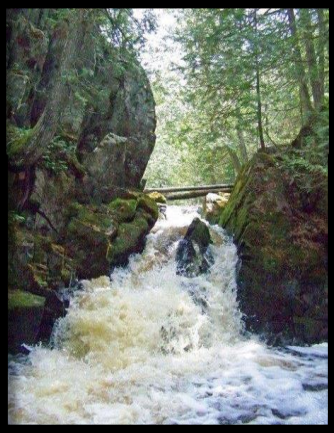
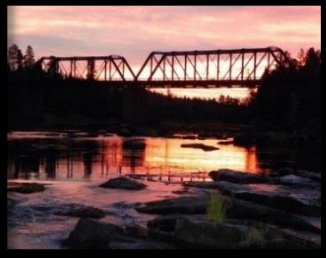
Koochiching County Comprehensive Local Water Management Plan

2018-2028





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KOOCHICHING
SOIL & WATER
CONSERVATION DISTRICT

KOOCHICHING COUNTY
715 4th St.
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The following Koochiching County Comprehensive Local Water Management Plan (KCCLWMP) as defined in Minnesota Statutes §103B.305, was developed to identify resource priority concerns in Koochiching County and will serve as the foundation for the 2018 - 2028 Koochiching County Comprehensive Local Water Management Plan update.

The KCCLWMP was developed by the Koochiching Soil and Water Conservation District, the Koochiching County Environmental Services Department, and the Koochiching County Water Plan Advisory Committee with input provided by local stakeholders and resource agencies.

ACRONYMS AND ABBREVIATIONS

- **AIS** Aquatic Invasive Species
- **BMPs** Best Management Practices
- **BWCA** Boundary Waters Canoe Area
- **BWSR** Board of Water and Soil Resources
- **CECs** Contaminants of Emerging Concerns
- **CSP** Conservation Stewardship Program
- **cfs** Cubic feet per second
- **DWSMA** Drinking Water Supply Management Area
- **EDCs** Endocrine Disrupting Compounds
- **EPA** Environmental Protection Agency
- **EQIP** Environmental Quality Incentives Program
- **ESD** Environmental Services Department
- **FEMA** Federal Emergency Management Agency
- **GIS** Geographic Information System
- **GWP** Ground Water Protection
- **HSPF** Hydrologic Simulation Program-Fortran
- **IJC** International Joint Commission
- **IRLWWB** International Rainy-Lake of the Woods Watershed Board
- **IS** Invasive Species
- **ITPH** Imminent Threat to Public Health
- **JPB** Joint Powers Board
- **KEDA** Koochiching Economic Development Authority
- **KCCLWMP** Koochiching County Comprehensive Local Water Management Plan
- **LOWWSF** Lake of the Woods Water Sustainability Foundation
- **MASWCD** Minnesota Association of Soil and Water Conservation Districts
- **MDH** Minnesota Department of Health
- **MN DNR** Minnesota Department of Natural Resources
- **MN DOT** Minnesota Department of Transportation
- **MFRC** Minnesota Forest Resources Council
- **MLEP** Minnesota Loggers Education Program
- **MPCA** Minnesota Pollution Control Agency
- **NHIS** Natural Heritage Information System
- **NLF** Northern Lakes and Forests
- **NKASD** North Koochiching Area Sanitary District
- **NOAA** National Oceanic and Atmospheric Administration
- **NRBG** Natural Resources Block Grant
- **NRCS** Natural Resources Conservation Service
- **P** Phosphorus
- **PCA** Packaging Corporation of America
- **PCPs** Pharmaceuticals and personal care products

- **RLWD** **Red Lake Watershed District**
- **SFIA** **Sustainable Forest Incentives Act**
- **SHPO** **State Historic Preservation Office**
- **SSTS** **Subsurface Sewage Treatment System**
- **SWCD** **Soil and Water Conservation District**
- **TIP** **Targeted Implementation Plan**
- **TIS** **Terrestrial Invasive Species**
- **TMDL** **Total Maximum Daily Load**
- **TP** **Total phosphorus**
- **TSS** **Total suspended solids**
- **USACE** **U.S. Army Corps of Engineers**
- **USDA** **U.S. Department of Agriculture**
- **USGS** **U.S. Geological Survey**
- **VNP** **Voyageurs National Park**
- **WCA** **Wetland Conservation Act**
- **WHAF** **Watershed Health Assessment Framework**
- **WHPA** **Wellhead Protection Area**
- **WHPP** **Wellhead Protection Plan**
- **WPAC** **Water Plan Advisory Committee**
- **WRAPS** **Watershed Restoration and Protection Strategy**
- **VNPCWJPB** **Voyageurs National Park Clean Water Joint Powers Board**

ACKNOWLEDGEMENTS

The Koochiching County Comprehensive Local Water Management Plan was developed through the involvement and participation of numerous individuals. In addition to offering our thanks to members of the public and various agency staff for their input and feedback, Koochiching County and Koochiching Soil and Water Conservation District would like to acknowledge the following individuals for their time, dedication and contributions to the planning process.

Koochiching County Board of Commissioners

- **Kevin Adee**
- **Brian McBride**
- **Ron Norby**
- **Wade Pavleck**
- **Wayne Skoe**

Koochiching Soil and Water Conservation District Board of Supervisors

- **George Aitchison**
- **Richard Dreher**
- **Ralph Lewis**
- **Al Linder**
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- **Tom Worth, Resident** – Rainy Lake Sportfishing Club
- **Brian Dreher, Resident**
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- **Dain Erickson, Graphic Designer** – MASWCD Area 8

1 EXECUTIVE SUMMARY

1.1 Introduction

This is an update to the 2007-2017 Koochiching County Comprehensive Local Water Management Plan which was developed by the Koochiching Soil and Water Conservation District (SWCD), the Koochiching County Environmental Services Department (ESD), and the Water Plan Advisory Committee (WPAC).

Koochiching County is located along Minnesota's northern-most border, adjacent to Ontario, Canada. It is the state's second largest county, covering more than 2,000,000 acres. Rainy River runs almost the full length of Koochiching County's jagged northern border and serves as an international border between the United States and Canada.

Koochiching County is home to seven major watersheds (see **Figure 1**) including the Rapid River, Lower Rainy River, Rainy River-Rainy Lake, Rainy Headwaters, Upper/Lower Red Lake, Big Fork River, and Little Fork River. Within these major watersheds are 157 minor watersheds. Because portions of each watershed intersect multiple jurisdictions, agencies and other partners work across the border to ensure healthy waters.

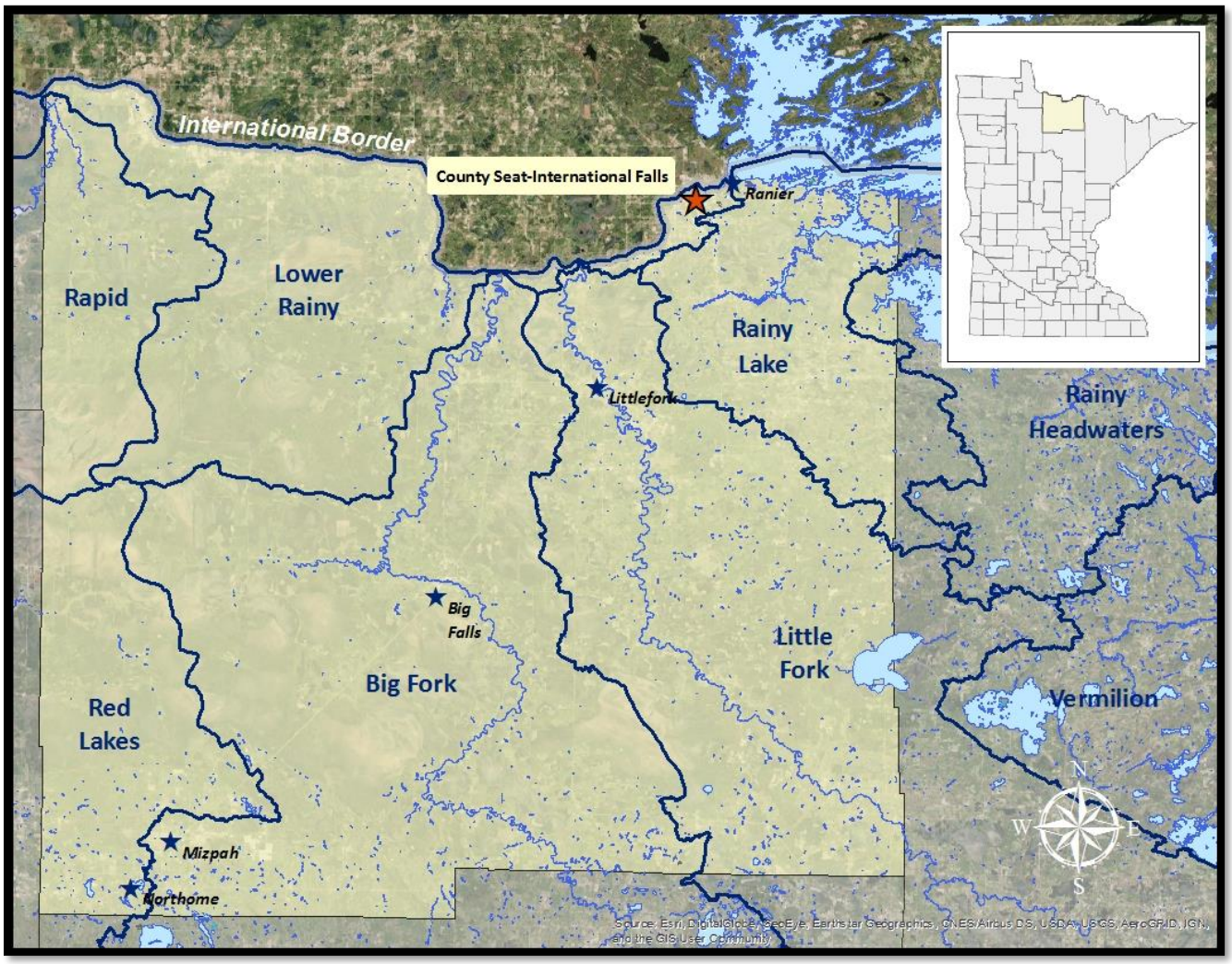


Figure 1: Koochiching County and Major Watershed Boundaries

Not only does water provide the foundation for a thriving fishery and tourism industry, it is a vital source of drinking water for many communities including International Falls and the City of Ranier on the U.S. side, Fort Frances, Kenora and Winnipeg on the Canadian side, as well as many First Nation and tribal communities.

Upper/Lower Red Lake watershed flows west into the Red River of the North Basin; all other watersheds in Koochiching County flow north to the Rainy River which then flows west to Lake of the Woods and are part of the Rainy River Basin. The greater Rainy River Basin (**Figure 2**) is home to some of Minnesota's finest forest and water resources, such as Voyageurs National Park and the Boundary Waters Canoe Area Wilderness (BWCA).

According to the U.S. Geological Survey (USGS) website, over the past five years, the average daily discharge at the mouth of the Rainy River below the dam was 11,072 cubic feet per second (cfs) and the average daily discharge where Rainy River enters Lake of the Woods was 14,265 cfs (figures were calculated using daily averages over the past five years). The additional discharge added between International Falls and Baudette comes mainly from other rivers that drain into Rainy River including the Big Fork, Little Fork, Black, Rapid, Baudette, and Winter Road Rivers as well as several rivers on the Canadian side.

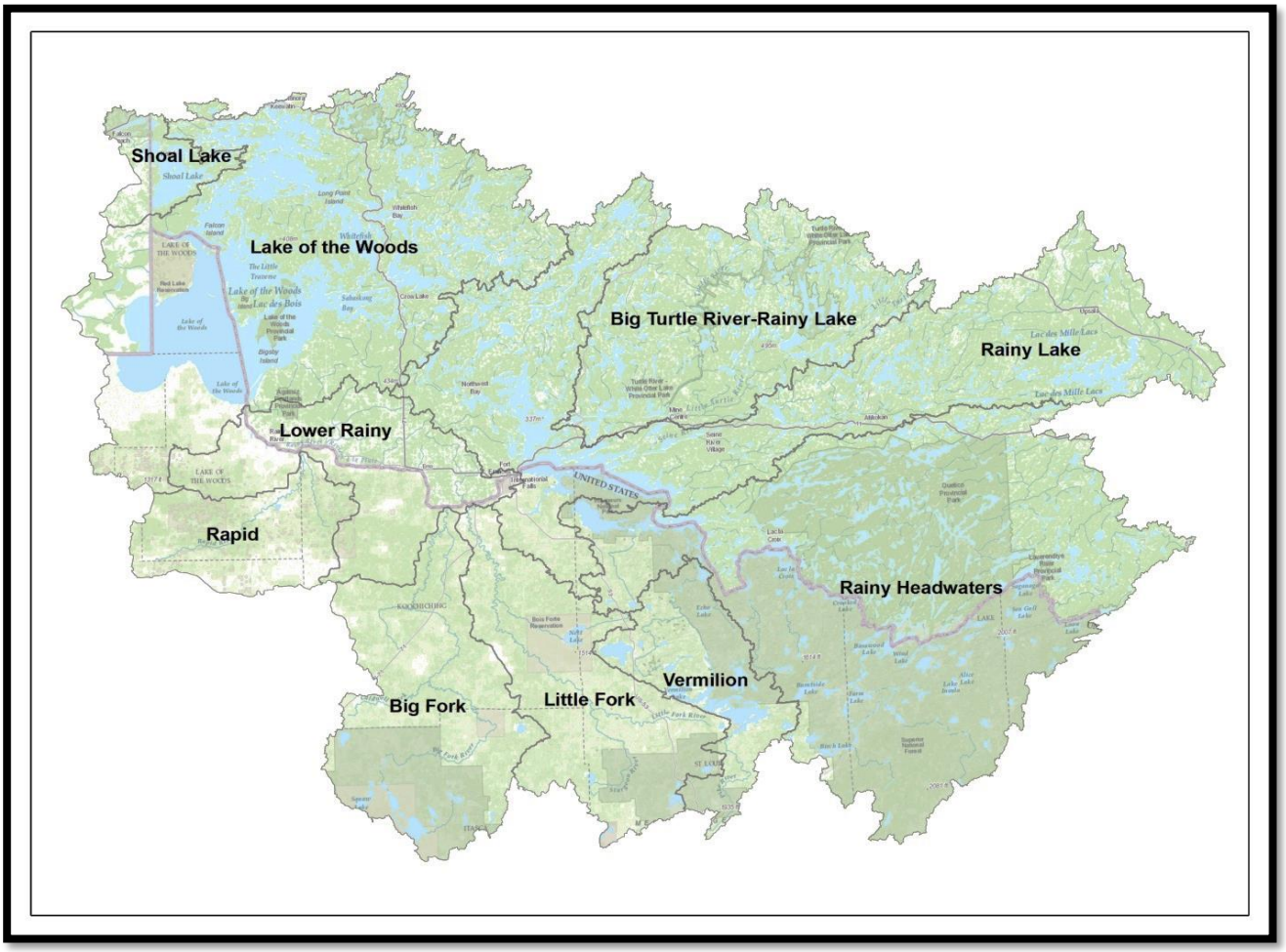


Figure 2: Major Watershed Boundaries within the Rainy River Basin (U.S. and Canada)

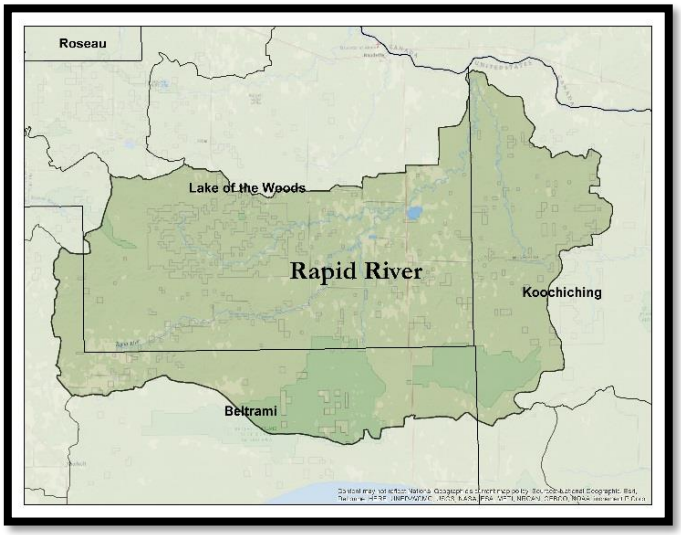


Figure 3: Rapid River Watershed Boundary

Rapid River Watershed

The Rapid River watershed, which covers 573,060 acres, is located in the Laurentian Mixed Forest Ecological Province of northern Minnesota. Over 79% of the land in the watershed is owned or managed by state entities (Minnesota Pollution Control Agency (MPCA)). According to the Minnesota Department of Natural Resources (MN DNR) Watershed Health Assessment Framework data (2015), the majority of this watershed is in Lake of the Woods County, with 23% lying within the borders of Koochiching County. This data also shows that 94% of the land cover is wetland and 2% is agriculture. Over 72% of the watercourses were altered historically for log transport and agricultural drainage. The population in the Rapid River watershed is low, 182 residents total (U.S. Census Bureau, 2010). Very few impervious surfaces exist, less than .05%. MN DNR's hydrology scores in the Rapid River showed no concern in water quality, ranging from 93-100 (where 100 is a perfect score).

Lower Rainy River Watershed

The Lower Rainy River watershed lies on the United States-Canadian border and covers 195,153 acres. The watershed is situated in the Laurentian Mixed Forest Ecological Province of northern Minnesota. The Lower Rainy River watershed is characterized by extensive wetlands located on the Glacial Lake Agassiz lake bed (MPCA). The largest populated area in this watershed is the county's seat, International Falls (population 6,424 – U.S. Census Bureau, 2010). Much of the land in the watershed is poorly suited for agricultural uses.

Figure 4: Lower Rainy River Watershed Boundary

Wetlands are the dominate land cover at approximately 48%, followed by forest at 32%, grass/pasture/hay at 9%, and row crops at 7%. Compared to the other six watersheds in Koochiching County, the Lower Rainy River watershed has a relatively higher percentage of private ownership, creating increased opportunities for private stewardship outreach to protect water quality.

Figure 5: Rainy River-Rainy Lake Watershed Boundary

Rainy River - Rainy Lake Watershed

The Rainy River-Rainy Lake watershed covers 583,791 acres and has a total population of 5,103 (U.S. Census Bureau, 2010). Open water makes up 75,815 of those acres and wetlands occupy another 84,851 acres. The northern boundary is part of the international border waters with Ontario, Canada. There are no large cities in this remote watershed. Ranier (population 145 – U.S. Census, 2010) is the only town and is located on the northwestern-most corner of the watershed. The eastern two-thirds of massive Rainy River-Rainy Lake is part of the border lakes in Voyageurs National Park (VNP), as are adjacent Namakan and Sand Point Lakes. Rat Root River and Rat Root Lake are also located in this watershed. Protection projects began in 2011 and continue at present to enhance fish habitat and reduce shoreline erosion. More information on this project can be found at http://koochichingswcd.org/conservation-partners-legacy-grant-cpl/.

This area is primarily boreal forest on shallow soils over bedrock or peat bog. The eastern four-fifths is in the Border Lakes ecological sub-region; the western one-fifth is in the Little Fork/Vermillion Uplands interlaced with extensive wetland bogs. Wilderness recreation/tourism is the prime economic driver due to the scenic beauty, resorts, camping, fishing and hunting opportunities (MPCA). According to MN DNR Watershed Health Assessment Framework (WHAF) data (2015), hydrology scores ranged between 74-100 and water quality scores ranged from 92 to 97 on a scale of 1-100.

Rainy Headwaters Watershed

The Rainy Headwaters watershed covers 1,890,689 acres and includes 3,531 lakes which represent 267,654 of the watershed's acreage; wetlands represent another 362,218 acres. The population in this region totals 6,261 (U.S. Census Bureau, 2010).

The watershed starts in northern Cook and Lake Counties and flows west and northwesterly into St. Louis County, the Canadian border waters, Basswood Lake and the Rainy River. Only a very small, northwest portion of the Rainy Headwaters watershed crosses into Koochiching County.

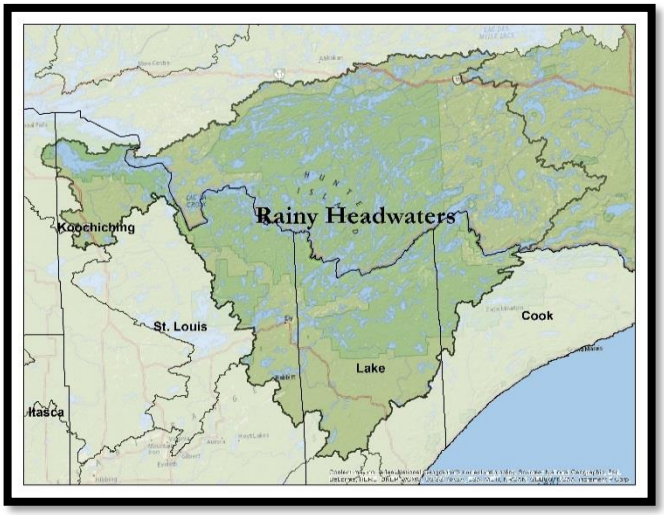


Figure 6: Rainy Headwaters Watershed Boundary

This remote watershed is largely protected as the *Boundary Waters Canoe Area Wilderness* (*BWCAW*), located in the northern third of the Superior National Forest in northeastern Minnesota. Approximately 1.1 million acres in size, it extends nearly 150 miles along the international boundary adjacent to Canada's Quetico

Provincial Park and is bordered on the west by Voyageurs National Park. According to the MN DNR Watershed Health Assessment Framework data (2015), the largest town in the Rainy River Headwaters is Ely, MN with a population of 3,460 (U.S. Census Bureau, 2010). This watershed consists of over 90% federal lands and has near perfect scores in both water quality and hydrology.

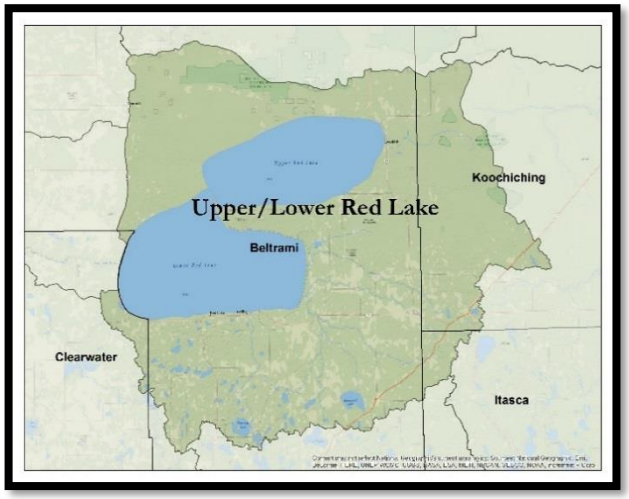


Figure 7: Upper/Lower Red Lake Watershed Boundary

Upper/Lower Red Lake Watershed

The Upper/Lower Red Lake watershed covers 1,263,678 acres. Located in Minnesota's Northern Wetlands, Northern Lakes and Forest Ecoregions and a portion of the Red River Valley Ecoregion, this watershed is home to Upper and Lower Red Lakes. Combined, these two lakes make up the largest body of water within the state. The watershed is, by both flow volume and surface area, the largest drainage basin of the Red River. Shotley Brook and the Tamarac River are the most prominent tributaries that flow directly into Upper Red Lake. Significant tributaries that flow directly into Lower Red Lake (from west to east) include the Sandy River, Pike Creek, Mud River, Hay Creek, Blackduck River, and Battle River. According to the MN DNR Watershed Health Assessment Framework data (2015), Koochiching County holds 16% of the watershed, including the town of Northome, population 200 (U.S. Census Bureau, 2010). Excessive nutrients in Bartlett Lake are a concern in this watershed and will be discussed further in this document. This is the only watershed in Koochiching County that does not reside in the Rainy River Basin, but rather in the Red River of the North Basin. Upper/Lower Red Lake watershed scores high in water quality and hydrology but low in biological health (55% for terrestrial species and 65% for stream species). There are also a number of altered (channelized) streams.

Big Fork River Watershed

The Big Fork River watershed, which covers 1,326,947 acres, flows 165 miles from Dora Lake (45 miles northeast of Bemidji in north-central Itasca County) to the Rainy River, which forms the Minnesota/Canadian border. Towns within this watershed are Bigfork, population 446, and Big Falls, population 236 (U.S. Census Bureau, 2010). This confluence is 16 miles west-southwest of International Falls. Nearly 60% of the watershed is land owned or managed by the state. Just over 50% of this watershed lies within Koochiching County, shared with Itasca County and is 57% wetland. MN

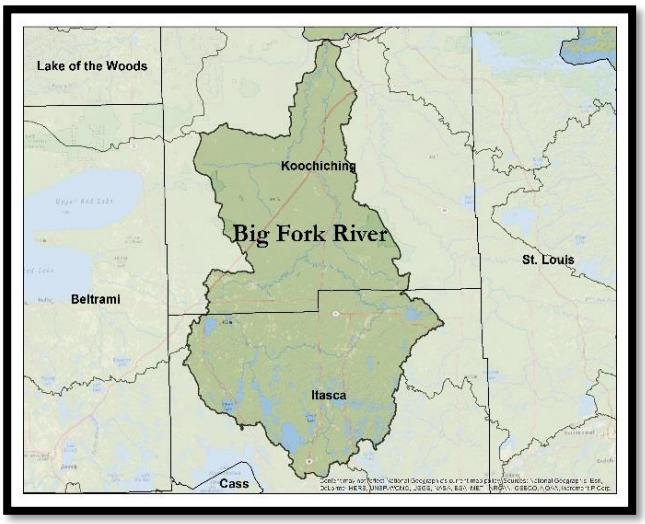


Figure 8: Big Fork River Watershed Boundary

DNR's Watershed Health Report shows near perfect scores in the high 90's for water quality and hydrology, where flow variability and altered streams scored the lowest. A Watershed Restoration and Protection Strategy (WRAPS) with the MPCA was completed in 2016 and found no impairments in Koochiching County's portion of the Big Fork River watershed.

Little Fork River Watershed

Figure 9: Little Fork River Watershed Boundary

The Little Fork River watershed is 1,179,520 acres, the main stem flowing 160 miles through north central St. Louis County and heading northwest into Koochiching County, then flowing more northerly until it reaches its confluence with the Rainy River about 11 miles west of International Falls. There are no large cities in this remote watershed. Cook's population is 667 and Little Fork, 674 (U.S. Census Bureau, 2010). According to MN DNR's Watershed Health Report, 39% of the Little Fork River watershed lies in Koochiching County, shared with Itasca and St. Louis counties and is 46% wetland. Water quality scored between 95 and 98 and hydrology scored between 69 and 99.

A WRAPS and TMDL were completed in 2015, where it was determined that there are impairments in Koochiching County stream segments for Total Suspended Solids (TSS), meaning there is too much sediment in the water to meet the water quality standard set by the MPCA for this water body. Koochiching SWCD plans to partner with adjacent counties over the course of this water plan to address as much of the TSS issue as possible.

Table 1 below provides a good overview of the general make up and health of Koochiching County watersheds. However, due to variations in geographical boundaries used by different state and federal agencies as well as the timing of data collection, acres and percentages may vary between the text above and the table below.

Table 1: Watershed Statistics - MN DNR WHAF

Watershed	Total Acres (U.S./Canada)	% of Watershed in Koochiching	Population (2010 Census)	% of Land Cover						Water Quality Scores
				Open Water	Crops	Prairie/ Shrub	Forest	Wetland	Developed	
Rapid River	603,843	23%	182	0%	2%	1%	2%	94%	1%	93 - 100
Lower Rainy River	196,592	Not Listed	2,372	1%	13%	3%	3%	77%	2%	92 - 98
Rainy River - Rainy Lake	582,765	36%	5,103	17%	0%	5%	45%	32%	1%	92 - 97
Rainy Headwaters	1,607,851	Not Listed	6,261	14%	0%	8%	48%	29%	1%	91 - 98
Upper/Lower Red Lake	1,241,690	16%	10,784	24%	6%	1%	18%	49%	2%	92 - 98
Big Fork River	1,315,135	51%	5,079	5%	2%	5%	30%	57%	2%	95 - 99
Little Fork River	1,198,295	39%	7,319	3%	2%	10%	37%	46%	2%	93 - 98

1.2 Plan Purpose

The purpose of the Koochiching County Comprehensive Local Water Management Plan is to address existing and/or potential water resource related issues, threats, and concerns. Developed under the legislative authority and mandate of the Comprehensive Local Water Management Act (Minnesota Statutes, Chapter 103B), county water plans must:

1. Cover the entire area within a county;
2. Address water problems in the context of watershed units and groundwater systems;
3. Be based upon principles of sound hydrologic management of water, effective environmental protection, and efficient management;
4. Be consistent with local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or groundwater system;
5. Cover a period of at least five years and no more than ten years; and
6. Fully utilize existing water and related land resources plan; including plans related to agricultural land preservation programs.

The Koochiching County Board of Commissioners has delegated the KCCLWMP update responsibility to the Environmental Services Department (ESD) and the Koochiching Soil and Water Conservation District (SWCD). As the LGUs responsible for the development and implementation of the KCCLWMP, the ESD and SWCD are committed to protecting, preserving and improving water resources in Koochiching County.

The first resolution by Koochiching County to develop a comprehensive local water management plan was in 1990, with the original plan being completed and adopted in 1995. Pursuant to Minnesota Statutes §103B.305, the KCCLWMP has been revised three times in the following years: 2000, 2007, and 2012.

The current Koochiching County Comprehensive Local Water Management Plan is set to expire on December 31, 2017.

1.3 Priority Concerns Addressed by Plan

After review of existing data and considering input from the public as well as local, state, and federal resource agencies, eight main priority concerns were selected for inclusion in the KCCLWMP. A summary of this process is located in **Appendix D** of this document (***Priority Concerns Scoping Document)***.

1. Surface Water Quality

Koochiching County's surface water is a valuable resource for maintaining citizen health and well-being. The impacts of surface water to transport chemical, nutrient, and soil particles into water bodies makes management of Koochiching County's surface water quality a high priority and can be addressed through an array of different projects and programs.

2. **Ground Water Protection**

   Groundwater is found in bedrock fractures and small glacial aquifers that often have a limited capacity for groundwater pumping. Clean groundwater is important as a drinking water supply for many residents within Koochiching County.

3. **Forest Management:**

   Protection of forest hydrology through Best Management Practices (BMPs) and designation of riparian zones, training and education programs, community involvement, and retention of public ownership of water accesses can have a positive effect on water quality.

4. **Shoreline Management**

   Koochiching County has 4,228.5 miles of shoreline. The proper management of the shoreline protection, use of BMPs and implementation of restoration initiatives can decrease the risk of erosion, runoff, and contamination of Koochiching's water resources.

5. **Invasive Species**

   The presence/spread of aquatic and terrestrial invasive species has the potential to negatively affect native ecosystems, reduce biodiversity and negatively impact fisheries, wildlife habitat, water quality, tourism, recreational activities and the agricultural and forest industries.

6. **Wetland Management**

   Wetlands provide valuable ecosystem functions and services that can be lost when impacts to wetlands occur from development, catastrophic weather events, and invasive species.

7. **Education and Outreach**

   Public education is essential to sustain high water quality and good land management practices in Koochiching County.

8. **Commercial / Industrial Impacts**

   Minimizing impacts of heavy industry activity through management and regulation will protect the natural resources in Koochiching County's watersheds.

Although individual concerns can appear to have minor effects on our vast water resources, it should be recognized that their cumulative effect can produce more significant actions. Koochiching County and Koochiching SWCD will continue to work with local, state, and federal agencies on assessing and addressing the cumulative effects of priority concerns on water resources wherever possible. These collaborative efforts play a key role in reaching our ultimate goal of keeping the waters of northern Minnesota among the most pristine in the state.

1.4 Summary of Plan Goals and Implementation

Priority concerns to be addressed in the KCCLWMP were identified through the assessment of current local and regional management plans as well as input from the Water Plan Advisory Committee, resource agencies, and the public. Existing studies and plans were reviewed to identify overlapping goals and potential project partners. Using these resources, priority concerns were defined, measurable goals were developed, and implementation activities were assigned to address individual goals, in combination with local knowledge of the specific resource protection and/or restoration needs.

The implementation activities were prioritized and sorted by tiers, resulting in the development of three separate implementation planning categories within the ***KCCLWMP Targeted Implementation Plan (TIP)***, a 10-year plan with identified actions to achieve the stated goals (see **Table 4** on **pages 52 - 62**). Within the plan, activities to be completed include on the ground conservation practices, data collection, outreach and education, and implementation of protection and restoration strategies. On an annual basis, the WPAC will meet to review activities identified in all three tiers of the TIP, assess progress, and re-evaluate/set priorities for the next year.

The first tier includes activities to be completed with currently approved funding and identified as carried out by the County and SWCD, the entities ultimately responsible for plan implementation.

The second and third tiers contain other implementation items that were identified as needing additional funding or staff resources and/or supported by the KCCLWMP but led and administered by an entity other than the County or SWCD.

Tier 1 – Targeted Implementation Activities

This tier identifies implementation activities that Koochiching County and Koochiching SWCD plan to undertake within the 10-year time frame of the KCCLWMP, funded by the Natural Resources Block Grant (NRBG), Local Capacity Grant, and/or in-house contributions.

Tier 2 – Secondary Implementation Activities

This tier identifies implementation activities that Koochiching County and Koochiching SWCD hope to accomplish if additional sources of funding, staff resources, or shared service opportunities become available over the 10-year time frame of the KCCLWMP.

Tier 3 – Partner Implementation Activities

This tier contains additional implementation activities identified during the plan development process that are the responsibility of state and/or federal agencies or are better suited to other entities in the watershed. In addition to the annual review, ongoing partner communication will continue to identify opportunities to collaborate on these implementation activities.

The estimated cost to implement action items within the KCCLWMP Targeted Implementation Plan is approximately $1,136,420 (Tier 1 activities), $24,021,330 (Tier 2 activities), and $820,595 (Tier 3 activities) for a total estimated cost of $25,978,345 over the next 10 years.

1.5 Local, State, and Regional Plans

While determining priority concerns, existing state, local, and regional management plans were reviewed including the Northern Landscape Management Plan, Big Fork River WRAPS final document, Little Fork River WRAPS draft document, Little Fork River Watershed Total Maximum Daily Load (TMDL) draft document, Little Fork/Rat Root River Management Plan, Big Fork River Management Plan, "A Long Range Plan for the Management of Tax Forfeited Land and Forest Resources of Koochiching County", 2014 Multi-Hazard Mitigation Plan, Koochiching County Subsurface Sewage Treatment System (SSTS) Ordinance, Voyageur's National Park General Management Plan (2002), 2007 Koochiching County Priority Concerns Scoping Document from the Comprehensive Local Water Management Plan, and the 2015 "A Water Quality Plan of Study for the Lake of the Woods Basin". Information found in these plans was used to ensure consistency with regard to potential goals, objectives, and action items identified in the KCCLWMP.

This review confirmed that all priority concerns selected are supported by these existing resource management plans. The review of other plans also highlighted additional issues for consideration including stormwater reduction, feedlot permits and rules, and preservation of historical and archeological sites.

2 ASSESSMENT OF PRIORITY CONCERNS

2.1 Priority Concerns Analysis

Priority concerns areas were determined based on data derived from a variety of sources including WRAPS and TMDL reports from the MPCA, MN DNR WHAF, Rapid Watershed Assessment reports from United Stated Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) and geographic information system (GIS) mapping developed by the Minnesota Association of Soil and Water Conservation Districts (MASWCD) Area 8 GIS specialist (see **Appendix C** for information on priority concerns map development).

SURFACE WATER QUALITY (SWQ)

Koochiching County's surface water is a valuable resource for maintaining citizen health and well-being; it is equally valuable for local wildlife and the economy. The potential impacts of surface water transportation of chemical, nutrient, and soil particles into water bodies makes management of Koochiching County's surface water quality a high priority. This can be addressed through an array of different projects and programs such as forestry and agricultural BMPs, drinking water source protection, flood effect mitigation, improving/protecting at risk waters, maintaining local septic systems, and increasing stormwater management.


Photo by Jeff Kantor

PRIORITY AREA SUMMARY:

Agriculture

Although agriculture is not a primary land use throughout the major watersheds contained within Koochiching County, existing farms, pastureland and row cropping can play a role in the health of these watersheds. Agricultural land use is spread throughout the county; however, the highest density is found within these three areas outlined in green below in **Figure 10** below. Using MPCA and University of

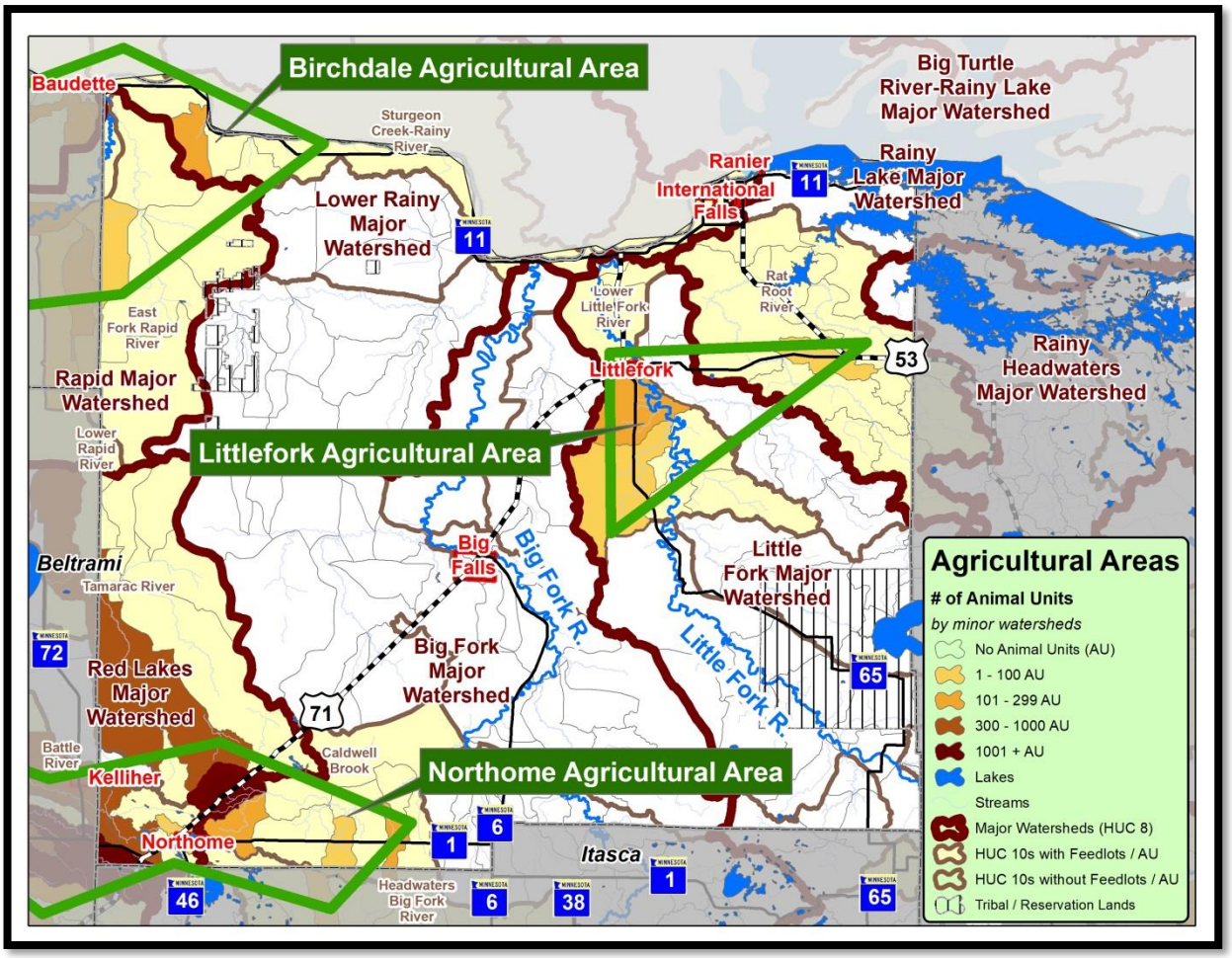


Figure 10: Agricultural Areas by Watersheds

Minnesota datasets, as well as local resource agency staff knowledge, these areas have been identified as priority areas because of the prevalence of livestock operations (with the majority to be found in the Northome area) and annual cropping systems. Hay and small grains are the primary crops in the county and pose a limited risk to water quality. Using the official MPCA definition of the word, feedlots are rare in Koochiching County. However, unmanaged runoff from livestock operations and annual row cropping has the potential to negatively impact water quality, habitat, and cause shoreline erosion. Offering opportunities for agricultural BMP cost-share and conservation improvement incentives in these priority areas can improve and/or safeguard water quality in these vulnerable areas.

Wood Ash – Packaging Corporation of America (PCA) maintains a standing permit with MPCA to land apply their industrial byproduct (wood ash) on farm fields. Surface-applying wood ash promotes beneficial reuse and keeps over 20,000 tons worth of various analytes (substance or material determined by a chemical analysis) from being landfilled each year. Once wood ash is applied to agricultural fields and tilled into the soil, crops will take up the added nutrients and analytes. Wood ash also improves soil quality parameters that reduce runoff potential of the soil. Proper setbacks and guidelines set forth by the MPCA ensure that this byproduct does not enter our water resources. For more information on ash application setbacks: http://koochichingswcd.org/wp-content/uploads/2017/06/2017-wood-ash-program-brochure.pdf

Municipal Sludge – A similar beneficial reuse program is run by the North Koochiching Area Sanitary District in conjunction with their discharge permits. Municipal sludge is applied to farm fields in accordance with permitting guidelines to fertilize land while keeping 100% of the sludge produced from being landfilled.

Culverts

Culverts play an important role in water quality including sediment transport, fish passage, and water retention. Their shape, length, size, placement, and geographic orientation can make a big difference in how well they perform the roles listed above. Road-stream crossings have the potential to negatively affect the physical and biological function of our streams if designed and installed improperly. Methods used in the past for sizing and installing stream crossings were based on a less complete understanding of these potential impacts. Currently, many of the culverts dispersed throughout our watersheds may be negatively impacting the biological and physical function of these stream networks and completing a culvert assessment will provide a list of priority locations for culvert replacement to restore fish passage or increase stream channel stability.

Drinking Water

The City of International Falls provides drinking water to its citizens and those in the City of Ranier, utilizing **Rainy River** and **Rainy Lake** as the drinking water sources making surface water protection an important part of drinking water source protection. Koochiching County will support the activities of the Minnesota Department of Health Source Water Protection Program. See Ground Water Protection (GWP) for more on private wells and drinking water protection.

Flood Mitigation

Flooding can result from a variety of factors including changes in land use, improperly sized sewer and stormwater pipes, and/or extreme precipitation or rapid snowmelt. Due to lack of topographical deviation in the **Lower Rainy River, Rapid River,** and **Rainy River-Rainy Lake** watersheds, flood events continue to be a moderate to high concern for surface water quality degradation as well as property damage. During flood events, high waters saturate the soil and create the risk of erosion. Flood waters can then carry sediment from eroding soils and other pollutants into the surface waters, contaminating the water, damaging structures and creating risks to human and aquatic health.

The outlets of two of the largest lakes in the Rainy Basin, Rainy and Namakan, have been controlled by dams for more than 100 years. Since 1949, Canada and the United States, through the International Joint Commission (IJC), have jointly established formal rules for regulating water levels and flows for the two lakes. While the volume of inflow from precipitation or snowmelt is outside human control, efforts to manage water levels through dam operation are overseen by the International Rainy-Lake of the Woods Watershed Board (IRLWWB).

The IRLWWB was created in January 2013, from an amalgamation of the International Rainy Lake Board of Control and the International Rainy River Water Pollution Board, with added water quality responsibilities for the broader Rainy-Lake of the Woods watershed. The Board was formed to assist with binational coordination of water quality efforts for the entire transboundary watershed and to ensure compliance with the IJC's Order on the regulation of water levels on Rainy Lake and the Namakan Reservoir (Source: http://ijc.org/en_/RLWWB/International_Rainy-Lake_of_the_Woods_Watershed_Board).

Despite best efforts to control extreme inflows, floods continue to occur at varying degrees of intensity. In an effort to prepare for and/or mitigate the effects of flooding, several actions have been identified including updating floodplain maps, increasing precipitation monitoring sites, upgrading failing septic system, assessing stormwater management, and improving communications between water level management entities and residents regarding planned changes to Rainy Lake outflows.

Additional information on minimizing and managing risks associated with flooding can be found at:

- https://www.pca.state.mn.us/waste/floods-minimizing-pollution-and-health-risks
- http://www.health.state.mn.us/divs/eh/emergency/natural/floods/index.html

Impaired / At Risk Waters

Much of the waters in Koochiching County remain pristine and unimpaired. This can be attributed to many factors including little development in most areas of the county, predominate land cover of forests and wetlands, and total amount of land in county, state, and tribal ownership.


Photo by Jeff Kantor

Figure 11 on the next page shows that only two of the seven major watersheds in Koochiching County have been identified as having impairments for one parameter in each watershed. In the larger scope of water health, this is indicative of extremely high water quality and is the main reason for this plan's primary focus centering on preservation and protection versus restoration.

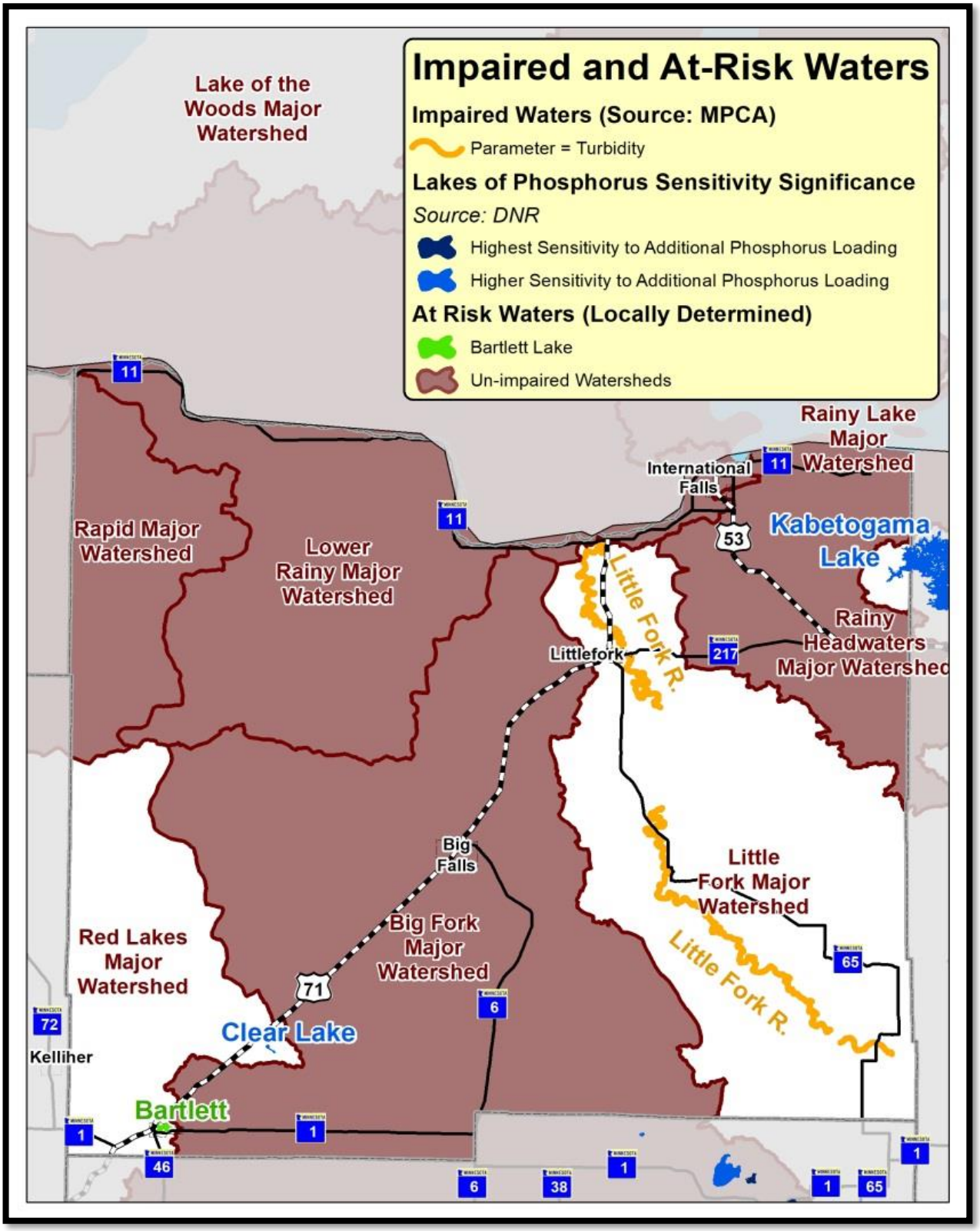


Figure 11: Impaired and At-Risk Waters by Major Watershed

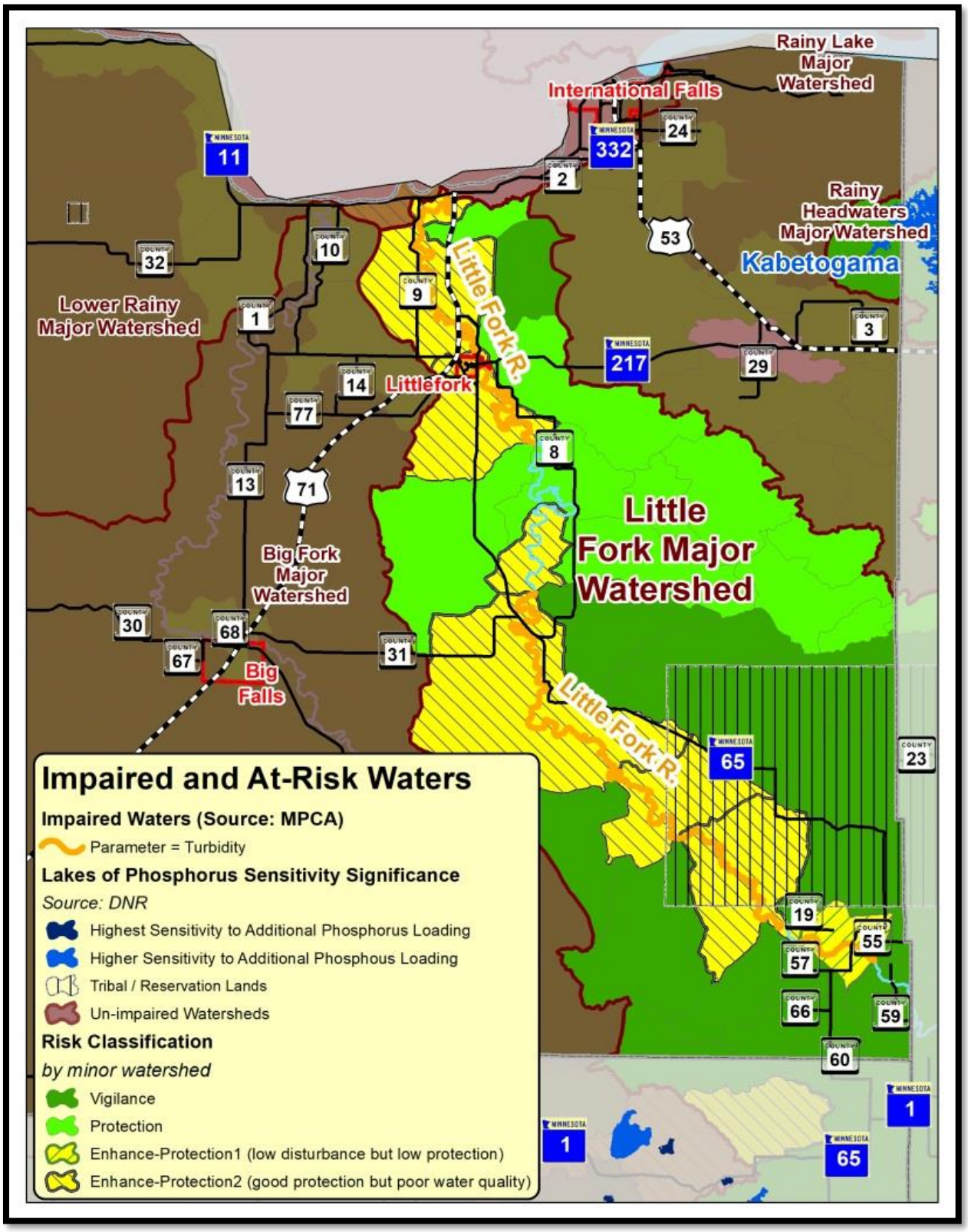


Figure 12: Impaired and At-Risk Waters – Little Fork River Watershed Priority Areas

Little Fork River Watershed

In the Little Fork River watershed, six stream reaches were found to be impaired (**Figure 12** on page 21). In five of these segments, the impairment was determined to be excess turbidity (or sediment) in the water. In the sixth segment, the impairment was due to a poor fish community. Of the six impaired segments, two are being deferred at this time and will be addressed during Cycle 2 of the WRAPS process in the Little Fork River watershed, starting in 2018. A TMDL was written for the remaining 4 segments. The affected sub-watersheds within Koochiching County boundaries are Middle Little Fork River, Lower Middle Little Fork River, and Lower Little Fork River.

The geology of the Little Fork River watershed makes it more vulnerable to natural and human disturbance and contributes to bank failures and high sediment concentrations. Glacial Lake Agassiz and other post-glacial lakes deposited heavy clay layers, which are now covered by fluvial sediments (sediments deposited by a glacier) (2007 *Little Fork River Channel Stability and Geomorphic Assessment Report*). These soils are

Table 2: Little Fork River Watershed Priority Areas

Tributary	Subwatershed Area (ac)	Annual TSS Load (kg/yr)	Annual TSS Load as Areal Load* (kg/yr/ac)
Upper Little Fork River	211,637	3,630,061	17
Bear River	108,444	3,447,820	32
Sturgeon River	258,772	4,104,116	16
Willow River	47,654	1,899,633	40
Valley River	46,528	1,612,514	35
Nett Lake River	138,878	4,784,585	34
Beaver Brook	77,613	2,605,222	34

susceptible to gradual bank erosion and sometimes large bank failure events. Sediment release is more likely to occur along sections of the river that are deeply incised (high flows are confined within the river's banks, with reduced access to spill out across the historic floodplain to dissipate energy). As noted in the Little Fork River TMDL document, five tributaries are estimated to deposit most of the sediment load, or total suspended solids (TSS), in the watershed on a per acre basis as depicted in **Table 2** (highlighted in yellow). Predicted TSS loads at each tributary outlet were modeled in Hydrologic Simulation Program-Fortran (HSPF). Annual loads are shown as both total and areal, or combined source loads.

These tributaries will be the focus of future projects partnering with adjacent resource agencies. Koochiching SWCD will explore these areas for sediment sources and possible erosion control projects in an effort to reduce TSS in high priority tributaries. To determine specific project sites, Koochiching SWCD will refer to *Appendix E* of the *Little Fork River Watershed TMDL* document. Where possible, maintaining or

increasing the stability of the banks and near bank areas with deeply rooted native vegetation can reduce the physical stresses on the channels surrounding sediment structures. Other practices such as toe wood structures, or lining the banks with whole-tree stabilization, may help to disperse the forces of water upon the banks and help to stabilize the near stream sediments. The continued use of riparian BMPs when conducting timber harvests also helps maintain bank stability (see Forest Management section). Livestock exclusion is also a bank stabilizing conservation practice that may be identified as needed within these impaired reaches. Another sediment reduction approach that will be explored will be an assessment of canoe carry-down and campsite areas, as was determined a possible project in the WRAPS strategies table.

Cycle 2 of the WRAPS process will begin for the Little Fork River watershed in 2018. The two deferred segments mentioned above (one for turbidity and one for fish health) will be revisited to gain more monitoring data. A large part of the WRAPS process for any watershed is civic engagement. Throughout the first 5 years, civic engagement will occur to allow for local input to be incorporated into plans as they are being developed.

Upper/Lower Red Lake Watershed

In the Upper/Lower Red Lake watershed within Koochiching County boundaries, Battle River, Shotley Brook, Lost River, and Tamarac River subwatersheds were found to have impairments for Fish Index Biological Integrity (low dissolved oxygen (DO) and elevated total phosphorus (TP)) (*Source: Upper/Lower Red Lake Watershed Monitoring and Assessment Report*). While the likely cause of impairment is natural and due to wetland influence, historical drainage of peatlands may also play a role in some of the subwatersheds. Additionally, Darrigans Creek was found to have impairments for macroinvertebrates and bacteria. Bartlett Lake, located in Battle River subwatershed, has a long history of environmental stress that has resulted in frequent cyanobacterial blooms and winter fish kills.

Due to legacy effects of past industrial waste, internal loading may continue to impact the resource. In Lost River watershed, Dark Lake was found to have excess Chlorophyll-a, exceeding the standard. Some types of algae, such as aphanizominon, allow for greater light to penetrate the surface and may be the reason the lake still has good clarity. Protecting Dark Lake to prevent impairments should be considered a high priority.

Bartlett Lake

Bartlett Lake is located just outside of the town of Northome, Minnesota. The lake is over 300 acres and reaches a maximum depth of about 16 feet. The lake has a long history of environmental stress that has resulted in frequent cyanobacterial blooms and winter fish kills. Although current loadings of phosphorus (P) to the lake have been strongly curtailed (currently most human-based sources are limited to some storm drainage and a few lake homes), the lake still suffers from extremely high P levels and poor water quality, with Secchi readings often less than 1 meter and water column total phosphorus (TP) values approaching hypereutrophic levels. Historical loading of nutrients likely occurred from both a lumber mill and creamery that were located on Bartlett's shoreline, and legacy effects though internal loading may be continuing to impact this resource. Current concern for the lake centers on its impaired status because it does not meet current state standards (30 ppb TP) for lakes in the Northern Lakes and Forests (NLF) ecoregion. These

impairments and a known history of excess nutrient loadings have led to questions of how much the productivity of Bartlett has changed over time, what the natural or historical condition of the lake was, what the current trajectory of each lake is given some improvement since the 1970s, and how to best set management goals for this valued regional resource. Knowledge of the natural state of a lake and an understanding of the timing and magnitude of historical ecological changes are critical components for any management and remediation plan. In this work plan, the Red Lake Watershed District (RLWD) outlines a project using paleolimnological and sediment techniques to reconstruct the nutrient and algal history, temporal and spatial trends in sedimentation, and the distribution and availability of phosphorus within the sediments of Bartlett Lake. Results will provide a history of ecological changes that have occurred in the lake during the last 150 years and form the foundation for developing a nutrient management strategy for the lake.

Although other watersheds in Koochiching County have not been found to have impairments so far, not all information has been gathered to determine this with certainty. The Watershed Restoration and Protection Strategy (WRAPS) process begins in Koochiching County watersheds as follows:

Table 3: Watershed WRAPS Schedule

Watershed Restoration and Protection Strategy (WRAPS) Schedule		
WATERSHED	**CYCLE 1**	**CYCLE 2**
Rapid River	2017	2027
Lower Rainy River	2017	2027
Rainy River-Rainy Lake	2017	2027
Rainy Headwaters	2014	2024
Upper/Lower Red Lake	2014	2024
Big Fork River	2010	2020
Little Fork River	2008	2018

County-wide

Contaminants of Emerging Concern (CECs):

A nationwide issue is Contaminants of Emerging Concern (CECs): Any synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment but has the potential to enter the environment and cause adverse ecological and/or human health effects. In some cases, release of emerging chemical or microbial contaminants to the environment has likely occurred for a long time but may not have been recognized until new detection methods were developed. Examples include, but are not limited to, pharmaceuticals, and personal care products (PCPs) such as soaps, cosmetics, fragrances, etc.; endocrine disrupting compounds (EDCs), substances that may interfere with the function of hormones in aquatic organisms. Trace amounts of these contaminants are being discovered in water throughout the country. The Minnesota Department of Health (MDH) and U.S. Environmental Protection Agency (EPA) are working to improve their understanding of emerging contaminants, including perchlorate, pharmaceuticals, PCPs and EDCs.

Mercury TMDL:

The MPCA initiated statewide mercury TMDL in 2007, establishing a 93% reduction in mercury from the 1990 levels (12.5 g/km^2). Since then, stakeholders have been consulted to create an implementation plan.

The MPCA's mercury implementation plan includes:

- *Introduction and Implementation Overview* describing the basis for the plan, stakeholder involvement, implementation roles and responsibilities, and key milestones.
- *Water Implementation Strategies* to ensure that total statewide mercury discharges remain below 24.2 lbs. per year. This includes a permitting strategy for addressing mercury in municipal and industrial permits.
- *Air Implementation Strategies* describes strategies to achieve reductions from existing sources to below 789 lb. by 2025 as well as guidelines for minimizing emissions from potential new and modified sources.
- *A Monitoring and Evaluation Plan* describes the MPCA's plan for tracking the effectiveness of this implementation plan including monitoring releases to air and water as well as tracking key environmental response indicators.

Ecological Resilience:

Koochiching County has an array of ecologically rich native plant communities and working landscapes such as farm and pasturelands. As commercial, industrial, and cultural priorities change regionally and worldwide, the resilience these ecosystems possess will vary greatly depending on the diversity of species, influences of pollutant loads from point and non-point sources, increases of runoff, flooding, climate alterations, and sedimentation. Preparation and planning to address these issues are a rising concern across the country; Koochiching County is not immune from these threats. Human activities can adversely affect ecosystem resiliency and the changes that may inevitably occur.

Some of the activities that may affect Koochiching County's ecosystems include reductions of biodiversity, exploitation of natural resources, pollution, and land use alterations. These events can create less desirable and degraded conditions in our watersheds and respective ecosystems. The following highlight potential emerging issues:

- A rise in the frequency of heavy rainfall events that increase runoff, siltation, erosion, and flooding;
- Increased time between rainfall events that may lead to drought;
- Reduction of wetland productivity due to precipitation extremes;
- Increases in average temperatures and low temperatures that promote exotic plants and increased insect pressures.

In an effort to address concerns associated with a change in weather patterns, the following actions will be explored:

- Public education on climate issues;

- Land water retention via drainage management, soil health, etc.;
- Filter silt from runoff via buffers, wetlands, filtration, grasses, detention/retention, etc.;
- Slow stream and inlet velocities via detention/retention, wetland protection/restoration, and grade control.
- Stabilize stream banks and beds
- Utilize the most up-to-date climate models (i.e. Atlas 14 by National Oceanic and Atmospheric Administration (NOAA))

The KCCLWMP will strive to address these climate fluctuations and the potential resiliency of sensitive ecosystems by educating developers and land managers to focus efforts on strategies that will sequester carbon, filter runoff, and reduce impacts from human alterations and development.

Septic Systems

Koochiching County does not currently require septic system inspections during property sale. However, the County does encourage the practice and will become involved if a buyer or lending institution requires an inspection. The County has an SSTS ordinance that meets state standards for septic systems. Rather than concentrate on individual systems, Koochiching County tries to solve wastewater treatment issues on a much larger scale. In 2007 the Jackfish Bay Sewer Project was completed, and the Island View Sewer Project is currently being constructed. Both projects consist of extending an existing sewer line to properties on the shores of Rainy Lake. Due to the large amount of surface bedrock it has been extremely difficult to find wastewater treatment solutions for this area. Both these projects allow wastewater to be transported to the treatment facility in International Falls. They provide service to more than 400 homes and cabins as well as numerous resorts and other businesses.

Stormwater Runoff

There are three types of stormwater permits: Industrial, Construction, and Municipal Separate Storm Sewer System (MS4) which regulates the discharge of stormwater into lakes, rivers, streams, and wetlands in Minnesota. The improper management of stormwater can contribute to the change in natural flow of a watershed; it can also increase erosion and the chances of a waterbody becoming impaired. Because Koochiching County does not currently have any MS4 permits, there is an opportunity to improve water quality through the permitting process.

For a map of permits in Koochiching County, see http://pca-gis02.pca.state.mn.us/wimn2/index.html.

ISSUE STATEMENT:

Koochiching County is largely dependent on surface water as a drinking water source, as well as commercial and recreational uses. Maintaining current high-quality surface water resources as well as addressing specific threats and/or impacts is high priority and critical to human and ecological health.

GROUND WATER PROTECTION (GWP)

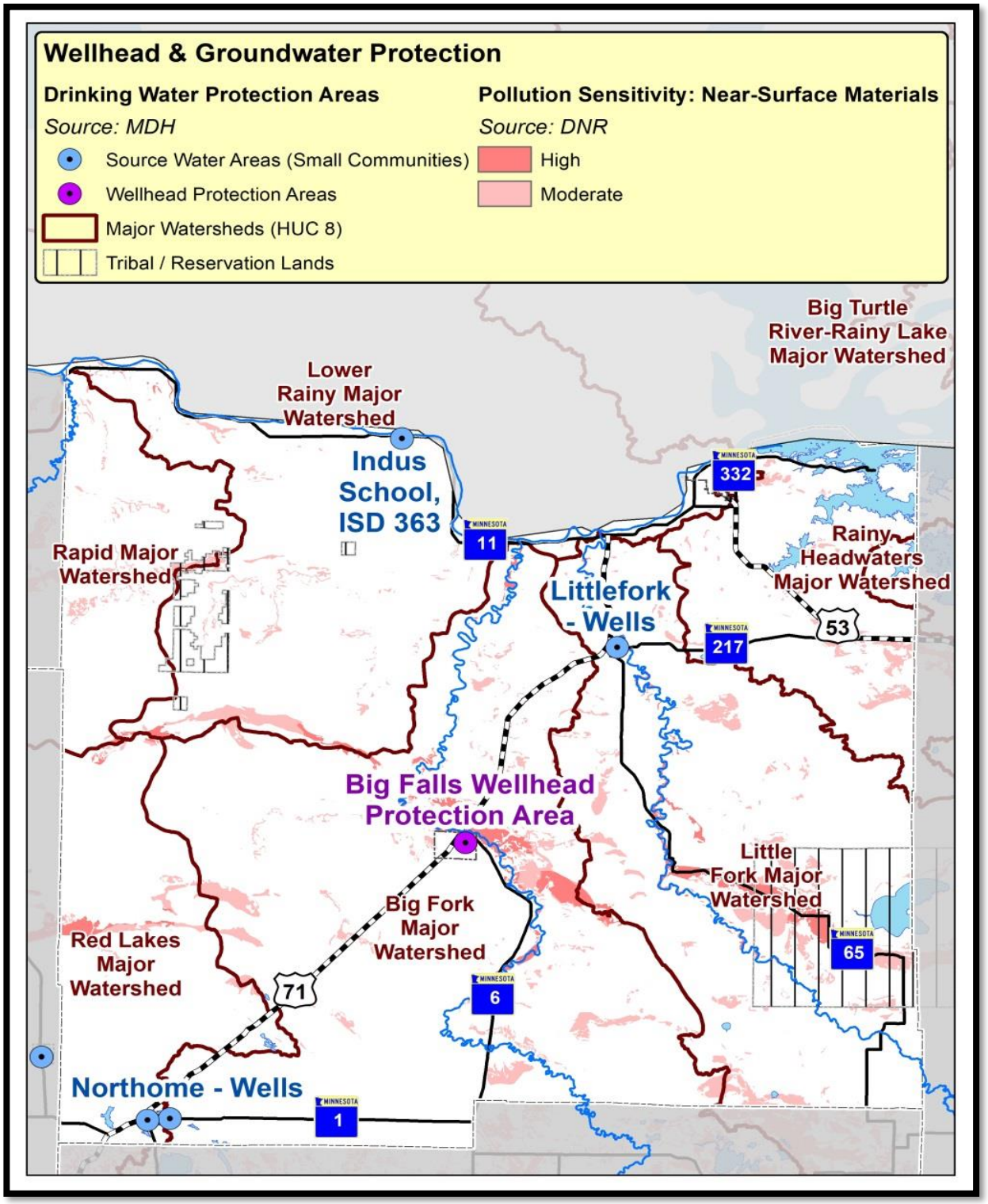


Figure 13: Well and Groundwater Protection Areas by Major Watershed

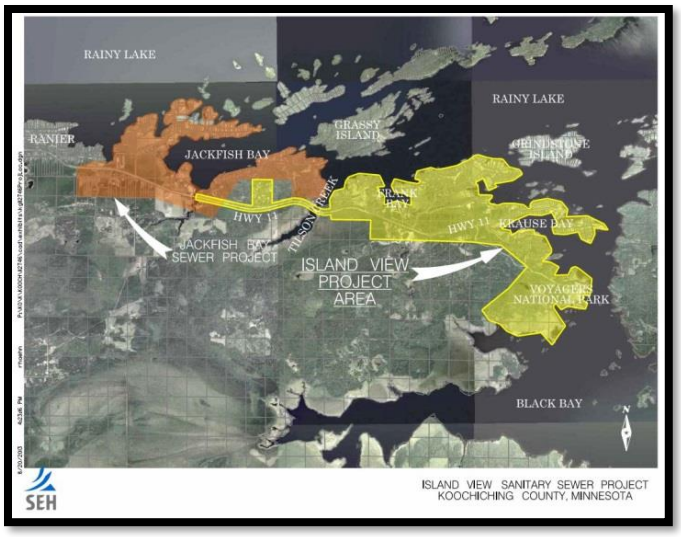
Groundwater is found in bedrock fractures and small glacial aquifers that often have a limited capacity for groundwater pumping. Clean groundwater is important as a drinking water supply for many. Potential impacts to ground water quality include failing septic systems, improper solid and/or hazardous waste disposal, and abandoned or unused wells.

PRIORITY AREA SUMMARY:

Koochiching County has held collections for household and business hazardous waste every year for more than two decades. Over that time many thousands of gallons of paint, pesticides, cleaning products and other materials have been collected and properly disposed of. Approximately 400 households participate in the program annually. There have been recent discussions about expanding the program if financially feasible.

A Wellhead Protection Area (WHPA) is a scientifically modeled boundary that reflects the geographic area where water will travel to the public water supply well(s) in a 10-year time of travel. Because the WHPA polygons are difficult to determine in the field, MN Rule requires that the WHPA be entirely contained within another polygon whose boundaries are easily recognizable – streets, highways, parcels, water courses, etc., and this boundary is termed the Drinking Water Supply Management Area (DWSMA). Potential contaminants in a DWSMA are identified and managed via a Wellhead Protection Plan (WHPP) that is prepared for each community public water supply. The incorporated community of Big Falls has an approved WHPP in place which is currently being amended. The incorporated communities of Littlefork, and Northome that also use wells as a potable water source are currently working with the MDH to develop WHPPs. It is anticipated that these communities will have approved WHPPs in place by the end of 2019. Over the past few years a lot of resources have been put into replacing water and wastewater infrastructure in the smaller communities. Big Falls, Littlefork and Northome all have either completed infrastructure projects or are working on them. When completed, these projects will play a huge role in protecting local groundwater resources.

In addition to surface water quality impacts, failing septic systems can also pose a threat to ground water quality. Recent efforts to address areas where threats were deemed highest priorities are explained in the **Surface Water Management** section above on **page 26** (project area pictured right). Additional high priority areas and potential funding sources are currently being assessed.



ISSUE STATEMENT:

Incorrect disposal of hazardous wastes, abandoned wells, and failing septic systems have the potential to adversely impact groundwater quantity and quality resulting in reduced groundwater recharge and impacts to receiving waters and drinking water supplies.

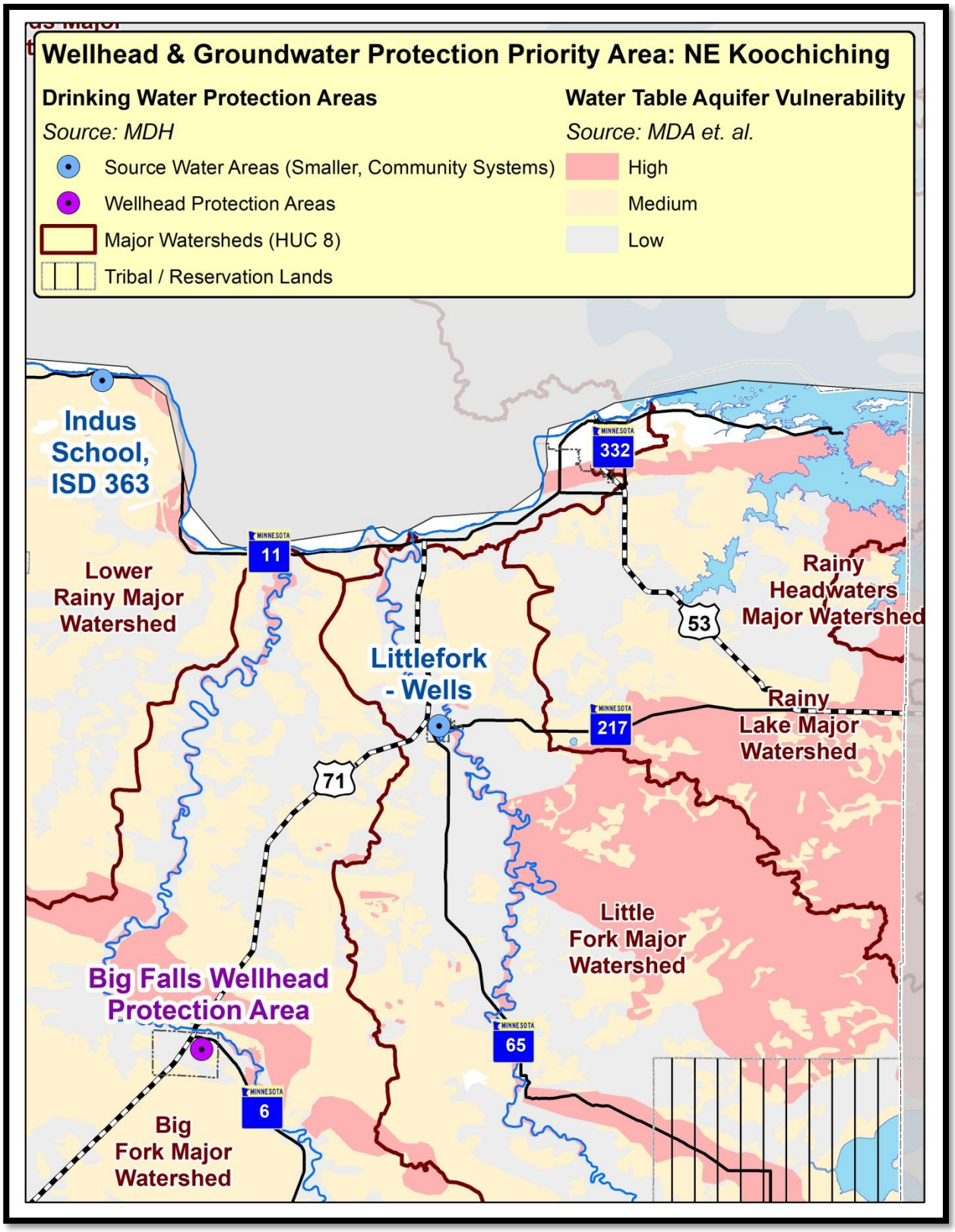


Figure 14: Well and Groundwater Protection Priority Areas

FOREST MANAGEMENT (FM)

Proactive forest management, monitoring for health and disease issues, mitigating the threat of invasive species, and the use BMPs have proven to play a positive role in maintaining and even increasing water quality. With over 350,000 acres of forested upland and much of the county's 1,517,114 acres of wetlands containing ecologically and culturally important native plant communities, effective and sustainable forest management is a major priority in Koochiching County. While much of Koochiching's forests are 3rd party certified and/or carefully managed by forestry professionals on county, state, and tribal lands through strategic long-term plans, the county also contains 495,608 acres of private land. Although much of the privately held industrial forest land base in Koochiching County is already under conservation easements, private woodland stewardship outreach and management assistance programs offer additional opportunities to protect and improve water quality within impaired or at-risk areas while benefiting landowners.

One of the primary reasons Koochiching County has maintained a high level of water quality is the region's vast amount of maintained and managed forest lands. Contemporary resource management continues to build on the association between native vegetative landscapes and high water quality. By keeping native forests forested, productive, and healthy, water quality threats can be minimized or mitigated reducing the need for costly restoration or clean-up projects and keeping our lakes and rivers enjoyable places to recreate. By identifying targeted priority areas through specialized mapping, priority concern action items can be focused, and measurable results can be achieved.

Keep Native Forests Forested, Productive, and Healthy

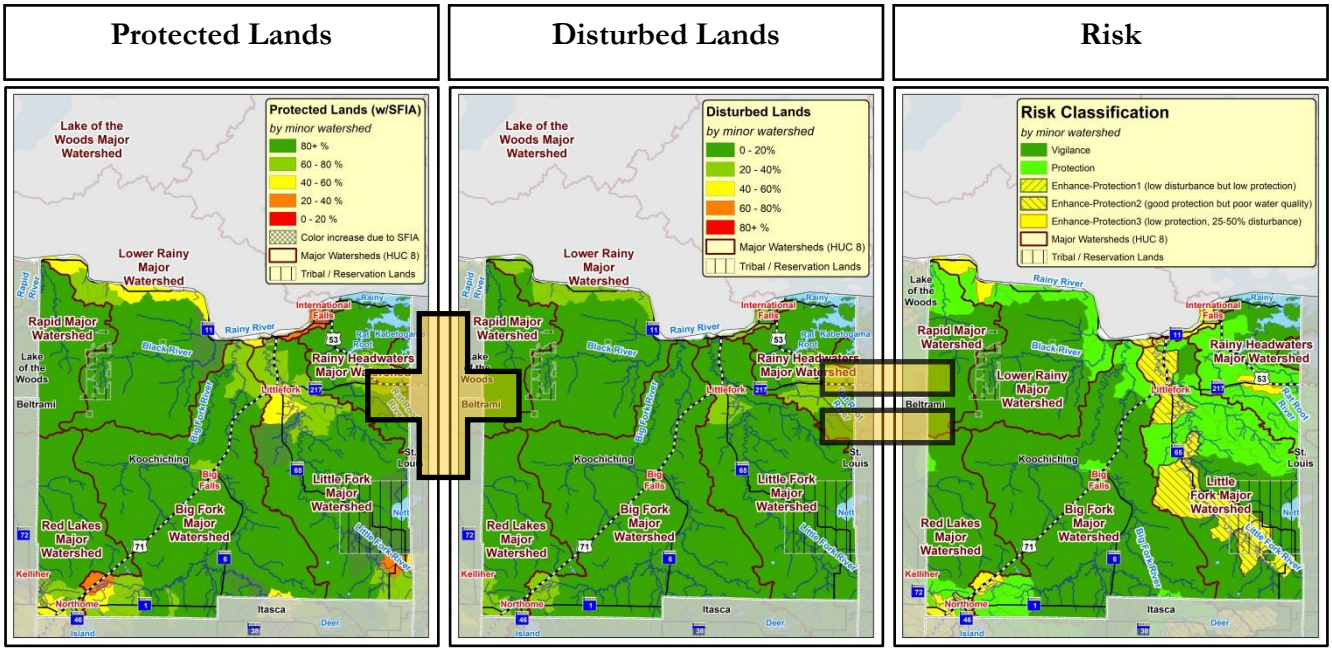


Figure 15: Risk Classification Strategy

Adapting a technique first developed by Crow Wing County and the Mississippi Headwaters Board, a protection model was used to assess minor watersheds/catchments to determine which watersheds are already in good condition (class: vigilance), which could use more protection (classes: protection, enhance-protection), and which would likely need restoration strategies (enhancement). This method was simplified (called the 'basic model') and is now expanding to the rest of north-central MN. When prioritizing watersheds for focus implementation strategies, the distinction between public and private lands is important. From a planning perspective, watersheds with a high percentage of public land are not as "at-risk" for future water qualify impacts and do not require the same level of focus as watersheds with a smaller percentage of public land. For purposes of this plan, public land is considered to be already in a "protected" state. Public water bodies, such as lakes and streams, are also "protected" in that they cannot generally be filled or drained. Another potential addition to the protection model is land voluntarily enrolled in the Sustainable Forest Incentives Act (SFIA) program or conservation easements.

In addition to the amount of these protected lands/waters, each minor watershed was classified and mapped by the amount of land use disturbance, water quality trends, and various risk factors. Minimizing these changes in land use is important to maintaining high water quality. For this plan, land use disturbance includes land cover classes that are converted from a natural, forested state to man-induced classes such as: developed, cultivated, or pasture.

Watershed health is also influenced by the water quality of the land and streams they contain. For this plan, watersheds with a declining trend in water quality (or impaired) were classified lower simply because of the declining trend. For more information on the Risk Classification Mapping Model see 70 and 71 in the Priority Concerns Mapping Summary (**Appendix C**).

PRIORITY AREA SUMMARY:

Little Fork River

Forest Management is a high priority within the Little Fork River watershed, where 83% of this watershed is native forest and wooded wetland cover types according to MN DNR's WHAF. Water quality issues identified by the MPCA monitoring programs have led to a documented impairment for total suspended solids (TSS). The Risk Classification Map identifies two stretches of Little Fork River corridor where enhanced protection projects on private forestland could mitigate or enhance water quality issues within the greater Little Fork River watershed. For more on the Little Fork River TMDL, see "Surface Water Quality".

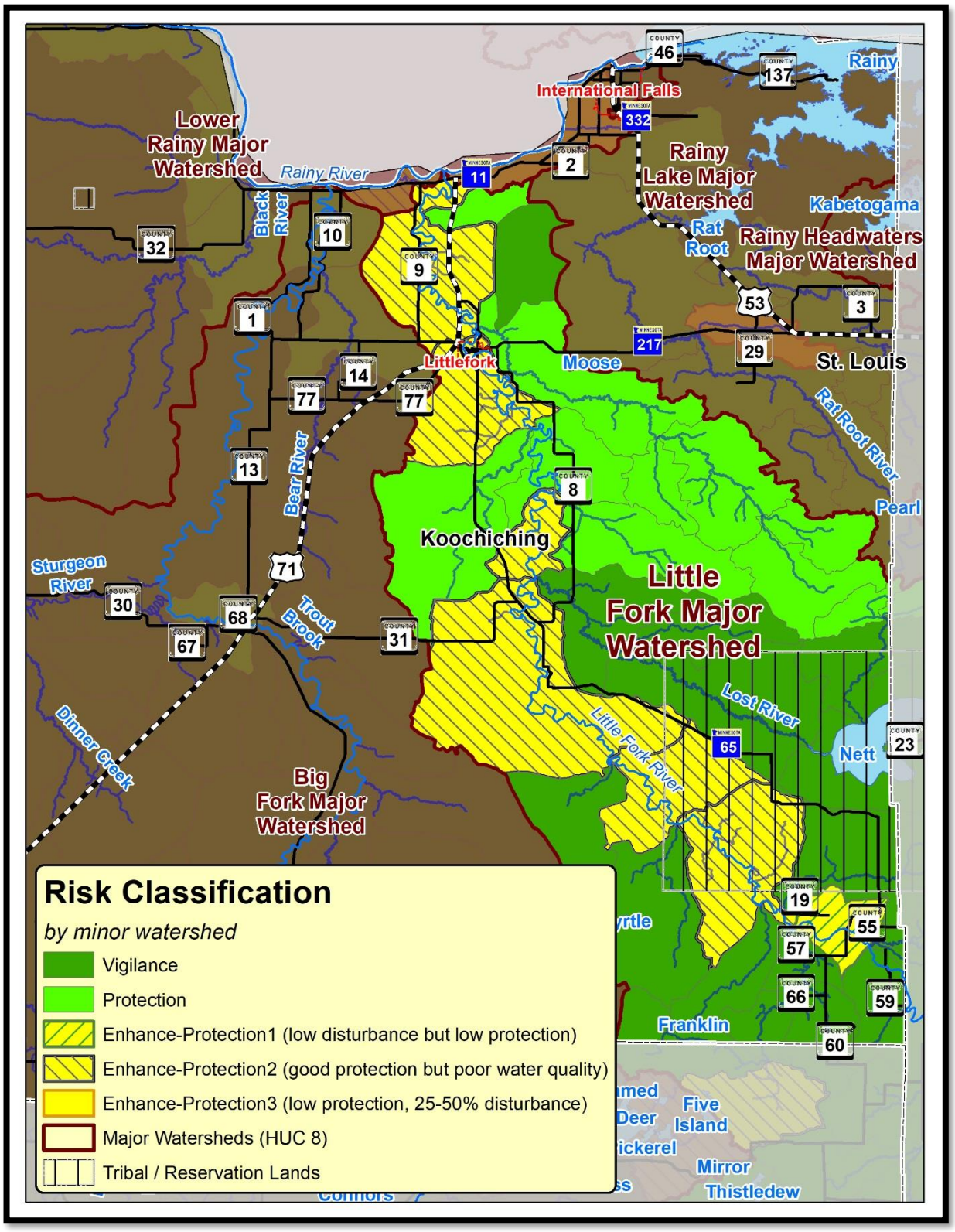


Figure 16: Risk Classification – Little Fork River Watershed Priority Area

Lower Rainy River

Like the Little Fork River watershed, 88% of the Lower Rainy River watershed's 329,291 acres is native forest or forested wetland, making active forest management a primary land use (MN DNR WHAF). The Lower Rainy River contains a portion of the Rainy River, the largest river in Koochiching County and one of the highest concentrations of private lands in the county. The threat of parcelization of private forests and marginal farmlands throughout this watershed make continued sustainable forest practices, private forest stewardship, and use of riparian buffers large priorities.

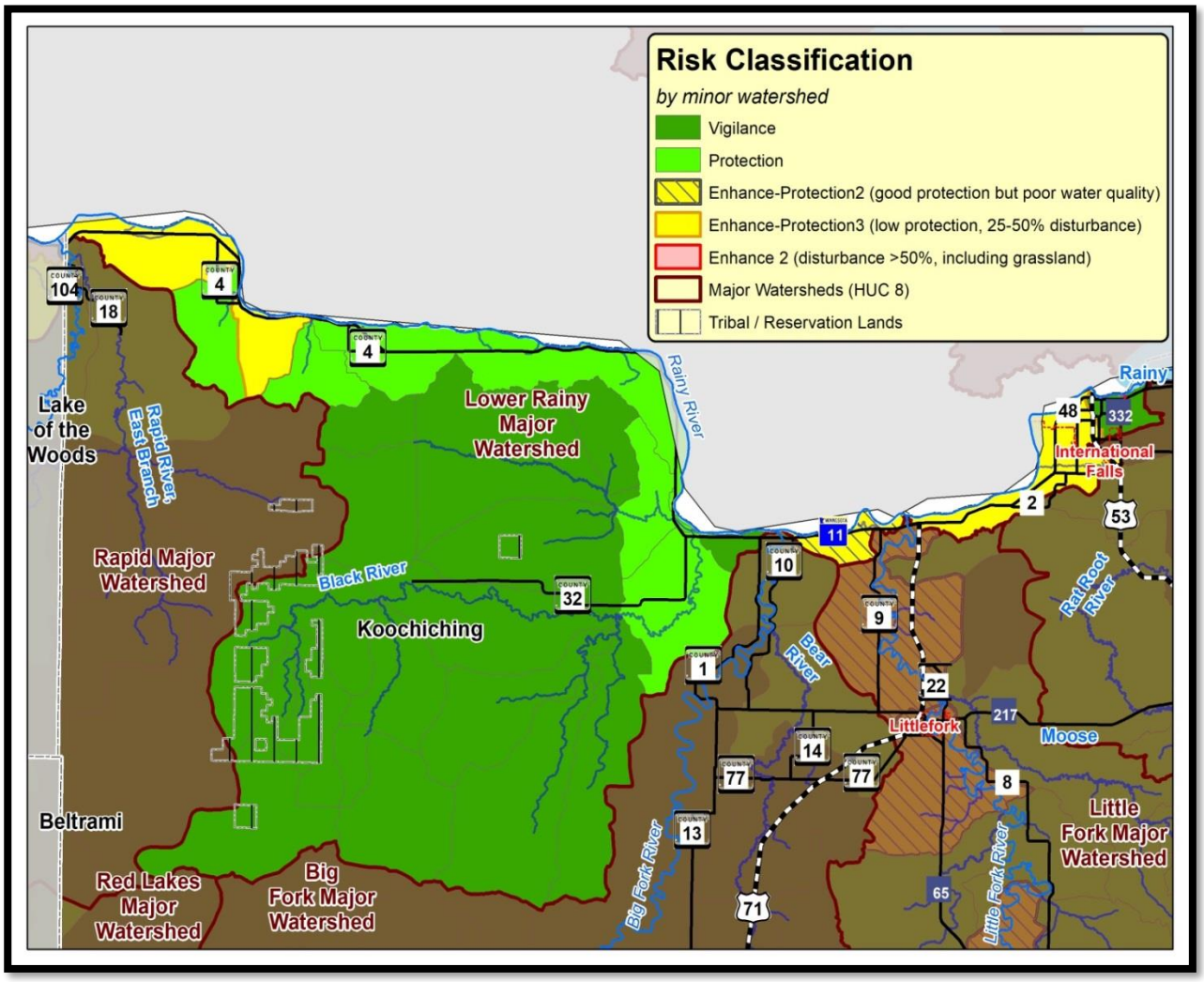


Figure 17: Risk Classification – Lower Rainy River Watershed Priority Area

ISSUE STATEMENT:

Properly managed forestland contributes greatly to clean water and allows implementation strategies to focus on keeping lands forested, productive, and healthy. This can be achieved by ensuring BMPs across all woodland ownerships and targeting tax incentive, easement or forest project cost-share opportunities for private landowners in areas that are impaired or vulnerable to conversion to other land uses.

SHORELINE MANAGEMENT (SM)

Koochiching County has approximately 4,228.5 miles of shoreline. Proper shoreline management through the use of BMPs and implementation of restoration initiatives can decrease the risk of erosion, runoff, and contamination of Koochiching's water resources. Current county zoning ordinances ensure proper setbacks which also aid in keeping shorelines from eroding and degrading. In addition, the Minnesota Buffer Law establishes new rules requiring perennial vegetative buffers of up to 50 feet along public waters (lakes, rivers, and streams) and buffers of 16.5 feet along public ditches. These buffers are intended to help filter out phosphorus, nitrogen and sediment and prevent them from entering the watersheds.

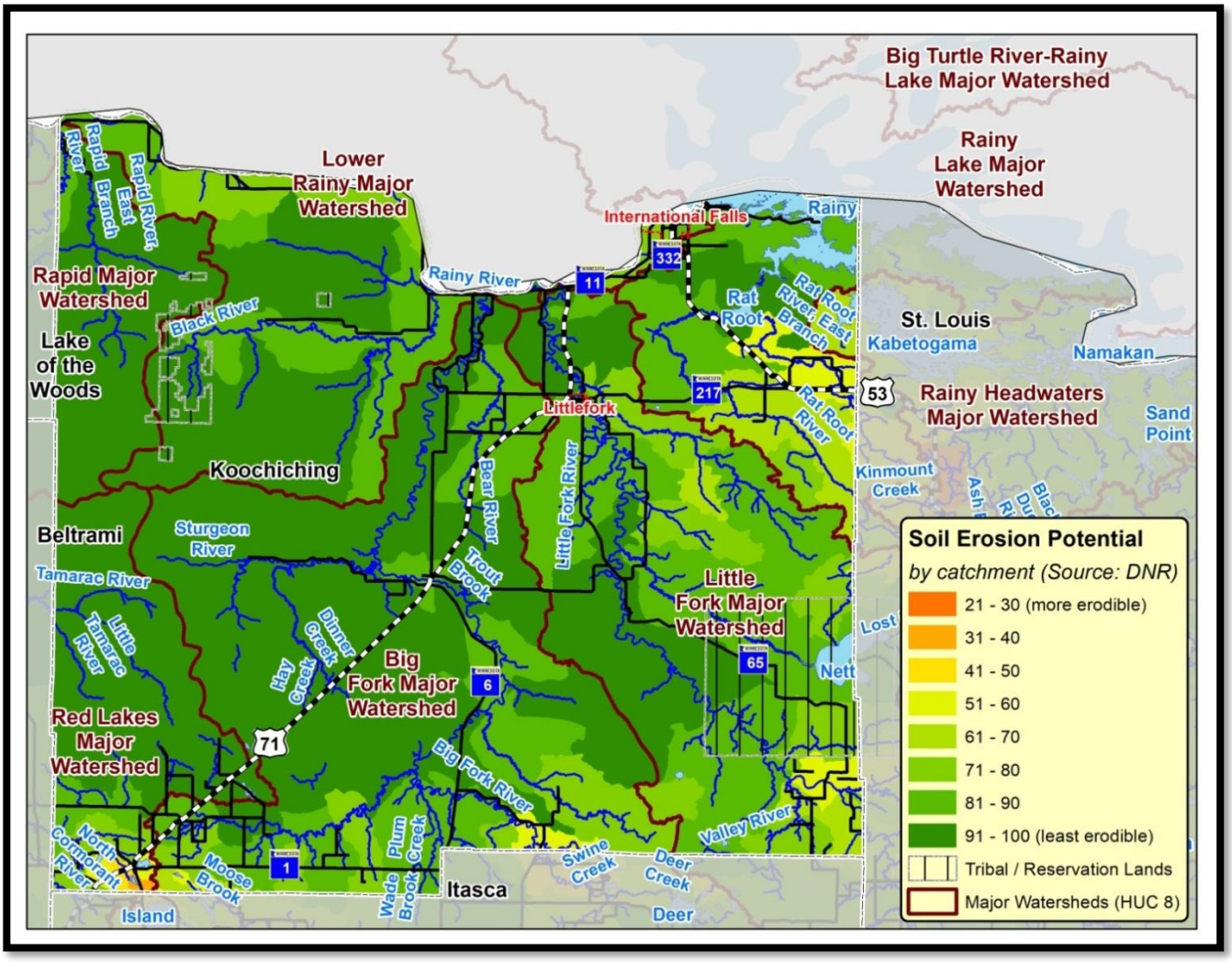


Figure 18: Soil Erodibility Index

Population densities have a direct impact on shoreline disturbances due to increased activity from development, septic systems, and other related land uses and their effect on soil composition/integrity. Ensuring that all shoreline areas, particularly those with a higher population, are being properly managed plays a vital role in water quality and the health of our watersheds as a whole.

PRIORITY AREA SUMMARY:

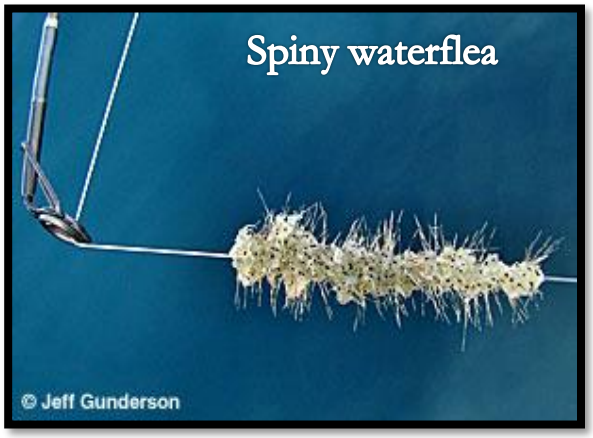
Shoreline management is a high priority concern in Koochiching County, especially along our major waterways where much of new residential development occurs and where seasonal visitors have steadily transformed into year-round residents, thus increasing the potential for water quality impacts. In shoreland areas it is particularly important for septic systems to be maintained properly because soil and water conditions near shore can impede the systems' efficiency in treating wastewater. Incomplete treatment can result in health risks to human and aquatic life. The highest population densities are located on and around **Rainy River** and **Rainy Lake**, the watersheds identified as high priority for enhanced protection in order to maintain the health of these important water resources. Soil composition plays a direct role in shoreline erodibility and stability and areas that have a high composition of fine particles can inhibit overland water infiltration and increase runoff and erosion which in turn can negatively impact the health of our watersheds. Soil textures, slope, and moisture content vary along shorelines making stabilization requirements differ from site to site, such as some portions of the Little Fork River where shoreline with inadequate vegetation in developed areas is vulnerable to damaging erosion and slumping.

ISSUE STATEMENT:

Ensure that state guidelines are met through current zoning and shoreland ordinances. All structures, septic systems, grading and filling operations, dredging and other projects in shoreland areas must meet agency permitting requirements.

INVASIVE SPECIES (IS)

Terrestrial invasive species (TIS) and aquatic invasive species (AIS) can negatively impact the health of a watershed. Once invasive species are introduced and established they can be difficult and costly to remove. Properly managing invasive species in Koochiching County is of high priority to keep our watersheds healthy. Human travel and transportation corridors and lake/stream access points are the most common locations for invasive species to be introduced. For example, the well-known terrestrial invasive species, Wild parsnip (Pastinaca sativa), has been identified as a concern throughout Koochiching County ditches and right of ways. Spiny waterflea (Bythotrephes longimanus) is one of the most prevalent aquatic invasive species found in Koochiching County water bodies.



Working in partnership, Koochiching County and Koochiching SWCD are implementing a watercraft inspection program utilizing a decontamination unit to pre-empt infestations on Rainy Lake. While efforts to address known invasive species are currently underway, emerging and future un-known invasive species within the county's boundaries will be addressed as these issues are identified.

PRIORITY AREA SUMMARY:

Rainy River-Rainy Lake (Aquatic)

Rainy River-Rainy Lake watershed contains the biggest and most populated lake in the county, Rainy Lake. The lake drains into the Rainy River and eventually Lake of the Woods. Protecting this resource from infestation is of high priority for not only the lake but the downstream waterbodies. Rainy Lake is home to Voyageurs National Park along with many resorts and businesses that could be negatively affected by the infestation of AIS. Rainy River-Rainy Lake watershed is currently on the infested waters list for Spiny Waterflea and our goal is to prevent infestation of other aquatic invasive species. The County and SWCD have partnered with each other to create a watercraft inspection program at various landings on Rainy Lake.

Lower Rainy River (Aquatic)

The Rainy River is the major waterbody in the Lower Rainy River watershed; it is 86 miles long and flows from Rainy Lake into Lake of the Woods. The Rainy River is an outstanding fishery and preventing the infestation of aquatic invasive species is vital to keeping it high quality. The Rainy River is currently on the infested waters list for Spiny Waterflea. The goal is to prevent the spread of incoming and outgoing aquatic invasive species to the waterbodies of the Lower Rainy River watershed.

County Wide (Terrestrial)

In order to address the introduction and infestation of terrestrial invasive species, a County wide initiative is the most effective and comprehensive approach. Efforts to keep our native forest communities, road and right of ways, and private lots invasive free must include a three-fold approach: educate-mitigate-eradicate/control. Educating the public and local government partners on invasive threats and their spread is the cheapest and most effective on the scale of alternatives. This includes providing educational material such as brochures and online sources. Mitigation is an alternative after an invasive has been established but is limited to a confined area or areas. Identification of the invasive and mode of transportation and planning is key at this stage. This could include the transportation of invasive insects through firewood hauling or import of invasive weed seeds in aggregate or building material. Eradication/control is the most expensive and last resort in the invasive management playbook. This requires cooperation on behalf of all property owners within areas in which the infestation has spread. Cross-boundary invasive weed management can be undertaken with the development of a Cooperative Weed Management Area.

ISSUE STATEMENT:

The presence and spread of invasive species (IS) has potential to alter ecosystems and negatively impact commercial and recreational activities. Preventing the introduction and spread of invasive species is crucial to the health of Koochiching county ecosystems. While re-establishing native species in infested areas will help mitigate some of the impact, public education and outreach is also a critical component and provides the best opportunity currently available to manage and prevent the spread of invasive species.

WETLAND MANAGEMENT (WM)

Wetlands provide valuable ecosystem functions and services that can be lost when impacts occur from various sources including development, catastrophic weather events, and invasive species. According to the National Land Cover Dataset (2011), Koochiching County's land base is approximately 77% open water or wetland with more than 80% of pre-settlement wetlands still intact (*Source: Board of Soil and Water Resources*). Dominating the county's landscape, wetlands contribute significantly to Koochiching County's high water quality but can also, at times, impede important and necessary economic development opportunities.

There are several different wetland types found throughout Minnesota, each providing various functions and benefits. Although a certain wetland type may not serve all functions, each wetland works in combination with other wetlands as part of a complex integrated system. The eight main types of wetlands and their subgroups are summarized below.

Type 1 wetlands represent a seasonally flooded basin with three different subgroups. Subgroup A is a fresh (wet) meadow where soils are usually well drained but may be intermittently inundated or saturated during the growing season. In forested landscapes, these may blend almost imperceptibly into the surrounding upland forest during dry periods. Subgroup B is a floodplain forest wetland that is usually found along streams or rivers and are somewhat well drained during the growing season but are flooded in the spring or after heavy rains. Flooding frequencies vary from frequent (1 to 2 years) to occasional (2 to 5 years out of 10 years). Subgroup C is a seasonally flooded basin which is dry during much of the growing season, looks like part of the forest, and generally measures less than an acre in size. Water is usually gone by mid-summer, but the basin may re-fill after heavy rains. Flooding frequencies are similar to floodplain forests.

Type 2 wetlands represent inland fresh meadows with two different subgroups. Subgroup A is a fresh (wet) meadow where the soil is usually without standing water for most of the growing season but is waterlogged within at least a few inches of the surface. Meadows may fill shallow basins, sloughs, or farmland sags, or they may border shallow marshes on the landward side. Subgroup B is a sedge meadow where the soils are saturated throughout the growing season and usually have some standing water. Vegetation is dominated by sedges.

Type 3 wetlands represent shallow marshes with saturated soils and are covered with about 6 inches of water throughout the growing season. Vegetation is typically herbaceous emergent aquatics and some floating aquatics including broad-leaf cattail, giant and green bur-reed, pink smartweed, arrowhead, and duckweed. Small bladderwort (Utricularia minor) and some species of pondweed (Potamogeton) may be found in the deepest parts of the marsh.

Type 4 wetlands represent deep marshes with saturated soils and are covered with 6 inches to 3 feet of water throughout the growing season. Vegetation is typically herbaceous emergent, floating, and submerged aquatics including broad-leaf cattail, giant bur-reed, soft-stem and hardstem bulrushes, river bulrush, wild rice, arrowhead, coontail, water milfoil, common bladderwort (Utricularia macrorhiza), and various species of pondweed (Potamogeton).

Type 5 wetlands represent open water. These wetlands have shallow open water between 6 and 10 feet deep fringed by emergent, floating, and submerged vegetation.

Type 6 wetlands represent shrub swamps with two different subgroups. Subgroup A is a shrub-carr wetland where willows and other deciduous woody shrubs form thickets on saturated to seasonally flooded soils. Subgroup B is an alder thicket wetland that is a deciduous woody shrub community dominated by tag alder.


Photo by Tom Morris

Type 7 wetlands represent wooded swamps with two different subgroups. Subgroup A is a hardwood swamp dominated by lowland hardwoods in basins and troughs. Subgroup B is a coniferous swamp dominated by lowland conifers in basins and troughs. For both subgroups, vegetation is lush and species diversity is high. Groundwater interaction or water flow through is evident. There may be a layer of gravel, cobbles and boulders under the soil.

Type 8 wetlands represent bogs with two different subgroups. Subgroup A represents an open bog composed of living sphagnum mosses over saturated fibric acidic peat. Vegetation is limited to a few species of sedges, black spruce, tamarack, and woody shrubs in the plant family known as Ericaceae that includes such familiar plants as rhododendron and blueberry. Subgroup B represents a coniferous bog and is similar to open bogs but has a canopy of mature tamarack and black spruce. Sphagnum moss may be common, or it may be co-dominant with feather moss. When coniferous bogs form on extensive raised mounds of moss, the upper layers are essentially cutoff from subsurface water and may appear dry.

While major threats from human impacts are regulated under local, state, and federal laws, uncontrolled and/or smaller impacts, including unpermitted development or wetland hydrologic alteration, invasive plant and insects, beaver activity, and climactic threats to ecological resilience can compound and adversely affect the quality and function of high priority wetlands.

PRIORITY AREA SUMMARY:

Areas that are located near public waterways are the main focus of implementing the Wetland Conservation Act (WCA) which regulates how much wetland, shoreland, and overall area is able to be impacted. The higher priority areas are within 1000 feet from all lakes and 500 feet from rivers that are in Koochiching County where population is higher and impacts to wetlands are more likely to happen. These areas have

been deemed high priority for avoiding the loss of major wetland functions such as the filtering of contaminants, biodiversity, flood water storage, and water quality which all protect and aid in the health of our waters in Koochiching County.

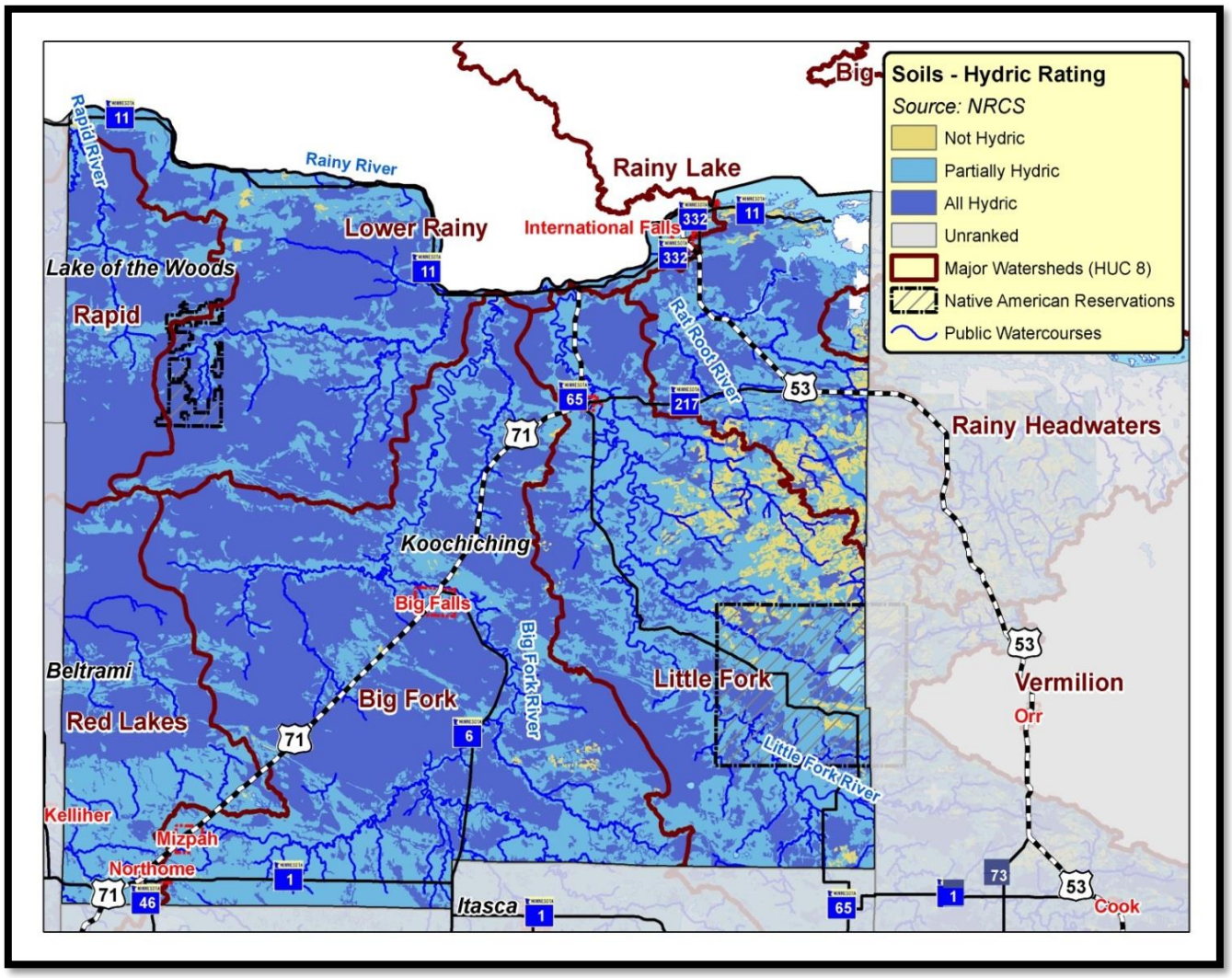


Figure 19: Wetland Areas Classified by Hydric Soil Ratings

ISSUE STATEMENT:

Balancing the needs of economic development with the needs of wetland protection can be challenging in wetland-rich counties like Koochiching. Recognizing that high functioning wetlands are critical to water quality and flood retention/control, Koochiching County feels it is important to effectively manage high priority wetland areas while encouraging local flexibility through the update and adoption of the ***Koochiching County Wetland Flexibility Plan***. In addition, Koochiching County has seen a sizeable increase in beaver activity. While beavers can play an important role in native ecosystem variability, uncontrolled populations are problematic and can result in flooded property as well as the loss of valuable timber stands throughout the county as documented by multi-year aerial photography (1940-2016).

EDUCATION AND OUTREACH (EO)

Education is a large component of every priority concern within this water plan. Koochiching County is a unique area with varying resources throughout its span. Informing and empowering citizens to incorporate best management practices into their daily lives is the first step in conserving Koochiching County's valuable landscape and water resources. Increases in public engagement and natural resource practice participation have been shown through websites, social media, formal public presentations, school presentations, landowner site visits, and workshops.

PRIORITY AREA SUMMARY:

This concern was categorized as county-wide and encompasses all other priority concerns in this document. It is the goal of Koochiching County, Koochiching SWCD, and partners to provide local landowners and visitors of Koochiching County with knowledge of good resource management. Existing educational projects will continue, and new opportunities will be explored. Civic engagement will continue during the TMDL process in all watersheds to engage citizens, business, and organizations in developing their roles/opportunities in restoring and maintaining high quality lakes, streams and wetlands. This work began in 2017 in the Lower Rainy, Rapid, and Rainy River-Rainy Lake watersheds; will begin in 2018 in Little Fork River watershed; and in 2020 in the Big Fork River watershed. This work will include informing the public of the Monitoring and Assessment Report findings, gathering local input towards solutions to any impairments found, and looking for specific strategies which can be used in future water planning.

As part of the civic engagement process, a staff gauge (measuring device for monitoring water levels) has been placed on the Rat Root River at Watson Landing (***pictured right***). Boat landing users are able to read the water level and text in the reading as directed on attached signage. Recently, an information kiosk was constructed in the area and provides information on the purpose this data serves and further instructions on how to submit readings. Efforts to expand this project to other landings in northern Minnesota as well as neighboring landings in Canada are ongoing.

In an effort to educate youth and the general public about the dangers of untreated storm drain runoff, an international drain stenciling project began in 2017 (***pictured below***). This was a partnership between MPCA, Koochiching SWCD and Lake of the Woods Sustainability Foundation. Two events took place, one in International Falls, MN and one in Fort Frances, Ontario (Canada). Local schools, cities, and county became involved in the planning and event day. In addition to painting messages near storm drains, students received an educational demonstration, picked up litter, and hung informational door signs at adjacent homes. Efforts will continue to expand this project each year.

Aiding in the creation of promotional materials for this and other projects will be the new MASWCD Area 8 graphic designer.

This recent increase in regional capacity will further local education and outreach efforts.

Additionally, youth and adults throughout the County will be involved in multiple education events each year, led by the Koochiching SWCD and/or Koochiching County, including the SWCD Area VIII Envirothon, Outdoor Education Days, climatology monitoring, and household hazardous waste collections.

ISSUE STATEMENT:

Education and outreach to raise awareness and understanding of our water resources is essential to the best management of our resources. Collaboration between partnering agencies in Koochiching County, adjacent counties, and internationally is necessary to protect water quality within the boundaries of each watershed.

COMMERCIAL/INDUSTRIAL IMPACTS (CII)

Koochiching County has a number of heavy industries including timber, mining, energy production and distribution, waste disposal and recycling, and construction. Some of these activities have unique water resource management considerations and regulation needs associated with them.
While these industries are vital to the region's economy, they can pose some of the greatest threats to the natural resources in the watershed. Many of these resources are regulated under local, state, and federal authorities and are required to have specific permits intended to minimize those impacts.

PRIORITY AREA SUMMARY:
Transportation of Hazardous Material

The derailment or leakage of hazardous material during transportation can be a significant threat to water quality. While economical, efficient, and vital to the region's economy, a major continental railway corridor that runs through the northeastern portion of the Koochiching County poses a risk for industrial material infiltration into the environment in the event of a disaster. Hazardous material may include but is not limited to coal, fertilizer, metals and minerals, petroleum, and chemicals. Priority areas for water quality contamination from industrial transportation spills are centered in the **Rainy River-Rainy Lake** watershed.

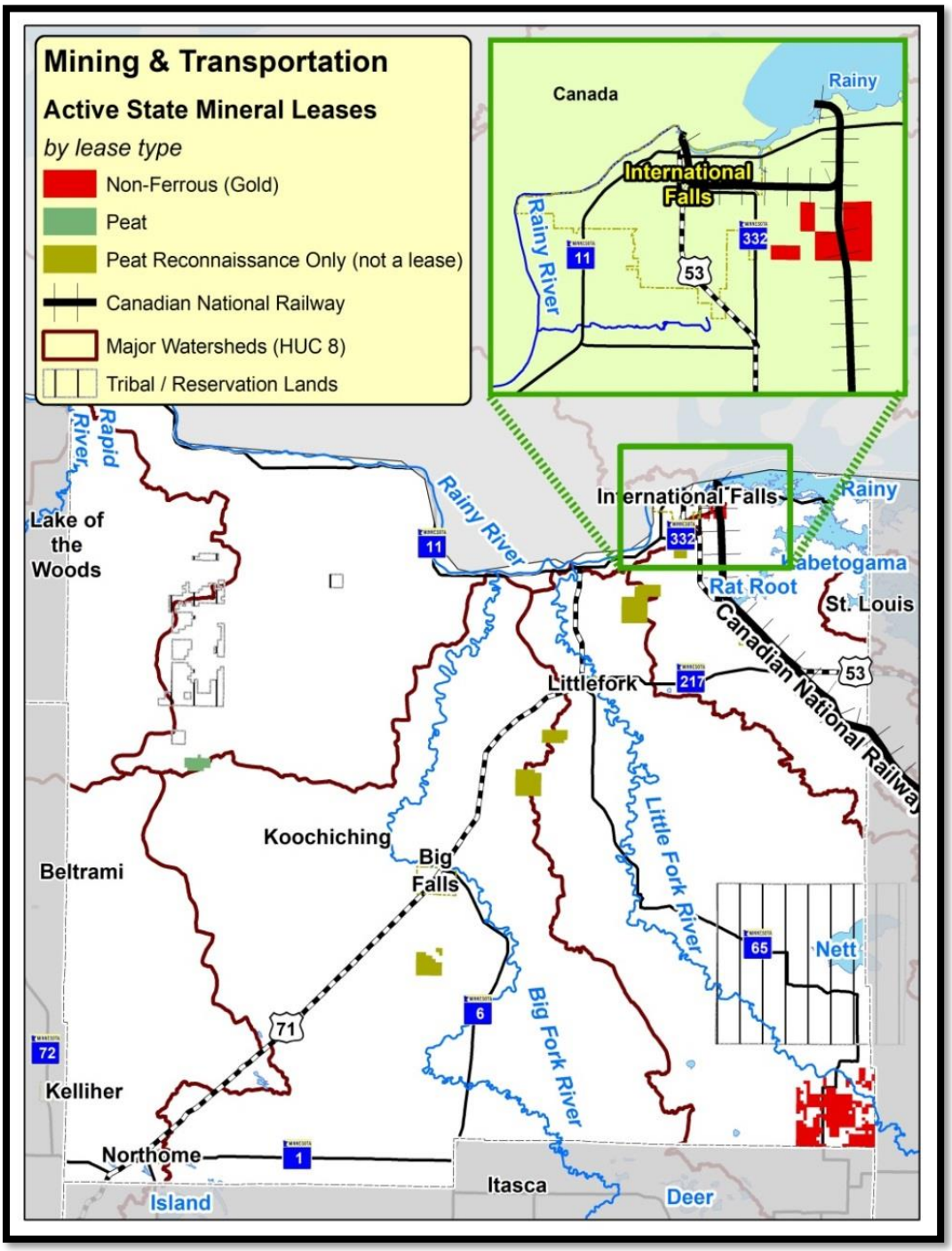


Figure 20: Active State Mineral Leases by Type (2017) & Major Transportation Routes

Mining Operations and Active Mineral Leases

The extraction of mineral, aggregate, and organic materials poses another potential risk to the water quality of Koochiching County. While mining and the exploration for underground resources is regulated by state and federal agencies and must undergo thorough review and permitting processes, potential long-term water quality impacts of mining operations should be monitored and assessed to mitigate and minimize risk to Koochiching's water resources. Active leases administered by the MN DNR are continually changing.

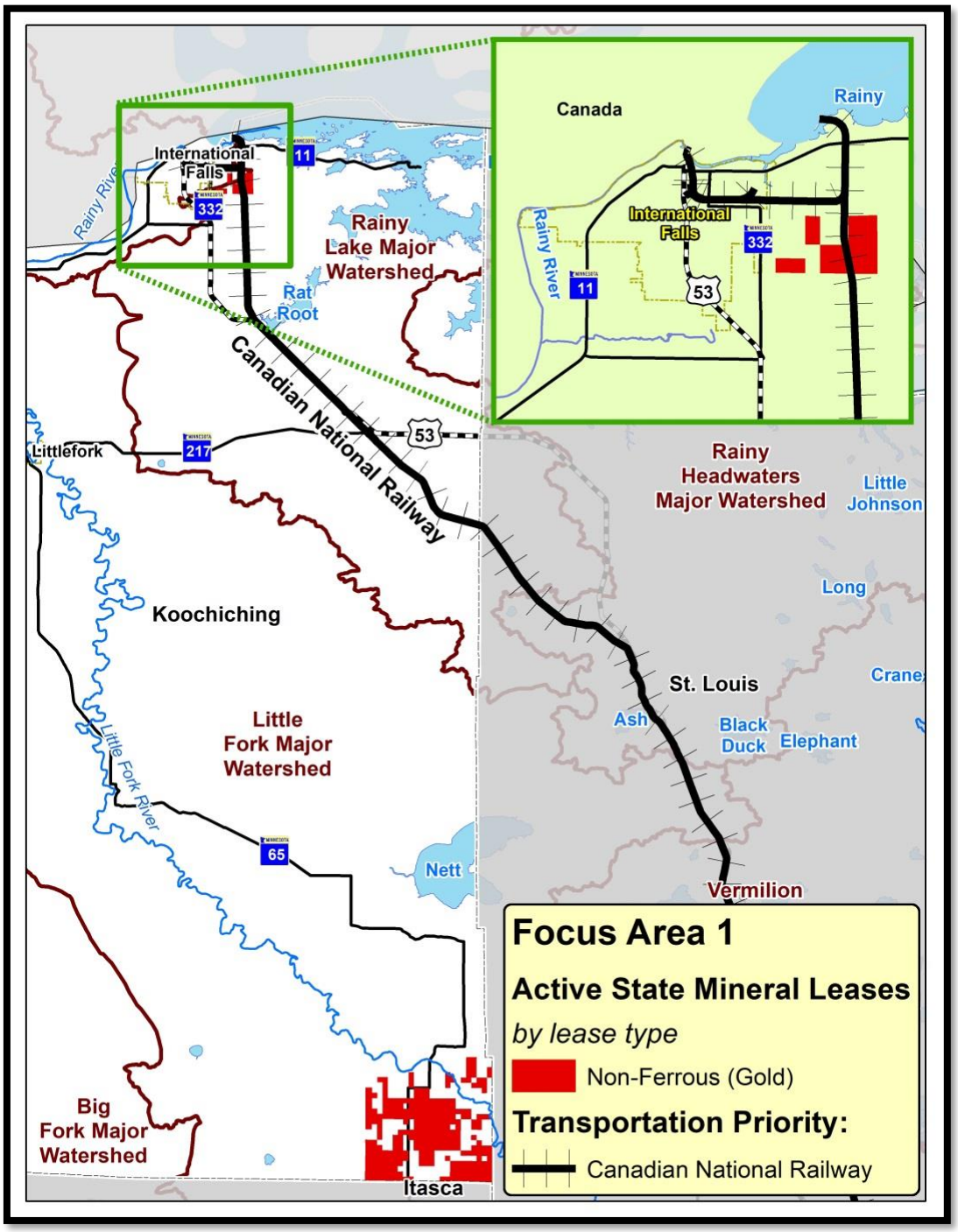


Figure 21: Mineral Leases – Focus Area 1

Currently there are no active metallic mining operations in the county.

However, there are numerous exploratory, non-ferrous (metals other than iron) leases that are concentrated in the southern portion of the Little Fork River watershed and a smaller amount near the county seat of International Falls.

In addition, historic mining activity (such as the Indus and Rainy Lake City gold mining operations) should be considered for periodic follow up regarding residual water quality effects.

Much of Koochiching County's wetlands contain large areas of the decomposed organic material known as ***peat***. This material can be removed and sold as a valuable fertilizer for commercial agricultural operations and individual home gardens. The industrial extraction process requires removal of the vegetative surface layer throughout a wetland complex, decreasing the rate of water filtration and storage and posing potential risks to water quality and hydrologic functions of the watershed. As of this water plan update, peat mining operations are active in the southern portion of the **Lower Rainy River** watershed crossing the boundary into western portion of the **Big Fork River** watershed. While regulated to a similar degree as traditional mineral extraction, monitoring of potential water quality impacts are a necessity in this priority area.

ISSUE STATEMENT:

In some situations, extraction and transportation of local industrial material has the potential to affect biological and water resources. Best management practices in both mining and transportation of materials can eliminate or reduce most predictable risks to an acceptable level.

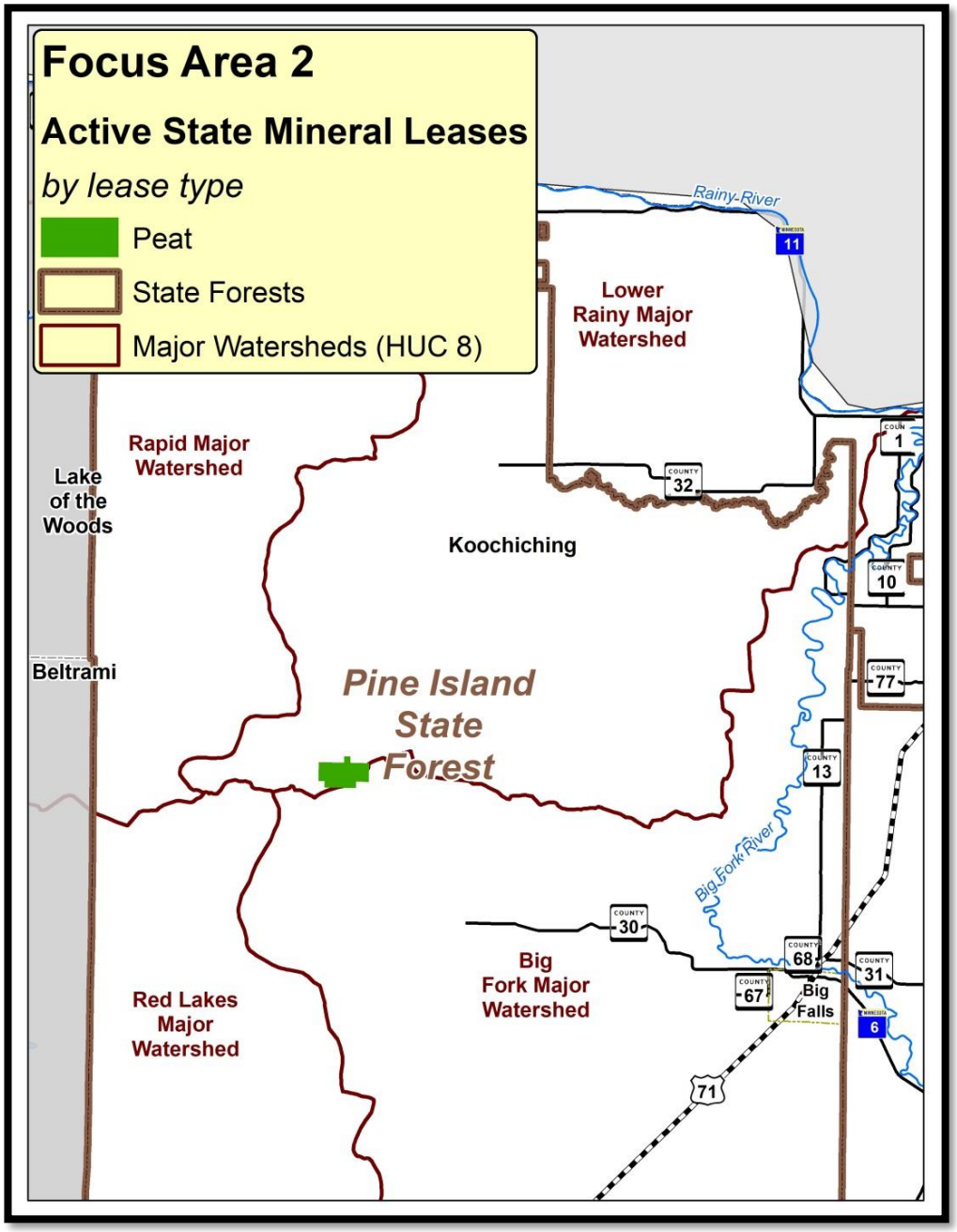


Figure 22: Mineral Leases – Focus Area 2

3 PRIORITY CONCERN GOALS AND OBJECTIVES

SURFACE WATER QUALITY (SWQ)

GOAL 1: Support sustainable agricultural practices and the use of BMPs to improve and protect surface water quality throughout the county.

SWQ 1.1 Identify water quality resource concerns on private lands and address them using voluntary implementation of conservation practices, supported with financial assistance through Farm Bill programs.

SWQ 1.2 Continue to implement the wood ash program for the beneficial reuse of this local byproduct and promote BMPs.

SWQ 1.3 Continue to implement the municipal sludge program for the beneficial reuse of this local byproduct and promote BMPs.

GOAL 2: Ensure the quality of surface drinking water sources and water supply management areas in Koochiching County

SWQ 2.1 Support the MN Department of Health Source Water Protection program.

SWQ 2.2 Educate rural property owners on proper septic treatment/disposal, chemical application disposal, and the potential effects of runoff on drinking water sources.

GOAL 3: Work with businesses, residents and other governmental entities to prepare for, reduce, and/or mitigate potential damage from flood events.

SWQ 3.1 Continue to enforce the 100-year floodplain rule when issuing land use permits to reduce the risk to surface water quality from contaminated flood waters.

SWQ 3.2 Make culvert inventory data available to FEMA to support the creation of new floodplain maps.

SWQ 3.3 Seek funding to address impacts to water resources resulting from flood events.

GOAL 4: Strive to identify, improve, and protect impaired and at-risk waters in Koochiching County.

SWQ 4.1 Implement MPCA's Water Quality Monitoring Programs.

SWQ 4.2 Support MPCA's TMDL and WRAPS studies in the Little Fork River, Big Fork River, Rapid River, Lower Rainy River, and Rainy River-Rainy Lake watersheds.

SWQ 4.3 Explore the Little Fork River subwatersheds via desktop/field analysis for sediment sources and possible projects.

SWQ 4.4 Work with DNR Stream Assessment staff to determine feasibility of installing grade stabilization measures on the portions of the Little Fork River.

SWQ 4.5 Collaborate with the Red Lake Watershed District and other partners on projects aimed at addressing impairments in Bartlett Lake.

GOAL 5: Reduce the risk of surface water contamination from non-compliant and/or failing septic systems.

SWQ 5.1 Assist residents in bringing Subsurface Sewage Treatment Systems (SSTS) into compliance through education, low income grants, and other available means.

SWQ 5.2 Continue to identify and assist landowners in replacing systems that fall into the Imminent Threat to Public Health (ITPH) category.

SWQ 5.3 Complete the Island View Sewer Project. Continue to work with the Voyageurs National Park Clean Water Joint Powers Board (VNPCWJPB) to identify other projects in and around Voyageurs National Park. Look at the feasibility of hooking up other areas adjacent to International Falls and Ranier

GOAL 6: Manage stormwater runoff and infiltration in order to decrease the amount of contaminants such as chemicals, nutrients, toxic metals, litter, and disease-causing organisms from entering the water.

SWQ 6.1 Perform a stormwater best management retrofit analysis for developed areas in the county.

SWQ 6.2 Provide technical assistance and onsite guidance to enable landowners to implement stormwater management practices.

SWQ 6.3 Utilize grants and other funding mechanisms to provide financial incentives for implementing stormwater management practices.

SWQ 6.4 Expand the availability of educational materials, workshops, and network of resources for promoting stormwater management.

GOAL 7: Ensure proper placement and function of culverts to maintain natural water movement and stream stability.

SWQ 7.1 Conduct county-wide culvert inventory and assess condition of county owned culverts.

SWQ 7.2 Although a general permit exists between the MN DNR Ecological and Water Resources and Koochiching County Highway Department for proper culvert placement, encourage broader use of the MN DNR general permit language.

SWQ 7.3 Review the Koochiching County Beaver Management Plan and participate in plan revisions as necessary.

GROUND WATER PROTECTION (GWP)

GOAL 1: Protect ground water by keeping household/business hazardous waste out of drains, landfills, and the environment in Koochiching County.

GWP 1.1 Promote proper disposal of household hazardous waste, electronic waste, and petroleum products by continuing to organize and offer hazardous waste collection program for county residents.

GWP 1.2 Update and implement the Koochiching County Hazard Mitigation Plan

GOAL 2: Preserve drinking water quality by maintaining and updating wellhead protection plans and water supply management areas in Koochiching County.

GWP 2.1 Participate on local wellhead protection planning teams.

GWP 2.2 Provide educational opportunities to non-community water sources and well owners about the importance of wellhead protection and work with MDH to provide nitrate testing on private wells.

GWP 2.3 Work to identify unused/abandoned wells, especially in sensitive groundwater areas, and provide access to cost-share assistance for well sealing.

GWP 2.4 Request MDH to conduct source water contaminant inventories and historical assessments for municipalities.

GOAL 3: Minimize threats to human and environmental health by fixing failing septic systems which can leak and cause contamination of ground water.

GWP 3.1 Seek grant funding to help offset landowner costs associated with installation / repair/replacement of failing septic systems.

GWP 3.2 Continue assisting FEMA, where possible, in the creation of new floodplain maps, particularly in areas of the county where current maps are outdated and/or not effective.

FOREST MANAGEMENT (FM)

GOAL 1: Support and promote the use of sustainable forestry practices on public and private lands throughout the county.

FM 1.1 Promote the use of the Minnesota Forest Resource Council's Voluntary Forest Management Guidelines through offering educational material and technical support.

FM 1.2 Support regional citizen-based sustainable forest groups like the Northern Landscape Committee through participation and technical assistance.

FM 1.3 Promote tree planting/reforestation by making native seedlings and/or transplants available through the Koochiching SWCD annual tree sale program.

GOAL 2: Reduce the risk of parcelization and fragmentation of private forestlands in Koochiching County.

FM 2.1 Offer educational opportunities for interested land owners to learn and participate in the Sustainable Forestry Initiative Act (SFIA), the economic and ecological benefits of sustainable timber harvest, Conservation Stewardship Program (CSP), private land easements, and other incentive programs that reduce the chance of division and fragmentation of wooded tracts.

FM 2.2 Develop a priority area map that would identify high priority forest easement areas to protect forested parcels against slumping and other risks.

GOAL 3: Promote private stewardship practices and healthy forest management opportunities.

FM 3.1 Support private forest stewardship plan writing programs and project cost-share opportunities by offering plan writing and educational resources.

FM 3.2 Promote forest stewardship in sensitive or at-risk areas through targeted cost-share projects like the Little Fork Headwaters In-Holdings NIPF Pilot Project.

FM 3.3 Pursue forest stewardship cost-share opportunities within the Lower Rainy River watershed in order to promote forestry BMP's, tax incentives, and easements that may aid private landowners and reduce the risk of fragmentation, parcelization, and conversion to other land uses.

SHORELINE MANAGEMENT (SM)

GOAL 1: Support responsible use and development of shoreline areas and encourage environmentally friendly practices.

SM 1.1 Continue to administer the Koochiching County Shoreland Management Ordinances and update as needed.

SM 1.2 Provide education and/or conduct workshops on shoreland BMPs including the need for proper permits/project reviews within shoreland areas.

GOAL 2*:* Promote the installation and maintenance of native vegetative buffers in riparian zones in Koochiching County.

SM 2.1 Implement Minnesota Buffer and Soil Loss Law through monitoring, education, and buffer installation assistance to attain County water quality buffer compliance according to BWSR's buffer implementation timeline.

SM 2.2 Provide access to state and federal cost-share for landowners affected by the Minnesota Buffer and Soil Loss Law and those requesting assistance to establish buffers on a voluntary basis on "other waters" as defined in ***Resolution No. 2017-06-05 Koochiching Local Water Resources Riparian Protection Resolution***.

SM 2.3 Ensure required buffer enforcement and jurisdictional duties are completed locally.

GOAL 3: Reduce and prevent shoreline erosion on lakeshores and streambanks.

SM 3.1 Educate landowners about county ordinances related to building setbacks and shoreland activity and promote native/natural vegetation along shorelines.

SM 3.2 Provide financial and technical assistance on shoreline erosion practices through state and federal cost share programs.

SM 3.3 Contact the State Historic Preservation Office (SHPO) and/or the MN DNR's Natural Heritage Information System (NHIS) for projects involving earth work to safeguard historic and/or archeological protection.

SM 3.4 Inform the IJC and other water level management entities of any erosion impacts caused by highly fluctuating water levels.

GOAL 4: Ensure that all properties in shoreland areas have means to properly treat their wastewater. Refer to action items under *Surface Water Quality, Goal 5.*

INVASIVE SPECIES (IS)

GOAL 1: Reduce the risk of new infestations and spread of AIS in county waterbodies while educating citizens in the county on AIS and the risk they pose.

IS 1.1 Continue to follow and update the Koochiching County Aquatic Invasive Species Prevention Plan.

IS 1.2 Work with neighboring entities on the collaborative prevention and/or treatment of aquatic invasive species on shared water bodies.

GOAL 2: Reduce the spread and risk of new infestations in the county while educating citizens on terrestrial invasive species (TIS) and the risk they pose.

IS 2.1 Offer educational materials through partnership with local entities in order to educate citizens on TIS.

IS 2.2 Pursue funding to develop a cooperative weed management area through collaboration across ownership entities across the County. Seek funding mechanisms and partnerships to identify new TIS threats and treat existing TIS threats.

IS 2.3 Monitor for new/existing infestations of TIS.

WETLAND MANAGEMENT (WM)

GOAL 1: Minimize wetland impacts through education and implementation of the Wetland Conservation Act (WCA).

WM 1.1 Implement WCA and promote wetland education through websites, social media, local news media, printed material, and public workshops/events.

WM 1.2 Provide technical and administrative assistance through site visits, project reviews, permit applications, and agency coordination.

GOAL 2: Update the Koochiching County Wetland Flexibility Plan

WM2.1 Provide leadership in revising/updating the Koochiching County Wetland Flexibility Plan to ensure protection of high quality wetlands and allow increased flexibility to utilize low quality/prior converted wetlands to increase economic development.

EDUCATION AND OUTREACH (EO)

GOAL 1: Educate land users about the importance of conserving the unique and valuable resources of Koochiching County and provide opportunities for youth and adult participation in related activities.

EO 1.1 Provide general natural resource education through one-on-one communication, technical assistance, websites, social media, local news media, printed materials, and workshops/presentations.

EO 1.2 Promote and recruit participation in water quality related activities/events including the Area VIII Envirothon, Outdoor Education Days, climatology monitoring, and household hazardous waste collections; develop new educational partnerships as opportunities arise, including but not limited to local schools, Voyageurs National Park, local organizations/associations, etc.

EO 1.3 Work with local, state, and federal partners to conduct civic engagement outreach within the Big Fork River, Little Fork River, Rainy River-Rainy Lake, Lower Rainy River, Upper/Lower Red Lake, and Rapid River Watersheds.

EO 1.4 Participate in bi-national coordination among groups and organizations to promote communication and civic engagement throughout the Rainy River Basin.

COMMERCIAL/INDUSTRIAL IMPACTS (CII)

GOAL 1: Encourage the creation and development of responsible businesses.

CII 1.1 Continue to work with the local development authorities to promote new environmentally sustainable business ventures.

CII 1.2 Educate new and existing business owners on water quality and other environmental issues.

CII 1.3 Continue to enforce zoning and shoreland ordinances with respect to commercial and industrial endeavors.

GOAL 2: Assess potential ground water contamination from solid waste disposal sites.

CII 2.1 Continue monitoring and inventorying active and inactive solid waste disposal sites.

CII 2.2 Work with MPCA where needed to ensure proper collection and treatment of leachate from the former International Falls landfill.

CII 2.3 Continue monthly inspections at county owned facilities throughout the county to reduce the potential for contamination.

GOAL 3: Advocate for water quality protection from potential impacts of mining activities.

CII 3.1 Stay locally involved by reviewing mining leases with state and federal authorities to ensure that water quality is a priority, that lease holder(s) are following all agency regulations, and that all mining, restoration and other plans are followed throughout the life of the project.

4 TARGETED IMPLEMENTATION PROGRAM

Because of the current high quality of Koochiching County's natural and water resources, along with low population densities and extensive amount of protected lands, many of the long-term water quality strategies in this document focus on preservation and/or protection efforts as opposed to restoration activities. As a result, some of the "measurable results" for specific goals and actions are difficult to quantify.

As future TMDL and WRAPS documents are completed for additional watersheds, various goals, actions, and measurable results may be amended during the five-year update to address newly identified restoration needs.

Table 4: Targeted Implementation Plan

Tier 1: Targeted Implementation Activities – Tier 2: Secondary Implementation Activities – Tier 3: Partner Implementation Activities										
Priority Concern	**Goals / Actions**	**Measurable Results**	**Estimated Cost**	**Funding Source**	**Timeline**	**Lead**	**Partners**	**Priority Area**		**Tier**
								Watershed	**Sub-watershed**	
Surface Water Quality	**SWQ Goal 1: Support sustainable agricultural practices and the use of BMPs to improve and protect water quality throughout the county.**									
	SWQ1.1	EQIP general water quality practices installed; CSP water quality enhancements on agricultural lands	$3000/yr	USDA-NRCS Farm Bill	2018-2028	USDA-NRCS	Koochiching SWCD	County-wide	All	3
	SWQ1.2	Minimum of 2000 acres permitted annually for beneficial reuse of wood ash application, saving 50% or more of total ash produced annually from entering landfills	$20,000/yr	Packaging Corporation of America (PCA)	2018-2028	Koochiching SWCD	MPCA, PCA, UND, DH Contracting	County-wide	All	2
	SWQ1.3	100% of municipal sludge produced annually prevented from entering landfills	$30,000/yr	NKASD	2018-2028	NKASD	Mountain Environmental, MPCA, Pace Analytical	County-wide	All	3
	SWQ Goal 2: Protect surface drinking water sources and water supply management areas in Koochiching County.									
	SWQ2.1	MDH source water protection planning strategies integrated into existing county land use plans	N/A	N/A	2018-2028	Koochiching County	MDH, City of International Falls, Koochiching SWCD, City of Fort Frances, NKASD, MPCA, VNP, public	County-wide	All	2

Surface Water Quality	**SWQ2.2**	At least one public education event on septic systems conducted per year; brochures/other education material created and distributed	$3,200/yr	NRBG	2018-2028	Koochiching County	Koochiching SWCD, rural property owners	County-wide	All	1
	SWQ Goal 3: Work with businesses, residents and other governmental entities to prepare for, reduce, and/or mitigate potential damage from flood events.									
	SWQ3.1	No new floodplain rule violations, reducing risk to surface water quality from contaminated flood waters	$5,000/yr	Koochiching County	2018-2028	Koochiching County	Koochiching SWCD, DNR	County-wide	All	2
	SWQ3.2	Updated floodplain maps for Koochiching County	TBD	FEMA	2018	FEMA	MPCA, Koochiching County, Koochiching SWCD	County-wide	All	3
	SWQ3.3	Emergency flood relief funding made available to public and private landowners	$1000/yr	BWSR	2018-2028	Koochiching SWCD	Koochiching County, BWSR, FEMA	County-wide	All	2
	SWQ Goal 4: Strive to identify, improve, and protect impaired and at-risk waters in Koochiching County.									
	SWQ4.1	MPCA's Water Quality Monitoring Programs implemented each year in watersheds assigned by MPCA	$82,000/yr	MPCA	2018-2028	Koochiching SWCD	MPCA, DNR	County-wide	As identified by MPCA	2
	SWQ4.2	WRAPS and TMDL documents completed for 5 watersheds within Koochiching County	$6,500/yr	MPCA	2018-2028	Koochiching SWCD	MPCA, Adjacent SWCDs, Adjacent Counties	County-wide	All	2
	SWQ4.3	Project assessment completed for sub-watersheds identified in the 2017 Little Fork River TMDL as high priority for sediment deposit; Clean Water Fund application submitted if mitigation is deemed feasible	$8,000	MPCA, BWSR	2018	Koochiching SWCD	MPCA, BWSR, Koochiching County, DNR, Itasca SWCD, Itasca County, North St. Louis SWCD, St. Louis County	Little Fork River	Willow River, Valley River, Nett Lake River, Beaver Brook, Bear River	2

Surface Water Quality	**SWQ4.3**	Project assessment completed for additional subwatersheds identified in future WRAPS processes as high priority for sediment deposit	$8,000/yr	MPCA	2018-2023	Koochiching SWCD	BWSR, DNR Koochiching County, adjacent counties and SWCDs	As identified by MPCA	As identified by MPCA	2
	SWQ4.4	Grade stabilization feasibility study completed on entrenched areas of the Little Fork River	$20,000	BWSR	2018-2019	Koochiching SWCD	MN DNR, BWSR	Little Fork River	TBD	2
	SWQ4.5	Lake analyses will be completed as described in the "Paleolimnological study of Bartlett Lake, Koochiching County, MN" grant	$35,595	Science Museum of Minnesota	2019	Red Lake Watershed District	Koochiching SWCD, Koochiching County, Science Museum of MN, St. Croix Watershed Research Station	Upper/Lower Red Lake	Battle River	3
	SWQ Goal 5: Reduce the risk of surface water contamination from non-compliant and/or failing septic systems.									
	SWQ5.1	Apply for grant and make available to low-income households for assistance in upgrading non-compliant septic systems	$13,966/2 yrs	BWSR	2018-2028	Koochiching County	Koochiching SWCD, BWSR	County-wide	All	2
	SWQ5.2	ITPH systems replaced to protect surface and ground water quality	$3,000/yr	NRBG	2018-2028	Koochiching County	MPCA, Property owners	County-wide	All	1
	SWQ5.3	Complete Island View Project bringing sewer service to approximately 400 parcels spread out along more than 15 miles of shoreline	$20 million	Federal, State, County	2019	Koochiching County	USACE, MPCA, MMB, Property Owners of Island View Sewer Project	Rainy River-Rainy Lake	Rainy Lake	2
	SWQ Goal 6: Manage stormwater runoff and infiltration in order to decrease the amount of contaminants such as chemicals, nutrients, toxic metals, litter, and disease-causing organisms from entering the water.									
	SWQ6.1	Conduct a stormwater best management retrofit analysis and explore potential projects	$10,000	BWSR	2019	Koochiching SWCD	Koochiching County, City of International Falls, NKASD	City of Int'l Falls; Rainy-River /Rainy Lake, Lower Rainy River	Rainy Lake, Rainy River	2

Surface Water Quality	**SWQ6.2**	Technical assistance provided for stormwater management practice implementation	$1,000/yr	NRBG	2018-2028	Koochiching SWCD	Koochiching County, BWSR, Landowners	County-wide	All	1
	SWQ6.3	Provide access to funding for landowners to implement stormwater management practices	$3,000/yr	NRBG	2018-2028	Koochiching SWCD	Koochiching County, BWSR	Rainy-River/Rainy Lake; Lower Rainy River; Upper/Lower Red Lake Little Fork River; Big Fork River	Rainy Lake; Rainy River; South Battle River; Lower Little Fork River; Lower Middle Big Fork River	1
	SWQ6.4	The public and municipalities will receive information on stormwater management	$1,000/yr	NRBG	2018-2028	Koochiching SWCD	Koochiching County, BWSR	County-wide	All	1
	SWQ Goal 7: Ensure proper placement and function of culverts to maintain natural water movement and stream stability.									
	SWQ7.1	Complete county-wide culvert inventory and identify incorrectly sized culverts causing water quality issues	$40,000	MPCA	2017-2018	Koochiching SWCD	MPCA, Koochiching County	County-wide	All	2
	SWQ7.2	Increased number of culverts installed properly using MN DNR general permit language	N/A	N/A	2018-2028	MN DNR	Koochiching County, Koochiching SWCD	County-wide	All	3
	SWQ7.3	Decrease in flooding of timberland, roads and other property from beaver activity	$2,000	Koochiching County	2018-2019	Koochiching County	Koochiching County	County-wide	All	1

Ground Water Protection	**GWP Goal 1: Protect ground water by keeping household /business hazardous waste out of drains, landfills, and the environment in Koochiching County.**									
	GWP1.1	Conduct Koochiching Hazardous Waste Collection Day twice/yr	$4,000/yr	Koochiching County	2018-2028	Koochiching County	Koochiching SWCD, Western Lake Superior Sanitary District	County-wide	All	1
	GWP1.2	Updated Koochiching County Hazard Mitigation Plan	$3,000/5 yrs	Koochiching County	2018-2028	Koochiching County	Consultants	County-wide	All	1
	GWP Goal 2: Preserve drinking water quality by maintaining and updating wellhead protection plans and water supply management areas in Koochiching County.									
	GWP2.1	Updated and/or new wellhead protection plans completed	$1,000/yr	Koochiching County	2018-2028	Municipalities	Koochiching County	Big Fork River, Little Fork River, Upper/Lower Red Lake	Lower Middle Big Fork River; Lower Little Fork River; South Battle River	1
	GWP2.2	Wellhead protection education; nitrate clinic conducted for landowners with private wells	$500/yr	Koochiching County	2018-2028	Koochiching County/MDH	Koochiching SWCD, Business owners and residents	County-wide	All	1
	GWP2.3	Abandoned and/or unused wells identified and sealed as required	$500/yr	BWSR	2018-2028	Koochiching SWCD	MDH, Koochiching County, private well owners	County-wide	All	2
	GWP2.4	Source water contaminants inventoried, and historical assessments completed	TBD	MDH	2018-2028	MDH	Municipalities Koochiching County,	County-wide	All	3
	GWP Goal 3: Minimize threats to human and environmental health by fixing failing septic systems which can leak and cause contamination of ground water.									
	GWP3.1	Non-compliant/failing septic systems replaced to prevent ground water contamination	$15,000/yr	State, Federal	2018-2028	Koochiching County	MPCA, DNR, Clean Water Joint Powers Board	Rainy River-Rainy Lake	All	2
	GWP3.2	Updated floodplain maps completed to ensure septic system setbacks are appropriate	$1,000/yr	Koochiching County	2018-2028	Koochiching County	FEMA	County-wide	All	2

Forest Management	**FM Goal 1: Support and promote the use of sustainable forestry practices on public and private lands throughout the county.**									
	FM1.1	Forest stewardship and BMP educational material distributed to landowners	$1,500	MFRC	2018-2028	Koochiching SWCD	MFRC, local industrial agencies, local landowners, state agencies	County-wide	All	2
	FM1.2	Locally led forest management coordination for sustainable forestry	$2,500/yr	BWSR Local Capacity Funding	2018-2028	Koochiching SWCD	MFRC, local industrial agencies, local landowners, state agencies	County-wide	All	1
	FM1.3	Native tree sale conducted each spring for Koochiching County landowners	$8,000/yr	Koochiching SWCD	2018-2028	Koochiching SWCD	Koochiching County	County-wide	All	1
	FM Goal 2: Reduce the risk of parcelization and fragmentation of private forestlands in Koochiching County.									
	FM2.1	At least one private forest management workshop conducted per year	$2,000/yr	MFRC	2018-2028	Koochiching SWCD	MFRC, local industrial agencies, local landowners, state agencies, U of MN Extension, MN Department of Revenue	County-wide	All	2
	FM2.2	Priority area map produced to identify at risk private forestland	$1,000	BWSR Local Capacity Funding	2018-2028	Koochiching SWCD	BWSR, MASWCD Area VIII GIS Specialist	County-wide	All	2
	FM Goal 3: Promote private stewardship practices and healthy forest management opportunities.									
	FM3.1	A minimum of 5 forest stewardship plans written per year; educational materials provided to interested landowners	$6,000/yr	BWSR Local Capacity Funding	2018-2028	Koochiching SWCD	Local landowners, MN DNR	County-wide	All	1

Forest Management	**FM3.2**	A minimum of 5 forest stewardship plans written per year for landowners in targeted areas of the Little Fork River Watershed through the Non-Industrial Private Forestland grant	$4,500/yr	US Forest Service	2018-2019	Koochiching SWCD	MFRC, Aitkin SWCD, Carlton SWCD, Wadena /East Ottertail SWCDs, St. Croix River Association, The Nature Conservancy, MLEP	Little Fork River Watershed	All	2
	FM3.3	Grant submitted for a targeted forest stewardship cost-share project for private inholdings in ecologically important areas	$4,500/yr	US Forest Service	2019-2022	Koochiching SWCD	MFRC, Aitkin SWCD, Carlton SWCD, Wadena /East Ottertail SWCDs, St. Croix River Association, The Nature Conservancy, MLEP	Lower Rainy River Watershed	All	2
Shoreline Management	**SM Goal 1: Support responsible use and development of shoreline areas and encourage environmentally friendly practices.**									
	SM1.1	Updated shoreland management ordinance	$5,000/yr	Koochiching County	2018-2028	Koochiching County	Koochiching SWCD, MN DNR	County-wide	All	1
	SM1.2	Increased awareness and compliance with shoreland activities; increased use of shoreland BMPs.	$2,000/yr	NRBG	2018-2028	Koochiching SWCD	Koochiching County, MN DNR	County-wide	All	1
	SM Goal 2: Promote the installation and maintenance of native vegetative buffers in riparian zones in Koochiching County.									
	SM2.1	Technical assistance provided to landowners affected by the MN Buffer and Soil Loss Law	$5,000/yr	Buffer Law Implementation	2018-2028	Koochiching SWCD	Koochiching County, BWSR	County-wide	All	2
	SM2.2	Financial assistance provided to landowners for installation of riparian buffers required through the MN Buffer and Soil Loss Law	$5,000/yr	Riparian Buffer Cost Share	2018-2028	Koochiching SWCD	Koochiching County, BWSR	County-wide	All	2

Shoreline Management	**SM2.3**	County-wide compliance with the MN Buffer and Soil Loss Law	$50,000/yr	MN Department of Revenue	2018-2028	Koochiching County	Koochiching SWCD, BWSR, MN DNR	County-wide	All	2
	SM Goal 3: Reduce and prevent shoreline erosion on lakeshores and streambanks.									
	SM3.1	Increased native and natural vegetated shorelines	$1,000/yr	NRBG	2018-2028	Koochiching SWCD	Koochiching County, MN DNR	Rainy River-Rainy Lake; Lower Rainy River	All	1
	SM3.2	State cost-share provided for residents eligible for erosion control projects	$10,142/yr	BWSR	2018-2028	Koochiching SWCD	Koochiching County, BWSR	County-wide	All	1
	SM3.3	Historic and archeological protection throughout the county	$0	N/A	2018-2028	Koochiching County	Koochiching SWCD, MN DNR, USACE, NRCS, SHPO, MN DOT	County-wide	All	1
	SM3.4	Increased awareness by water level management entities to better assess impacts of regulatory changes on water quality.	$500/yr	NRBG	2018-2028	Koochiching County, Koochiching SWCD	IJC, IRLWWB	Rainy River-Rainy Lake; Lower Rainy River	All	1
	SM Goal 4: Ensure that all properties in shoreland areas have means to properly treat their wastewater. **See action items under Surface Water Quality, Goal 5.**									
Invasive Species	**IS Goal 1: Reduce the risk of new infestations and spread of AIS in county waterbodies while educating citizens on AIS and the risk they pose.**									
	IS1.1	Conduct one AIS Education event per; increase the number of inspections and decontaminations by 5% each year; drain plug /violations rates not to exceed 3% of all inspections performed	$90,000/yr	MN DNR	2018-2028	Koochiching County	Koochiching SWCD, MN DNR	County-wide	All	2
	IS1.2	Participate in 10 meetings, WebEx, or conference calls per year with neighboring entities	$6,000/yr	MN DNR	2018-2028	Koochiching County	Koochiching SWCD, MN DNR	County-wide	All	2

Invasive Species	**IS Goal 2: Reduce the spread and risk of new infestations in the county while educating citizens on terrestrial invasive species (TIS) and the risk they pose.**									
	IS2.1	TIS education materials distributed during 3 County outdoor themed events per year	$2,000/yr	Koochiching County	2018-2028	Koochiching County	Koochiching SWCD, MN DNR	County-wide	All	1
	IS2.2	Cooperative Weed Management Area established and herbicide application program maintained	$45,000/yr	BWSR, Koochiching County	2018-2028	Koochiching County	Koochiching SWCD, MN DNR, BWSR, Tribal Communities, Molpus	County-wide	All	2
	IS2.3	Existing TIS areas mapped and new infestations identified through TIS monitoring network	$5,000/yr	BWSR Local Capacity	2018-2028	Koochiching SWCD	Koochiching SWCD, MN DNR	County-wide	All	1
Wetland Management	**WM Goal 1: Minimize wetland impacts through education and implementation of the Wetland Conservation Act (WCA).**									
	WM1.1	Projects impacting wetlands are permitted and comply with the WCA	$20,000/yr	NRBG	2018-2028	Koochiching SWCD	Koochiching County, BWSR, USACE	County-wide	All	1
	WM1.2	Decrease in number of wetland violations throughout the County	$10,000/yr	NRBG	2018-2028	Koochiching County, Koochiching SWCD	Koochiching County, BWSR, USACE	County-wide	All	1
	WM Goal 2: Update the Koochiching County Wetland Flexibility Plan									
	WM2.1	Updated county-wide wetland plan that identifies high and low functioning wetlands	$10,000	Koochiching County	2020	Koochiching County	BWSR, USACE, SWCD	County-wide	All	2

Education & Outreach	**EO Goal 1: Educate land users about the importance of conserving the unique and valuable resources of Koochiching County and provide opportunities for youth and adult participation in related activities.**									
	EO1.1	Educational information provided to the residents via written, electronic, and in-person communications tools	$5,000/yr	BWSR Local Capacity Funding	2018-2028	Koochiching SWCD	Koochiching County, local schools and organizations	County-wide	All	1
	EO1.2	Students and volunteers recruited to participate in the Area VIII Envirothon, Outdoor Education Days, climatology monitoring, household hazardous waste collections and similar events annually	$8000/yr	NRBG	2018-2028	Koochiching County, Koochiching SWCD	Local schools and organizations	County-wide	All	1
	EO1.3	Civic engagement activities held within Koochiching County to gather input from local government, businesses and citizens regarding the health and protection of water quality	$23,000/yr	MPCA	2018-2028	Koochiching SWCD	MPCA, local/state/federal government, international agencies, local stakeholders	County-wide	All	2
	EO1.4	Rainy Basin Public Participation Team established, 1 Community Engagement Training held for local partners, Rainy Basin community and citizen values assessment through the MPCA civic engagement interview process, and 1 presentation conducted at the Rainy River-Lake of the Woods Water Quality Forum on the Rainy Basin Community Engagement Project	$51,000	MPCA	2017-2019	Koochiching SWCD	MPCA, LOWWSF	Basin-wide	All	2

Commercial & Industrial Impacts	**CII Goal 1: Encourage the creation and development of responsible businesses.**									
	CII1.1	New sustainable businesses established with no measurable impact to natural resources.	$5,000/yr	KEDA	2018-2028	KEDA	Koochiching County, Municipalities	County-wide	All	3
	CII1.2	Minimum of one conservation education event held per year for business owners.	$500/yr	BWSR	2018-2028	Koochiching SWCD	Koochiching County, KEDA	County-wide	All	1
	CII1.3	All new and existing commercial and industrial businesses meet zoning and shoreland ordinances	$2,000/yr	Koochiching County	2018-2028	Koochiching County	KEDA	County-wide	All	2
	CII Goal 2: Assess potential ground water contamination from solid waste disposal sites.									
	CII2.1	Establishment of water quality baseline at specific waste disposal sites.	$5,000/yr	Koochiching County	2018-2028	Koochiching County	MPCA	Big Fork River	Lower Big Fork River	2
	CII2.2	Continued removal and treatment of leachate from the former Int'l Falls Landfill.	$40,000/yr	MPCA	2018-2028	MPCA	Koochiching County	Rainy River-Rainy Lake	West Rat Root River	3
	CII2.3	Prevention of ground water contamination from landfill sites.	$10,000/yr	Koochiching County	2018-2028	Koochiching County	MPCA	County-wide	All	1
	CII Goal 3: Advocate for water quality protection from potential impacts of mining activities.									
	CII3.1	Preservation of current water quality in all watersheds with no measurable impacts from mining activities.	$1,000/yr	Koochiching County	2018-2028	Koochiching County	State and federal permitting agencies	County-wide	All	1

5 APPENDICES

5.1 APPENDIX A – LIST OF FIGURES & TABLES

5.2 APPENDIX B – LINKS TO SUPPORTING DATA & REPORTS

Rapid River Watershed
http://koochichingswcd.org/rapid-river/
https://www.pca.state.mn.us/water/watersheds/rapid-river#overview
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_78.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/context_report_major_78.pdf
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022947.pdf

Lower Rainy River Watershed
http://koochichingswcd.org/lower-rainy-river/
https://www.pca.state.mn.us/water/watersheds/rainy-river-baudette
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_79.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/context_report_major_79.pdf
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_021585.pdf
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022948.pdf

Rainy River-Rainy Lake Watershed
http://koochichingswcd.org/rainy-riverrainy-lake/
https://www.pca.state.mn.us/water/watersheds/rainy-river-rainy-lake#overview
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_74.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/context_report_major_74.pdf
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022282.pdf

Rainy Headwaters Watershed
https://www.pca.state.mn.us/water/watersheds/rainy-river-headwaters#overview
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_72.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/context_report_major_72.pdf
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022517.pdf

Upper/Lower Red Lake Watershed
http://koochichingswcd.org/upperlower-red-lake/
https://www.pca.state.mn.us/sites/default/files/wq-ws3-09020302b.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_62.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/context_report_major_62.pdf
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022513.pdf

Big Fork River Watershed
http://koochichingswcd.org/big-fork-river/
https://www.pca.state.mn.us/sites/default/files/wq-ws3-09030006b.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_77.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/context_report_major_77.pdf
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022518.pdf

Little Fork River Watershed
http://koochichingswcd.org/little-fork-river/
https://www.pca.state.mn.us/water/watersheds/little-fork-river
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/ReportCard_Major_76.pdf
http://files.dnr.state.mn.us/natural_resources/water/watersheds/tool/watersheds/context_report_major_76.pdf
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_023206.pdf

5.3 APPENDIX C – PRIORITY CONCERNS MAPPING SUMMARY

The following information offers details on how maps were developed by the MASWCD Area 8 GIS Specialist for each priority concern addressed and/or referenced in the **KCCLWMP.**

Vegetation / Land Cover

- *Disturbed/Protected lands (see Risk Maps section at the end of this document)*

- *Forest Cover*

  Although many watersheds in North-central MN have vast amounts of public forests, which are effectively managed by local, state, and federal government, it is the forested lands on private property that provide one of the largest opportunities to maintain high water quality in the watershed. Landowners have a number of educational resources, tax incentives, and other economic opportunities available to them that work to promote long-term forest health and productivity along with benefits to wildlife and water quality. The forest maps produced pull out all upland forest types from the 2011 National Land Cover Data Set (NLCD) and are shown in various maps at the minor watershed level. The 2014 NLCD is due out in the next year or so as well.

- *Land Cover Use (U of M)*

  This is a 15-meter raster dataset of land cover and impervious surfaces created by the University of Minnesota using a combination of multi-temporal Landsat 8 satellite data as well as LiDAR elevation/topography data. This has the potential to be a more accurate land cover data set because it uses more current satellite data (2013 vs. 2011), uses an object-based classification vs. pixel based, and was conducted at a higher resolution than most other land cover datasets (15m vs. 30m). For the objects classified as urban or developed, a regression model relating the Landsat greenness variable to percent impervious was developed to estimate and map the percent impervious surface area at the pixel level.

Water Resources

- *Watersheds (U.S. Geological Survey)*

  Watersheds in the United States were delineated by the USGS using a national standard hierarchical system based on surface hydrologic features and are classified into 6 levels of hydrologic units:

  - 2-digit HUC first-level (region)
  - 4-digit HUC second-level (sub-region)
  - 6-digit HUC third-level (accounting unit)
  - 8-digit HUC fourth-level (cataloguing unit)
  - 10-digit HUC fifth-level (watershed)
  - 12-digit HUC sixth-level (subwatershed)

- *Lakes & Rivers (Public Waters)*

  Lakes included in these maps were based on the list of regulated lakes in each County's Zoning/Land Use Ordinance. Lake boundaries were taken from the DNR's Public Waters GIS layer. The DNR's Public Watercourse layer was used as the primary rivers layer.

- *Wetlands*

  Wetlands are transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Minnesota has 8-12 different types of wetlands (depending on the classification system). Wetland maps are based on the National Wetlands Inventory (NWI). The National Wetlands Inventory is a national program sponsored by the US Fish and Wildlife Service (USFWS). The NWI database was funded jointly between the USFWS and the State. The base data was developed through interpretation of National Aerial Photography Program (NAPP) imagery (approx. 1:50,000 scale, typically color-infrared) in conjunction with limited field verification studies. Ancillary data sources, particularly USGS Quadrangle Maps and soil surveys, were also used in the interpretation process. After interpreting the aerial photographs, delineations were transferred to a 1:24,000 scale orthogonal base, digitized, and coded in conformance to the USFWS classification scheme. For North-central MN, NWI data is current from the 1980s, but the DNR plans to update this data in the next few years.

- *Impairments*

  Water is sampled for a variety of things (biology, chemistry, turbidity, bacteria, etc.). These measurements are summarized and reported to the Minnesota Pollution Control Agency (MPCA), who is mandated by the federal Environmental Protection Agency to maintain water quality standards for Minnesota's lakes and streams. Those water bodies that do not meet standards are deemed to be impaired and require total maximum daily load (TMDL) studies in order to set pollutant reduction goals needed to restore these waters. Impairments are mapped by parameter (especially streams, where more variability exists) as most impaired lakes are just for nutrients (and Mercury, which I generally do not map however). This information is current through the 2014 list.

- *Phosphorus Sensitivity (DNR)*

  This layer was created by DNR to identify Lakes of Phosphorus Sensitivity Significance (LPSS) within Minnesota. Available lake data were analyzed to classify lakes based on sensitivity to nutrient pollution. Phosphorus sensitivity was estimated for each lake by predicting how much water clarity would be reduced with additional phosphorus loading to the lake. A phosphorus sensitivity significance index was formulated to prioritize lakes as they relate to MPCA's policy objective of focusing on high quality, unimpaired lakes at greatest risk of becoming impaired. The phosphorus sensitivity significance index is a function of phosphorus sensitivity, lake size, lake total phosphorus concentration, proximity to MPCA's phosphorus impairment thresholds, and watershed disturbance.

The goal of the LPSS list was to objectively prioritize lakes based on their sensitivity to phosphorus pollution. These results are not appropriate for those lakes listed by MPCA as impaired. For more info on this DNR layer, go to: ftp://ftp.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_dnr/env_lakes_phosphorus_sensitivity/metadata/lakes_of_phosphorus_sensitivity_significance_20150820.pdf

Soils, Geomorphology, and Groundwater

Geomorphology and surficial geology are critical drivers of watershed health for a number of reasons. Outwash areas (sand & gravel) allow better infiltration for both groundwater recharge and stormwater management than till. However, these areas can be more erodible and can also be more difficult to stabilize. The heavier till soils shed more water and when eroded can contribute sediment further downstream. Outwash areas with a surficial geology of sands or gravels are the most critical areas to focus on in terms of both groundwater recharge and potential contamination. Many Minnesotans rely on this surficial aquifer for their source of drinking water. Since there is a direct connection from the surface to this aquifer, any contamination from human uses at the surface could have a direct effect. In addition, any disruptions to the recharge capacity of this aquifer could affect water levels in the groundwater and lakes / streams. Agricultural withdrawals in these surficial aquifers are often significant in many areas. The DNR maintains a layer of these annual appropriations with the annual amount of usage (a permit is required for over 10,000 GPD or 1 Million GPY). The associated irrigated areas data is available in some areas. There are basic statewide groundwater province information and geomorphic layers that show the glacial phases, sedimentary (surficial), and topographic information. There are also other layers available depending on the location. These are summarized below:

- *Water Table Aquifer Vulnerability*

  This dataset provides a rating of Minnesota water table aquifer vulnerability. The data, methodology and ratings are based on similar work done previously by Porcher [Porcher, E. (1989), Ground water contamination susceptibility in Minnesota, Minnesota Pollution Control Agency, St. Paul, Minn., 29 p.].

  In 1989, Porcher prepared a statewide assessment of groundwater contamination susceptibility, using the statewide Quaternary geology map that was prepared by the Minnesota Geological Survey (Hobbs, 1982). In 2011, an interagency group (MDH, MDA, and DNR) worked to find a map that would be an update to the map used by Porcher in 1989. The interagency work group decided that the statewide geomorphology layer that was produced by the Minnesota Geological Survey and the University of Minnesota at Duluth (DNR, UMD, MGS 1997) provided an updated interpretation of Quaternary materials and at higher level of resolution than the 1982 map with the addition of a Quaternary sand and gravel layer file to capture the "Beach Sands" in the northeast.

The geomorphology layer includes generalized categories of the sediments or bedrock types that are associated with landforms and can be used to assign geologic sensitivity ratings. The ratings are based upon guidance from the Geologic Sensitivity Project Workgroup (DNR, 1991). MDA developed this dataset based on the guidance from the 2011 interagency workgroup.

- *Groundwater Management Areas*

  A Groundwater Management Area (GWMA) is the surface and subsurface area within which a GWMA Plan, approved by the commissioner of the Department of Natural Resources, is implemented in accordance with Minnesota Statute 103G.287, Subd. 4. The boundaries of a GWMA are delineated by identifiable physical features, Minnesota Department of Natural Resources Catchments, and/or political or administrative boundaries.

- *Wellhead Protection:*

  These sets of data include the drinking water supply management area (DWSMA) boundaries and the vulnerability levels within each management area in Minnesota for public water supplies. DWSMAs are the boundaries (based on political infrastructure -i.e. parcels, streets) that surround a wellhead protection area (which is also an available dataset). Smaller community systems are also available to show on maps and are known as Source Water Assessment areas.

- *Hydrogeologic Sensitivity of the Water Table Aquifer (Pollution Sensitivity: Near-Surface Materials):*

  Hydrogeologic sensitivity mapping was done as part of the nitrate risk mapping effort. Hydrogeologic sensitivity of the water table aquifer was generated using guidelines provided in Minnesota DNR (1991). Areas were ranked as low, moderate, high, or very high hydrogeologic sensitivity based on permeability of near-surface bedrock or unconsolidated geologic materials, estimated depth to water, and land slope. LOW (1 point) was assigned to areas 1) covered by geologic materials primarily composed of clay or shale close to the surface, or 2) where land slopes were greater than 12% (regardless of underlying geologic materials). MODERATE (2 points) was assigned to areas not already assigned LOW and underlain by modified clay till (clay plus a significant sand or gravel fraction). MODERATE was also assigned where land slopes were at least 6% and at most 12% (regardless of the rank of underlying geologic materials, except that material already ranked LOW remained LOW). HIGH (3 points) was assigned to areas not already assigned LOW or MODERATE, and underlain by unconsolidated sands and gravels. HIGH was also assigned to areas where limestone, dolomite, or sandstone were close to the surface and covered by loess. VERY HIGH (4 points) was assigned to areas not already assigned LOW, MODERATE or HIGH, where loess was absent, and shallow bedrock was limestone, dolomite, or sandstone.

Risk Maps

- *Protected & Disturbed*

  North-central MN is blessed with abundant water resources. Because of this sheer quantity, sorting these resources and prioritizing implementation strategies as well as funding are some of the biggest water planning challenges. Often, very few of each County's water resources are impaired and need to be restored, a new approach was developed to focus on which resources could benefit from water protection strategies, rather than restoration strategies. For these counties with an abundance of natural resources and relatively low land values, a well-designed protection approach is much more efficient and cost-effective than a restoration approach. Crow Wing County and the Mississippi Headwaters Board developed a protection model that assesses minor watersheds/catchments to determine which watersheds are already in good condition (class: vigilance), which could use more protection (classes: protection, enhance-protection), and which would likely need restoration strategies (enhancement). This method was simplified (called the 'basic model') and now expanding to the rest of north-central MN. When prioritizing which watersheds to focus implementation strategies on, the distinction between public and private lands is important. From a planning perspective, watersheds with a high percentage of public land are not as at-risk for future water qualify impacts and do not require the same level of focus as watersheds with a smaller percentage of public land. For purposes of this plan, public land is considered to be already in a "protected" state. Public water bodies, such as lakes and streams, are also "protected" in that they cannot generally be filled or drained. Wetlands on private lands are also protected by the Minnesota Wetland Conservation Act (WCA), which also generally prohibits draining or filling of wetland areas. Many counties also have land with perpetual conservation easements, which are also considered to be protected. These areas added together forms one of the critical foundations of this plan's watershed classification. Another potential addition to the protection model is land enrolled in the Sustainable Forest Incentives Act (SFIA) program.

  In addition to the amount of these protected lands/waters, each minor watershed was classified and mapped by the amount of land use disturbance, water quality trends, and various risk factors. Sandy Verry (US Forest Service Hydrologist, retired) and others have determined that the amount of mature forest cover on the landscape is a driving factor in sediment and nutrient delivery to downstream water bodies. Minimizing these changes in land use is important to maintaining high water quality. For this plan, land use disturbance includes land cover classes that are converted from a natural, forested state to man-induced classes such as: developed, cultivated, pasture, or grassland.
  In addition to protected areas and land use disturbance, watershed health is also influenced by the water quality of the lands / streams that they contain. For this plan, watersheds with a declining trend in water quality (or impaired) were classified lower simply because of the declining trend. See below for more:

- *Water Quality Trends (MPCA & RMB labs)*

  From 2008-2015, several north-central MN counties contracted with an environmental laboratory (RMB labs) to compile all available data for larger lakes from all the different sources, evaluate the data quality, identify data gaps, assess the data, and look for water quality trends. These reports contain a summary of the current state of these larger lakes with recommendations for future monitoring. In addition to lake trends, these reports provided an analysis of the lakeshed of each lake assessed to determine the amount of "protected" land (i.e. public lands/waters & wetlands) within the area that drained to the lake. These lake screening reports formed the basis of Crow Wing County's basic "protection" approach. Lake water quality trend is one of the three key data elements used to determine the risk classification of each minor watershed. "Protected" lands and land cover within the watershed were also used. In recent years, MPCA has also published lake trend information, which often is more available. Which trend is used depends on the county/SWCD's preference and the available information.

- *Risk Classification*

  Vigilance

  These watersheds have a high percentage of protected lands (> 50%), low amount of disturbed land cover classes (<8 %) and have no other potential threats to water quality, such as development, agriculture, drainage, or extractive uses. While all watersheds have some risk for negative impacts, "vigilance" watersheds have the least amount of risk and thus warrant the least amount of implementation focus.

  Protection

  These watersheds generally have a percentage of protected lands that is > 40% but also have some potential risk factors that could negatively impact the surface water (and / or groundwater) systems of the watershed. Low to moderate amounts of impervious surfaces, agriculture, and development pressure result in disturbed land cover classes of 8 – 25 %. These watersheds are generally in good condition and have no lakes with a declining trend in water quality. However, these watersheds have the potential to be better protected with strategies such as private forest stewardship, stormwater management, shoreline buffers, and conservation easements.

  Enhance-Protection

  These watersheds generally have a percentage of protected lands that is generally less than 40% but also have many potential risk factors that could negatively impact the surface water (and / or groundwater) systems of the watershed. Moderate amounts of impervious surfaces, development pressures (existing or potential), disturbed land cover classes, animal units, extractive uses, and/ or drainage systems are likely within the watershed. In addition, lakes or streams that are impaired or have declining trends in water quality may also be present in

these watersheds. These watersheds are in fair condition but have many opportunities for project implementation and further protection efforts.

Enhance

These watersheds generally have a percentage of protected lands that is < 40 % but also have numerous potential risk factors that could negatively impact the surface water (and / or groundwater) systems of the watershed. High amounts of impervious surfaces, agriculture, development pressures lead to disturbed land cover classes of >50%. In addition, lakes or streams with declining trends in water quality or that are impaired for nutrients are also typically present in these watersheds. These watersheds are in fair to poor condition and while there are limited opportunities for protection or restoration strategies, many projects would likely be required to make a meaningful difference.

A decision tree is available that shows the classification of each minor watershed/catchment based on the amount of protection, land use disturbance, and water quality trend.

Other

- *Mining and Transportation*

  These shapefiles contain the boundaries of current active mining leases administered by the MNDNR to private mining and exploration companies. This information is continually updated as leases expire, are renewed, or new applications are approved. Transportation corridor shapefiles, including rail and roads, represent their extent and boundaries across the state.

- *Number of Animal Units (MPCA)*

  This dataset contains point representations of the locations of animal feedlot facilities in Minnesota based on information from the Minnesota Pollution Control Agency. The attributes for each feedlot point include information about the number and types of animals for each location, specifically including the type of primary animal and the number of animal units. This information is aggregated by counting the total number of animal units for each minor watershed.

- *Watershed Health Assessment Framework Scores (DNR)*

  The Watershed Health Index approach identifies and analyzes data that characterizes the principal components of watershed health at the Major Watershed and Catchment scales. For each of the principal components (Geomorphology, Connectivity, Hydrology, Biology, and Water Quality) indices and underlying metrics have been developed that describe the relative health of the system. The generated values are scaled from 0 to 100 to provide a statewide comparable index of relative health risk. For more info: http://www.dnr.state.mn.us/whaf/index.html

5.4 APPENDIX D – PRIORITY CONCERNS SCOPING DOCUMENT

Koochiching County

Priority Concerns Scoping Document

for the

2017 Koochiching County Comprehensive Local Water Management Plan Update

Prepared by:
Koochiching Soil and Water Conservation District, Koochiching Environmental Services Department, and Koochiching County Water Plan Advisory Committee

KOOCHICHING
SOIL & WATER
CONSERVATION DISTRICT

KOOCHICHING COUNTY
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Int'l Falls, MN
56649

The following Priority Concerns Scoping Document (PCSD), as defined in Minnesota Statutes §103B.305, was developed to identify resource priority concerns in Koochiching County and will serve as the foundation for the 2017 Koochiching County Comprehensive Local Water Management Plan update. The PCSD was developed by the Koochiching Soil and Water Conservation District, the Koochiching County Environmental Services Department, and the Koochiching County Water Plan Advisory Committee; it contains a detailed account of the identification and selection process for chosen priority concerns.

1 *INTRODUCTION*

1.1 County Overview

County Name and County Seat

Koochiching County is located on the northern border of Minnesota. The City of International Falls is the county seat and is located on the international border between the United States and Canada.

Koochiching County is home to seven (7) major watersheds including the Rapid River, Lower Rainy, Rainy Lake, Rainy Headwaters, Upper/Lower Red Lakes, Big Fork River, and Little Fork River. Within these major watersheds are 157 minor watersheds.

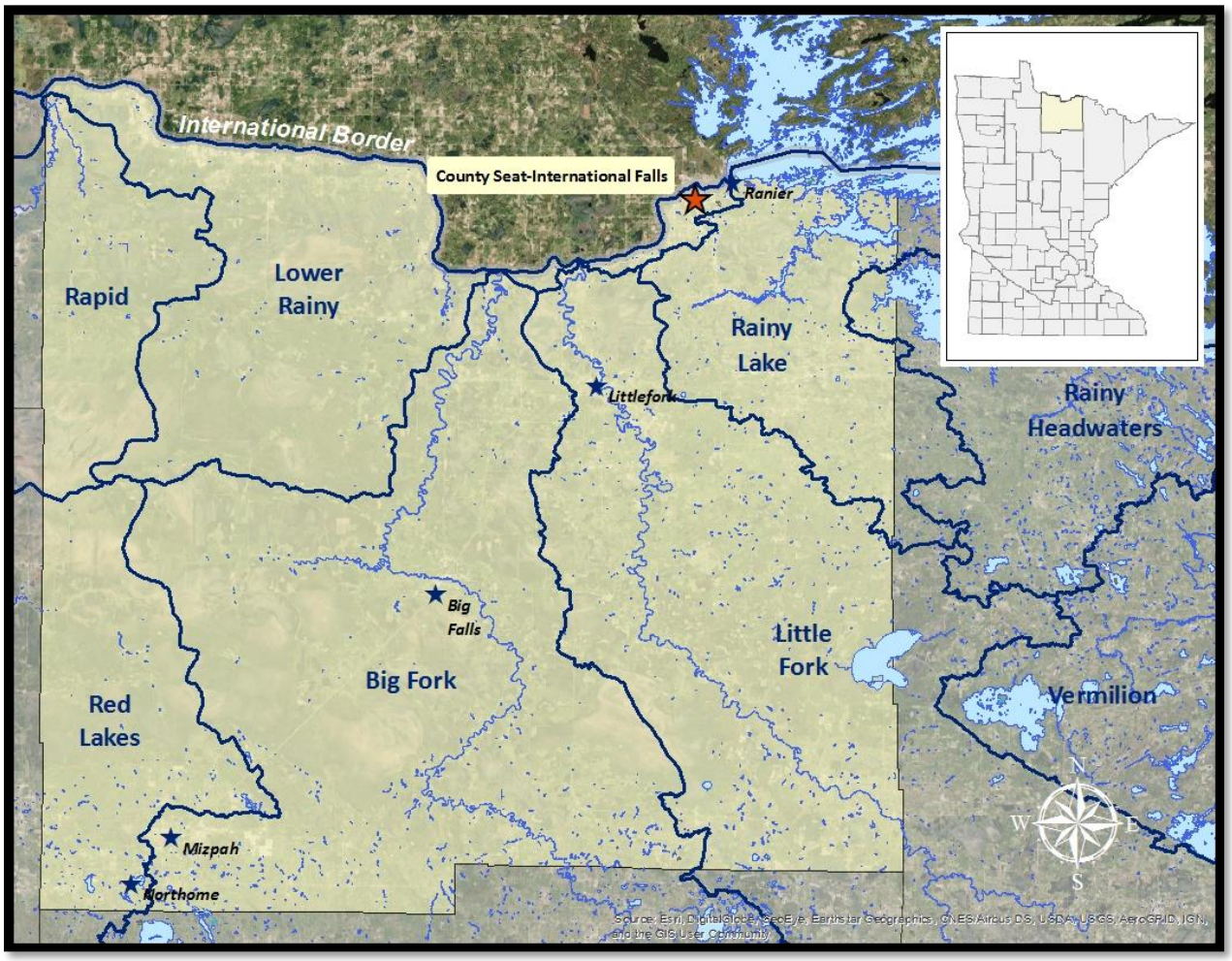


Figure 1: Koochiching County Seat and Boundaries

County Population and Trend Projections

Koochiching County's population has undergone a consistent decline since the 1980's. Over a 30-year span, there was a 24% decrease in population from 17,571 in 1980 to 13,311 in 2010. According to the US Census Bureau, this decline has continued as illustrated in Table 1 below.

Table 1: Koochiching County Population (Source: US Census Bureau)

Koochiching County, Minnesota	Population Estimate (as of July 1)						
	2010	2011	2012	2013	2014	2015	2016
	13,307	13,245	13,190	13,121	12,880	12,829	12,628

As illustrated in Table 2 below, the State of Minnesota projects that the population of Koochiching County will continue to decline well into the future.

Table 2: Koochiching County Population Projections (Source: Minnesota State Demographic Center)

Koochiching County, Minnesota	Population Projections from Years 2020 - 2050						
	2020	2025	2030	2035	2040	2045	2050
	11,931	11,205	10,570	9,995	9,489	9,035	8,597

County Land Use and Trend Projections

Koochiching County is the second largest county in the State of Minnesota with a land area totaling over 2,000,000 acres or approximately 3,182 square miles. The dominant land use continues to be sustainable forests which are managed for both the local economy and environmental values including water quality.

Figure 2 below highlights the landscape cover types, of which approximately 77% is open water or wetland. According to the National Land Cover Dataset, land cover conversion was less than 1% from 2001 to 2006. Since 2006, land use has seen the same minimal change as in the previous five years. Given Koochiching County's unique landscape, ownership and small population, change in land use over the next 10 years is expected to be negligible.

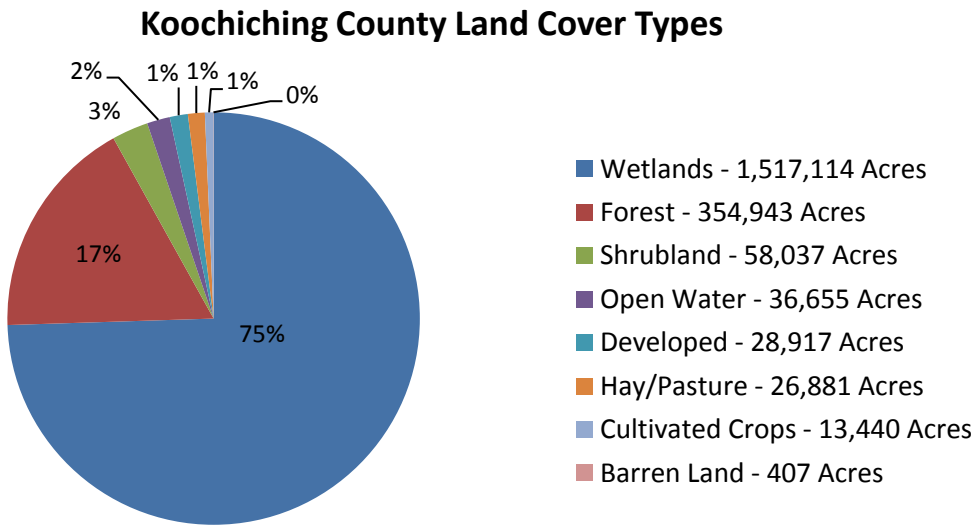


Figure 2: Koochiching County Land Cover Types (Source: National Land Cover Dataset, 2011)

County Ownership

As shown in Figure 3 below, the State of Minnesota is the largest landowner in Koochiching County with over one million acres or approximately 55%. Privately owned lands account for 495,608 acres, or 25% of land in Koochiching County, with approximately 224,510 acres being professionally managed forest/timber land and 271,098 acres under individual private ownership.

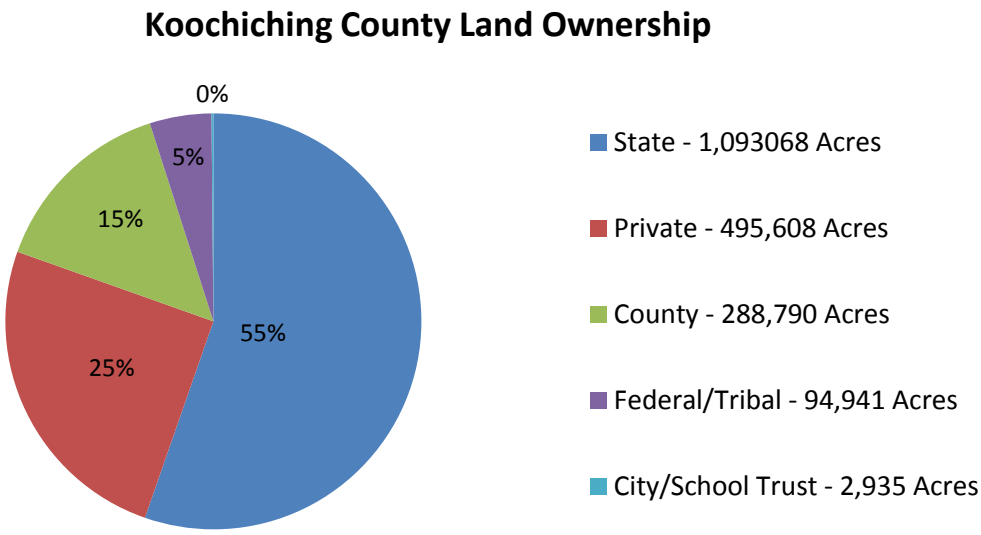


Figure 3: Koochiching County Land Ownership (Source: Koochiching County Parcel Data)

1.2 Plan Information

Local Government Unit (LGU) Delegation

The Koochiching County Board of Commissioners has delegated the Comprehensive Local Water Management Plan (CLWMP) update responsibility to the Environmental Services Department (ESD) and the Koochiching Soil and Water Conservation District (SWCD). As the LGUs responsible for the development and implementation of the CLWMP, the ESD and SWCD are committed to protecting, preserving and improving water resources in Koochiching County.

Plan History

The first resolution by Koochiching County to develop a Comprehensive Local Water Management Plan was in 1990, with the original plan being completed and adopted in 1995. Pursuant to Minnesota Statutes §103B.305, the CLWMP has been revised three times in the following years: 2000, 2007, and 2012.

The current Koochiching County Comprehensive Local Water Management Plan is set to expire on December 31, 2017.

Six priority concerns were identified in the current CLWMP with the intention of protecting the surface water, ground water and related resources within Koochiching County. These priority

concerns were reviewed and amended as needed based on input from the public, WPAC, and state and local agencies.

2007 - 2017 Priority Concerns

1. Erosion
2. Subsurface Sewage Treatment Systems
3. Education/Collaboration
4. Monitoring
5. Protection of Water Quality
6. Forestry

2 PRIORITY CONCERNS ADDRESSED BY THE PLAN

Eight priority concerns have been identified for the 2017 Koochiching County Comprehensive Local Water Management Plan are (listed in no specific order – prioritization will be established according to watershed in the CLWMP)

1. Surface Water Quality
2. Ground Water Protection
3. Forest Management
4. Shoreline Management
5. Invasive Species
6. Wetland Management
7. Education and Outreach
8. Commercial / Industrial Impacts

3 PRIORITY CONCERNS IDENTIFICATION PROCESS

The five-step priority concerns identification process began on 1/10/17 with a *Notice of Decision to Revise and Update the Koochiching County Comprehensive Local Water Management Plan* sent from Koochiching County to state and local agencies.

Next, input was solicited in the form of a "request for input" letter mailed to stakeholders from the Koochiching County Environmental Services Department (ESD). Respondents were invited to provide input on the following via written letter, survey link, or email:

The county invites everyone to submit input on water management issues they feel the Plan should address. For each issue submitted, please consider including the following information:

1. *Why is it important that the plan focus on this issue or concern (include or cite relevant data if available)?*
2. *What actions do you think are needed to address the concern?*
3. *What resources are available to accomplish the actions (names, funding sources, partnerships, etc.)?*
4. *What specific areas of the county are the highest priorities in regard to this issue?*

Third, input was sought via an online survey that was posted on the Koochiching County and SWCD websites, shared through social media, announced on the local radio station, and emailed to the same stakeholder list as the letter. In addition to the questions in the original survey letter, the online survey also collected demographic information, areas of concern, and a list of 10 possible priority concerns that

they were asked to rank against each other. A section that allowed respondents to add additional priority concerns and comments was also included.

The next step was to hold a public meeting to gather input regarding priority concerns and provide information regarding the water plan history and planning process.

Finally, a Water Plan Advisory Committee (WPAC) was appointed by the Koochiching County Board on 2/28/17 made up of resource professionals and engaged citizens throughout the County. The WPAC met on 3/29/17 and 4/12/17 to review priority concerns and comments provided by stakeholders as well as to provide additional input.

3.1 Public and Internal Forums

The following provides a time table outlining the initiatives to collect public and internal input on priority concerns.

1/10/17	Koochiching County Board of Commissioners adopted resolution to update plan.
1/18/17	Public input request letter sent via email and mail.
1/18 – 4/3/17	Public input survey posted to Koochiching SWCD and Koochiching County websites and shared on local social media pages (public comment period end date extended from March 10, 2017 to April 3, 2017).
1/18 – 3/10/17	Public input announcement aired on local radio stations KGHS/KSDM.
2/28/17	Koochiching County Board appointed the Water Plan Advisory Committee (WPAC).
3/3/17	Reminder sent out to all original request participants to complete public input.
3/22/17	Koochiching County ESD and Koochiching SWCD hosted a public input meeting to assist in determining priority concerns.
3/29/17	Koochiching ESD and Koochiching SWCD hosted an initial WPAC committee meeting to review public comments and assist in determining priority concerns.
4/12/17	Koochiching ESD and Koochiching SWCD hosted a second WPAC committee meeting to review the draft PCSD, assist in selecting priority concerns to be addressed in the CLWMP, and provide input on revisions to the draft PCSD.
4/17/17	Draft PCSD sent for state agency review and comment.

List of Participants and Affiliated Organizations

On January 18, 2017 a request for input letter with online survey link was sent to city offices in Koochiching County, Koochiching SWCD volunteers, local landowners, local industries, local river boards, resource organizations including the Department of Natural Resources, Bois Forte Band Tribal Government, Board of Soil and Water Resources, MN Department of Agriculture, MN Department of Health, Rainy Lake Sportfishing Club, Red Lake Watershed District, USDA-NRCS, Koochiching County and adjacent county officials, International Joint Commission, the Environmental Quality Board, and the Northern Landscape Committee.

On February 28, 2017 the Koochiching County Board appointed an 18-member Water Plan Advisory Committee (WPAC). Members appointed included:

Dale Olson – Koochiching County ESD
Stephen Blair – Koochiching County ESD
Eldon Voigt – Koochiching SWCD Supervisor
Pam Tomevi – Koochiching SWCD Staff
Eric Olson – Koochiching SWCD Staff
Sam Soderman – Koochiching SWCD Staff
James Aasen – Koochiching SWCD Staff
Chad Severts – BWSR Board Conservationist
Mike Kennedy – MPCA Project Manager
Kevin Adee – Koochiching County Commissioner
Kelly Voigt – NRCS District Conservationist
Kevin Peterson – DNR Fisheries Supervisor
Marc Windsnes – Former WPAC Member
Shawn Pritchard – Interested Landowner
Tom Crompton – Private Forester
Tom Worth – Rainy Lake Sportfishing Club
Brian Dreher – Local Resident
Cyndy Strand – N. Koochiching Area Sanitary District

On March 22, 2017 the Koochiching ESD and SWCD hosted a *Koochiching County Water Plan Priority Concerns Public Meeting* in Littlefork, MN. Participants included:

Ralph Lewis – Koochiching SWCD
Kelly Meyers –Int'l Falls City Council
Dale Olson – Koochiching County ESD
Jolen Simon – Koochiching SWCD
Eric Olson – Koochiching SWCD
Sam Soderman – Koochiching SWCD
Richard Dreher – Koochiching SWCD
James Aasen – Koochiching SWCD
Brian Dreher – WPAC Member
Mitch Brinks – Water Protection Specialist
Sandy Heem–Littlefork City Council Member
Al Linder – Koochiching SWCD
Kevin Sather –Littlefork City Council Member
George Aitchison – Koochiching SWCD
Eldon Voigt – Koochiching SWCD
Gary Saunders – Koochiching County Resident
Larry Aasen – Koochiching County Resident
Wayne Skoe – Koochiching County Commissioner
Kevin Adee – Koochiching County Commissioner

On March 29, 2017 the Koochiching ESD and SWCD met with the WPAC. Participants included:

Dale Olson – Koochiching County ESD
Stephen Blair – Koochiching County ESD
Pam Tomevi – Koochiching SWCD
Jolen Simon – Koochiching SWCD
Eric Olson – Koochiching SWCD
Sam Soderman – Koochiching SWCD
James Aasen – Koochiching SWCD
Kevin Peterson – DNR Fisheries
Chad Severts – BWSR Board Conservationist
Kevin Adee – Koochiching County Commissioner
Brian Dreher – WPAC Member
Cyndy Strand – N. Koochiching Area Sanitary District
Marc Windsnes – Former WPAC Member

On April 12, 2017 the Koochiching ESD and SWCD met with the WPAC. Participants included:

Dale Olson – Koochiching County ESD
Eldon Voigt – Koochiching SWCD
Pam Tomevi – Koochiching SWCD
Jolen Simon – Koochiching SWCD
Sam Soderman – Koochiching SWCD
James Aasen – Koochiching SWCD
Kevin Adee – Koochiching County Commissioner
Kevin Peterson – DNR Fisheries Supervisor
Marc Windsnes – Former WPAC Member
Cyndy Strand – N. Koochiching Area Sanitary District
Rian Reed – DNR Area Hydrologist

Summary of Proceedings and Supporting Data

From the "request for input" letter mailed to stakeholders, two written responses were received: one from the MN Department of Health and one from the Red Lake Watershed District (summarized below):

Summary of response submitted by the **Minnesota Department of Health**:

- **Priority Concern 1: Source Water Protection for the City of International Falls and resorts located on Rainy Lake** - The public drinking water supply for International Falls (PWS ID 1360002) is exclusively from Rainy Lake and its adjacent watersheds. International Falls' protection area includes portions of the Rainy River – Rainy Lake major watershed and the Black Bay Catchment Area. These surface water-based drinking water systems are highly susceptible to potential contaminants entering the public water supply at a level that may result in an adverse human health impact. Protecting the drinking water for the residents of, and visitors to, Koochiching County is a wise and relatively inexpensive investment in the future.

- **Priority Concern 2: Protect groundwater-based drinking water sources within Koochiching County** - In addition to the 5 public water suppliers, there are another 23 public water suppliers that utilize groundwater appropriation for their domestic use. The balance of Koochiching County's residents depends on groundwater for their drinking water supply. Wellhead protection efforts will result in public water suppliers developing and implementing Wellhead Protection Plans. All public water suppliers within the county should be identified in the Local Water Plan (see the above referenced web address for a complete listing of public water suppliers in Koochiching County). Residents who utilize private wells also need protection from potential contaminant sources. This can be accomplished by maintaining proper setbacks to potential contaminant sources and implementing proper well management efforts, including appropriate land use decision-making.

- **Priority Concern 3: Sealing of unused, unsealed wells** - Proper well abandonment is an effective means of protecting groundwater from potential contaminants that may be carried into an aquifer. Also, unused, unsealed wells can pose a safety hazard to children or animals and a potential liability to the well owner.

Summary of response submitted by the **Red Lake Watershed District**:

- The Upper/Lower Red Lakes Watershed Restoration and Protection Strategy (WRAPS) project is in progress. The Red Lake DNR has taken the lead on that project. The watershed was assessed in 2016 and some impairments were identified. Fish index of biological integrity (F-IBI) impairments were found in the Lost River and the Tamarac River. The North Cormorant River was found to be impaired by high total suspended

solids, low dissolved oxygen, and high E. coli bacteria. Bartlett Lake will be listed as impaired by eutrophication in 2018 List of Impaired Waters.

- Our office has only sampled as far north as the North Cormorant River in the Upper/Lower Red Lakes watershed in recent years. Based upon the high E. coli concentrations that we've found there, livestock operations along streams would be a primary water quality concern.

- Bartlett Lake, in Northome, has been the subject of water quality studies. Some paleolimnology work was recently conducted in the lake. I have attached the work plan for that study.

From the online surveys, eleven completed responses were received. Results from total responses are shown in Table 3 below. Note: Six additional surveys were returned with incomplete data that could not be scored. Written comments contained in those six surveys have been incorporated into Table 4 in section 3.3.

Table 3: Online Survey Priority Concerns Ranking (1=High / 10=Low)

Preliminary Priority Concerns Public Input Online Survey Results										
	Failing Septic Systems	Shoreline Erosion	Aquatic Invasive Species (AIS)	Lack of Shoreline Vegetative Buffers	Sensitive Shoreline Zoning	Flooding Risk	Natural Habitat Destruction	Development Pressure/Issues	Water Resource Education	Adjacent Agricultural Pressure
Survey1	3	7	10	5	4	1	8	6	9	2
Survey2	5	3	1	4	7	9	8	6	2	10
Survey3	1	4	3	5	7	2	8	9	6	10
Survey4	1	7	2	8	5	9	3	4	6	10
Survey5	6	5	8	4	1	10	3	2	9	7
Survey6	1	3	6	5	9	10	2	8	4	7
Survey7	1	6	3	4	9	2	8	5	7	10
Survey8	4	1	10	3	6	2	9	8	7	5
Survey9	5	4	8	9	2	7	10	6	3	1
Survey10	9	1	3	8	5	2	4	6	10	7
Survey11	1	3	2	5	8	10	4	7	9	6
Average:	**3.36**	**4.00**	**5.09**	**5.45**	**5.73**	**5.82**	**6.09**	**6.09**	**6.55**	**6.82**
Priority Ranking	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**7**	**9**	**10**

Additional comments received from online surveys included concerns over shoreline erosion and property values affected by high water on Rainy River.

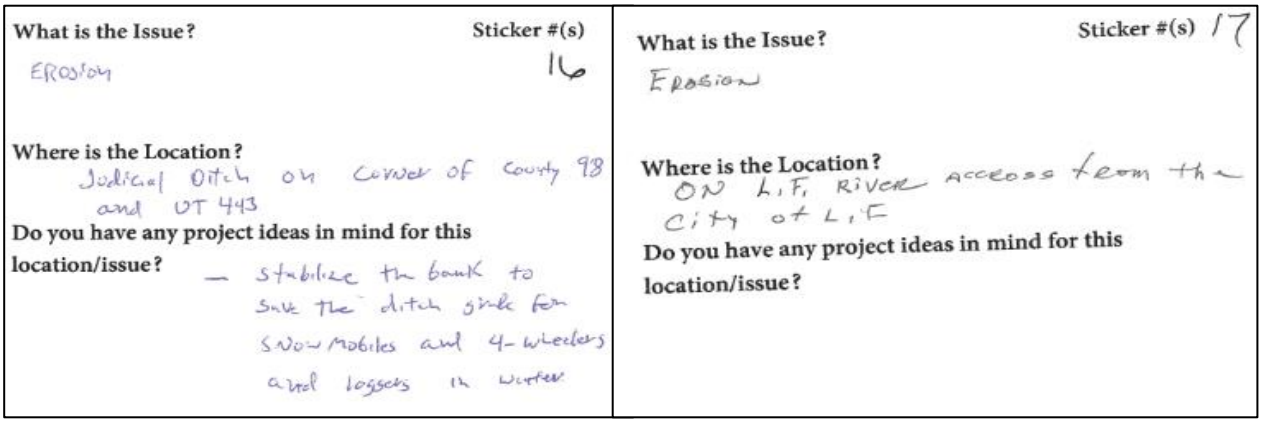
During the public meeting, attendees were invited to provide input on priority concerns. Main comments received included concerns about septic systems, aquatic and terrestrial invasive species, water quality monitoring, forestry practices, buffers, and flooding. These concerns have been incorporated into Table 4 in section 3.3.

During the WPAC meeting, members reviewed the issues/concerns relayed via written comment and surveys. Additional concerns raised included mining practices and mineral leases and the

possible effect on water quality. These concerns have been incorporated into Table 4 in section 3.3. These collective responses were used to help identify priority concerns to be addressed in the 2017 Koochiching County Comprehensive Local Water Management Plan.

3.2 Written Comments Received at Public Meetings

During the public meeting on 3/22/17, verbal comments were recorded in the meeting minutes and are included in sections *3.1 Summary of Proceedings and Supporting Data* and *3.3 Concerns Identified by Stakeholders*. Only two written comments were received as shown:



What is the Issue? Sticker #(s) 16
Erosion
Where is the Location? Judicial Ditch on corner of County 98 and UT 443
Do you have any project ideas in mind for this location/issue? — stabilize the bank to save the ditch bank for snowmobiles and 4-wheelers and loggers in winter

What is the Issue? Sticker #(s) 17
Erosion
Where is the Location? ON L.F. River access from the City of L.F.
Do you have any project ideas in mind for this location/issue?

3.3 Concerns Identified by Stakeholders

Table 4 is a compilation of issues and concerns brought forth by stakeholders during public meetings and submitted via written response, verbal input, email, and online/paper surveys:

Table 4: Stakeholder Issues / Concerns

Issue / Concerns	Description of Concern
Adjacent Agricultural Pressure	Agricultural practices adjacent to waterbodies and waterways can create a risk if not managed properly.
Algal Blooms on Rainy Lake	Harmful algal blooms (including blue-green algae) can have severe impacts on human health, aquatic ecosystems and the economy.
Aquatic Invasive Species	The presence/spread of aquatic invasive species has potential to alter native ecosystems and negatively impact fisheries, recreational activities and tourism.
Bartlett Lake Water Quality	Bartlett Lake does not meet the current total phosphorous standards (30 ppb) for lakes in the Northern Lakes Forested (NLF) ecoregion.
Coliform	High levels of fecal coliform and/or E. coli in waterbodies can have severe impacts on human health, aquatic ecosystems and the economy.
Development Pressure/Issues	Development and/or land use changes can negatively affect high value resources in Koochiching County.

Failing Septic Systems	Failing septic systems can leak and cause contamination of ground and surface water, threatening human and environmental health.
Flooding Risk	Flood events pose a risk for property damage, structural damage and/or erosion. Flood water can become contaminated with effluent and runoff, leading to health risks.
Forestry Best Management Practices	Protection of forest hydrology through BMPs and designation of riparian zones, training and education program, community involvement, and retention of county ownership of water accesses can have a positive effect on water quality.
Terrestrial Invasive Species	The presence/spread of terrestrial invasive species has potential to alter native ecosystems, reduce biodiversity and negatively impact wildlife habitat, water quality and recreational activities.
Lack of Shoreline Vegetative Buffers	Areas of land that border creeks, rivers and lakes need perennial vegetation to help stabilize shorelines and prevent erosion.
Mining	Mining poses a potential environmental impact that could negatively affect Koochiching County resources. There are 36 State mineral leases in Koochiching County as of January 1, 2017.
Natural Habitat Destruction	Habitats are no longer able to support the native biodiversity.
Parcelization	Forestland sold and divided into smaller parcels increases the likelihood of development, making landscape level forest management difficult.
Protect Groundwater-based Drinking Water Sources in the County	Land use practices have the potential to adversely impact groundwater quantity and quality resulting in reduced groundwater recharge and impacts to receiving water and drinking water supplies.
Rail Crossings	Rail crossing accidents can potentially threaten surface and ground water quality.
Sealing of Unused, Unsealed Wells	Unsealed, unused wells provide a direct pathway for contaminants to quickly enter groundwater.
Sensitive Shoreline Zoning	Zoning regulations in place to protect sensitive shoreline from erosion.
Shoreline Erosion	Gradual (although sometimes rapid), removal of sediments from the shoreline contributes to sedimentation and increased phosphorous levels in a waterbody.
Source Water Protection for International Falls and Resorts on Rainy Lake	International Falls is the most populated city in the county and protecting the drinking water for the city and resort communities located on Rainy Lake is critical.
Education and Outreach	Public education is essential to sustain high water quality and good land management practices in Koochiching County.

4 PRIORITY CONCERN SELECTION PROCESS

4.1 Priority Concerns Selected

Stakeholders were asked to consider what resources they felt were most threatened and to prioritize corresponding resource concerns. Local ordinances, local and regional water management plans, Total Maximum Daily Load (TMDL) plans and Watershed Restoration and Protection Strategy Reports (WRAPS) were also reviewed to ensure consistency.

Based on available data, local expertise, survey responses, and public input eight main priority concerns were selected for inclusion in the CLWMP. Of the specific concerns in Table 4 above, all were incorporated into one or more of the main priority concerns selected.

Priority concerns selected for inclusion in the 2017 Koochiching County Comprehensive Local Water Management Plan are described below (priority order will be established per watershed):

1 **Surface Water Quality**
- Agriculture
- Drinking Water Source Protection
- Flood Events
- Impaired / At Risk Waters
- Septic Systems
- Stormwater Management

2 **Ground Water Protection**
- Septic Systems
- Solid & Hazardous Waste Disposal
- Wellhead & Drinking Water Source Protection

3 **Forest Management**
- Sustainable Forestry
- Parcelization
- Private Forest Management
- Riparian Zone Management

4 **Shoreline Management**
- Development Pressure/Issues
- Septic Systems
- Shoreline Buffers
- Shoreline Erosion

5 **Invasive Species**
- Aquatic Invasive Species
- Terrestrial Invasive Species

6 **Wetland Management**
- Implement the Wetland Conservation Act
- Update the Koochiching County Wetland Flexibility Plan

7 **Education and Outreach**
- Water Quality Education & Collaboration

8 **Commercial / Industrial Impacts**
- Mining
- Transportation

4.2 Priority Concerns Relative to Other Plans

While determining priority concerns, existing state, local, and regional management plans were reviewed including the Northern Landscape Management Plan, Big Fork River Watershed Restoration and Protection Strategies (WRAPS) draft document, Little Fork River WRAPS draft document, Little Fork River Watershed Total Maximum Daily Load (TMDL) draft document, Little Fork/Rat Root River Management Plan, Big Fork River Management Plan, "A Long Range Plan for the Management of Tax Forfeited Land and Forest Resources of Koochiching County", 2014 Multi-Hazard Mitigation Plan,

Koochiching County Subsurface Sewage Treatment System (SSTS) Ordinance, Voyageur's National Park General Management Plan (2002), 2007 Koochiching County Priority Concerns Document from the Comprehensive Local Water Management Plan, and the 2015 "A Water Quality Plan of Study for the Lake of the Woods Basin". This review confirmed that all priority concerns selected are supported by these existing resource management plans. The review of other plans also highlighted additional issues for consideration including stormwater reduction, feedlot permits and rules, and preservation of historical and archeological sites.

5 PRIORITY CONCERNS NOT ADDRESSED BY THE PLAN

The main priority concerns selected allowed for considerable flexibility to address all issues identified by stakeholders listed in section 3.3 (see Table 4).