



# COMPREHENSIVE LOCAL WATER MANAGEMENT PLAN

2010-2020, Amended 2014

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The Plan is available on the Carlton County website [www.co.carlton.mn.us](http://www.co.carlton.mn.us)

***ABBREVIATIONS***

ACOE	Army Corps of Engineers
AIS	Aquatic Invasive Species
BMP	Best Management Practices
BWSR	Board of Water and Soil Resources
CLMP	Citizens Lake Monitoring Program
CSMP	Citizens Stream Monitoring Program
CWA	Clean Water Act
DNR	Department of Natural Resources
EDA	Environmental Data Access
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FEMA	Federal Emergency Management Agency
FDL	Fond du Lac Reservation
HUC	Hydrologic Unit Code
LGU	Local Government Unit
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MPCA	Minnesota Pollution Control Agency
NPDES	Nationl Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	Nephelometric turbidity units
OHWL	Ordinary High Water Level
PCB	Polychlorinated biphenyls
RIM	Reinvest in Minnesota
SDS	State Disposal System
SSTS	Subsurface Sewage Treatment System
STORET	Storage and Retrieval (of Data)
SWAG	Surface Water Assessment Grant
SWCD	Soil and Water Consercation District
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
USGS	U.S. Geological Survey
WCA	Wetland Conservation Act
WRAPS	Watershed Restoration and Protection Strategy

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## **EXECUTIVE SUMMARY**

### ***BACKGROUND***

Carlton County (County) is a rural county covering 862 square miles. It is located in northeastern Minnesota within easy commuting distance to the Duluth-Superior metropolitan area. The county seat is located in the City of Carlton. Surrounding counties include St. Louis to the north, Aitkin to the west, Pine to the south and Douglas County of Wisconsin to the east (Figure 1).

The State of Minnesota (State) is divided into ten major basins. Carlton County is unique in that it overlaps three of those basins. Water, from the eastern part of the county, flows east into the Lake Superior Basin. In the northwest corner of the county water flows west into the Upper Mississippi River Basin. Water, in the southwestern portion of the county, moves south into the St. Croix River Basin.

At the sub-basin level, Carlton County is divided into four major watersheds: St. Louis River, Nemadji River, Kettle River and Mississippi River (Grand Rapids) watersheds (Figure 2). Table 1 summarizes each basin, watershed and hydrologic unit code (HUC).

Carlton County Zoning and Environmental Services is the local government unit (LGU) responsible for the Local Water Management Plan program. The Carlton County water planning process started when the Board of Commissioners passed a resolution on December 8, 1987, to enter into the Comprehensive Local Water Planning process under Chapter 103B.311 and 103B.315 of Minnesota Statutes. The original Carlton County Comprehensive Local Water Plan was completed and adopted in late 1990. This is the fourth generation Local Water Management Plan in Carlton County. The Local Water Management Plan was amended as required by 2015 for the five year review.

A group of the County's citizens, known as the Water Plan Task Force, has been authorized by the Carlton County Board of Commissioners to oversee the development and implementation of the 2010-2020 Carlton County Water Plan. The Task Force met over a twelve-month period in 2008-2009 to establish the priority concerns, goals, objectives and implementation plan. The Task Force reconvened in 2014 to review and update the priority concerns, goals, objectives and implementation plan.

### ***PLAN PURPOSE***

The purpose of the Carlton County Comprehensive Local Water Management Plan is to provide the citizens of Carlton County, local government, state agencies and federal agencies with a strategic framework to manage its water and land resources. An assessment for the required five year review was undertaken in 2014.

This plan has been developed to meet the requirements of Minnesota Statute 103B.301 – 103B.355. In accordance with those guidelines, this Water Plan covers the whole of Carlton County; addresses water problems in the context of watershed units and groundwater systems; is based upon principles of sound hydrologic management of water, effective environmental protection, and efficient management; is consistent with

local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or groundwater system; and will extend ten years from the date the Board approves the local water management plan, with a five-year review.

***PAST ACCOMPLISHMENTS (1990-2009)***

Since the Water Plan was adopted in 1990, there have been numerous accomplishments. Highlights of these accomplishments include:

- Abandoned well sealing demonstrations.
- Wetland Conservation Act workshops.
- Several Nemadji River Watershed studies and projects.
- Lake monitoring with volunteers.
- County Well Index computerized.
- Established several shoreland revegetation demonstration sites.
- Geologic Atlas.
- Private well testing program.
- Development of Wellhead Protection Plans with five Local Government Units.
- Feedlot inventory (Level 1 and 2).
- Carlton County Waters Summit.
- Collaboration with Arrowhead Water Quality Team on several projects.
- Several shoreland best management practices (BMP) workshops.

***CURRENT ACCOMPLISHMENTS (2010 - 2014)***

Since the 4<sup>th</sup> generation Water Plan was adopted in 2010, there have been numerous accomplishments. Highlights of these accomplishments include:

- Three surface water assessment grants (SWAG), see Tables 3 and 4, Water Quality Data.
- Annual DNR grants for the treatment of Eurasian Water Milfoil on Chub Lake.
- Facilitated semi-annual watercraft inspection training for Lake Associations.
- Developed a plan for annual water craft inspections and aquatic invasive species (AIS) education.
- Assisted the Carlton County Soil & Water Conservation District (SWCD) with implementation of a US Fish and Wildlife Service grant for a fish passage culvert inventory in the Nemadji River watershed.
- Participated in the Nemadji River and Deer Creek Total Maximum Daily Load (TMDL) process.
- Applied for two Clean Water Legacy grants for shoreland restoration projects.
- Annually reviewed and updated outreach and educational materials, including the County website.
- Attend and participate in lake association meetings, including Chub Lake, Big Sandy Watershed, Tamarack Lake, and Hanging Horn Lake.
- 2011 Waters Summit for all county lake associations held in conjunction with a volunteer recognition ceremony.

- Provided technical assistance on numerous shoreland restoration projects, including a project on the Midway River which included 12 acres of riparian buffer restoration on 7 sites.
- Facilitated the development of a public, web-based GIS mapping tool for the County.
- Added lakes listed on the Carlton County Waters and Wetlands Inventory Map, but not included in the Shoreland Management Overlay District, to list of waters requiring a 100 feet setback for Subsurface Sewage Treatment Systems (SSTS) from the Ordinary High Water Level (OHWL).
- Implemented a program for safe disposal of unwanted medications for county residents.
- Invasive Weed Management Project completed with local expert meetings held, development and distribution of a local resource document, and outreach with local groups.
- The SWCD assisted nine landowners in utilizing the 2012 Flooded Well Disinfection/Sealing Grant from the Minnesota Department of Health.
- Obtained more than \$600,000 in state grant funding and over \$450,000 in federal grant funding through the water plan process.

#### ***DESCRIPTION OF PRIORITY CONCERNS***

The Carlton County Water Plan Task Force has selected three priority concerns that will be addressed in this plan. The priority concerns were selected through a public input process that included written and online surveys, three public meetings and input from representatives of various government agencies and local groups. A complete history of this process can be found in the Carlton County Local Water Management Plan Priority Concerns Scoping Document found in Appendix A. From this process, the Task Force selected the following priority concerns:

#### ***Priority Concern #1: Water Quality in County Lakes, Rivers and Streams***

There are fourteen lakes in the County that are on the Impaired Water List, six of which are impaired due to excess nutrients (Eagle Lake, Tamarack Lake, Upper Island Lake, Lower Island Lake, Lac La Belle, and Net Lake). The other lakes are currently listed for mercury impairment only, which is addressed on a state level. The four major rivers in the County (Kettle, St. Louis, and Nemadji) have been identified as impaired due to a combination of conditions. The impairments for the turbidity include the Nemadji River and many streams in the Nemadji River Watershed. The selection of water quality in County lakes, rivers and streams as a priority concern includes assessing water to determine impairment, supporting the Impaired Waters TMDL process, and maintaining and improving water quality. Each of these goals is appropriate under the four major HUCs described in Table 1. TMDLs are a part of the MPCA's Watershed Restoration and Protection Strategy (WRAPS) process, which is a 10-year cycle of restoration and protection of the 81 watersheds in Minnesota.

**Goal 1:** Assess waters that do not have sufficient data for determination of impairment.

**Goal 2:** Improve water resources that are listed as impaired.

**Goal 3:** Maintain and improve water quality in County lakes, rivers and streams.

*Estimated cost to implement Priority Concern #1: \$339,500 – \$584,000*

***Priority Concern #2: Development Impacts and Land Use***

According to the Carlton County Comprehensive Plan (2001), most development within the next 20 years is anticipated to occur in the northeastern part of the County and along Interstate 35. According to the Carlton County Comprehensive Plan, some areas, such as Thomson, Blackhoof, and Wrenshall Townships, as well as the cities of Wrenshall and Moose Lake, grew by over 10 percent from 1990 to 1998. With the close proximity to Duluth and Superior, Carlton County is seeing additional development of rural lands for residential housing. Due to the excellent recreational opportunities in Carlton County, it is also ideal for seasonal residents. Many of the small cabins along lakeshore have converted to retirement homes. Increased development has the potential to have a negative impact on the County's resources. The selection of development impacts and land use as a priority concern includes the following:

**Goal 1:** Promote strengthening regulations and policies to maintain and improve the County's water resources.

**Goal 2:** Encourage low impact development in both current and proposed developments.

**Goal 3:** Continue to manage and protect wetlands.

*Estimated cost to implement Priority Concern #2: \$582,000*

***Priority Concern #3: Promote and Educate the Public about the County's Water Resources***

Education is a major component for all of the selected priority concerns, but the Task Force felt it deserved a priority of its own. The selection of education as a priority concern includes both promoting programs that are currently in place to enhance our water resources and the development of new programs. Through the public meeting process, residents were asked which audiences would benefit from education about the County's natural resources. The public process chose the following target audiences:

- Current and seasonal residents
- Schools
- Contractors and developers
- Realtors
- Lake associations
- Recreational users
- Public employees



The selection to promote and educate the public about the County's water resources as a priority concern includes the following goals and actions:

**Goal 1:** Promote programs currently in place to enhance our water resources.

**Goal 2:** Educate the public on how to be good stewards of the land and water.

*Estimated cost to implement Priority Concern #3: \$500,000*

***CONSISTENCY WITH OTHER PLANS***

The Carlton County Water Management Plan is consistent with existing local and State plans reviewed. Local and State plans reviewed include the Carlton County Comprehensive Plan; Cromwell, Carlton, Wrenshall, Barnum, Moose Lake, Esko, Cloquet and Kettle River Wellhead Protection Plans; St. Louis, Pine and Aitkin Local Water Management Plans and Carlton County Ordinances.

***RECOMMENDATIONS TO OTHER PLANS AND OFFICIAL CONTROLS***

No recommendations to other plans and official controls are included in this plan unless otherwise noted. However, the Water Plan Task Force would like to reserve the right to make recommendations, when necessary, for the duration of this plan.

### ***PRIORITY CONCERNS ASSESSMENT***

Three priority concerns were identified by the Task Force during the Water Management Plan update process: (1) water quality in County lakes, rivers and streams; (2) development impacts and land use; (3) promote and educate about Carlton County's water resources. The process used to identify the priority concerns is detailed in the Priority Concerns Scoping Document, which can be found in Appendix A. The following provides a general assessment of each priority concern and why it was selected.

#### ***Assessment of Water Quality in County Lakes, Rivers and Streams***

Carlton County's water resources are very important because they provide social, recreational, economic and aesthetic value to its residents and visitors.

The selection of water quality as a priority concern has three overall goals: Assess waters that do not have sufficient data for determination of impairment, improve water resources listed as impaired, and maintain and improve water quality.

The Federal Clean Water Act (CWA) requires states and tribes to adopt water-quality standards to protect waters from pollution. These standards define how much of a pollutant can be in the water and still allow it to meet designated uses, such as drinking water, fishing and swimming. The standards are set on a wide range of pollutants, including bacteria, nutrients, turbidity and mercury. An impairment may also be a biological indicator revealed through fish bioassessments and aquatic macroinvertebrate bioassessments. A water body is "impaired" if it fails to meet one or more water quality standards.

To identify and restore impaired waters, Section 303(d) of the Clean Water Act requires states to:

1. Assess all waters of the State to determine if they meet water-quality standards.
2. List waters that do not meet standards (also known as the 303d List or Impaired Waters List) and update every even-numbered year.
3. Conduct TMDL studies in order to set pollutant reduction goals needed to restore waters.

In 2008, the Minnesota Pollution Control Agency (MPCA) adopted the Watershed Restoration and Protection Strategy (WRAPS) process to streamline and improve the efficiency of developing TMDLs for the State. The watershed approach is built around a four-step process. During the 10-year cycle, the MPCA and its partner organizations work on each of the State's 81 major watersheds to evaluate water conditions, establish priorities and goals for improvement, and take actions designed to restore or protect water quality. When a watershed's 10-year cycle is completed, a new cycle begins.

- Step 1. Monitor water bodies and collect data.
- Step 2. Assess the data.
- Step 3. Develop strategies to restore and protect the watershed's water bodies.
- Step 4. Conduct restoration and protection projects in the watershed.

The 10-year schedule for the four major watersheds in Carlton County have, or will begin as follows:

- 2009 - St. Louis River Watershed
- 2011 - Nemadji River Watershed
- 2015 - Mississippi River-Grand Rapids Watershed
- 2016 - Kettle River Watershed

The Clean Water Act assesses water in terms of three types of use supports: aquatic life, aquatic consumption, and aquatic recreation, with each use assessed as either:

- fully supporting (FS)
- not supporting (NS)
- insufficient information (IF)
- not assessed (NA)

Table 2 summarizes data needed for Water Quality Assessments: 305(b) Report and 303(d) List.

The first goal under this priority concern is to continue to collect data on Carlton County lakes, rivers and streams. Currently, a lake becomes assessed by MPCA standards (aquatic recreation) when Total Phosphorus, Chlorophyll *a* and Secchi disk readings are measured on 8 different sampling dates collected from June to September over the most recent 10-year period. Total Phosphorus is the nutrient that promotes excessive aquatic plant growth, including algae. The abundance of algae is expressed in terms of Chlorophyll *a*. The amount of algae in the water will determine how deep light penetrates and this clarity can be measured by Secchi disk readings.

Carlton County lakes are organized into three different DNR development classifications or they are considered non-classified. Carlton County has 40 Natural Environmental Lakes, 18 Recreational Development Lakes, 3 General Development Lakes and 16 un-classified lakes. Table 3 provides a summary of these waters along with whether or not data has been collected to determine impairment. This data was obtained from MPCA's Environmental Data Access (EDA) and FDL Office of Water Protection and is current through the calendar year of 2014. Of the 77 lakes in the County, 39 (including FDL data) of the lakes have enough data collected to be considered assessed.

Currently, a stream or river needs a minimum of 20 samples collected (over at least 2 years) for turbidity, suspended solids and transparency tube. Streams and rivers in Carlton County are categorized into three DNR classifications. There are 3 Remote Rivers, 6 Forested Rivers and 108 Tributary Streams. Of these, 34 are designated DNR trout streams. Table 4 provides a summary of these waters along with whether or not any data is available for that river or stream. Of the 117 classified rivers and streams in the County, 45 rivers and streams have data collected on them. Most of this data is considered insufficient per MPCA assessment standards.

A goal of this priority concern is to maintain a list for prioritizing County waters, determining the minimal amount of data that needs to be collected, developing volunteer monitoring programs to accomplish this goal and to have data summarized in a user friendly way.

Another goal of this plan is to address those waters that have been assessed and are, or will be, listed as impaired under current standards. The following lakes, rivers and streams are on the impaired list only due to mercury or polychlorinated biphenyls (PCB) impairment and will not be addressed in this plan as the MPCA is leading efforts for these TMDL studies:

- St. Louis River (several reaches)
- Kettle River (several reaches)
- Thomson Reservoir
- Sand Lake
- Sand Lake (on Pine County border)
- Park Lake
- Moosehead Lake
- Hanging Horn Lake
- Little Hanging Horn Lake
- Eddy Lake
- Cross Lake
- Chub Lake

Please refer to Table 5 which summarizes the 2014 impaired waters of the County, the affected use, and the pollutant/stressor. Figure 3 shows the location of the County's impaired waters and also illustrates the pollutant/stressor.

Turbidity is the cloudiness or murkiness of water caused by soil, algae, and other suspended particles that scatter light in the water column. Excess turbidity can significantly degrade the aesthetic qualities of streams and rivers. Turbidity can also make the water more expensive to treat for drinking and can affect the shipping industry. Turbidity may make it hard for fish and other aquatic animals to find food, breathe through gills, and reproduce when spawning beds are clogged with deposited sediment. Turbidity is measured in nephelometric turbidity units (NTU).

Excess nutrients such as nitrogen and phosphorus can cause nuisance growths of weeds and algae. Nutrient input to a lake is most often caused by what is known as nonpoint sources of pollution, meaning they are washed off the land or seep into groundwater. Sources include agricultural runoff, stormwater runoff, leakage from septic systems, nutrients from wetland drainage, shoreline erosion, etc.

Fish bioassessments and aquatic macroinvertebrate bioassessments are an evaluation of natural and anthropogenic factors responsible for impairment to these aquatic life communities. For example, if a waterway is deemed impaired for fish bioassessments, then it means the fish species that should be present are not there, indicating a potential water quality problem.

For each impairment on the list, the Clean Water Act requires completion of a TMDL. The term “TMDL” describes both a process and a number. The *process* typically involves two to four years of technical study and intensive stakeholder and public input. The *number* is a calculation of the maximum amount of a pollutant the water body can receive and still meet water quality standards.

A TMDL results in a pollution reduction plan. The pollution reduction plan identifies all the sources of the pollutant in the watershed and allocates needed reductions among them.

This goal will ultimately require collaboration between the County, SWCD and the MPCA. Currently, the County is providing technical assistance to the Carlton County SWCD for the turbidity impairments in the Nemadji River Watershed. It is anticipated that as more waters are assessed and determined to be impaired, the workload for current staff at the County and SWCD will increase beyond current capacity. It is the intent of this plan to seek funding for the development of TMDL studies and implementation of TMDL projects, including staffing.

#### ***Assessment of Development Impacts and Land Use***

Carlton County is predominately rural in character with urban and suburban development occurring primarily along the Interstate 35 corridor. The 2010 United States Census reports a county population of 35,386 people. Approximately 50% of the County’s population lives in cities and another 25% of people live in the five most populated townships (Thomson, Twin Lakes, Moose Lake, Perch Lake and Blackhoof), four of which are along the interstate corridor.

According to the Carlton County Comprehensive Plan, most development within the next 20 years is anticipated to occur in the northeastern part of the County and along Interstate 35. This growth is anticipated to be primarily residential, with commercial development occurring directly adjacent to highway corridors. In general, most commercial and industrial development will remain along the Interstate 35 corridor.

The Economic Development Office of Carlton County currently reports six major industrial, commercial or residential developments within the County including the Cloquet Business Park, United Development of Cloquet, Esko Industrial/Business Park, Moose Lake Retail Park, Esko Town Center, and the Carlton County Commercial Development. The location of these developments is depicted on Figure 4.

The Task Force felt that with an increase in population and development, it is important to explore strengthening current regulations and policies to maintain or improve the County's water resources.

Input provided by the DNR for Carlton County's Water Plan recommended adopting the revised Protected Water Inventory Map (1996), including tributaries to trout streams, in the shoreland classification for waters subject to shoreland zoning and permitting. These waters are depicted on Figure 5. The Task Force felt as development increases in the County, more marginal lands will be developed, including those surrounding tributaries to trout streams, shallow lakes and wetlands. These smaller lakes and streams are often the most sensitive to development pressures. Additionally, the Wetland Conservation Act defines shoreland according to the current Protected Water Inventory Map.

With the increase in development, the number of SSTS increases too. The current Carlton County Ordinance requires system compliance inspections at point of sale or with application submittal for properties within the Shoreland Management Overlay District. Table 6 summarizes the number of sewer compliance inspections completed for existing systems.

The Task Force felt that if 21% (average over 11 years) failed sewer compliance inspections within the Shoreland Management Overlay District, the number would likely be equivalent County wide. Non-complying septic systems not only pose a potential problem to the environment, but also to human health. If a septic system is not functioning properly, it can discharge high levels of nutrients to the groundwater (drinking water), lakes, rivers and streams. High levels of nutrients can lead to increased algae and aquatic vegetation growth.

Some of the most pervasive effects of urban development are on water quality and quantity as a result of replacement of the natural landscape with pavement and other impervious materials. As little as 10 percent impervious cover can substantially affect the amount of rainfall that filters into the soil, causing reduced groundwater recharge, increased flooding and bank erosion, and diminished stream stability.

Soil eroding from construction sites is the leading cause of water quality impairment in Minnesota. Soil erosion costs Minnesota homeowners millions of dollars a year. Soil loss not only causes damage to roads and property but eventually finds its way to lakes, streams and rivers. It contributes to the phosphorus load and can result in algae blooms. In addition, silt removal from roadside ditches, sidewalks, curbsides and storm drains is required, costing taxpayers money.

The Task Force recognizes that the MPCA requires a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater General Permit if you are the owner or operator for any construction activity disturbing:

- One acre or more of soil.
- Less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre.
- Less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources.

Under this Water Plan, the Task Force would like to explore the need and reasonableness of a local stormwater management ordinance. The Task Force felt it is important to explore that opportunity and others as they arise over the next ten years for stormwater management.

The Task Force also recognizes the importance of encouraging low impact development. Low impact development is a stormwater management approach and site-design technique that emphasizes water infiltration, values water as a resource and promotes the use of natural systems to treat water runoff.

The purpose of the Wetland Conservation Act is to achieve no net loss in the quantity, quality and biological diversity of Minnesota's existing wetlands. In those instances where impacts to a wetland do not qualify for an exemption, the area of impacted wetland must be replaced, usually via wetland banking. Table 7 summarizes Wetland Conservation Act (WCA) activities in Carlton County from 2003 to 2013. While the Task Force felt Carlton County administers the WCA in accordance with the law, they recognize the need for a local wetland bank. Of the 160 wetland applications received from 2003 to 2008, over 33 acres of wetlands were filled and these wetland impacts were replaced outside of Carlton County. Wetlands surround some of the County's most valuable resources: our lakes and rivers. Wetlands filter and absorb polluted surface water runoff before it enters lakes and rivers downstream. The Task Force recommends exploring restoration or creation of wetlands along impaired waters for local wetland banking.

***Assessment of Promoting and Educating the Public about the County's Water Resources***

The State of Minnesota has defined goals for its citizens in regards to environmental literacy. They are contained in **State Goals for Environmental Education** (Minnesota Statute §115A.073). Pupils and citizens should be able to apply informed decision-making processes to maintain a sustainable lifestyle. In order to do so, citizens should:

1. understand ecological systems,
2. understand the cause and effect relationship between human attitudes and behavior and the environment,
3. be able to evaluate alternative responses to environmental issues before deciding on alternative courses of action,
4. understand the effects of multiple uses of the environment.

The Second Minnesota Report Card on Environmental Literacy documents the results concerning environmental literacy of adults in Minnesota, in particular its water resources. Minnesotans were asked a series of questions to examine their knowledge of water issues. Forty-five percent of Minnesota adults have at least an average level of knowledge about water issues where a C grade (3 or more questions correct) represents this level. Overall, few Minnesota residents believe that environmental laws have gone “too far”—only 11% or fewer gave such a response for the questions in the attitude section of the survey. The responses to laws and regulations on specific environmental issues show that Minnesotans consider water pollution to be extremely important and an area not safeguarded enough.



### ***OBJECTIVES AND GOALS***

#### ***Priority Concern 1: Improve water quality in County lakes, rivers and streams.***

**Goal 1:** Assess waters that do not have sufficient data for determination of impairment.

Actions:

1. Maintain a priority list of lakes, rivers and streams for monitoring.
2. Maintain a monitoring plan for priority lakes, rivers and streams.
3. Coordinate with the MPCA and the SWCD to complete baseline monitoring on priority lakes and streams at a capacity to allow the monitoring data to define water quality trends.
4. Coordinate with the private sector laboratories and the MPCA to utilize user-friendly, online databases of water quality monitoring results for County residents.
5. Submit water quality data to the MPCA to be entered into the Storage and Retrieval (STORET) database.
6. Maintain a volunteer monitoring program.
7. Seek funding in partnership with the MPCA and SWCD for surface water quality monitoring.
8. Continue to coordinate and promote the Citizens Lake Monitoring Program (CLMP) and CLMP plus programs.
9. Continue to coordinate and promote the Citizens Stream Monitoring Program (CSMP) and CSMP plus programs.
10. Collaborate with the Fond du Lac Reservation, SWCD, other government agencies, and other organizations to share data on the lakes and streams they monitor.
11. Participate with the MPCA, SWCD, other government agencies, and other organizations to access state and federal funds to meet the requirements of the WRAPS process for all four major watersheds in Carlton County.

**Goal 2:** Improve water resources that are listed as impaired.

Actions:

1. Support and work with the MPCA on ongoing TMDL projects, specifically, in the Nemadji River Watershed, Kettle River Watershed, Tamarack River Watershed and St. Louis River Watershed.
2. Seek funding for development of TMDL studies and implementation of TMDL projects.
3. Support the SWCD in seeking funding for implementation efforts for sediment load reduction and other impairments of surface waters.

**Goal 3:** Maintain and improve water quality in County lakes, rivers and streams.

Actions:

1. Coordinate with the MPCA and the SWCD to complete baseline monitoring on priority lakes and streams at a capacity to allow the monitoring data to define water quality trends.
2. Continue to work with County lake associations and promote the formation of new lake associations.
3. Develop a County-wide lake association.

4. Apply for Clean Water Partnership and Section 319 Programs to provide technical and financial assistance to landowners seeking to implement shoreland best management practices.
5. Identify and prioritize fish passage barriers on protected waters in the County and seek funding to correct them.
6. Utilize Clean Water, Land and Legacy Amendment Funds to maintain and improve water quality in County lakes, rivers and streams.
7. Utilize the Department of Natural Resources (DNR) grants to maintain and improve water quality in County lakes, rivers and streams.
8. Utilize Minnesota Flood Relief grants to restore and prevent flood damage that affects water quality in County lakes, rivers, and streams.
9. Implement measures for controlling the spread of aquatic and terrestrial invasive species, such as monitoring, education and enforcement. The control of Eurasian Water Milfoil on Chub Lake is a priority.
10. Perform lakeshed assessments on priority lakes and watersheds.
11. Seek funding for lakeshed assessments.
12. Utilize Minnesota's Lake Superior Coastal Program grants to maintain and improve water quality within the Coastal Program Boundary.
13. Seek funding for reducing groundwater sources of sediment in the Nemadji River Watershed, including sources from "mud volcanoes" in Deer Creek.
14. Support and seek funding for landowners interested in a cooperative effort, such as through a lake association, to inventory SSTS for compliance and funding for replacement of failing systems.
15. Support the DNR's use of the five components of watershed health, biology, connectivity, geomorphology, hydrology, and water quality.
16. Develop strategies for adaptation and mitigation of climate change for sustaining healthy watersheds.
17. Collaborate with the SWCD and other agencies to remove Red Clay Dams and restore hydrological regime of streams.
18. Develop a plan for a full-time Water Planner, resulting in a staff person dedicated to water quality planning and accessing and managing water quality grants for Carlton County.

***Priority Concern 2: Minimize the adverse effects of development and land use on water quality in the County.***

**Goal 1:** Promote strengthening regulations and policies to maintain and improve the County's water resources.

**Actions:**

1. Recommend adopting the revised Protected Water Inventory Map (1996) in the shoreland classification for waters subject to shoreland zoning and permitting.
2. Support and recommend approval of county wide point-of-sale compliance inspections of existing septic systems.
3. Support clarifying and strengthening county ordinances to include stormwater and erosion control requirements.

4. Encourage municipalities to develop stormwater management plans or regulations.
5. Support wastewater collection and treatment facility projects, such as the Big Lake Sanitary District.
6. Seek funding to staff a position to insure compliance with stormwater and erosion control regulations.
7. Encourage state and federal agencies to prioritize the update of the County's Federal Emergency Management Agency (FEMA) floodplain maps.
8. Assist communities with technical and financial assistance for updating sewage overflow as it relates to future floods based on the events of the 2012 Northland Flood.

**Goal 2:** Encourage low impact development in both current and proposed developments.

Actions:

1. Promote best management practices to prevent and correct stormwater runoff and erosion (rain gardens, pervious pavement, infiltration swales, rain barrels, green roofs, etc.).
2. Discourage the approval of variances in shoreland impact zones.
3. Develop a program for encouraging no mow zones along shoreland, such as monetary incentives per foot allowed to revegetate.
4. Encourage more utilization of SWCD financial and technical assistance resources to encourage owners to fix eroding shorelines.
5. Showcase stormwater pollution prevention techniques through the use of rain barrels, rain gardens, pervious pavement, infiltration swales, green roofs, etc. at County facilities and at the County Fair. Seek funding to complete such projects. Encourage other municipalities to do the same.
6. Continue to enforce the Floodplain Overlay District in Carlton County Zoning Ordinance #27.
7. Support the expansion of Reinvest in Minnesota (RIM) projects to protect high value shoreland, such as wild rice lakes.

**Goal 3:** Continue to manage and protect wetlands.

Actions:

1. Develop a local wetland bank.
2. Identify potential wetland restoration or creation areas along sensitive or impaired waters.
3. Continue to work with the BWSR, DNR, SWCD, ACOE and FDL to implement and enforce the Wetland Conservation Act.

***Priority Concern 3: Promote and coordinate the development and implementation of environmental education programs in Carlton County.***

**Goal 1:** Promote programs currently in place to enhance our water resources.

Actions:

1. Promote Carlton County SWCD programs including state cost share and low interest loan program for water quality improvement and implementation of soil erosion control best management practices.
2. Promote Carlton County SWCD planning efforts through other state and federal agencies including forest stewardship and shoreland restoration, as in the Hanging Horn Lakes area for Tullibee habitat protection.
3. Promote the Carlton County SWCD and the Natural Resources Conservation Service (NRCS) technical and financial assistance programs for conservation work on farmland and forestland, such as the Environmental Qualities Incentives Program (EQIP).
4. Promote available Carlton County SWCD technical assistance resources for water quality improvement and soil erosion control practice implementation.
5. Advocate increased resources for Carlton County SWCD to address the growing, planning and technical assistance workload for water quality improvement and soil erosion control practice implementation.
6. Promote the Carlton County Zoning and Environmental Services' program for private well testing.

**Goal 2:** Educate the public on how to be good stewards of the land and water.

Actions:

1. Educate both landowners and contractors on the Wetland Conservation Act, including workshops for realtors, contractors and developers.
2. Educate both landowners and contractors on erosion control and stormwater best management practices, including workshops for contractors and developers.
3. Educate the public that health and septic systems are tied together.
4. Develop presentations and brochures that focus on land and water stewardship.
5. Educate the public on non-toxic cleaning supplies, recycling, the Carlton County Household Hazardous Waste Facility, the hazards of burning garbage, medication disposal, etc.
6. Continue to promote and find new ways to distribute the quarterly newsletter drafted by the Carlton County Resource and Recycling Coordinator.
7. Educate the public on shoreland best management practices including restoring and maintaining buffers, fixing eroding shorelines and healthy aquatic vegetation.
8. Educate landowners on BMPs including reducing soil erosion, proper application of fertilizers and pesticides, livestock management, shoreland buffers and aquatic vegetation.
9. Continue the momentum of the 2008, 2010 and 2012 Carlton County Waters Summit by holding annual workshops or seminars for shoreland property owners.
10. Collaborate with Fond du Lac Environmental Education Program.
11. Reach out to new landowners in Carlton County and encourage best management practices.

12. Continue to educate landowners on the Floodplain Overlay District in Carlton County Zoning Ordinance #27.
13. Continue to educate landowners and contractors on timber harvest best management practices and the restrictions included in Carlton County Zoning Ordinance #27.

**IMPLEMENTATION SCHEDULE**

Throughout the next five years, this plan will undergo continuous review, and revisions will certainly be made to schedules and resource allocations. New priority action items will be added and items completed or deemed unjustifiable will be deleted on a regular basis. The County recognizes that completion of all goals and action items require staff and funding resources beyond the existing capacities and that state and federal funding to support plan implementation may be limited. The County will therefore continue to initiate efforts for matching grants from other sources. Please note that some of the action items listed are already in progress or ongoing activities. This plan will enable the County to evaluate its overall resource allocation for water planning.

<b><i>Priority Concern 1: WATER QUALITY IN COUNTY LAKES, RIVERS AND STREAMS</i></b>				
<b><i>Goal 1: Assess waters that do not have sufficient data for determination of impairment.</i></b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
<b>1.</b>	Maintain a priority list of lakes, rivers and streams for monitoring.	County, SWCD, DNR, MPCA, FDL	2014-2019	\$2,000/year
<b>2.</b>	Maintain monitoring plans for priority lakes, rivers and streams.	County, SWCD, MPCA	2014-2019	\$2,000/water body
<b>3.</b>	Coordinate with the MPCA and SWCD to complete baseline monitoring on priority lakes, rivers and streams.	County, SWCD, MPCA	2014-2019	\$50,000-100,000
<b>4.</b>	Coordinate user-friendly online database of water quality monitoring results for County residents.	County	2014-2019	\$15,000
<b>5.</b>	Submit water quality data to MPCA to be entered into the STORET database.	County, SWCD	2014-2019	\$2,000/year
<b>6.</b>	Maintain volunteer monitoring program.	County, SWCD, MPCA	2014-2019	\$15,000
<b>7.</b>	Seek funding for surface water quality monitoring.	County, SWCD, BWSR	2014-2019	\$1,000/year
<b>8.</b>	Continue to coordinate and promote the Citizens Lake Monitoring Program (CLMP) and CLMP Plus programs.	County, SWCD, MPCA	2014-2019	\$1,000/year
<b>9.</b>	Continue to coordinate and promote the Citizens Stream Monitoring Program (CSMP) and CSMP Plus programs.	County, SWCD, MPCA	2014-2019	\$1,000/year

10.	Collaborate with the FDL Reservation to share data on the lakes and streams they monitor.	County, FDL	2014-2019	\$500/year
11.	Participate with the other organizations to access funds to meet the requirements of the WRAPS process for all four major watersheds in Carlton County.	County, MPCA, SWCD, other	2014-2019	unknown
<b>Goal 2: Improve water resources that are listed as impaired.</b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1.	Support and work with the MPCA on ongoing TMDL projects.	County, SWCD, MPCA	2014-2019	\$50,000
2.	Seek funding for development of TMDL studies and implementation of TMDL projects.	County, SWCD, MPCA, BWSR	2014-2019	\$50,000-100,000
3.	Support the SWCD in seeking funding for implementation efforts for sediment load reduction and other impairments of surface waters.	County, SWCD	2014-2019	\$50,000
<b>Goal 3: Maintain and improve water quality in County lakes, rivers and streams.</b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1.	Coordinate with the MPCA to complete baseline monitoring on County lakes, rivers and streams.	County and MPCA	2014-2019	\$50,000-100,000
2.	Continue to work with County lake associations and promote the formation of new lake associations.	County	2014-2019	\$1,000/year
3.	Develop a County-wide lake association.	County	2014-2019	\$5,000
4.	Apply for Clean Water Partnership and Section 219 Program funds to implement shoreland best management practices.	County, MPCA, DNR, SWCD, BWSR	2014-2019	\$5,000/year

5.	Identifying fish passage barriers on protected waters in the County and seek funding to correct them.	County, DNR, FDL	2014-2019	\$100,000-\$200,000
6.	Utilize Clean Water, Land and Legacy Amendment Funds to maintain and improve water quality in County lakes, rivers and streams.	County, MPCA, SWCD, BWSR	2014-2019	Unknown
7.	Utilize the Department of Natural Resources grants to maintain and improve water quality in County lakes, rivers and streams.	County, DNR	2014-2019	Unknown
8.	Utilize Minnesota Flood Relief grants to restore and prevent flood damage that affect water quality in County lakes, rivers, and streams	County, DNR, SWCD, FDL	2014-2019	Unknown
9.	Monitor and implement measures for controlling the spread of aquatic and terrestrial invasive species. The control of Eurasian Water Milfoil on Chub Lake is a priority.	County, DNR, SWCD, FDL	2014-2019	\$15,000
10.	Perform lakeshed assessments on priority lakes and watersheds.	County, MPCA, SWCD, DNR, BWSR	2014-2019	\$1,000/lake
11.	Seek funding for lakeshed assessments.	County, MPCA, SWCD, DNR, BWRS	2014-2019	\$2,000
12.	Utilize Minnesota's Lake Superior Coastal Program grants to maintain and improve water quality within the Coastal Program Boundary.	County, MPCA	2014-2019	Unknown
13.	Seek funding for reducing groundwater sources of sediment in the Nemadji River Watershed.	County, MPCA, DNR, BWSR, SWCD	2014-2019	Unknown
14.	Inventory SSTS for compliance and funding for replacement of failing systems.	County, MPCA, BWSR, SWCD	2014-2019	Unknown



<b>15.</b>	Support the DNR's use of the five components of watershed health, biology, connectivity, geomorphology, hydrology, and water quality.	County, MPCA, DNR, BWSR, SWCD	2014-2019	Unknown
<b>16.</b>	Develop strategies for adaptation and mitigation of climate change for sustaining healthy watersheds.	County, MPCA, DNR, BWSR, SWCD, other	2014-2019	Unknown
<b>17.</b>	Remove Red Clay Dams and restore hydrological regime of streams.	County, MPCA, DNR, BWSR, SWCD, other	2014-2019	\$500,000-\$1,000,000
<b>18.</b>	Develop a plan for a full-time Water Planner.	County, MPCA, BWSR, SWCD	2014-2019	unknown

<b><i>Priority Concern 2: DEVELOPMENT IMPACTS AND LAND USE</i></b>				
<b><i>Goal 1: Promote strengthening regulations and policies to maintain and improve the County's water resources.</i></b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
<b>1.</b>	Recommend adopting the revised Protected Water Inventory Map (1996) in the shoreland classification for waters subject to shoreland zoning and permitting.	County	2014-2019	Unknown
<b>2.</b>	Support and recommend approval of County wide point-of-sale compliance inspections of existing septic systems.	County	2014-2019	Unknown
<b>3.</b>	Support clarifying and strengthening County ordinances to include stormwater and erosion control requirements.	County	2014-2019	Unknown
<b>4.</b>	Encourage municipalities to develop stormwater management plans or regulations.	County	2014-2019	\$2,000
<b>5.</b>	Support wastewater collection and treatment facility projects, such as the Big Lake Sanitary District.	County, FDL	2014-2019	Unknown
<b>6.</b>	Seek funding to staff a position to insure compliance with stormwater and erosion control regulations.	County, MPCA, BWSR	2014-2019	Unknown
<b>7.</b>	Encourage state and federal agencies to prioritize the update of the County's Federal Emergency Management Agency (FEMA) floodplain maps.	County, SWCD, DNR, FEMA	2014-2019	\$100,000
<b>8.</b>	Assist communities with technical and financial assistance for updating sewage overflow as it relates to future floods based on the events of the Northland Flood 2012.	County, MPCA, MDH	2014-2019	Unknown

<b>Goal 2: Encourage low impact development in both current and proposed developments.</b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1.	Promote best management practices to prevent and correct stormwater runoff and erosion (rain gardens, pervious pavement, infiltration swales, rain barrels, green roofs, etc.).	County, MPCA, SWCD, BWSR, FDL	2014-2019	\$1,000/year
2.	Discourage the approval of variances in shoreland impact zones.	County	2014-2019	\$1,000/year
3.	Develop a program for encouraging no mow zones along shoreland, such as monetary incentives per foot allowed to revegetate.	County, DNR, SWCD, BWSR, FDL	2014-2019	\$5,000
4.	Encourage more utilization of SWCD financial and technical assistance resources to encourage owners to fix eroding shorelines.	County, DNR, SWCD, BWSR, FDL	2014-2019	\$15,000
5.	Showcase stormwater pollutions prevention techniques. Seek funding to complete such projects. Encourage other municipalities to do the same.	County, MPCA, SWCD, BWSR, FDL	2014-2019	\$2,000/year
6.	Continue to enforce the Floodplain Overlay District in Carlton County Zoning Ordinance #27.	County	2014-2019	\$10,000/year
7.	Support the expansion of Reinvest in Minnesota (RIM) projects to protect high value shoreland, such as wild rice lakes.	County, MPCA, SWCD, BWSR, FDL	2014-2019	unknown
<b>Goal 3: Continue to manage and protect wetlands.</b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1.	Develop a local wetland bank.	County, BWSR, SWCD, DNR, ACOE	2014-2019	Unknown

<b>2.</b>	Identify potential wetland areas for restoration or creation along sensitive or impaired waters.	County, FDL	2014-2019	\$2,000/year
<b>3.</b>	Implement and enforce the WCA.	County, BWSR, SWCD, DNR, ACOE, FDL	2014-2019	\$50,000/year

<b><i>Priority Concern 3: PROMOTE AND EDUCATE THE PUBLIC ABOUT THE COUNTY'S WATER RESOURCES</i></b>				
<b><i>Goal 1: Promote programs currently in place to enhance our water resources.</i></b>				
	<b>Action</b>	<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
<b>1.</b>	Promote Carlton County Soil and Water Conservation District (SWCD) programs including state cost share and low interest loan program for water quality improvement and implementation of soil erosion control best management practices.	County, SWCD	2014-2019	\$1,000/year
<b>2.</b>	Promote Carlton County SWCD planning efforts through other state and federal agencies including forest stewardship, farmland, and shoreland re-vegetation planning as important first steps in land and water best management practices implementation.	County, SWCD	2014-2019	\$1,000/year
<b>3.</b>	Promote the Carlton County SWCD and the Natural Resources Conservation Service (NRCS) technical and financial assistance programs for conservation work on farmland and forestland, such as the Environmental Qualities Incentives Program (EQIP).	County, SWCD, NRCS	2014-2019	\$1,000/year
<b>4.</b>	Support and advocate increased resources for Carlton County SWCD to address the growing, planning and technical assistance workload for water quality improvement and soil erosion control practice implementation.	County, SWCD	2014-2019	\$1,000/year
<b>5.</b>	Advocate increased resources for Carlton County SWCD to address the growing, planning and technical assistance workload for water quality	County, SWCD	2014-2019	unknown

	improvement and soil erosion control practice implementation.			
6.	Promote the Carlton County Zoning and Environmental Services' program for private well testing.	County	2014-2019	\$1,000/year
<b>Goal 2: Educate the public on how to be good stewards of the land and water.</b>				
	<b>Action</b>	<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1.	Educate both landowners and contractors on the Wetland Conservation Act, including workshops for realtors, contractors and developers.	County, SWCD, BWSR	2014-2019	\$2,000/year
2.	Educate both landowners and contractors on erosion control and stormwater best management practices, including workshops for contractors and developers.	County, SWCD, BWSR, MPCA	2014-2019	\$2,000/year
3.	Educate the public that health and septic systems are tied together.	County, SWCD, BWSR, MPCA, MDH	2014-2019	\$2,000/year
4.	Develop presentations and brochures that focus on land and water stewardship.	County, SWCD	2014-2019	\$2,000/year
5.	Educate the public on non-toxic cleaning supplies, recycling, the Carlton County Household Hazardous Waste Facility, the hazards of burning garbage, medication disposal, etc.	County	2014-2019	\$2,000/year
6.	Continue to promote and find new ways to distribute the quarterly newsletter drafted by the Carlton County Resource and Recycling Coordinator.	County	2014-2019	\$2,000/year
7.	Educate the public on shoreland best management practices including restoring and maintaining buffers, fix eroding shorelines and healthy aquatic vegetation.	County, SWCD, DNR, BWSR	2014-2019	\$5,000/year

<b>8.</b>	Educate landowners on BMPs including reducing soil erosion, proper application of fertilizers and pesticides, livestock management, shoreland buffers and aquatic vegetation.	County, SWCD, DNR, BWSR, NRCS, MPCA	2014-2019	\$2,000/year
<b>9.</b>	Continue the momentum of the 2008, 2010 and 2012 Carlton County Waters Summits by holding annual workshops or seminars for shoreland property owners.	County, SWCD	2014-2019	\$5,000/year
<b>10.</b>	Collaborate with FDL Environmental Education Program.	County, FDL	2014-2019	\$2,000/year
<b>11.</b>	Reach out to new landowners in Carlton County and encourage best managements practices.	County, SWCD, FDL	2014-2019	\$2,000/year
<b>12.</b>	Continue to educate landowners on the Floodplain Overlay District in Carlton County Ordinance #27.	County	2014-2019	\$5,000/year
<b>13.</b>	Continue to educate landowners and contractors on timber harvest best management practices and restrictions included in Carlton County Zoning Ordinance #27.	County, SWCD	2014-2019	\$5,000/year

### ***IMPLEMENTATION SCHEDULE – ONGOING ACTIVITIES***

As previously stated, the implementation schedule lists some action items that are already in progress or are ongoing activities. Additional ongoing activities to note are as follows:

#### **Nemadji River Watershed**

##### ***Nemadji River Watershed TMDL***

Previous watershed studies identified high turbidity and sediment as significant impacts to water quality. The result of these studies was to “list” Deer Creek and Nemadji River on the Federal Clean Water Act (303)d List of impaired waters. Turbidity or cloudiness of the water, and high sediment yields can be detrimental to fish and other aquatic life, and in this case, even shipping. Sediment degrades the quality of the spawning habitat and turbidity can affect feeding success. High sediment loads from the Nemadji River have also been a major contributor to sediment buildup in the Superior Harbor. Historically, about 33,000 tons of Nemadji River sediment has been dredged annually from Lake Superior Bay by the ACOE to maintain adequate depth for shipping traffic.

The year 2008 marked the TMDL start-up year. Assessing and gathering up-to-date data is an important first step. Approximately 30 water sample events were completed in 2008 on Deer Creek. Samples were collected and sent to a lab for analysis of turbidity and Total Suspended Solids. In addition, other water chemistry data was collected and analyzed in the field to support the laboratory data. Flow monitoring stations have been installed and provide a seasonal record of changes in water level and volume.

One other on-going study to note within the Nemadji River Watershed is the “sand volcanoes” or “sediment volcanoes”. Sediment contribution via groundwater flow can be responsible for high sediment even under baseflow conditions, which is rather unique for a turbidity related impairment. Past studies have analyzed such occurrences in the Nemadji River Watershed. A groundwater seepage investigation was conducted along a reach of Deer Creek in 2005. The study was completed by Howard Mooers and Nigal Watrus and was summarized in the report “Results of Deer Creek Groundwater Seepage Investigation” to Carlton County Zoning and Environmental Services. The study concluded that groundwater from sand confined aquifers moves through fault scarps in lacustrine clays and clay till sediments bringing sand to the surface. These discharge points, called “sand volcanoes” or “sediment volcanoes,” were found to be significant contributors of sediment in Deer Creek. The study suggested that the shear strength of the clay and the driving shear stress are very close to one another, leading to rotational failure when the shear strength is reduced, possibly due to increase in pore pressure. When the faults begin to form due to rotational failure, dewatering occurs, carrying along aquifer materials. The study indicated that the phenomenon is widespread throughout the region.

As of 2014, the SWCD is coordinating with MPCA, Carlton County and private consultants to:

1. Address implementation priorities for the Deer Creek TMDL implementation plan.



2. Finish the Nemadji WRAPS including the TMDL, Stressor Identification and implementation plan development for all impaired streams, lakes and rivers, in the Nemadji River watershed.
3. Work through an improved civic engagement process in the watershed.

The Nemadji Civic Engagement grant is a focused effort to have a citizen-led civic engagement strategy. It includes a framework determined by citizen volunteers to extend outreach and education throughout the Nemadji Watershed. The end goal is to extend the scientific data from the MPCA WRAPS process to the land users to improve the Nemadji Watershed and find local solutions to the local water quality issues. Special focus will be on coordinating with local schools, creating a *Red Clay Landowners' Guide*, increasing public access and use to public lands, hosting technical workshops with natural resource professionals and landowners.

### ***Red Clay Sediment Dams***

The Red Clay Project was a 1970s era project that encompassed watersheds in the Lake Superior Basin portion of Northeastern Minnesota and Northern Wisconsin. Primary partners included the Soil Conservation Service now the Natural Resources Conservation Service (NRCS) and the Environmental Protection Agency (EPA) with local SWCD support.

In Minnesota, efforts focused on sediment retention structures in two subwatersheds of the Nemadji River Basin, Skunk Creek and Deer Creek in Carlton County. Sixteen structures were constructed in the Skunk Creek Watershed and four structures were constructed in the Deer Creek Watershed. The project also constructed several ditch stabilization projects. The design life of these structures was 10 – 25 years depending on the specific project. The design life has now been exceeded.

In 2006, an EPA Section 319 Grant funded Carlton County to inventory these structures. Photos were taken of the pond, inlets, and outlets of each structure and linked to a GIS database with coordinates for each structure. The survey showed a wide range of conditions on these structures. Some of the metal pipe spillways are rusted through and failing. Some outlets are significantly perched causing more energy transport from the pipe to the watercourse below the structure. Some embankments are breached and flow water is not contacting the principal spillway at all. Still other structures are in good condition. The Carlton County SWCD maintains two of the largest structures under a loose maintenance agreement. These structures have concrete pipe spillways, so rust is not an issue.

The Nemadji River Basin Project Technical Committee has discussed how to proceed in addressing this erosion issue. Three issues have been identified for future consideration:

1. Assess the effectiveness of each structure individually and as a whole in addressing sedimentation in the sub-watershed where they were installed. Identify the impact these structures had on the watershed.

2. Assess each site's potential for rehabilitation of the structure versus removal and restoration of stream habitat. Develop cost estimates for both options.
3. Proceed with permitting and construction based on these two assessments.

The DNR would have permitting authority over these structures and fish passage and habitat issues would need to be addressed in any construction work proposed. The state of these structures impacts sedimentation in the Nemadji River basin, which relates to both the St. Louis River Area of Concern (AOC) and the Nemadji River and Deer Creek Impaired Waters Listings.

### ***Elim Creek Restoration through Aging Sediment Retention Structure Removal***

#### ***Also referred to as Red Clay Dam Phase I***

In 2011, a Clean Water Fund grant was secured by the Carlton SWCD to conduct a three part Red Clay dam project called Red Clay Dam Phase I. This grant included a restoration project on a series of three red clay dams over 1/3 mile on Elim Creek, an in-depth assessment of three dams in the Deer Creek subwatershed providing primary restoration plans, and a complete inventory of the Red Clay Dams to establish a prioritization schedule for future project phases to restore the stream corridor from the unmaintained dams. The in-depth restoration design plans were completed in 2012, the inventory was completed in 2013, and the restoration project will be completed in 2014.

### ***Phase II Red Clay Dam: Deer Creek Tributary Restoration through Aging Sediment Retention Structure Removal***

In 2014, a Clean Water Fund grant was secured by the Carlton SWCD to conduct Red Clay Dam Phase II project, which includes a restoration project on one of the prioritized sites from Phase I. This project will fund the stream restoration of a failed, 30 year old sediment control structure in the Deer Creek subwatershed using natural channel design methods to restore the stream to a stable state. Since the dam breached, approximately 22,400 tons of soil have been lost and annually an estimated 78 tons of sediment is transported to the turbidity-impaired Deer Creek.

### ***Phase III Red Clay Dam: Development of Erosion Control Design Plans***

In 2014, a Great Lakes Commission grant was secured by the Carlton SWCD to develop five erosion control design plans for the highest prioritized sites in Phase I. The project will utilize field surveying and GIS analysis to develop options for erosion control actions landowners may pursue with future funding. Each site features 30+ year old Red Clay Dams that have exceeded their life expectancy and are at varying stages of failure. The sediment retained by these structures over the last decade presents a massive sediment load into Lake Superior should the dams fail. The erosion control design plans will provide landowners options to either repair the erosion damage to the dams or restore the streams to natural channel design.

### ***USFWS Fish Passage Grant***

In 2011 the Carlton SWCD was awarded two grants from the U.S. Fish and Wildlife Service Fish Passage Program to focus resources on streams in the Nemadji Basin. The

first grant was to restore perched culverts at two sites on Spring Creek and the second grant was to conduct a watershed-wide culvert assessment.

In 2012 construction took place on Spring Creek to restore fish passage and replace old, failing culverts at two sites. Spring Creek is a tributary to the Blackhoof River, which is an important trout fishery not only for the Nemadji River Watershed, but for the Lake Superior watershed as well.

In 2013 the culvert inventory was conducted, with assistance from Carlton County Zoning & Environmental Services, focusing primarily on perennial streams for fish passage barriers on the Nemadji River Watershed. The inventory will be completed in 2014 to include multi-use trails that intersect many targeted streams within the watershed. The inventory will include a final prioritization element to guide future restoration funds to increase fish passage within the Nemadji River Watershed. The assessment and prioritization of potential future culvert projects will increase the valuable fish habitat in the watershed and aid in the restoration of old infrastructure.

## **Kettle River Watershed**

### ***Kettle River Watershed TMDL Phosphorous Reduction Project***

In 2012, a Clean Water Fund grant was secured by the Carlton SWCD to develop integrated watershed management tools to accelerate on-the-ground conservation projects in the Kettle River Watershed. Specifically, GIS data for the watershed will be compiled, analyzed, and processed for use in an Environmental Benefits Index (EBI) tool, which will identify sites with high value for conservation practice implementation. This project is taking place across the Lake St. Croix Basin of which the Kettle River Watershed is a part of. This watershed project is a partnership between Carlton, Pine, Kanabec, and Aitkin SWCDs, with the Carlton SWCD acting as the project administrator. This project will improve the water quality in the Kettle River Watershed, a designated National and Minnesota Wild and Scenic River and MN DNR Canoe Route, by addressing the Lake St. Croix Basin TMDL phosphorous reduction targets for each 12 digit HUC sub-watershed in the Kettle River Watershed. NRCS staff in these counties are also a partner and will work with landowner contacts for planning and implementation of phosphorous reducing practices through USDA programs.

The overall outcome of this project will produce a list of landowners ready to implement phosphorous reducing practices in the watershed. Local, state, and federal funding opportunities will be pursued to assist these landowners in completing their projects.

### **Tullibee Lake Protection**

Tullibee, or Cisco as they are also known, can only survive in deep, cold water lakes. They are a major forage fish for lake trout, muskies, northerns, and walleyes. The SWCD is working with landowners in the Hanging Horn Lakeshed to do forest stewardship planning and project implementation for clean water practices to improve and protect the valuable tullibee habitat in the Hanging Horn Lake chain. A forest stewardship plan is developed and projects identified that will benefit the landowner and the water resource. Cost share grants are available to landowners who voluntarily choose

to work with the SWCD in implementing these planned clean water practices. The SWCD wrote seven plans for landowners totaling 648 acres in 2013. The program will continue into 2014 and hopefully beyond.

## **Upper Mississippi-Grand Rapids Watershed**

### ***Upper Mississippi-Grand Rapids Watershed WRAPS***

The Upper Mississippi – Grand Rapids Watershed contains a portion of the NE corner of Carlton County. This area includes Tamarack Lake, Eagle Lake, Upper and Lower Island Lake. This area is also referred to as the Big Sandy Watershed. The watershed is scheduled to begin the Watershed Restoration and Protection Strategy (WRAPS), the MPCA’s 10-year watershed assessment cycle in 2015. Carlton County and the SWCD have been providing input for the monitoring preparation with MPCA and other LGUs in the watershed.

### ***Tamarack River Monitoring***

The SWCD will be monitoring 6 sites on the Tamarack River for two years, which is ahead of schedule for the WRAPS 10-year assessment scheduled to begin in 2015.

### ***Wild Rice RIM***

Reinvest in Minnesota (RIM) is a state conservation easement program that started in 1986. It has been very successful in protecting habitat at risk in the cash cropping areas of Minnesota. With the program expansion into the forested region of the state through protecting wild rice habitats, the Carlton County SWCD has been active in working to bring this program to eligible residents. Funding has been provided by the Lessard Sams Outdoor Heritage Council to pay landowners a one-time fee approximately equal to 60% of the assessed tax value. This easement prevents development on the easement parcel which minimizes disturbance to the wild rice. No public access is required to participate in the program and the land continues to be assessed for property taxes.

## **St. Louis River Watershed**

The county and the SWCD are not as active in the St. Louis River Watershed due to the active involvement of Lake Superior coastal programs and non-profit groups such as the St. Louis River Alliance.

## **County Wide Projects**

### ***Northland Flood 2012***

The devastating floods that took place in June 2012 left many private landowners in need of financial and technical assistance. The county and the SWCD continue to provide technical planning and design to repair and mitigate flood damage. The SWCD was the local administrator of State and Federal funds for these projects, including the Minnesota Flood Relief Grant. The County continues to provide outreach, education, and access to

resources for those directly affected by the flood and for future flood planning.

***Forest Stewardship Planning and Implementation***

Carlton County has 481 registered Forest Stewardship plans and many more that are not registered. Some of these plans require updating to keep the plan holder eligible for state cost share and state tax programs. There is a significant implementation workload represented by these plans. The SWCD, DNR and private consultants update existing plans, complete new plans and work with existing plan holders on implementing the projects identified in their plans.

***MDH Chemicals of Emerging Concern Grant***

In cooperation with the Western Lake Superior Sanitary District (WLSSD), funding has been received from the Minnesota Department of Health (MDH) Drinking Water Contaminants of Emerging Concern grant program. The project is to produce an advertising toolkit specific to Chemicals of Emerging Concern (CEC) that also overlap with the goals of the state hazardous waste programs. Specifically public information regarding awareness and proper use and disposal of pesticides, mercury & pharmaceuticals/personal care products. The toolkit would enable program managers across the state to produce educational materials appropriate for their residents, using the most effective means of communication available in individual communities. All templates and prepared content will emphasize one or more of these core concepts: identification of CEC in household products, modes of possible drinking water contamination, health impacts, alternative products and practices, proper storage and use, proper disposal. The toolkit will be hosted on a website accessible statewide to household hazardous waste program managers and public health officials.

***Potable Water Systems***

Carlton County Economic Development is seeking funds for potable water systems in the county from the DEED Business Infrastructure Fund, Army Corps of Engineers 569 Fund, Department of Health Clean Drinking Water Fund, Public Facilities Authority, Fond du Lac Band, and the State of Minnesota special legislation. Large scale potable water delivery systems are desired over many individual private wells in regards to ground water protection, especially in areas of the county where the landscape is predominately bedrock.

**Fond du Lac Reservation Water Quality Monitoring and Management**

The Fond du Lac (FDL) Reservation Environmental Program has developed and implemented a broad-based tribal water quality protection program that includes federally approved water quality standards under Section 303(c) of the Clean Water Act, a comprehensive monitoring program (under CWA Section 106) designed to assess the health of Reservation lakes and streams, and protection plans for wetlands and ground water resources. Fond du Lac has been implementing its water quality monitoring strategy for the lakes and streams of the Reservation since 1999.

Currently, the FDL Office of Water Protection is routinely collecting physical, chemical and biological data on 23 lakes and 6 streams on the Reservation (some of which are in

St. Louis County), all of which have defined beneficial uses. The Office of Water Protection has developed a water quality database that provides the foundation for decision-making on waterbody assessments and identifying restoration needs, and submits data annually to STORET. Additionally, two sediment quality assessments (with a comprehensive sediment quality database) were completed for Reservation lakes and the St. Louis River, identifying mercury as the only known sediment-based contaminant of concern. Fish collections and analysis led to the development of Reservation-specific fish consumption guidelines, again singling out mercury as a human health and wildlife exposure risk. These additional projects supplemented the water quality monitoring and aquatic resource assessments of the Reservation, and the relative implications for human health and aquatic life.

Fond du Lac has been approved for Treatment as a State, or TAS, for purposes of administering its own nonpoint source management program under Section 319 of the Clean Water Act, and completed a nonpoint source assessment report and management program that was approved by EPA Region 5 in 2004. Currently staff is updating both the assessment report and management program to identify new projects and practices to protect Reservation waters from nonpoint sources that include pollution, primarily urban development, forestry, and hydrologic modification.

In general, Fond du Lac's lake and stream monitoring is organized by designated uses, with sampling frequencies tiered according to priority of usage. Priority fisheries lakes are sampled in May, June, August and October. Lesser-priority lakes (less desirable fish communities, sparse wild rice production, inhibited access) are sampled annually in mid-summer to provide a "snapshot" of ecological conditions, which can also be compared over time as their database grows. The seven most productive wild rice lakes are sampled at the same frequency as the priority fisheries lakes, with an annual sediment sample collected for nutrient analysis (TKN, TP, total solids and total volatile solids) and iron. Sulfate is also measured in the water column in order to evaluate against the wild rice water quality criterion (<10mg/liter). Streams are assessed three times a year. The following parameters are included in their lake and stream monitoring program:

1. Total Phosphorus (TP)
2. Ortho Phosphorus (OP)
3. Total Kjeldahl Nitrogen (TKN)
4. Nitrite + Nitrate
5. Ammonia Nitrogen
6. Total Suspended Solids
7. One annual toxic metals analysis: Arsenic, Cadmium, Chloride, Chromium, Copper, Lead, Nickel, Selenium, Zinc
8. Total Alkalinity
9. Total Hardness
10. Color (true and apparent)

For lakes only:

1. Depth profile of: temperature, dissolved oxygen, pH, specific conductance,

- turbidity (at 1-foot intervals).
- 2. Zooplankton vertical tows
- 3. Targeted beach monitoring for *E. coli* (Big Lake only)
- 4. Sulfate (in wild rice lakes)
- 5. Secchi transparency
- 6. Chlorophyll *a*; algal community scans

For streams only:

- 1. Periphyton; Chlorophyll *a*
- 2. Dissolved oxygen, pH, and specific conductance, one sample only
- 3. Discharge measurement
- 4. Annual fish species survey (electroshocking)
- 5. Benthic macroinvertebrate survey (twice a year with D-nets)

Recently, the Office of Water Protection included mercury in water column sampling for Reservation lakes and streams, to inform future Total Maximum Daily Load (TMDL) development for the mercury in fish/mercury in water impairments. Additionally, Fond du Lac has implemented a wetlands monitoring program, performing functional assessments and vegetation surveys on multiple wetlands each year using a rotating basin approach and including reference wetlands.

Assessments of use support for FDL are based upon the individually identified lakes and streams in our tribal Water Quality Standards. Our Water Quality Standards define threshold criteria for toxic contaminants and pathogenic bacterial levels (*E. coli*), and narrative standards for excessive nutrients and biological criteria which will establish action levels; lake-specific numeric nutrient criteria and stream biocriteria for both benthic macroinvertebrate and fish communities are currently in development. Many of these standards are essentially derived from procedures contained in the Final Water Quality Guidance for the Great Lakes System, 40 CFR parts 132 and 136, and Minnesota Rules, Chapters 7050 and 7052, deviating from these criteria only in that a more protective level of fish consumption (60 g/day) is assumed for FDL. The purpose of meeting water quality standards is to protect the beneficial uses associated with the standards. Based upon the assessment of the water quality data and other relevant information compared to the standards for a given pollutant or water quality characteristic, the beneficial use may be fully supported, partially supported, or not supported.

For conventional parameters such as dissolved oxygen, pH and turbidity, levels of support are defined as: fully supporting - fewer than 10% of the samples exceed the standard; partially supporting - 10-25% of the samples exceed that standard; not supporting - more than 25% of the samples exceed the standard. The 10% and 25% exceedance thresholds for conventional pollutants are based on EPA guidance. All are subject to periodic 'exceedances' due to natural causes, such as increased turbidity after a storm event. These potential pollutants are also natural characteristics of surface waters, and indigenous aquatic organisms have long adapted to cope with their fluctuations. The

extent of these natural exceedances will be considered using best professional judgment as part of the assessments.

In addition, the FDL Natural Resources Program is responsible for wild rice management and restoration activities. The 47-mile Judicial Ditch system was constructed in the early 1900s with the intent to provide for agriculture activities. Due to the extremely flat grade of the channel and the large areas of poorly drained organic soils, the original intent of converting lands to agricultural production was not realized. Estimates of wetland loss range between 2,000 and 4,000 acres as a result of the ditching, and the hydrology of the Stoney Brook watershed has been substantially altered. Ditching significantly lowered water levels on five wild rice lakes (Perch, Jaskari, Rice Portage, Deadfish, and Miller). For example, the open water area of Rice Portage Lake was reduced from 634 acres to 114 acres. These lower water levels and larger water-level fluctuations observed in lakes following precipitation events after ditch installation resulted in reduced rates of wild rice production.

An effort began in the late 1990s to restore the hydrology to the principal wild rice lakes as water level management is critical to the production of wild rice. FDL installed outlet structures on Perch, Rice Portage, and Deadfish Lakes; the structures have stop logs to manipulate lake levels throughout the year and outlet gates to release water following runoff events. In addition to the lake outlet structures, a gated storage area upstream of Deadfish Lake (named Upper Deadfish Impoundment) was installed to control up to approximately 373 acre feet of runoff. In addition to controlling water levels, wild rice production is also managed by removing competing vegetation and beaver dams.

Surface water hydraulic and hydrologic models for the upper Stoney Brook watershed have been produced in partnership with the NRCS. Concurrently, a groundwater assessment for the upper Stoney Brook watershed has been recently completed by the U.S. Geological Service (USGS). The conclusions from this report indicate that the ditch system has a larger impact on surface water flows than on groundwater throughout the Stoney Brook watershed. The surface water modeling provided recommendations for water level management through stop log controls and ditch segment clean-out to optimize seasonal lake levels in the wild rice lakes.



***WATER PLAN AMENDMENT PROCEDURE***

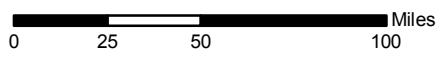
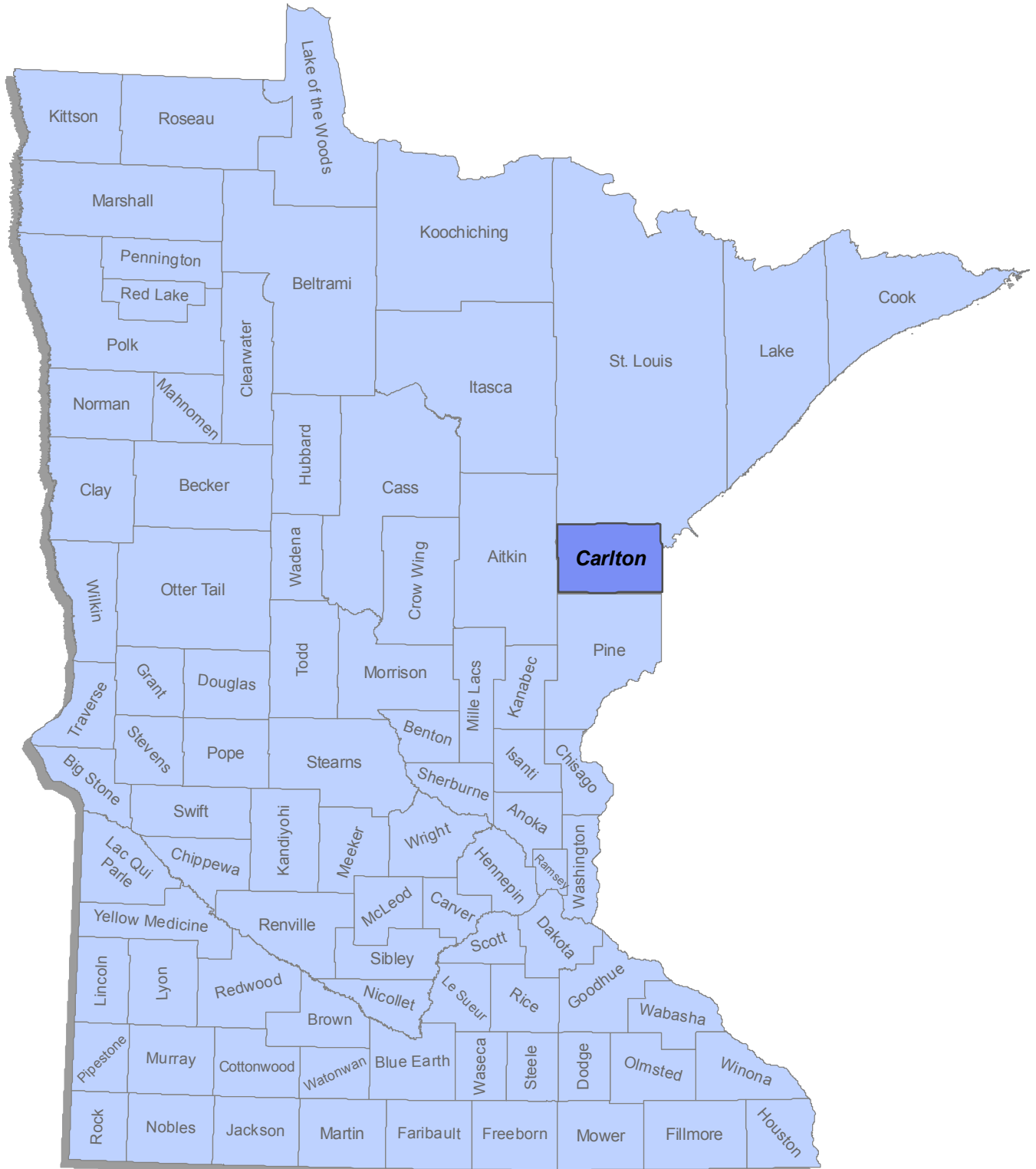
The Carlton County Comprehensive Local Water Management Plan is intended to extend through the year 2019. The County may prepare proposed amendments to the plan prior to 2019; however, the Plan will be updated including any proposed plan amendments before the end of 2019.

The following procedure will be used by Carlton County to deal with proposed amendments to the 2010 – 2020 County Water Plan.

1. When issues are brought to the attention of the County for amendments to its adopted Water Plan, the County will refer that person, group, local unit of government, or agency to the County's Water Plan Task Force.
2. The Task Force will review the issue and may, if necessary, undertake studies or investigations to gather information relating to the issue. After reviewing the issue, the Task Force will determine whether the Water Plan should be amended.
3. If the Committee determines that the Water Plan should be amended, it will make recommendations to the County Board. The County Board shall approve or disapprove the proposed amendment.
4. If the County Board approves the amendment, the Task Force will petition the BWSR Board, schedule a public hearing, send notice to the required parties and follow all procedures required under Minnesota Statute 103B.314 Subd. 6.

## **FIGURES**

# Site Location Map



**Figure 1**

# Location of Major Watersheds in Carlton County

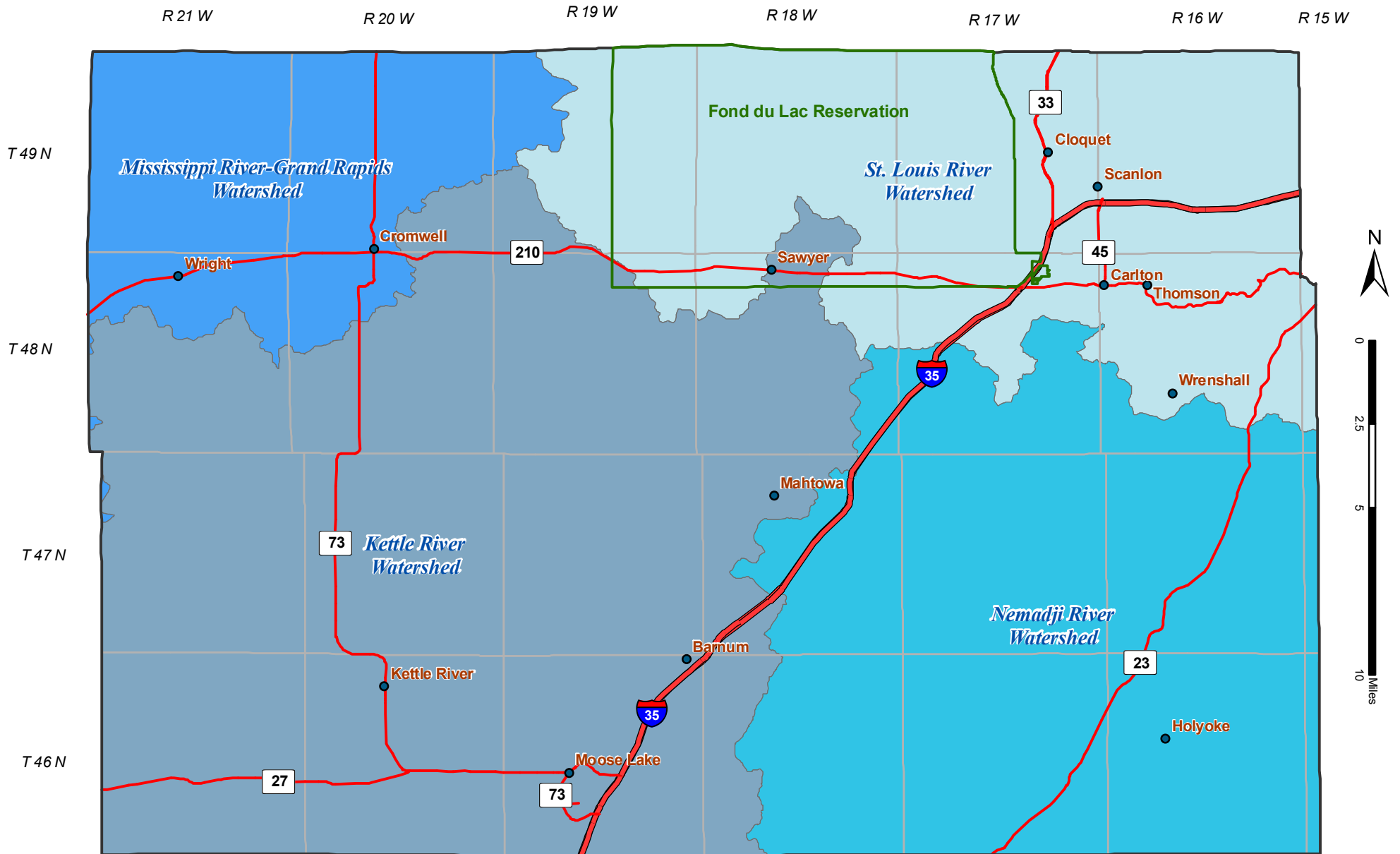
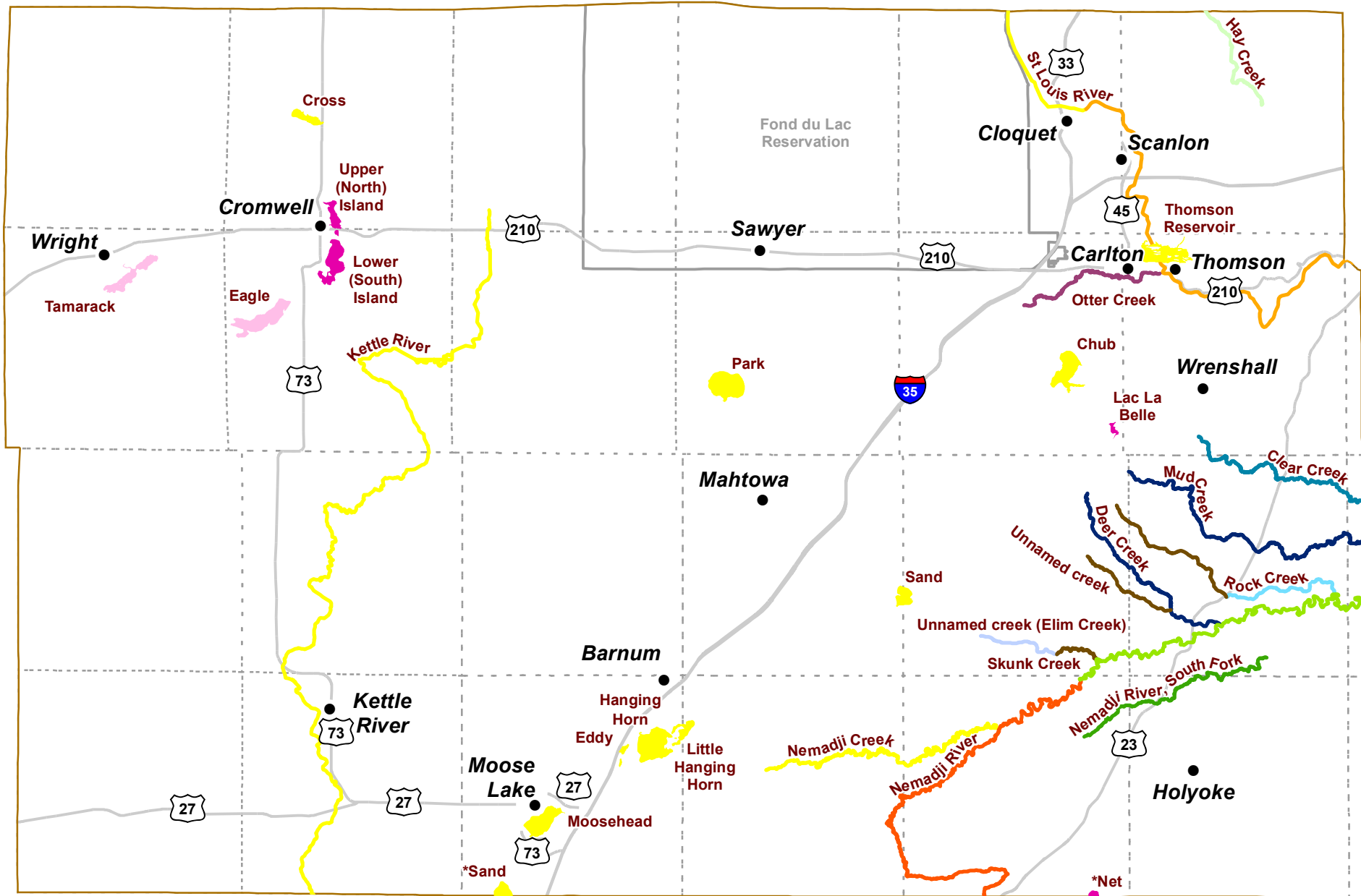


Figure 2

# Location of 2014 Impaired Waters in Carlton County

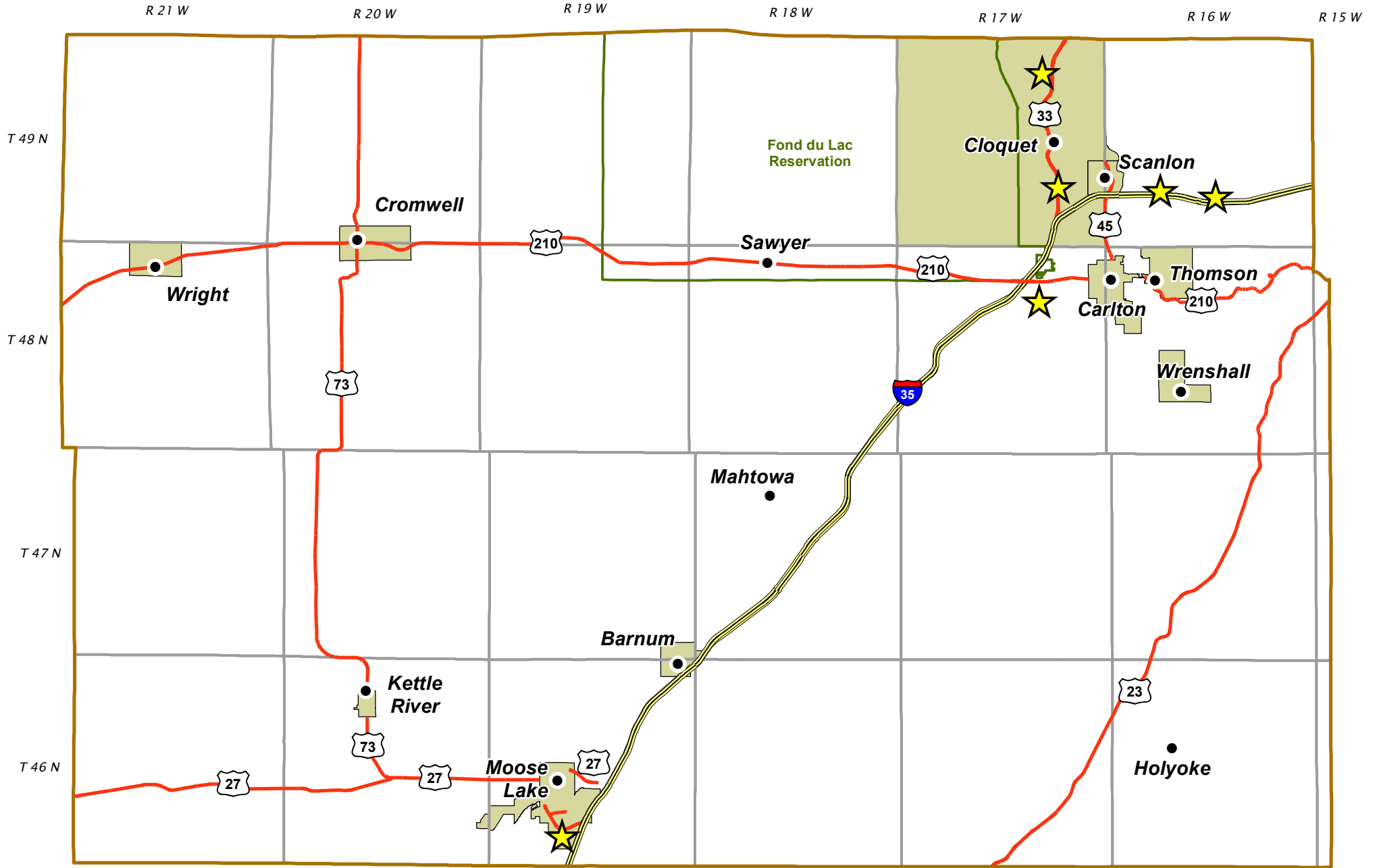


- |               |                |                       |              |            |         |               |           |
|---------------|----------------|-----------------------|--------------|------------|---------|---------------|-----------|
| E.coli        | E.coli, Turbid | Fish, A.Macro         | Fish, Turbid | Hg, PCBF   | A.Macro | Hg            | Nutrients |
| E.coli, Hg, T | Fish           | Fish, A.Macro, Turbid | Hg           | Hg, Turbid | Turbid  | Hg, Nutrients |           |

**Figure 3**

DISCLAIMER: Carlton Co., MN, makes no representation or warranties, express or implied, with respect to the use or reuse of the data provided herewith, regardless of its format or the means of its transmission. THE DATA IS PROVIDED "AS IS" WITH NO GUARANTEE OR REPRESENTATION ABOUT THE ACCURACY, CURRENCY, SUITABILITY, PERFORMANCE, MERCHANTABILITY, RELIABILITY, OR FITNESS OF THE DATA FOR ANY PARTICULAR PURPOSE. Carlton Co., MN, shall not be liable for any direct, indirect, special, incidental, compensatory or consequential damages or third party claims resulting from the use of this data, even if Carlton Co., MN, has been advised of the possibility of such potential loss or damage. This data may not be used in states that do not allow the exclusion or limitation of incidental or consequential damages.

# Location of Developments in Carlton County



 Location of industrial, commercial, or residential developments

**Figure 4**

# 1996 Protected Waters Inventory Map

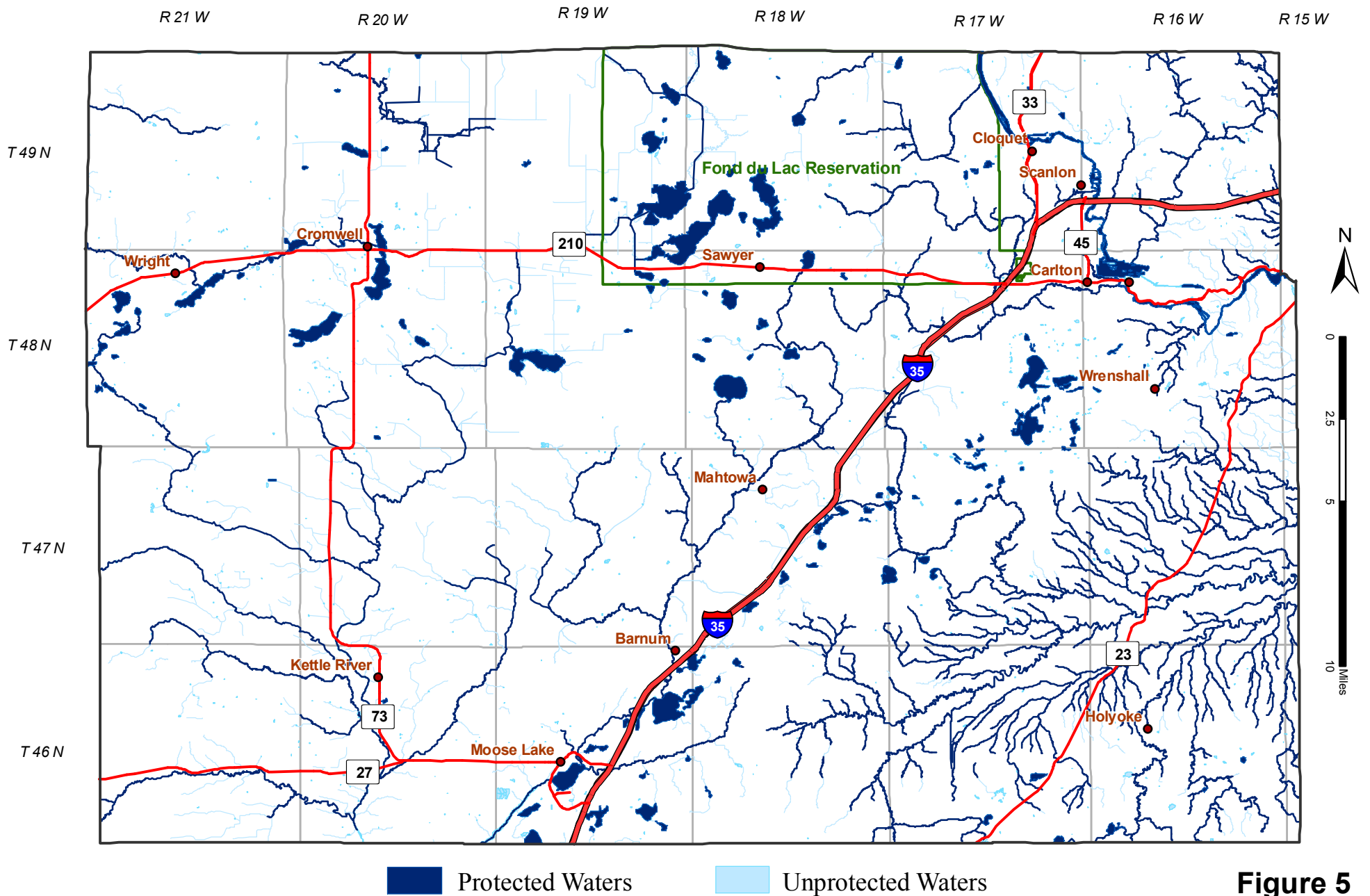


Figure 5

## **TABLES**



**TABLE 1 - BASINS, MAJOR WATERSHEDS AND HYDROLOGIC UNIT CODES**

<b>BASIN NAME</b>	<b>MAJOR WATERSHED UNIT</b>	<b>HYDROLOGIC UNIT CODE (HUC)</b>
Lake Superior	St. Louis River	4010201
Lake Superior	Nemadji River	4010301
St. Croix River	Kettle River	7030003
Upper Mississippi River	Mississippi River (Grand Rapids)	7010103

**TABLE 2 - DATA NEEDED FOR WATER QUALITY ASSESSMENTS<sup>1</sup>**

<b>POLLUTANT CATEGORY</b>	<b>PARAMETERS</b>	<b>PERIOD OF RECORD</b>	<b>MINIMUM NUMBER OF VALUES</b>
Pollutants with toxicity-based standards	Un-ionized ammonia (total ammonia, pH & temperature) chloride	Most recent 10 years	Varies, generally requires extensive monitoring during times when exceedances are most likely to occur, within a 3 year period .
Conventional pollutants and water quality characteristics	pH, turbidity (including total suspended solids and transparency tube), temperature, dissolved oxygen unique	Most recent 10 years	20 over at least 2 years
Swimming safety indicator bacteria, rivers and streams separate from beaches	Escherichia coli bacteria impairment determination via monthly geometric mean or invalid max. values	Most recent 10 years, April-October	5 per month (to calculate mean); at least 3 months
Eutrophication of lakes (effects of excess nutrients)	Total Phosphorus (TP) Chlorophyll <i>a</i> , Secchi disk transparency	Measurements collected from June to Sept. over the most recent 10-yr period	At least one TP, Secchi disk or Chlorophyll <i>a</i> measurement
		Measurements collected from June to Sept. over the most recent 10-yr period	At least 8 measurements (8 separate sampling dates) for each of TP, Secchi disk & Chlorophyll <i>a</i>
Impairment of the biological community	Index of Biological Integrity	Most recent 10 years	Assess multiple attributes against an index score for reference stream. Incorporate water chemistry and other lines of evidence. Can be based on a single biological monitoring event on a given reach
Supporting water quality data	Total Suspended Solids, Total Kjeldahl Nitrogen, Nitrite-Nitrate Nitrogen, conductivity, 5-day biochemical oxygen demand, alkalinity, stream TP	Most recent 10 years	As available; these measurements provide supporting information for determining assessments

<sup>1</sup> From MPCA's Guidance Manual for Assessing the Quality of Minnesota Surface Water for Determination of Impairment (2014 assessment and Listing Cycle)

**TABLE 3 - LAKES WATER QUALITY DATA**

<b>LAKE</b>	<b>I.D.</b>	<b>DATA</b>	<b>ASSESSED<sup>1</sup></b>	<b>DATE ASSESSED</b>	<b>HISTORICAL DATA<sup>3</sup></b>	<b>TYPE OF HISTORICAL DATA</b>
<b>Natural Environmental</b>						
Forbay Lake	9-2	no	no			
Soper Lake	9-4	no	no			
Bear Lake	9-5	yes	yes	2009-2012		
Blackhoof Lake	9-6	yes	no		1980	chemistry
Spring Lake	9-7	yes	yes	2011-2012	1980	chemistry
Venoah Lake	9-9	yes	yes	2011-2012		
Hay Lake	9-10	yes	yes	2009-2010		
Flodin Lake	9-14	no	no			
Ellstrom Lake	9-15	no	no			
Sand Lake	9-16	yes	no		1997	chemistry
Hizer Lake	9-18	yes	no		1982	chemistry
Munson Lake	9-19	yes	no		1982	chemistry
Crystal Lake	9-20	yes	no		1982	chemistry
Benfield Lake	9-21	no	no			
Lake Twenty Nine	9-22	no	no			
Wild Rice Lake	9-23	yes	yes <sup>4</sup>	1999-2009		
Unnamed	9-28	no	no			
Hardwood Lake	9-30	yes	yes <sup>4</sup>	1999-2009		
Cedar Lake	9-31	yes	yes <sup>4</sup>	1999-2009		
Sofie Lake	9-33	yes	yes <sup>4</sup>	1999-2009		
Perch Lake	9-36	yes	yes <sup>4</sup>	1999-2009		
Rice Portage Lake	9-37	yes	yes <sup>4</sup>	1999-2009		
Eddy Lake	9-39	yes	no		1997	chemistry
Kohring Lake	9-42	no	no			
Echo Lake	9-44	no	no			
Spring Lake	9-47	yes	yes <sup>4</sup>	1999-2009		
Corona Lake	9-48	no	no			
Kettle Lake	9-49	no	no			
Jaskari Lake	9-50	yes	yes <sup>4</sup>	1999-2009		
Dead Fish Lake	9-51	yes	yes <sup>4</sup>	1999-2009		
Miller Lake	9-53	yes	yes <sup>4</sup>	1999-2009		
Merwin Lake	9-58	no	no			
Cross Lake	9-62	yes	yes	2005-2006		

**TABLE 3 - LAKES WATER QUALITY DATA**

<b>LAKE</b>	<b>I.D.</b>	<b>DATA</b>	<b>ASSESSED<sup>1</sup></b>	<b>DATE ASSESSED</b>	<b>HISTORICAL DATA<sup>3</sup></b>	<b>TYPE OF HISTORICAL DATA</b>
<b>Natural Environmental Continued</b>						
Woodbury Lake	9-63	yes	yes	2005-2010		
Long Lake	9-66	yes	yes	2005-2006		
Mattila Lake	9-70	no	no			
Walli Lake	9-71	no	no			
Unnamed	9-73	no	no			
Kettle Lake	9-74	no	no			
Heikkila Lake	69-846	no	no			
<b>Recreational Development</b>						
Graham Lake	9-3	yes	no		1991	chemistry
Chub Lake	9-8	yes	yes	2009-2013		
Lac La Belle Lake	9-11	yes	yes	Impaired List <sup>2</sup>		
Torch Light Lake	9-25	yes	yes	2011-2012		
Bob Lake	9-26	yes	no		1982	chemistry
Park Lake	9-29	yes	yes	2009-2010		
Big Lake	9-32	yes	yes <sup>4</sup>	1999-2009		
Bear Lake	9-34	yes	yes	2009-2012		
Little Hanging Horn	9-35	yes	yes	2009-2010		
Hanging Horn Lake	9-38	yes	yes	2008		
Moose Lake	9-43	no	yes	2003		
Coffee Lake	9-45	no	no			
Bang Lake	9-46	yes	yes <sup>4</sup>	1999-2009		
Eagle Lake	9-57	yes	yes	Impaired List <sup>2</sup>		
Tamarack Lake	9-67	yes	yes	Impaired List <sup>2</sup>		
Cole Lake	9-68	yes	yes	2009-2010		
*Net Lake	58-38	yes	yes	2009-2010, 2012, Impaired List <sup>2</sup>		
Sand Lake	58-81	yes	yes	2003		
<b>General Development</b>						
Thomson Reservoir	9-1	yes	no	State		
Moosehead Lake	9-41	yes	yes	2003		
Island Lake	9-60	yes	yes	Impaired List <sup>2</sup>		

**TABLE 3 - LAKES WATER QUALITY DATA**

<b>LAKE</b>	<b>I.D.</b>	<b>DATA</b>	<b>ASSESSED<sup>1</sup></b>	<b>DATE ASSESSED</b>	<b>HISTORICAL DATA<sup>3</sup></b>	<b>TYPE OF HISTORICAL DATA</b>
<b>Non-Classified</b>						
Unnamed	9-12					
Unnamed	9-13					
Lost Lake	9-17	yes	yes <sup>4</sup>	1999-2009		
Unnamed	9-24					
Unnamed	9-27					
Cranberry	9-40					
Lac Lake	9-52	yes	yes <sup>4</sup>	1999-2009		
Spruce Lake	9-54	yes	yes <sup>4</sup>	1999-2009		
Unnamed	9-55					
Unnamed	9-59					
Springer Lake	9-61	yes	yes	2011-2012		
Flower Lake	9-64	yes	yes	2009-2010		
Unnamed	9-65					
Section One Lake	9-69					
Unnamed	9-72					

\*Located on the border of Carlton and Pine counties

<sup>1</sup>Assessment for Eutrophication of Lakes in accordance with MPCA Standards (Total Phosphorus (TP), chlorophyll *a*, Secchi disk transparency) or Fond du Lac Water Quality Standards (FDL WQS)

<sup>2</sup>Listed as impaired for excess nutrients on the 2014 Proposed Impaired Waters List

<sup>3</sup> For lakes that have not been assessed, denotes dates of historical data

<sup>4</sup> FDL WQS denotes all data types included in FDL's Water Quality Program (physical, chemistry and biology)

**TABLE 4 - RIVERS AND STREAMS WATER QUALITY DATA**

RIVER	I.D. #	LEGAL DISCRPTION		DATA
		From	To	
<b>Remote Rivers</b>				
North Fork	9-219	East Section Line Sec.32, T46N, R17W	Border of Carlton Co. and State of WI in Sec. 19, T47N, R15W	yes
Nemadji	9-219	East Section Line Sec.32, T46N, R17W	Border of Carlton Co. and State of WI in Sec. 19, T47N, R15W	yes
South Fork	9-254	Confluence w/ Net River Sec. 34, T47N, R16 W	Border of Carlton Co. and State of WI	yes
Nemadji River	9-254	Confluence w/ Net River Sec. 34, T47N, R16 W	Border of Carlton Co. and State of WI	yes
Net	9-260	West Section Line, Sec. 21, T46N, R16W	Confluence w/ S. Fork Nemadji River in Sec. 34, T47N, T16W	yes

**TABLE 4 - RIVERS AND STREAMS WATER QUALITY DATA**

RIVER	I.D. #	LEGAL DISCRPTION		DATA
		From	To	
<b>Forested Rivers</b>				
Kettle	9-166	State Hwy 210 Bridge, N Section Line, Sec 6, T48N, R19W (Public ditch that has altered the natural watercourse)	NE1/4, Sec 7, T48N, R19W	yes
Kettle	9-166	SW1/4, Sec 36, T48N, R20W	Border of Carlton and Pine Counties in Sec 32/33, T46N, R20W	yes
Moose	9-182	Outlet of Moosehead Lake in Sec 29, T46N, R19W	Border of Carlton and Pine Counties in Sec 36, T46M, R20W	yes
Moose Horn	9-183	W Section Line, Sec 15, T48N, R18W	Inlet of Mosehead Lake in Sec 21, T46N, R19W	yes
St. Louis	9-193	Border of St. Louis and Carlton Counties in Sec 4, T49N, R17W	Border of St. Louis and Carlton Counties in Sec 6, T48N, R15W	yes
Blackhoof Creek	9-234	N Section Line, T48N, R17W	Sec 31, Confluence with Nemadji River in Sec 29, T47N, R16W	yes

**TABLE 4 - RIVERS AND STREAMS WATER QUALITY DATA**

RIVER	I.D. #	LEGAL DISCIPTION		DATA
		From	To	
<b>Tributary Streams</b>				
Hasty Brook (HB)	9-158	18-49-19	4-49-20	yes
Unnamed to HB	9-159	24-49-20	14-49-20	
Unnamed to HB	9-160	5-49-20	5-49-20	
Tamarack River (TR)	9-161	32-49-20	31-49-21	yes
Unnamed to TR	9-162	8-48-20	9-48-20	
Unnamed to TR	9-163	33-49-20	32-49-20	
Unnamed to TR	9-164	32-49-20	32-49-20	
Little Tamarack Rivers	9-165	15-49-21	7-49-21	
Unnamed to KR	9-167	9-48-19	18-48-19	
Heikkila Creek	9-168	29-48-20	9-47-20	
Unnamed to KR	9-169	8-47-20	16-47-20	
West Branch Kettle River (WBKR)	9-170	18-48-21	20-47-20	yes
Unnamed Tributary	9-171	17-48-21	17-48-21	
Unnamed to WBKR	9-172	4-47-21	4-47-21	
Dead Moose River	9-173	19-47-21	5-46-20	yes
Silver Creek (SC)	9-174	32-47-21	16-46-20	yes
Unnamed to SC	9-175	3-46-21	3-46-21	
Unnamed to SC	9-176	18-46-20	17-46-20	
Gillespie Brook (GB)	9-177	26-47-20	28-46-20	yes
Unnamed to GB	9-178	13-47-20	30-47-19	
Split Rock River (SRR)	9-179	31-46-21	32-46-20	yes
Unnamed to SRR	9-180	30-46-21	30-46-21	
Unnamed to SRR	9-181	36-46-21	25-46-21	
Moose Horn River (MHR)	9-183	3-48-18	16-48-18	yes
Unnamed to MHR	9-184	27-48-18	35-48-18	
Park Lake Creek	9-185	29-48-18	8-47-18	
King Creek (KC)	9-186	1-47-19	19-47-18	
Unnamed to KC	9-187	1-47-19	1-47-19	
West Branch Moose Horn River (WBMHR)	9-188	3-47-19	36-47-19	yes



**TABLE 4 - RIVERS AND STREAMS WATER QUALITY DATA**

RIVER	I.D. #	LEGAL DISCRPTION		DATA
		From	To	
Unnamed to WBMHR	9-189	20-47-19	29-47-19	
Unnamed to MHR	9-190	16-46-19	21-46-19	
Portage River	9-191	5-46-18	21-46-19	
Unnamed Tributary	9-192	36-49-19	2-48-19	
Simian Creek	9-194	10-49-18	1-49-18	yes
Crystal Creek	9-198	17-49-16	31-49-16	yes
Crystal Creek	9-199	1-48-17	6-48-16	yes
Midway River (MR)	9-200	1-49-16	5-48-16	yes
Elim Creek	9-201	2-49-16	1-49-16	yes
Unnamed to MR	9-202	2-49-16	12-49-16	
Unnamed to Unnamed	9-203	12-49-16	12-49-16	
Unnamed to MR	9-204	12-49-16	12-49-16	
Hay Creek	9-205	4-49-16	15-49-16	yes
Unnamed to MR	9-206	29-49-16	33-49-16	
Otter Creek (OC)	9-207	26-49-18	8-48-16	yes
Unnamed to OC	9-209	4-48-17	10-48-17	
Little Otter Creek (LOC)	9-210	11-48-18	10-48-17	yes
Unnamed to LOC	9-211	5-48-17	7-48-17	
Silver Creek (SiC)	9-212	17-48-16	15-48-16	yes
Unnamed to SiC	9-213	29-48-16	16-48-16	
Gill Creek	9-214	2-48-16	2-48-16	
Little River	9-215	2-48-16	1-48-16	
Mission Creek	9-216	26-49-16	36-49-16	yes
Red River (RR)	9-217	26-48-16	30-48-15	
Unnamed to RR	9-218	24-48-16	19-48-15	
North Fork Nemađji River (NFNR)	9-219	33-46-17	33-46-17	yes
Unnamed to NFNR	9-220	31-46-17	31-46-17	
Unnamed to Unnamed	9-221	36-46-18	31-46-17	
Unnamed to NFNR	9-222	26-46-18	5-46-18	
Unnamed to NFNR	9-223	19-46-17	9-46-17	
Nemađji Creek (NC)	9-224	22-46-18	9-46-17	yes

**TABLE 4 - RIVERS AND STREAMS WATER QUALITY DATA**

RIVER	I.D. #	LEGAL DISCRPTION		DATA
		From	To	
Unnamed to NC	9-225	16-46-18	15-46-18	
Unnamed to NC	9-226	16-46-18	15-46-18	
Hunter's Creek (HC)	9-227	35-47-18	13-46-18	yes
Unnamed to HC	9-228	34-47-18	35-47-18	
Unnamed to HC	9-229	34-47-18	2-46-18	
Unnamed to NC	9-230	7-46-17	7-46-17	
Skunk Creek (SkC)	9-231	28-47-17	36-47-17	yes
Unnamed to SkC	9-232	30-47-17	35-47-17	
Unnamed to Unnamed	9-233	6-46-17	34-47-17	
Unnamed to BC	9-235	30-48-17	30-48-17	
Unnamed to BC	9-236	14-47-18	12-47-18	
Unnamed to BC	9-237	20-47-17	27-47-17	
Deer Creek (DC)	9-238	11-47-17	28-47-16	yes
Unnamed to DC	9-239	19-47-16	20-47-16	
Unnamed to DC	9-240	24-47-17	29-47-16	
Rock Creek (RC)	9-241	12-47-17	24-47-16	yes
Unnamed to RC	9-242	17-47-16	17-47-16	
Unnamed to Unnamed	9-243	17-47-16	17-47-16	
Mud Creek(MC)	9-244	6-47-16	18-47-15	yes
Unnamed to MC	9-245	9-47-16	16-47-16	
Unnamed to Unnamed	9-246	16-47-16	16-47-16	
Unnamed to MC	9-247	10-47-16	14-47-16	
Unnamed to MC	9-248	10-47-16	13-47-16	
Unnamed to MC	9-249	13-47-16	13-47-16	
Clear Creek (CC)	9-250	33-48-16	7-47-15	yes
Unnamed to CC	9-251	27-46-17	3-47-16	
Unnamed to CC	9-252	2-47-16	2-47-16	
Unnamed to CC	9-253	1-47-16	1-47-16	
South Fork Nemadji River (SFNR)	9-254	12-46-17	34-47-16	yes
Clear Creek	9-255	29-46-17	12-46-17	yes
Anderson Creek	9-256	26-46-17	12-46-17	yes
Silver Creek	9-257	25-46-17	14-46-17	

**TABLE 4 - RIVERS AND STREAMS WATER QUALITY DATA**

RIVER	I.D. #	LEGAL DISCRPTION		DATA
		From	To	
Stony Brook	9-258	21-46-17	11-46-17	yes
Unnamed to SFNR	9-259	7-46-16	6-46-16	
Net River (NR)	9-260	36-46-17	36-46-17	yes
Unnamed to NR	9-261	33-46-16	32-46-16	
Unnamed to NR	9-262	9-46-16	9-46-16	
Unnamed to NR	9-263	4-46-16	4-46-16	
Little Net River (LNR)	9-264	34-46-16	3-46-16	yes
Unnamed to LNR	9-265	26-46-16	26-46-16	
Unnamed to LNR	9-266	27-46-16	27-46-16	
Unnamed to NR	9-267	11-46-16	34-47-16	
Section 36 Creek (SeC)	9-268	13-46-16	36-47-16	
Unnamed to SeC	9-269	11-46-16	1-46-16	
Unnamed to SeC	9-270	13-46-16	36-47-16	
Unnamed to SeC	9-271	1-46-16	36-47-16	
State Line Creek	9-272	31-46-15	30-47-15	yes

**TABLE 5 - IMPAIRED WATERS OF CARLTON COUNTY**

<b>WATER BODY</b>	<b>AFFECTED USE</b>	<b>POLLUTANT/STRESSOR</b>
St. Louis River (several reaches)	Aquatic Consumption	PCB, Hg
Kettle River (several reaches)	Aquatic Consumption	Hg
Thomson Reservoir	Aquatic Consumption	Hg
Sand Lake	Aquatic Consumption	Hg
*Sand Lake	Aquatic Consumption	Hg
Park Lake	Aquatic Consumption	Hg
Moosehead Lake	Aquatic Consumption	Hg
Hanging Horn Lake	Aquatic Consumption	Hg
Little Hanging Horn	Aquatic Consumption	Hg
Eddy Lake	Aquatic Consumption	Hg
Cross Lake	Aquatic Consumption	Hg
Chub Lake	Aquatic Consumption	Hg
Tamarack Lake	Aquatic Consumption, Aquatic Recreation	Hg, Excess Nutrients
Upper Island Lake	Aquatic Recreation	Excess Nutrients
Lower Island Lake	Aquatic Recreation	Excess Nutrients
Eagle Lake	Aquatic Recreation	Excess Nutrients
Lac La Belle	Aquatic Recreation	Excess Nutrients
*Net Lake	Aquatic Recreation	Excess Nutrients
Rock Creek	Aquatic Life	Turbidity, Aquatic Macroinvertebrate Bioassessments, Fish Bioassessments
Deer Creek	Aquatic Life	Turbidity, Fish Bioassessments
Nemadji River	Aquatic Life, Aquatic Consumption	Turbidity, Hg
Nemadji River	Aquatic Recreation	Escherichia coli
Nemadji River (South Fork)	Aquatic Life, Aquatic Recreation	Turbidity, Escherichia coli
Nemadji Creek	Aquatic Consumption	Hg
Clear Creek	Aquatic Life	Turbidity, Aquatic Macroinvertebrate Bioassessments, Fish Bioassessments
Mud Creek	Aquatic Life	Turbidity, Fish Bioassessments
Skunk Creek	Aquatic Life	Turbidity, Fish Bioassessments
Hay Creek	Aquatic Recreation	Escherichia coli
Otter Creek	Aquatic Life	Aquatic Macroinvertebrate Bioassessments

\*Located in Carlton County and Pine County.

Hg = Mercury

PCB = Polychlorinated biphenyls

**TABLE 6 - SEWER COMPLIANCE INSPECTIONS COMPLETED FOR EXISTING SYSTEMS - POINT OF SALES AND ZONING PERMITS**

<b>YEAR</b>	<b>NUMBER OF INSPECTIONS</b>	<b>PERCENT FAILING</b>
2003	86	26%
2004	70	33%
2005	109	19%
2006	88	19%
2007	100	15%
2008	71	18%
2009	64	26%
2010	75	17%
2011	94	16%
2012	89	21%
2013	109	16%
<b>Average</b>	<b>87</b>	<b>21%</b>

**TABLE 7 - SUMMARY OF WETLAND CONSERVATION ACT ACTIVITIES**

WETLAND CONSERVATION ACT ACTIVITY	YEAR											
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL
Number of exemption determinations approved by LGU:	13	14	19	37	24	11	10	7	5	12	8	160
Wetland acres impacted via exemptions:	2.11	1.95	3.14	5.01	9.00	1.06	0.85	0.48	0.33	1.18	0.81	25.92
Number of wetland banking applications reviewed:	0	0	1	1	1	0	0	0	0	0	0	1*
Number of wetland banking site monitoring assessments completed:	0	0	0	0	1	0	0	0	0	0	0	1
Number of replacement plans reviewed:	7	4	4	2	5	5	0	1	2	2	2	34
Number of acres drained/filled under WCA replacement plan:	8.60	3.32	1.29	0.96	3.57	2.82	0.00	11.90	0.20	0.12	0.82	33.59

\* = same wetland banking application was reviewed with modifications

## **APPENDIX A**

# **Carlton County Local Water Management Plan 2009-2019 Update**

## **PRIORITY CONCERNS SCOPING DOCUMENT**



**Prepared by:  
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P.O. Box 220  
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## INTRODUCTION

The following Priority Concerns Scoping Document was developed in accordance with the changes to the Comprehensive Local Water Management Act; Statutes: 103B.304-103B.355. This scoping document lists the priority concerns the Carlton County Water Management Task Force has chosen along with a detailed account of how these concerns were identified and chosen.

### *County Primer*

Carlton County is a large rural county covering 862 square miles. It is located in northeastern Minnesota within easy commuting distance to the Duluth-Superior metropolitan area. The county seat is located in the City of Carlton. Surrounding counties include St. Louis to the north, Aitkin to the west, Pine to the south and Douglas County of Wisconsin to the east. Carlton County contains 10 cities (Barnum, Carlton, Cloquet, Cromwell, Kettle River, Moose Lake, Scanlon, Thomson, Wrenshall and Wright), 19 organized townships (Atkinson, Automba, Barnum, Beseman, Blackhoof, Eagle, Holyoke, Kalevala, Lakeview, Mahtowa, Moose Lake, Perch Lake, Silver, Silver Brook, Skelton, Split Rock, Thomson, Twin Lakes and Wrenshall) and 5 unorganized townships (Clear Creek, Corona, Progress, Red Clover and Sawyer).

The 2000 United States Census reports a county population of 31,671 people. The projected population for 2007 was 33,990, or a growth of about 1% per year. Approximately 50% of the county's population lives in cities and another 25% of people live in the five most populated townships (Thomson, Twin Lakes, Moose Lake, Perch Lake and Blackhoof).

The state of Minnesota is divided into ten major basins. Carlton County is unique in that it overlaps three of those basins: Lake Superior, Mississippi River and St. Croix River. At the sub-basin level, Carlton County is divided into four major watersheds: St. Louis River, Nemadji River, Kettle River and the Mississippi River / Grand Rapids watersheds.

The following table provides an inventory of estimated acreage for each land cover category in the County.

<b>Land Use</b>	<b>Total Acres</b>
Bare Rock	166
Coniferous Forest	54,438
Cultivated Land	10,574
Deciduous Forest	172,816
Farmsteads and Rural Residences	2,545
Forest Cut-Overs	21,321
Grassland	96,498
Gravel Pits and Open Mines	967
Mixed Wood Forest	16,504
Open Water	11,864
Other Rural Developments	4,344
Shrubby Grassland	3,786
Urban/Industrial	4,523
Wetlands – Bogs	99,024
Wetland – Marshes & Fens	44,293
<b>TOTAL ACRES</b>	<b>543,663</b>

This table was prepared as part of the Carlton County Comprehensive Plan dated 2001. A land use inventory was conducted by the Arrowhead Regional Development Commission (ARDC) using GIS software. Land uses were delineated based on available zoning maps, aerial photographs and conversations with local communities for accuracy.

According to the Carlton County Comprehensive Plan, most development within the next 20 years is anticipated to occur in the northeastern part of the County and along Interstate 35. This growth is anticipated to be primarily residential, with commercial development occurring directly adjacent to highway corridors. In general, most commercial and industrial development will remain along the Interstate 35 corridor.

### ***Plan Information***

Carlton County Planning and Zoning is the local government unit (LGU) responsible for the local water management plan program. The Carlton County water planning process started when the Board of Commissioners passed a resolution on December 8, 1987, to enter into the Comprehensive Local Water Planning process under Chapter 103B.311 and 103B.315. The original Carlton County Comprehensive Local Water Plan was completed and adopted in late 1990. Implementation of the plan began immediately the next year. In 1996, the County completed its first plan update. The 2002-2009 Carlton County Water Plan update combines information from the 1990 plan and 1996 update with new information identified by county advisors, county staff and the general public. The current plan will expire at the end of 2009.

### **PRIORITY CONCERNS HISTORY**

The Carlton County Local Water Management planning process addressed the priority concerns as follows:

**April 8, 2008:** The Carlton County Board of Commissioners resolved to update the current Water Plan.

**April 18, 2008:** The Carlton County Water Planner sent a letter indicating the intent to update the plan, along with a request for input on priority concerns, request for a copy of any water and related land resource plans and a request for volunteers for the Water Plan Task Force. The letter was sent to all townships, cities, adjacent counties, lake associations, local legislators, Carlton County Board of Commissioners, Soil and Water Conservation District (SWCD) Board Members, Fond du Lac Environmental Program, and representatives of the Department of Natural Resources (DNR), Minnesota Department of Agriculture (MDA), Board of Water and Soil Resources (BWSR), Environmental Quality Board (EQB), Minnesota Department of Health (MDH), Natural Resources Conservation Service (NRCS) and the Minnesota Pollution Control Agency (MPCA).

**June 13, 2008:** Responses for priority concerns were due from the groups listed above.

**June and July 2008:** Phone calls were made to the various agencies reminding them to provide their priority concerns. Responses were received from Carlton County Water

Planner, Carlton County SWCD Program Manager, BWSR, City of Thomson, Chub Lake Association, Hanging Horn Lake Association, Tamarack Watershed Group, Fond du Lac Environment Program, MDH, DNR, MPCA and Pine County SWCD. These responses are summarized on the attached Table 1 Summary of Agency and Local Units of Government Input.

Based on the priority concerns input, the responses were categorized into areas of concern. These included (number of responses in parentheses): Water Quality (17), Education (6), Drinking Water (2), Land Use (1), Stormwater (4), Septic Systems (3), Wetlands (4) and Regulations (4). After categorizing the responses, the Water Planner met with two staff from the Carlton County SWCD (July 29, 2008) to review the responses and areas of concerns. Based on the areas of concern, a Carlton County Citizen Survey was developed. This survey is included as Table 2. The Carlton County Water Planner and SWCD also reviewed the current Water Plan to determine which goals have been met, which are no longer important or feasible and which goals should be retained in the updated plan.

**August 12, 2008:** The Carlton County Board of Commissioners approved the Carlton County Water Plan Task Force. The Task Force is composed of the following persons: Lu Olean (Township Representative), Ann Gustafson (City Representative), Kari Jacobson-Hedin (Fond du Lac Representative), Carol Hauck (SWCD Representative), Len Hansmeyer (Citizen-at-Large), Harvey Ukura (Lake Association Representative), and Dick Brenner (Carlton County Commissioner). Table 3 summarizes the members of the Task Force and the members of the Technical Advisory Committee.

**August 14-17, 2008:** The Carlton County Citizen Survey was distributed at the Carlton County Fair in Barnum, Minnesota. A total of 56 responses were received. The number in parentheses indicates the number of votes each area of concern received.

1. Lake and Stream Water Quality (35)
2. Lack of Environmental Education (26)
3. Drinking Water Quality (20)
4. Development Impacts / Land Use (32)
5. Stormwater Management (18)
6. Non-compliant Septic Systems (29)
7. Loss of Wetlands / Quality of Wetlands (32)
8. Lack of Regulations (8)

The most threatened resource and number of votes were:

1. Groundwater (20)
2. Wetlands (11)
3. Lakes (14)
4. Rivers and Streams (11)

The survey indicated that Carlton County citizens believe the top four problems in order of highest response are lake and stream water quality, development impacts/land use, loss of wetlands/quality of wetlands (tied), and non-compliant septic systems. The resource that Carlton County citizens found to be the most threatened was groundwater, followed by lakes, then streams and rivers and lastly, wetlands.

**August 26, 2008:** The Carlton County Water Plan Task Force met for the first time. The agenda included reviewing the previous water plans, reviewing agency and government responses, reviewing the Carlton County Citizen Survey responses and developing a plan for gathering further input from Carlton County citizens.

The Task Force developed a plan that included soliciting citizen input at three public meetings to be held around Carlton County and an online survey posted on the Carlton County website. The meetings were scheduled for October 7 in Carlton, October 8 in Cromwell and October 9 in Moose Lake. The on-line survey was made available on the County's website on September 8, 2008.

**September 15-19, 2008:** News releases were featured in four area newspapers announcing the public meetings and web survey.

**September 22-26, 2008:** Advertisements were placed in four area newspapers announcing the public meetings and web survey.

**September 30, 2008:** The Carlton County Water Plan Task Force met to develop a process for soliciting input during the public meetings. The Task Force decided to use the same approach as the survey, except use a poster board with sticky notes. Each attendee had four sticky notes to put behind the area of concern they felt was most important.

**October 7, 2008:** A public meeting was held in Carlton and was attended by 8 people. A brief presentation was given on the Water Management Plan. After the presentation, attendees were given a chance to place their sticky notes on each area of concern. Once the sticky notes were placed, each area of concern was discussed. Comments are as follows. The number in parentheses indicates the number of votes each area of concern received.

1. Lake and Stream Water Quality (8)

- need monitoring and begin a database to show results
- need to protect them from pollution and construction
- need a county wide lake association
- possible ordinance for existing residence at point of sale to add buffer to lakeshore and not grandfather them in
- livestock in rivers and streams
- residential use of pesticides and/or fertilizers near lakeshore
- perched culverts

2. Lack of Environmental Education (4)
  - should concentrate educational efforts with the following groups: schools, contractors, developers, landscapers, lakeshore residents, medical facilities, Board of Adjustment, churches, community education, girl and boy scouts, local government, Kiwanis, rotary clubs, nursery growers and outdoor sport groups
  - education should concentrate on shoreline issues, recycling, medication disposal, burning garbage, fertilizers, low-impact development, low-impact recreation and wetlands
3. Drinking Water Quality (4)
  - abandoned wells
  - backyard dumps polluting drinking water sources
  - general concern over quality of drinking water and what possible pollutants might be there and what business/sources could be responsible
4. Development Impacts / Land Use (4)
  - runoff from construction sites, no enforcement of the law
  - too much development
  - excessive seasonal cabins converted to homes
  - too many variances granted
  - lack of green space
  - smaller lakes and streams not regulated and are very sensitive, set basic standards for all water bodies
5. Stormwater Management (2)
  - working with contractors and developers
  - lack of enforcement
  - may need a County ordinance
  - maintenance of stormwater ponds
6. Non-compliant Septic Systems (3)
  - septic system inventory
  - tougher regulations
  - development of experimental systems
7. Loss of Wetlands / Quality of Wetlands (4)
8. Lack of Regulations (2)
  - stormwater
  - septic systems
  - shoreline development
  - good data and science to back up regulations

**October 8, 2008:** A public meeting was held in Cromwell and was attended by 1 person. The same format as the Carlton meeting was followed.

1. Lake and Stream Water Quality (1)
  - lake water quality is getting better because of the city sewer around Island Lake
  - more aquatic vegetation than usual
  - still concerns with grey water and old septic systems leaching into lakes
2. Lack of Environmental Education (1)
  - should concentrate educational efforts with the following groups: lakeshore owners, city and township employees, snowmobile clubs, ATV clubs and horse clubs
  - education should concentrate on septic systems, land use around lakes, wetlands and burning and burying garbage
3. Drinking Water Quality
  - radon in drinking water in Cromwell area
4. Development Impacts / Land Use (1)
  - cabins reconstructed into permanent homes on small lots
5. Stormwater Management
6. Non-compliant Septic Systems (1)
  - biggest impact to lakes in the area
7. Loss of Wetlands / Quality of Wetlands
8. Lack of Regulations

**October 9, 2008:** A public meeting was held in Moose Lake and was attended by 4 people. The same format as the Carlton meeting was followed.

1. Lake and Stream Water Quality (4)
  - notice a difference in water quality after the fair
  - should concentrate efforts on pinpointing sources of contamination
  - should continuously monitor flow on rivers and streams
  - should have a monitoring plan for all lakes in the county
  - non-compliant sewers and saunas
  - should mandate buffers along shoreline
  - need wetlands for runoff, should monitor wetlands
  - Moose Lake is filling with sand from storm sewers and every year they dump sand at the beach
  - too much sand and salt used on roads
2. Lack of Environmental Education (1)
  - should concentrate educational efforts with the following groups: realtors, schools, lake associations, scouts

- education should concentrate on non-phosphorus fertilizers, buffers, non-toxic cleaning supplies, changing oil and car maintenance, recycling and household hazardous waste
3. Drinking Water Quality (1)
    - protect groundwater for the future
  4. Development Impacts / Land Use (3)
    - Planned Unit Development (PUD) on Hanging Horn Lake and all other development should be restricted on lakes
    - concerns with developing in clay
    - developments are removing too much aquatic vegetation and terrestrial vegetation
    - lack of enforcement of existing land use regulations
    - too many variances are granted
    - developments building too many roads, more impervious surfaces
  5. Stormwater Management (1)
    - too much sand and road salts
    - sand in Moose Lake
  6. Non-compliant Septic Systems (2)
    - general concern
    - 2 citizens thought that all septic systems should be under compliance within 10 years and should be tested for compliance every ten years
    - 2 citizens thought that all septic systems within shoreland zone should be under compliance within 10 years and should be tested for compliance every ten years
  7. Loss of Wetlands / Quality of Wetlands (3)
    - no filling in any wetland without proper permits
  8. Lack of Regulations (2)
    - enforcement of existing regulations, including setbacks and lot size

**September 8 – October 28, 2008:** The on-line survey was made available on the County's website. The survey had twelve responses. Each participant was allowed to vote for four priority concerns. These included (number of votes in parentheses): Water Quality (12), Education (6), Drinking Water (6), Land Use (9), Stormwater (4), Septic Systems (8), Wetlands (10) and Regulations (5). The survey also indicated that the most threatened resource was lakes, followed by groundwater, wetlands and rivers and streams.

**October 30 and November 18, 2008:** The Carlton County Water Plan Task Force met to review the public input process, the results and select priority concerns. A summary of all of the input is provided as Table 4.

**April 16, 2009:** The Carlton County Water Planner sent a letter and/or email at the request of the BWSR Board to Sappi and Potlach indicating the intent to update the plan, along with a request for input on priority concerns and request for a copy of any water and related land resource plans.

### **PRIORITY CONCERNS SELECTION**

After discussion and evaluation of public input by the Task Force, the following three Priority Concerns were chosen:

#### ***Water Quality in County Lakes, Rivers and Streams***

There are thirteen lakes in the County that are on the 2008 Impaired Water list, two of which are impaired due to excess nutrients (Eagle Lake and Lower Island Lake). Twenty-three reaches of streams and rivers have been identified as impaired due to a combination of conditions, including turbidity in the Nemadji River and Deer Creek. The majority of surface water in the County has not been assessed to determine whether the water is impaired or not. While the Task Force felt that water quality in Carlton County is very good, they felt that it was important to maintain or improve current conditions. This priority concern was ranked highest by government agencies, the survey at the county fair, web survey and at public meetings. The selection of water quality in county lakes, rivers and streams as a priority concern includes supporting the Impaired Waters/Total Maximum Daily Load (TMDL) process, assessing water to determine impairment and maintaining and improving water quality.

#### ***Development Impacts and Land Use***

According to the Carlton County Comprehensive Plan, most development within the next 20 years is anticipated to occur in the northeastern part of the County and along Interstate 35. With the close proximity to Duluth and Superior, Carlton County is seeing additional development of rural lands for residential housing. Due to the excellent recreational opportunities in Carlton County, it is also ideal for seasonal residents. Many of the small cabins along lakeshore have converted to retirement homes. This priority concern was ranked third highest according to public input. The selection of development impacts and land use as a priority concern includes incorporating land use issues such as non-compliant septic systems (ranked 4<sup>th</sup>), stormwater (ranked 7<sup>th</sup>) and wetland management (ranked 2<sup>nd</sup>).

#### ***Promote and Educate the Public about the County's Water Resources***

Education is a major component of all of the selected priority concerns, but the Task Force felt it deserved a priority of its own. The selection of education as a priority concern includes both promoting programs that are currently in place to enhance our water resources and the development of new programs.

### **CONCERNS NOT ADDRESSED BY THE PLAN**

As detailed above, many of the issues brought up during the public input process will be incorporated in each of the three priority concerns.



Two priority concerns that were not selected, drinking water quality and lack of regulations, will not be addressed in this plan. Comments received regarding drinking water quality included abandoned wells and developing a local groundwater quality database. Abandoned wells will be addressed in the education priority concern. The development of a local groundwater quality database will be explored but not incorporated into this Water Plan update.

Comments received regarding lack of regulations included adopting a point-of-sale compliance inspection for septic systems. The Task Force felt that it was important to support this change to the local ordinance. Since the ordinance is currently under revision, the Task Force made a formal recommendation to the Planning Commission. Most of the comments received regarding regulations were related to enforcement of existing regulations rather than creation of new regulations.

**APPENDIX A**  
**TABLES**

**TABLE 1  
SUMMARY OF AGENCY AND LOCAL UNITS OF GOVERNMENT INPUT**

Agency	PRIORITY CONCERNS INPUT - 1	PRIORITY CONCERNS INPUT - 2	PRIORITY CONCERNS INPUT - 3	PRIORITY CONCERNS INPUT - 4
Carlton County Water Planner, Heather Cunningham	Water quality monitoring. There is a need for more lake and river monitoring and an easy access database of local information. Many of our lakes and rivers have not been monitored on a consistent basis and some not at all. It is difficult to assess water quality when there is a lack of water chemistry and water quality data. Included in this concern would be the continued support of the TMDL process on Lower Island Lake, Eagle Lake, Deer Creek and Nemadji River. (WQ)	Stormwater pollution prevention. There is a need to fill in the gap between what is not regulated by the MPCA, such as construction projects less than 1 acre in size. There is a need for more vigilant inspection of projects both larger and smaller than 1 acre. (SW)	Water resource education. Support and distribute water resource education via media such as quarterly newsletters, lake associations, water quality workshops, articles in local papers, websites and radio. This would also include both the general public and contractors. (E)	
Carlton County SWCD, Brad Matlack	Lake association assistance. This is important to continue the momentum from the 2008 Waters Summit. Action needed includes 1) A clearing house of resources and answers to lake questions. 2. More meetings with focused information on weed control options, invasive species, erosion control, water quality issues. (WQ, E)	Addressing priority erosion control and water quality issues. Cooperative educational effort with partners to educate citizens of BMP for water quality improvement. (WQ, E)		
Board of Water and Soil Resources, Jason Weinerman	Land Use. As previous water plan indicates, development around lakes and rivers can contribute to declining water quality. (LU)	Nemadji River and other 303d listed waters. (WQ)	Livestock management. Feedlots and grazing next to rivers, streams and lakes can contribute significant pollutants to the water body. (WQ)	
City of Thomson, Ann Gustafson	Mercury/acid rain and PSBs that fall into the lakes from various industries. These collecting in fish and wildlife rendering them dangerous for human consumption. (WQ)	Pesticide and herbicide run-off (non-point source). (WQ)	Thermal pollution from pavement run-off and deforestation (non-point). (SW, WQ)	Sediment runoff and development of wetlands. (SW, W)
Chub Lake Association	Runoff from West Chub Lake old horse farm. (WC)	Ensuring septic systems are in compliance. (SS)		
Hanging Horn Lake Association, Tony and Sandy Wentkiewicz	Shoreland regulations are not being enforced. Excessive number of variances are applied for and granted. (R)	Need to restore shoreline with natural vegetation and increase shoreland buffer zones in agricultural areas. (WQ)	Get people involved in preserving and improving the environment by recycling and using environmentally safe products. (E)	
Tamarack Watershed Group, Harvey Ukura	All individual sanitary sewers within 800 feet of a lake's OHWL and more than 10 years old must be inspected to see if they are in compliance with County Ordinance #25 and if not in compliance be brought into compliance within one year. (SS)	All contractors who are working on shoreland and are not in compliance with the County Ordinance will be stopped and a shoreland mitigation plan be submitted. (R)		
Fond du Lac Environmental Program, Kari Hedin, Nancy Schuldt, Rick Gitar	Fund and construct a wastewater collection and treatment facility for the Big Lake Sanitary District. (SS)	Exploratory drilling by mining companies, which can lead to loss of wetlands and groundwater and surface water contamination. (W, WQ)	Problematic culverts. We have several culverts on the Fond du Lac Reservation that are perched, improperly installed, or nonfunctional. These culverts prevent fish passage, create dams, and cause erosion. We assume problematic culverts also exist within other areas of Carlton County as well. (SW)	

**SUMMARY OF AGENCY AND LOCAL UNITS OF GOVERNMENT INPUT**

<b>Agency</b>	<b>PRIORITY CONCERNS INPUT - 1</b>	<b>PRIORITY CONCERNS INPUT - 2</b>	<b>PRIORITY CONCERNS INPUT - 3</b>	<b>PRIORITY CONCERNS INPUT - 4</b>
MN Department of Health, Beth Kluthe	Protect ground water based drinking water sources within Carlton County. (DW)	Sealing unused, unsealed wells. (DW)	Develop a local ground water quality data base. (WQ)	
MN DNR Fisheries, Deserae Hendrickson	Recommend deleting Goal 4, Objective A, Action 1 Beaver Control from Water Plan. (R)	DNR recommends that the County consider adding additional trout stream tributaries from the revised Protected Waters Inventory Map (1996) in the Shoreland Classification for waters subject to all shoreland zoning and permitting. (R)		
MN DNR Lands and Minerals Division, Julie Jordan	Allow for drainage of peatlands for peat mining under permitted circumstances. (W)			
MN DNR Ecological Resources, Rian Reed	Lake water quality. (WQ)	Nemadji River Watershed. (WQ)		
MN Pollution Control Agency	Impaired waters/Total Maximum Daily Loads (TMDL) (WQ)	Development and Implementation of Watershed Projection Strategies. (WQ)	Wetland protection. (W)	Collaboration with the State of Wisconsin in the Nemadji River Basin. (WQ)
Pine SWCD, Sam Martin (concerns for Pine County were provided)	TMDL's (WQ)	Working more with lake associations. Involving more volunteers in monitoring and getting more people active in their associations. (E)	Education: Informing the public of best management practices and the good activities the SWCD is doing. (E)	

**Based on the input, the responses were categorized into the following areas of concern:**

<b>Area of Concern</b>	<b>Number of Responses</b>
Water Quality (WQ)	17
Education (E)	6
Drinking Water (DW)	2
Land Use (LU)	1
Stormwater (SW)	4
Septic Systems (SS)	3
Wetlands (W)	4
Regulations (R)	4

**TABLE 2**

**Carlton County Citizen Survey**

**Which City or Township do you live in?**

\_\_\_\_\_

**Which resource do you feel is the most threatened?**

**Rank 1-4, with 1 being the most threatened.**

- Groundwater (drinking water)
- Wetlands
- Lakes
- Streams/Rivers
- Other \_\_\_\_\_

**Related to the above resources, what do you feel are the top four problems in Carlton County? Rank 1-4, with 1 being the biggest problem.**

- Lake and stream water quality
- Lack of environmental education
- Drinking water quality
- Development impacts/land use
- Stormwater management
- Non-compliant septic systems
- Loss of wetlands / quality of wetlands
- Lack of regulations

**Additional Comments/Suggestions:**

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\_\_\_\_\_  
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**TABLE 3****WATER PLAN TASK FORCE**

<b>Task Force Representative</b>	<b>First Name</b>	<b>Last Name</b>	<b>Title</b>	<b>Address</b>	<b>City, State, Zip</b>
Township Representative	Lu	Olean	Twin Lakes Township Treasurer	1360 Cologne Road	Carlton, MN 55718
City Representative	Ann	Gustafson	City of Thomson, Cloquet Middle School Teacher	29 Myra Avenue	Carlton, MN 55718
Fond du Lac Representative	Kari	Jacobson Hedin	Watershed Specialist	1720 Big Lake Road	Cloquet, MN 55720
Soil and Water Conservation District	Carol	Hauck	SWCD Supervisor	3828 County Road 4	Mahtowa, MN 55707
Soil and Water Conservation District	Merril	Loy	SWCD Supervisor	337 Cedar Avenue	Carlton, MN 55718
Citizen-at-Large Representative	Len	Hansmeyer	Citizen-at-Large, Chub Lake Committee	1554 Bass Bay Road	Carlton, MN 55718
Lake Association Representative	Harvey	Ukura	Tamarack River Watershed Group	6054 Lillian Lane	Cromwell, MN 55726
County Commissioner	Dick	Brenner	District 1 Commissioner	1501 Summit Avenue	Cloquet, MN 55720

**WATER PLAN TECHNICAL COMMITTEE**

<b>Agency</b>	<b>First Name</b>	<b>Last Name</b>	<b>Title</b>	<b>Address</b>	<b>City, State Zip</b>
Carlton County	Bruce	Benson	Zoning, Solid Waste and WCA Administrator	PO Box 220	Carlton, MN 55718
Carlton County	Heather	Cunningham	Water Planner	PO Box 220	Carlton, MN 55718
Carlton County	Greg	Bernu	Land Commissioner	1630 County Road 61	Carlton, MN 55718
Board of Water and Soil Resources	Jason	Weinerman	Board Conservationist	1601 Minnesota Drive	Brainerd, MN 56401
Board of Water and Soil Resources	Ryan	Hughes	Board Conservationist	394 South Lake Avenue, Room 403	Duluth, MN 55802
Soil and Water Conservation District	Brad	Matlock	District Manager	PO Box 29	Carlton, MN 55718
Soil and Water Conservation District	Kelly	Smith	Conservation Technician	PO Box 29	Carlton, MN 55718
MN Department of Natural Resources	Patricia	Fowler	Area Hydrologist	1568 Highway 2	Two Harbors, MN 55616
MN Pollution Control Agency	Brian	Fredrickson	Watershed Specialist	525 Lake Avenue South, Suite 400	Duluth, MN 55802
Fond du Lac	Nancy	Schuldt	Water Protection Coordinator	1720 Big Lake Road	Cloquet, MN 55720

**TABLE 4**  
**SUMMARY OF INPUT - Government Agencies and Local Groups, County Fair, Web Survey and Public Meetings**

<b>PRIORITY CONCERNS</b>	<b>Lake and Stream Water Quality</b>	<b>Lack of Environmental Education</b>	<b>Drinking Water Quality</b>	<b>Development Impacts / Land Use</b>	<b>Stormwater Management</b>	<b>Non-Compliant Septic Systems</b>	<b>Loss of Wetlands / Quality of Wetlands</b>	<b>Lack of Regulations</b>
<b>Government Agencies and Local Groups</b>	17	6	2	1	4	3	4	4
<b>County Fair</b>	35	26	20	32	18	29	32	8
<b>Web Survey</b>	12	6	6	9	4	8	10	5
<b>Public Meetings</b>	13	6	5	8	3	6	7	4
<b>Number of Votes</b>	77	44	33	50	29	46	53	21
<b>Rank</b>	1	5	6	3	7	4	2	8

<b>MOST THREATENED RESOURCE</b>	<b>Groundwater</b>	<b>Wetlands</b>	<b>Lakes</b>	<b>Rivers and Streams</b>
<b>County Fair</b>	20	11	14	11
<b>Web Survey</b>	3	2	5	1
<b>Number of Votes</b>	23	13	19	12
<b>Rank</b>	1	3	2	4