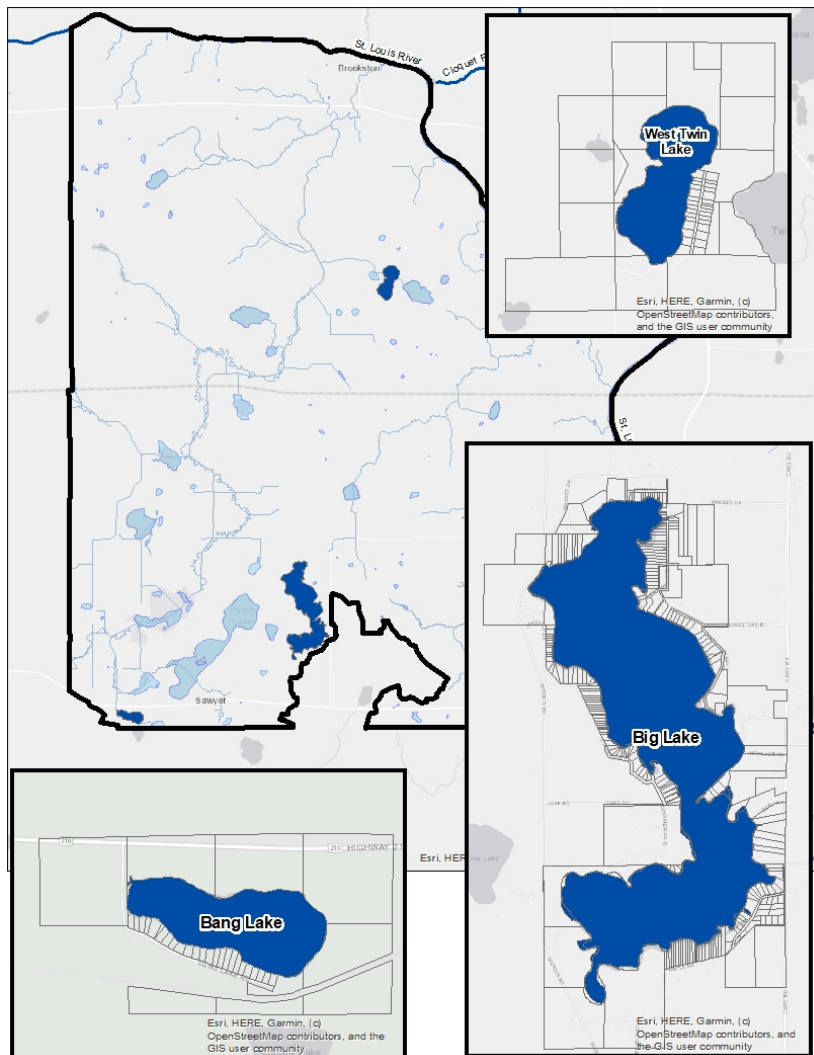




Figure 7-9. Parcels on priority lakes in the Fond du Lac planning area including Big, Bang and West Twin Lakes. Areas with more parcels are targeted for shoreline restorations.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Conduct 2 training events at Big Lake to teach landowners about natural shorelines		WBIF	2 events	Big Lake	Fond du Lac / Carlton SWCD, County			✓		✓	\$5000
Complete 5 shoreline projects		WBIF	5 shoreline projects completed	Big Lake, Bang Lake, West Two Lake	Carlton SWCD / FDL, Carlton County	✓	✓	✓			\$25,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect/Restore 3 high priority wild rice stands/populations (water levels, disturbance, shoreland development).

According to oral traditions, more than a thousand years ago seven spirits or Grandfathers came to the Anishinaabe people living on the Atlantic coast, from the mouth of the St. Lawrence River south into Maine and New England states. In order to survive and preserve their ways of life, the Anishinaabeg migrated westward through the Great Lakes basin, guided by the prophecies that led them to the place where food grew up out of the water. That food was wild rice or manoomin, the “good berry”; the only grain native to North America. They found manoomin growing in the waters of tributaries, lakes and coastal areas of Lake Superior, and established a new homeland here, depending upon the harvest and preservation of this highly nutritious food to survive the long winters. Today, it remains a dietary staple for the Ojibwe people, as much medicine as it is food, with cultural and spiritual importance and a necessary offering at community feasts and ceremonies.

For millennia, Minnesota tribes have been physically and spiritually sustained by their harvest and consumption of wild rice (*Zizania palustris*, *Zizania aquatica*), known as manoomin to the Ojibwe and Psíŋ to the Sioux or Dakota people. Manoomin is considered sacred, a gift from the Creator; it is essential to tribal subsistence culture, diet, and traditions. Wild rice is also an important food source for resident and migratory waterfowl, and provides forage and cover for many other wildlife species indigenous to this ecoregion, making it a keystone species in the water-rich landscape of the upper Midwest. The wild rice harvest is still one of the most important annual events on many Native American reservations and across ceded territories, where tribes retain hunting, fishing and gathering rights protected by treaties. This unique and nutritious grain was once widely distributed across much of the United States east of the Rockies. However, most of the specific wetland and aquatic habitat that wild rice requires has been developed, altered or degraded. Today, natural wild rice only grows abundantly in north central and northeastern Minnesota. From historical reports, Band member accounts, and current Minnesota Department of Natural Resources and tribal reports, manoomin has extensively declined throughout Minnesota.

Priority Area	Long-Term Goal (wild rice lakes restored/protected)	10-Year Goal (wild rice lakes restored/protected)
Simian Creek	2	1
Stoney Brook	11	2
Total	13	3

Targeted Resources
Deadfish Lake
Cedar Lake
Bang Lake

Project Outcomes
Improved habitat
Supporting wild rice harvesting
Protecting wild rice
Protecting Band member health

Important Considerations



This goal addresses **equity** by protecting wild rice for subsistence harvest. As many as 36% of people reported income less than 185% of the poverty level and 50% are people of color ([MPCA Understanding Environmental Justice in Minnesota, 2016-2020 data](#)).



Education and outreach can increase **social capacity** and participation projects to help protect wild rice.



Restoring wild rice can improve a **culturally significant species**

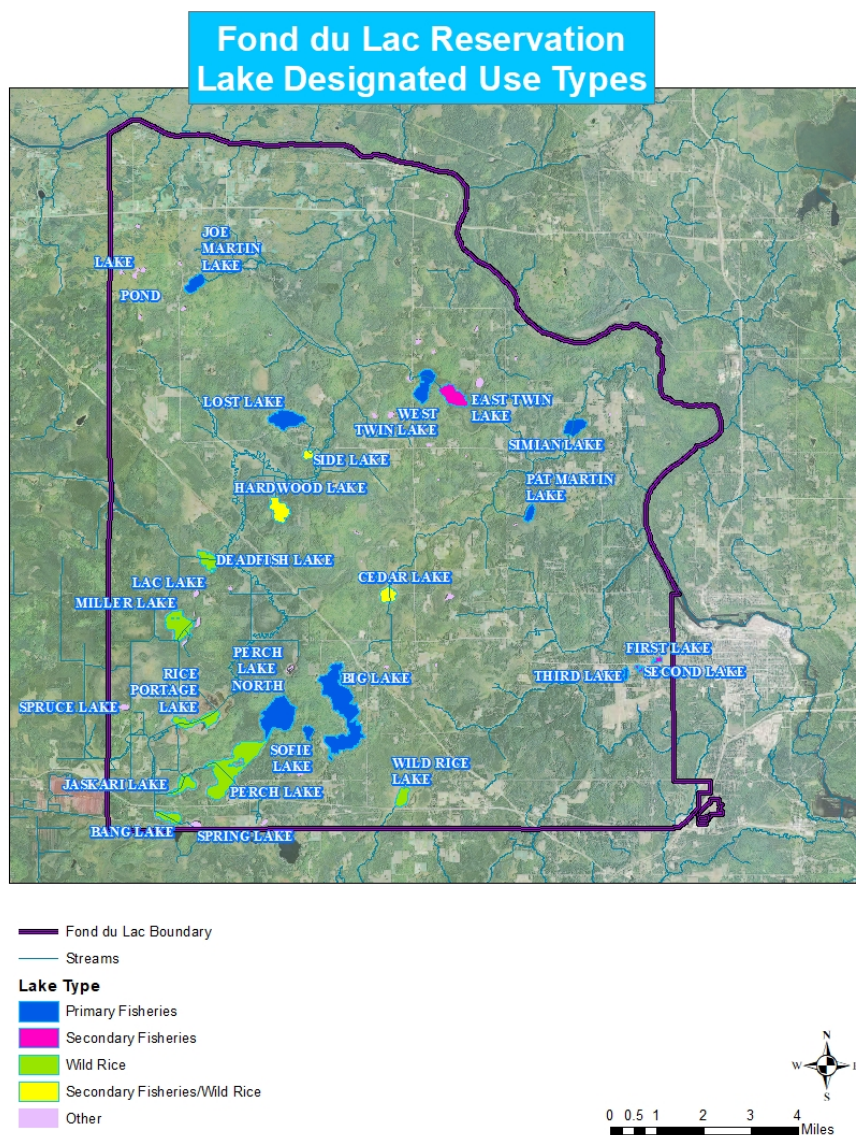






Figure 7-10. Designated lake uses in the Fond du Lac planning area. Lakes in green are the priority for wild rice restoration.

What		How Much		Where	Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Ditch management of 62 feet of ditch downstream of Deadfish Lake to reduce wild rice loss due to backwater effects		WBIF	Resorted wild rice	Deadfish Lake	Fond du Lac				✓	✓	See ditch laterals project costs
Create design plans based off the Army Corps watershed model and remove the beaver dam on Simian Creek downstream of Cedar Lake and dredge 3500 feet of blocked channel at the outlet of Cedar Lake to lower water levels to support wild rice		Other	1 Project designed and implemented	Cedar Lake, Simian Creek	Fond du Lac		✓	✓			\$150,000
Restore wild rice at Cedar Lake after restoration activities completed to lower lake level		Other	1 wild rice restoration project	Cedar Lake	Fond du Lac					✓	\$1000
Conduct outreach to landowners at Bang Lake to protect littoral wild rice		WBIF	1 outreach effort	Bang Lake	Fond du Lac/ Carlton County				✓		\$500

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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Section 8. Duluth Urban Planning Area

The Duluth Urban Area is the most developed part of the entire planning area. At the same time, this area has abundant cold-water streams, including an incredible trout stream resource. According to [Social Vulnerability Index](#) developed by the Centers for Disease Control, the Duluth Planning Area also has highly vulnerable populations, especially in the Keene Creek watershed. The convergence of all these factors provides many opportunities to protect and restore resources used by a diversity of people.

The main concerns for this planning area are protecting trout streams from urban stressors including bacteria, chlorides (salt) and stormwater. Improving habitat in these streams is also a major goal.

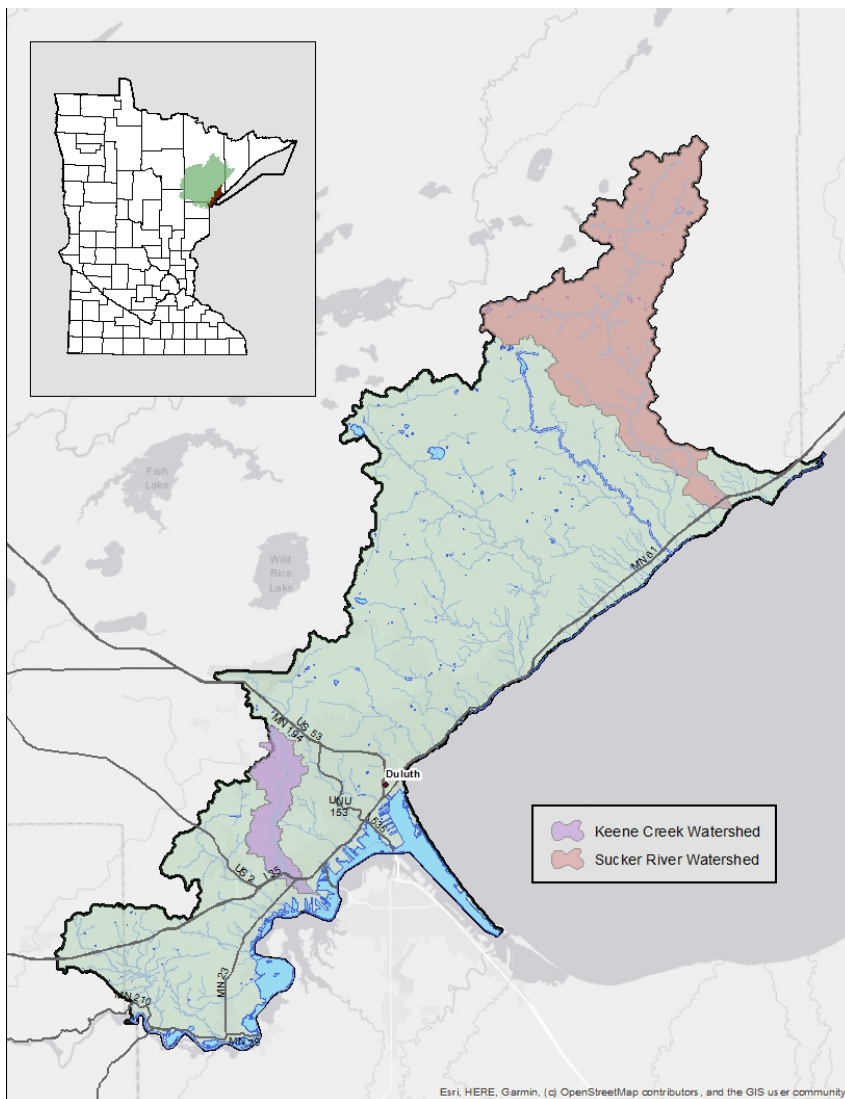






Figure 8-1. Duluth Urban planning area that includes the many trout streams that flow directly into Lake Superior. Priority areas include Keene Creek and the Sucker River.

Duluth Urban Area Priority Issues

	Surface Water Quality	<ul style="list-style-type: none"> • Pollutants (e.g., nutrients, bacteria, sediment, chloride, mercury, etc.) are a source of degradation leading to the impairment of aquatic life, aquatic consumption, and aquatic recreation uses.
	Land Use	<ul style="list-style-type: none"> • Urbanization, development, and road expansion can impact watershed health and increase nutrient and other pollutant loadings when stormwater is not effectively managed.
	Altered Hydrology	<ul style="list-style-type: none"> • Channel instability, excess sedimentation, and disruption of natural sediment transport and flow are present throughout the Planning Area. • Loss of water storage, alt. flows, and changes in watershed boundaries are the result of land development, drainage, and legacy mining that alter nat. hydrologic processes. • Obsolete and nonfunctioning dams alter natural hydrology, impede fish passage and aquatic organism movement, and affect stream temp.
	Habitat	<ul style="list-style-type: none"> • Forest fragmentation and loss can affect ecological community processes, community resilience and adaptive capacity, habitat connectivity and quality, species migration capacity, and surface water and groundwater quality. • Aquatic, riparian, and shoreland habitats are impacted by land use changes, pollution, climate change and altered flows which can lead to degraded resources, incisement and floodplain disconnection, impeded fish passage, and fragmentation. • Aquatic and terrestrial invasive species pose a threat to individual habitats and overall biodiversity.

Main Planning Area Issues

- Urban stressors including bacteria, salt and stormwater are impacting stream health
- Habitat for trout and other aquatic species is in need of restoration



Desired Future Condition (Long-Term Goal):

- *Urban streams provide safe fishing and recreation for all people*
- *Streams provide good habitat for trout and other aquatic species*



Reduce bacteria and other pollutants into streams by completing farm projects on 100% of properties identified as needing enhancements

Keene Creek is listed as impaired for aquatic recreation due to *E. coli* bacteria by the MPCA. This type of bacteria is found in the intestines of warm-blooded animals, including people. Bacteria in streams can come from a variety of sources, including geese and other birds, pet waste and leaky sewer connections. Normally *E. coli* does not survive long in the environment. However, in Keene Creek, *E. coli* is surviving and regrowing in unhealthy stream reaches where the sediment is abundant (Burns McDonnell, 2020 p. 72-74). *E. coli* bacteria alone does not cause harm to people recreating in streams, but it can indicate the presence of other pathogens that could cause illnesses.

The goal of the plan is to work with municipalities to implement projects and strategies to reduce bacteria input and regrowth in Keene Creek.

Priority Area	Long-Term Goal (Municipalities)	10-Year Goal (Municipalities)
Keene Creek	2	2
Sucker River	0	0
Total	2	2

Targeted Municipalities
Duluth
Hermantown

Project Outcomes
Waters are safe for recreation
Improved habitat

Important Considerations

This goal addresses **equity** by keeping streams safe for recreation and protecting drinking water. Replacement assistance is targeted to low-income residents.



Education and outreach can increase **social capacity** to make change.



Addressing septic systems near trout streams can improve critical habitat for **culturally significant species** and ensure fishing is safe for all.

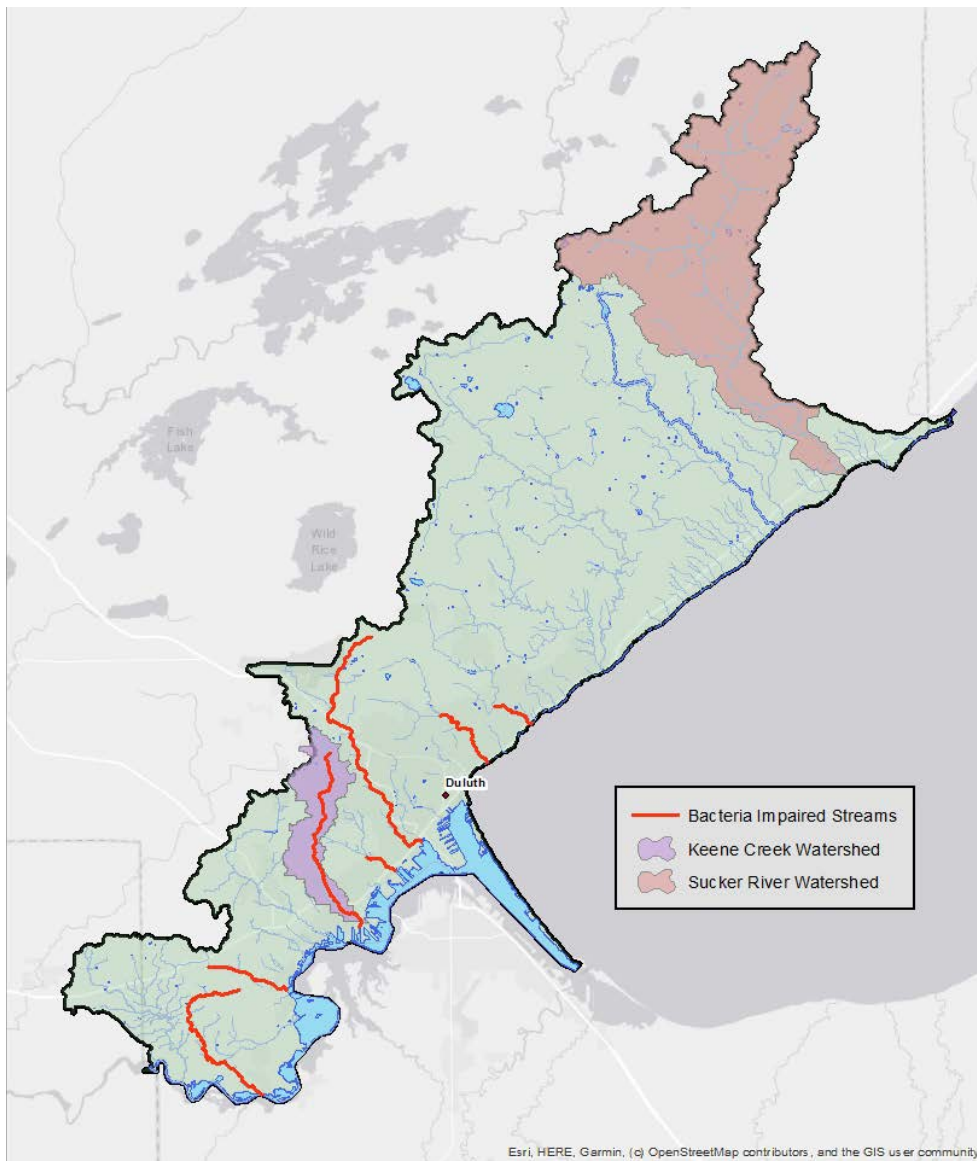



Figure 8-2. Bacteria impaired streams in the Duluth Urban planning area.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Replace/upgrade 14 of the identified 21 sewer lines in Keene Creek subwatershed (<i>Tetra Tech, 2018b, p. 63-64</i>)		Baseline	14 projects implemented	Keene Creek		City of Duluth	✓	✓	✓	✓	✓	\$300,000
		Other										
Address sanitary sewer stream crossings within the City of Hermantown and City of Duluth.		Other	1 project implemented	Keene Creek		City of Duluth, City of Hermantown	✓	✓	✓	✓	✓	\$300,000
Coordinate implementation of bacteria reduction strategies among communities		WBIF	8 meetings held	Keene Creek		DUWAC			✓			See watershed wide staff costs
Follow recommendations outlined in the Duluth Streams Bacterial Source Identification Study Final Report (<i>Burns & McDonnell. P. 84-88</i>).		WBIF	2 projects implemented	Keene Creek		City of Duluth		✓	✓			See watershed wide staff costs
Ensure the MS4 members uphold their permit requirements		Baseline	3 MS4s are in compliance	Keene Creek		MPCA	✓	✓	✓	✓	✓	MPCA cost not calculated
Update Sub Surface Treatment Systems (SSTS)		WBIF	3 systems updated	Sucker River		St. Louis County	✓	✓	✓	✓	✓	\$60,000
		Baseline										
Reduce sediment input by connecting the stream to the floodplain to minimize fine sediment for E. coli regrowth.		WBIF	5000 linear feet of stream bank restored	Lower Keene Creek		South St. Louis SWCD and City of Duluth			✓	✓		See stream restoration goal

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Provide outreach to municipalities for the MPCA Green Steps and Adopt a Drain programs		WBIF	2 programs adopted	Keene Creek	SLN	South St. Louis SWCD	✓	✓	✓	✓	✓	\$25,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Manage chlorides reaching surface and ground water from road salts and water softener salts by ensuring 100% of municipalities have Smart Salt Certified Staff, 100% Communities achieved Level 2 Certified & education & outreach to 100% of priority landowners.

The Duluth planning area is the most developed area in the entire watershed. The density of roads, sidewalks and parking lots results in a high risk of chloride from road salts being washing into streams. Once salt washes into streams and lakes, it cannot be removed, affecting the health of fish and other aquatic life to survive. There are currently three chloride impairments in the watershed, including Keene Creek as listed in the [MPCA's 2022 Impaired Waters List](#).

The goal of this plan is to reduce salt use from road maintenance by providing Smart Salt training to municipality maintenance staff and private maintenance staff with large parking lots near priority resources. Priority landowners were identified as commercial landowners with greater than 3 acres of land.

Smart Salt Trained Staff		
Priority Area	Long-Term Goal (Road Authorities)	10-Year Goal (Road Authorities)
Keene Creek	3	3
Sucker River	0	0
Total	3	3

Level 2 Certification		
Priority Area	Long-Term Goal (Road Authorities)	10-Year Goal (Road Authorities)
Keene Creek	3	3
Sucker River	0	0
Total	3	3

Education & Outreach to Priority Landowners		
Priority Area	Long-Term Goal (Road Authorities)	10-Year Goal (Road Authorities)
Keene Creek	30	30
Sucker River	0	0
Total	30	30

Targeted Communities
Duluth
Hermantown
St. Louis County

Project Outcomes
Improved habitat
Reduced pollutants into high quality resources

Important Considerations



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities.



Education and outreach can increase **social capacity** to make change.



Addressing salt use near trout streams can improve habitat for **culturally significant species**.

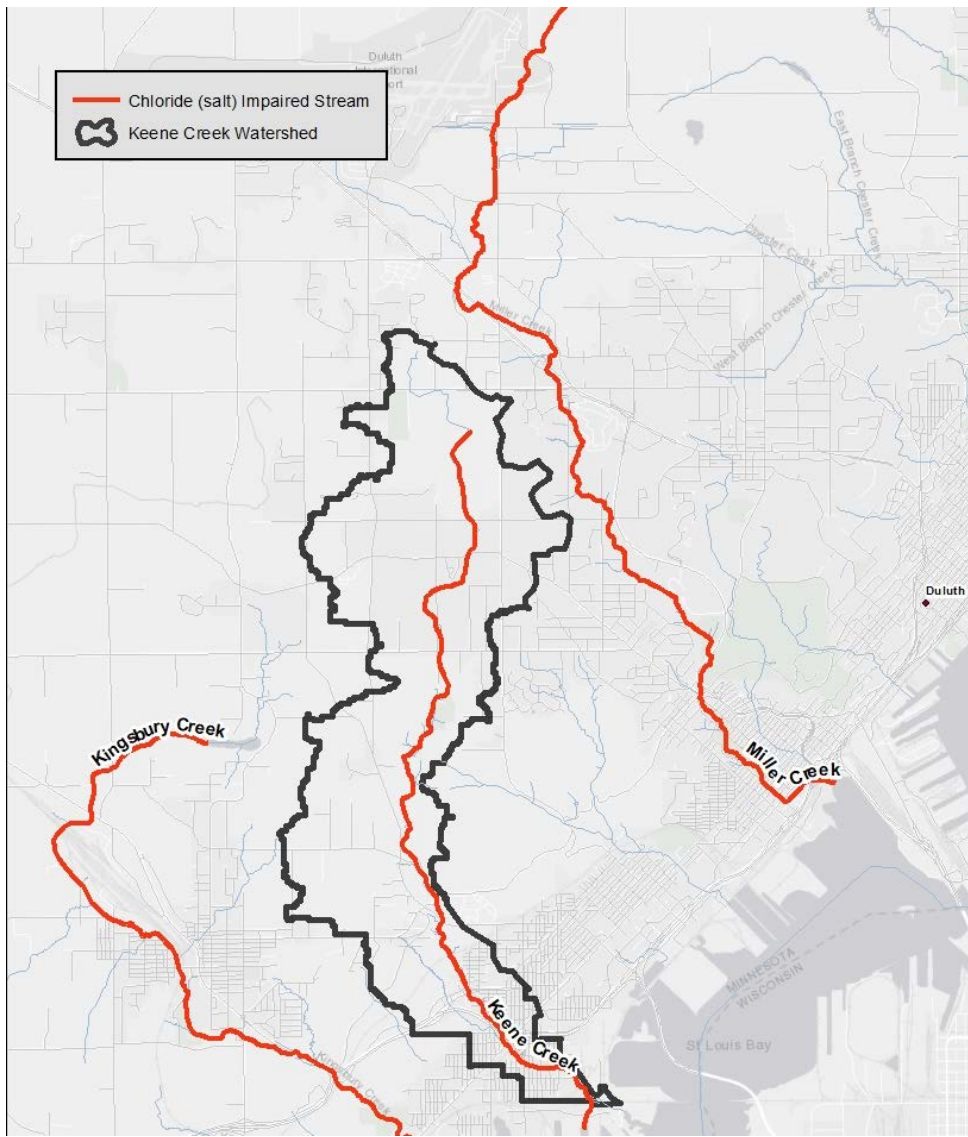














Figure 8-4. Duluth Urban Area chloride impaired streams.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Education and outreach campaign is developed and implemented to property owners with three acres or more of impervious surface and provide training to commercial landowner employees on salt application and storage		WBIF	1 plan developed and implemented	Keene Creek Watershed		SWCD / RSPT municipalities		✓				\$25,000
Review Chloride TMDL and participate in MPCA led meetings for Keene Creek for potential implementation projects		Other	1 Implementation on List	Keene Creek		South St. Louis SWCD / Municipalities/ MPCA/DUWAC or Sea Grant		✓				See watershed wide staff costs
Help municipalities secure grant funds to increase their street sweeping programs and purchase sweeper to improve local programs		WBIF	1 grant coordination meeting	Keene Creek		DUWAC / St. Louis County, City of Duluth, or City of Hermantown	✓	✓	✓	✓	✓	See watershed wide staff costs
		Other										
Promote purchase of salt reducing equipment, like brine application		WBIF	1 Promotional Campaign	Keene Creek		SWCD/ RSPT	✓	✓				\$20,000
Fund DUWAC group coordination as a place to share knowledge and promote education opportunities		WBIF	2 mtgs/Yr focused on Keene Cr	Keene Creek		DUWAC	✓	✓	✓	✓	✓	\$50,000
Evaluate road authority's salt training with Smart Salt training and identify gaps.		WBIF	1 report	Watershed Wide	Watershed Wide	SWCD / municipalities	✓					See watershed wide staff costs

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Development & implement a salt use reduction education and outreach campaign		WBIF	1 campaign implemented	Keene Creek	Watershed Wide	SWCD / municipalities, RSPT	✓	✓	✓	✓	✓	\$50,000
Track salt use to determine salt trends		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	SWCD / County	✓	✓	✓	✓	✓	See watershed wide staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Promote the implementation of low impact development techniques to reduce stormwater runoff, volume and rate control in 75% of communities

Stormwater runoff is a concern in this area due to the amount of development near high quality trout resources. Stormwater not only impacts these resources by washing pollutants into streams, but it also has the potential to increase water temperature. Coldwater loving species such as trout are stressed when waters get too warm. By reducing stormwater runoff, watersheds benefit by reducing sediment and nutrient pollutants along with helping keep streams cold. An added benefit is that stormwater best management practices (BMPs) can help groundwater recharge, which in turn helps fuel spring fed streams. Stormwater BMPs can also help slow the flow of stormwater runoff, which reduces peak flows and erosion within stream channels.

The goal of this plan is to work with communities to plan and implement stormwater BMPs where they will have the biggest benefit to water resources.

Priority Area	Long-Term Goal (MS4 Communities)	10-Year Goal (MS4 Communities)
Keene Creek	2	2
Sucker River	1	0
Total	3	2

Targeted Communities
Duluth
Hermantown

Project Outcomes
Decreased sediment and nutrient pollution
Increased protection of high-quality resources
Improved habitat for trout

Important Considerations



Addressing stormwater can mitigate impacts of **climate change** by reducing peak flows during increasingly common high rainfall events and replenishing groundwater supplies

This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities.

Education and outreach can increase **social capacity** to make change.

Addressing stormwater can protect urban trout stream habitat. Trout are a **culturally significant species**

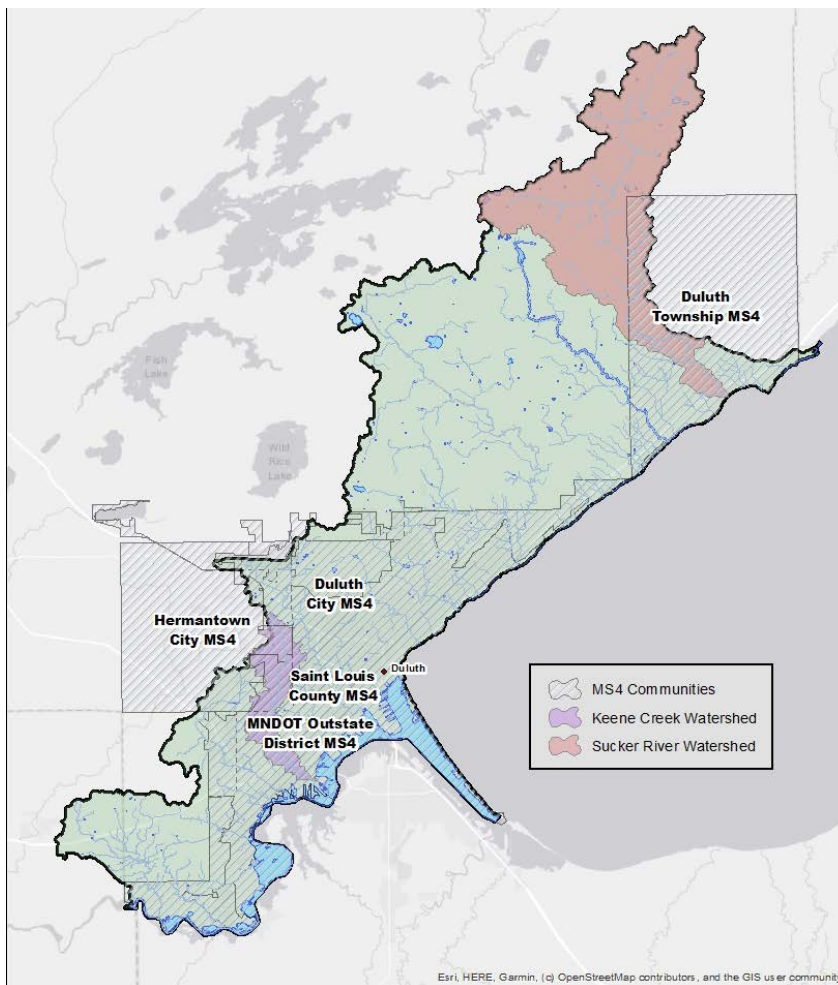














Figure 8-5. MS4 communities in the Duluth Urban planning area.

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Build capacity for green infrastructure projects to be implemented, especially when eligible for outside grant funding		Other	3 grants applied for	Keene Creek		City of Duluth	✓	✓				See watershed wide staff costs
Integrate with US Environmental Protection Agency (EPA) Visualization Ecosystem Land Management Assessments (VELMA) modeling into stormwater management for Keene Creek		Other	1 model completed & incorporated into planning documents	Keene Creek		DUWAC and EPA	✓					\$50,000
Review ordinances and remove barriers to low impact development.		Other	1 ordinance study completed	Duluth Urban Area		DUWAC		✓				\$100,000
		WBIF										
Coordinate and develop stormwater management plans for Keene Creek that considers stormwater flow may be different than watersheds flow		WBIF	1 plan developed	Keene Creek		City of Duluth, DUWAC			✓			\$200,000
Implement a Keene Creek stormwater management plan.		WBIF	2 BMPs implemented from the plan	Keene Creek		SWCD / St. Louis County and the Cities of Duluth and Hermantown				✓	✓	\$1,000,000
Develop and implement an education and outreach campaign for the effects of stormwater on Keene Creek that includes TV and radio commercials and post signage in public spaces. Share the results of the TMDL and new impairments		WBIF	1 campaign developed and implemented	Keene Creek		DUWAC		✓				\$25,000

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Utilize the DUWAC (Duluth urban watershed advisory committee) and RSPT (Regional Stormwater Protection Team) to coordinate the actions of MS4 agencies in the Keene Creek watershed.		WBIF Baseline	1 meeting / year	Duluth Urban Area		DUWAC & SWCD/, County, Cities, Townships, State Agencies, RSPT	✓	✓	✓	✓	✓	See watershed wide staff costs
Incorporate stormwater implementation into planned road construction projects		WBIF	5 projects completed	Duluth Urban Area		St. Louis County, City of Duluth and City of Hermantown (road authorities).	✓	✓	✓	✓	✓	\$500,000
Develop and implement an education and outreach campaign that could include: -Promote and educate public on project success, such as the restoration of the coastal wetland - green infrastructure promotion		WBIF	1 campaign developed and implemented	Duluth Urban Area		Sea Grant	✓	✓	✓	✓	✓	\$50,000
Develop and implement a homeowner program for help with design and implementation of BMPS's such as rain gardens and urban forestry		WBIF	1 program implemented	Keene Creek	DUA, SLS	South St. Louis SWCD	✓	✓	✓	✓	✓	\$350,000
Look for opportunities to reduce flood risk and associated infrastructure damage		Other	5 meetings	Watershed Wide	Watershed Wide	South St. Louis SWCD	✓	✓	✓	✓	✓	See watershed wide staff costs

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Work with road authorities to educate and implement stormwater BMPs associated with roadside ditches to help slow the flow and minimize un-vegetated channels and associated erosion		WBIF	5 projects implemented	Keene Creek	DUA, SLS	South St. Louis SWCD South St. Louis SWCD	✓	✓	✓	✓	✓	\$500,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Reconnect 18 miles of priority streams and tributaries to benefit aquatic life and improve water quality.

The Duluth Urban area has abundant trout streams and cold-water resources. Trout and other aquatic organisms need to travel within the stream systems during different seasons and periods of their life cycle. Connecting habitats within this watershed is vital to support these species. In addition, replacing undersized culverts has the added benefit of reducing sediment erosion. Undersized culverts not only prevent fish passage, but can also alter the hydrology of the stream, resulting in unwanted sediment pollutants. Dams and other man-made barriers have a similar effect on stream health, warming water and preventing fish passage.

South St. Louis SWCD and MPCA completed barrier assessments in both the Keene Creek watershed (*Tetra Tech, 2018b, Appendix B, p.15-17*) and the Sucker River Watershed (Sucker River Geomorphic Assessment). These studies found 27 culverts and dams that were affecting fish passage. This study prioritized these crossings based on fish passage. The focus of this plan will be to remove the structures that have the most impact of fish passage. Prioritized based on fish which includes culvert width, outlet drop, and sediment erosion.

Priority Area	Long-Term Goal (Sites)	10-Year Goal (Sites)
Keene Creek	18	3
Sucker River	9	2
Total	27	5

Targeted Resources
Keene Creek
Sucker River

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



Upsizing culverts can mitigate impacts of **climate change** by reducing washouts and stream erosion during increasingly common high rainfall events.



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities.







Education and outreach can increase **social capacity** to make change.



Addressing undersized culverts can protect trout stream habitat. Trout are a **culturally significant species**

Table 8-1. Priority connectivity projects in the Duluth Urban planning area (Tetra Tech, 2018b, Appendix B, p. 15-17; SSL SWCD, 2018 Appendix 4).

Stream	Location
Sucker River	Highway 61
Sucker River	Snowmobile Trail
Sucker River	McQuade Road
Sucker Creek Tributary 5	McQuade Road
Sucker Creek Tributary 3	Paul Road
Ross Creek (Sucker Creek Watershed)	Pequaywan Lake Road
Sucker Creek Tributary 4	McQuade Road
Sucker Creek Tributary 2	Ryan Road
Keene Creek	Okerstrom Road (in Keene Creek Park)
Keene Creek	South Central Avenue
Keene Creek	Dog Park – low head dam

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Outreach to local groups for Keene Creek Park MNDOT Dam Stream restoration and removing MNDOT dam.		WBIF	3 public meetings	Keene Creek		South St. Louis SWCD and City of Duluth		✓	✓	✓		\$10,000
Design and implement 2 priority connectivity projects in Keene Creek: Priority crossings in Keene: 1) Okerstrom Road in the park, 2) South central Ave, 3) Keene Creek Park MNDOT Dam (<i>Tetra Tech, 2018b, Appendix B, p. 15-17</i>)		WBIF	3 completed designs / Implemented, 1.7 miles reconnected	Keene Creek		South St. Louis SWCD		✓	✓	✓		\$1,000,000
Design and implement 2 high priority fish friendly crossings in the Sucker Watershed: Priority Crossings in Sucker (2 mainstem and 2 tributary crossings) - crossings are prioritized now. (<i>SSL SWCD, 2018, Appendix, 4</i>)		WBIF	3 completed projects, 16 miles reconnected	Sucker River		South St. Louis SWCD		✓	✓			\$1,000,000
Use road authorities 5–10-year plans to coordinate with crossing upgrades		Baseline	Annual Plan Review	Trout Streams & Tributaries	Watershed Wide	St. Louis County / South St. Louis SWCD	✓	✓	✓	✓	✓	See watershed wide staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Restore stream reaches that have been altered by human activity, including impounded, straightened, and incised stream reaches on 11,500 Linear Feet of high priority streams and tributaries.

Many tributaries in this watershed have been altered in this area. Altering the stream in this way reduces habitat quality, warms waters and increases sediment pollution. Data collected through the South St. Louis SWCD has identified 11 potential restoration sites in the Keene Creek (*Tetra Tech, 2018b, Appendix B, p. 4*) and Sucker River watersheds (*SSL SWCD, 2018, p. 108-121*).

Restoring these stream reaches will improve habitat quality and water temperatures and reduce sediment and nutrient pollutants.

Priority Area	Long-Term Goal (Potential Restoration Sites) (Linear Feet)	10-Year Goal (Potential Restoration Sites)
Keene Creek	7 (8500)	4
Sucker River	4 (6500)	3
Total	11 (15,000)	7

Targeted Resources
Keene Creek
Sucker River

Project Outcomes
Protection of high-quality streams
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



Restoring streams can mitigate impacts of **climate change** by reducing erosion during increasingly common high rainfall events.







This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities.



Restoring streams can improve trout stream habitat. Trout are a **culturally significant species**.

Table 8-2. Stream restoration sites in the Duluth Urban planning area (Tetra Tech, 2018b, Appendix B, p. 4; SSL SWCD, 2018, p. 108-121).

Stream	Location	Restoration Length (Feet)
Keene Creek	Within Irving Park, downstream 57 th avenue west	690
Keene Creek	Between 57 th Avenue West and Grand Avenue	2008
Keene Creek	Between Grand Avenue and Green Street (Includes dog park)	1905
Keene Creek	Between Green Street and Cody Street	760
Keene Creek	Downstream of Highland Street	732
Keene Creek	Adjacent to Okerstrom Road upstream of Morris Thomas Road	1200
Keene Creek	Engvall's pond	1200
Sucker Creek	Downstream of the downstream-most McQuade Road crossing	570
Sucker Creek	Upstream of Ryan Road crossing	2350
Sucker Creek	Between Ryan Road and Bergquist Road	3400
Sucker Creek	Upstream most McQuade Road crossing	200

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Complete designs and construct 4 priority stream restoration projects in Keene Creek (<i>Tetra Tech, 2018b, Appendix B, p. 4</i>)		WBIF	4 projects implemented	Keene Creek		South St. Louis SWCD			✓	✓		\$1,000,000
Coordinate with utilities and municipalities on project planning		Other	3 project meetings	Keene Creek		South St. Louis SWCD, City of Duluth, DNR - fisheries	✓	✓	✓			\$1500
Complete designs and construct 3 prioritized stream restoration projects in Sucker River (<i>SSL SWCD, 2018, p. 108-121</i>)		WBIF	3 projects implemented	Sucker River		South St. Louis SWCD				✓	✓	\$700,000
		Other										
Coordinate with Keene Creek partners to continue to plan for restoration in the lower reaches of the watershed (below Grand Ave)		Other	3 planning meetings	Keene Creek		City of Duluth / DNR	✓		✓		✓	\$1500

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Maintain and increase 2.5 acre/feet of watershed storage by restoring wetlands in identified priority areas where they have been lost and/or altered due to ditching or development activities

Due to the large amount of development in the Keene Creek subwatershed, areas that hold water on the landscape are vital for protecting water quality. Water storage reducing the impact of rain events and flooding by holding water on the landscape longer and releasing it over a longer period. Roads, parking lots and buildings all speed up water as it falls on the landscape, while natural cover like forests and wetlands hold it back.

Protecting non-developed land in key places is the focus of the first 10 years of the plan. The City of Duluth is finding that tax-forfeited lands are providing the biggest benefit for watershed storage. They have identified parcels with significant environmental, recreational, and/or storm water management value ([City of Duluth Strategic Public Lands Realignment Project](#)). The City of Duluth supports county sale of that minor portion of tax forfeit open space, specifically areas located next to public infrastructure and lacking significant environmental value, which can be economically developed for housing or other community priorities. Based on this information, a total of about 600 acres in the Keene Creek watershed has been identified for protection.

Connected stream floodplains provide another source of water storage. When a stream is connected to the floodplain, water infiltrates the riparian area and is stored on the landscape. A connected floodplain increases ground water input to coldwater trout streams during warm summer months. Floodplain storage can be increased through stream restoration. Projects listed under the "stream restoration" goal will also address this section

Priority Area	Long-Term Goal (Acres Protected)	10-Year Goal (Acres Protected)
Keene Creek	402	200
Sucker River	0	0
Total	400	200

Targeted Resources
Keene Creek
Sucker Creek

Project Outcomes
Protection of high-quality resources
Reduce impacts from climate change

Important Considerations



Maintaining watershed storage can mitigate impacts of **climate change** by slowing the flow of water and reducing erosion during increasingly common high rainfall events.



This goal addresses **equity** by providing areas for recreation in socially vulnerable neighborhoods.



Meeting with ditch authorities can increase **social capacity** to make change.



Maintain watershed storage can improve trout stream habitat. Trout are a **culturally significant species**.

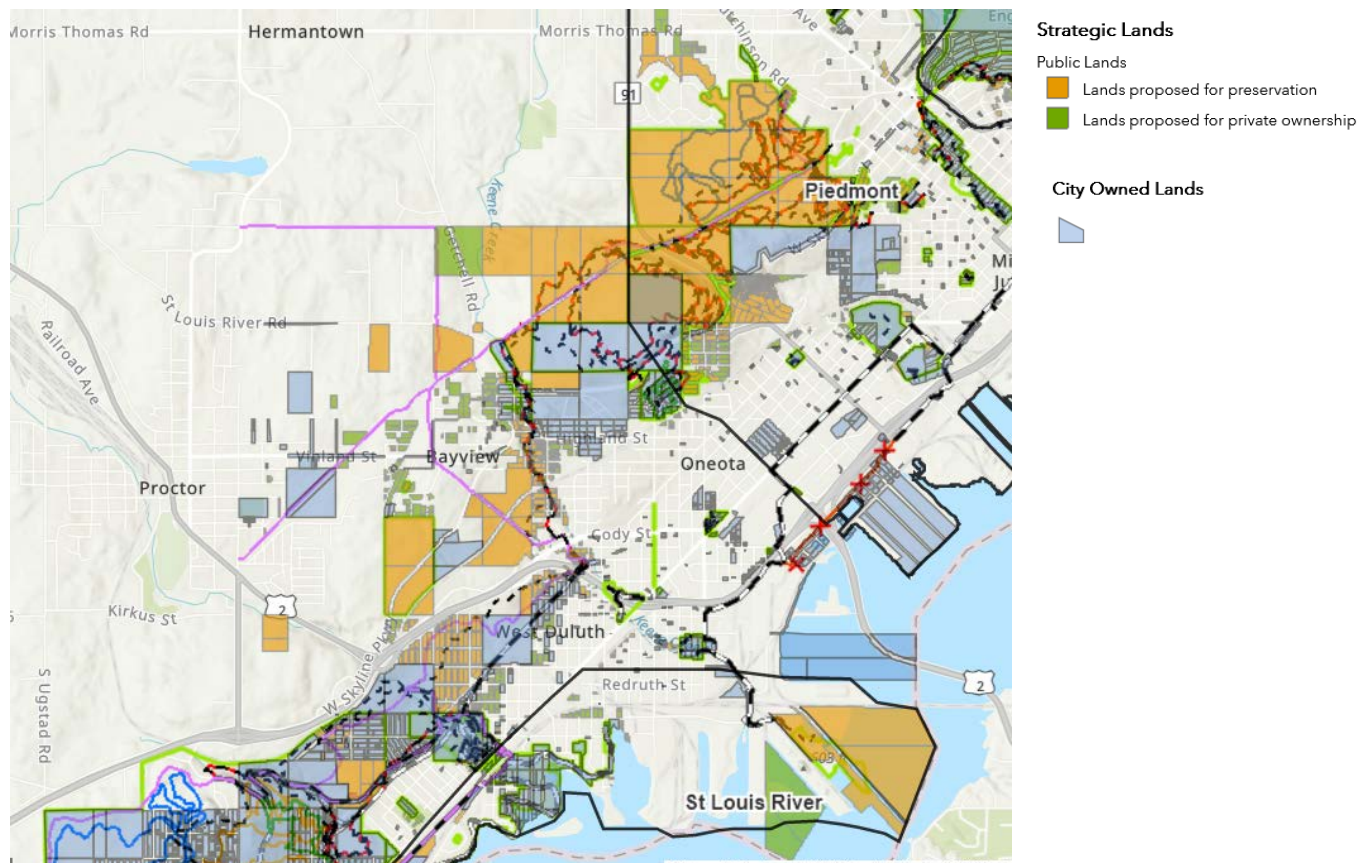





Figure 8-6. Public lands targeted for permanent protection by the City of Duluth. Map from the Imagine Duluth 2035 Comprehensive Plan dataset:

<https://duluthmn.maps.arcgis.com/apps/webappviewer/index.html?id=b76e5c094f3e4c78ac96b3819495f149>

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Protect non-developed land for watershed storage using acquisition or conservation easements (RIM, MN Land Trust among others).		WBIF	200 acres protected	Keene Creek		City of Duluth and City of Hermantown		✓	✓			\$195,000
Coordinate the Keene Creek implementation tables in this plan with the partners.		WBIF	5 meetings	Keene Creek		South St. Louis SWCD / DUWAC	✓	✓	✓	✓	✓	\$2500
Restore floodplain wetlands associated with stream restorations		WBIF	2.5 acre/feet watershed storage	Keene Creek, Sucker River		South St. Louis SWCD			✓	✓		See stream restoration costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect & manage 2050 acres of private owned forests in areas that protect surface water, drinking/groundwater water quality and riparian habitat.

Forests in this region play a vital role in protecting lakes, streams and drinking water. They help slow the flow of water on the landscape, reducing erosion and increasing groundwater infiltration. In addition, they provide habitat to countless animal species, and protect stream temperatures during the summer by providing shade. Although mostly developed, the Duluth Urban Area still has forested areas, especially the Northshore streams. Protecting these forests from conversion to other land uses will protect water quality.

Forests within this watershed are considered protected when they are under public ownership where they are prevented from being converted to other land use types. In this watershed there are state and county owned forests. The [St. Louis River Landscape Stewardship Plan](#) identifies privately owned parcels that are high value based on their proximity to water resources and large blocks of forests, along with the quality habitat and groundwater protection they provide. There are over 4700 acres of privately owned forests contained within the Sucker River minor subwatershed (minor watershed numbers: 2027, 2028, 2029 and 2031) that were identified as needed projection (*MN BWSR, p. 46*).

Priority Area	Long-Term Goal (acres / landowners)	10-Year Goal (acres / landowners)
Keene Creek	400 (15)	0
Sucker River	4700 (30)	2050 (10)
Total	5100 (45)	2050 (10)

Targeted Resources
Keene Creek
Sucker River

Project Outcomes
Protection of high-quality streams
Protection of groundwater resources
Reduced sediment and nutrient pollutants
Improved habitat for trout

Important Considerations



Protecting forests can mitigate impacts of **climate change** by reducing peak flows during increasingly common high rainfall events and replenishing groundwater supplies.

This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities.

Education and outreach can increase **social capacity** to make change.

Protecting forests can protect trout stream habitat. Trout are a **culturally significant species**

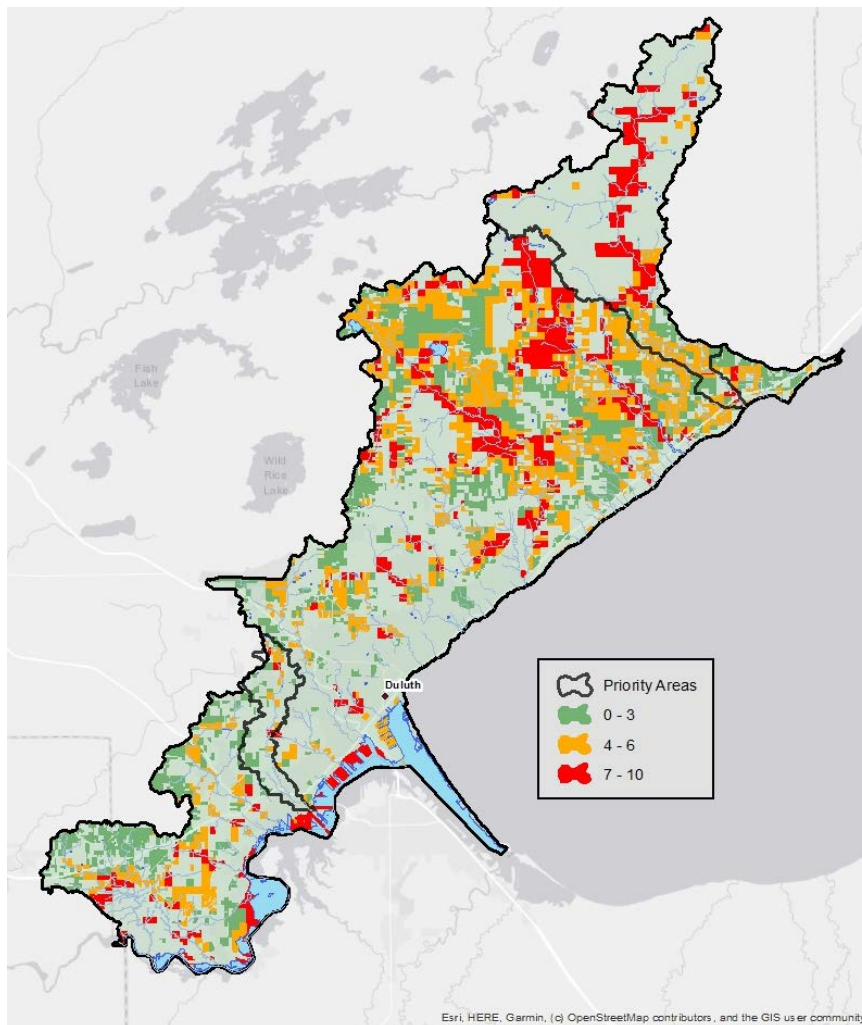







Figure 8-7. Priority private owned forest parcels in the Duluth Urban planning area. Priority was determined by the Landscape Stewardship Plan (MN BWSR).

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Develop woodland stewardship plans for 10 parcels (greater than 20 acres)		WBIF	10 plans developed	Sucker River		South St. SWCD / Private foresters, NRCS, DNR	✓	✓	✓	✓	✓	\$6000
Other												
Protect and manage 2050 acres of private forests with SFIA or conservation easements on parcels with a RAQ of 10		Other	2050 acres protected	Sucker River		South St. Louis SWCD, MN Land Trust, TNC, DNR, BWSR, NRCS		✓	✓	✓	✓	\$1,120,000
Provide technical assistance to forest landowners with less than 20 acres		WBIF	10 plans developed	Sucker River		South St. Louis SWCD	✓	✓	✓	✓	✓	\$3000
Develop and implement an education and outreach campaign for forest landowners.		WBIF	1 outreach campaign developed and implemented	Sucker River	Watershed Wide	South St. Louis SWCD/DNR/ NRCS	✓	✓	✓	✓	✓	\$5000
Coordinate forestry activities within the watershed to promote forest health for water quality		WBIF	Ongoing coordination	Sucker River	Watershed Wide	South St. Louis SWCD / DNR & NRCS	✓	✓	✓	✓	✓	See watershed wide staff costs

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Identify and manage 10 high priority sites/resources for invasive species.

The St. Louis River Landscape Stewardship Plan (p. 46) lists emerald ash borer as plants main invasive species concern in this region is emerald ash borer (EAB). This pest effects ash forests, which are prominent in the watershed, especially in the headwater’s wetlands and floodplain forests. When EAB attacks trees, it can cause mass die offs. The long-term impacts to surrounding wetlands is unknown but could have consequences for watershed storage and habitat. Mitigating for these impacts is the main goal of this plan. The target for the first 10-years are high priority sites in the Sucker Creek subwatershed, especially the floodplain area of Sucker Creek and its tributaries.

Priority Area	Long-Term Goal (sites)	10-Year Goal (sites)
Keene Creek	0	0
Sucker River	15	10
Total	15	10

Targeted Resources
Sucker River & Tributaries

Project Outcomes
Improved forest health
Improve water storage
Improve stream habitat and shading

Important Considerations



Managing invasive species can mitigate impacts of **climate change** by maintaining wetland functions and reducing peak flows during increasingly common high rainfall events.

This goal addresses **equity** by protecting trout streams that may be impacted by loss of riparian or headwaters forests. Protecting trout can help subsistence harvest of fish.

Managing invasive species can protect trout. Trout is a **culturally significant species**

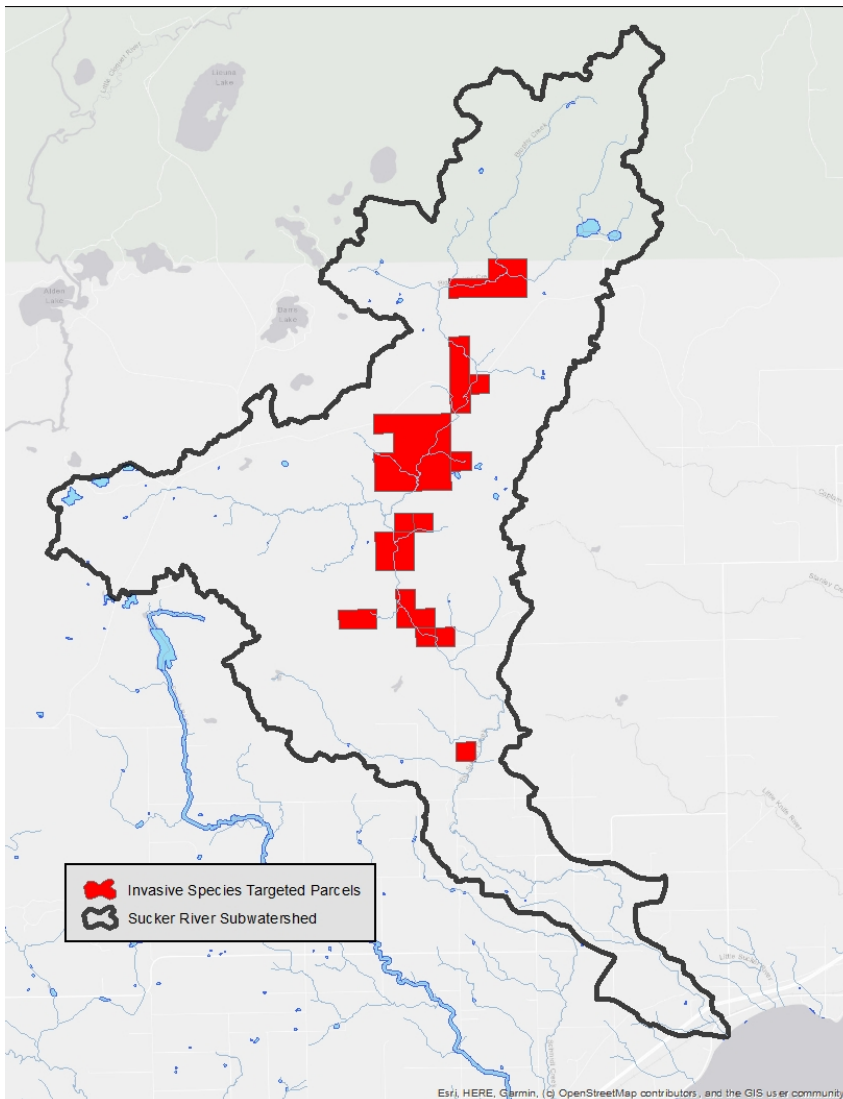




Figure 8-8. Targeted parcels for Emerald Ash Borer (EAB) mitigation (MN BWSR).

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Work with 10 landowners on invasive species management or prevention in forests (Emerald Ash Borer (EAB) (could include understory plantings), Buckthorn) Focus on invasives that have a connection to water quality/quantity issues		WBIF	10 projects implemented	Sucker River		South St. Louis SWCD		✓	✓			\$10,000
Other												
Work together with Cooperative Invasive Species Management Area to identify priority locations to implement invasive species control projects.		Other	10 meetings	Keene Creek		South St. Louis SWCD	✓	✓	✓	✓	✓	\$5000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Protect and restore 11,500 feet of shoreline in prioritized lakes and streams for natural buffers and reduced erosion

There are almost 400 miles of streams in the Duluth Urban area. While the Sucker River’s shoreline is largely still natural, much of the shoreline in Keene Creek has been altered due to land development. Restoring altered shorelines provide a variety of benefits including filtering sediment and other pollutants, providing shade to streams, storing water, reducing flooding, and providing valuable habitat. Data collected through the South St. Louis SWCD has identified 11 potential restoration sites in the Keene Creek (*Tetra Tech, 2018b, Appendix B, p. 4*) and Sucker River (*SSL SWCD, 2018, p. 108-121*) watersheds.

Priority Area	Long-Term Goal (Sites)	10-Year Goal (Sites)
Keene Creek	7 (8500)	4
Sucker River	4 (6500)	3
Total	11 (15,000)	7

Targeted Resources
Keene Creek
Sucker River

Project Outcomes
Improved habitat
Reduced sediment and nutrient pollutants
Protected Streams

Important Considerations



Improving riparian areas can mitigate impacts of **climate change** by providing shade to help cool streams during increasingly warmer summer months.



This goal addresses **equity** by protecting streams for recreation. Small streams are often the only water resource available to disadvantaged communities.








Education and outreach can increase **social capacity** to make change.



Restoring streamlines can protect urban trout stream habitat. Trout are **a culturally significant species**

Table 8-3. Priority shoreland restoration sites in the Duluth Urban planning area (Tetra Tech, 2018b, Appendix B, p. 4; SSL SWCD, 2018, p. 108-121).

Stream	Location	Restoration Length (Feet)
Keene Creek	Within Irving Park, downstream 57 th avenue west	690
Keene Creek	Between 57 th Avenue West and Grand Avenue	2008
Keene Creek	Between Grand Avenue and Green Street (Includes dog park)	1905
Keene Creek	Between Green Street and Cody Street	760
Keene Creek	Downstream of Highland Street	732
Keene Creek	Adjacent to Okerstrom Road upstream of Morris Thomas Road	1200
Keene Creek	Engvall's pond	1200
Sucker Creek	Downstream of the downstream-most McQuade Road crossing	570
Sucker Creek	Upstream of Ryan Road crossing	2350
Sucker Creek	Between Ryan Road and Bergquist Road	3400
Sucker Creek	Upstream most McQuade Road crossing	200

What		How Much		Where		Who	When					Cost
Action	Program	Level of Effort	10-year measurable Outcome	Targeted Resources	Other Areas	Lead/ Supporting entities	2023-2024	2025-2026	2027-2028	2029-2030	2031-2032	Total 10-year cost
Complete 4 shoreline stabilization projects in conjunction with stream restoration projects in Keene Creek (<i>Tetra Tech, 2018b, Appendix B. p. 4</i>)		WBIF	4 projects completed	Keene Creek		South St. Louis SWCD		✓	✓	✓		See stream restoration costs
		Other										
Complete 3 stream stabilization projects in conjunction with stream restorations in Sucker River (<i>SSL SWCD, 2018, p. 108-121</i>)		WBIF	3 projects completed	Sucker River		South St. Louis SWCD				✓	✓	See stream restoration costs
		Other										
Enforce shoreland setbacks/buffers in all parts of the watershed		Baseline	Continued Local Program	Watershed Wide	Watershed Wide	St. Louis County, Cities, Townships	✓	✓	✓	✓	✓	\$25,000
Develop and implement a BMP education and outreach campaign to shoreline landowners in targeted areas		WBIF	1 Campaign implemented	Trout Streams & Tributaries, Wild Rice Waters	Watershed Wide	South St. Louis SWCD	✓	✓	✓	✓	✓	\$25,000
Use Reinvest in Minnesota program and other conservation easements to protect indicator species habitat		Other	See Forest Protection Action	Trout Streams & Tributaries, Wild Rice Waters, wood turtle	Watershed Wide	South St. Louis SWCD, MN Land Trust, TNC, DNR, BWSR, NRCS	✓	✓	✓	✓	✓	\$300,000

Conservation Programs 	Land Use Policy 	Research, Data Collection and Monitoring 	Education and Outreach 
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WBIF = Watershed Based Implementation Funds	Baseline = Local Baseline Funding	Other = other funding sources (grants, cost-share programs, etc.)
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Section 9. Plan Implementation Programs

This section of the plan describes the programs that will be used for implementing this plan. The Steering Committee developed the program categories that best fit the St. Louis Watershed and the Policy Committee approved them. There are four main program categories: Conservation, Land Use Policy, Education & Outreach, and Research, Data, and Monitoring.

Introduction

Implementation of this plan will involve programs that will be actively targeted to prioritized areas for management. Non-priority areas will be considered on an opportunity basis. The four programs that will be used to implement this plan include Conservation Programs, Land Use Policy, Education and Outreach and Research, Data Collection and Mentoring. Table 10-1 describes each program.

Table 9-1. St. Louis River Comprehensive Watershed Management Plan Implementation Programs.

Conservation Programs		Voluntary programs implemented mainly by the Soil and Water Conservation Districts. These programs include incentive programs, easements, and capital improvements.
Land Use Policy		Required programs including regulation and ordinances. These programs include the Wetland Conservation Act, Buffer Law, Shoreline Ordinances, Septic System maintenance and more.
Education and Outreach		Programs are used to promote conservation in the watershed and encourage landowners to adopt practices on their land. These programs build social capacity to get conservation on the ground.
Research, Data Collection and Monitoring		Practices identify places (or “gaps”) where projects are needed, where existing information is insufficient, and where additional data collection would help to track the progress toward plan goals.

Conservation Programs

Conservation programs are those that protect and manage land, water, and forest resources through voluntary measures. These programs include private and public forest management, permanent protection such as conservation easements, and government-sponsored large capital improvement projects such as culvert replacement projects.

1. Private Forest Management

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

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

- *Forest 2C Designation*: Landowners with DNR-registered Woodland Stewardship Plans are eligible for 2C Classification, which is a state program that provides a reduced tax rate to forested property of 20 acres or more. This is an annual program.
- *The Sustainable Forest Incentive Act (SFIA)*: provides annual incentive payments for the landowner recording a covenant that keeps lands forested. 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: 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).

2. Minnesota Agriculture Water Quality Certification Program (MAWQCP)

The MAWQCP is a voluntary program for farmers who are working to protect water resources by implementing conservation practices on their property. Producers are in compliance with any new water quality rules for 10 years and can use the certification to promote their business. In addition, they are eligible for technical and financial assistance to implement conservation practices.

3. 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. Contract duration is 10-15 years.

4. Incentive Programs

Like CRP, incentive programs can be used to take land out of production to protect vulnerable habitats. For example, access control payments can encourage producers to limit access to stream corridors or wetlands but may have shorter duration contracts or less requirements for participation than CRP.

5. Conservation Plans

Land management planning is an important first step to implementing conservation programs. Examples include comprehensive nutrient management (CNMP), rotational grazing, woodland stewardship, or stormwater management plans. In addition to jumpstarting implementation, these plans help build social capacity and stewardship.

6. Cost-Share Programs

Cost-share programs or projects are those where the cost of installing a project is shared with the landowner(s). Forest enhancement, shoreline buffers and riparian tree planting are applicable examples that meet plan goals. Cost-share programs can also be used for structural practices. Implementing fencing and water sources for grazing cattle away from streams, shoreline restorations on lakeshore, and well sealing are applicable examples that meet the goals of this plan.

7. Conservation Easements

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

8. 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 of this include Aquatic Management Areas that are used for fish spawning habitat and Wildlife Management Areas that are used for small game hunting and waterfowl mitigation.

9. Low-Interest Loans

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

10. Capital Improvements

Capital improvements are large projects that require significant investment and have longer lifespan than that for 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 among multiple public and private organizations or governmental departments and are often good candidates for state or federal grant funding. Culvert replacements are examples of capital improvement projects within the plan boundary.

11. Operations and Maintenance

After projects are installed, regular on-site inspections and maintenance to ensure the project's continued function and success is required by the BWSR Grants Administration Manual. 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.
- Capital-improvement projects with a minimum effective life of 25 years:
 - The ends of Years 1, 8, 17, and 24 after certified completion is a recommended minimum.

Land Use Policy

Land Use Policy programs are determined by the County, State and Federal Governments. 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

1. County-Wide Zoning Ordinance

A county-wide zoning ordinance establishes land use regulations for unincorporated areas. All counties have these and subdivision ordinances in place.

- Regulations: Minnesota Statutes, 394.21-394.37

2. Aggregate Management

The MPCA oversees air permits, hazardous waste licenses, stormwater and wastewater management, and storage tanks (<https://www.pca.state.mn.us/business-with-us/nonmetallic-mining>). Local

ordinances are in place in St. Louis, Carlton and Lake counties that include additional guidelines for aggregate management in those jurisdictions.

- **St. Louis County:** Aggregate resource exploration and evaluation is allowed with a conditional use permit, except in IND zone district, with the following standards:
 1. The activity shall be located outside the shoreland area.
 2. Operations shall be a minimum of one-quarter mile from a residence.
 3. Access to the site shall be obtained from the appropriate road authority.
 4. Written authorization shall be obtained from the surface owner of the property being evaluated.
 5. All state regulations are followed, including reclamation.

No Permit Required: In an industrial zone district, no permit is required for mineral exploration and evaluation if all standards above are met.

- **Carlton County:** The use of land for the removal of topsoil, sand, gravel or other materials (except borrow pits) from the land is not permitted in any zoning district except by the granting of a conditional or interim use permit by the County Board. Excavations and removal of sand and gravel for personal use, for road construction borrow occurring within public rights-of-way, for building construction, and other activities for which a separate permit has been issued are exempt.
- **Lake County:** Aggregate resource extraction is allowed with a conditional use permit. The planning commissioner will consider: The Planning Commission shall consider:
 1. The effect of the proposed operation on the area hydrology and water quality.
 2. Input from appropriate governmental agencies.
 3. Relation to the comprehensive plan
- **Regulations:** Minnesota statutes 298.75, 394.25

15. 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

16. 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

17. Feedlots

MPCA rules govern the collection, transportation, storage, processing, and land application of animal manure and other livestock operation wastes. St. Louis, Carlton County and Lake County follows Minnesota regulation on feedlots

- Regulations: Minnesota Rules Chapter 7020

18. Groundwater Use

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

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

19. Groundwater Protection Rule

The MDA administers the Groundwater Protection Rule, which went into effect on June 24, 2019. The rule has two parts: Part 1 restricts the application of nitrogen fertilizer in the fall and on frozen soils; Part 2 responds to public water supply wells and elevated nitrate. Part 1 does apply to parts of the St. Louis Watershed. A map can be viewed on the MDA website.

- Regulations: Minnesota Statute 14.16

20. 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 Comprehensive Watershed Management Plan boundary.

- Regulations: Minnesota Statute, chapter 12

21. Invasive Species

Invasive species, both aquatic and terrestrial can cause ecological and economic damage to water resources and forests. The DNR has regulatory authority over aquatic plants and animals, and terrestrial animals. For aquatic species, permits are required by the general public for transporting lake water, invasive species, and for treating invasive species. St. Louis, Carlton and Lake Counties oversee the aquatic invasive species prevention and management programs.

- [Carlton County AIS Program](#)
- [St. Louis County AIS Program](#)
- [Lake County AIS Program](#)
- Regulations: Minnesota Statute 84D

22. Noxious Weed Law

Noxious weeds affect the natural, native balance of ecological functions. The Noxious Weed Law in Minnesota is administered by the MDA through Carlton, St. Louis and Lake Counties. The Land Department in Carlton County, the Land and Minerals Department in St. Louis County and the Highway

Department in Lake County enforces the Minnesota Noxious Weed Law. The State maintains noxious weed lists of those species to eradicate, control, restrict, and specially regulated plants.

- Regulations: Minnesota Statutes 18.75-18.91

23. Protection of Critical Natural Habitat

Land acquisition for protection of critical natural habitat to form wildlife management areas and scientific and natural areas is regulated by the state. The county board must approve new land acquisitions. In the St. Louis Watershed, there are 14 wildlife management areas, 6 state forests, 39 aquatic management areas, 3 state parks, one state recreation area and 10 scientific and natural area. Uses on protected land is also regulated by the state.

- Regulations: Minnesota Statutes 97A, 84.944

24. Public Drainage Systems: Establishment, Improvement, Re-routing, Repairs, and Impoundments

Minnesota Drainage Law enables multiple landowners to collectively construct, improve, and repair drainage systems across property boundaries and governmental boundaries. These drainage systems can be open ditches and/or subsurface tile.

- Regulations: Minnesota Statute 103E

25. Shoreland Management

Minnesota has shoreland management rules that are administered by the DNR. Local governmental units 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. Carlton counties have DNR Approved Ordinances, but they are slightly different. 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.

- Carlton County: DNR Approved Shoreline Ordinance with red clay overlay. The Red Clay Overlay District is intended to establish additional requirements that reflect the unstable and highly erodible soil characteristics of several clayey soil associations within the and St. Louis River basin. In addition, Carlton County has two overlay districts for the St. Louis River: Remote Area and Recreational Area. These districts limit the lot size, buildable area and setbacks on the St. Louis River.
- St. Louis: St. Louis County has additional shoreland standards for many protected waters including trout streams. For example, the trout stream set back is 150 feet, while non-protected waters are 75 feet.
- Lake: In developments established since June 1, 1973, lawn establishment is prohibited on Natural Environment and Recreational Development Lakes.
- Regulations: Minnesota Statute 103F and Minnesota Rules 6120.2500-3900

26. Subsurface Sewage Treatment Systems

The Subsurface Sewage Treatment System (SSTS) Programs are required by Minnesota State Statute 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 are available through the SWCD or County. St. Louis requires SSTS inspections on point-of-sale, while Carlton is slightly more limited. Carlton County allows SSTS holding tanks where Type I SSTSs cannot be feasibly installed dwellings.

- **Carlton:** Point of sale inspections only required in shoreland district (1,000 feet from a lake, 300 feet from a river or stream).
- **St. Louis:** St. Louis County Subsurface Sewage Treatment System (SSTS) Ordinance 61 requires that prior to the sale, transfer, contract for deed, or any other conveyance of land upon which a dwelling is located, or a tract of land upon which a structure that is required to have an SSTS, the following must be met: NO INSPECTION REQUIRED, if these Conditions are met:
 1. A valid "Certificate of Compliance for a New-Replacement System" is on file and has been issued within the last 10 years.
 2. A valid "Certificate of Compliance Existing System" is on file and has been issued within the last three (3) years.
 3. A valid "Notice of Non-Conforming" is on file and has been issued within the last three (3) years
- **Lake:** Lake County requires an inspection on new systems after 12 years and every 8 years afterward when applying for a permit (Land Use, Interim Use, Conditional, Use, Variances) or upon sale of your home. Point of Sale also requires disclosure forms and possibly money to be set aside in escrow for repairs. Vacation rental homes and bedroom additions require inspections after 5 years new, and 3 years after that. Certain systems require an operating permit which must be renewed every 3 years or at point of sale.
- **Regulations:** Minnesota Statutes 115.55 and 115.56, Minnesota Rules Chapters 7080, 7081, 7082, 7083

27. Waste Management

Waste management permitting and regulatory programs (including hazardous waste, storage tanks, and solid waste) are implemented by the MPCA. The counties have a hazardous waste facility available at no charge to county residents.

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

28. 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 which rely on surface water. Wellhead Protection is mostly administered at the city level. There are no DWSMAs in the watershed.

- **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.

29. 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 (most often credits are utilized over an on-site replacement). Carlton and St. Louis Counties serve as the local LGU for implementing WCA.

- Regulations: Minnesota Rules, part 8420.0105 and 7050.0186

30. Existing Comprehensive or Land Use Plans in the Watershed:

- Carlton County Comprehensive Water Plan, 2010-2020, Amended 2014
- Carlton County Community-Based Comprehensive Plan – 2001
- St. Louis County Comprehensive Water Management Plan – 2010-2020, Amended 2015
- St. Louis County Comprehensive Land Use Plan, 2019
- Lake County Comprehensive Water Management Plan, 2010-2020, Amended 2015
- Lake County Comprehensive Plan, 2017

Education and Outreach

1. Public Participation and Engagement

Public participation and engagement are essential for successful implementation of this plan. The implementation of actions in this plan is voluntary and require willing landowner participation. There are many different steps to adopting conservation practices. 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 knowledge exchange, including site visits, technical assistance, peer-to-peer networks, and demonstration plots. Sometimes the outreach and knowledge exchange 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 cover crops from the SWCD or the EQIP program can help them implement the practice for a couple years to ensure profitability.

1. Outreach

Specific outreach actions for implementation of this plan related to each goal are listed below. The lead organization and specific goal are listed in brackets.

Surface Water Quality

- Develop and implement a pet waste education program (North St. Louis SWCD)
- Development & implement a salt use reduction education and outreach campaign. Identify high priority private landowners as part of the process. (North & South St. Louis SWCD, RSPT, Fond du Lac)
- Design and implement an education and outreach campaign to SSTS landowners and SSTS professionals in targeted areas. (St. Louis, Lake & Carlton Counties)

- Develop and implement an Education and Outreach campaign to livestock owners in priority areas. (St. Louis & Carlton SWCD)
- Meet with stakeholders to discuss adding Grand Lake residents to WLSSD or creating community systems (South St. Louis SWCD & County)
- Coordinate a Smart Salt training for township and county road authorities (RSPT)
- Outreach campaign to Big Lake residents on Septic system maintenance (Fond du Lac, Carlton County)

Drinking Water

- Develop and implement an education & outreach campaign to promote drinking water quality North & South St. Louis SWCD, Carlton SWCD)

Land Use

- Develop an education and outreach campaign to urban landowners and municipalities on stormwater BMPs (Carlton SWCD)
- Develop and implement an education and outreach campaign to recreational land users and landowners (Lake, North & South St. Louis SWCDs)

Habitat

- Develop and implement an education and outreach campaign for forest landowners targeting private forest landowners (North & South St. Louis, Carlton and Lake SWCDs)
- Design and implement a targeted outreach campaign to shoreline owners and operators. (North & South St. Louis, Carlton and Lake SWCDs, Fond du Lac)
- Develop and implement an education and outreach campaign promoting wild rice protection and value (Fond du Lac, South St. Louis SWCD, Lake SWCD)
- Complete 2 mailings to Lakeshore landowners about Chinese Mystery Snail @ Simian and West Twin Lake (Fond du Lac)

2. *Knowledge Exchange*

Specific knowledge exchange actions for implementation of this plan related to each goal are listed below. The lead organization and specific goal are listed in brackets.

Surface Water Quality

- Promote Smart Salt training (North & South St. Louis and Carlton SWCDs, Fond du Lac and RSPT)

Altered Hydrology

- Outreach to road authorities in the Swan River watershed to plan culvert replacements (North St. Louis SWCD)
- Work with road authorities to incorporate stormwater BMPs into ditch design (Carlton SWCD, Carlton County)
- Use road authorities 5–10-year plans to coordinate with crossing upgrades (South St. Louis County, Carlton County)

Research, Data and Monitoring

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. Targeted screening, inventory, monitoring and outreach actions are listed under each goal.

1. Current Data Collection and Monitoring Efforts

Currently, a wide variety of monitoring is carried out on multiple government and local organization levels. These existing data helped determine the current conditions of surface water, groundwater, habitat, and land resources in this plan and developed a starting point for measuring goals moving forward. Because these are already established projects, they don't cost additional funds for this plan.

- 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 Total Maximum Daily Loads (TMDL) needed, and results in numerous comprehensive reports. The St. Louis Watershed was first assessed in 2011 and Cycle 2 began in 2021. The Cloquet Watershed was first assessed in 2017 and will be reassessed in 2027. The Duluth Urban Streams Watershed was assessed in 2020 and utilizes the assessment results from the respective watersheds that comprise this administrative watershed. The Lake Superior South Watershed was first assessed in 2013 and will be reassessed in 2023.
- The Fond du Lac Band of Lake Superior Chippewa monitor lakes, streams and wetlands within reservation boundaries and produce comprehensive reports of the collected data.
- The roles in groundwater monitoring in Minnesota are spread between four agencies:
 - The MDH monitors wells and drinking water supplies for public health, including bacteria, nitrates, and arsenic.
 - The DNR monitors groundwater availability and ecological impacts through the Cooperative Groundwater Monitoring network. There are over 20 monitoring observation wells in the St. Louis Watershed.
 - The MDA monitors groundwater for agricultural chemicals and fertilizer contamination.
 - The MPCA monitors groundwater for industrial contamination.
- During the MPCA's intensive monitoring cycle, the rivers in the watershed are tested for biological parameters including fish and macroinvertebrate habitat. Any biological impairments are evaluated for stressors that may be causing or contributing to the reduction in diversity. Stressors include loss of habitat, loss of connectivity, sediment, dissolved oxygen, and altered hydrology.
- Forest habitat is described in the St. Louis Landscape Forest Resources Plan. Areas for restoration and enhancement and recommended species assemblages are outlined in the plan.
- Land Stewardship practices are tracked in eLINK and NRCS databases.

2. Filling Data Gaps

This planning process has identified data gaps to be filled through implementation of this plan. The following inventory and study activities are listed in the targeted implementation schedule. The lead organization is listed in brackets.

Surface Water Quality

- E. coli genetic study of impaired streams to identify bacteria sources (North St. Louis SWCD)
- Track Salt Use to determine trends (St. Louis County)
- Evaluate St. Louis County's Salt training and compare it to the Smart Salt program (RSPT)
- Review septic system records to assess potential risks (St. Louis & Carlton Counties)
- Infrared surveys of septic system runoff into waterways in key areas (MPCA)
- Review riparian corridor survey for livestock exclusion and implement 4 projects to increase livestock exclusion (NRCS, SWCD supporting)
- Identify high priority private landowners (owners with large amounts of impervious surface (Carlton SWCD)
- Create a publicly available GIS database for SSTS location, size and condition (St. Louis County)

Drinking Water

- Develop and update surface water source protection plans for municipalities (Virginia, Eveleth, Hoyt Lakes, Biwabik, Aurora & Chisholm) (MDH)
- Develop and implement groundwater monitoring program (MDH, SWCDs)

Altered Hydrology

- Complete culvert inventory in the Upper Sand River watershed (North St. Louis SWCD)
- Inventory priority reaches to prioritize restoration sites including, if possible, info on which restorations would also help reduce costs associated with major flooding (North St. Louis SWCD)
- Deploy drone to gather footage of beaver dam extent at Simian Creek downstream of Cedar Lake; use footage to create a plan for beaver dam management to lower water levels in Cedar Lake to support wild rice (Fond du Lac, Carlton County)
- Assess dams on Murphy Lake, Wilson Lake, Sullivan Lake, and Little Stone Lake to determine the extent they are altering natural hydrology and impeding fish and aquatic organism movement and affecting stream temperature. (Lake & North St. Louis SWCDs)
- Use stream road crossing assessment data to coordinate with road authorities (South St. Louis SWCD and St. Louis County)

Land Use

- Review MS4 plans and look for green infrastructure opportunities; design & implement identified projects (Carlton SWCD)
- Assist communities to develop stormwater management plans (Carlton & South St. Louis SWCDs)
- Collaborate with recreational land managers to inventory and assess high priority recreational sites (Lake SWCD)
- Use St. Louis and Lake County geologic atlases part A and B to evaluate sand and gravel mining resources to determine if additional protections are needed and create a tool for residents and governments to assess the impact of proposed gravel pits (St. Louis County)
- Form interagency work group for pilot studies using geologic atlas when it becomes available and include monitoring wells and streamflow to determine impacts (DNR, MPCA, St. Louis County)
- Integrate with USEPA VELMA modeling into stormwater management for Keene Creek (DUWAC)
- Review ordinances and remove barriers to low impact development (DUWAC)

Habitat

- Survey municipalities that are not covered under County zoning to determine the status of their shoreline ordinances (Carlton SWCD & County)

Achieving Plan Goals

Overall plan monitoring and progress will be tracked by the South St. Louis SWCD. Table 10-2 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 9-2. Plan monitoring will be tracked using five levels to measure progress during the 10-years plan period.

Level	Description	St. Louis River Tracking Application
Tracking	Outputs in Targeted Implementation Schedule. Projects will be tracked with a system and reported in eLINK during implementation.	Practices, Acres, Miles of River, Number of Landowners Contacted
Estimating	Using lower resolution calculators and tools to give a sense of the collective impacts of projects.	Estimating the tons of sediment reduced for each culvert replacement. Estimating tons of sediment and pounds of phosphorus reduced from the implementation of Agricultural BMPs.
Modeling	Incorporating landscape factors and project information to predict future conditions.	HSPF modeling in WRAPS Cycle 3
Measuring	Using field-collected information to assess the condition of the water.	Lake Monitoring, Pollutant Load Monitoring Network stream monitoring, WRAPS Cycle 3
Proving	Having enough measurements to compare with standards and decide if it is improved.	Analysis of lake water quality trends, Analysis of loading at WPLMN, WRAPS Cycle 3, future WRAPS Cycles.

Section 10: Plan Administration

The St. Louis River planning area spans five counties (Figure 11-1). The plan administration section describes how the plan will be implemented, how the watershed partners will work together, how the funding will move between them, and who will handle the administrative duties. The St. Louis River Comprehensive Watershed Management Plan will be implemented through a Memorandum of Agreement (MOA) between North & South St. Louis SWCDs, Carlton SWCD, Lake SWCD, St. Louis County, Carlton County, and Fond du Lac Band of Lake Superior Chippewa. This MOA largely contains the same framework that was included in the MOA for developing this plan. Refinements to the implementation agreement that changed from the planning agreement may include clarifying voting procedures and fiscal agent responsibilities.



Figure 10-1. St. Louis River Comprehensive Watershed Management Planning Area Boundary spans five counties, six SWCDs, the Fond du Lac Reservation.

Decision-Making and Staffing

Implementation of the St. Louis River Comprehensive Watershed Management Plan 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 St. Louis River Comprehensive Watershed Management Plan will be conducted based on the concepts outlined in this section of the plan. Presented below are the probable roles and functions related to plan implementation (Table 11-1). Expectations are that the roles of each committee will shift and change during implementation to best meet the needs of the planning partners. 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 10-1. Committee roles for plan administration.

Committee Name	Description	Primary Implementation Role and Functions
Policy Committee	One board member from each MOA entity.	<ul style="list-style-type: none"> • Meet twice a year or as needed • Annual review and confirmation of Advisory Committee recommendations • Direction to Advisory Committee on addressing emerging issues • Recommends approval of the biannual work plan to the individual boards of the MOA members • Review the use of implementation funds from plan participants
Local Fiscal and Administrative Agent	One of the participating LGUs as decided by the Policy Committee.	<ul style="list-style-type: none"> • Convene committee meetings • Prepare the annual work plan • Prepare and submit grant applications/funding requests • Research opportunities for collaborative grants • Report on how funds were used • Compile annual results for annual assessment
Steering Committee	A representative from the staff of each MOA entity and local BWSR Board Conservationist.	<ul style="list-style-type: none"> • Review the status of available implementation funds from plan participants • Review opportunities for collaborative grants • Review annual fiscal reports • Review annual reports submitted to BWSR • At least biennial review and confirmation of priority issues • Evaluate and recommend response to emerging issues • Prepare plan amendments • Implement the targeted implementation schedule
Advisory Committee	A committee of local stakeholders and state agency representatives appointed by Policy Committee	<ul style="list-style-type: none"> • At least meet biennially • Review and provide input for the annual work plan • Review and identify collaborative funding opportunities • Recommendations to Planning Work • Group on program adjustments • Assist with execution of the targeted implementation schedule

Collaboration

Collaboration between St. Louis River Comprehensive Watershed Management Plan Planning Partners

The St. Louis River Comprehensive Watershed Management Plan Steering Committee and Policy Committee acknowledge the value of collaboration between planning partners to achieve successful plan implementation. Benefits of successful collaboration include consistent implementation of actions watershed-wide, increase likelihood of funding, and resource efficiencies gained. There is already some collaboration in the watershed:

- SWCDs and Counties have worked collaboratively on multiple projects including culvert and stream related projects.
- All the SWCDs have access to service through Technical Service Area 3 Engineering staff.

This collaboration is an advantage for implementation in the watershed. Where possible and feasible, the St. Louis River Comprehensive Watershed Management Plan Steering Committee will pursue opportunities for collaboration with fellow planning members to gain program efficiencies, pursue collaborative grants, and provide technical assistance. The St. Louis River Comprehensive Watershed Management Plan Steering Committee and Policy Committee 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 St. Louis River Comprehensive Watershed Management Plan Steering Committee will continue to coordinate and cooperate with other governmental units at all levels. Coordination with state agencies including BWSR, DNR, MDH, MDA, and the MPCA 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 Natural Resource Conservation Service (NRCS), municipalities, city councils, township boards, county boards, joint powers boards, and other water management authorities are a practical necessity to facilitate watershed wide activities. Examples of collaborative programs in the watershed include Environmental Quality Incentives Program (NRCS), Conservation Reserve Program (Farm Services Agency), Minnesota Agriculture Water Quality Certification (Minnesota Department of Agriculture), Wellhead Protection for city Drinking Water Supply Management Areas (Minnesota Department of Health), Minnesota Forest Resource Council and Watershed Restoration and Protection Strategy (Minnesota Pollution Control Agency). In addition, many planning efforts related to the St. Louis River watershed are ongoing through multiple agencies. The St. Louis River is a Lake Superior Watershed, and therefore is also a part of many larger Lake Superior Basin Plans (see Appendix B for a list of plans).

St. Louis River Watershed implementation actions and goals were developed through a collaborative process. Some agency goals, objectives, directions, and some strategies for resource management within the plan area have not been selected as priority issues. The responsibility for achieving the goals associated with lower priority tier issues remains with the respective agency or organization.

Collaboration with Others

Local support and partnerships will drive the success of final outcomes of the actions prescribed for implementing this plan. Because this plan's focus is voluntary land stewardship practices, collaborations

with landowners in the watershed is of paramount importance. There are many actions in the plan that describe working with individual landowners on personalized forest management plans and providing cost share and technical assistance for implementing agricultural best management practices. 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’s resources. Partners for these collaborations include, but are not limited to 1854 Treaty Authority, American Bird Conservancy, civic groups, lake associations, Pheasants Forever, private businesses, individuals, and foundations, Trout Unlimited, University of Minnesota Extension. The St. Louis River Comprehensive Watershed Management Plan Steering Committee collaborates with these groups for education, outreach, monitoring, and project implementation

Funding





The St. Louis River Comprehensive Watershed Management Plan Steering Committee will pursue funding opportunities collaboratively to implement the activities prescribed in the targeted implementation schedule. Table 11.2 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.

Current programs and funding (Baseline) will not be enough to meet the full targeted implementation schedule. The success of plan implementation will hinge on reliable noncompetitive watershed-based funding being available for plan implementation in addition to competitive local/county, state, federal, and private grant dollars. The St. Louis River Comprehensive Watershed Management Plan Steering Committee and Policy Committee acknowledge that additional staffing may be necessary to meet plan goals. Because implementation is occurring under a MOA, staff will be hired by existing local government units in the watershed.

The current funding level (Baseline) is based on the annual revenue and expenditures for the following counties and SWCDs: St. Louis (North & South) Carlton and Lake. The current level of investment by each local government unit is reasonably expected to remain the same during the St. Louis River Comprehensive Watershed Management Plan ten-year period. The current expenditure includes all the state program and conservation delivery grants, including the Natural Resources Block Grant and SWCD Local Capacity Building Grants. WBIF funding describes watershed-based implementation funding that could be obtained to implement the plan. The total funding can also be broken out by management focus and planning area (Table 11.2).

Table 10.2 Funding by funding level, implementation program and planning area.

Funding Level	Description	Estimated Annual Average	Estimated Plan Total (10 Years)
Baseline	Local Baseline Funding	\$58,700	\$587,000
WBIF	Watershed-based implementation funding	\$1,412,250	\$14,122,500
Other	Other funding sources: (competitive grants, partner cost share)	\$1,552,650	\$15,526,500

Implementation Program	Estimated Annual Average	Estimated Plan Total (10-years)
Conservation Programs 	\$2,860,600	\$28,606,000
Land Use Policy 	\$28,600	\$286,000
Education & Outreach 	\$57,400	\$574,000
Research, Data Collection and Monitoring 	\$77,000	\$770,000
Total	\$3,023,600	\$30,236,000

Planning Area	Estimated Annual Average	Estimated Plan Total (10-years)
St. Louis River North	\$646,650	\$6,466,500
St. Louis River South	\$791,400	\$7,914,000
Cloquet	\$457,800	\$4,578,000
Fond du Lac	\$226,300	\$2,263,000
Duluth Urban Area	\$901,150	\$9,014,500

The variety of funding sources available to implement this plan vary with each activity. Actions addressing culvert replacement can be funded using various road funding, including County State Aid, Township Bridge Funds and Federal sources depending on the road. Forestry implementation and planning can be partially funded through established DNR Cost-share programs. There are many cost-share programs available that fund cost sharing for agricultural best management practice construction, but there is a gap in engineering resources that are needed to get projects on the ground.

Table 10.3. Available funding sources in the St. Louis River Watershed planning area.

Source	Organization	Program/Fund Name	Type of Assistance	Form of Assistance	Conservation	Policy	Data	Outreach
State	BWSR	Clean Water Fund	Financial	Grant	X			X
	BWSR	RIM	Financial	Easement	X			
	BWSR	Natural Resources Block Grant	Financial	Grant	X	X		
	BWSR	SWCD Local Capacity Service Grants	Financial	Grant	x		x	x
	BWSR	Erosion Control & Management Program	Financial	Grant	x			
	DNR	Conservation Partners Legacy	Financial	Grant	x			
	DNR	Aquatic Invasive Species control	Financial/ Technical	Grant	x			x
	DNR	Aquatic Management Area, Wildlife Management Area	Financial	Fee Title Acquisition	x			

Source	Organization	Program/Fund Name	Type of Assistance	Form of Assistance	Conservation	Policy	Data	Outreach
	DNR/ Dept. Revenue	Class 2C Managed Forest Land	Financial	Reduced Property Taxes	x			
	DNR/ Dept. Revenue	Sustainable Forest Incentive Act	Financial	Incentive Payment	x			
	MPCA	Clean Water Partnership	Financial	Grant	x		x	x
	MPCA	State-Revolving Fund	Financial	Grant	x			
	MPCA	Surface Water Assessment Grant	Financial	Grant			x	
	MPCA	Clean Water Fund	Financial / Technical	Contract			x	
	MDH	Source Water Protection Grant	Financial		x		x	
	MDA	Nitrate Testing	Technical	Monitoring			x	x
	MDA	Agricultural BMP Loan Program	Financial	Loan	x			
	MDA	MAWQC Program Cost Share	Financial	Cost Share	x			
	LSOHC	Outdoor Heritage Funds	Financial	Grant	x			
	LCCMR	Environmental Trust Fund	Financial	Grant	x			
	Legislature	Bonding	Financial	Bond	x			
	MN DOT	County State Aid Highway	Financial	Allocation	x			
MN DOT	Township Bridge Funds	Financial	Allocation	x				
Federal	FSA	Conservation Reserve Program	Financial	Cost Share	x			
	FSA	Grassland Reserve Program	Financial	Cost Share	x			
	FHWA	Emergency Relief Program, Federal aid	Financial	Allocation	x			
	NRCS	Conservation Innovation Grant	Financial	Grant	x			
	NRCS	EQIP	Financial	Cost Share	x			
	USGS	Stream Gaging Network	Technical	Monitoring			x	
	USACE	Planning Assistance	Technical	Planning	x			
	EPA	319	Financial	Cost Share	X		X	X
Varies	Great Lakes Restoration Initiative	Financial	Grant	x		x	x	
Other	Trout Unlimited		Financial / Technical	Easement/ Cost Share	x			x
	The Nature Conservancy		Financial	Easement	x			
	Minnesota Land Trust		Financial	Easement	x			

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, townships and cities can provide limited local funding to assist with the local share of culvert and some floodwater-retention projects.

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:

1. Restoring those waters that are closest to meeting state water quality standards.
2. Protecting those high-quality unimpaired waters at the greatest risk of becoming impaired
3. 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 St. Louis River Comprehensive Watershed Management Plan Policy Committee, which may be competitive or non-competitive. The assumption is that future base support for implementation will be provided to the St. Louis River Watershed as one or more noncompetitive 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 11.3.

Federal Funding

Federal funding includes all funds derived from the federal tax base. This includes programs such as the EQIP administered by NRCS and road project funds through the Federal Highway Administration. 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 and local 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

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. Several conservation organizations are active in the watershed, including but not limited to local co-ops (i.e., Breakfast on the Farm), MN Deer Hunters Association, National Wild Turkey Federation, Pheasants Forever, The Nature Conservancy and Trout Unlimited. 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 the priority issues addressed, the availability of funds, and the roles and responsibilities for implementation.

Local Work Plan

Work planning will be decided as follows or in Figure 11-2:

- Steering Committee meets at least annually.
 - Biennially, Steering Committee members submit projects for their planning area to be reviewed by the Steering Committee. Partners within each planning area must work with their representative Steering Committee member to submit projects. For example, DUAWC would work with South St. Louis SWCD.
 - Annually, each partner will share project and goal progress for their planning area.
- Steering Committee ranks projects using the following criteria:
 - All projects **must**
 - Make progress towards plan's measurable goals
 - Be identified in the plan's implementation table
 - Be within a priority area or targeted resource of the plan
 - Have required match (required grant match is 10% for the overall grant; match is not required per project)
 - Ranking considerations
 - Timing aligns with other projects/funding (high urgency) or critical first step for future implementation (design or study)
 - Cost-effectiveness (percentage of goal achieved per dollar)

- Shovel readiness (designs, permits, easements or landowner agreements)
- Final work plan is recommended by one representative from each member organization of the Steering Committee (Carlton County & SWCD, St. Louis County, North & South St. Louis SWCD, Fond du Lac and Lake SWCD). If a committee member cannot attend, they must waive their vote in writing.
- Steering Committee recommended work plan is brought to the Policy Committee. After their approval, each individual board must also approve the work plan.
- Once approved by the individual boards, the work plan can be submitted to BWSR.
- Up to \$50,000 of the grant can be moved without approval by the Policy Committee. The Steering Committee must agree to approve the move.
- **No one project can take more than 30% of the budget without unanimous approval from the Policy Committee.**

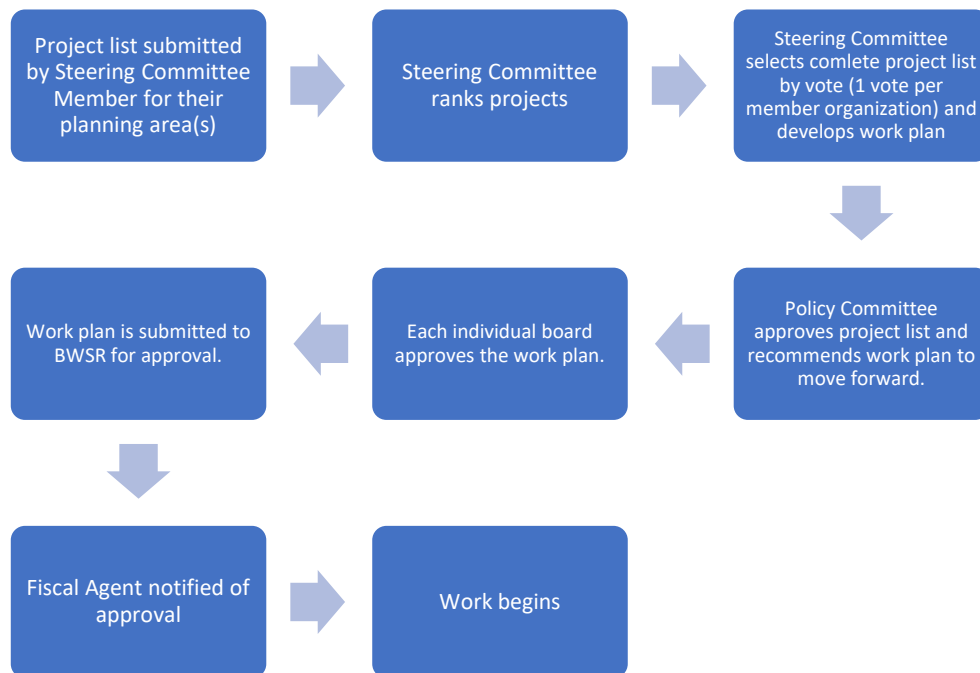


Figure 10-2. Work plan development process for biennium funding requests.

Implementing the St. Louis River Comprehensive Watershed Management Plan will be complex, requiring the coordination of multiple partners, governments, and stakeholders over a very large geographical area. Coordination with other planning efforts including the Lake-wide Action Management Plan, EPA 319 Small Watershed Program, Area of Concern, Fond du Lac Reservation along with multiple municipal programs will also be important. In addition, coordination will need to continue between the Steering Committee, Advisory Committee and Policy Committee. Early in the process, the need for a watershed coordinator was identified. Funds from the Watershed Based Implementation Funds should be used to fund this position.

Other staff may be needed to fully implement this plan. Expanded programs for forestry and stormwater may require new staff to coordinate the many projects listed in this plan. New programs for outreach, shoreland restoration and farm projects will require additional staff to implement plan actions. Staffing will be funded through the Watershed Based Implementation Funds for this plan and will be recommended by the Steering Committee during their annual meeting.

Funding Request

The St. Louis River Comprehensive Watershed Management Plan Steering Committee will collaboratively develop, review, and submit a watershed-based funding request to the Policy Committee from this plan. This request will be approved by the MOA partners prior to submittal to BWSR. The first 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 culverts replaced will be tracked so that each year the Steering Committee will report how many additional stream miles were connected in the watershed. A tracking system will be used to measure progress 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 will review the St. Louis River Watershed Comprehensive Watershed Management Plan 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 five-year evaluation. The St. Louis River Comprehensive Watershed Management Plan Steering Committee intends to pursue watershed-based funding to meet goals and plan implementation schedules.

Five-Year Evaluation

Beginning in 2023, this plan will be in effect for ten 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 five-year evaluation will be undertaken, as per the BWSR Order approving it, to determine if the current course of actions is sufficient to reach the goals of the plan, or if a change in the course of actions is necessary. At the 10-year mark, and every five years after, the plan will be fully re-evaluated.

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 11-1). In addition to annual reporting, the St. Louis River Comprehensive Watershed Management Plan Steering Committee will also develop a biennial State of the Watershed Report to present to the Policy Committee. 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 State of the Watershed Report will be developed through the annual evaluation process.

The fiscal agent is responsible for submitting all required reports and completing annual reporting requirements for the St. Louis River Comprehensive Watershed Management Plan as required by state law and policy. The Advisory Committee will assist in developing the required reports and roles and responsibilities will be defined in the MOA Bylaws.

Plan Amendments

The St. Louis River Comprehensive Watershed Management Plan 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 achieving the plan goals. This provision for flexibility includes changes to the activities except for those of capital improvement projects.

During the time this plan is in effect, it is likely that new data giving a better understanding of watershed issues and solutions will be generated. Administrative authorities, state policies, and resource concerns may also change. New information, significant changes to the projects, programs, or funding in the plan, or the potential impact of emerging concerns and issues may require activities to be added to the plan. If revisions are required or requested, the Policy Committee will initiate a plan amendment process following their MOA Bylaws.

Formal Agreements

The St. Louis River Comprehensive Watershed Management Plan Policy Committee is a coalition of St. Louis County, North & South St. Louis SWCDs, Carlton SWCD, Carlton County and Lake SWCD and the Fond du Lac Band of Lake Superior Chippewa. The Policy Committee previously entered into a Memorandum of Agreement (MOA) for planning the One Watershed One Plan for the LWR Watershed (Appendix E). The entities will draft a MOA for purposes of implementing this plan. The Policy Committee is advisory to the individual county, tribal and SWCD boards under the umbrella of the MOA.