Rainy River Headwaters – Vermilion River Watershed Landscape Stewardship Plan

1854 Treaty Authority
Cook County Soil and Water Conservation District
Dovetail Partners Inc
Houston Engineering
Lake County Soil and Water Conservation District
Natural Resources Conservation Service
North St. Louis Soil and Water Conservation District
Packaging Corporation of America International Falls
University of Minnesota- Hubachek Wilderness Research Center
St. Louis County Land Department

CLEAN WATER LAND & LEGACY AMENDMENT

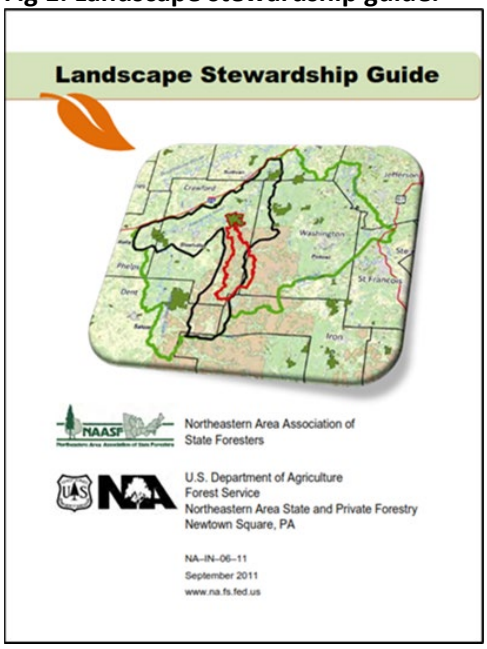
BOARD OF WATER AND SOIL RESOURCES

DEPARTMENT OF NATURAL RESOURCES

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

What is Landscape Stewardship?

Fig 1. Landscape stewardship guide.



Effective landscape conservation is a compelling challenge across the United States. Declining water quality, climate adaptation, forest land conversions, wildfires, and invasive species are among many threats to our Nation's forests and the ecosystem services they provide. Forest lands cover roughly 42% of the Midwest and Northeast states, with 77% of those forests in private ownership. There are nearly five million private forest landowners in these 20 states. With over one-quarter of the Nation's forests, and nearly half (43%) of the Nation's population in this region, conserving our forests is not a luxury, it is a necessity. Landscape stewardship is the process established by the United States Congress through policy directives in the 2008 Farm Bill to face these challenges. Leadership from the United States Department of Agriculture Forest Service (USDA FS) and the Northeastern Area Association of State Foresters developed a vision for landscape scale conservation to address these threats. They recognized the public and private benefits that planning and managing forest lands across boundaries are best addressed through integrated local based partnerships with supporting resources. In 2011, they published the document, “Landscape Stewardship Guide” to help state and local partners establish their landscape stewardship programs.

Recognizing the critical linkages between forests and water quality, the Minnesota Department of Natural Resources (DNR) and the Minnesota Board of Water and Soil Resources (BWSR), together with local partners and private landowners, have teamed up to develop watershed-based landscape stewardship plans (LSPs) across the forested regions of the state.

Credits

Local Forestry Technical Team: David Abazs, Lake County Soil and Water Conservation District; Callie Bertsch, Natural Resources Conservation Service; Tim Byrns, Lake County Soil and Water Conservation District; Courtney Clark, Department of Natural Resources; Gloria Erickson, Dovetail Partners Inc; Zachary Evans, North St. Louis Soil and Water Conservation District; Brian Feldt, Department of Natural Resources; Aaron Frankl, Houston Engineering; Kyle G Gill, University of Minnesota- Habachek Wilderness Research Center; Kari Hedin, Lake County Soil and Water Conservation District; Jess Holmes, Department of Natural Resources; Stephan Janasie, Cook County Soil and Water Conservation District; Victoria Jari, Department of Natural Resources; Aaron Kania, United States Department of Agriculture Forest Service; Tyler Kasper, 1854 Treaty Authority; Beth Kleinke, Natural Resources Conservation Service; Andrew Mathis, Packaging Corporation of America- International Falls; Chris Parthun, MDH; Allison Praet, Natural Resources Conservation Service; Nate Quadhamer, Lake County Soil and Water Conservation District; Becca Reiss, North St. Louis Soil and Water Conservation District; Moriya Rufer, Huston Engineering; Bill Schuster, Consultant Forester; Tara Solem, Lake County Soil and Water Conservation District; Mike Stubbs, St. Louis Land Department; Jen Teegarden, Department of Natural Resources; Joy VanDrie, United States Department of Agriculture Forest Service; and Natalya Walker, North St. Louis Soil and Water Conservation District.

Staff Team: John Carlson, Department of Natural Resources; Lindberg Ekola, BWSR; Bethany Chaplin, Plan Writer; Mitch Brinks, GIS Contractor; Stephanie Finch, Geology Consultant; and Andy McGuire, Department of Natural Resources.

Cover photo: Kawishiwi River near Koma Lake by Kari Hedin.

Website: This plan can be found online at:

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Introduction

Forests play a critical role in keeping water clean by absorbing and filtering water, preventing erosion through soil stabilization, and allowing for groundwater recharge. The National Association of State Foresters recognized the connection of healthy forests to clean water with its policy statement: “Water, in all its uses and permutations, is by far the most valuable commodity that comes from the forest land that we manage, assist others to manage, and/or regulate.”

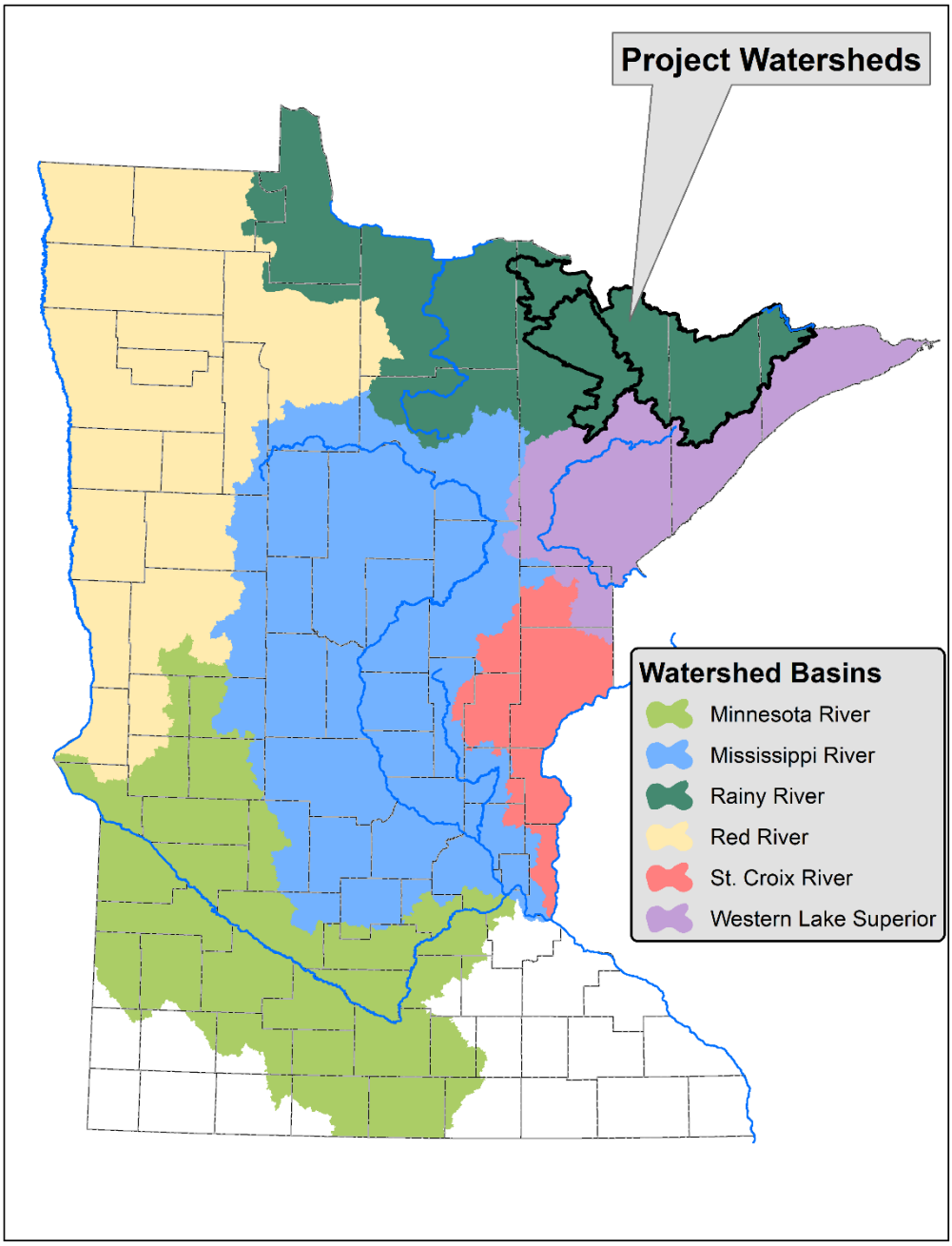
Purpose and Scope

Recognizing the critical linkages between forests and water quality, the DNR and the BWSR, together with local partners and private landowners, are teaming up to develop watershed-based LSPs across the forested regions of the state.

The Rainy River Headwaters – Vermilion River Watershed planning region encompasses two whole major watershed the Rainy River Headwaters (09030001) and the Vermilion River (09030002) (Fig 2). The Rainy River Headwaters watershed has a total area of 1,890,740.5 acres and almost half of the drainage area is within the Boundary Waters Canoe Area Wilderness (BWCAW). It covers four counties; Lake, St. Louis, Cook, and Koochiching. The Vermilion River watershed has a total area of 661,299.1 acres and is located north of the Laurentian Divide, the watershed drains to the north and discharges at Crane Lake. It covers only one county, St. Louis. Their waterbodies and riparian areas provide drinking water, wildlife habitat, and recreational opportunities like swimming, fishing, and canoeing. Research of lakes and rivers by DNR Fisheries and hydrologist Sandy Verry revealed the impacts of land use disturbance in a watershed and importance of protecting private lands. The Rainy River Headwaters – Vermilion River Watershed planning region is well-situated to advance the protection and management of working forest lands on a landscape level.

The Rainy River Headwaters – Vermilion River Watershed LSP is a 10-year tactical plan focused on guiding the protection and management of working forests on private lands on a watershed basis. The goal of this LSP is to empower teams of service providers to collaborate with private landowners and land managers to strategically protect working forest lands and promote private forest stewardship to enhance both private and public benefits that forests provide. Investing resources for private forest management in the parts of the watershed where the public benefits can be stacked (e.g., tourism, timber, habitat, etc.) supplies the greatest return on investment for the citizens of Minnesota.

Fig 2. Location of the Rainy River Headwater and Vermilion River major watersheds.



Forest and Water Resources Context

The Rainy River Headwaters – Vermilion River Watershed planning region is in northeastern Minnesota. An assessment of the resources in the region described in the first part of this LSP found that:

- Public land ownership is currently at 1,875,872 acres or 73.50%
- Private land ownership is currently at 676,168 acres or 26.50%
    - Forestry and mining account for 107,000 acres or 4.19%
- The Rainy River Headwaters contains a large portion of the BWCAW and the Voyageurs National Park (VNP), Bear Head Lake State Park, 6 State Forests, and 14 Scientific and Natural Areas.
- The Vermilion River Watershed contains a portion of the Voyageurs National Park (VNP), Superior National Forest (SNF), BWCAW, 5 State Forests, 2 State Parks, 2 Wildlife Management Areas, 4 Scientific and Natural Areas, and sections of the Bois Forte Band of Chippewa Native American Reservation.
- The 1854 Ceded Territory is within the eastern part of this planning region. The Bois Forte Band of Chippewa, the Fond du Lac Band of Lake Superior Chippewa, and the Grand Portage Band of Lake Superior Chippewa retain hunting, fishing, and gathering rights.
- The largest land use pressures are from the timber industry and recreational tourism.
- Smaller land use pressures include gravel mining, channelization, farming, and pasture operations.
- Water resources provide recreational opportunities and source water for populations centers in the United States.
- Water quality is dependent on maintaining significant levels of forest land cover across the region.

Linking Landscape Stewardship and Local Water Planning

Landscape stewardship is an "all lands" approach to forest management. Created by the USDA FS, it addresses multiple conservation challenges through the practical application of science and collaboration. It is based on five working principles:

1) Invest in priority areas
2) Build a collaborative network of service providers that effectively work together to serve more landowners
3) Appeal to interests of both landowner and service providers
4) Manage for results
5) Encourage flexibility at all levels to be more adaptive and cooperative in serving customers

Watershed-based LSPs analyze the critical contexts between land cover and water quality in ways useful to local water planning.

In Minnesota, water management planning is done on either the county or the major watershed (Hydrologic Unit Code or HUC 8) scale, and the goals or recommendations from the LSPs may be integrated into these water management plans. Comprehensive Watershed Management Plans (CWMP) are created through the One Watershed One Plan (1W1P) program administered by BWSR in partnership with local units of government. As described in Minnesota Statutes §103B, these plans must address:

1) Surface water and ground water
2) Storage and retention systems
3) Groundwater recharge
4) Flooding and water quality problems
5) Wetlands
6) Riparian zone management and buffers
7) Fish and wildlife habitat and water recreational facilities

Setting priorities is the first step in BWSR's strategic Prioritize-Target-Measure (PTM) approach to water resource planning and conservation. In managing watersheds, it is essential to recognize that not all valued resources and issues can be addressed at the same time. Prioritizing public and private investments through forest land protection down to the minor watershed level is a critical function in the LSP process. The second step is to target action towards more specific areas and issues within the priority watersheds. Through LSPs, targeting is done down at the specific parcel level within priority minor watersheds. To measure is the ability to demonstrate progress towards the achievement of management goals over time. After landowners decide what actions to take and implementation occurs, LSPs provide guidance on monitoring.

Partners and Process

This LSP was developed by a team of resource professionals working in the watershed. The list of project partners is provided in the Appendix. Data, maps, and reports detailing land cover, hydrology, and an array of natural resource topics developed by the project staff were provided to the Local Forestry Technical Team (LFT). The LFT reviewed and discussed this material at three meetings as a basis to help shape this LSP. This planning process was made possible through the Clean Water Land and Legacy Amendment.

Plan Content – Using this LSP

The primary audience of this LSP is the service providers who work with the thousands of private forest landowners in the watershed. Service providers include Soil and Water Conservation Districts (SWCD), Watershed Management Organizations (WMO), consulting foresters, DNR, Natural Resources Conservation Service (NRCS) and conservation organizations. This LSP is generally organized into three parts including:

1) Analysis of Forest and Water Resources
2) Vision and Goals
3) Guidance for Implementing the LSP

The Appendix supplies additional background information designed to be used by service providers to help them work more effectively together to serve greater numbers of landowners on a consistent basis. Ultimately it is the landowner's choice as to which level of forest protection works for them and how active they want to manage their woods. This LSP looks to help service providers increase their intentionality together to increase the strategic delivery of services to landowners and provide a full suite of forest management options to them.

Part 1: Analysis of Forest and Water Resources

Introduction

The first part of this LSP supplies background information on the setting of the Rainy River Headwaters – Vermilion River Watershed planning region and the conditions of its forest and water resources. It also introduces concepts to help increase the ability of service providers to deliver private forest management services.

Resource Context

The Rainy River Headwaters – Vermilion River Watershed planning region is in the southeastern part of the Rainy Basin and is located directly on the Minnesota and Canadian border. The basin encompasses a total area of 4,698,984 acres, of which 2,552,167 acres (54.31%) are in the United States and 2,146,817 acres (45.69%) are in Canada.

The Rainy River Headwaters – Vermilion River Watershed planning region constitutes the eastern portion of the Laurentian Divide in Minnesota. All the water that flows through the Rainy River Headwaters and the Vermilion River eventually makes its way to Hudson Bay and the Arctic Ocean. It is composed of 21 (HUC 10) subwatersheds (Fig 3) which correspond to major rivers and lakes in the region. The subwatersheds are further subdivided into 226 minor watersheds (HUC 14), each averaging 11,292.2 acres or 17.6 square miles.

Smaller than minor watersheds are catchments, which is the area between pour points, and it is also the level at which watersheds can be classified to a protection or restoration strategy as defined by the DNR Fisheries Lake Habitat Framework (Fig 4 and Fig 5). The framework states that water quality and fish habitat decline once development in a watershed reaches above 75% of the total area. Most of the catchments fall into either the partial restoration or full restoration categories.

Fig 3. Rainy River Headwaters – Vermilion River Watershed planning region subwatersheds.

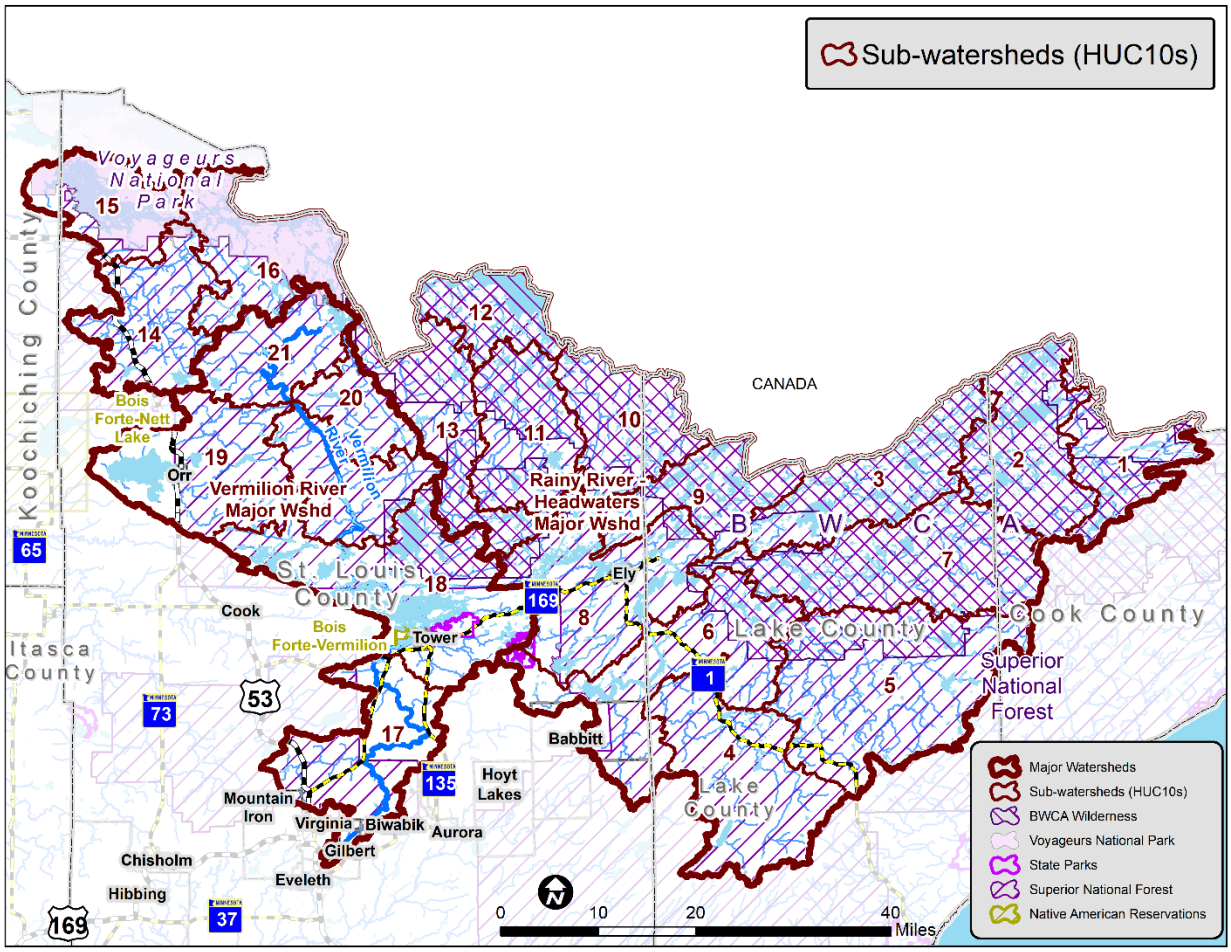


Table 1. Subwatershed number, HUC 10 number, name, and major watershed name.

Subwatershed Number	HUC 10 Number	HUC 10 Name	Major Watershed Name
1	903000103	Granite River	Rainy River - Headwaters
2	903000104	Saganaga Lake	Rainy River - Headwaters
3	903000105	Knife Lake-Sucker Lake	Rainy River - Headwaters
4	903000106	Stony River	Rainy River - Headwaters
5	903000107	Isabella River	Rainy River - Headwaters
6	903000108	Birch Lake	Rainy River - Headwaters
7	903000109	Kawishiwi River	Rainy River - Headwaters
8	903000110	Fall Lake	Rainy River - Headwaters
9	903000111	Basswood Lake	Rainy River - Headwaters
10	903000112	Crooked Lake-Iron Lake	Rainy River - Headwaters
11	903000113	Boulder River	Rainy River - Headwaters
12	903000120	Lac La Croix	Rainy River - Headwaters
13	903000121	Little Vermilion Lake	Rainy River - Headwaters
14	903000124	Ash River	Rainy River - Headwaters

15	903000125	Kabetogama Lake	Rainy River - Headwaters
16	903000126	Namakan Lake	Rainy River - Headwaters
17	903000201	Pike River	Vermilion River
18	903000202	Vermilion Lake	Vermilion River
19	903000203	Pelican River	Vermilion River
20	903000204	Echo River	Vermilion River
21	903000205	Vermilion River	Vermilion River

Fig 4. Watershed categorization framework.

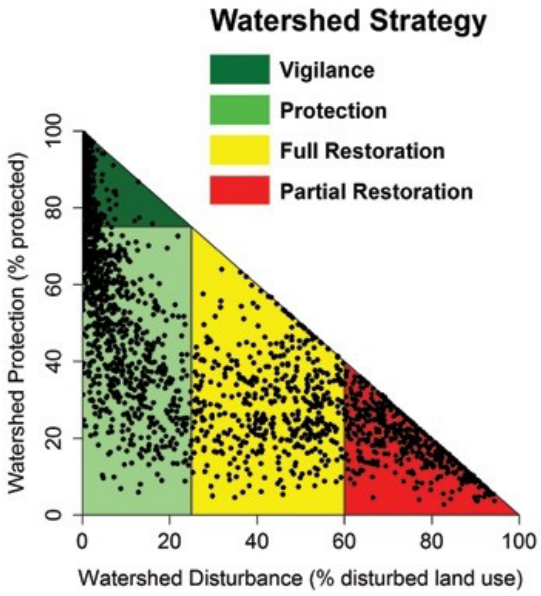
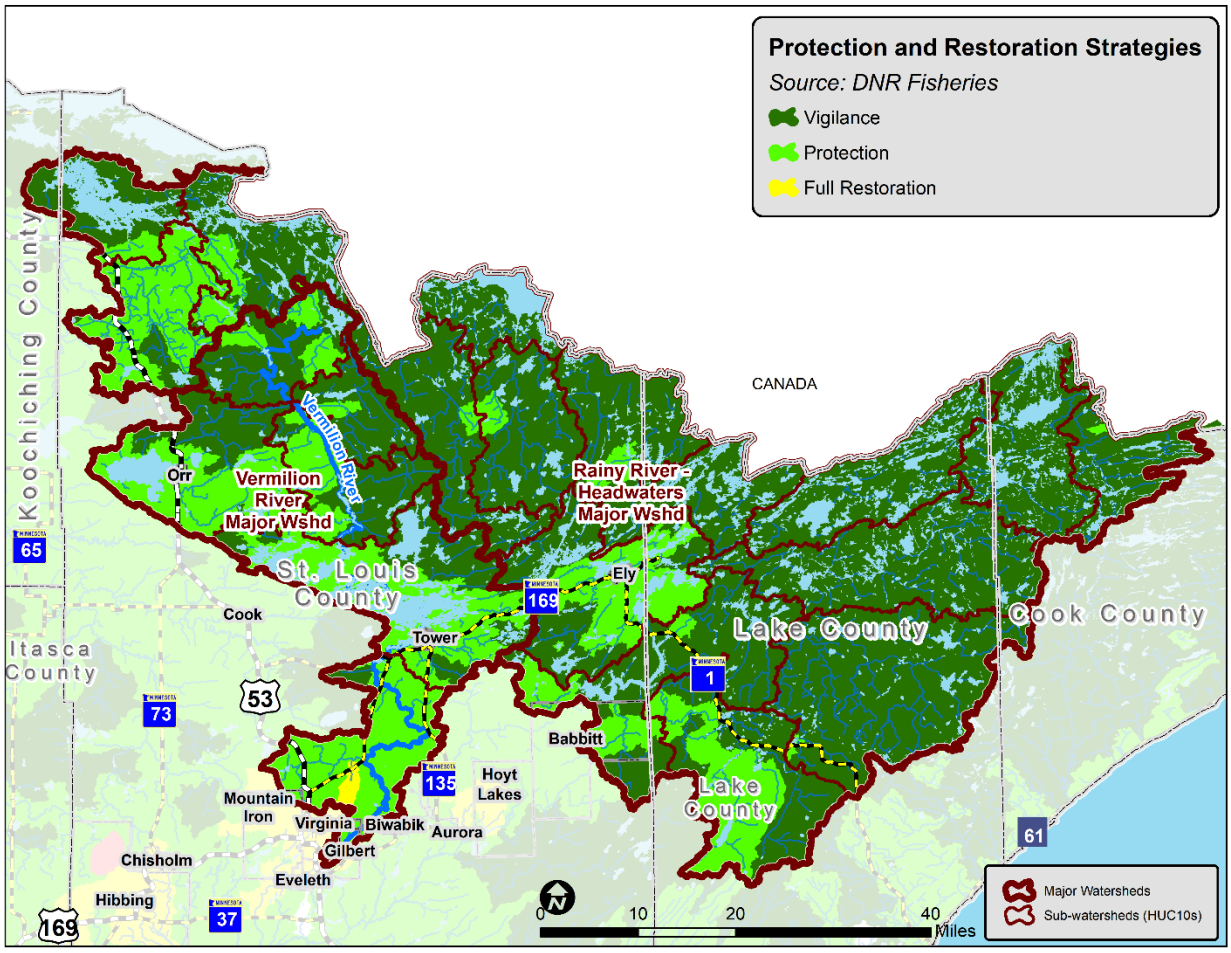


Fig 5. Protection/restoration classifications.



Geology

The Rainy River Headwaters – Vermilion River Watershed planning region contains significant amounts of exposed bedrock, with a shallow average depth-to-bedrock across the watershed. The igneous and metamorphic bedrocks are not the parent material of this watershed's soils; rather, soils are derived from rock debris moved south with glacial activity. The bedrock in this area of the state is ancient and underlies the entirety of the region, with faults influencing present-day lake orientation and prevalence. Groundwater and surface water interaction is limited by near-impermeable bedrock.

Geomorphology

As glaciers carved the landscape, traveling southwest along what is now the coast of Lake Superior, topography was smoothed and flattened. During the last period of glacial advance, the Rainy lobe swept across the entirety of the watershed, leaving a slightly calcareous brown till containing sand, gravel, and boulders. Most soils are thin and patchy, but there are pockets of deep till, reaching over 100 ft in depth. Gravelly ridges--moraines-- mark the edges of stalled glaciers and sub-glacial drainage channels. Peatlands and wetlands are indicative of a still-developing drainage system.

The northeast corner of the watershed was influenced by the later St. Louis sublobe glacial advance from the northwest, best observed in the Ash River and Kabetogama subwatersheds. This glacier carried rocks from a different source than the earlier glaciation and deposited soils with a higher silt/clay content than found in the rest of the watershed. There are also remnants of Glacial Lake Agassiz in this area, with clayey and silty bedding found in the soils.

Fig 6. Geology of the Rainy River Headwaters – Vermilion River Watershed planning region.

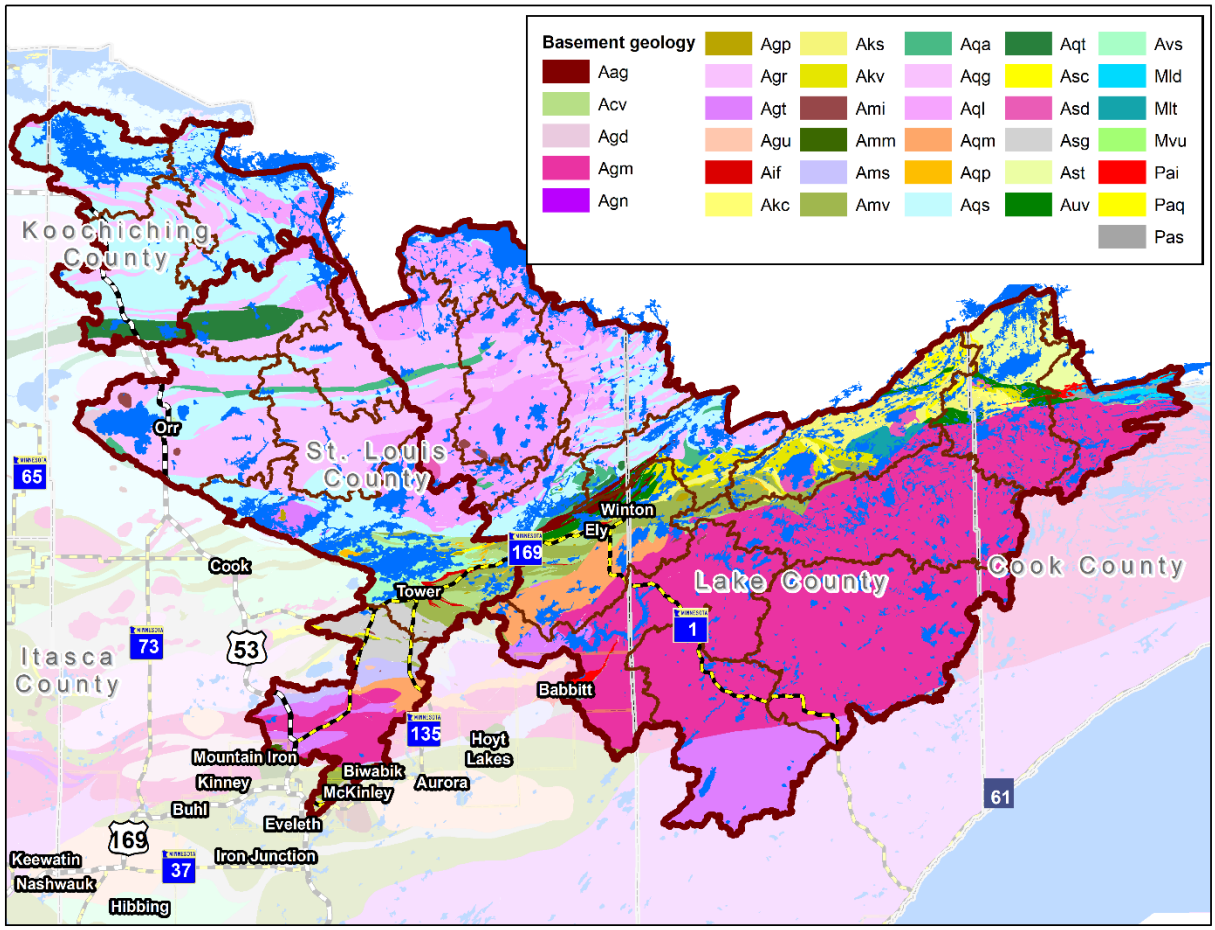
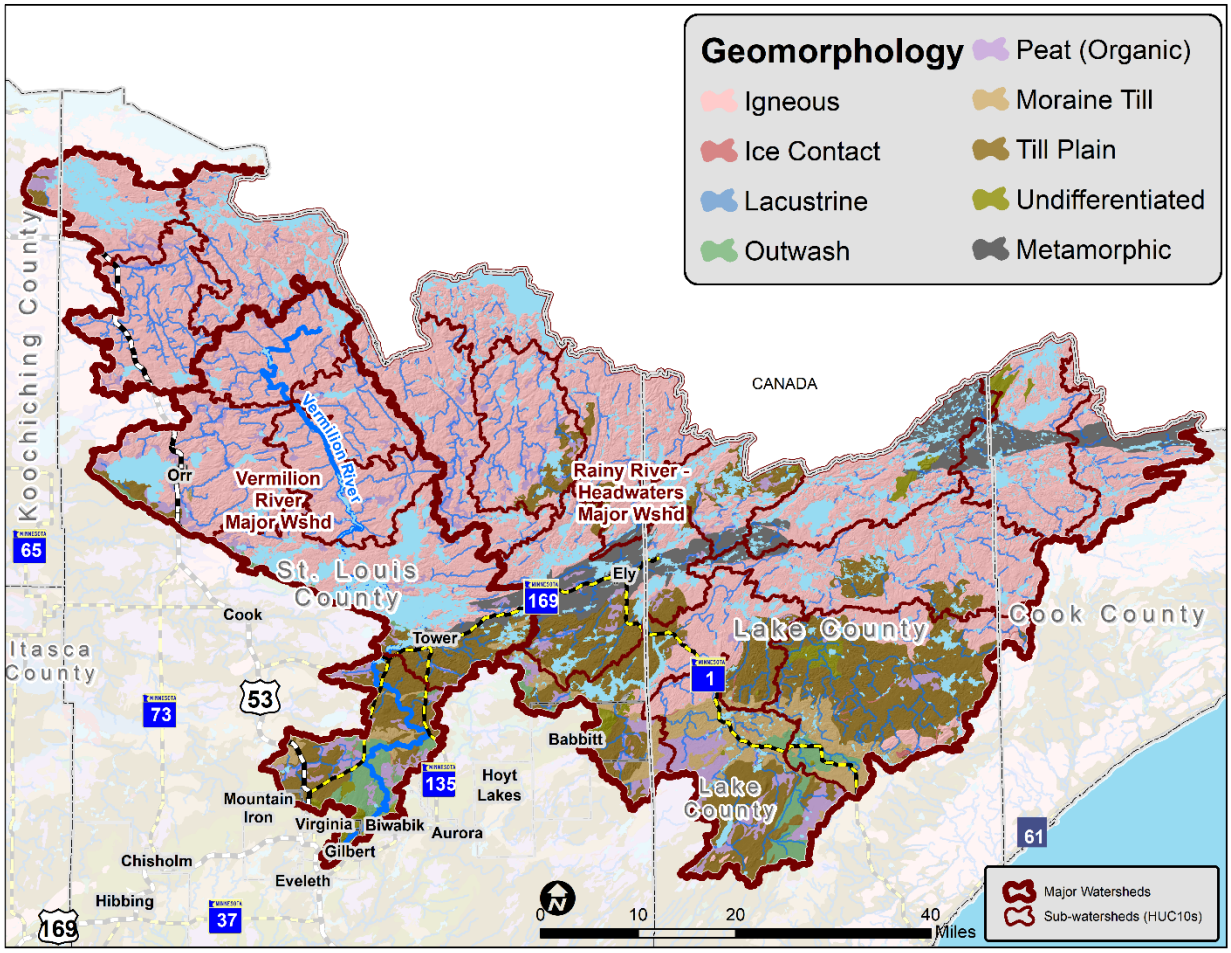


Table 2. Basement geology map label and description.

Map Label	Description
Aag	Mafic to ultramafic hypabyssal intrusive complexes; gabbro, anorthosite
Acv	Calc-alkalic volcanic and volcaniclastic rocks
Agd	Granodioritic intrusion
Agm	Granite to granodiorite, variably magnetic
Agn	Granitic to granodioritic orthogneiss
Agp	Gabbro, pyroxenite, peridotite, lamprophyre intrusion
Agr	Granitic intrusion
Agt	Tonalite, diorite and granodiorite
Agu	Granitoid intrusion, undifferentiated or poorly constrained by core and outcrop
Aif	Iron-formation
Akc	Knife Lake Group volcanic conglomerate, breccia; alkalic, hornblende-bearing
Aks	Knife Lake Group volcanogenic lithic sandstone, siltstone, conglomerate, slate
Ami	Mafic plug-like intrusion; typically magnetic
Amm	Interlayered volcanic and volcaniclastic rocks; amphibolite grade metamorphism
Ams	Amphibolitic to dioritic gneiss
Amv	Mafic metavolcanic rocks; minor volcaniclastic and hypabyssal intrusions
Aqa	Amphibolitic schist and gneiss

Aqg	Granite-rich migmatite; locally magnetic
Aql	Lac La Croix Granite; locally pegmatitic and magnetic
Aqm	Quartz monzonite, monzonite, granodiorite; non-magnetic
Aqp	Porphyritic quartofeldspathic dike
Aqs	Biotite schist, paragneiss, and schist-rich migmatite
Aqt	Tonalite- to granodiorite-rich migmatite
Asc	Conglomerate, lithic sandstone, graywacke, mudstone
Asd	Syenitic, monzodioritic, or dioritic pluton
Asg	Graywacke and mudstone; typically greenschist facies metamorphism
Ast	Saganaga Tonalite
Auv	Ultramafic to mafic volcanic and hypabyssal intrusive rocks
Avs	Volcanic and volcaniclastic rocks; felsic to intermediate composition
Mld	NA
Mlt	Logan intrusion; diabase and gabbro sills and dikes
Mvu	NA
Pai	NA
Paq	NA
Pas	NA

Fig 7. Geomorphology of the Rainy River Headwaters – Vermilion River Watershed planning region.



Land Cover

Prior to European settlement, the Rainy River Headwaters – Vermilion River Watershed planning region was covered by 0.1% prairie, 59.8% forest, 24.2% woody wetlands, 2.4% emergent wetlands, and 13.6% open water (Fig 8 and Table 2). Today, the landscape is 4.5% urban and rural development, 0.0% cultivated land, 1.7% prairie, 50.3% forest, 27.5% woody wetlands, 1.9% emergent wetlands, and 14.0% open water.

Fig 8. Historic vegetation in the Rainy River Headwaters – Vermilion River Watershed planning region.

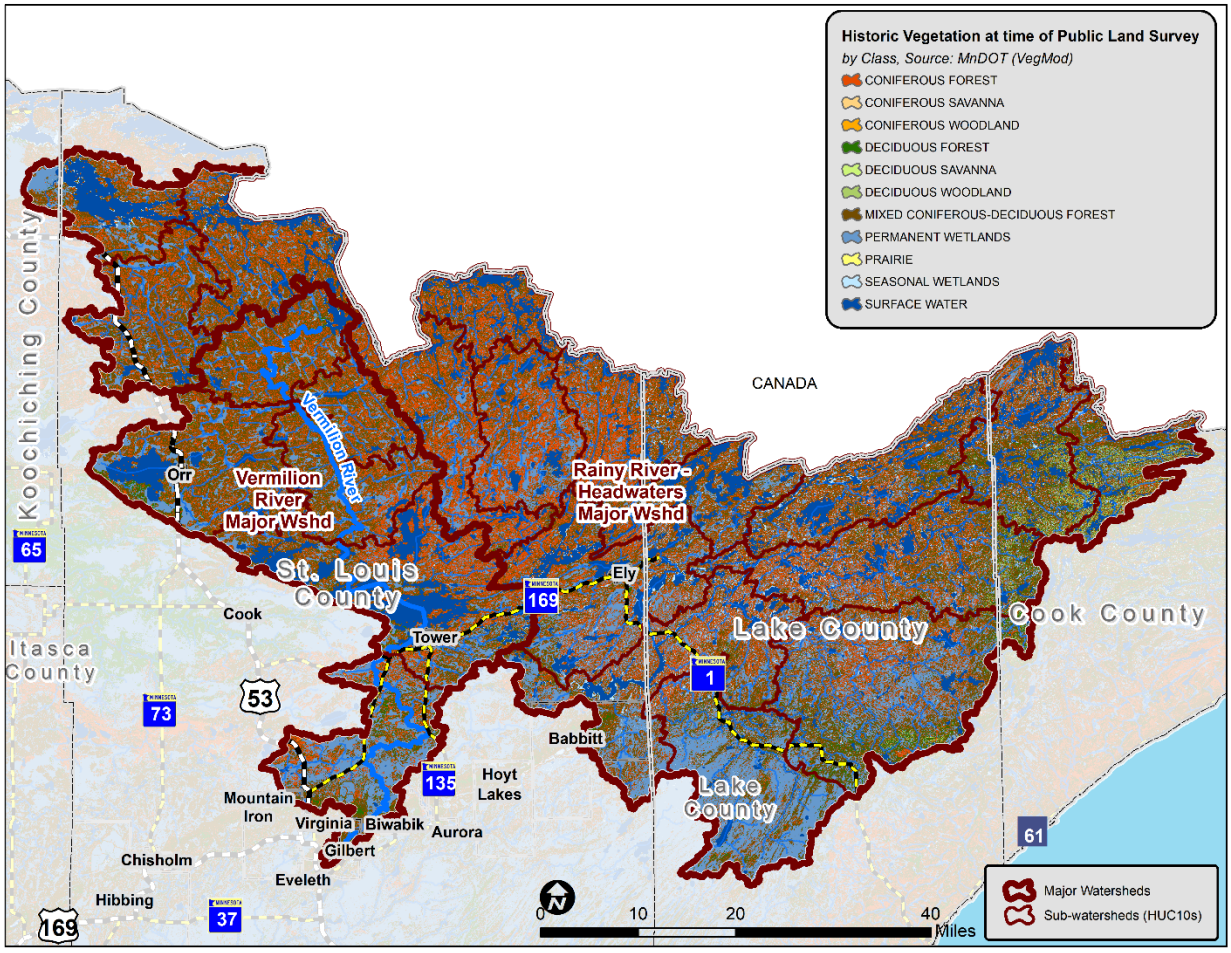


Fig 9. Current land cover in the Rainy River Headwaters – Vermilion River Watershed planning region.

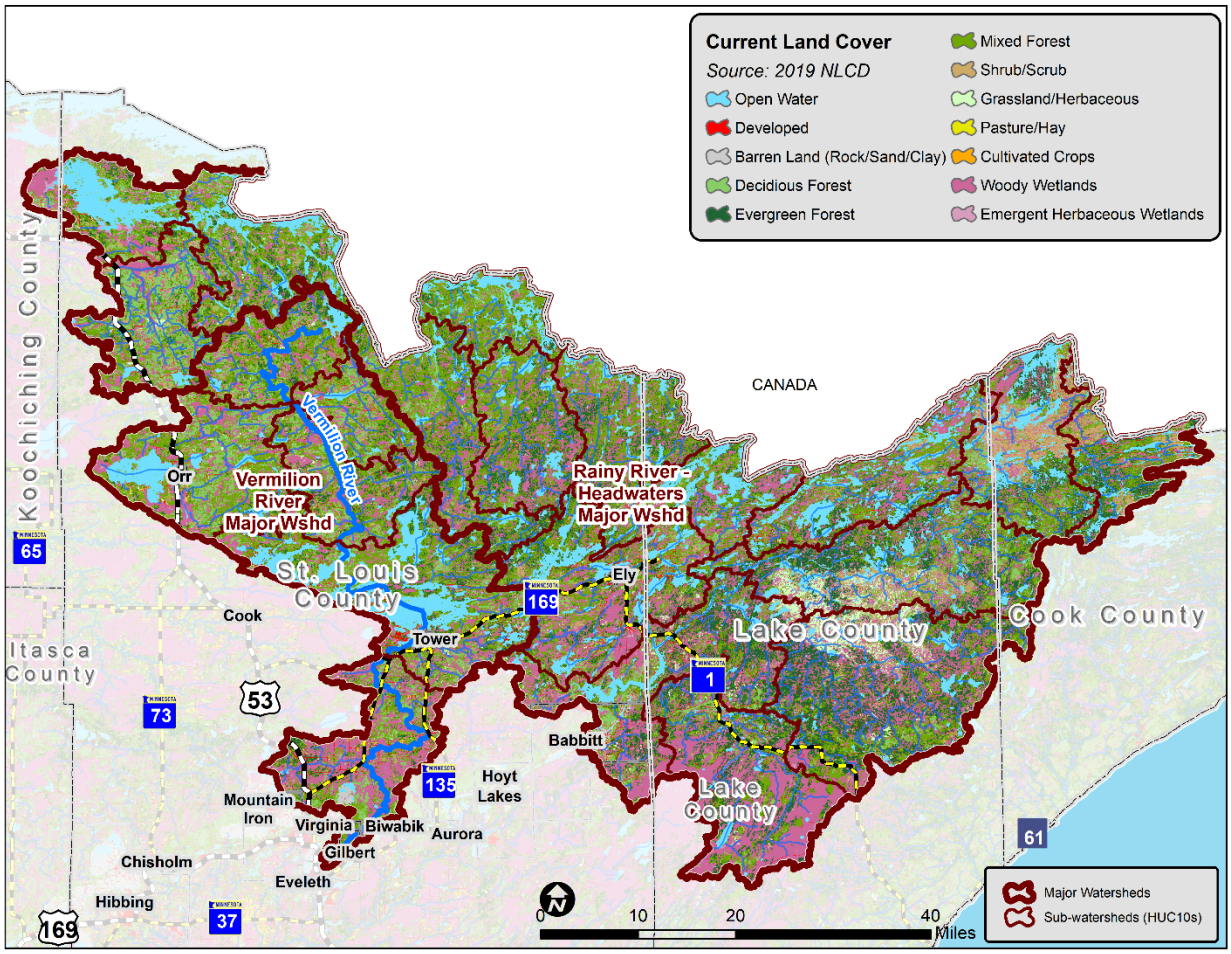


Table 3. Historic and current land cover comparison.

Land Cover Description	Pre-European Settlement		2019	
	Acres	Percent	Acres	Percent
Urban and Rural Development	0.0	0.0%	115,293.1	4.5%
Cultivated Land	0.0	0.0%	51.2	<0.0%
Prairie: Hay/Pasture/Grassland	1,873.9	0.1%	43,604.7	1.7%
Forest	1,525,536.4	59.8%	1,277,290.3	50.3%
Woody Wetlands	617,987.8	24.2%	697,858.6	27.5%
Emergent Wetlands	60,711.9	2.4%	49,031.8	1.9%
Open Water	345,841.5	13.6%	354,933.4	14.0%
Total	**2,551,951.5**	**100.0%**	**2,538,063.0**	**100.0%**

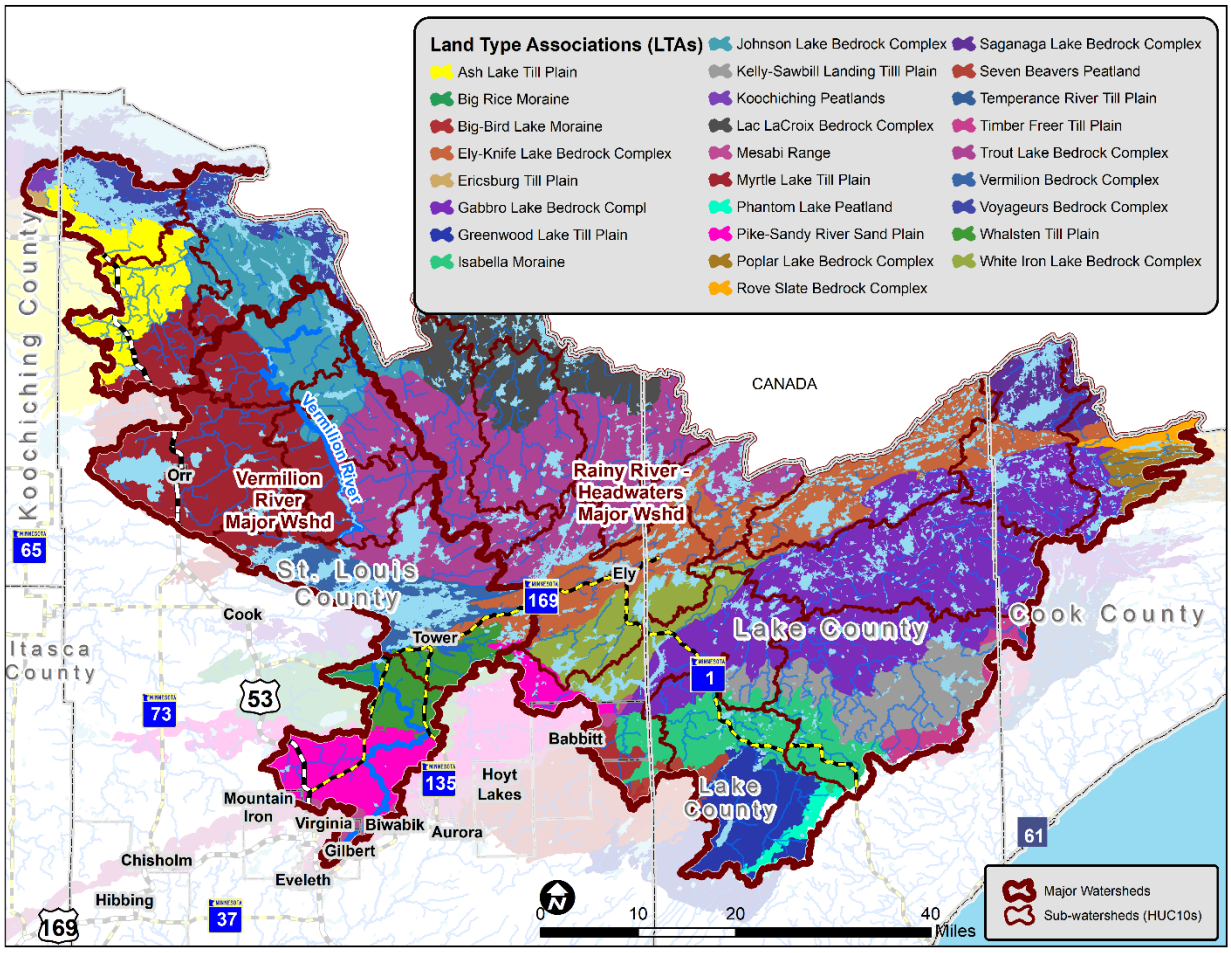
Source: Minnesota Model Historical Vegetation Model and National Land Cover Database.

Ecological Setting

The Rainy River Headwaters – Vermilion River Watershed planning region is in the Laurentian Mixed Forest Province. On the northwestern side is in the North Minnesota and Ontario Peatlands Ecological Classification System (ECS) section. The DNR and the US FS developed the ECS for ecological mapping and classification following the National Hierarchical Framework of Ecological Units research paper. It uses associations of biotic and environmental factors, including climate, geology, topography, soils, hydrology, and vegetation to classify land. The eastern side is in the Northern Superior Uplands ECS Section. At the ECS Subsection level the region intersects with five Subsections: Border Lakes (80.24%), Laurentian Uplands (12.73%), Littlefork – Vermilion Uplands (0.28%), Nashwauk Uplands (6.51%), and North Shore Highlands (0.24%).

The next level below the ECS Subsection is the Land Type Association (LTA). LTAs are units within ECS subsections that are defined using glacial landforms, bedrock types, topographic roughness, lake and stream distributions, wetland patterns, depth to ground water table, soil parent material, and pre-European settlement vegetation. The Rainy River Headwaters – Vermilion River Watershed planning region has portions of 33 LTAs (Fig 10), the top three LTAs are Trout Lake Bedrock Complex (15.87%), Myrtle Lake Till Plain (10.25%), and Ely-Knife Lake Bedrock Complex (9.17%).

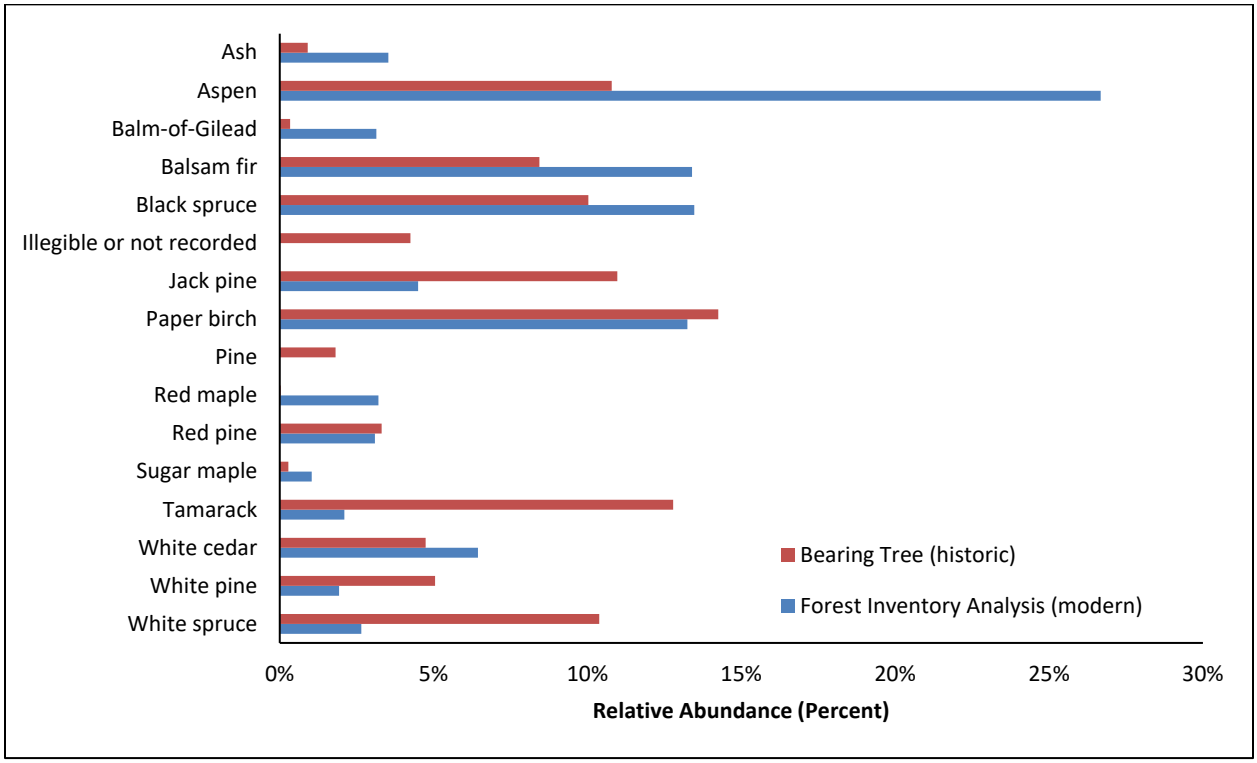
Fig 10. Land Type Associations of the Rainy River Headwaters – Vermilion River Watershed planning region.



Prior to European settlement the vegetation in the Rainy River Headwaters – Vermilion River Watershed planning region was mostly covered by forest consisting of paper birch, tamarack, jack pine, aspen, white spruce, black spruce, balsam fir, white pine, white cedar, red pine, and ash.

As a result of land conversion and logging of Minnesota's forests in the late 1800's and early 1900's, along with subsequent forest management practices, the composition of the forest has changed significantly. In the area around the Rainy River Headwaters – Vermilion River Watershed planning region the forest was dominated by paper birch and tamarack. Today, the most common species are aspen, black spruce, balsam fir, and paper birch (Fig 11).

Fig 11. Relative abundance of species in the Rainy River Headwaters – Vermilion River Watershed planning region (historic and modern).



Source: DNR Division of Forestry, Resource Assessment.

Land Ownership

1,824,991.5 acres (71.51%) of the Rainy River Headwaters – Vermilion River Watershed planning region is public land, and is split between city, township, county, federal, and state. Major public land includes the BWCAW, VNP, SNF, Bear Head Lake State Park, Lake Vermilion-Soudan Underground Mine State Park, 3 Wildlife Management Areas, 9 State Forests, and 8 Scientific and Natural Areas, and sections of the Bois Forte Band of Chippewa Native American Reservation.

Fig 12. Public and private land ownership.

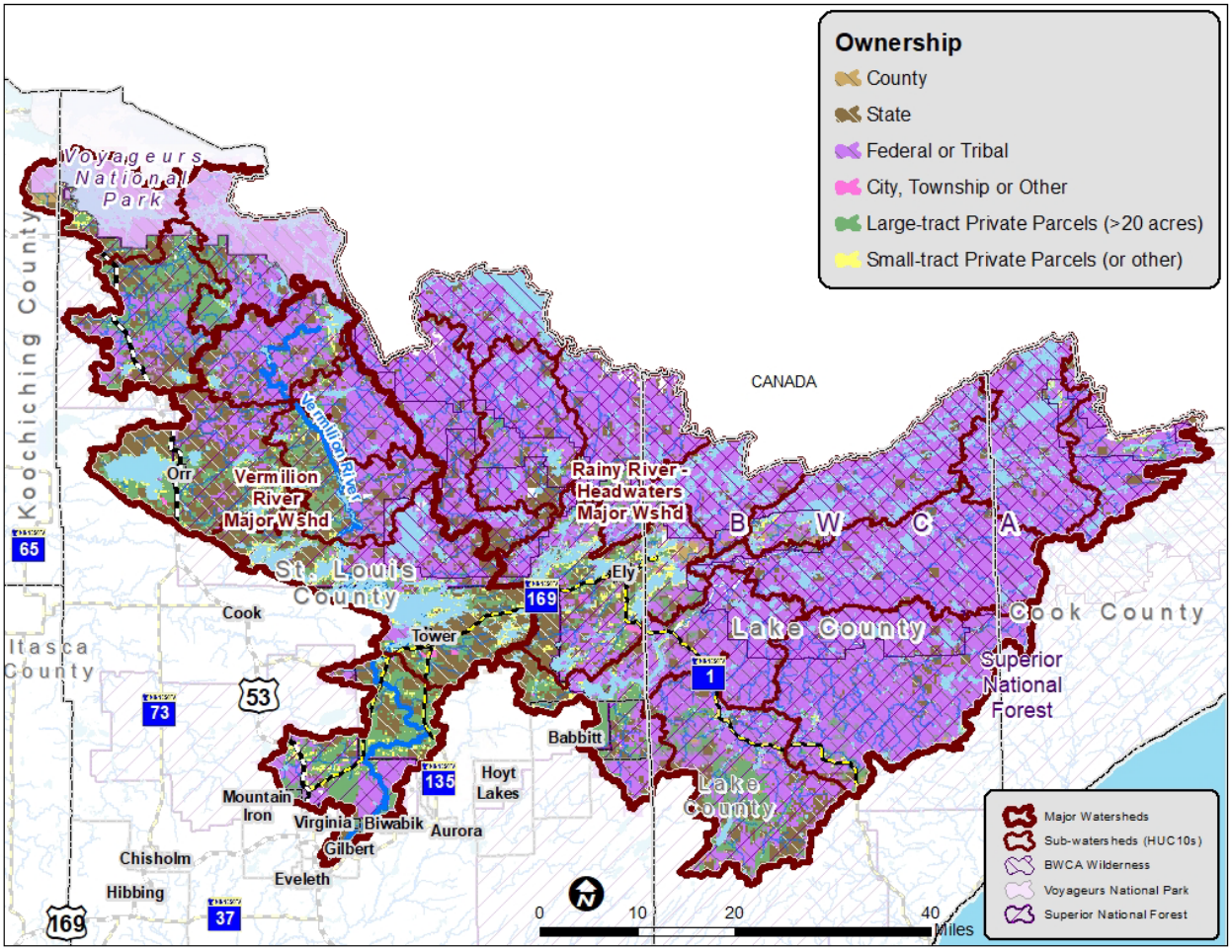


Table 4. Public land ownership.

Public Land Ownership	Acreage	Percent of Watershed
City or Township	7,073	0.28%
County	16,810	0.66%
Federal	1,389,352	54.44%
State	459,826	18.02%
Tribal	2,811	0.11%
Total	**1,875,872**	**73.50%**

Social and Economic Context

Census data from 2021 estimates that the population of the Rainy River Headwaters – Vermilion River Watershed planning region's four counties are Cook (5,574), Koochiching (12,203), Lake (10,835), and St. Louis (199,182). Minnesota's 2020 total population was 5,707,390, making the population in the four counties a total of 3.99% of Minnesota's population.

In the Rainy River Headwaters major watershed, water accumulates in Namakan Lake and flows into Rainy lake via Kettle Falls. Water continues to flow through a series of lakes and rivers eventually flowing

into the Hudson Bay. In the Vermilion River major watershed, water flows from the Pike River and Eagles Nest Chain of Lakes via the East Two River flow into Lake Vermilion. From Lake Vermilion, water flows out of Wolf Bay into the Vermilion River, which the watershed is named after. As the Vermilion River flows north to Crane Lake, various streams, and rivers, such as the Pelican River, contribute flows to the Vermilion River. This water is first filtered by the forests and wetlands, and then goes on to supply drinking water for population centers in the United States.

To continue producing high quality drinking water, the forests, and wetlands in the Rainy River Headwaters – Vermilion River Watershed planning region must be protected. In general, forests and wetlands export much less phosphorous (which is a key determinant of water quality) than development or agriculture (Fig 13). Furthermore, natural cover greatly promotes infiltration and reduces runoff of sediment and potentially pollution-laden runoff (Fig 14).

Fig 13. Annual phosphorous exports by land use.

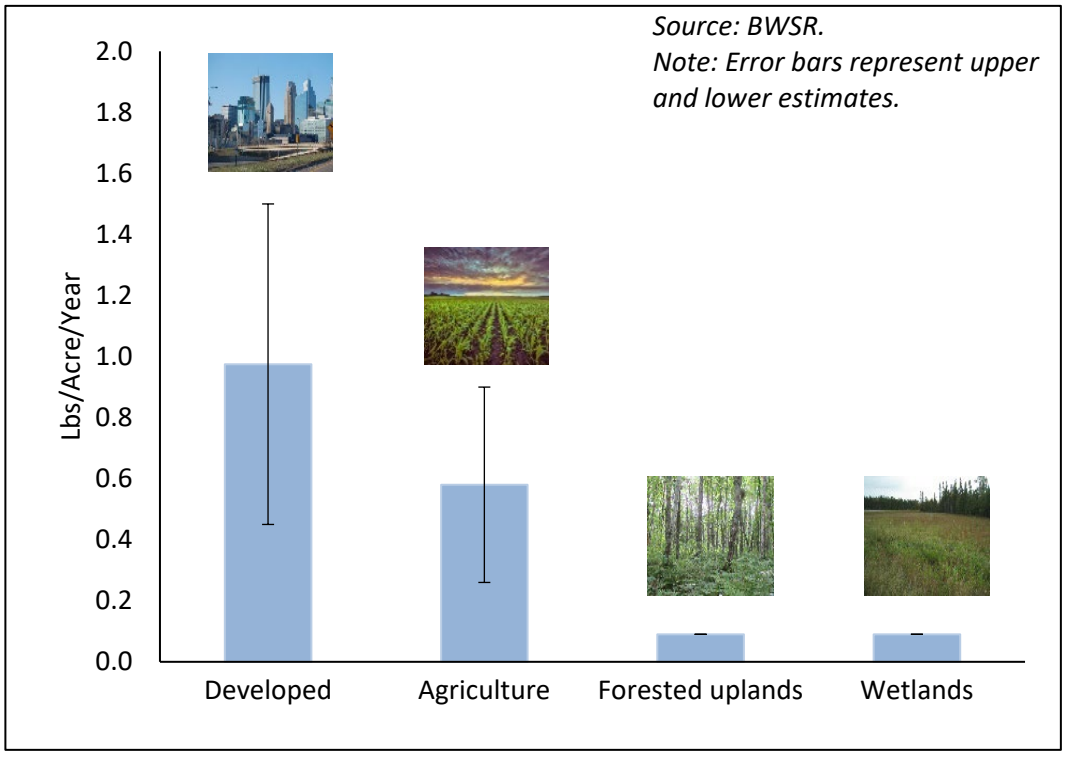
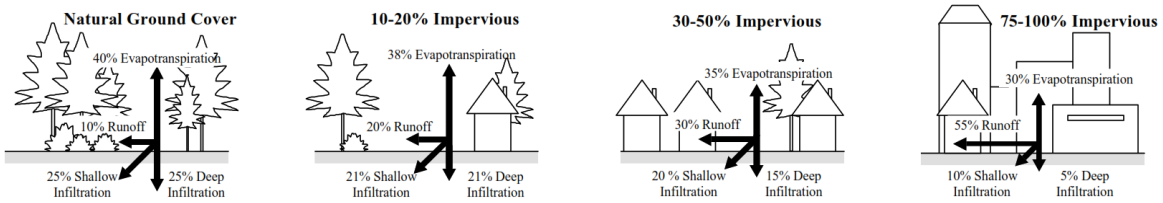


Fig 14. Effects of imperviousness on runoff and infiltration.



Source: Adapted from Arnold and Gibbons, 1996.

Drinking Water Sources

The Rainy River Headwaters major watershed contributes to two community public water supplies and 29 noncommunity public water supplies that use surface water or groundwater under the direct influence of surface water as a source for drinking water. The city of International Falls, Fort Frances, and Ontario rely on the Rainy River for its drinking water. The Rainy River Headwaters major watershed is a major tributary to the Rainy River. The noncommunity public water supplies in the watershed rely on surface water from the lakes and rivers present in the watershed for drinking water. Noncommunity public water supplies include bars, restaurants, camps, and resorts that serve customers for shorter periods. The following waterbodies either serve as drinking water sources or appear to contribute flow to nearby drinking water wells: Big Lake, Burntside Lake, Farm Lake, Fenske Lake, Gunflint Lake, Johnson Lake, Kawishiwi River, Lake Kabetogama, Mitchell Lake, Moose Lake, Sea Gull Lake, Sea Gull River, Shagawa Lake, Snowbank Lake, and White Iron Lake. The city of Ely relies on water from Burntside Lake for its drinking water. This information was adapted from the Minnesota Pollution Control Agency's (MPCA) Watershed Restoration and Protection Strategy Report (WRAP).

The Vermilion River major watershed contributes to one downstream community public water supply. This includes the city of International Falls and five noncommunity public water supplies that use surface water or groundwater under the direct influence of surface water as a source for drinking water. The city of International Falls relies on the Rainy River for their drinking water. The Vermilion River is a major tributary to the Rainy River. The noncommunity public water supplies in the watershed rely on surface water from the many lakes and rivers present in the watershed for drinking water. Noncommunity public water supplies include bars, restaurants, camps, and resorts that serve customers for shorter periods. The following waterbodies either serve as drinking water sources or appear to contribute flow to nearby drinking water wells: Crane Lake; Kabustasa (and/or Echo) Lake; Lake Vermilion; and Pelican Lake. This information was adapted from the MPCA's WRAPS Report.

Figure 15. Drinking water supply management areas.

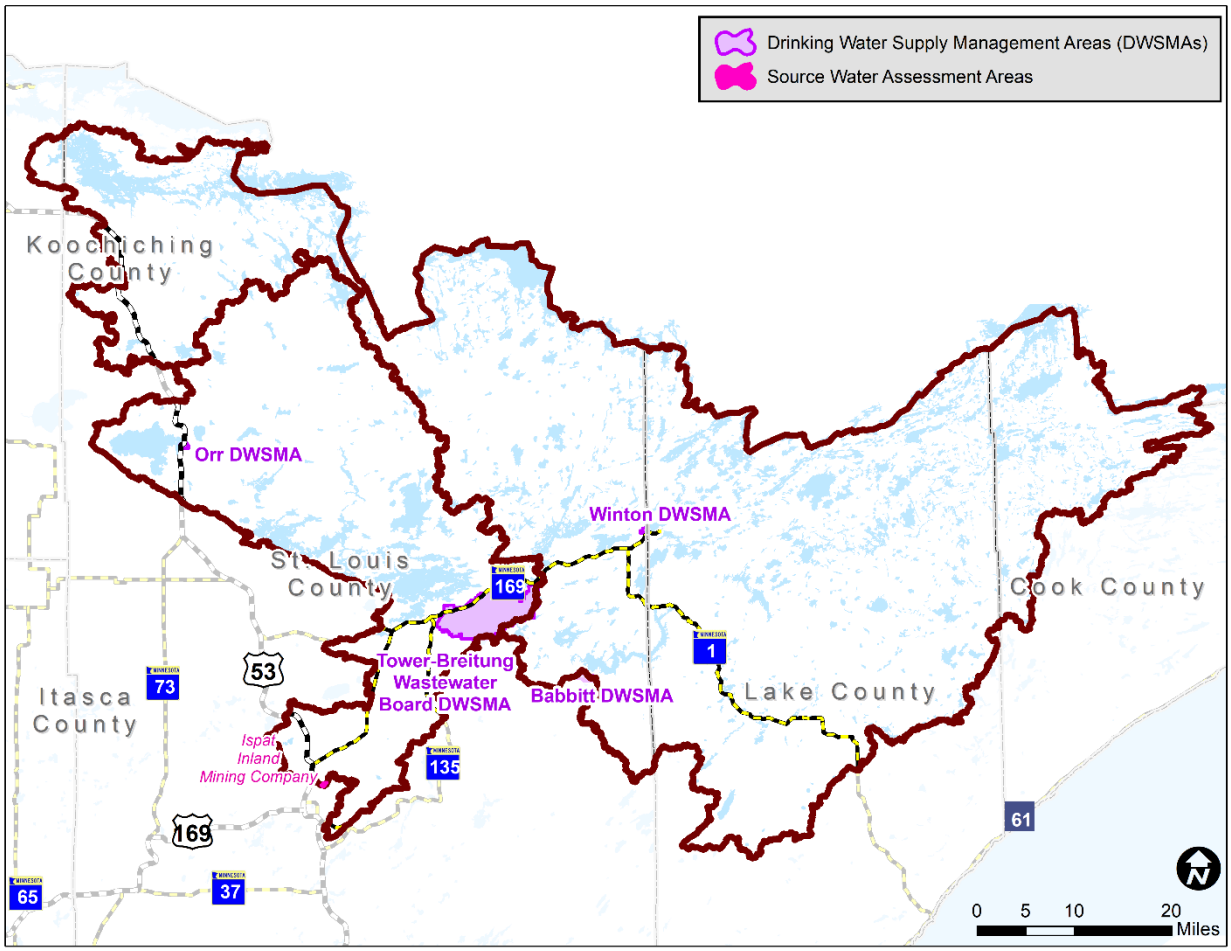
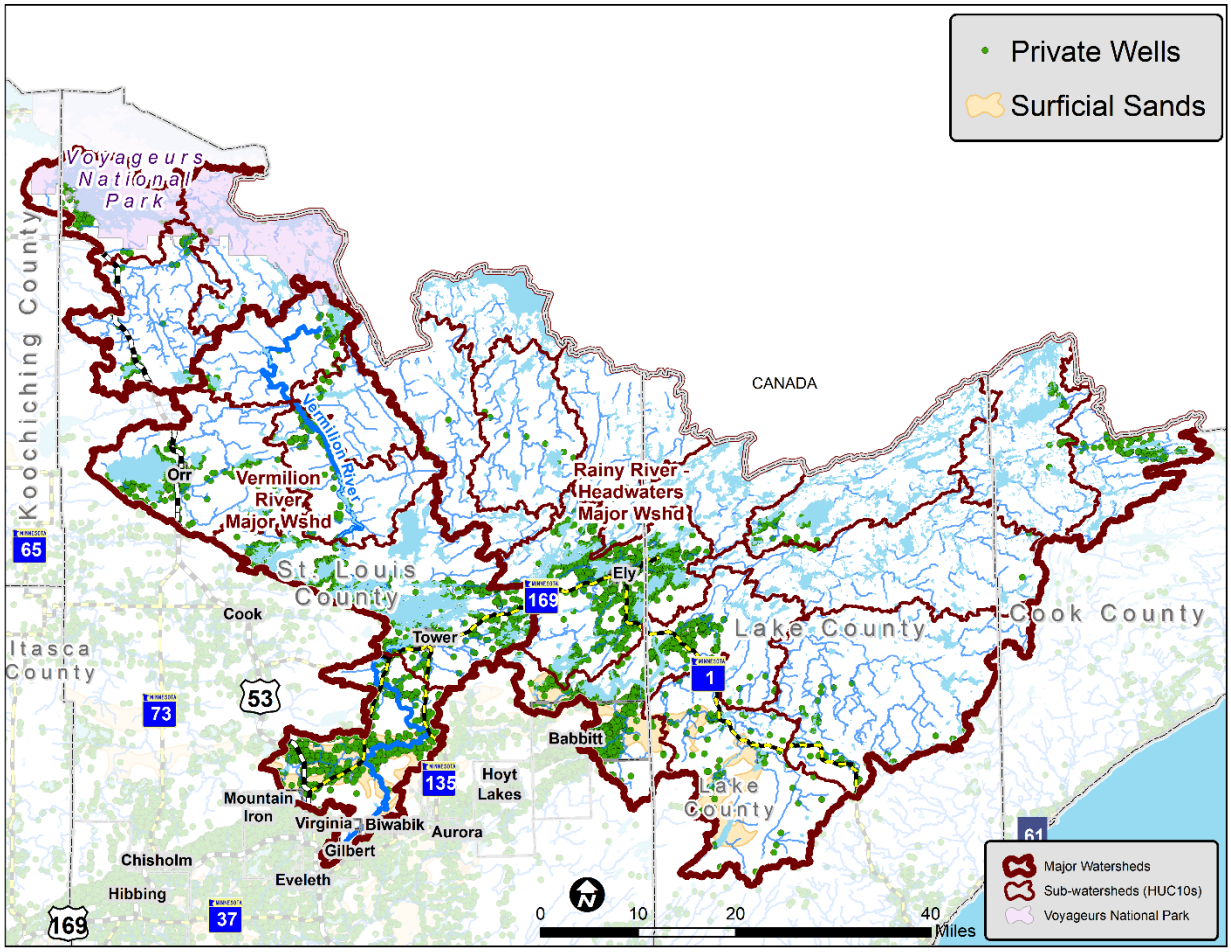


Figure 16. Drinking water private wells and surficial sands.



Risk/Quality Assessment

What is Protection?

One of the most important concepts in landscape stewardship is that of protection. In the context of this LSP, the parts of a landscape that are protected are those areas that are not likely to be converted from an intact natural ecosystem (e.g., forest, wetland, lakes, etc.) to an open or disturbed state (e.g., agriculture, development, or mining). Protected land is commonly defined as public lands (local, state, federal), public waters (lands and streams), wetlands on private lands, and perpetual conservation easements on private lands. The Generalized Land Protection Model (Fig 17) illustrates the details of what in the landscape is protected and what is at risk.

Fig 17. Generalized Land Protection Model.

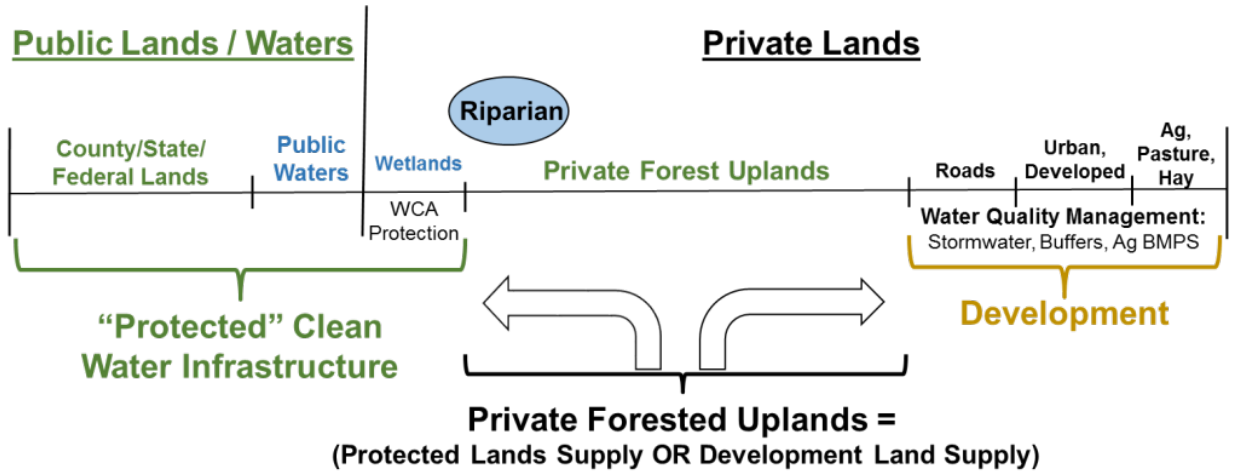
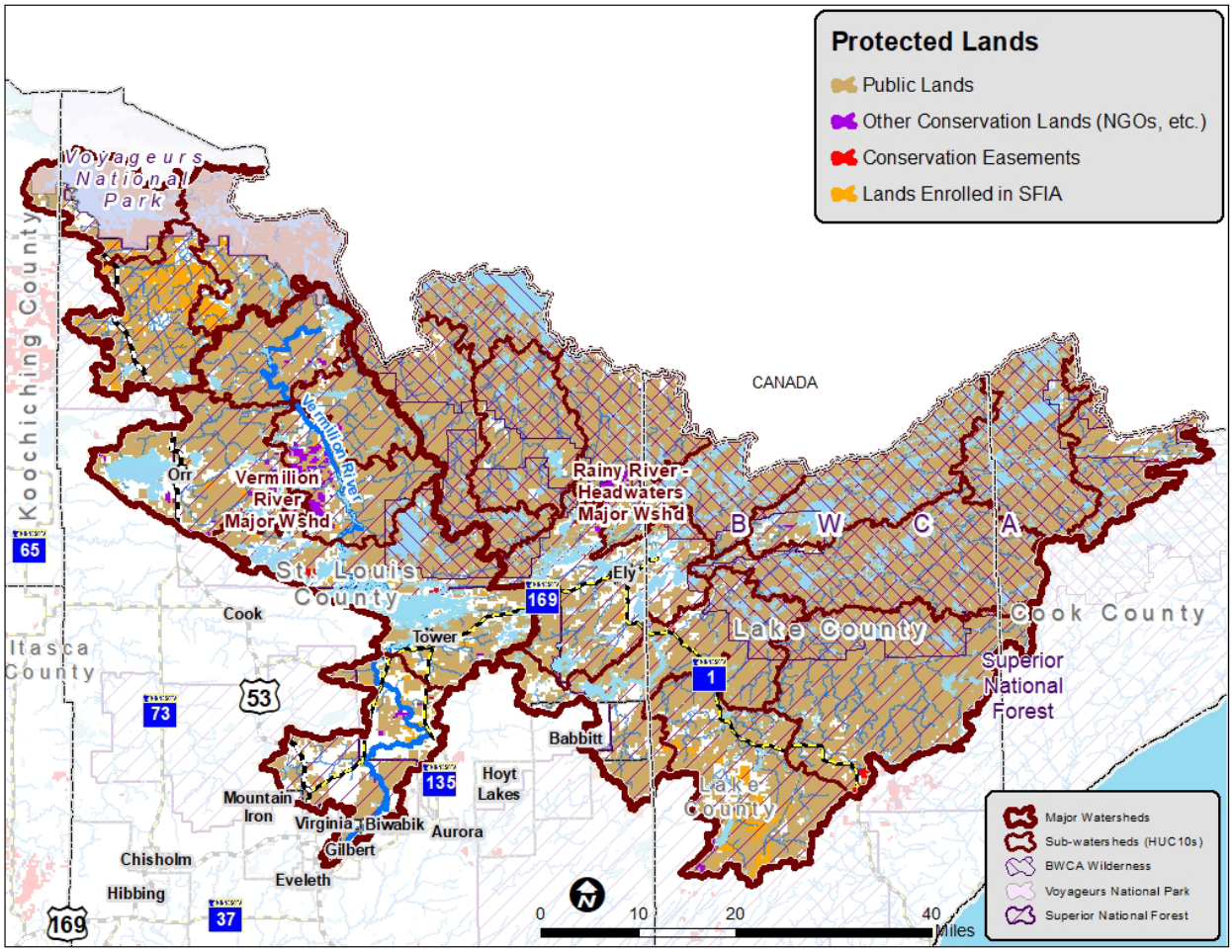


Figure 18. Currently protected lands.



What is Priority?

The view that protection efforts should focus on areas that have high quality habitat but are at risk of being lost is one of the guiding principles of landscape stewardship in Minnesota. Generally, the greatest risk occurs on private lands because that is where conversion of natural ecosystems to agriculture and development is the most likely to occur. Other potential indicators of risk include lake water quality trends, lake phosphorous sensitivity, point source pollution, land disturbance, slope, and road development. Conversely, measures of quality include prioritized lakes (e.g., wild rice, tullibee, cisco, trout), lakes of biodiversity significance, exceptional use streams, forest cover, Forests for the Future (FFF) score, terrestrial biodiversity ranking from the Minnesota Biological Survey (MBS), Wildlife Action Network (WAN) score from the DNR, and others. A summary of these drivers for each subwatershed is provided in the table 4.

"Priority is at the intersection of risk and quality"
- Pete Jacobson, DNR Fisheries

Table 5. Drivers of quality and risk in the Rainy River Headwaters – Vermilion River Watershed planning region.

Subwatershed Name	Drivers of quality	Drivers of risk
1. Granite River- 903000103 (Rainy River - Headwaters)	• Cisco refuge lakes: 1 • Lakes with high biodiversity significance: 8 • Lakes with outstanding biodiversity significance: 10 • Streams of exceptional use: Cross River • Terrestrial biodiversity outstanding and high • Trout lakes: 7 • Wetlands • Wild rice lakes: 3 • Wildlife action network high and medium	• Phosphorous sensitive lakes
2. Saganaga Lake- 903000104 (Rainy River - Headwaters)	• Cisco refuge lakes: 5 • Lakes with high biodiversity significance: 2 • Lakes with outstanding biodiversity significance:22 • Terrestrial biodiversity outstanding and high • Trout lakes: 4 • Wetlands • Wild rice lakes: 1 • Wildlife action network high and medium	• Declining water quality trend • Phosphorous sensitive lakes
3. Knife Lake-Sucker Lake- 903000105 (Rainy River - Headwaters)	• Cisco refuge lakes: 18 • Improving water quality trend • Lakes with high biodiversity significance: 14 • Lakes with outstanding biodiversity significance: 29 • Terrestrial biodiversity outstanding and high • Trout lakes: 6 • Wetlands • Wild rice lakes: 4 • Wildlife action network high and medium	• Declining water quality trend • Impaired lakes: 1 • Phosphorous sensitive lakes
4. Stony River- 903000106 (Rainy River - Headwaters)	• Lakes with high biodiversity significance: 4 • Lakes with outstanding biodiversity significance: 7	• Greenwood Fire • Phosphorous sensitive lakes

	• Priority shallow lakes: 20 • Streams of exceptional use: Denley Creek • Terrestrial biodiversity outstanding and high and medium • Trout lakes: 6 • Trout streams: 25.3 miles • Wetlands • Wild rice lakes: 17 • Wildlife action network high	
5. Isabella River- 903000107 (Rainy River - Headwaters)	• Lakes with high biodiversity significance: 12 • Lakes with outstanding biodiversity significance: 6 • Priority shallow lakes: 13 • Streams of exceptional use: Little Isabella River, Jack Pine Creek, and Mitawan Creek • Terrestrial biodiversity outstanding and high • Trout lakes: 9 • Trout streams: 176.1 miles • Wetlands • Wild rice lakes: 13 • Wildlife action network high and medium	• Phosphorous sensitive lakes
6. Birch Lake- 903000108 (Rainy River - Headwaters)	• Lakes with high biodiversity significance: 6 • Lakes with outstanding biodiversity significance: 1 • Priority shallow lakes: 1 • Streams of exceptional use: Snake River • Terrestrial biodiversity outstanding and high • Trout lakes: 1 • Trout streams: 15.2 miles • Wetlands • Wild rice lakes: 3 • Wildlife action network high and medium	• Impaired streams: 3 ○ Due to natural background. • Phosphorous sensitive lakes

7. Kawishiwi River- 903000109 (Rainy River - Headwaters)	• Cisco refuge lakes: 3 • Lakes with high biodiversity significance: 21 • Lakes with outstanding biodiversity significance: 2 • Priority shallow lakes: 1 • Terrestrial biodiversity outstanding and high • Trout lakes: 1 • Wetlands • Wild rice lakes: 2 • Wildlife action network high and medium	• Declining water quality trend • Impaired streams: 1 ○ Due to natural background. • Phosphorous sensitive lakes
8. Fall Lake- 903000110 (Rainy River - Headwaters)	• Improving water quality trend • Lakes with high biodiversity significance: 13 • Lakes with outstanding biodiversity significance: 4 • Priority shallow lakes: 9 • Terrestrial biodiversity outstanding and high • Trout lakes: 2 • Trout streams: 9 miles • Wetlands • Wild rice lakes: 14 • Wildlife action network high and medium	• Declining water quality trend • Impaired lakes: 1 ○ Due to natural background. • Phosphorous sensitive lakes
9. Basswood Lake- 903000111 (Rainy River - Headwaters)	• Cisco refuge lakes: 2 • Improving water quality trend • Lakes with high biodiversity significance: 2 • Lakes with outstanding biodiversity significance: 6 • Priority shallow lakes: 2 • Terrestrial biodiversity high • Trout lakes: 7 • Wetlands • Wild rice lakes: 11 • Wildlife action network high and medium	• Declining water quality trend • Phosphorous sensitive lakes
10. Crooked Lake-Iron Lake- 903000112 (Rainy River - Headwaters)	• Cisco refuge lakes: 2 • Lakes with high biodiversity significance: 14 • Lakes with outstanding biodiversity significance: 2	• Phosphorous sensitive lakes

	• Priority shallow lakes: 1 • Terrestrial biodiversity outstanding and high • Trout lakes: 2 • Wetlands • Wild rice lakes: 6 • Wildlife action network high and medium	
11. Boulder River- 903000113 (Rainy River - Headwaters)	• Cisco refuge lakes: 1 • Lakes with high biodiversity significance: 4 • Lakes with outstanding biodiversity significance: 3 • Priority shallow lakes: 4 • Streams of exceptional use: Bezhik River • Terrestrial biodiversity outstanding and high • Wetlands • Wild rice lakes: 4 • Wildlife action network high and medium	• Phosphorous sensitive lakes
12. Lac La Croix- 903000120 (Rainy River - Headwaters)	• Cisco refuge lakes: 9 • Lakes with high biodiversity significance: 4 • Lakes with outstanding biodiversity significance: 6 • Terrestrial biodiversity outstanding • Trout lakes: 1 • Wetlands • Wildlife action network high and medium	• Phosphorous sensitive lakes
13. Little Vermilion Lake- 903000121 (Rainy River - Headwaters)	• Cisco refuge lakes: 2 • Lakes with high biodiversity significance: 3 • Lakes with outstanding biodiversity significance: 2 • Priority shallow lakes: 6 • Terrestrial biodiversity outstanding and high • Wetlands • Wild rice lakes: 4 • Wildlife action network high and medium	• Phosphorous sensitive lakes
14. Ash River- 903000124 (Rainy River - Headwaters)	• Lakes with high biodiversity significance: 1	• Impaired streams: 2 • Phosphorous sensitive lakes

	• Priority shallow lakes: 1 • Terrestrial biodiversity high • Trout streams: 132.6 miles • Wetlands • Wildlife action network high and medium	
15. Kabetogama Lake- 903000125 (Rainy River - Headwaters)	• Lakes with outstanding biodiversity significance: 1 • Terrestrial biodiversity high • Wetlands • Wildlife action network high and medium	• Phosphorous sensitive lakes
16. Namakan Lake- 903000126 (Rainy River - Headwaters)	• Cisco refuge lakes: 4 • Lakes with high biodiversity significance: 4 • Lakes with outstanding biodiversity significance: 5 • Priority shallow lakes: 2 • Terrestrial biodiversity high • Wetlands • Wild rice lakes: 1 • Wildlife action network high and medium	• Declining water quality trend • Phosphorous sensitive lakes
17. Pike River- 903000201 (Vermilion River)	• Lakes with outstanding biodiversity significance: 4 • Priority shallow lakes: 1 • Terrestrial biodiversity outstanding and high • Wetlands • Wild rice lakes: 4 • Wildlife action network high and medium	• Impaired lakes: 2 • Impaired streams: 3 • Phosphorous sensitive lakes
18. Vermilion Lake- 903000202 (Vermilion River)	• Cisco refuge lakes: 1 • Improving water quality trend • Lakes with high biodiversity significance: 9 • Lakes with outstanding biodiversity significance: 3 • Priority shallow lakes: 8 • Terrestrial biodiversity outstanding and high • Trout streams: 39 miles • Wetlands • Wild rice lakes: 14 • Wildlife action network high and medium	• Declining water quality trend • Impaired lakes: 2 • Impaired streams: 1 • Phosphorous sensitive lakes

19. Pelican River- 903000203 (Vermilion River)	• Improving water quality trend • Lakes with outstanding biodiversity significance: 3 • Priority shallow lakes: 10 • Trout streams: 3.2 miles • Wetlands • Wild rice lakes: 4 • Wildlife action network medium	• Impaired lakes: 1 • Phosphorous sensitive lakes
20. Echo River- 903000204 (Vermilion River)	• Lakes with high biodiversity significance: 2 • Priority shallow lakes: 2 • Terrestrial biodiversity high • Wetlands • Wild rice lakes: 2 • Wildlife action network high and medium	• Impaired lakes: 1 ○ Due to natural background. • Phosphorous sensitive lakes
21. Vermilion River- 903000205 (Vermilion River)	• Lakes with high biodiversity significance: 2 • Lakes with outstanding biodiversity significance: 3 • Priority shallow lakes: 6 • Terrestrial biodiversity outstanding and high • Wetlands • Wild rice lakes: 3 • Wildlife action network high • Wildlife action network medium	• Phosphorous sensitive lakes

*Wetlands: palustrine classes only (i.e., non-lake/river)

Forest Conservation Opportunity Areas

The following list of existing conservation priorities in the Rainy River Headwaters – Vermilion River Watershed planning region have been identified by various state agencies and environmental organizations. As noted previously, these resources were consulted by the Rainy River Headwaters – Vermilion River Watershed LFT in helping to determine private forest land protection priorities. As this LSP is implemented, project partners are encouraged to consult these priority efforts and seek to support their concurrent implementation. For more information on these priorities, please refer to the Appendix.

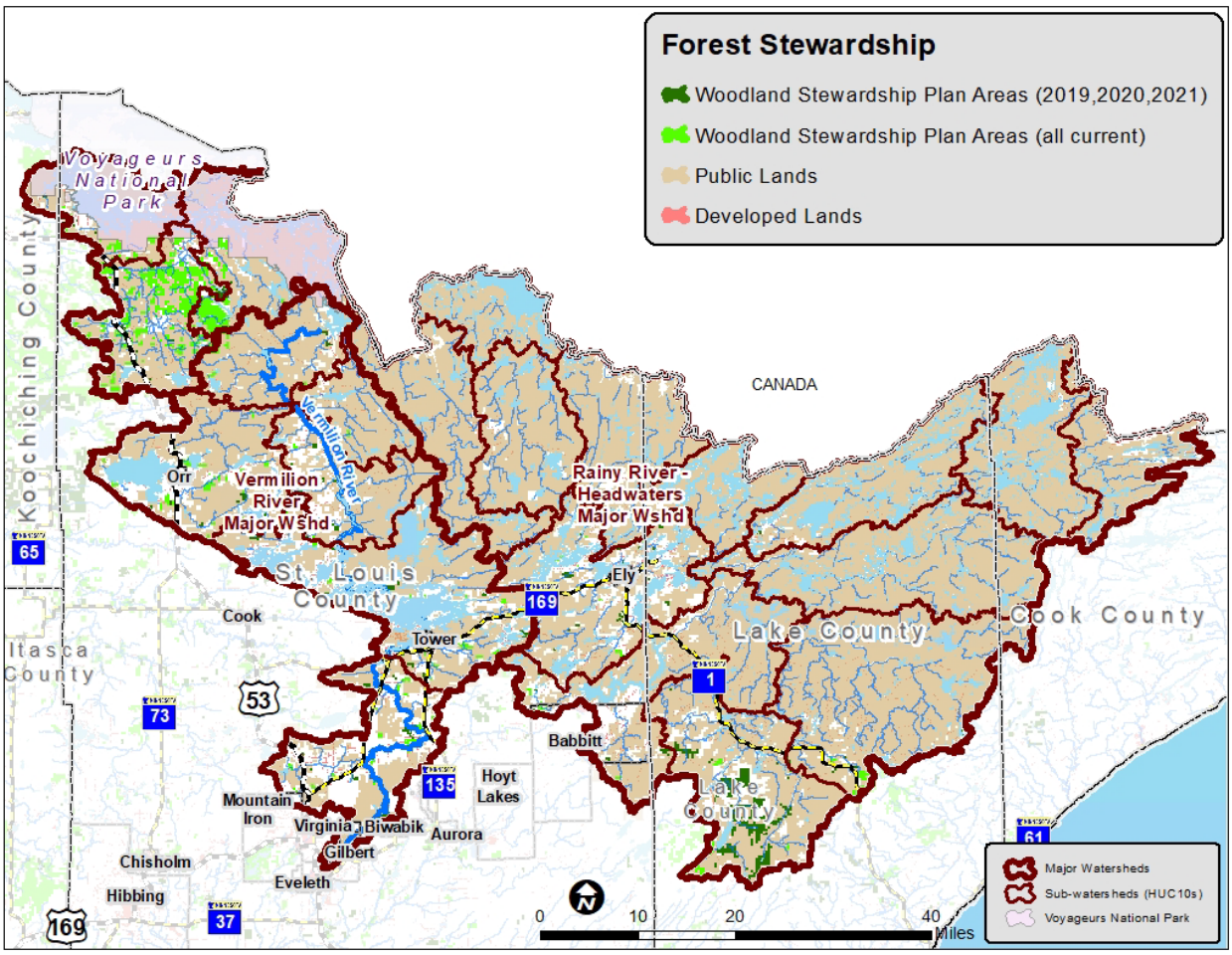
- 25-Year Lessard-Sams Outdoor Heritage Council (LSOHC) Forest Habitat Vision: Minnesota Forest Resources Council (MFRC) and Minnesota Forest Resources Partnership (MFRP)
- FFF Analysis: DNR Forestry Forest Legacy Program, USDA FS
- Important Forest Resource Areas: DNR Private Forest Management (PFM) Program, USDA FS

- Minnesota Biological Survey: DNR Ecological and Water Resources
- Minnesota DNR WAN: DNR Ecological and Water Resources
- Rainy Headwaters and Vermilion River WRAPS: MPCA
- Resilience Study by Region: The Nature Conservancy (TNC)
- PTM Application: BWSR

Forest Restoration Opportunity Areas

The Rainy River Headwaters – Vermilion River Watershed planning region was originally 59.8% forest cover, today it is at 50.3%.

Fig 19. Private forest stewardship (current status).



For more information see the Appendix and the LFT Workbook. The LFT Workbook is a binder organized for the LFT that contains the following sections: 1) Get Organized; 2) LFT Work Plan and Budget; 3) PTM Based PFM Service Delivery; 4) Funding and Project Development; and 5) Accomplishment Reporting. This is meant to help the LFT track their goals defined in this LSP.

Key Observations and Conclusions

The following key observations and conclusions are based on the information gathered during the planning process for this LSP from three meetings:

- Most of the region, 20 out of the 21 subwatersheds currently meet the the 75% goal.
- Many excellent conservation tools and programs are already in place, and PFM is the key program through which we can reach out to and serve private landowners. Outreach should be conducted through public/private partnerships with state, local government, and private forest consultants.
- PFM is key in many minor watersheds, although some minors and lakes will be Best Management Practice (BMP) orientated (e.g., reducing nutrient and sediment runoff with practices such as riparian buffers).
- Cook County two forestry mill companies including Hedstrom Lumber Company Inc. and Mielke's Forest Products.
- Koochiching County has four forestry mill companies including Green Forest Wood Products, LLC, Packaging Corporation of America, Steve Lagen, and The Cedar Mill LLC.
- Lake County has two forestry mill companies including Hulls Sawmill, and Louisiana Pacific Corp.
- St. Louis County has 12 forestry mill companies including Robert McDonald, Gary Cencich, Brad Rudek, MQZ Logs to Lumber, Lester River Sawmill Inc., Butch Eggen, Robert Korpi, East Dhu River Sawmill Inc., Ryan's Rustic Railings & Furniture, Two Cut Portable Sawmill, Mat Inc., and Jims Native Wood.
- Updated forestry mill information can be found here: Primary Forest Product Interactive Mill Map (state.mn.us).
- Certified woodland stewardship plan writers are throughout the four-county area. Cook County has 10, Lake County has 18, St. Louis has 22, and Koochiching has 13 plan writers.
- Updated certified woodland stewardship plan writers can be found here: Woodland Stewardship Plan Writer | Minnesota DNR (state.mn.us).
- Well managed forests are important for carbon sequestration. Utilizing ecosystem-based forest management will improve carbon sequestration and storage. Furthermore, as concerns over climate adaptation increase and the need for increasing carbon capture is becoming more apparent, interest in the reforestation of open lands on the rise.
- This region supports the move towards managing for ECS/Native Plant Community (NPC) based forest management. Managing for NPC and healthier forests benefits the hydrologic functions of the watersheds.
- Need to educate forest landowners that there is technical and financial assistance available for writing FSPs.
- Forest management and health, insect, and disease issues:
    - Deer browse.
    - Lack of education to landowners and tourists.
    - Cumulative effects of pests, invasive species, disease, and climate apdaptation are unprecedented
    - A transition away from timber harvest monocultures. This will help create a more diverse and resilient forest.
    - Risk of losing forested cover type in black ash swamps with emerald ash borer. Management and underplanting before emerald ash borer arrive at sites is important to prevent marshy conditions that would inhibit tree seeding establishment and growth.
    - Many of our fire-dependent communities are categorized as woodlands and not forests in the MNDNR's NPC guide; however standard stocking specifications often call for more trees per acre than what would have naturally occurred in these ecosystems.
    - Upland shrub cover with little or absent desirable tree regeneration.

    - Balsam thinning as a result of spruce budworm is ongoing, but not much is known about impacts of this outside the Arrowhead. Highlight this management need more broadly, get research institutions (NRRI, Marcell, Hubacheck, Vermilion Community College) involved.
    - Support horticultural research into disease/pest-resistant trees.
    - Implement new guidance on underplanting in black ash stands.
    - Forest management and fire suppression has substantially increased aspen cover while decreasing desirable conifer cover, especially white pine, white spruce, tamarack, and jack pine.
- Ecological and economic opportunity areas include:
    - Use stewardship plans to foster further communication and coordination between agencies.
    - Consolidate reforestation response in Greenwood fire area to be more cost-effective. Replant concurrently on public and private land.
    - Consider effects of ownership change and lost knowledge on past management actions.
    - Consider a questionnaire to counties and SWCDS. What guidance are they using to assist landowners, what information do they need? Coordinate through Arrowhead Forestry Partnership.
    - Access for timber management in wet areas in winter becomes harder if frozen-ground season becomes less reliable.
    - Policy and practice standards needed to make fire feasible and not cost-prohibitive. Make sure laws don't make fire as a management tool impossible. Liability is a huge issue for fire on private property, but other regions of the country have ways to manage this (southeast US).
    - Increased involvement from Hubacheck Wilderness Research Center in research and education.
    - Spruce budworm, potential EAB, diversity of climate adaptation, and potential invaders. Need for blowdown management, small project cost effectiveness.
    - Support increase funding and outreach for Firewise and fire resilient community guidelines since most of the two watersheds are fire dependent plant communities.
- Potential NPCs on private lands discussion included:
    - Look to Marcell Research Forest for science on peatland loss and climate adaptation, carbon sequestration. Target native plant communities with forested rich peatland.
    - Map highlights how important fire is for this watershed, there is a huge need for a paradigm shift away from fire suppression and toward responsible fire management. This will protect this area from a huge western-style wildfire.
    - Need more fire contractors, need a market for this, and that takes subsidies and incentives.
    - Fire will not be feasible everywhere, so thinning will always be part of the management regime. Mimic nutrient cycling by possibly pairing thinning practices with spreading biochar. Support pilot projects for this approach.
    - Prepare reports to be shared with legislators. Highlight risks of doing nothing.
- Identified areas with potential wildfire concerns, issues, and areas of high fuel load.
    - Cost of burning permits is an important barrier, as is time it takes to plan burns
    - Reduce liability risk through prescribed burn co-ops
    - More outreach needed on fire risk, especially in the Ely area, to raise the sense of urgency among residents and lawmakers.
    - Highlight importance of small, numerous, low-intensity fires compared to high-risk intense wildfires.
    - Outreach focused on landowners – mosaics and succession are part of forest ecology.
- The LFT identified that there should be a sense of urgency around fire risk.

Part 2: The Vision

Mission

To empower teams of service providers to collaborate with private landowners and land managers in the Rainy River Headwaters – Vermilion River Watershed planning region to protect and manage working forest lands to increase both the private and public benefits that forests provide.

Vision

In ten years, the Rainy River Headwaters – Vermilion River Watershed planning region will have:

- **Protected Water Resources:** Landowners and project partners that recognize together healthy working forests are key to protecting good water quality and quantity.
- **Healthy and Sustained Forests:** Forests in the major watershed will be healthy and managed in an ecologically appropriate manner.
- **Multiple Uses of Forest Resources:** A full range of public and private benefits from timber to tourism will be produced by forests in the watershed.
- **Collaborative Management:** Service providers and partners will work together to achieve the goals in this LSP.

Major Watershed Forestry Goal

Goal 1: Increase Forest Land Protection Levels

- Major watershed level (HUC 8):
  - **Current:** 92.00%
  - **Goal:** 75.00%
- Subwatershed levels (HUC 10):
  - **Current:** 67.20% to 99.84%
  - **Goal:** 75.00%
- Minor watershed levels (HUC 14):
  - **Current:** 48.23% to 100.00%
  - **Goal:** 65.00% to 75.00%

Goal 2: Promote Private Forest Stewardship

- Convene LFT meetings to coordinate funding, outreach, service delivery.
- Target outreach to private landowners.
- Increase number/acres of stewardship plans. Minimum goal is for every acre in a conservation easement or enrolled in SFIA to have an updated stewardship plan.
- Promote integration of NPC based forest management goals and strategies developed in the MFRC Landscape Plans.
- Increase number/acres of practice plans and implementation projects.
- Increase targeted investment of NRCS, DNR and Legacy funding based on Minor Watershed Assessment (MWA)/Riparian Adjacency Quality (RAQ).

Coordinated Roles to Increase Forest Land Protection and Stewardship

Goal 1: Increase Forest Land Protection Levels

- DNR + BWSR: Administrative lead.
- DNR Cooperative Forest Management (CFM): Project coordination, reporting.
- DNR Forest Legacy: Target larger tracts.
- Landowners: They choose.
- Non-governmental Organization (NGO): Bring partner resources, advocate.
- SWCDs and WMOs: Local lead, outreach, implementation.
- Tribal Foresters: Implementation.

Goal 2: Promote Private Forest Stewardship

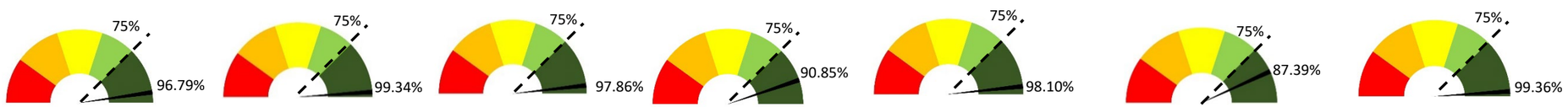
- Consulting Foresters: Plans, timber sales.
- DNR + BWSR: Administrative lead.
- DNR CFM: PFM program coordination.
- Landowners: It is their land.
- Loggers/Vendors: Forest management.
- SWCDs and WMOs: Local lead, outreach, plans, 1W1P.
- Tribal Foresters: Forest management.

Goal 1: Forest Land Protection

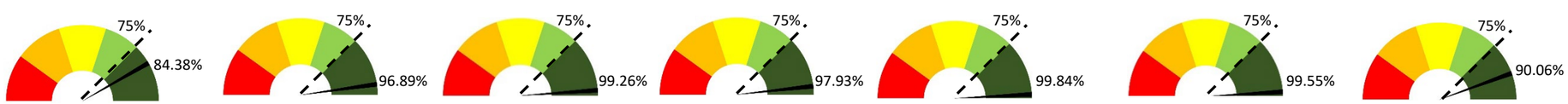
To draw conclusions for management priorities and to help compare each subwatershed with the others on each given resource issue, the resulting calculations of the key assessments were placed into a table format. The table below summarizes the results of the calculations made for each subwatershed through the subwatershed assessment process.

Table 6. Subwatershed calculations.

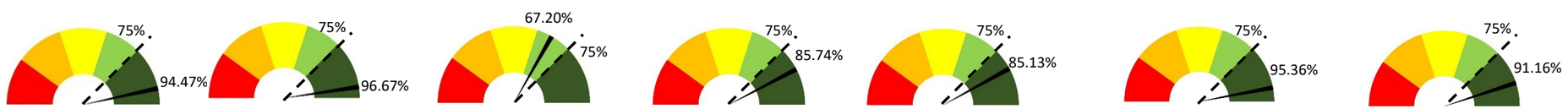
	Subwatershed 1 (HUC 903000103) Granite River	Subwatershed 2 (HUC 903000104) Saganaga Lake	Subwatershed 3 (HUC 903000105) Knife Lake-Sucker Lake	Subwatershed 4 (HUC 903000106) Stony River	Subwatershed 5 (HUC 903000107) Isabella River	Subwatershed 6 (HUC 903000108) Birch Lake	Subwatershed 7 (HUC 903000109) Kawishiwi River
Area	71,095 ac	119,072 ac	111,364 ac	152,583 ac	217,957 ac	166,599 ac	170,512 ac
Natural Factors							
Presettlement Forest Cover	46,125.7 ac; 64.8%	72,149.7 ac; 60.6%	64,304.7 ac; 57.7%	51,817.0 ac; 34.0%	126,169.3 ac; 57.9%	87,204.0 ac; 52.3%	108,094.8 ac; 63.4%
Current Forest Cover	36,994.0 ac; 58.1%	47,267.1 ac; 46.0%	46,800.0 ac; 42.8%	59,619.3 ac; 38.9%	108,609.9 ac; 47.6%	75,439.8 ac; 44.2%	85,688.6 ac; 50.1%
Lakes (over 10 acres)	84 lakes; 9.85%	225 lakes; 23.78%	181 lakes; 26.43%	54 lakes; 3.86%	150 lakes; 5.72%	50 lakes; 8.69%	208 lakes; 12.92%
Wetlands	23.08%	12.12%	11.54%	40.53%	26.00%	26.22%	17.53%
Forest Land Protection Assessment							
Public Waters	7,543.93 ac; 10.61%	28,277.64 ac; 23.75%	29,543.33 ac; 26.53%	6,948.20 ac; 4.55%	13,848.61 ac; 6.35%	14,794.72 ac; 8.88%	22,575.76 ac; 13.24%
Public Lands	56,960.69 ac; 80.12%	89,830.37 ac; 75.4%	77,825.54 ac; 69.88%	109,932.43 ac; 72.05%	197,049.06 ac; 90.41%	122,261.22 ac; 73.39%	145,582.07 ac; 85.38%
Private Wetlands	4,208.81 ac; 5.92%	180.86 ac; 0.15%	1,434.96 ac; 1.29%	15,732.02 ac; 10.31%	1,868.00 ac; 0.86%	8,030.14 ac; 4.82%	1,255.20 ac; 0.74%
Sustainable Forest Incentives Act (SFIA)	0 ac; 0%	0 ac; 0%	0 ac; 0%	5,284.50 ac; 3.46%	441.70 ac; 0.20%	414.78 ac; 0.25%	0 ac; 0%
Easements	97.70 ac; 0.14%	0.00 ac; 0.00%	179.11 ac; 0.16%	0.00 ac; 0.00%	601.28 ac; 0.28%	85.39 ac; 0.05%	0.00 ac; 0.00%
Other Conservation Lands	0 ac; 0%	0 ac; 0%	0 ac; 0%	718.90 ac; 0.47%	0 ac; 0%	0 ac; 0%	0 ac; 0%
Total Protected Area	68,811.13 ac; 96.79%	118,288.87 ac; 99.34%	108,982.94 ac; 97.86%	138,616.04 ac; 90.85%	213,808.64 ac; 98.10%	145,586.25 ac; 87.39%	169,413.02 ac; 99.36%
Forest Land Protection Cost Analysis							
Minor Watershed Protection Goal Total*	0 ac to goal	0 ac to goal	0 ac to goal	0 ac to goal	0 ac to goal	1,994.06 ac to goal	0 ac to goal
Subwatershed Protection Goal*	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal
Potential to Protect	1,236.34 ac; 1.74%	133.62 ac; 0.11%	1,187.33 ac; 1.07%	10,961.41 ac; 7.18%	2,829.91 ac; 1.3%	13,807.72 ac; 8.29%	629.14 ac; 0.37%
Average Land Value (> 20 ac parcels)	$4,534/ac	$6,743/ac	$1,928/ac	$732/ac	$1,155/ac	$1,216/ac	$2,091/ac
Minor Watershed Protection Cost Total†	$0	$0	$0	$0	$0	$$1,852,424.78	$0
Subwatershed Protection Cost†	$0	$0	$0	$0	$0	$0	$0
Forest Land Protection Priorities							
Quality Protection Factors							
Cisco Lakes	1 lake; 1.60%	5 lakes; 17.60%	18 lakes; 15.97%	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%	3 lakes; 0.38%
Trout Lakes	7 lakes; 0.34%	4 lakes; 0.23%	6 lakes; 0.19%	6 lakes; 0.10%	9 lakes; 0.11%	1 lake; 0.01%	1 lake; 0.03%
Lakes of Biodiversity Significance (outstanding & high)	18 lakes; 9.64%	24 lakes; 16.37%	43 lakes; 20.67%	11 lakes; 2.23%	18 lakes; 3.21%	7 lakes; 6.50%	23 lakes; 6.36%
Priority Shallow Lakes	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%	20 lakes; 2.99%	13 lakes; 1.25%	1 lake; 0.04%	1 lake; 0.12%
Priority Wild Rice Lakes	3 lakes; 0.31%	1 lake; 0.03%	4 lakes; 6.07%	17 lakes; 2.66%	13 lakes; 2.49%	3 lakes; 6.19%	2 lakes; 0.66%
Trout Steams	0 mi	0 mi	0 mi	25.27 mi	176.08 mi	15.17 mi	0 mi
FFF Mean Composite Score	59.89	54.78	63.47	95.40	77.96	78.59	52.64
Terrestrial Biodiversity (outstanding and high)	55,097.63 ac; 77.50%	115,845.49 ac; 97.29%	105,354.05 ac; 94.60%	48,560.35 ac; 31.83%	88,425.89 ac; 40.57%	81,523.54 ac; 48.93%	169,065.86 ac; 99.15%
Wildlife Action Network (high & medium-high)	57,391.89 ac; 80.73%	111,433.41 ac; 93.59%	94,366.49 ac; 84.74%	25,591.39 ac; 16.77%	104,255.64 ac; 47.83%	94,504.62 ac; 56.73%	146,571.43 ac; 85.96%
Risk Management Factors							
Lake Phosphorous Sensitivity (highest & higher)	2 lakes; 1,713.30 ac	0 lakes; 0 ac	2 lakes; 6,322.49 ac	5 lakes; 813.59 ac	5 lakes; 1,018.69 ac	2 lakes; 890.66 ac	0 lakes; 0 ac
Water Quality Trend (declining)	0 lakes; 0 ac	1 lake; 827.63 ac	1 lake; 749.85 ac	0 lakes; 0 ac	0 lakes; 0 ac	0 lakes; 0 ac	1 lake; 1,616.28 ac
Land Use Disturbance	2,062.71 ac; 1.88%	1,826.08 ac; 1.08%	1,888.35 ac; 1.18%	5,002.99 ac; 2.32%	20,411.14 ac; 5.77%	14,256.38 ac; 5.58%	10,221.03 ac; 3.73%



	Subwatershed 8 (HUC 903000110) Fall Lake Rainy River Headwaters	Subwatershed 9 (HUC 903000111) Basswood Lake Rainy River Headwaters	Subwatershed 10 (HUC 903000112) Crooked Lake-Iron Lake Rainy River Headwaters	Subwatershed 11 (HUC 903000113) Boulder River Rainy River Headwaters	Subwatershed 12 (HUC 903000120) Lac La Croix Rainy River Headwaters	Subwatershed 13 (HUC 903000121) Little Vermilion Lake Rainy River Headwaters	Subwatershed 14 (HUC 903000124) Ash River Rainy River Headwaters
Area	156,370 ac	80,541 ac	95,104 ac	99,240 ac	59,299 ac	108,117 ac	101,266 ac
Natural Factors							
Presettlement Forest Cover	86,302.9 ac; 55.2%	43,330.7 ac; 53.7%	65,155.4 ac; 68.6%	63,565.2 ac; 64.1%	35,955.9 ac; 60.7%	76,551.5 ac; 70.8%	78,050.5 ac; 77.1%
Current Forest Cover	69,839.2 ac; 44.2%	36,532.7 ac; 45.2%	53,664.9 ac; 56.5%	56,693.7 ac; 56.9%	33,172.6 ac; 56.0%	68,328.9 ac; 63.4%	63,267.9 ac; 64.0%
Lakes (over 10 acres)	62 lakes; 16.90%	40 lakes; 24.97%	69 lakes; 8.68%	41 lakes; 9.11%	57 lakes; 41.67%	64 lakes; 6.25%	18 lakes; 3.14%
Wetlands	22.74%	16.75%	22.19%	24.25%	7.08%	21.32%	17.03%
Forest Land Protection Assessment							
Public Waters	26,935.13 ac; 17.23%	20,338.26 ac; 25.25%	8,794.24 ac; 9.25%	9,545.14 ac; 9.62%	24,795.19 ac; 41.81%	7,346.73 ac; 6.80%	3,806.14 ac; 3.76%
Public Lands	93,868.33 ac; 60.03%	56,575.32 ac; 70.24%	77,729.44 ac; 81.73%	86,922.00 ac; 87.59%	34,215.55 ac; 57.70%	97,561.69 ac; 90.24%	61,009.43 ac; 60.25%
Private Wetlands	9,812.72 ac; 6.28%	836.77 ac; 1.04%	6,023.38 ac; 6.33%	719.24 ac; 0.72%	191.45 ac; 0.32%	2,720.25 ac; 2.52%	5,113.27 ac; 5.05%
Sustainable Forest Incentives Act (SFIA)	903.34 ac; 0.58%	78.79 ac; 0.10%	0 ac; 0%	0 ac; 0%	0 ac; 0%	0 ac; 0%	21,097.14 ac; 20.83%
Easements	273.91 ac; 0.18%	0.00 ac; 0.00%	93.15 ac; 0.10%	0.00 ac; 0.00%	0.00 ac; 0.00%	0.00 ac; 0.00%	0.00 ac; 0.00%
Other Conservation Lands	150.07 ac; 0.10%	209.05 ac; 0.26%	1,762.84 ac; 1.85%	0 ac; 0%	0 ac; 0%	0 ac; 0%	176.09 ac; 0.17%
Total Protected Area	131,943.49 ac; 84.38%	78,038.19 ac; 96.89%	94,403.05 ac; 99.26%	97,186.38 ac; 97.93%	59,202.19 ac; 99.84%	107,628.68 ac; 99.55%	91,202.07 ac; 90.06%
Forest Land Protection Cost Analysis							
Minor Watershed Protection Goal Total*	1,900.19 ac to goal	0 ac to goal	0 ac to goal	0 ac to goal	0 ac to goal	0 ac to goal	0 ac to goal
Subwatershed Protection Goal*	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal
Potential to Protect	16,183.63 ac; 10.35%	1,868.58 ac; 2.32%	158.79 ac; 0.17%	1,498.79 ac; 1.51%	0 ac; 0%	274.29 ac; 0.25%	7,493.02 ac; 7.40%
Average Land Value (> 20 ac parcels)	$2,251/ac	$1,783/ac	$1,451/ac	$1,911/ac	NA	$1,394/ac	$851/ac
Minor Watershed Protection Cost Total†	$2,125,788.06	$0	$0	$0	$0	$0	$0
Subwatershed Protection Cost†	$0	$0	$0	$0	$0	$0	$0
Forest Land Protection Priorities							
Quality Protection Factors							
Cisco Lakes	0 lakes; 0%	2 lakes; 17.72%	2 lakes; 0.26%	1 lake; 0.78%	9 lakes; 4.36%	2 lakes; 0.47%	0 lakes; 0%
Trout Lakes	2 lakes; 0.02%	7 lakes; 0.78%	2 lakes; 0.04%	0 lakes; 0%	1 lake; 0.04%	0 lakes; 0%	0 lakes; 0%
Lakes of Biodiversity Significance (outstanding & high)	17 lakes; 12.48%	8 lakes; 20.61%	16 lakes; 11.07%	7 lakes; 5.76%	10 lakes; 26.94%	5 lakes; 3.67%	1 lake; 1.23%
Priority Shallow Lakes	9 lakes; 0.78%	2 lakes; 0.43%	1 lake; 0.07%	4 lakes; 0.75%	0 lakes; 0%	6 lakes; 1.04%	1 lake; 0.10%
Priority Wild Rice Lakes	14 lakes; 10.80%	11 lakes; 22.26%	6 lakes; 0.74%	4 lakes; 2.70%	0 lakes; 0%	4 lakes; 1.25%	0 lakes; 0%
Trout Steams	8.95 mi	0 mi	0 mi	0 mi	0 mi	0 mi	132.65 mi
FFF Mean Composite Score	84.90	56.43	46.67	58.95	53.48	60.94	98.81
Terrestrial Biodiversity (outstanding and high)	50,072.91 ac; 32.02%	67,970.13 ac; 84.39%	87,683.98 ac; 92.20%	86,547.96 ac; 87.21%	59,262.87 ac; 99.94%	98,542.26 ac; 91.14%	7,742.83 ac; 7.65%
Wildlife Action Network (high & medium-high)	61,725.15 ac; 39.47%	65,448.76 ac; 81.26%	74,124.08 ac; 77.94%	73,378.40 ac; 73.94%	41,121.35 ac; 69.35%	71,497.36 ac; 66.13%	1,354.96 ac; 1.34%
Risk Management Factors							
Lake Phosphorous Sensitivity (highest & higher)	8 lakes; 13,455.80 ac	4 lakes; 1,138.64 ac	0 lakes; 0 ac	2 lakes; 2,002.68 ac	0 lakes; 0 ac	1 lake; 612.43 ac	2 lakes; 1,939.52 ac
Water Quality Trend (declining)	1 lake; 7,313.90 ac	1 lake; 14,084.57 ac	0 lakes; 0 ac	0 lakes; 0 ac	0 lakes; 0 ac	0 lakes; 0 ac	0 lakes; 0 ac
Land Use Disturbance	11,559.40 ac; 4.94%	1,289.00 ac; 1.09%	543.98 ac; 0.36%	1,159.56 ac; 0.74%	155.45 ac; 0.17%	1,088.40 ac; 0.61%	4,907.58 ac; 2.90%



	Subwatershed 15 (HUC 903000125) Kabetogama Lake Rainy River Headwaters	Subwatershed 16 (HUC 903000126) Namakan Lake Rainy River Headwaters	Subwatershed 17 (HUC 903000201) Pike River Vermilion River	Subwatershed 18 (HUC 903000202) Vermilion Lake Vermilion River	Subwatershed 19 (HUC 903000203) Pelican River Vermilion River	Subwatershed 20 (HUC 903000204) Echo River Vermilion River	Subwatershed 21 (HUC 903000205) Vermilion River Vermilion River
Area	76,073 ac	105,549 ac	118,675 ac	193,840 ac	134,290 ac	50,650 ac	163,845 ac
Natural Factors							
Presettlement Forest Cover	39,368.5 ac; 51.8%	70,834.2 ac; 67.2%	61,389.1 ac; 51.7%	102,658.2 ac; 53.0%	85,794.5 ac; 63.9%	38,624.1 ac; 76.2%	122,090.6 ac; 74.5%
Current Forest Cover	30,925.5 ac; 41.1%	59,257.9 ac; 556.8%	50,597.2 ac; 52.5%	90,522.1 ac; 46.2%	72,072.3 ac; 54.1%	31,162.8 ac; 63.1%	100,833.9 ac; 62.1%
Lakes (over 10 acres)	10 lakes; 31.30%	75 lakes; 22.65%	6 lakes; 0.55%	47 lakes; 28.33%	18 lakes; 12.71%	17 lakes; 4.43%	31 lakes; 5.02%
Wetlands	18.28%	13.27%	38.98%	17.13%	22.22%	19.36%	19.82%
Forest Land Protection Assessment							
Public Waters	23,897.95 ac; 31.41%	24,231.18 ac; 22.96%	1,336.23 ac; 1.13%	55,246.41 ac; 28.50%	17,984.77 ac; 13.39%	2,500.79 ac; 4.94%	9,637.33 ac; 5.88%
Public Lands	43,101.76 ac; 56.66%	68,631.92 ac; 65.02%	52,214.52 ac; 44.00%	99,763.01 ac; 51.47%	84,326.44 ac; 62.79%	44,304.72 ac; 87.47%	125,325.97 ac; 76.49%
Private Wetlands	1,284.78 ac; 1.69%	2,329.34 ac; 2.21%	22,722.19 ac; 19.15%	7,968.34 ac; 4.11%	6,452.72 ac; 4.81%	868.26 ac; 1.71%	5,287.81 ac; 3.23%
Sustainable Forest Incentives Act (SFIA)	3,583.47 ac; 4.71%	6,845.53 ac; 6.49%	2,703.16 ac; 2.28%	1,469.72 ac; 0.76%	2,022.97 ac; 1.51%	97.24 ac; 0.19%	2,056.01 ac; 1.25%
Easements	0.00 ac; 0.00%	0.00 ac; 0.00%	48.07 ac; 0.04%	567.17ac; 0.29%	67.24 ac; 0.05%	0.00 ac; 0.00%	0.00 ac; 0.00%
Other Conservation Lands	0 ac; 0%	0 ac; 0%	726.50 ac; 0.61%	1,178.54 ac; 0.61%	3,460.22 ac; 2.58%	527.84 ac; 1.04%	7,048.17 ac; 4.30%
Total Protected Area	71,867.97 ac; 94.47%	102,037.96 ac; 96.67%	79,750.67 ac; 67.20%	166,193.19 ac; 85.74%	114,314.36 ac; 85.13%	48,298.86 ac; 95.36%	149,355.29 ac; 91.16%
Forest Land Protection Cost Analysis							
Minor Watershed Protection Goal Total*	0 ac to goal	0 ac to goal	10,606.68 ac to goal	485.79 ac to goal	276.37 ac to goal	0 ac to goal	443.16 ac to goal
Subwatershed Protection Goal*	75%; 0 ac to goal	75%; 0 ac to goal	75%; 9,255.28 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal	75%; 0 ac to goal
Potential to Protect	2,506.60 ac; 3.29%	2,791.97 ac; 2.65%	26,745.23 ac; 22.54%	16,935.78 ac; 8.74%	14,338.10 ac; 10.68%	1,424.69 ac; 2.81%	10,196.13 ac; 6.22%
Average Land Value (> 20 ac parcels)	$1,118/ac	$845/ac	$842/ac	$1,754/ac	$1,161/ac	$911/ac	$987/ac
Minor Watershed Protection Cost Total†	$0	$0	$10,055,328.77	$450,144.09	$272,361.38	$0	$465,199.45
Subwatershed Protection Cost†	$0	$0	$8,563,326.00	$0	$0	$0	$0
Forest Land Protection Priorities							
Quality Protection Factors							
Cisco Lakes	0 lakes; 0%	4 lakes; 9.42%	0 lakes; 0%	1 lake; 4.28%	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%
Trout Lakes	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%	0 lakes; 0%
Lakes of Biodiversity Significance (outstanding & high)	1 lake; 31.59%	9 lakes; 8.69%	0 lakes; 0%	9 lakes; 1.49%	0 lakes; 0%	2 lakes; 2.88%	2 lakes; 0.90%
Priority Shallow Lakes	0 lakes; 0%	2 lakes; 0.35%	1 lake; 0.15%	8 lakes; 0.61%	10 lakes; 1.77%	2 lakes; 2.50%	6 lakes; 1.01%
Priority Wild Rice Lakes	0 lakes; 0%	1 lake; 8.20%	4 lakes; 0.33%	14 lakes; 21.96%	4 lakes; 9.93%	2 lakes; 2.31%	3 lakes; 3.34%
Trout Steams	0 mi	0 mi	0 mi	39.02 mi	3.24 mi	0 mi	0 mi
FFF Mean Composite Score	87.49	72.20	99.67	92.01	96.06	93.32	94.32
Terrestrial Biodiversity (outstanding and high)	57,872.99 ac; 76.08%	89,566.95 ac; 84.86%	37,233.13 ac; 31.37%	127,839.11 ac; 65.95%	0 ac; 0%	5,875.52 ac; 11.60%	20,473.69 ac; 12.50%
Wildlife Action Network (high & medium-high)	27,575.71 ac; 36.25%	27,815.70 ac; 26.35%	61,487.16 ac; 51.81%	66,670.85 ac; 34.39%	2.01 ac; 0.00%	13,406.03 ac; 26.47%	16,761.69 ac; 10.23%
Risk Management Factors							
Lake Phosphorous Sensitivity (highest & higher)	0 lakes; 0 ac	1 lake; 566.12 ac	0 lakes; 0 ac	6 lakes; 41,571.94 ac	4 lakes; 14,446.39 ac	0 lakes; 0 ac	3 lakes; 1,348.14 ac
Water Quality Trend (declining)	0 lakes; 0 ac	1 lake; 581.54 ac	0 lakes; 0 ac	1 lake; 389.62 ac	0 lakes; 0 ac	0 lakes; 0 ac	0 lakes; 0 ac
Land Use Disturbance	1,932.16 ac; 1.77%	1,551 42 ac; 0.93%	10,519.26 ac; 5.93%	10,671.82 ac; 3.66%	6,573.31 ac; 3.09%	1,690.64 ac; 2.04%	5,982.41 ac; 2.22%



HUC 10 Protection Levels and Goals‡

*The LFT set separate subwatershed (HUC 10) and minor watershed (HUC 14) protection goals. The acres to goal and protection cost between the minor and subwatershed goals in this table are overlapping, not additive (see the subwatershed action plans for more details).

*Occasionally the overall subwatershed protection goal has been met, but individual minors in the subwatershed are still in need of greater protection.

†Protection cost assumes 50% conservation easement and 50% SFIA.

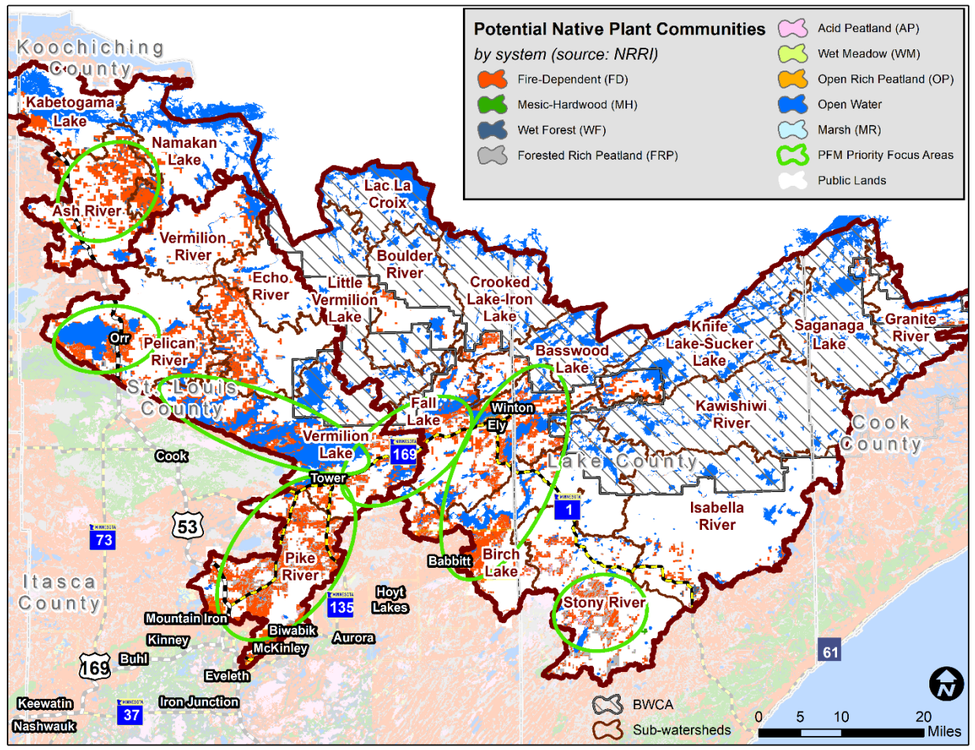
‡Solid lines stand for current level of protection; dashed line is the goal.

Goal 2: Promote Private Forest Stewardship

The second major goal of this LSP is to promote private forest stewardship and consideration of NPCs in management activities. The map on the right displays the potential NPC system for private lands in the Rainy Headwaters – Vermilion River Watershed planning region.

It is important to note that this map displays the potential NPC of private lands only, and it includes lands that are not currently forested. This map is a vision for all private lands, including non-forested lands, because it reflects what the private landscape can potentially be if the land is managed following its biological potential. Priority focus areas were choses by this LFT in meetings 1 – 3.

Fig 20. Private forest stewardship and native plant communities.



Forest Management Goals

The goals listed below for each subwatershed are for increased forest management through forest stewardship plans (FSPs) and acres as well as for cost share practices over the next ten years.

Subwatershed 1
(HUC 903000103)
Granite River
Rainy River Headwaters Major Watershed
19.88% private; 80.12% public
45 parcels > 20 ac
2,703 ac > 20 ac
0 FSPs; 0 ac

10 Year PFM Goals:*
HUC 10 goal: 1 FSPs; 149 ac
HUC 14 goal total: 1 FSPs; 149 ac

Subwatershed 2
(HUC 903000104)
Saganaga Lake
Rainy River Headwaters Major Watershed
24.56% private; 75.44% public
25 parcels > 20 ac
5,668 ac > 20 ac
0 FSPs; 0 ac

10 Year PFM Goals:*
HUC 10 goal: 0 FSPs; 0 ac
HUC 14 goal total: 0 FSPs; 0 ac

Subwatershed 3
(HUC 903000105)
Knife Lake-Sucker Lake
Rainy River Headwaters Major Watershed
30.12% private; 69.88% public
59 parcels > 20 ac
2,271 ac > 20 ac
1 FSPs; 72 ac

10 Year PFM Goals:*
HUC 10 goal: 1 FSPs; 74 ac
HUC 14 goal total: 0 FSPs; 0 ac

Subwatershed 4
(HUC 903000106)
Stony River
Rainy River Headwaters Major Watershed
27.95% private; 72.05% public
894 parcels > 20 ac
34,673 ac > 20 ac
7 FSPs; 13,197 ac

10 Year PFM Goals:*
HUC 10 goal: 60 FSPs; 13,687 ac
HUC 14 goal total: 60 FSPs; 13,687 ac

Subwatershed 5
(HUC 903000107)
Isabella River
Rainy River Headwaters Major Watershed
9.59% private; 90.41% public
166 parcels > 20 ac
6,257 ac > 20 ac
4 FSPs; 152 ac

10 Year PFM Goals:*
HUC 10 goal: 6 FSPs; 1,266 ac
HUC 14 goal total: 6 FSPs; 1,266 ac

Subwatershed 6
(HUC 903000108)
Birch Lake
Rainy River Headwaters Major Watershed
26.61% private; 73.39% public
566 parcels > 20 ac
29,045 ac > 20 ac
10 FSPs; 1,157 ac

10 Year PFM Goals:*
HUC 10 goal: 3 FSPs; 754 ac
HUC 14 goal total: 12 FSPs; 2,748 ac

Subwatershed 7
(HUC 903000109)
Kawishiwi River
Rainy River Headwaters Major Watershed
14.62% private; 85.38% public
25 parcels > 20 ac
1,574 ac > 20 ac
0 FSPs; 0 ac

10 Year PFM Goals:*
HUC 10 goal: 0 FSPs; 0 ac
HUC 14 goal total: 0 FSPs; 0 ac

Subwatershed 8
(HUC 903000110)
Fall Lake
Rainy River Headwaters Major Watershed
39.97% private; 60.03% public
833 parcels > 20 ac
34,170 ac > 20 ac
20 FSPs; 2,005 ac

10 Year PFM Goals:*
HUC 10 goal: 6 FSPs; 1,379 ac
HUC 14 goal total: 14 FSPs; 11,200 ac

Subwatershed 9
(HUC 903000111)
Basswood Lake
Rainy River Headwaters Major Watershed
29.76% private; 70.24% public
76 parcels > 20 ac
3,052 ac > 20 ac
0 FSPs; 0 ac

10 Year PFM Goals:*
HUC 10 goal: 1 FSPs; 213 ac
HUC 14 goal total: 1 FSPs; 213 ac

Subwatershed 10
(HUC 903000112)
Crooked Lake-Iron Lake
Rainy River Headwaters Major Watershed
18.27% private; 81.73% public
66 parcels > 20 ac
2,705 ac > 20 ac
1 FSPs; 40 ac

10 Year PFM Goals:*
HUC 10 goal: 1 FSPs; 105 ac
HUC 14 goal total: 1 FSPs; 1,105 ac

Subwatershed 11
(HUC 903000113)
Boulder River
Rainy River Headwaters Major Watershed
12.41% private; 87.59% public
51 parcels > 20 ac
1,980 ac > 20 ac
0 FSPs; 0 ac

10 Year PFM Goals:*
HUC 10 goal: 0 FSPs; 0 ac
HUC 14 goal total: 0 FSPs; 0 ac

Subwatershed 12
(HUC 903000120)
Lac La Croix
Rainy River Headwaters Major Watershed
42.30% private; 57.70% public
0 parcels > 20 ac
0 ac > 20 ac
0 FSPs; 0 ac

10 Year PFM Goals:*
HUC 10 goal: 0 FSPs; 0 ac
HUC 14 goal total: 0 FSPs; 0 ac

Subwatershed 13
(HUC 903000121)
Little Vermilion Lake
Rainy River Headwaters Major Watershed
9.76% private; 90.24% public
9 parcels > 20 ac
308 ac > 20 ac
0 FSPs; 0 ac

10 Year PFM Goals:*
HUC 10 goal: 0 FSPs; 0 ac
HUC 14 goal total: 0 FSPs; 0 ac

Subwatershed 14
(HUC 903000124)
Ash River
Rainy River Headwaters Major Watershed
39.75% private; 60.25% public
775 parcels > 20 ac
36,647 ac > 20 ac
12 FSPs; 1,415 ac

10 Year PFM Goals:*
HUC 10 goal: 107 FSPs; 24,713 ac
HUC 14 goal total: 107 FSPs; 24,713 ac

Subwatershed 15
(HUC 903000125)
Kabetogama Lake
Rainy River Headwaters Major Watershed
43.34% private; 56.66% public
197 parcels > 20 ac
8,822 ac > 20 ac
6 FSPs; 619 ac

10 Year PFM Goals:*
HUC 10 goal: 18 FSPs; 4,072 ac
HUC 14 goal total: 18 FSPs; 4,072 ac

Subwatershed 16
(HUC 903000126)
Namakan Lake
Rainy River Headwaters Major Watershed
34.98% private; 65.02% public
213 parcels > 20 ac
11,675 ac > 20 ac
4 FSPs; 291 ac

10 Year PFM Goals:*
HUC 10 goal: 34 FSPs; 7,892 ac
HUC 14 goal total: 34 FSPs; 7,892 ac

Subwatershed 17
(HUC 903000201)
Pike River
Vermilion River Major Watershed
56.00% private; 44.00% public
1,378 parcels > 20 ac
61,611 ac > 20 ac
29 FSPs; 4,611 ac

10 Year PFM Goals:*
HUC 10 goal: 58 FSPs; 7,892 ac
HUC 14 goal total: 64 FSPs; 7,892 ac

Subwatershed 18
(HUC 903000202)
Vermilion Lake
Vermilion River Major Watershed
48.53% private; 51.47% public
812 parcels > 20 ac
33,384 ac > 20 ac
24 FSPs; 2,968 ac

10 Year PFM Goals:*
HUC 10 goal: 13 FSPs; 3,097 ac
HUC 14 goal total: 13 FSPs; 3,582 ac

Subwatershed 19
(HUC 903000203)
Pelican River
Vermilion River Major Watershed
37.21% private; 62.79% public
653 parcels > 20 ac
27,760 ac > 20 ac
14 FSPs; 3,721 ac

10 Year PFM Goals:*
HUC 10 goal: 18 FSPs; 4,058 ac
HUC 14 goal total: 19 FSPs; 4,334 ac

Subwatershed 20
(HUC 903000204)
Echo River
Vermilion River Major Watershed
12.53% private; 87.47% public
70 parcels > 20 ac
3,162 ac > 20 ac
2 FSPs; 202 ac

10 Year PFM Goals:*
HUC 10 goal: 1 FSPs; 185 ac
HUC 14 goal total: 1 FSPs; 185 ac

Subwatershed 21
(HUC 903000205)
Vermilion River
Vermilion River Major Watershed
23.51% private; 76.49% public
565 parcels > 20 ac
25,357 ac > 20 ac
9 FSPs; 2,435 ac

10 Year PFM Goals:*
HUC 10 goal: 11 FSPs; 2,416 ac
HUC 14 goal total: 12 FSPs; 2,859 ac

*These goals are linked to the minor watershed (HUC 14) and subwatershed (HUC 10) forest land protection goals (see Vision Summary on next page for explanation).
*The HUC 14 and HUC 10 goals are overlapping, not additive – see the subwatershed action plans for more details.

Vision Summary

The following points summarize the vision and the two major goals for the Rainy River Headwaters – Vermilion River Watershed planning region.

- Public lands dominate much of the Rainy River Headwaters – Vermilion River Watershed planning region. As a result, twenty out of the twenty-one subwatersheds have met the 75% protection goal.
- To focus protection efforts the LFT set both subwatershed (HUC 10) and minor watershed (HUC 14) goals. Furthermore, team selected priority minor watersheds to concentrate landowner outreach efforts (see tables in the following subwatershed action plans).
- Goal 1 Forest Land Protection Guidance aims at highlighting the current protection levels.
- Goal 2 Forest Stewardship Guidance is to at a minimum have an updated FSP on every acre that is or will be protected by a conservation easement or SFIA. Consequently, larger areas of existing conservation easements or SFIA and higher forest land protection goals equate to higher FSP goals in this plan.
- It should be noted that some priority minor watersheds will be challenging to achieve protection goals due to the large quantity of active mining land.

Subwatershed Guidance

The purpose of the following twenty-one narratives is to provide service providers and resource managers with a detailed description of subwatershed-level conditions and recommendations.

These subwatershed action plans are intended to help service providers and managers identify and prioritize specific areas in the Rainy Headwaters – Vermilion River Watershed planning region so they can more effectively work together to implement activities that are likely to improve water quality, increase forest management, and achieve other public and private benefits.

Fig 21. Subwatershed (HUC 10) protection levels.

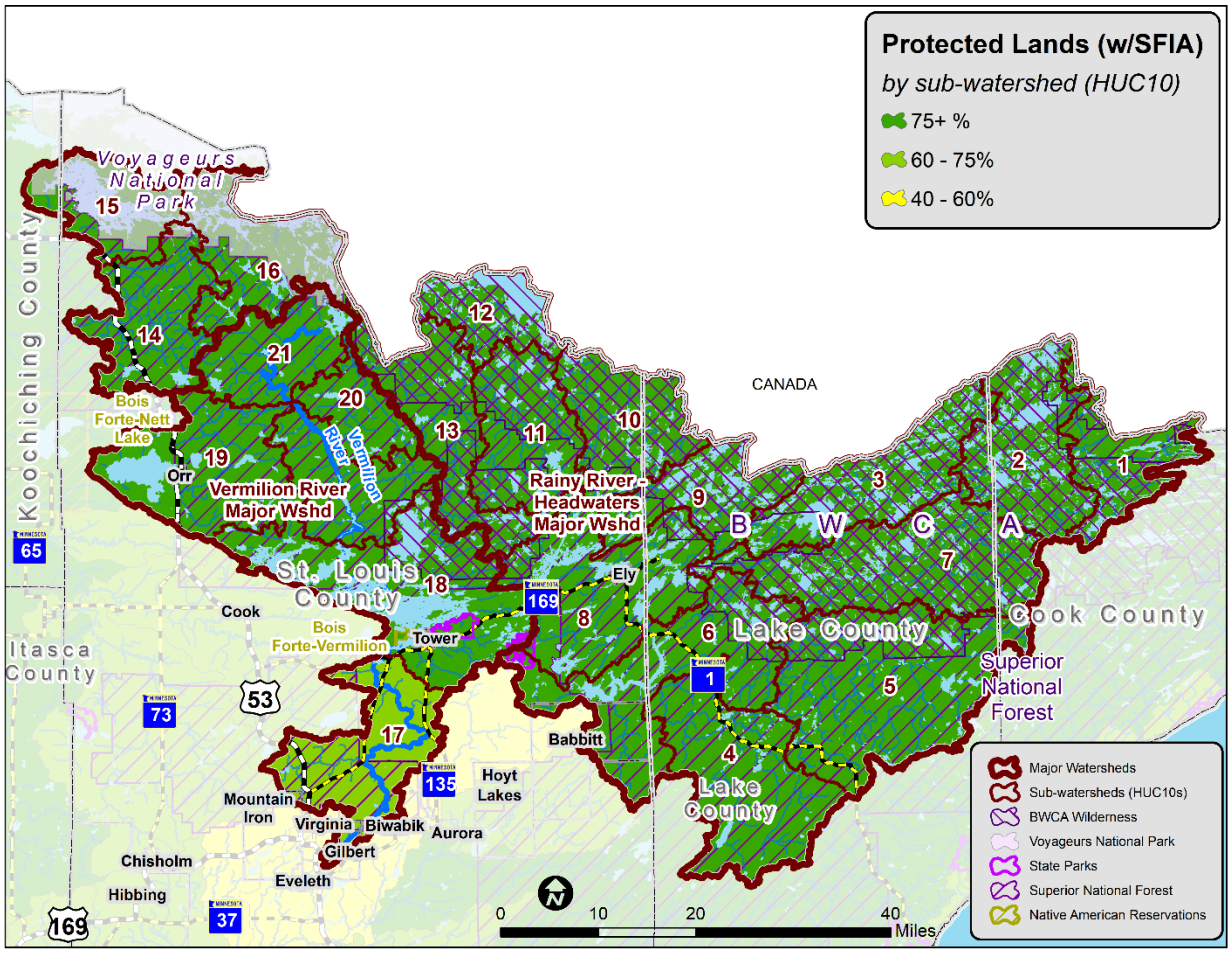
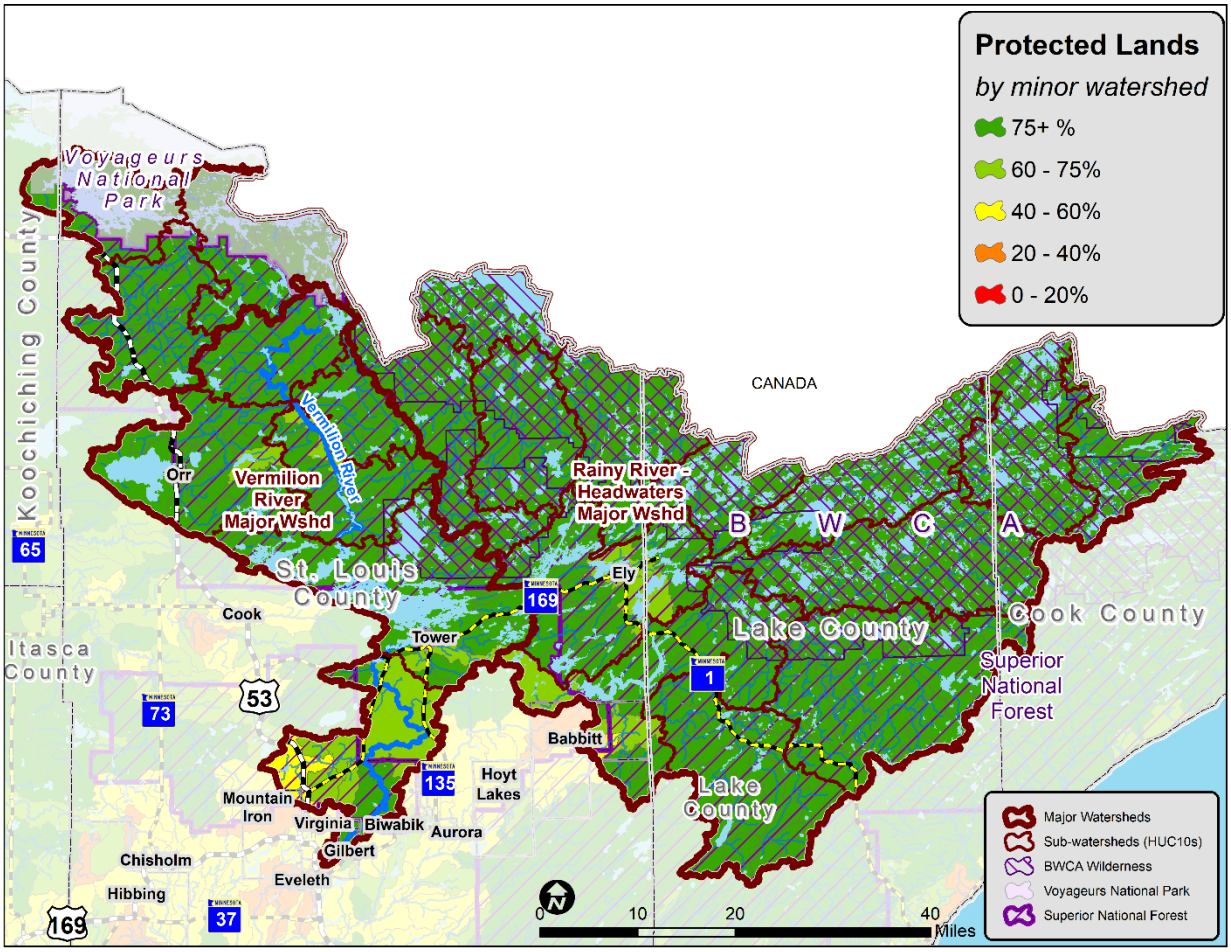


Fig 22. Minor watershed (HUC 14) protection levels



Subwatershed Action Plan #1
Granite River (HUC 903000103)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 71,095 acres.
- Forest cover is at 58.1% of the subwatershed.
- Contains 84 lakes over 10 acres for a total of 9.85% of the subwatershed.
- Subwatershed protection goal is met at 96.79%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Gravelly moraines and eskers over shallow igneous and metamorphic bedrock. Large, scattered glacial erratics are present.
- Soils: Extremely rocky, with bedrock exposed or several inches below soil surface. Thin layers of sandy and gravelly loam are most common.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 149 acres, estimated 1 plan.
- Minor watershed FSP goal: 149 acres, estimated 1 plan.
- No priority minor watersheds.

Fig 23. Subwatershed map.

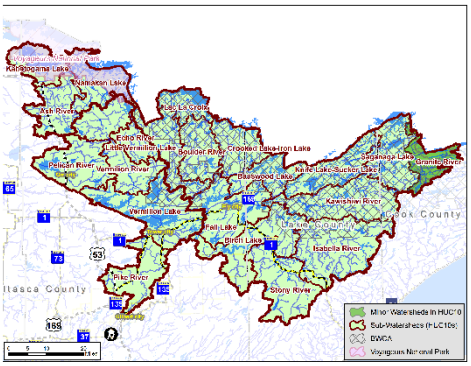


Fig 24. Subwatershed protection status.

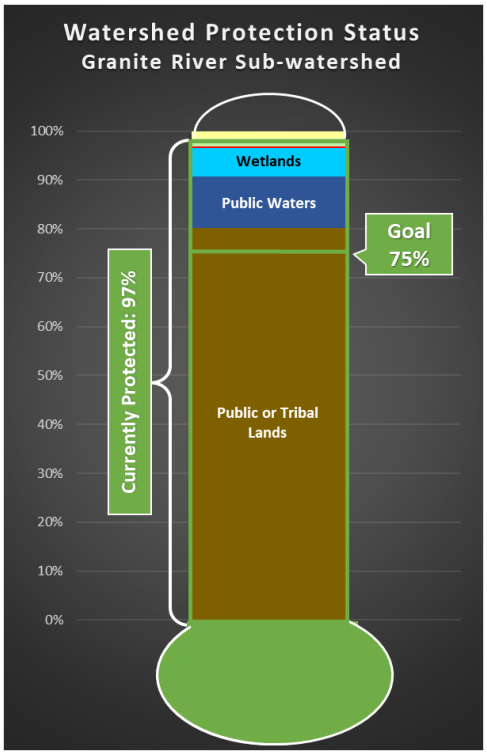


Table 7. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72008	5,206.4	99.99%	75.00%
72120	5,156.6	92.14%	75.00%
72121	16,722.4	99.93%	75.00%
72122	8,439.9	99.92%	75.00%
72124	10,178.8	99.06%	75.00%
72125	18,846.5	91.01%	75.00%
72126	6,544.5	98.93%	75.00%

Subwatershed Action Plan #2
Saganaga Lake (HUC 903000104)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 119,072 acres.
- Forest cover is at 46.0% of the subwatershed.
- Contains 225 lakes over 10 acres for a total of 23.78% of the subwatershed.
- Subwatershed protection goal is met at 99.34%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Gravelly moraines and eskers overlay shallow igneous and metamorphic bedrock. Large, scattered glacial erratics are present.
- Soils: Extremely rocky, with bedrock exposed or several inches below soil surface. Thin layers of sandy and gravelly loam are most common. Few peatlands.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 0 acres, estimated 0 plans.
- Minor watershed FSP goal: 0 acres, estimated 0 plans.
- No priority minor watersheds.

Fig 25. Subwatershed map.

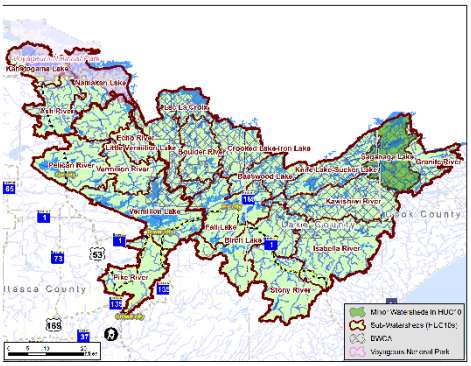


Fig 26. Subwatershed protection status.

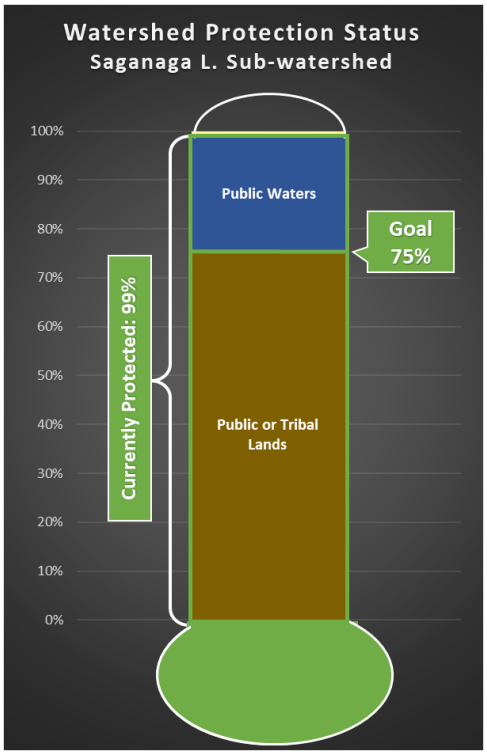


Table 8. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72001	24,991.8	99.77%	75.00%
72007	35,090.7	98.17%	75.00%
72009	17,758.0	99.88%	75.00%
72010	20,357.8	99.91%	75.00%
72127	20,873.4	99.78%	75.00%

Subwatershed Action Plan #3
Knife Lake-Sucker Lake (HUC 903000105)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 111,364 acres.
- Forest cover is at 42.8% of the subwatershed.
- Contains 181 lakes over 10 acres for a total of 26.43% of the subwatershed.
- Subwatershed protection goal is met at 97.86%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Gravelly outwash layered over both igneous and metamorphic bedrock. Large, scattered glacial erratics are present.
- Soils: Extremely rocky, with bedrock exposed or several inches below soil surface. Thin layers of sandy and gravelly loam most common.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 74 acres, estimated 1 plan.
- Minor watershed FSP goal: 74 acres, estimated 1 plan.
- No priority minor watersheds.

Fig 27. Subwatershed map.

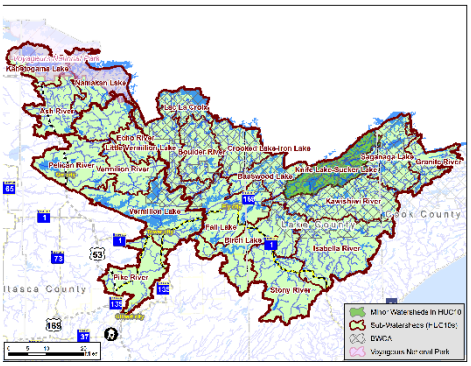


Fig 28. Subwatershed protection status.

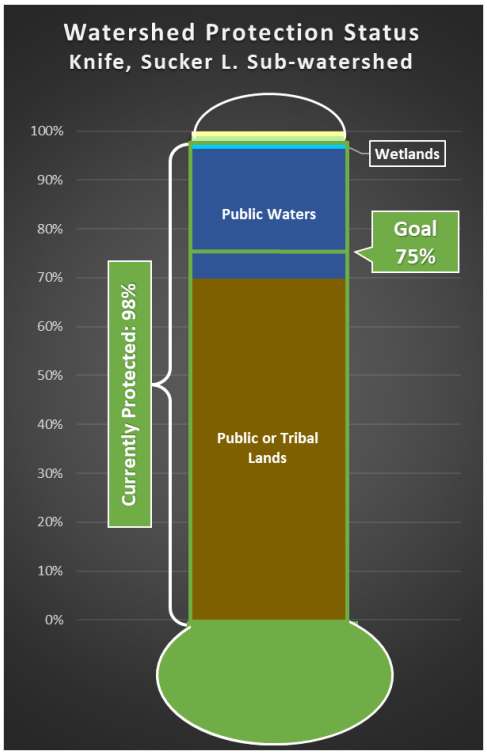


Table 9. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72001	10,967.9	99.84%	75.00%
72002	13,564.7	99.51%	75.00%
72020	17,105.7	90.75%	75.00%
72123	31,761.4	99.53%	75.00%
72128	16,880.4	97.08%	75.00%
72129	21,083.9	99.65%	75.00%

Subwatershed Action Plan #4
Stony River (HUC 903000106)
Rainy River Headwaters Major Watershed

Fig 29. Subwatershed map.

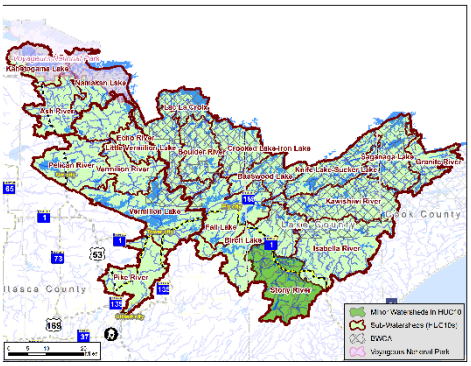
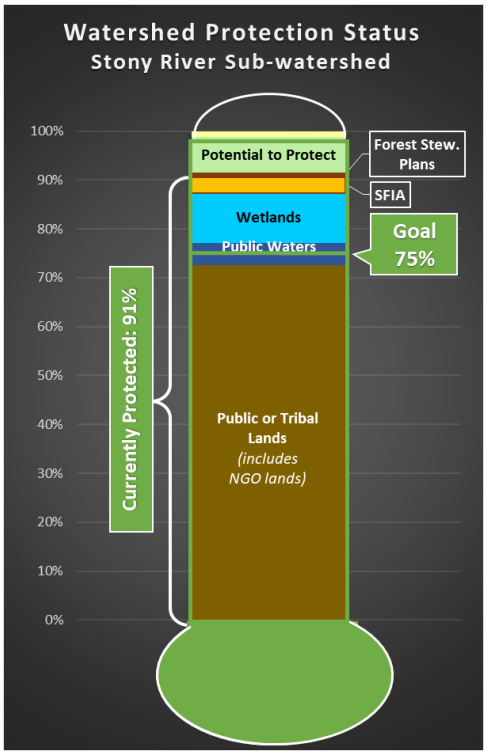


Fig 30. Subwatershed protection status.



Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 152,583 acres.
- Forest cover is at 38.9% of the subwatershed.
- Contains 54 lakes over 10 acres for a total of 3.86% of the subwatershed.
- Subwatershed protection goal is met at 90.85%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Drumlins cross through this subwatershed, near Toimi. Deeper tills, with significant amounts of organic soils and peats.
- Soils: Stony sandy loam, with a higher sand component than much of the Rainy River watershed, and greater amounts of peatlands.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, marsh, mesic hardwood, wet forest, wet meadow, and open rich peatland.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of develop, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 13,687 acres, estimated 60 plans.
- Minor watershed FSP goal: 13,687 acres, estimated 60 plans.
- Priority minor watersheds include: 72050, 72052, 72053, 72055, and 72066. These are bolded in the table below.

Table 10. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72035	11,475.8	99.87%	75.00%
72045	18,058.4	87.20%	75.00%
72046	6,402.8	94.97%	75.00%
72048	7,076.5	93.91%	75.00%
72049	8,472.8	90.31%	75.00%
72050	**17,726.5**	**94.97%**	**75.00%**
72052	**9,987.2**	**85.21%**	**75.00%**
72053	**23,386.5**	**88.64%**	**75.00%**
72054	9,644.6	97.99%	75.00%
72055	**7,756.5**	**98.37%**	**75.00%**
72056	8,747.1	93.35%	75.00%
72064	5,517.0	93.08%	75.00%
72066	**16,618.6**	**78.04%**	**75.00%**
72130	1,712.6	93.60%	75.00%

Subwatershed Action Plan #5
Isabella River (HUC 903000107)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 217,957 acres.
- Forest cover is at 47.6% of the subwatershed.
- Contains 150 lakes over 10 acres for a total of 5.72% of the subwatershed.
- Subwatershed protection goal is met at 98.10%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Mostly glacial till, with peatlands, rocky soils over bedrock, and outwash plains in the southwest corner. Moraines are present, as well as scattered glaciofluvial deposits.
- Soils: Primarily stony loams with scattered large cobbles. Areas of sandier loam and pockets of mucky peat.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, mesic hardwood, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 1,266 acres, estimated 6 plans.
- Minor watershed FSP goal: 1,266, estimated 6 plans.
- No priority minor watersheds.

Fig 31. Subwatershed map.

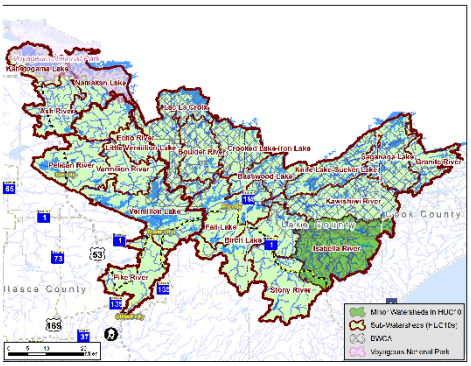


Fig 32. Subwatershed protection status.

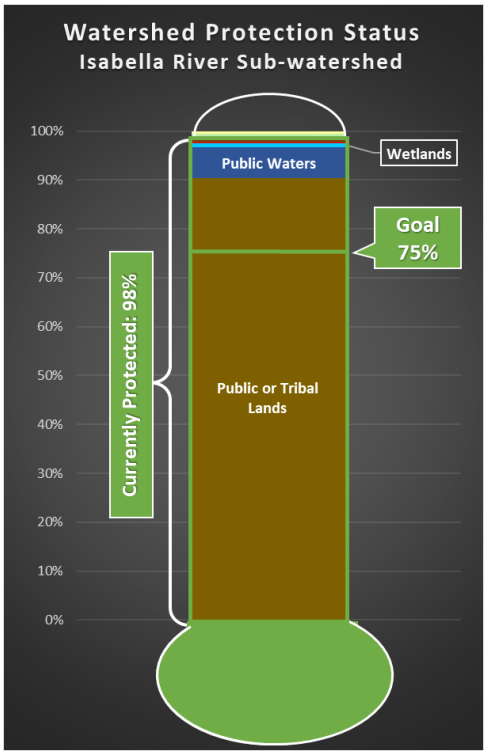


Table 11. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72006	21,157.0	99.95%	75.00%
72015	15,261.2	100.00%	75.00%
72017	4,914.7	100.00%	75.00%
72018	19,172.1	99.94%	75.00%
72019	8,378.0	92.86%	75.00%
72023	20,550.3	99.88%	75.00%
72024	12,430.2	99.81%	75.00%
72025	6,365.2	99.99%	75.00%
72026	18,759.6	99.08%	75.00%
72027	7,907.4	99.19%	75.00%
72028	5,663.9	98.99%	75.00%
72038	27,998.2	93.96%	75.00%
72039	7,725.0	99.55%	75.00%
72040	14,952.9	97.12%	75.00%
72041	4,242.0	93.69%	75.00%
72042	3,718.3	100.00%	75.00%
72043	8,125.3	95.08%	75.00%
72044	5,681.1	98.53%	75.00%
72116	4,954.2	93.83%	75.00%

Subwatershed Action Plan #6
Birch Lake (HUC 903000108)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 166,599 acres.
- Forest cover is at 44.2% of the subwatershed.
- Contains 50 lakes over 10 acres for a total of 8.69% of the subwatershed.
- Subwatershed protection goal is met at 87.39%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Varied; igneous bedrock with glacial till predominant, areas of rocky glacial outwash plains and organic soils.
- Soils: Primarily gravelly stony loam with a higher gravel component at a few feet of depth. Very shallow bedrock typical. Small pockets of peatlands and deep muck.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, wet meadow, and open rich meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 754 acres, estimated 3 plans.
- Minor watershed FSP goal: 2,748 acres, estimated 12 plans.
- Priority minor watersheds include: 72031, 72099, and 72131. These are bolded in the table below. Subwatersheds 72047 and 72098 are not priorities because they contain mine features.

Fig 33. Subwatershed map.

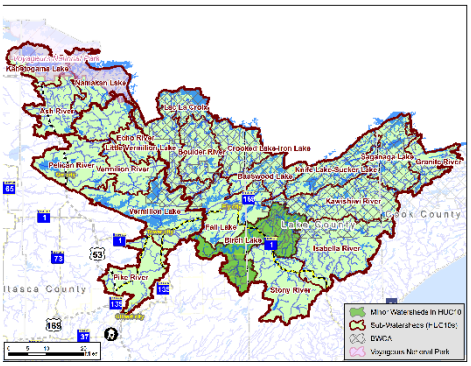


Fig 34. Subwatershed protection status.

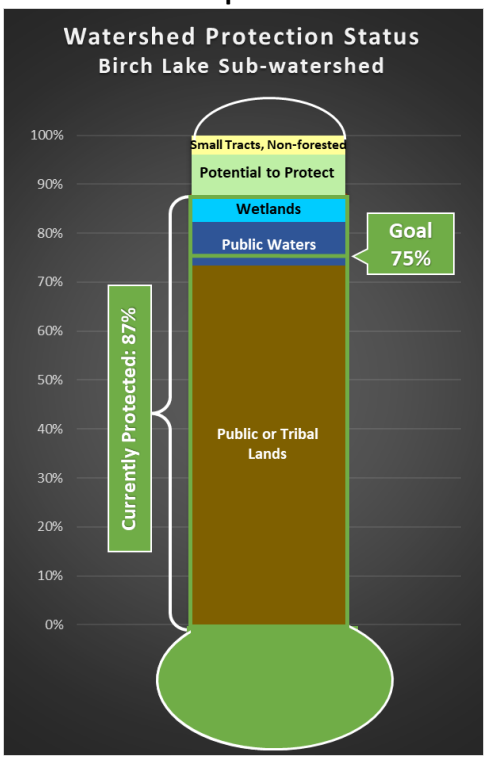


Table 12. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72031	**35,778.0**	**83.09%**	**75.00%**
72032	6,514.5	95.58%	75.00%
72033	27,023.9	99.92%	75.00%
72034	7,002.7	100.00%	75.00%
72036	8,110.8	99.98%	75.00%
72037	13,494.9	99.95%	75.00%
72047	13,764.0	67.45%	75.00%
72051	8,764.1	92.17%	75.00%
72069	10,273.7	91.93%	75.00%
72098	4,424.9	48.23%	75.00%
72099	**18,491.4**	**73.85%**	**75.00%**
72131	**12,956.2**	**88.24%**	**75.00%**

Subwatershed Action Plan #7
Kawishiwi River (HUC 903000109)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 170,512 acres.
- Forest cover is at 50.1% of the subwatershed.
- Contains 208 lakes over 10 acres for a total of 12.92% of the subwatershed.
- Subwatershed protection goal is met at 99.36%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Primarily rocky soils and igneous bedrock; several pockets of glacial till along the Kawishiwi River and Kawishiwi Lake.
- Soils: Dominated by gravelly loam, with larger cobbles and boulders. In several areas, muck covers fine sand deposits in former outwash plains.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 0 acres, estimated 0 plans.
- Minor watershed FSP goal: 0 acres, estimated 0 plans.
- No priority minor watersheds.

Fig 35. Subwatershed map.

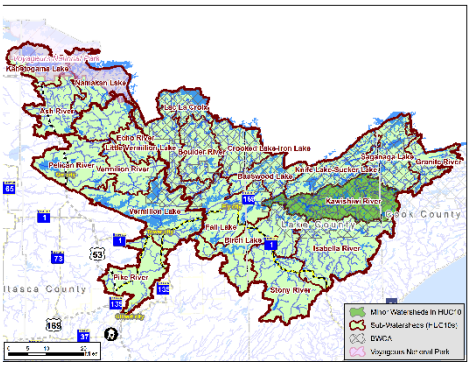


Fig 36. Subwatershed protection status.

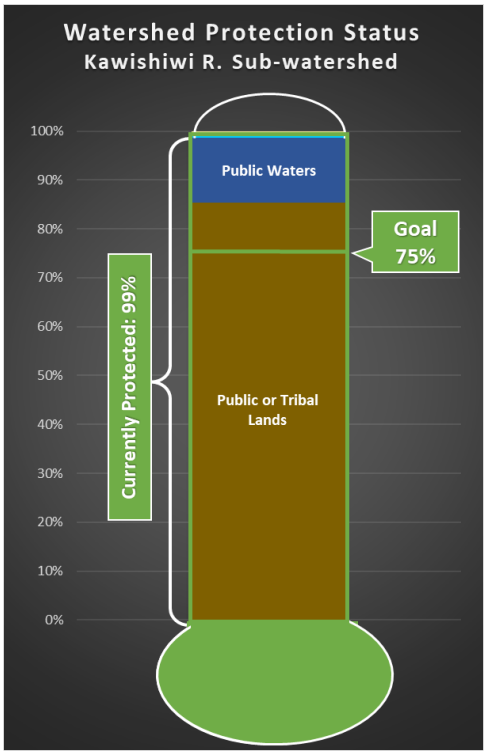


Table 13. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72003	19,352.0	98.03%	75.00%
72004	13,599.5	100.00%	75.00%
72012	7,930.3	100.00%	75.00%
72013	7,047.2	100.00%	75.00%
72014	18,950.6	100.00%	75.00%
72016	25,803.6	99.82%	75.00%
72021	6,231.6	98.83%	75.00%
72022	5,711.4	100.00%	75.00%
72132	23,848.9	99.88%	75.00%
72133	17,224.3	98.70%	75.00%
72134	12,736.7	99.90%	75.00%
72135	6,589.5	98.02%	75.00%
72136	5,486.6	95.96%	75.00%

Subwatershed Action Plan #8
Fall Lake (HUC 903000110)
Rainy River Headwaters Major Watershed

Fig 37. Subwatershed map.

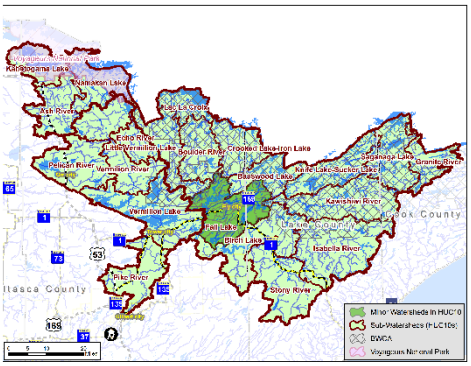
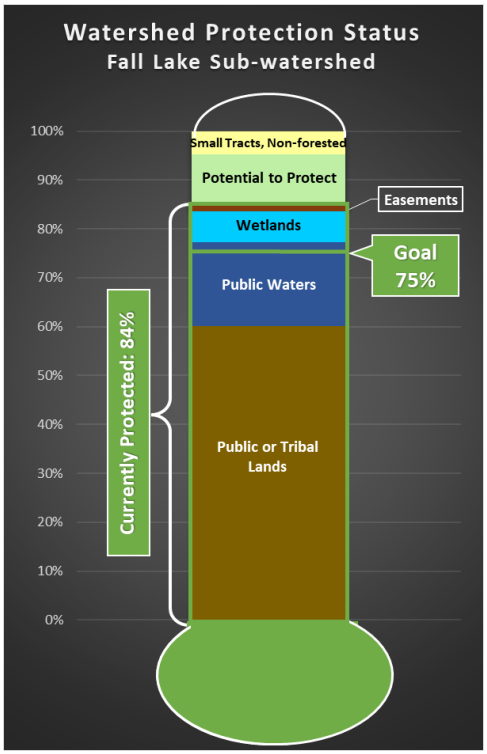


Fig 38. Subwatershed protection status.



<u>Goal 1: Forest Land Protection Guidance</u>

- Total area of subwatershed is 156,370 acres.
- Forest cover is at 44.2% of the subwatershed.
- Contains 62 lakes over 10 acres for a total of 16.90% of the subwatershed.
- Subwatershed protection goal is met at 84.38%.

<u>Goal 2: Forest Stewardship Guidance</u>

- Geomorphology: Rocky soils and shallow metamorphic bedrock, with patches of deeper glacial till and peatlands.
- Soils: Primarily stony and sandy loams, some with significant gravel component. Deep mucky peatlands.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, wet meadow, and open rich peatland.
- Refer to the vegetation management framework in the <u>MFRC Northern and Northeast Landscape Plans</u> for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 1,379 acres, estimated 6 plans.
- Minor watershed FSP goal: 3,279 acres, estimated 14 plans.
- Priority minor watersheds include: 72030, 72061, 72065, 72068, 72095, and 72096. These are bolded in the table below.

Table 14. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72068	**11,559.6**	**63.00%**	**75.00%**
72065	**15,932.5**	**71.78%**	**75.00%**
72093	6,428.8	77.14%	75.00%
72095	**16,776.3**	**80.41%**	**75.00%**
72030	**13,957.3**	**80.94%**	**75.00%**
72061	**16,972.0**	**82.55%**	**75.00%**
72096	**6,018.9**	**84.79%**	**75.00%**
72072	25,276.5	85.78%	75.00%
72092	5,632.2	89.34%	75.00%
72067	4,984.9	89.59%	75.00%
72091	3,928.3	93.03%	75.00%
72094	13,571.6	94.23%	75.00%
72089	6,292.3	99.94%	75.00%
72090	9,038.3	100.00%	75.00%

Subwatershed Action Plan #9
Basswood Lake (HUC 903000111)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 80,541 acres.
- Forest cover is at 45.2% of the subwatershed.
- Contains 40 lakes over 10 acres for a total of 24.97% of the subwatershed.
- Subwatershed protection goal is met at 96.89%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Dominated by igneous and metamorphic bedrock, with areas of thin glacial till and organic soils. Rocky and moraine-derived; several glacial lake beds.
- Soils: Primarily rocky sand loams, with a significant gravel component. Areas of deep, mucky peats, and small pockets of silty clays where former lakebeds were located.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 213 acres, estimated 1 plan.
- Minor watershed FSP goal: 213 acres, estimated 1 plan.
- No priority minor watersheds.

Fig 39. Subwatershed map.

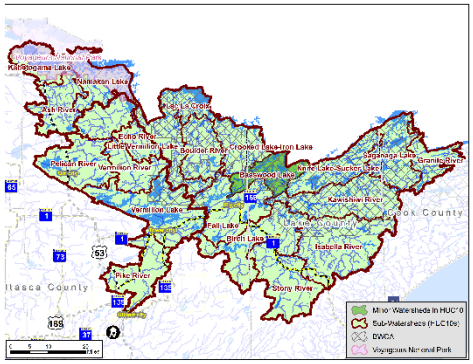


Fig 40. Subwatershed protection status.

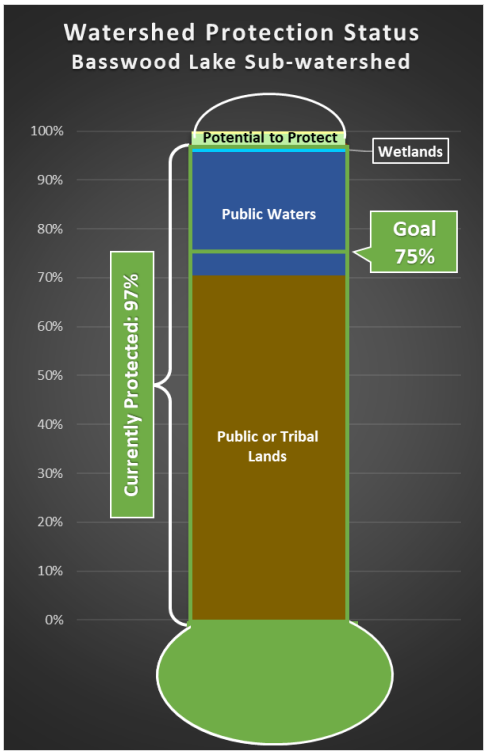


Table 15. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72029	38,849.0	99.18%	75.00%
72059	18,192.8	98.48%	75.00%
72060	4,534.4	100.00%	75.00%
72062	15,436.7	90.88%	75.00%
72063	3,528.4	85.83%	75.00%

Subwatershed Action Plan #10
Crooked Lake-Iron Lake (HUC 903000112)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 95,104 acres.
- Forest cover is at 56.5% of the subwatershed.
- Contains 69 lakes over 10 acres for a total of 8.68% of the subwatershed.
- Subwatershed protection goal is met at 99.26%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Igneous bedrock, with small pockets of glacial till.
- Soils: Primarily stony loam, with a significant gravel component at a few feet of depth. Very shallow bedrock typical. Small pockets of peatlands and muck.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 105 acres, estimated 1 plan.
- Minor watershed FSP goal: 105 acres, estimated 1 plan.
- No priority minor watersheds.

Fig 41. Subwatershed map.

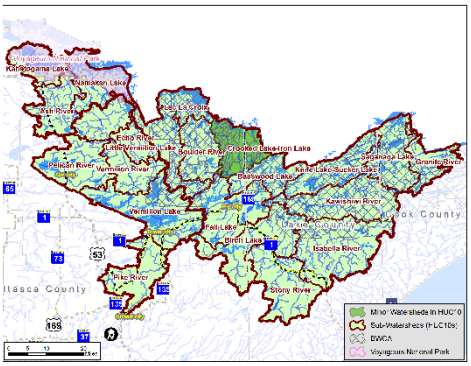


Fig 42. Subwatershed protection status.

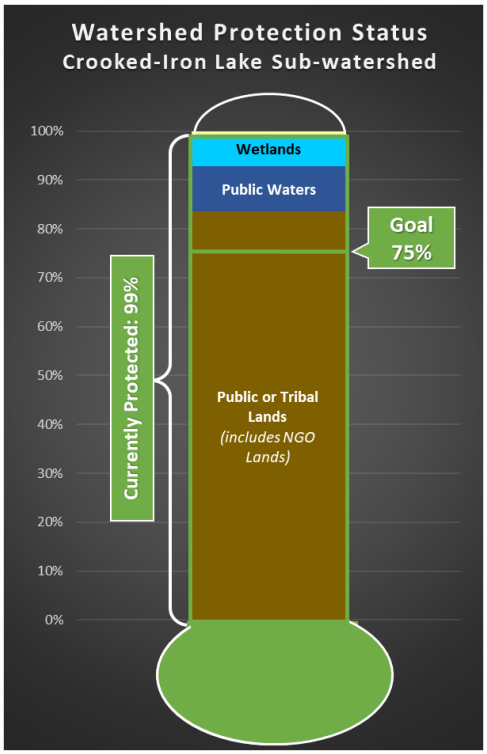


Table 16. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72005	31,016.2	99.07%	75.00%
72058	33,168.0	98.90%	75.00%
72070	8,473.5	99.95%	75.00%
72071	7,522.4	100.00%	75.00%
72075	5,119.3	99.96%	75.00%
72076	2,428.7	100.00%	75.00%
72137	7,376.4	99.47%	75.00%

Subwatershed Action Plan #11
Boulder River (HUC 903000113)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 99,240 acres.
- Forest cover is at 56.9% of the subwatershed.
- Contains 41 lakes over 10 acres for a total of 9.11% of the subwatershed.
- Subwatershed protection goal is met at 97.93%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Primarily igneous bedrock, with areas of mucky peat and glacial till.
- Soils: Rocky loam and gravelly sand as part of an esker with significant amounts of deep peatlands. Very shallow bedrock in many areas.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 0 acres, estimated 0 plans.
- Minor watershed FSP goal: 0 acres, estimated 0 plans.
- No priority minor watersheds.

Fig 43. Subwatershed map.

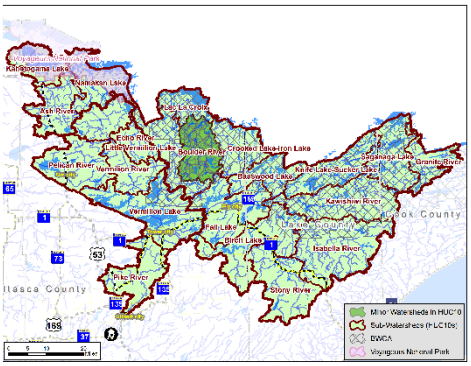


Fig 44. Subwatershed protection status.

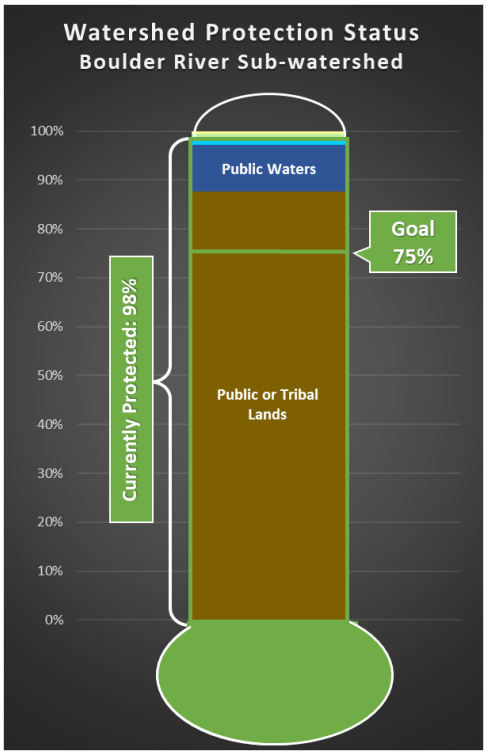


Table 17. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72073	7,568.8	94.97%	75.00%
72074	9,286.6	100.00%	75.00%
72077	4,494.4	100.0%	75.00%
72078	6,396.4	99.94%	75.00%
72079	5,763.8	99.94%	75.00%
72080	5,048.1	98.62%	75.00%
72081	3,098.4	99.87%	75.00%
72082	4,784.2	98.50%	75.00%
72083	7,119.1	97.13%	75.00%
72084	8,117.0	99.48%	75.00%
72086	6,461.0	97.75%	75.00%
72100	9,029.1	95.81%	75.00%
72105	6,116.7	87.79%	75.00%
72106	3,451.4	99.92%	75.00%
72107	3,246.9	99.92%	75.00%
72108	4,094.1	100.00%	75.00%
72114	5,163.4	99.93%	75.00%

Subwatershed Action Plan #12
Lac La Croix (HUC 903000120)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 59,299 acres.
- Forest cover is at 56.0% of the subwatershed.
- Contains 57 lakes over 10 acres for a total of 41.67% of the subwatershed.
- Subwatershed protection goal is met at 99.84%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Primarily moraines and eskers over shallow igneous bedrock, with sediments from former glacial lakes. Large, scattered glacial erratics are present.
- Soils: Extremely rocky, with bedrock exposed or several inches below soil surface. Thin layers of sandy and gravelly loam are most common. Patches of sandy glaciolacustrine sediment range from fine sand loam to silty clay loam.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Minor watershed FSP goal: 0 acres, estimated 0 plans.
- Subwatershed FSP goal: 0 acres, estimated 0 plans.
- No priority minor watersheds.

Fig 45. Subwatershed map.

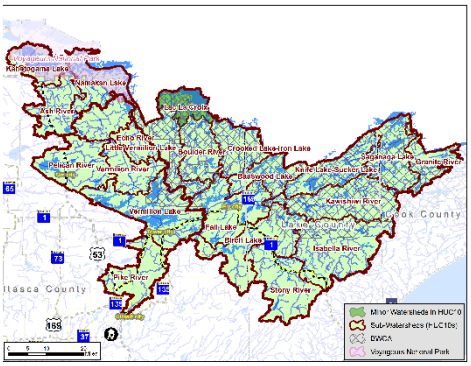


Fig 46. Subwatershed protection status.

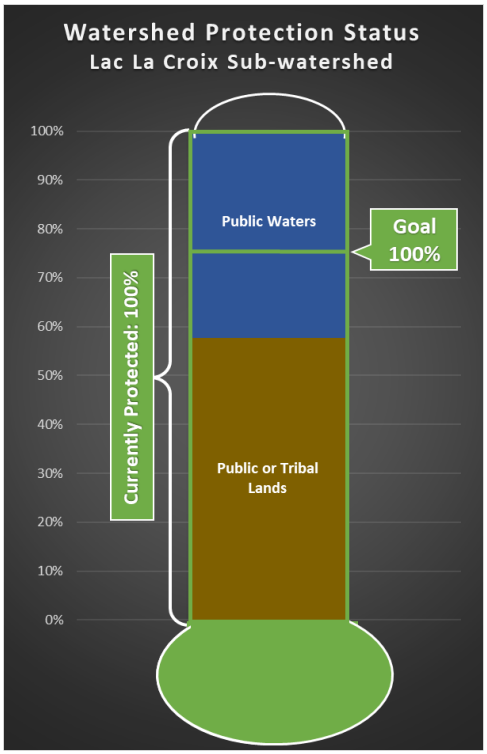


Table 18. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72113	11,476.5	99.87%	75.00%
72115	5,731.7	99.91%	75.00%
72117	42,091.2	99.82%	75.00%

Subwatershed Action Plan #13
Little Vermilion Lake (HUC 903000121)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 108,117 acres.
- Forest cover is at 63.4% of the subwatershed.
- Contains 64 lakes over 10 acres for a total of 6.25% of the subwatershed.
- Subwatershed protection goal is met at 99.55%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Gravelly moraines and glacial drainage channels overlay shallow igneous bedrock. Mucks and peat along current waterways.
- Soils: Coarse, gravelly, sandy loams and mucky peat. Small amounts of fine sandy loams and silty clay loams.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Minor watershed FSP goal: 0 acres, estimated 0 plans.
- Subwatershed FSP goal: 0 acres, estimated 0 plans.
- No priority minor watersheds.

Fig 47. Subwatershed map.

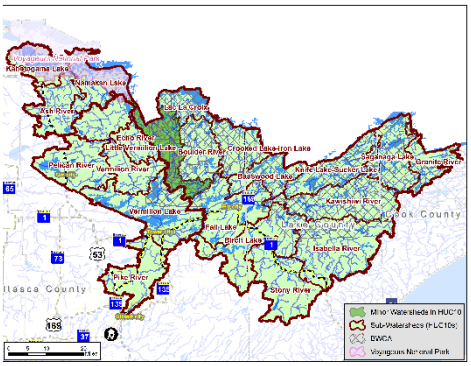


Fig 48. Subwatershed protection status.

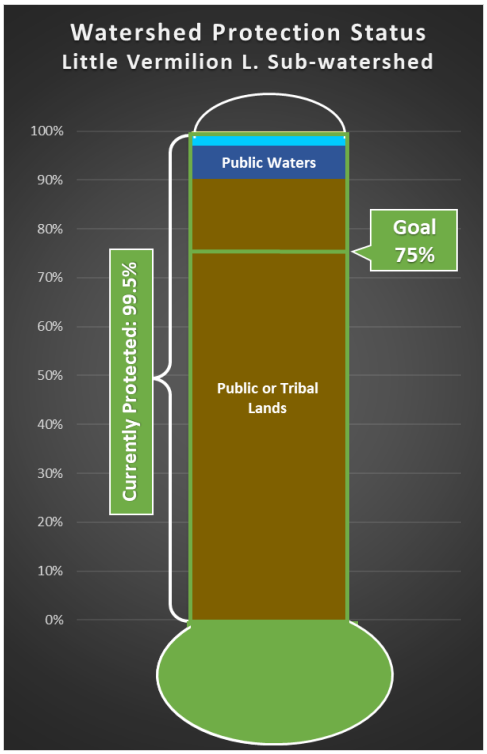


Table 19. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
72085	19,755.4	99.78%	75.00%
72087	5,290.9	99.98%	75.00%
72088	4,403.7	99.94%	75.00%
72097	5,386.6	99.86%	75.00%
72101	3,795.8	99.78%	75.00%
72102	8,771.8	99.93%	75.00%
72103	8,518.8	99.97%	75.00%
72104	3,418.7	91.37%	75.00%
72109	11,850.3	99.93%	75.00%
72110	5,033.3	99.85%	75.00%
72111	5,426.3	100.00%	75.00%
72112	6,217.4	99.99%	75.00%
72118	9,231.2	99.58%	75.00%
72119	11,016.8	99.39%	75.00%

Subwatershed Action Plan #14
Ash River (HUC 903000124)
Rainy River Headwaters Major Watershed

Fig 49. Subwatershed map.

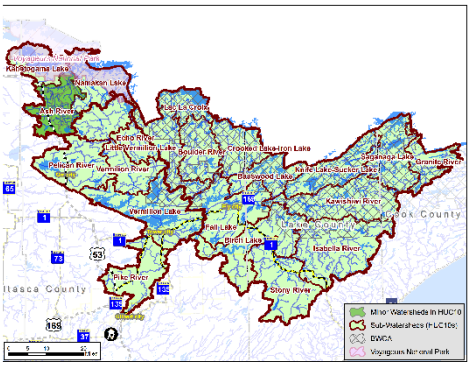
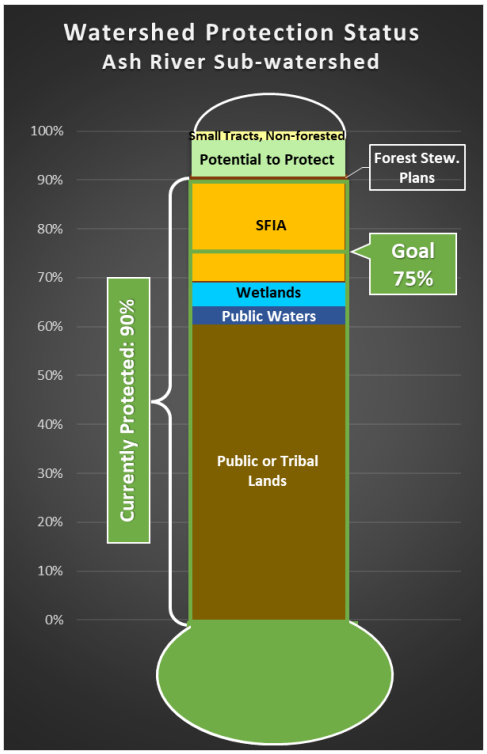


Fig 50. Subwatershed protection status.



<u>Goal 1: Forest Land Protection Guidance</u>

- Total area of subwatershed is 101,266 acres.
- Forest cover is at 64.0% of the subwatershed.
- Contains 18 lakes over 10 acres for a total of 3.14% of the subwatershed.
- Subwatershed protection goal is met at 90.06%.

<u>Goal 2: Forest Stewardship Guidance</u>

- Geomorphology: Primarily igneous, some lacustrine and pockets of peat. Partially located in Glacial Lake Agassiz footprint.
- Soils: Silty and clay loams are most common, some mucky peatlands.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the <u>MFRC Northern and Northeast Landscape Plans</u> for more specific NPC-based guidance.
- Current landcover consists of developed, cultivated crops, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 24,713 acres, estimated 107 plans.
- Minor watershed FSP goal: 24,713 acres, estimated 107 plans.
- No priority minor watersheds.

Table 20. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
74009	11,648.0	92.02%	75.00%
74010	4,225.9	83.57%	75.00%
74015	4,429.9	78.28%	75.00%
74017	9,923.9	95.96%	75.00%
74018	7,229.9	84.72%	75.00%
74019	8,077.1	90.69%	75.00%
74020	3,351.5	92.36%	75.00%
74023	8,073.5	87.83%	75.00%
74024	19,492.5	89.00%	75.00%
74025	5,550.9	94.67%	75.00%
74026	6,026.7	93.66%	75.00%
74027	5,072.5	94.27%	75.00%
74028	8,164.0	89.37%	75.00%

Subwatershed Action Plan #15
Kabetogama Lake (HUC 903000125)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 76,073 acres.
- Forest cover is at 41.1% of the subwatershed.
- Contains 10 lakes over 10 acres for a total of 31.30% of the subwatershed.
- Subwatershed protection goal is met at 94.47%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Primarily igneous bedrock and modern lacustrine deposits, with areas of peat and deep till. Partially located in Glacial Lake Agassiz footprint.
- Soils: Mostly silty and clayey loams, some areas of mucky peats. Few areas of gravelly and sandy soils atop shallow bedrock.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, mesic hardwood, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 4,072 acres, estimated 18 plans.
- Minor watershed FSP goal: 4,072 acres, estimated 18 plans.
- No priority minor watersheds.

Fig 51. Subwatershed map.

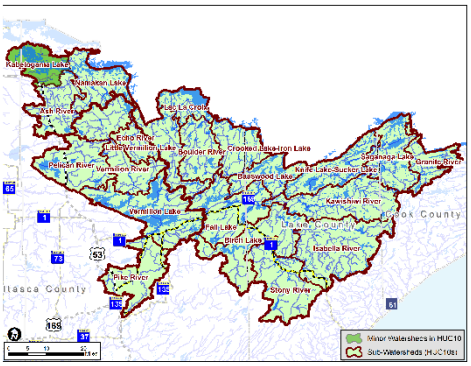


Fig 52. Subwatershed protection status.

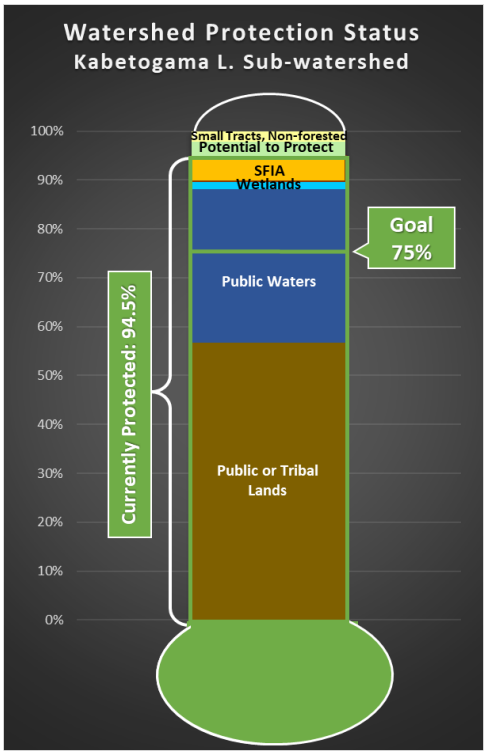


Table 21. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
74002	2,994.3	100.00%	75.00%
74004	63,598.9	94.47%	75.00%
74008	9,479.7	92.71%	75.00%

Subwatershed Action Plan #16
Namakan Lake (HUC 903000126)
Rainy River Headwaters Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 105,549 acres.
- Forest cover is at 56.8% of the subwatershed.
- Contains 75 lakes over 10 acres for a total of 22.65% of the subwatershed.
- Subwatershed protection goal is met at 96.67%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Gravelly moraines and eskers overlay shallow igneous bedrock. Mucks and peat along current waterways.
- Soils: Rocky, bouldery, poor sand loam soils. Small areas of mucky peat underlain by silty clay loams.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 7,892 acres, estimated 34 plans.
- Minor watershed FSP goal: 7,892 acres, estimated 34 plans.
- No priority minor watersheds.

Fig 53. Subwatershed map.

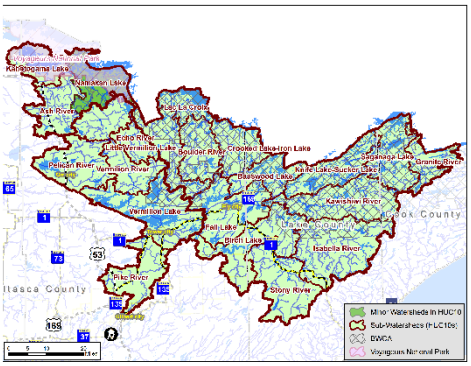


Fig 54. Subwatershed protection status.

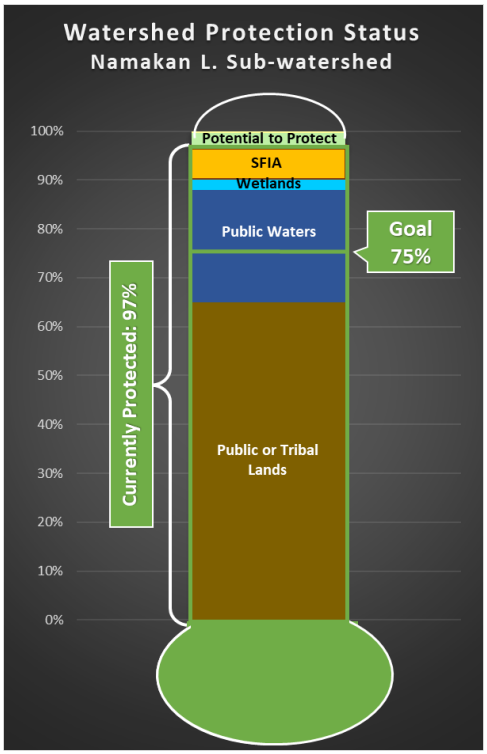


Table 22. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
74011	13,624.5	91.22%	75.00%
74012	4,534.7	99.98%	75.00%
74013	19,304.2	96.26%	75.00%
74014	20,908.2	99.28%	75.00%
74016	10,199.9	90.05%	75.00%
74037	36,977.5	98.85%	75.00%

Subwatershed Action Plan #17
Pike River (HUC 903000201)
Vermilion River Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 118,675 acres.
- Forest cover is at 42.5% of the subwatershed.
- Contains 6 lakes over 10 acres for a total of 0.55% of the subwatershed.
- Subwatershed protection goal is met at 67.20%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Primarily thicker glacial tills with few lakes. Significant outwash plains and peatlands.
- Soils: Sandy loams with patches of gravelly loam, deep mucky peats. Small areas of very coarse gravels and sands.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, mesic hardwood, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, cultivated crops, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 13,267 acres, estimated 58 plans.
- Minor watershed FSP goal: 14,618 acres, estimated 64 plans.
- Priority minor watersheds include: 73058, 73059, 73060, 73061, 73062, 73063, and 73064. These are bolded in the table below.

Fig 55. Subwatershed map.

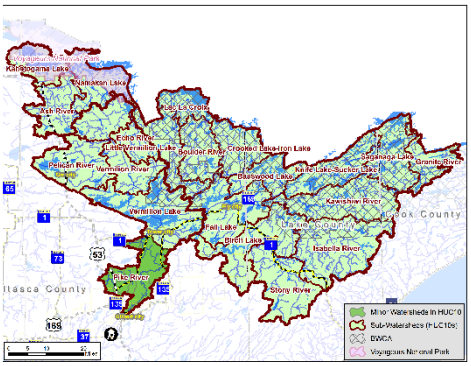


Fig 56. Subwatershed protection status.

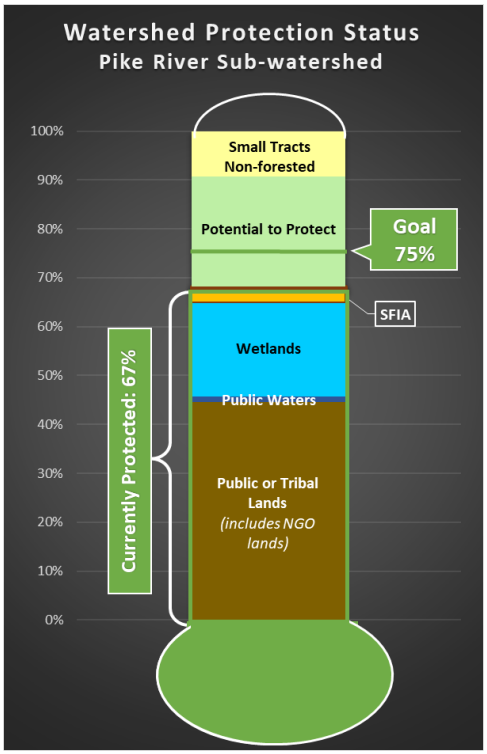


Table 23. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
73057	5,319.3	96.82%	75.00%
73058	**48,643.0**	**64.09%**	**75.00%**
73059	**7,687.4**	**67.71%**	**75.00%**
73060	**3,775.7**	**64.77%**	**75.00%**
73061	**16,876.4**	**57.89%**	**75.00%**
73062	**6,894.5**	**61.54%**	**75.00%**
73063	**4,714.1**	**63.57%**	**75.00%**
73064	**24,764.2**	**75.77%**	**75.00%**

Subwatershed Action Plan #18
Vermilion Lake (HUC 903000202)
Vermilion River Major Watershed

Fig 57. Subwatershed map.

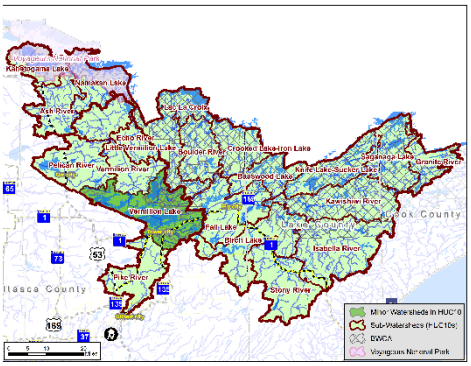
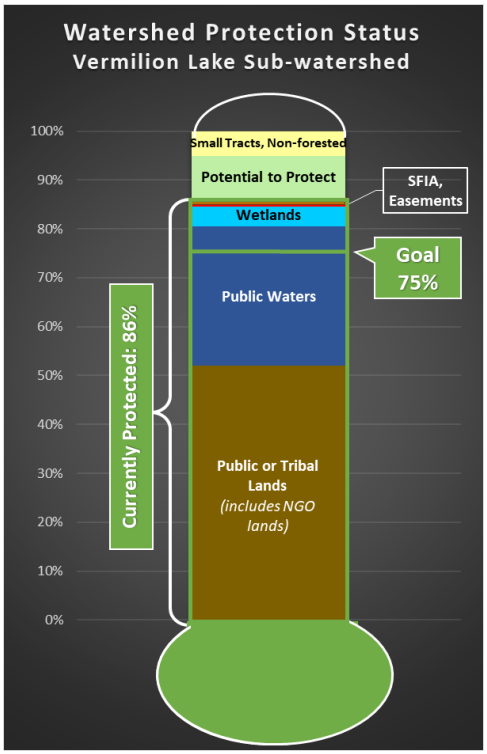


Fig 58. Subwatershed protection status.



<u>Goal 1: Forest Land Protection Guidance</u>

- Total area of subwatershed is 193,840 acres.
- Forest cover is at 46.2% of the subwatershed.
- Contains 47 lakes over 10 acres for a total of 28.33% of the subwatershed.
- Subwatershed protection goal is met at 85.74%.

<u>Goal 2: Forest Stewardship Guidance</u>

- Geomorphology: Dominated by Vermilion Lake. Gravel and sand from moraines and drainageways in the north, with deeper glacial till southwards. A mixture of igneous and metamorphic bedrock is several feet below the surface and exposed in places.
- Soils: Rocky and cobby loams, with a significant gravel component.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, mesic hardwood, wet forest, wet meadow, and open rich peatland.
- Refer to the vegetation management framework in the <u>MFRC Northern and Northeast Landscape Plans</u> for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 3,097 acres, estimated 13 plans.
- Minor watershed FSP goal: 3,582 acres, estimated 16 plans.
- Priority minor watersheds include: 73037, 73040, 73049, 73050, 73051, 73052, 73053, 73054, 73055, and 73056. These are bolded in the table below.

Table 24. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
73037	**5,785.6**	**90.32%**	**75.00%**
73040	**3,579.1**	**91.69%**	**75.00%**
73042	19,985.7	97.85%	75.00%
73044	8,928.9	98.88%	75.00%
73045	3,583.9	99.88%	75.00%
73046	3,674.9	99.97%	75.00%
73047	4,589.1	91.25%	75.00%
73048	2,865.7	96.53%	75.00%
73049	**3,302.7**	**100.00%**	**75.00%**
73050	**95,109.3**	**79.42%**	**75.00%**
73051	**9,381.2**	**98.73%**	**75.00%**
73052	**12,559.7**	**85.98%**	**75.00%**
73053	**8,536.2**	**72.52%**	**75.00%**
73054	**3,478.1**	**67.12%**	**75.00%**
73055	**5,694.1**	**95.72%**	**75.00%**
73056	**2,785.9**	**75.93%**	**75.00%**

Subwatershed Action Plan #19
Pelican River (HUC 903000203)
Vermilion River Major Watershed

Fig 59. Subwatershed map.

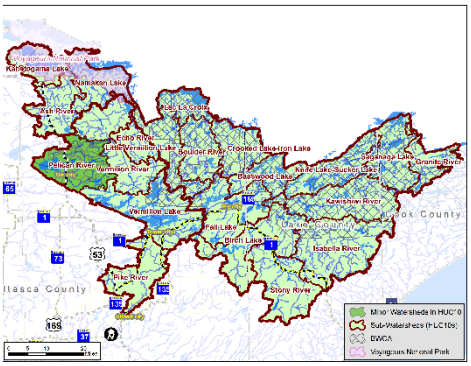
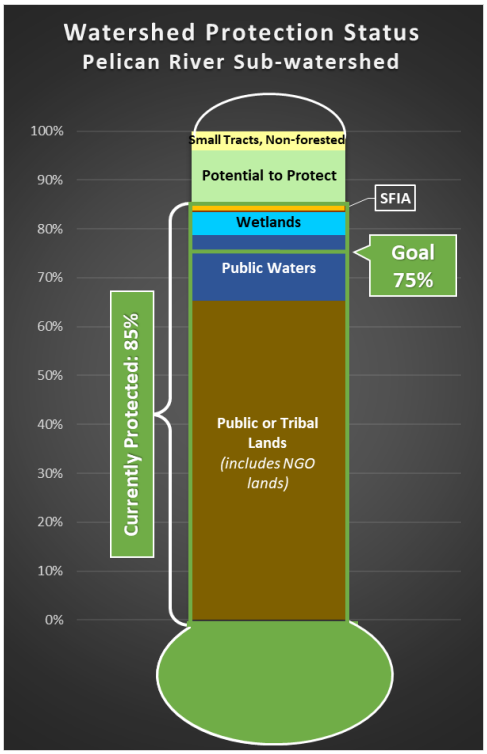


Fig 60. Subwatershed protection status.



Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 134,290 acres.
- Forest cover is at 54.1% of the subwatershed.
- Contains 18 lakes over 10 acres for a total of 12.71% of the subwatershed.
- Subwatershed protection goal is met at 85.13%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Moraines and eskers over shallow igneous bedrock. Significant amounts of organic mucks along rivers and other water features. Outwash and till along the southwest edge of subwatershed.
- Soils: Gravelly and stony, mostly loamy and shallow. Mucky peat, occasionally atop sand.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, mesic hardwood, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, cultivated crops, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 4,058 acres, estimated 18 plans.
- Minor watershed FSP goal: 4,334 acres, estimated 19 plans.
- Priority minor watersheds include: 73031, and 73034.

Table 25. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
73013	7,090.2	99.82%	75.00%
73014	6,760.5	99.80%	75.00%
73015	5,320.6	97.71%	75.00%
73016	3,851.7	96.11%	75.00%
73029	8,009.6	71.55%	75.00%
73030	3,620.8	99.50%	75.00%
73031	**5,010.6**	**76.67%**	**75.00%**
73032	3,706.6	95.88%	75.00%
73033	4,672.5	100.00%	75.00%
73034	**34,712.3**	**76.65%**	**75.00%**
73035	13,832.4	80.10%	75.00%
73036	7,986.4	79.59%	75.00%
73038	6,440.1	89.87%	75.00%
73039	16,877.0	83.91%	75.00%
73068	6,398.8	96.85%	75.00%

Subwatershed Action Plan #20
Echo River (HUC 903000204)
Vermilion River Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 50,650 acres.
- Forest cover is at 63.1% of the subwatershed.
- Contains 17 lakes over 10 acres for a total of 4.43% of the subwatershed.
- Subwatershed protection goal is met at 95.36%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Igneous bedrock with peat and organic soils along waterways; significant amounts of glacial outwash.
- Soils: Stony and gravelly loams underlaid by bedrock, with silt loams, mucky peat.
- Potential NPC include acid peatland, fire dependent forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 185 acres, estimated 1 plan.
- Minor watershed FSP goal: 185 acres, estimated 1 plan.
- No priority minor watersheds.

Fig 61. Subwatershed map.

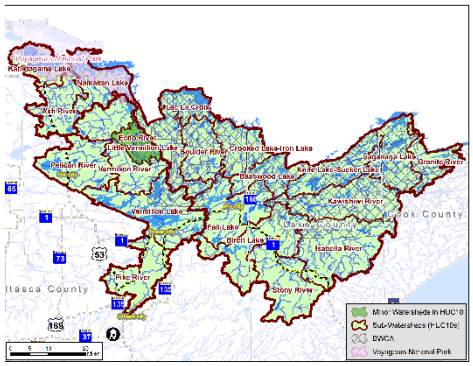


Fig 62. Subwatershed protection status.

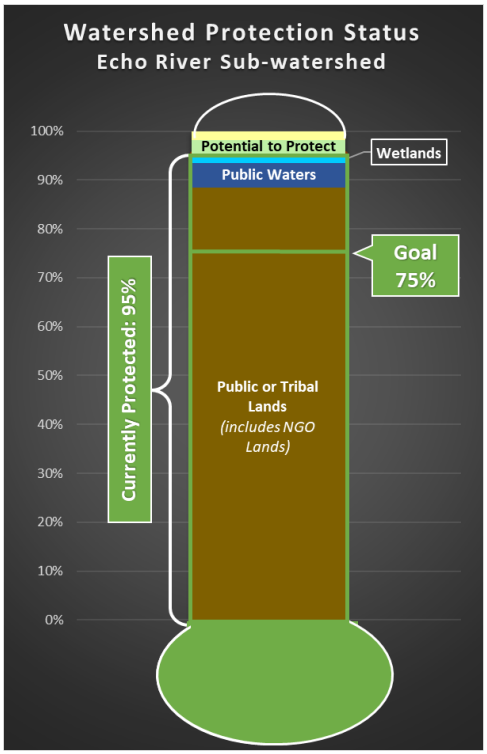


Table 26. Minor watershed info.

Minor Wshd #	Acres	Current % Protected	Protection Goal %
73001	6,230.3	93.03%	75.00%
73009	12,651.4	93.53%	75.00%
73018	4,770.9	80.53%	75.00%
73019	12,350.7	99.08%	75.00%
73020	5,867.1	99.98%	75.00%
73065	3,991.1	100.00%	75.00%
73066	4,788.3	98.88%	75.00%

Subwatershed Action Plan #21
Vermilion River (HUC 903000205)
Vermilion River Major Watershed

Goal 1: Forest Land Protection Guidance

- Total area of subwatershed is 163,845 acres.
- Forest cover is at 62.1% of the subwatershed.
- Contains 31 lakes over 10 acres for a total of 5.02% of the subwatershed.
- Subwatershed protection goal is met at 91.16%.

Goal 2: Forest Stewardship Guidance

- Geomorphology: Gravelly moraines and eskers overlay shallow igneous bedrock. Mucks and peat along current waterways. Northern portion contains silty loam glaciolacustrine deposits.
- Soils: Mostly shallow stony and gravelly loams, with mucky peat and silty loams in former glacial lake footprints.
- Potential NPC include acid peatland, fire dependent, forested rich peatland, wet forest, and wet meadow.
- Refer to the vegetation management framework in the MFRC Northern and Northeast Landscape Plans for more specific NPC-based guidance.
- Current landcover consists of developed, pasture/hay, grassland/herbaceous, evergreen forest, deciduous forest, mixed forest, woody wetlands, shrub/scrub, emergent herbaceous wetlands, and barren.
- Provide forest stewardship services to interested landowners.
- Subwatershed FSP goal: 2,416 acres, estimated 11 plans.
- Minor watershed FSP goal: 2,859 acres, estimated 12 plans.
- No priority minor watersheds.

Fig 63. Subwatershed map.

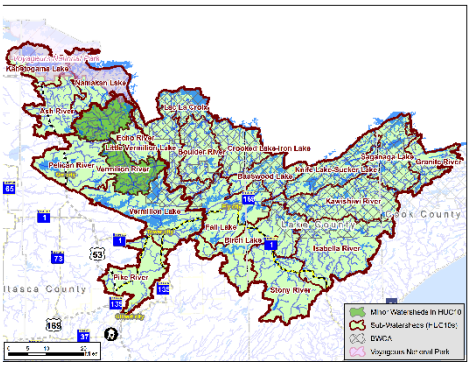


Fig 64. Subwatershed protection status.

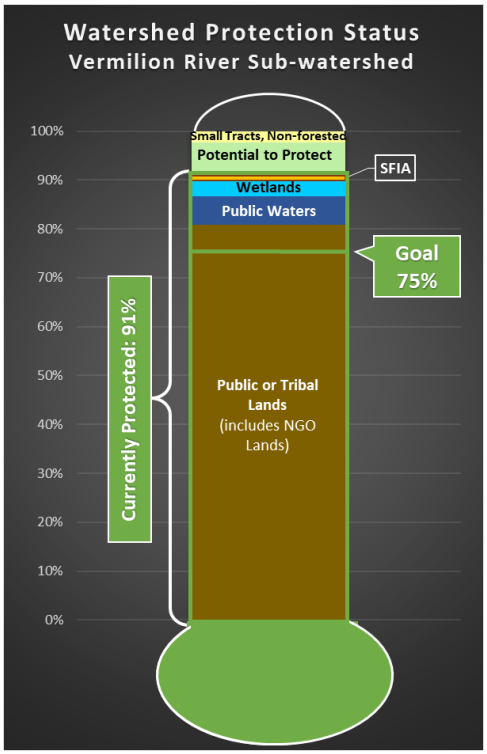


Table 27. Minor watershed info.

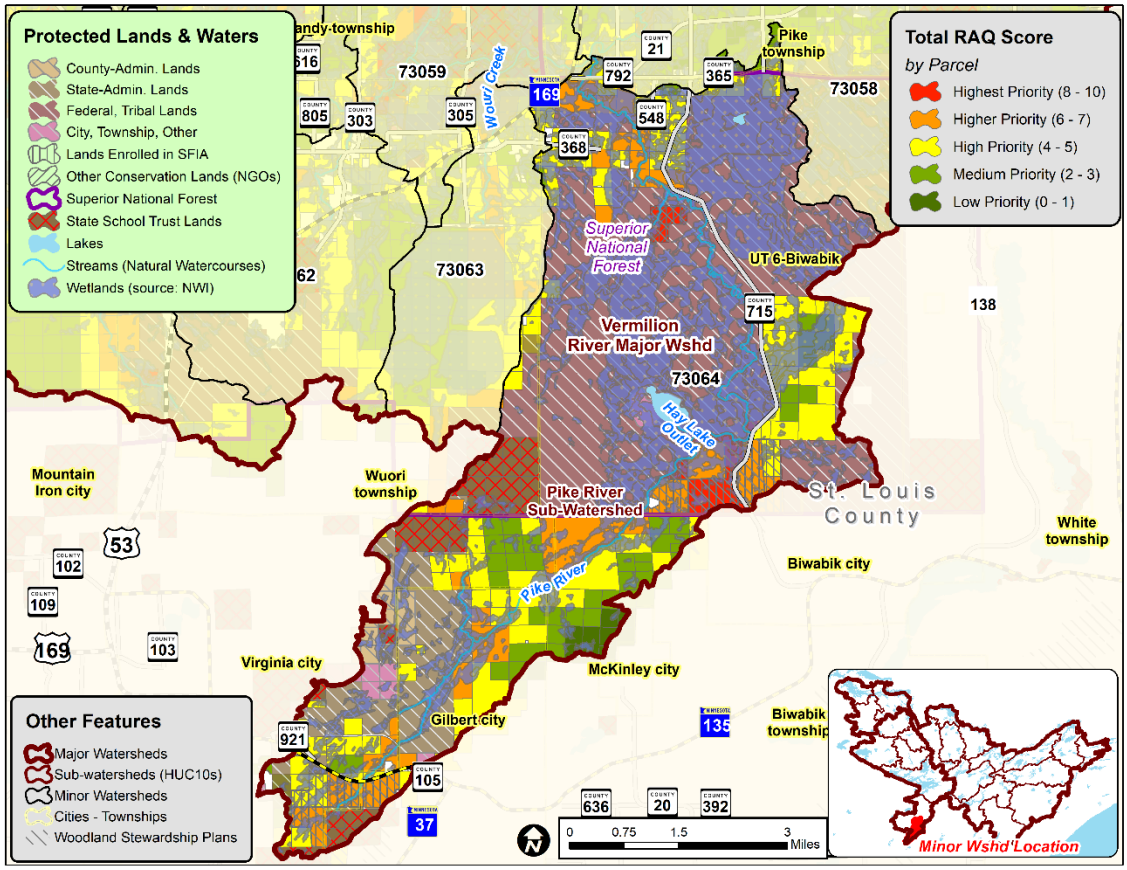
Minor Wshd #	Acres	Current % Protected	Protection Goal %
73002	8,652.6	86.54%	75.00%
73003	7,912.9	97.88%	75.00%
73004	4,390.4	96.90%	75.00%
73005	6,951.1	98.97%	75.00%
73006	8,005.8	97.91%	75.00%
73007	12,369.6	95.62%	75.00%
73008	9,092.0	86.49%	75.00%
73010	6,005.8	99.89%	75.00%
73011	3,693.6	98.09%	75.00%
73012	7,871.4	93.76%	75.00%
73017	10,167.7	70.64%	75.00%
73021	18,084.7	98.68%	75.00%
73022	3,972.7	97.83%	75.00%
73023	12,934.1	87.46%	75.00%
73024	8,627.1	76.64%	75.00%
73025	5,978.6	88.15%	75.00%
73026	3,561.9	92.48%	75.00%
73027	6,702.4	77.46%	75.00%
73028	4,146.5	82.26%	75.00%
73041	6,368.2	100.00%	75.00%
73043	2,989.8	97.52%	75.00%
73067	5,366.1	96.29%	75.00%

Minor Watershed Methodology and Riparian Adjacency Quality Scoring

The overall Rainy Headwaters – Vermilion River Watershed planning region has surpassed the goal of 75.00%. It is currently at 92.00% protected. Factors that play into the protection goal include public waters, public lands, wetlands, forest incentives (SFIA and Conservation Reserve Program), and conservation easements. Out of the 21 subwatersheds, Pike River is the only one to not have reached the goal of 75.00%. The subwatersheds have 3 to 22 minor watersheds, and each minor also has a protection goal that was determined by the LFT based on their best professional judgement on what is achievable for that minor.

To meet these goals local service providers will need to identify and target individual parcels and landowners. To assist in this effort, a MWA was developed for every minor watershed in the Rainy River Headwaters – Vermilion River Watershed planning region. As a part of this assessment every minor watershed has a map showing its potential for protection, parcel, and landowner RAQ scores, and tables of information about individual parcels and landowners. An example of one of these resources is Fig 65, which shows the RAQ scores for parcels in minor watershed #73064 within the Pike River subwatershed. We can see on this map that the parcels with the highest RAQ scores are adjacent to public and riparian lands. Protecting these parcels would provide the greatest return on investment. MWA maps and tables are provided in the LFT Workbook. The MWA priorities and RAQ scoring can also useful information to support local land use officials when developing their comprehensive plans and guidance on land use and public infrastructure decisions.

Fig 65. RAQ scores for parcels in minor watersheds #73064.



Part 3: Making it Happen

The key to successfully implementing any plan is coordination. Coordination is the critical, yet far too often, invisible process of organizing the ongoing work to be done in landscape management. Successful implementation requires proactive and purposeful coordination. This part of the LSP outlines how funding and staff resources will be coordinated to implement the vision and goals.

Coordination Strategies

This LSP calls for protecting 83,777 acres with 367 FSPs across the 2,552,040 acres of the Rainy Headwaters – Vermilion River Watershed over the next ten years. Implementing these goals will require significant collaborative efforts over this timeframe.

To be certain, these are optimistic goals. But they are doable, especially given growing funding levels for protection from state Legacy funds through Clean Water and Outdoor Heritage Funds. In addition, there are growing capacity funds for private forest management that service providers are securing including funding from the USDA FS State and Private Forestry through the Landscape Scale Restoration grants, DNR cost share and SFIA programs, and local capacity funds to SWCDs through the BWSR. These funds are foundational to supporting this dynamic private forest management.

The team of service providers working in this watershed need to think through and commit to a series of coordination strategies. The following outline provides partners in the Rainy Headwaters – Vermilion River Watershed planning region an initial pathway to greater success implementation through better coordination:

- Coordination Strategy # 1 – Reconvene, Support and Sustain the Local Forestry Technical Team
- Coordination Strategy # 2 – Confirm the Project Coordinator
- Coordination Strategy # 3 – Clarify Partner Roles in Serving Private Landowners
- Coordination Strategy # 4 – Coordinate Resources for Implementation
- Coordination Strategy # 5 – Support Accomplishment Reporting
- Coordination Strategy # 6 – Recommendations to Local and State Agencies and Programs

Coordination Strategy # 1 – Reconvene, Support and Sustain the Local Forestry Technical Team

The primary coordination strategy for this LSP is to periodically convene a core group of partners (resource professionals, service providers, tribal entities, local and state officials, environmental groups, and landowners) into a LFT to oversee the coordination and implementing efforts over the next ten years. The LFT should meet on a regular basis to:

1) Review and determine service delivery priorities and workloads
2) Collaborate on developing proposals for funding opportunities
3) Coordinate training and landowner outreach efforts
4) Support accomplishment reporting
5) Ensure clear communications on the status of the project

The LFT Workbook provides additional guidance to support the LFT's coordination efforts.

Coordination Strategy # 2 – Confirm the Project Coordinator

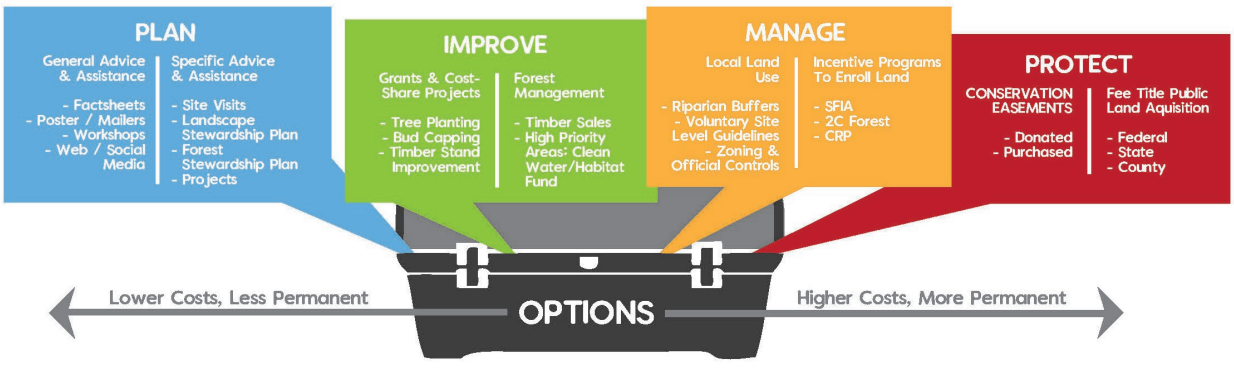
To support the ongoing coordination work by the LFT, it is essential that one person serve as the point of contact to manage the overall coordination process. This should be a paid position and could be administered by one of the four SWCDs. Seed money and capacity funding are available to support this position.

Coordination Strategy # 3 – Clarify Partner Roles in Serving Private Landowners

PFM Implementation Toolbox

There are four primary approaches to delivering services to private landowners. The PFM Implementation Toolbox (Fig 66) illustrates these approaches and the full suite of options available to serving private landowners. Promoting the full range of options to private landowners helps to improve the economic, ecological, and social benefits they can receive from their woodlands. Services provided to landowners on the left tend to be less costly but are also less permanent and generally have less societal benefits. In contrast, tools further to the right involve options that are more costly (to the public) but have a greater degree of permanence and produce more recognizable benefits to society. LFTs are encouraged to define roles and organize their implementation efforts through these four approaches and corresponding array of tools.

Fig 66. Private forest management implementation toolbox.



Forestry professionals including approved Minnesota FSP writers are available to help private forest landowners obtain FSP for their property and implement parts of the toolbox. These professionals are

typically from the DNR, SWCD and NRCS offices, forest industries, or are private consultants. An estimated four approved forestry professionals and plan writers have service areas in and near the Rainy River Headwaters – Vermilion River Watershed planning region.

Clarifying Roles, Growing Commitment

Partners and stakeholders working in the watershed are all encouraged to serve on the LFT. The LFT should include DNR Forestry, SWCDs, federal foresters, consulting foresters, tribal representatives, environmental organizations, industry foresters, loggers and vendors, landowners, local officials, and other local groups.

The PFM implementation toolbox displays many of the choices that can be used to promote private forest stewardship. However, not all service providers in this watershed have the resources to implement all the options. To efficiently implement the full toolbox, partners on the LFTs are encouraged to define the roles and responsibilities of each partner using the diagram below.

Table 28. Roles and responsibilities of partners.

	#1 General Advice & Assistance	#2 Specific Advice & Assistance	#3 Grants/ Cost-share Project	#4 Forest Management	#5 Land Use Controls	#6 Incentive Programs	#7 Conservation Easements	#8 Fee Title Public Land Acquisition
Mission and Roles • Primary • Supporting								
Programs/Projects • Geographic Areas of Interest • Topical Interests								
Staffing/equipment • FTE's, Expertise • Equipment • Other Resources								

By working together to define each partners roles and responsibilities will help to ensure seamless, effective, and efficient PFM service delivery. The more commitment that partners and stakeholders bring to the table in sharing resources and information increases the successful implementation of this plan. Actively participating on an ongoing basis is the core to developing and expanding partnership and stakeholder capacity to reach the shared goals and objectives of this LSP.

This proactive approach to PFM was directed by the United States Congress, USDA FS and state leaders through the Landscape Stewardship Initiative and the state's PTM policy. The approaches outlined in this LSP will help the LFT work proactively with landowners to help produce increased public benefits on private lands when spending public funds.

Individual service delivery to landowners is still an essential effort that will continue in the future. Public agencies recruiting family forest owners will allow those landowners to have the final decision as to what business or agency provides a given service. Family forest owners will be provided information on all private and public sector options qualified by DNR to perform that service in the landowner's area.

Collaborate Outreach Efforts to Engage Landowners, Community Leaders and Local Decision Makers

To gain the support of decision makers in the community, resource managers need to supply a convincing answer to the fundamental marketing question: "What is in it for them?". Broader community support is likely to depend on being able to demonstrate that conservation programs are effectively and efficiently addressing issues of importance in terms that residents and their decision makers easily understand. Increasing support for forest conservation that protects and enhances water quality will be based primarily on the off-site benefits that accrue to community residents, rather than on the on-site benefits that accrue to forest landowners.

Tools for Engaging Landowners Effectively (TELE) was developed by the Sustaining Family Forests Initiative (SFFI) to engage landowners effectively. The SFFI is a collaboration of government agencies, NGOs, certification systems, landowner groups, businesses, and universities organized to gain comprehensive knowledge about family forest owners (10-999 acres) in the United States. The SFFI has taken advantage of the wealth of information from the National Woodland Owner Survey database and linked this resource with demographic and behavior information to develop the TELE marketing approach to help natural resource professionals and others engage more effectively with family forest owners about their woods and woodland management. More information about the SFFI and TELE can be found at www.engaginglandowners.org and in the Appendix.

Coordination Strategy # 4 – Coordinating Resources for Implementation

Prioritizing PFM Service Delivery Through MWA and RAQ

DNR Forestry and BWSR have developed the MWA and RAQ methodology that connects forest land cover and water quality based on research developed by DNR Fisheries. The process works as follows:

1) Prioritize lakes that can meet at least 3 of 5 risk and quality factors, and have less than 75% protected watersheds
2) Target specific parcels with high scores for proximity to riparian "R", adjacency to public land "A", and habitat quality "Q" (RAQ) scores (5 or greater) and focused proactive outreach efforts to these landowners that promote increased forest management and forest land protection (SFIA, conservation easements, public land acquisitions)
3) Over time, measure progress toward 75% protection goal on watershed basis

We periodically measure the percent of the watersheds with permanent forest protection to illustrate this transformation on graphic dial like a speedometer. We call this measurement and assessment, moving the needle towards watershed protection. Through the implementation and monitoring of this LSP over time, we can document and assess forest land protection levels at the major watershed, subwatershed, and minor watershed levels.

This LSP is intended to help support the PTM thinking by all service providers in a collaborative manner. This intentional and measurable planning process enhances opportunities for the collaborative implementation of the plans over time. To support this effective cross boundary approach, increased coordination capacity provided by this federal grant is essential.

Linking Landscape Stewardship Plans and 1W1Ps through PTM

By coordinating forest and water resource planning and implementation through the development of this LSP, we are setting the watershed/land cover context for developing the Rainy River Headwaters –

Vermilion River Watershed CWMP. These interconnected public planning processes promote more active and cross boundary management of not only forest resources, but water resources along with fish and wildlife. This collaborative work is helping to strengthen working relationships with agency fish and wildlife managers as well as outdoor and sportsmen groups. Through the LSP and 1W1P, DNR Forestry and partners are shaping approaches to collaborating more proactively with landowners and providing them with more options to provide conservation-minded landowners with three protection options.

1) Promote SFIA, the state's incentives program for maintaining forest lands.
2) Conservation easements acquired by either FFF or Reinvest in Minnesota (RIM) programs.
    a. FFF focusing more on larger tracts and shoreland.
    b. Re-Invest in Minnesota (RIM) focusing on smaller tracts and backlots.
3) For landowners choosing fee title, proposals go to the county via the land commissioner for review and comment. Work with conservation organizations on fee title projects. Transfer land to either county or state.

The Subwatershed Action Plans, MWA and RAQ scoring (provided in the LFT Workbook) provide a useful evaluation of the land cover/watershed relationships and initial risk assessment. These tools provide the LFT with resource management strategies at the subwatershed and minor watershed scales to implement the two goals more effectively in this LSP.

Long Term Investment Plan

Table 27 summarizes acreage goals and estimated costs for implementing Goal 1: Increase Forest Land Protection and Goal 2: Promote Forest Stewardship. The acres, plans, and public investment amounts are estimates to meet both the minor watershed (HUC 14) and subwatershed (HUC 10) level goals. This information should be reviewed and integrated into the Rainy River Headwaters – Vermilion River CWMP and used to help secure funding needed to implement the goals in this LSP. It should be noted that the table below indicates 0 acres for forest land protection in some watersheds given the 75% protection metric. When conservation easements are desired and appropriate (higher RAQ scores) the LFT should review these for the investing of RIM funds. Other PFM services should be made available to interested landowners in these subwatersheds.

Table 29. Long-term forestry investment plan.

Number	Subwatershed Name	Goal 1 – Increase Forest Land Protection		Goal 2 – Promote Forest Stewardship	
		Acres	Public Investment[A]	Plans / Acres	Public Investment[B]
1	Granite River	0	$0.00	1 / 149	$800.00
2	Saganaga Lake	0	$0.00	0 / 0	$0.00
3	Knife Lake-Sucker Lake	0	$0.00	1 / 74	$800.00
4	Stony River	0	$0.00	60 / 13,687	$48,000.00
5	Isabella River	0	$0.00	6 / 1,266	$4,800.00
6	Birch Lake	1,994	$1,852,424.00	12 / 2,748	$9,600.00

Number	Subwatershed Name	Goal 1 – Increase Forest Land Protection		Goal 2 – Promote Forest Stewardship	
		Acres	Public Investment[A]	Plans / Acres	Public Investment[B]
7	Kawishiwi River	0	$0.00	0 / 0	$0.00
8	Fall Lake	1,900.20	$2,125,788.07	14 / 3,279	$11,200.00
9	Basswood Lake	0	$0.00	1 / 213	$800.00
10	Crooked Lake-Iron Lake	0	$0.00	1 / 105	$800.00
11	Boulder River	0	$0.00	0 / 0	$0.00
12	Lac La Croix	0	$0.00	0 / 0	$0.00
13	Little Vermilion Lake	0	$0.00	0 / 0	$0.00
14	Ash River	0	$0.00	107 / 24,713	$85,600.00
15	Kabetogama Lake	0	$0.00	18 / 4,072	$14,400.00
16	Namakan Lake	0	$0.00	34 / 7,892	$27,200.00
17	Pike River	10,607	$10,055,329.00	64 / 14,618	$51,200.00
18	Vermilion Lake	486	$450,144.00	16 / 3,582	$12,800.00
19	Pelican River	276	$272,361.00	19 / 4,334	$15,200.00
20	Echo River	0	$0.00	1 / 185	$800.00
21	Vermilion River	443	$456,199.00	12 / 2,859	$9,600.00
	Totals	**15,706**	***$15,221,246.07***	**367 / 83,777**	**$293,600.00**

[A]Cost assumes 50% of area in conservation easement and 50% in SFIA for 100 years.
[B]Cost assumes $800 / stewardship plan plus - $600 for the plan plus $200 for outreach and administration costs. Public funds to be used to help underwrite costs of preparing FSPs. Assumes average parcel size of 393 acres. 50% of the plan writing cost to be cost shared.

Funding Sources

How will the implementation of this LSP be funded? Experience has shown that landscape approaches to natural resource conservation tend to have a synergistic effect on funding. Partners that get involved in a landscape-scale project area do so because it meets some of their own resource or public relations goals. Because of this they can support efforts in the project area.

Landscape-scale, multi-partner, coordinated efforts often carry increased weight with foundations, trusts, and government agencies when it comes to applying for grants. Federal and state funding agencies as well as private foundations tend to look favorably on multi-partner project applications. There is a considerable amount of money available through grants and other programs that landscape stewardship approaches can facilitate.

The following is a list of potential resources available to the LFT to pursue in the project and funding development. The LFT should maintain and grow this inventory to foster increased success in implementation of this LSP.

1) DNR PFM Program: Cost Share and SFIA
2) BWSR: Local Capacity Funds
3) Watershed-based Implementation Funding (WBIF)
4) Clean Water Legacy Funding: BWSR, MPCA and DNR
5) LSOHC: Big and Small Grants
6) Legislative-Citizen Commission on Minnesota Resources (LCCMR)
7) US Endowment

Private Sector Partnerships

As envisioned by the USDA FS and state foresters, landscape stewardship projects seek to encourage and promote greater levels of private investments in ways to leverage public investments. Private woodland owners make significant investments in their own lands. These investments may not end up on the balance sheets of service provider agencies (although they sometimes do), but the investments private landowners make on their lands are no less important. The bottom line is that there will likely be more money and resources for coordination and implementation available in a more coordinated way for on-the-ground resource management work.

An untapped reservoir of funding may come from local businesses that will benefit from the results of the resource management activities taking place. Family resorts, campgrounds and other businesses that benefit from clean water and healthy forests can promote and support the watershed-based LSPs. By doing so, they can help promote opportunities for financial support at the community level through chambers of commerce to encourage more businesses decide to project a “high quality forest and water – sustainable green” image where we can all benefit through win-win-win approaches.

Coordination Strategy # 5 – Support Accomplishment Reporting

Accomplishment reporting will be critical to evaluating the success of implementation efforts of this LSP over the next ten years. Table 28 provides a starting point for monitoring progress made by all partners. It should be maintained on an annual basis. The LFT will be responsible for organizing this information and sharing it with their local boards, DNR, and BWSR.

Table 30. Annual PFM accomplishment report summary table (template).

	Granite River 903000103	Saganaga Lake 903000104	Knife Lake-Sucker Lake 903000105	Stony River 903000106	Isabella River 903000107	Birch Lake 903000108	Kawishiwi River 903000109	Fall Lake 903000110	Basswood Lake 903000111	Crooked Lake-Iron Lake 903000112	Boulder River 903000113
Total Land Area (Acres)	71,095.01	119,071.70	111,363.99	152,582.96	217,956.63	166,598.97	170,512.13	156,369.51	80,541.31	95,104.49	99,239.54
Area Of Private Ownership (Acres; % Of Subwshd)	14,133.69; 19.88%	29,244.01; 24.56%	33,542.01; 30.12%	42,646.94; 27.95%	20,902.04; 9.59%	44,331.99; 26.61%	24,928.87; 14.62%	62,500.89; 39.97%	23,969.09; 29.76%	17,375.59; 18.27%	12,315.63; 12.41%
Private Parcels <5 Acres	205	149	436	205	249	508	141	5,501	132	40	44
Private Parcels 5-20 Acres	77	33	58	88	70	164	5	982	25	14	17
Private Parcels >20 Acres	45	25	59	894	166	566	25	833	76	66	51
FSPs (#; Acres)	0;0	0;0	1;72	7;13,197	4;152	10;1,157	0;0	20;2,005	0;0	1;40	0;0
Mailings											
Workshops											
Site Visits											
FSPs											
Forest Restoration											
Forest Stand Improvement											
Timber Harvests											
Biomass Harvests											
Riparian Buffer Plantings											
Site-Level Guideline Compliance											
SFIA											
2c											
Public											
Private/Nonprofit NGO											
Public Land Acquisitions											
Land Trades/ Exchanges											

Template to be completed annually by the LFT and distributed to DNR Forestry, SWCD Board, County Board, USDA FS, and the MFRC Northern and North Central Landscape Committee.

	Lac La Croix 903000120	Little Vermilion Lake 903000121	Ash River 903000124	Kabetogama Lake 903000125	Namakan Lake 903000126	Pike River 903000201	Vermilion Lake 903000202	Pelican River 903000203	Echo River 903000204	Vermilion River 903000205
Total Land Area (Acres)	59,299.36	108,116.91	101,266.14	76,072.90	105,548.98	118,674.60	193,840.07	134,289.79	50,649.77	163,844.90
Area Of Private Ownership (Acres; % Of Subwshd)	25,083.63; 42.30%	10,552.21; 9.76%	40,253.29; 39.75%	32,969.99; 43.34%	36,921.03; 34.98%	66,457.77; 56.00%	94,070.59; 48.53%	49,969.23; 37.21%	6,346.42; 12.53%	38,519.94; 23.51%
Private Parcels <5 Acres	24	9	390	381	101	928	6,528	979	36	501
Private Parcels 5-20 Acres	0	2	90	92	36	643	865	336	45	262
Private Parcels >20 Acres	0	9	775	197	213	1,378	812	653	70	565
FSPs (#; Acres)	0;0	0;0	12;1,415	6;619	4;291	29;4,611	24;2,968	14;3,721	2;202	9;2,435
Mailings										
Workshops										
Site Visits										
FSPs										
Forest Restoration										
Forest Stand Improvement										
Timber Harvests										
Biomass Harvests										
Riparian Buffer Plantings										
Site-Level Guideline Compliance										
SFIA										
2c										
Public										
Private/Nonprofit NGO										
Public Land Acquisitions										
Land Trades/ Exchanges										

Template to be completed annually by the LFT and distributed to DNR Forestry, SWCD Board, County Board, USDA FS, and the MFRC Northern and North Central Landscape Committee.

Coordination Strategy # 6 – Recommendations to Local and State Agencies

Recommendations to Partners on the Rainy River Headwaters – Vermilion River Watershed CWMP

1) **Reference Document:** Adopt the Rainy River Headwaters – Vermilion River Watershed LSP by reference for addressing forest land protection and forest stewardship topics in the Rainy River Headwaters -Vermilion River Watershed CWMP.
2) **Policy Integration:** Incorporate the two forestry goals into the policy framework in the CWMP.
3) **Funding Coordination:** Integrate the overall funding needs listed in the Long-Term Forestry Investment Plan Table into the CMWP Implementation Schedule.

Recommendations to Rainy River Headwaters – Vermilion River Watershed Counties

1) **Reference Document:** Local land use officials are strongly encouraged to use this LSP as a reference document when developing their comprehensive plans to guide land use and public infrastructure decisions. They are further encouraged to adopt this LSP and appendix to their plans to provide more detailed guidance on sustainable forest resource management and support more proactive and collaborative funding development.
2) **Consider Forests in Local Land Use Decisions:** Local officials are encouraged to consider the values and benefits those forests can bring to their communities. Healthy and sustainable forests promote a high quality of life for citizens and can support increased economic opportunities as well. Forests should be included in the land use decision making process.
3) **Alternative Land Development Options:** Local officials are encouraged to use forestry as a design tool to help them work more effectively with landowners and developers. There are alternative ways that land can be developed to provide for both economic growth and the protection of forest and water resources. Large lot developments are not always desirable or cost effective from the public sector or taxpayers perspectives.
4) **Guide Growth to Existing Infrastructure:** Use the maps from the MWA and RAQ scoring and related tools to help inform local land use decisions. Guide growth and development towards existing roads and infrastructure and protection of larger blocks of working forest lands into interiors areas away from roads.
5) **Zoning:** Adopt higher shoreland standards or land use rules for at-risk and sensitive lakes.

Recommendations to Rainy River Headwaters – Vermilion River Watershed County Assessor's Office

1) **Assess Property Value:** Continue to assess property values in Rainy River Headwaters – Vermilion River Watershed planning region.
2) **Review 2c:** Continue to review forest land to determine if it meets the requirements of the Class 2c managed forest classification.

Recommendations to state and federal programs for PFM policy changes and funding needed

1) **MOUs:** Complete the memorandum of understanding (MOU) between DNR Forestry and BWSR which supports the development of watershed-based LSPs and incorporation into comprehensive watershed management plans developed through the 1W1P program. The MOU is to provide the framework for a productive and beneficial working relationship between DNR and BWSR in working with SWCDs and the private sector natural resource consultants on matters relating to management and protection of the forest resource and conservation of soil and water resources.
2) **Integrate Landscape Stewardship Approaches into the PFM Program:** Overall, encourage integrated service delivery between the broad range of agencies and organizations that serve private woodland

owners to make delivery of their programs better coordinated, simpler and less costly in processing, and less time consuming.

3) **Base PFM Program Funding:** Increase and sustain funding for the private forest management program including support for DNR, SWCDs, consulting foresters, industry foresters and loggers.
4) **Coordinated Landowner Outreach:** Support efforts by local partners to focus, coordinate and increase landowner outreach efforts to promote forest land protection, FSPs, and increased forest management in priority areas identified in this LSP through the PTM, MWA, and RAQ methodologies to meet the directive set forth by Governor Dayton in his November 2, 2016, letter to Minnesota Forest Industries, "accelerate outreach efforts with family forest landowners to increase harvest from private lands".
5) **Forest Habitat Priority Areas Planning:** Support the updating of the 25-Year LSOHC Forest Habitat Vision developed by the MFRC, its regional landscape committees, and the MFRP. Support the collaborative development and integration of other conservation priority efforts that complement priorities identified in the watershed-based LSPs.
6) **ECS/NPC:** Continue to promote the ECS and NPC modeling from the MFRC landscape plans as guides to developing forest vegetation and land management strategies when working with landowners and local officials.
7) **Source Water:** Continued support from the Minnesota Department of Health (MDH) to work with the LFT on projects through this the implementation of this LSP that support and protect source water resources.
8) **Climate Adaptation and Carbon Sequestration:** Support efforts by the LFT to address climate adaptation and carbon sequestration to support the implementation of the Governor's Climate Action Framework through the implementation of this LSP including:
    a. Protect existing forestlands in the watershed from being converted to non-forested land uses
    b. Improve forest management activities to increase carbon storage in the forest and associated wood products that come from the forests
    c. Climate models predict this watershed will transition from boreal forest to temperate hardwoods, so some of trees planted in FSPs should be climate-forward species. For more information refer to the Forest Assisted Migration Project.
    d. 3) Support efforts by the LFT to assist interested landowners in the reforestation of their open lands. Support the implementation of the 1-million-acre reforestation goal as by the Minnesota Climate Change Advisory Group (MCCAG) in 2009 and more recently by TNC.
9) **Fire Management:** Actively promote the implementation of the National Cohesive Wildland Fire Management Strategy including the three national goals:
    a. Restore and Maintain Resilient Landscapes
    b. Fire Adapted Communities
    c. Wildfire Response through the implementation of this plan. Provide resources to the LFT that support the integrated delivery of fire prevention and management efforts including the Firewise Program through delivery of PFM services to private landowners in this watershed.
10) **Alternative Land Development:** Reference the DNR Shoreland Higher Standards and incorporate these into forestry.
11) **Wetland Conservation Act:** Have Local Evaluation Panels refer to this LSP when reviewing wetland permit applications for the state Wetland Conservation Act.

Demonstration Projects

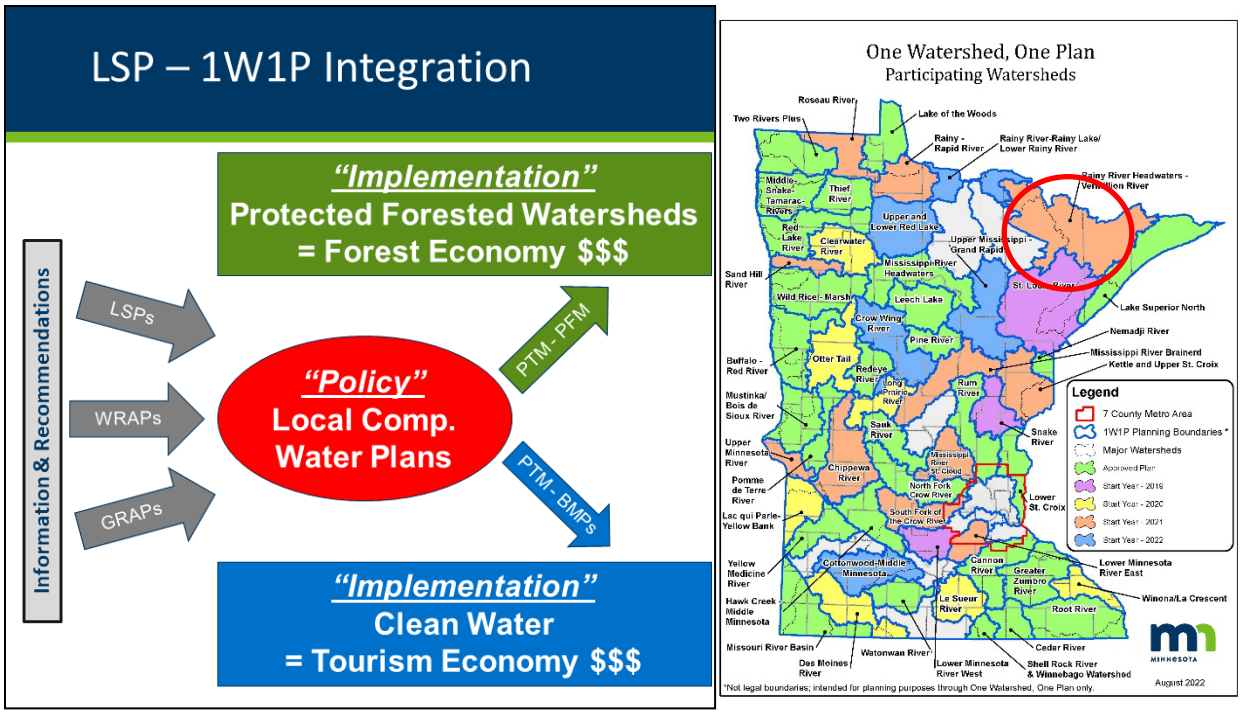
Demonstration projects can provide valuable insights to resource professionals and landowners. They can serve as starting points for the implementation of this LSP. Table 29 is a template for developing a 10-year demonstration project list on a subwatershed basis. This list summarizes potential projects with partners, initial priorities, and suggested timelines. One of the benefits and uses of project lists is they can help partners work together to develop shared priorities when pursuing additional funding. The LFT will be responsible for developing this list. The LFT should periodically review and refine the 10-year project list.

Table 31. 10-year demonstration project list.

Map No.	Project Name and Brief Description	Subwd/ Project Priority	Lead Entity/ Support Entities	Proposed Timeline
1	Granite River			
2	Saganaga Lake			
3	Knife Lake-Sucker Lake			
4	Stony River			
5	Isabella River			
6	Birch Lake			
7	Kawishiwi River			
8	Fall Lake			
9	Basswood Lake			
10	Crooked Lake-Iron Lake			
11	Boulder River			
12	Lac La Croix			
13	Little Vermilion Lake			
14	Ash River			
15	Kabetogama Lake			
16	Namakan Lake			
17	Pike River			
18	Vermilion Lake			
19	Pelican River			
20	Echo River			
21	Vermilion River			

Linking Forest & Water Planning and Implementation through LSPs and 1W1Ps

Figure 67. LSP to 1W1P integration.



LSPs like the MPCA Watershed Restoration and Protection Strategies (WRAPs) and the MDH Groundwater Restoration and Protection Strategies (GRAPs) provide important information and relevant context from state water and forest resource programs to inform comprehensive local water management (1W1Ps) processes. Members of the 1W1P committees are encouraged to consider the recommendations in this LSP for incorporation into their plans. Through the integration of LSPs and 1W1Ps, conservation professionals and landowners are working together to address the following national priorities from the USDA FS:

1) Conserve Working Forest Lands
2) Protect Forests from Harm
3) Enhance Public Benefits from Trees and Forests

"A lake is the landscape's most beautiful and expressive feature.
It is Earth's eye;
looking into which the beholder measures the depth of his own nature."
- Henry David Thoreau

Index Information: Rainy Headwaters – Vermilion River Watershed Planning Region

Figure 68. Subwatersheds in Rainy Headwaters – Vermilion River Watershed planning region.

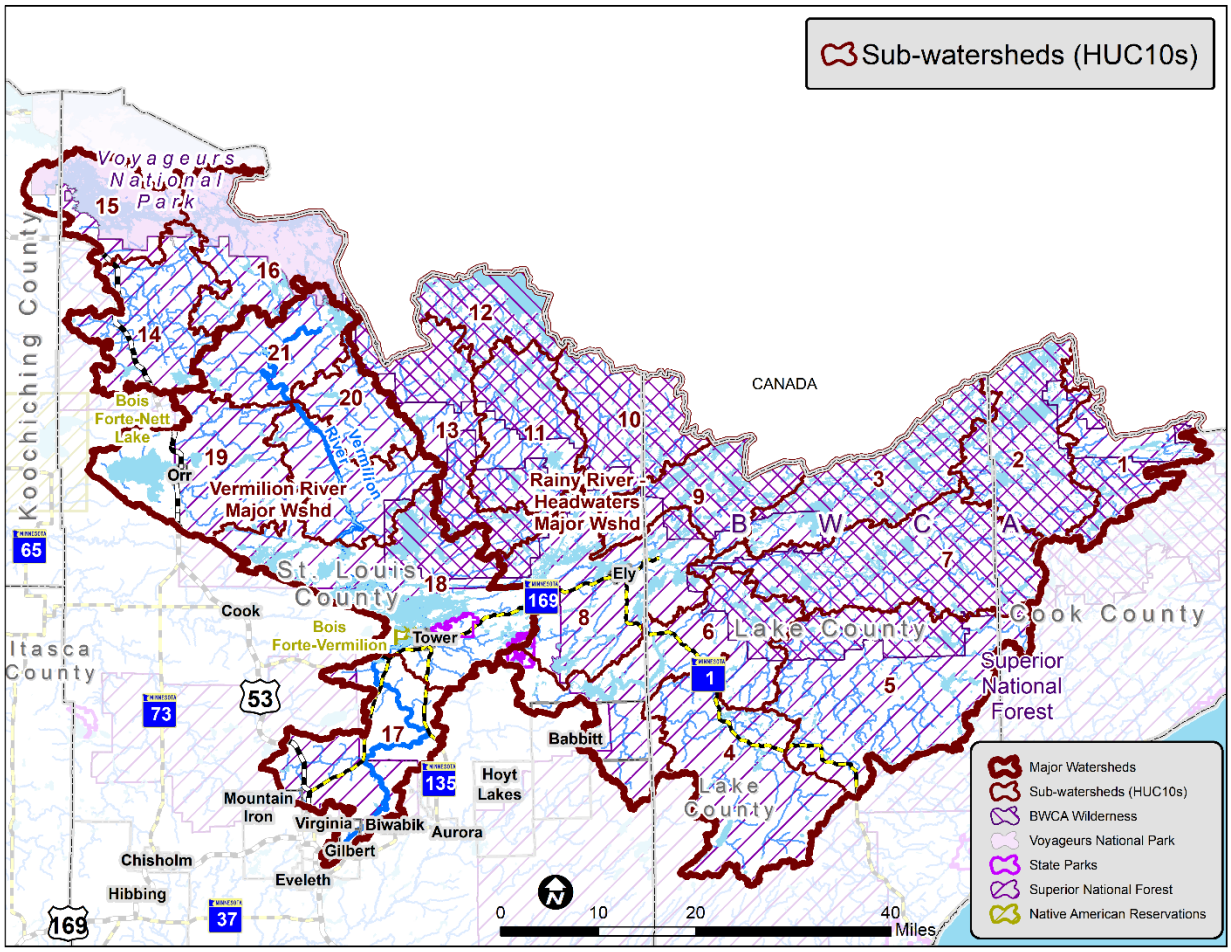


Table 32. Subwatershed information.

Subwatershed Number	HUC 10 Name	HUC 10 Number	Acres (MN Only)	Number of Minors
1	Granite River	903000103	71,095.01	7
2	Saganaga Lake	903000104	119,071.70	5
3	Knife Lake-Sucker Lake	903000105	111,363.99	6
4	Stony River	903000106	152,582.96	14
5	Isabella River	903000107	217,956.63	19
6	Birch Lake	903000108	166,598.97	12
7	Kawishiwi River	903000109	170,512.13	13
8	Fall Lake	903000110	156,369.51	14
9	Basswood Lake	903000111	80,541.31	5
10	Crooked Lake-Iron Lake	903000112	95,104.49	7
11	Boulder River	903000113	99,239.54	17
12	Lac La Croix	903000120	59,299.36	3
13	Little Vermilion Lake	903000121	108,116.91	14
14	Ash River	903000124	101,266.14	13
15	Kabetogama Lake	903000125	76,072.90	3
16	Namakan Lake	903000126	105,548.98	6
17	Pike River	903000201	118,674.60	8
18	Vermilion Lake	903000202	193,840.07	16
19	Pelican River	903000203	134,289.79	15
20	Echo River	903000204	50,649.77	7
21	Vermilion River	903000205	163,844.90	22
		Totals	**2,552,039.66**	**226**

Figure 69. Hydrologic unit code (HUC) map.