

2010 – 2020 Clearwater County Comprehensive Local Water Management Plan



Glossary of Acronyms

Acronyms and other labels used in the following section to identify potential funding sources, programs, lead agencies and supporting agencies are summarized below

- ~~BAJPB : Bemidji Area Joint Powers Board~~
- ~~BIA : Bureau of Indian Affairs~~
- ~~BMPs : Best Management Practices~~
- ~~BSU : Bemidji State University~~
- ~~BWSR : Minnesota Board of Water & Soil Resources~~
- ~~CRP : Conservation Reserve Program~~
- ~~CSP : Conservation Security Program~~
- ~~CWL : Clean Water Legacy Grants~~
- ~~DNR (div) : Minnesota Department of Natural Resources~~
~~fish Fisheries, eco Ecological Services, for Forestry, wtr Waters, wld Wildlife~~
- ~~EPA : Environmental Protection Agency~~

- ~~ESD : Environmental Services Department~~
- ~~GIS : Geographic Information Systems~~
- ~~GRCD : Giziibii Resource Conservation & Development Association~~
- ~~HRDC : Headwaters Regional Development Commission~~
- ~~HWY : Highway Department~~
- ~~LA : Individual lake or watershed associations~~
- ~~LCCMR : Legislative Citizen Commission on Minnesota Resources~~
- ~~MASWCD : Minnesota Association of Soil & Water Conservation Districts~~
- ~~MDA : Minnesota Department of Agriculture~~
- ~~MDH : Minnesota Department of Health~~
- ~~MG : Master Gardeners~~
- ~~MHB : Mississippi Headwaters Board~~
- ~~MnDOT : Minnesota Department of Transportation~~
- ~~NMF : Northwest Minnesota Foundation~~
- ~~NRCS : Natural Resources Conservation Service~~
- ~~PCA : Minnesota Pollution Control Agency~~
- ~~RL-DNR : Red Lake Reservation Department of Natural Resources~~
- ~~RLWD : Red Lake Watershed District~~
- ~~SSTS : Sub-Surface Sewage Treatment System~~
- ~~SWCD : Clearwater Soil & Water Conservation District~~
- ~~TMDL : Total Maximum Daily Load~~
- ~~TSA2 : Technical Service Area 2 (North-central)~~
- ~~TWPs : Townships~~
- ~~UMEX : University of Minnesota Extension~~
- ~~USACE : United States Army Corp of Engineers~~
- ~~USFS : United States Forest Service~~
- ~~USGS : United States Geological Survey~~
- ~~WEDNR : White Earth DNR~~
- ~~WRWD : Wild Rice River Watershed District~~
- ~~USFWS : United States Fish & Wildlife Service~~



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<u>CSP</u>	:	<u>Conservation Security Program</u>
<u>CWL</u>	:	<u>Clean Water Legacy Grants</u>
<u>DNR (div)</u>	:	<u>Minnesota Department of Natural Resources</u> <u>fsh-Fisheries, eco-Ecological Services, for-Forestry, wtr-Waters, wld-Wildlife</u>
<u>EPA</u>	:	<u>Environmental Protection Agency</u>
<u>ESD</u>	:	<u>Environmental Services Department</u>
<u>GIS</u>	:	<u>Geographic Information Systems</u>
<u>GRCD</u>	:	<u>Giziibii Resource Conservation & Development Association</u>
<u>HRDC</u>	:	<u>Headwaters Regional Development Commission</u>
<u>HWY</u>	:	<u>Highway Department</u>
<u>LA</u>	:	<u>Individual lake or watershed associations</u>
<u>LCCMR</u>	:	<u>Legislative-Citizen Commission on Minnesota Resources</u>
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<u>MDH</u>	:	<u>Minnesota Department of Health</u>
<u>MG</u>	:	<u>Master Gardeners</u>
<u>MHB</u>	:	<u>Mississippi Headwaters Board</u>
<u>MnDOT</u>	:	<u>Minnesota Department of Transportation</u>
<u>NMF</u>	:	<u>Northwest Minnesota Foundation</u>
<u>NRCS</u>	:	<u>Natural Resources Conservation Service</u>
<u>PCA</u>	:	<u>Minnesota Pollution Control Agency</u>
<u>RL-DNR</u>	:	<u>Red Lake Reservation Department of Natural Resources</u>
<u>RLWD</u>	:	<u>Red Lake Watershed District</u>
<u>SSTS</u>	:	<u>Sub-Surface Sewage Treatment System</u>
<u>SWCD</u>	:	<u>Clearwater Soil & Water Conservation District</u>
<u>TMDL</u>	:	<u>Total Maximum Daily Load</u>
<u>TSA2</u>	:	<u>Technical Service Area 2 (North-central)</u>
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<u>USGS</u>	:	<u>United States Geological Survey</u>
<u>WEDNR</u>	:	<u>White Earth DNR</u>
<u>WRWD</u>	:	<u>Wild Rice River Watershed District</u>
<u>USFWS</u>	:	<u>United States Fish & Wildlife Service</u>

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Clearwater County Comprehensive Local Water Management Plan

~~A.~~

I. Executive Summary

~~Almost~~Over twenty years ago Clearwater County completed its first comprehensive local water plan. There have been tremendous efforts put forth by the County and its partners to achieve the goals described in earlier water plans, as well as to protect and enhance our soil, water and natural resources throughout Clearwater County. ~~Major accomplishments of previous water plans~~the first half of the plan are listed ~~in~~at the ~~appendices~~end of this section. Since comprehensive local water planning first began in Clearwater County, great strides have been made in the local water planning effort of our understanding of water quality and quantity issues, local cooperation, data collection and analysis, and the use of technology. To be truly successful in local water management we must strive to continuously educate our citizens and youth in the ongoing soil and water issues we face. ~~It is the county's ability to implement and educate its citizens on corrective actions for the most important issues that have made Clearwater County a leader in water resource management in northern Minnesota.~~

This document is the 4th generation of Comprehensive Local Water Management Planning for Clearwater County. ~~This plan~~It is designed to address local water management planning for the next ten years in the county, ~~with an update to take place after the first five years.~~ ~~This document~~and includes the results of the five-year comprehensive local water management plan update. Like previous water plan updates, there is significantly more known about the water and soil resources in Clearwater County, largely due to the efforts and goals generated by previous water planning efforts. The strategies developed for Clearwater County for the next ten years show a deeper understanding of the issues we face and will address in the upcoming years. ~~For the purpose of this planning effort the Clearwater~~ SWCD Soil & Water Conservation District is the delegated water planning authority for Clearwater County.

The purpose of the Clearwater Comprehensive Local Water Management Plan is to address soil and water issues throughout the entirety of the county, with the focus primarily on strategies for the three major watersheds in the county: Wild Rice River Watershed, Clearwater River Watershed, and Upper Mississippi River Watershed. For areas in the county not specifically addressed in this plan, all applicable conservation efforts will take place on an as needed basis. As an enhancement to previous plans, several strategies are now targeted to specific watersheds or county-wide management issues. Strategies developed for Water Quality, Land Use Impacts, and Exotic/Invasive Species Management are focused on in this plan, with coordination and education being stressed in each area of focus.

Scope

This water planning effort deals with both water quality and quantity issues for ground water as well as surface water, land use issues, and exotic/invasive species management issues.

_This process covers a wide range of concerns, but focuses on those that were viewed as most important by the Water Plan Task Force and County Board. ~~For the County and SWCD to implement this plan and its objectives it would need just over \$2,800,000 in funds over the~~It focuses on the resources within Clearwater County, but acknowledges the County's role in the larger (regional or watershed) context.

~~next ten years. This dollar amount is only for costs that we know would exist, external costs that can not be determined at this point would add at least \$1,400,000 to the total costs to implement the plan. The total estimated cost of implementing this water plan would be \$4,200,000.~~

Process

~~The process~~Developing this plan involved ~~in~~ updating background information collected over the previous 3 planning processes, an initial assessment to determine areas where staff work should be focused on within each watershed, and a more detailed assessment of those selected issues. The final assessment resulted in the selection of the prioritized issues (Priority Concerns Scoping Document) to be addressed within the five-year action plan at the end of the report. An amended Plan of Action has been established for the remainder of the plan life.

The Priority Concerns Scoping Document and Action Plan identify actions addressing specific issues and geographic areas of Clearwater County. The comprehensive local water plan will serve as a tool to create even more detailed one-year plans (Annual Plan of Work) of action for the Clearwater SWCDSoil & Water Conservation District as well as county departments, state agencies, and other local parties.

The comprehensive local water management plan is a compilation of issues from a variety of groups and citizens of Clearwater County. An advisory committee — the Water Plan Task Force — oversaw the complete planning process. The task force met a number of times over the 1 ½ year timeline. In addition to task force meetings, committee members and local staff met with the SWCDSoil & Water Conservation District planning staff to discuss specific issues and concerns. Members of the public were invited to participate through public meetings at the beginning and end of the planning process. Public announcements were published in local media.

Amendments to the plan were completed at the midpoint of the plan under the direction of the Water Plan Task Force. The Plan of Action was updated to include new objectives and strategies to address current issues related to the priority concerns. New tools and processes were also utilized to prioritize resources and guide future implementation effort. These additions highlight the issues at hand in Clearwater County.

In the development of the final comprehensive local water management plan the Clearwater SWCDSoil & Water Conservation District made sure that this plan was consistent with local, state, and federal plans and objectives to avoid redundancy and make it easier to implement projects on the ground with our conservation partners and county residents. We will continue to work with both our government and non-government partners to ensure Clearwater County residents are getting the highest degree of efficiency and quality of work possible.

Contents

This plan is comprised of four primary sections. The first is the *Major Watershed Assessment* section which characterizes each watershed based upon land cover, land use, and population. Suggestions for best management practice implementation are also noted within this section. The second section of this document is the *Watershed Prioritization* section. This section utilizes a prioritization method to rank the level of disturbance or protection at a sub-

watersheds level. This assessment provides a clear visual model that highlights areas where efforts can be focused to restore or protect watersheds. The third section, the *Plan of Action*, is the key component of the plan that puts the plan on “the ground”. It addresses the specific objectives and strategies that will be employed to address the four priority concerns of Clearwater County. Specific implementation strategies were selected by the Water Plan Task Force and County to protect, enhance, and restore the County’s water and natural resources for the next five years. The final section of the plan is the *Implementation Schedule* which presents the Plan of Action in an easy to read framework.

<u>1. Surface Water Quality Protection and Enhancement</u>	<u>\$154,500</u>
<ul style="list-style-type: none"> <u>A. Monitoring Water Quality in Clearwater County</u> <u>B. Educate Clearwater County citizens about water quality enhancement practices and soil stewardship</u> <u>C. Identification and Implementation of projects that improve surface water quality</u> <u>D. Coordinate and cooperate with other governing agencies and surrounding tribal reservations</u> 	
<u>2. Drinking Water Source Protection</u>	<u>\$58,000</u>
<u>A. Protect drinking water sources throughout Clearwater County</u>	
<u>3. Exotic and Invasive Species Management</u>	<u>\$12,500</u>
<u>A. Exotic and Invasive Species Management</u>	
<u>4. Exotic and Invasive Species Management</u>	<u>\$189,500</u>
<ul style="list-style-type: none"> <u>A. Proper Land Management on Agricultural Lands</u> <u>B. Proper Management of Forest Resources</u> <u>C. Proper Land Management in Developed and Developing Areas</u> 	
<u>Total Annual Cost Estimate to Implement Plan</u>	<u>\$414,500</u>

Recommended Amendments to Other Plans and Official Controls

To fully execute the Clearwater Comprehensive Local Water Management Plan as written it is imperative that both state and local governments are consistent in funding both projects and planning efforts on a year to year basis. The implementation of this plan can be achieved only if funding for the work described in the following pages is available and enough to cover both project and personnel costs. To ensure that quality projects are put on the ground—and in the most efficient way possible our funding to implement them needs to be completely secure and available as needed.

We will actively be working with all of our conservation partners to make any changes or additions to any existing plans on an as needed basis. Many of the issues/changes in our local planning process are addressed directly in the Plan of Action.

Relationship to Other Planning Efforts and Resolution of Conflict

Clearwater County's Water Plan has been designed to identify priority water resource issues in the county; its intent is to provide policy direction to other planning efforts undertaken for the county.

In order to fulfill this intent, Clearwater Soil & Water Conservation District will, on a regular basis, communicate the county's priorities to other organizations involved in the management of Clearwater County's water resources.

In the event a conflict may arise between one or more organizations, the Water Plan Coordinator will implement steps to resolve the conflict. This will be done through meetings with the organizations where conflicts of interest shall be identified and alternative options explored that are acceptable to all parties.

2010-2015 Clearwater County Water Plan Accomplishments

2010

- ❖ [Awarded 2010-2011 Surface Water Assessment Grant to monitor 3 lakes](#)
- ❖ [Volunteers and staff completed monitoring of 19 lakes in 2008-2009 SWAG](#)
- ❖ [2 streambank protection projects installed](#)
- ❖ [1 Unused well sealed](#)
- ❖ [4 Shelterbelts installed](#)
- ❖ [2 Windbreak installed](#)
- ❖ [4 Forest Stewardship Plans completed](#)
- ❖ [27 Shoreland permits processed](#)
- ❖ [37 Sub-Surface Sewage Treatment System permits issued, systems inspected](#)
- ❖ [141 Individual WCA contacts, assistances rendered](#)
- ❖ [140 Road miles sprayed for noxious weed control](#)

2011

- ❖ [Lake Association & Water Monitoring Volunteer Recognition Event is held](#)
- ❖ [Awarded Lake Protection Water Plan Challenge Grant](#)
- ❖ [2 Lake Protection Screening Reports Developed](#)
- ❖ [Awarded 2011-2012 Surface Water Assessment Grant to monitor 5 lakes](#)
- ❖ [Volunteers and staff completed 2010-2011 SWAG](#)
- ❖ [1 Unused well sealed](#)
- ❖ [2 Lakeshore protection project installed](#)
- ❖ [1 Forest Stewardship Plan completed](#)
- ❖ [31 Shoreland permits processed](#)
- ❖ [33 Sub-Surface Sewage Treatment System permits issued, systems inspected](#)
- ❖ [162 Individual WCA contacts, assistances rendered](#)
- ❖ [149 Road miles sprayed for noxious weed control](#)

2012

- ❖ [Awarded Clean Water Assistance Grant: Lost River Watershed Runoff Reduction Project \(2012 CWAG\)](#)
- ❖ [Awarded Accelerated Implementation Grant: It's all in the Timing: Expanding Lake Protection \(2012 AIG\)](#)
- ❖ [Volunteers and staff completed 2011-2012 SWAG](#)
- ❖ [1 Native buffer installed](#)
- ❖ [1 Shelterbelt installed](#)
- ❖ [1 Streambank protection project installed](#)
- ❖ [1 Lakeshore protection project installed](#)
- ❖ [1 Lakeshore protection project installed \(Funded by 2012 AIG\)](#)
- ❖ [1 Forest Stewardship Plan completed](#)
- ❖ [27 Shoreland permits processed](#)
- ❖ [32 Sub-Surface Sewage Treatment System permits issued, systems inspected](#)
- ❖ [174 Individual WCA contacts, assistances rendered](#)
- ❖ [103 Road miles sprayed for noxious weed control](#)

2013

- ❖ [Awarded Clean Water Assistance Grant: Protecting the Clearwater River Watershed through Buffers and Other best management practices \(2013 CWAG\)](#)
- ❖ [Awarded 2013-2014 Surface Water Assessment Grant to monitor 3 lakes](#)
- ❖ [Clearwater County Shoreland Homeowner's Guide to Lake Stewardship is updated and distributed \(2012 AIG\)](#)
- ❖ [3 Lake Protection Screening Reports Developed \(Funded by 2012 AIG\)](#)
- ❖ [1 Sediment basin installed in Clearbrook](#)
- ❖ [1 Riparian forest buffer installed](#)
- ❖ [1 Side water inlet installed](#)
- ❖ [6 Side water inlets installed \(Funded by 2012 CWAG\)](#)
- ❖ [1 Lakeshore buffer installed \(Funded by 2012 CWAG\)](#)
- ❖ [2 Forest Stewardship Plans completed](#)
- ❖ [29 Shoreland permits processed](#)
- ❖ [32 Sub-Surface Sewage Treatment System permits issued, systems inspected](#)
- ❖ [7 Sub-Surface Sewage Treatment System replaced using low-income grant funding](#)
- ❖ [165 Individual WCA contacts, assistances rendered](#)
- ❖ [107 Road miles sprayed for noxious weed control](#)

2014

- ❖ [Awarded 2014-2015 Surface Water Assessment Grant to monitor 6 lakes and 3 stream sites](#)
- ❖ [Partnered with Red Lake Watershed District to monitor 6 stream sites in Clearwater Watershed](#)
- ❖ [2 Lake Protection Screening Reports Developed \(Funded by 2012 AIG\)](#)
- ❖ [Soil & Water Conservation District completes 2013-2014 SWAG](#)
- ❖ [1 Riparian forest buffer installed](#)
- ❖ [4 Unused wells sealed](#)
- ❖ [1 Shelterbelt installed](#)
- ❖ [4 Lakeshore protection projects installed \(Funded by 2012 CWAG\)](#)
- ❖ [1 Lakeshore buffer installed \(Funded by 2012 CWAG\)](#)
- ❖ [2 Forest Stewardship Plans completed](#)
- ❖ [32 Shoreland permits processes](#)
- ❖ [32 Sub-Surface Sewage Treatment System permits issued, systems inspected](#)
- ❖ [3 Sub-Surface Sewage Treatment System replaced using low-income grant funding](#)
- ❖ [151 Individual WCA contacts, assistances rendered](#)
- ❖ [105 Road miles sprayed for noxious weed control](#)

2015

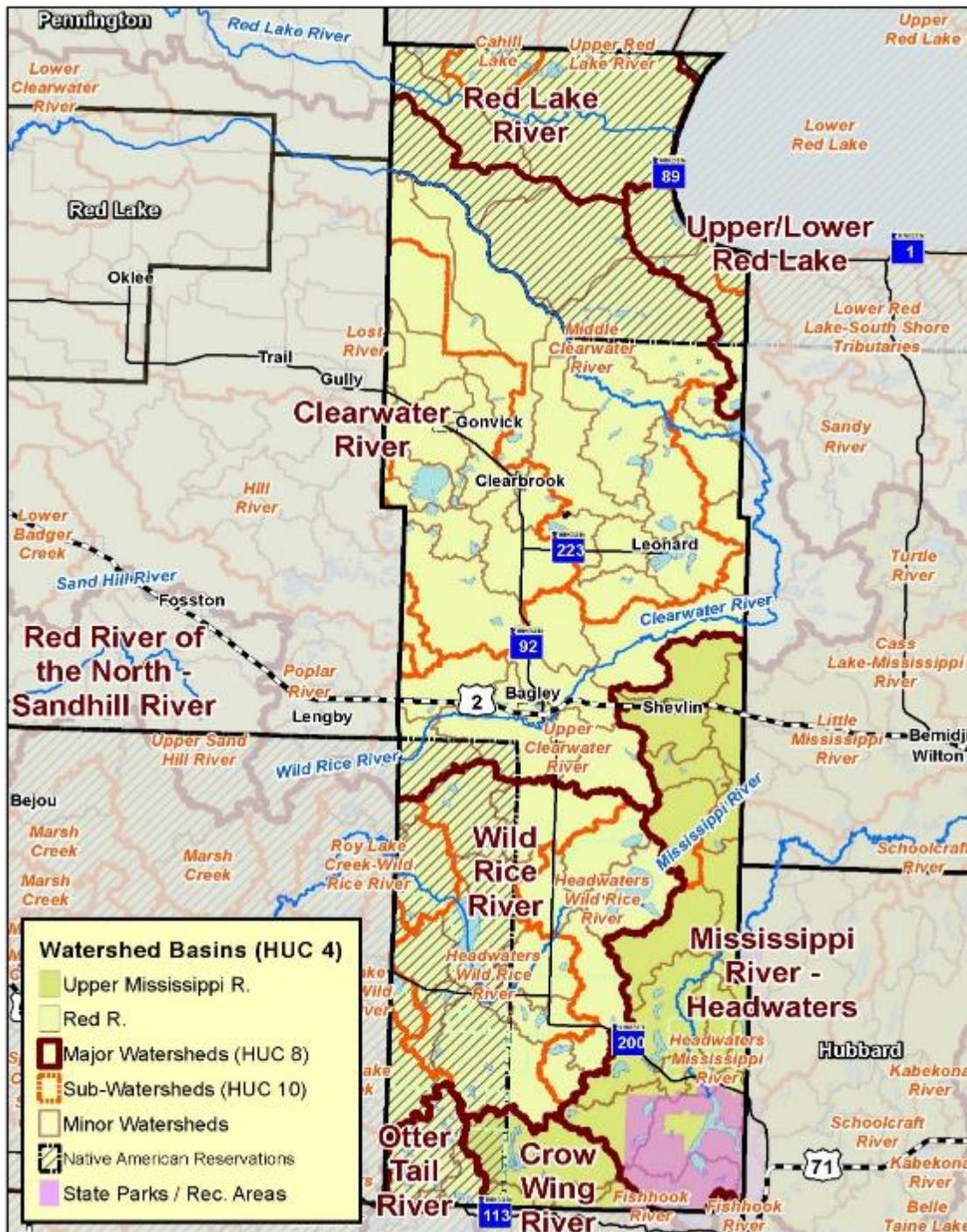
- ❖ [Awarded Accelerated Implementation Grant: Improving Water Quality, Soil Health and Pasture/Hayland production with No-Till \(AIG 2015\)](#)
- ❖ [138 acres of no-till drill use \(AIG 2015\)](#)
- ❖ [4 Riparian buffers installed \(CWF 2013 & State Cost Share\)](#)
- ❖ [1 Unused well sealed](#)
- ❖ [1 Lakeshore protection project installed](#)
- ❖ [23 Shoreland permits processes](#)

- ❖ [45 Sub-Surface Sewage Treatment System permits issued, systems inspected](#)
- ❖ [8 Sub-Surface Sewage Treatment System replaced using low-income grant funding](#)
- ❖ [181 Individual WCA contacts, assistances rendered](#)
- ❖ [129 Road miles sprayed for noxious weed control](#)

Ongoing Activities & Services

- ❖ [Lake Monitoring Program](#)
- ❖ [Nitrate Testing Clinics](#)
- ❖ [Bagley Wellhead Protection Program](#)
- ❖ [Comprehensive Local Water Plan administration](#)
- ❖ [State Conservation Cost-share Program](#)
- ❖ [Conservation Technical Assistance](#)
- ❖ [Clean Water Fund competitive grant implementation](#)
- ❖ [Wetland Conservation Act technical assistance](#)
- ❖ [Reinvest in Minnesota \(RIM\)](#)
- ❖ [Conservation Tree Sale Program](#)
- ❖ [Tree Planter Rental](#)
- ❖ [Custom Tree Planting](#)
- ❖ [Rural Rainfall Monitoring Network](#)
- ❖ [Clearwater Soil & Water Conservation District Conservation Farm & Learning Center](#)
- ❖ [North Central Envirothon](#)
- ❖ [Support to Lake Associations](#)
- ❖ [Spring Garden Wake-up Conference – Master Gardeners](#)
- ❖ [Bagley School Forest Committee](#)
- ❖ [Enviroscapes and other educational materials](#)
- ❖ [Clearwater County Fair Booth](#)
- ❖ [The Clearwater Soil & Water Conservation District Conservator \(quarterly newsletter\)](#)
- ❖ [Leafy Spurge Inventory & Control](#)
- ❖ [Voluntary Gravel Pit Certification Program](#)
- ❖ [County Roadside Noxious Weed Control](#)
- ❖ [Wetlands Conservation Act regulation administration](#)
- ❖ [Shoreland Management](#)
- ❖ [Sub-Surface Sewage Treatment System Programs](#)
- ❖ [Sub-Surface Sewage Treatment System Low-Income Grants](#)
- ❖ [No-Till-Drill rental and incentive program](#)
- ❖ [Aerator rental program](#)

II. Assessment of Major Watersheds



The above map shows the major watersheds within the county (called 8-digit “HUCs”) as a maroon colored boundary line, such as the Clearwater River. It also shows sub-watersheds (often of tributary streams) in orange and minor watersheds (of streams and creeks) in tan. Each smaller division of the “HUC” (hydrologic unit code) adds two digits to its registry number, and describes a subset of the hydrologic unit that contains it (e.g. the Clearwater River is a subset of the Red River System).

Crow Wing Watershed

The Crow Wing River Watershed accounts for a small portion of Clearwater County at only 21,772 acres of the county. Census 2010 data indicates that only 50-100 people reside in this major watershed. This watershed is comprised of approximately 83.7% forest land and 7.5% either wetlands or open water. Nearly all of the land in this watershed in the County is under public ownership (90%) and being actively managed by the County Land Department of which they are using the Resource Management Plan for Clearwater County. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*.

Ottertail Watershed

Like the Crow Wing River Watershed, this area of watershed in the county is very small, approximately 13,919 acres in size. The majority of land cover in this watershed is forest land (84%) and/or opens water or wetlands (9.1%). There is very little intensive use in this area of the county as well as very little population. Nearly all of the land in the watershed is public owned and managed by the County Land Department and White Earth Indian Reservation or the State of Minnesota. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*.

Red Lakes/Red Lake River Watersheds:

These watersheds are very similar in characteristics; both have very low populations and very high public land ownership. Approximately 50% of the land is forested, 42% is wetland or open water and only about 2-3% ag-related.

Mississippi Headwaters:

The Mississippi Headwaters Watershed is approximately 105,158 acres in size and is one of the three major watersheds in Clearwater County that contains substantial human activity; this area is home to over 1,000 people. The watershed contains 22 lakes and approximately 56 miles of protected steams and tributaries. A section of the Upper Mississippi River in Clearwater County has been deemed impaired with low dissolved oxygen (DO) readings by the MN Pollution Control Agency.

Much of this watershed is forested (67.6%), open water or wetlands (10.7%), or ag-related (15.6%), the rest of the land is mixed in use. The watershed has seen steady development of it shoreland areas and it is projected that those development trends will continue into the future. Because of the amount of shoreland and population, concerns for surface water should focus on areas such as shoreland development and the use of best management practices in those areas, promoting best management practices for timber harvesting while using the County Resource Management Plan, and the promotion of agricultural best management practices. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines* and in the

shoreland and riparian areas we should promote the use of the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*". Other surface water concerns in this watershed include road construction and maintenance, flooding, sedimentation concerns, and recreation in the areas lakes and forest lands. Agriculture in this watershed is primarily cattle and pasture related in nature, although there is a bit of row cropping as well in the area. Best management practices for this type of agriculture fits very well with both state and federal conservation programs and are readily available to agricultural producers. Although many of the concerns in this watershed are non-point source pollutants, it is an area of the county that is vital for tourism and rich in natural resources. Protection and enhancement of this watershed should always be considered when thinking of this watershed. Groundwater concerns in the area would be due to the high water table, dump areas, potential of leeching from failing septic systems, and agricultural activities that take place in this area. Below is a list of conservation practices that should be considered in the Mississippi Headwaters Watershed.

Conservation Practices:

- State Cost-Share Programs
 - Critical Area Plantings
 - Unused Well Sealing
 - Filter Strips
 - Grade Stabilization
 - Grassed Waterways
 - Livestock Exclusion from streams and waterways
 - Channel Stream Stabilization
 - Streambank and Shoreline Protection
 - Tree/Shrub Establishment
 - Wastewater & Feedlot Runoff Control
 - Sediment Basins
 - Riparian Buffers
- Forestry Stewardship Management Planning/Forestry best management practices and use the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*
- Continuation of Stream/Lake Water Quality Testing
- Natural Resources Conservation Service Conservation Practices
- Use of County Shoreland Ordinance and the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*
- Fixing Failing Septic Systems

Supporting Activity:

- Establishment of Lake Associations and develop lake management plans for area lakes, including volunteer water quality monitoring by their members
- Continuously seek grant and other funding opportunities to implement conservation practices

Wild Rice River Watershed

The Wild Rice River Watershed within Clearwater County is the second largest watershed at approximately 130,852 acres, with nearly ½ of the land being privately owned. There are around 1,200 people living in this watershed, but those numbers have remained static for the last few decades with little variation. Just over 60% of the land cover in the watershed is forested and around 18% is in agriculture. Like the Mississippi Headwaters Watershed, the Wild Rice contains over 25,000 acres of open water or wetlands (16% of land cover in watershed). Logging and agriculture are the predominant human activities that occur in the watershed.

The Wild Rice River Watershed in Clearwater County does contain a significant amount of lakes, at 27 lakes, but many of these lakes have not seen as much recent development as in other watersheds within the County. There is a significant amount of recreational activity that takes place in the watershed on both the public lands and public waters, which makes managing properly and protecting those areas an important issue. There are also a number of recreational and park lands, wildlife management lands, and boat accesses to public waters in this area of the County.

This watershed is similar to the Mississippi Headwaters Watershed in land use, population, and number of lakes, but has not seen as much ongoing development of its shoreland areas. In assessing this watershed, we should focus our efforts on the development of new and existing shoreland areas as well as the recreational water use on those lakes. Forest management best management practices on large tracts of forest land and forest stewardship plans for smaller, privately-owned tracts of land remain important to protecting the surface water resources in the area. The newly developed County Resource Management Plan, developed by the County Land Office, should be used when possible. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*. Road and bridge construction and maintenance, agricultural activities, ditches, lake and river levels, and the recreation and wildlife areas are also very important to consider when addressing surface water issues. Agriculture in this watershed is primarily cattle and pasture related in nature, although there is a bit of row cropping as well in the area. Best management practices for this type of agriculture fits very well with both state and federal conservation programs and are readily available to agricultural producers. Below is a list of the conservation practices that should be considered in the Wild Rice River Watershed.

Conservation Practices:

- State Cost-Share Programs
 - Critical Area Plantings
 - Unused Well Sealing
 - Filter Strips
 - Grade Stabilization
 - Grassed Waterways
 - Livestock Exclusion from streams and waterways
 - Channel Stream Stabilization
 - Streambank and Shoreline Protection

- Tree/Shrub Establishment
 - Wastewater & Feedlot Runoff Control
 - Sediment Basins
 - Riparian Buffers
- Forestry Stewardship Management Planning/Forestry best management practices and use the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*
 - Continuation of Stream/Lake Water Quality Testing
 - Natural Resources Conservation Service Conservation Practices
 - Use of County Shoreland Ordinance and the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*
 - Fixing Failing Septic Systems

Supporting Activities:

- Establishment of Lake Associations and develop lake management plans for area lakes, including volunteer water quality monitoring by their members
- Continuously seek grant and other funding opportunities to implement conservation practices

Clearwater River Watershed

The Clearwater River Watershed is the largest watershed in Clearwater County, consisting of approximately 310,514 acres. More than three-fourths of this watershed in the County is privately owned and is populated by just over 6,000 people. Although there are significant amounts of forested land in the watershed (37% of watershed) the majority of the county's agriculture is produced here, with just over 100,000 acres in ag-related land use. In addition to agriculture, this area of the county also contains the majority of the county's lakes and river systems. The Clearwater River Watershed is also home to three communities that use urban stormwater systems and have municipal wells including the city of Bagley, Clearbrook and Gonvick.

Since this watershed contains most of the human activity in the county as well as having a large amount of natural resources it is the area of the county that presents the most concern in protecting our water and soil resources. There are five stretches of river in this watershed that have been listed as impaired, they are: Clearwater River (turbidity impairment), (took off Lost River and fecal/low DO impairments off Clearwater River) Silver Creek (fecal coliform/*E. coli* impairment), Walker Brook (low dissolved oxygen impairment), and Ruffy Brook (fecal coliform/*E. coli* impairment). Below are conservation practices that should be considered in the Clearwater River Watershed.

Conservation Practices:

- All State Cost-Share Programs be considered

- Forestry Stewardship Management Planning/Forestry best management practices and use the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*
- Continuation of Stream/Lake Water Quality Testing
- Natural Resources Conservation Service Conservation Practices
- Use of County Shoreland Ordinance and the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*
- Fixing Failing Septic Systems
- Recommendations by the SWAT Model done on Silver Creek

Supporting Activities:

- Establishment of Lake Associations and develop lake management plans for area lakes, including volunteer water quality monitoring efforts by their members
- Healthy Lakes & Rivers Initiatives
- Continuously seek grant and other funding opportunities to implement conservation practices

Contents

The plan is divided into four sections. The *Inventory* describes all data collection activities and presents the results. The *Initial Assessment* provides a general overview of resources and issues and identifies areas for detailed study. The *Detailed Assessment* provides an analysis of specific watersheds and issues identified in the initial assessment. The *Plan of Action* is the key component of the plan that puts the plan on “the ground”.

III. Watershed Prioritization

Modeling Background

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

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

Vigilance

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

Protected

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

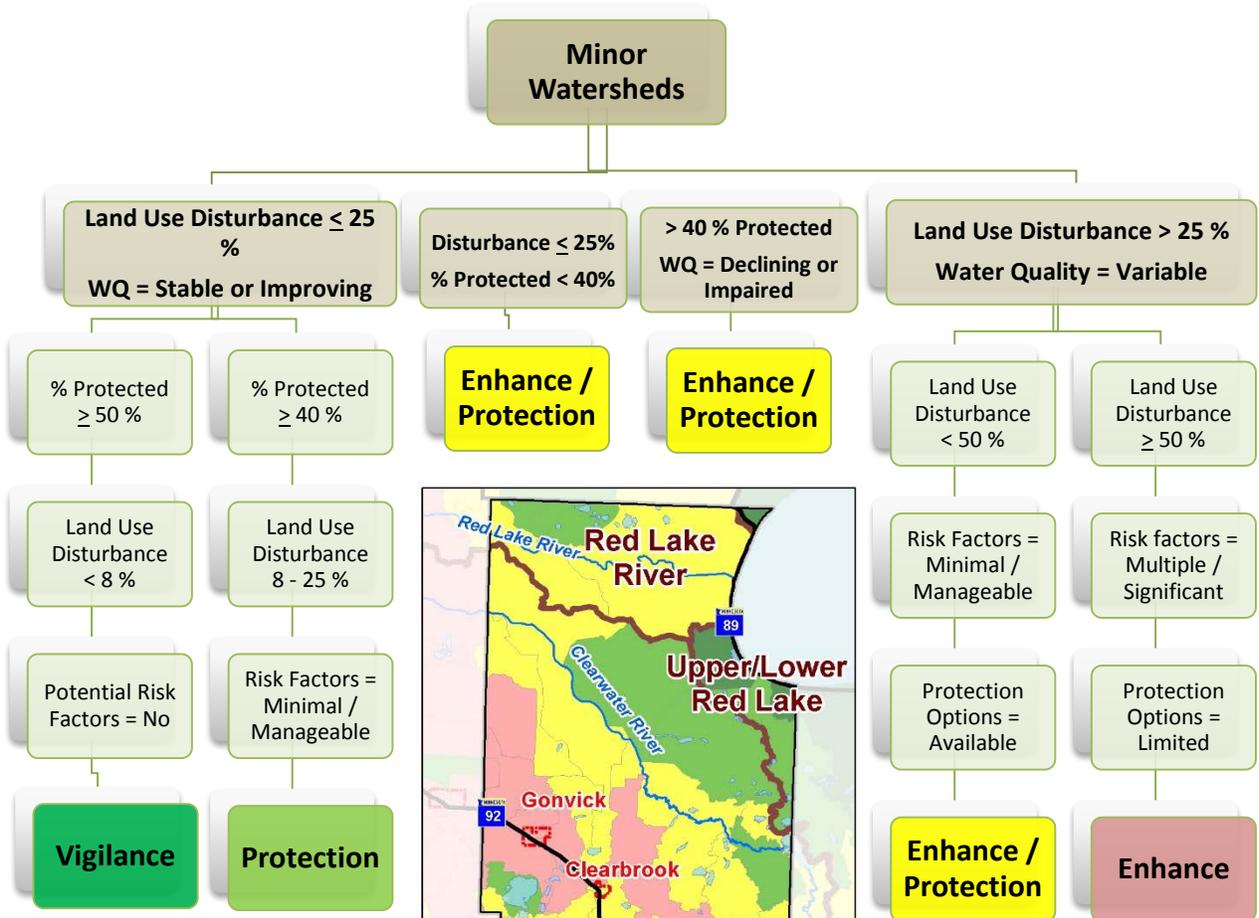
Enhance-Protection

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

Enhance

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

Figure 1: Classification of watersheds



[This map shows the Prioritization of minor watersheds within the county, based the decision tree above. Refer to Figure-2 for a breakdown of totals per major watershed and by category.](#)

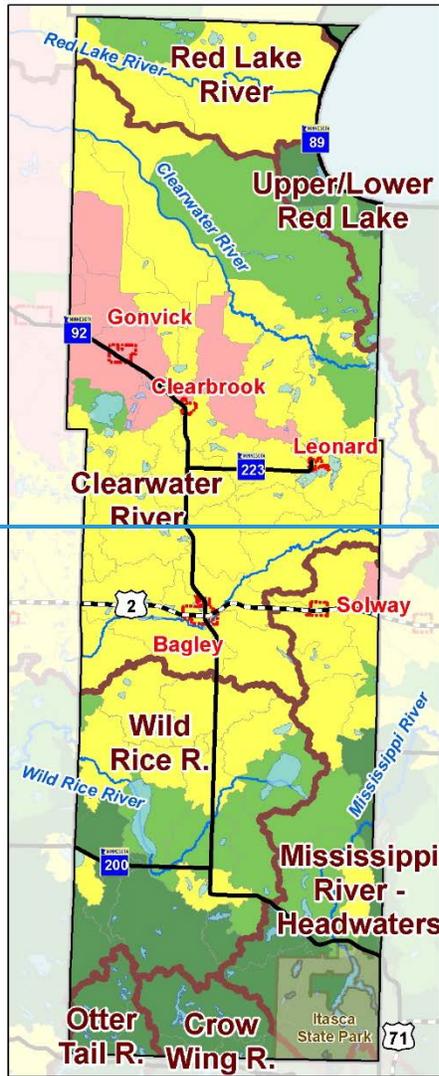
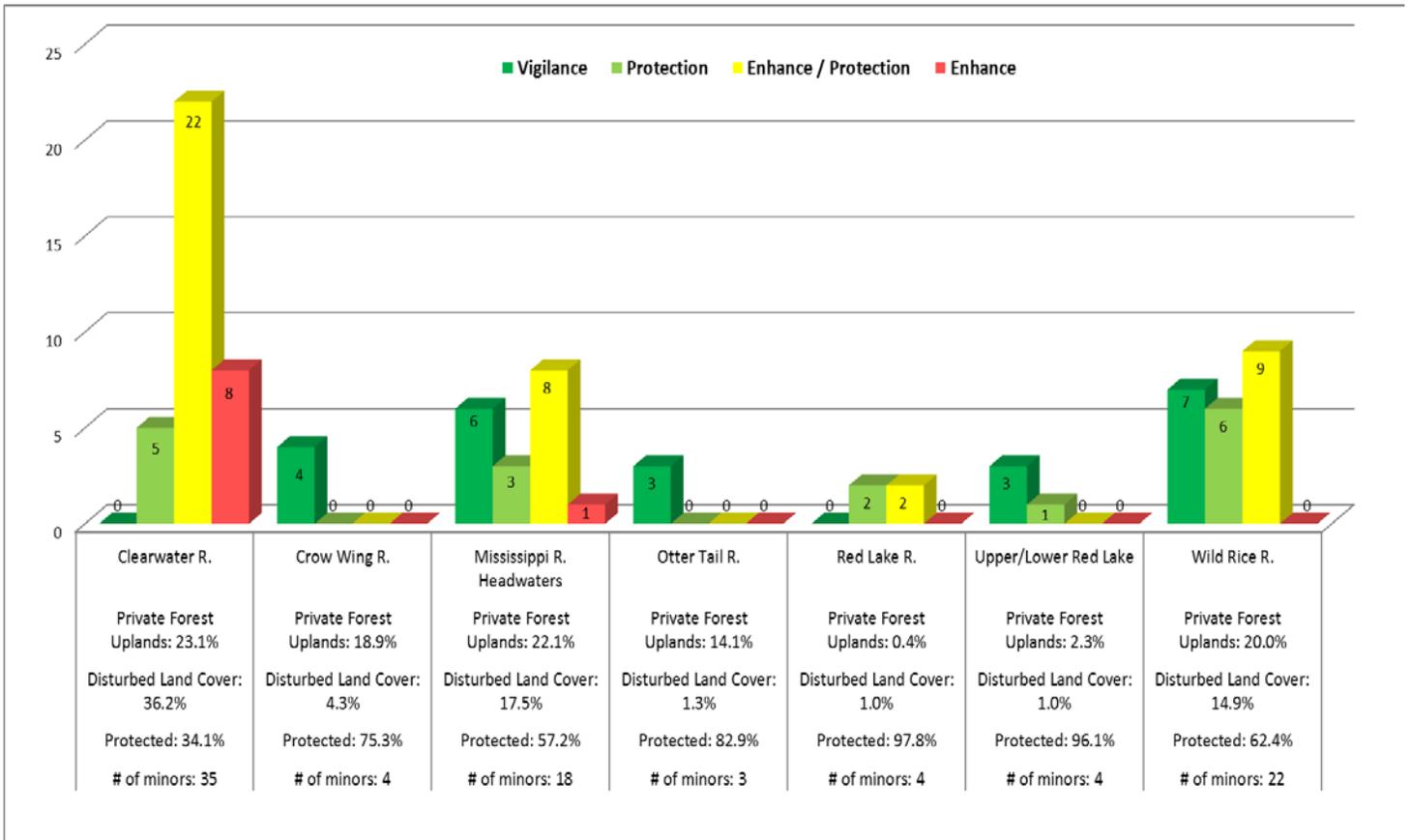


Figure 2: Major Watershed Summary Table



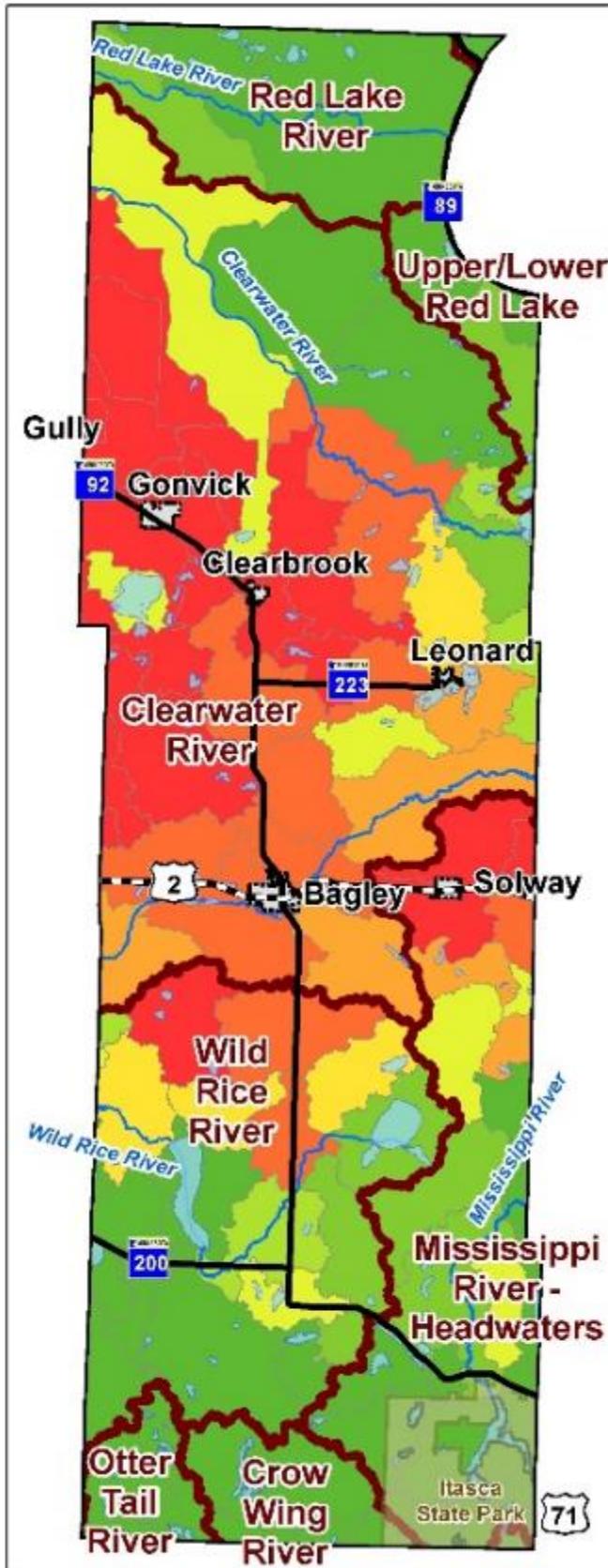
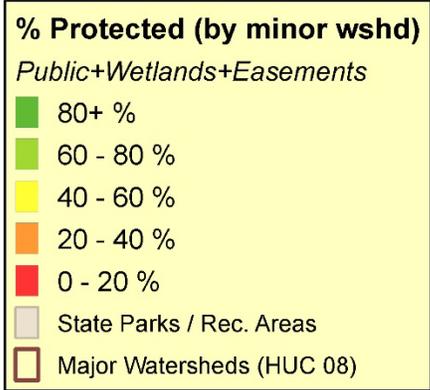
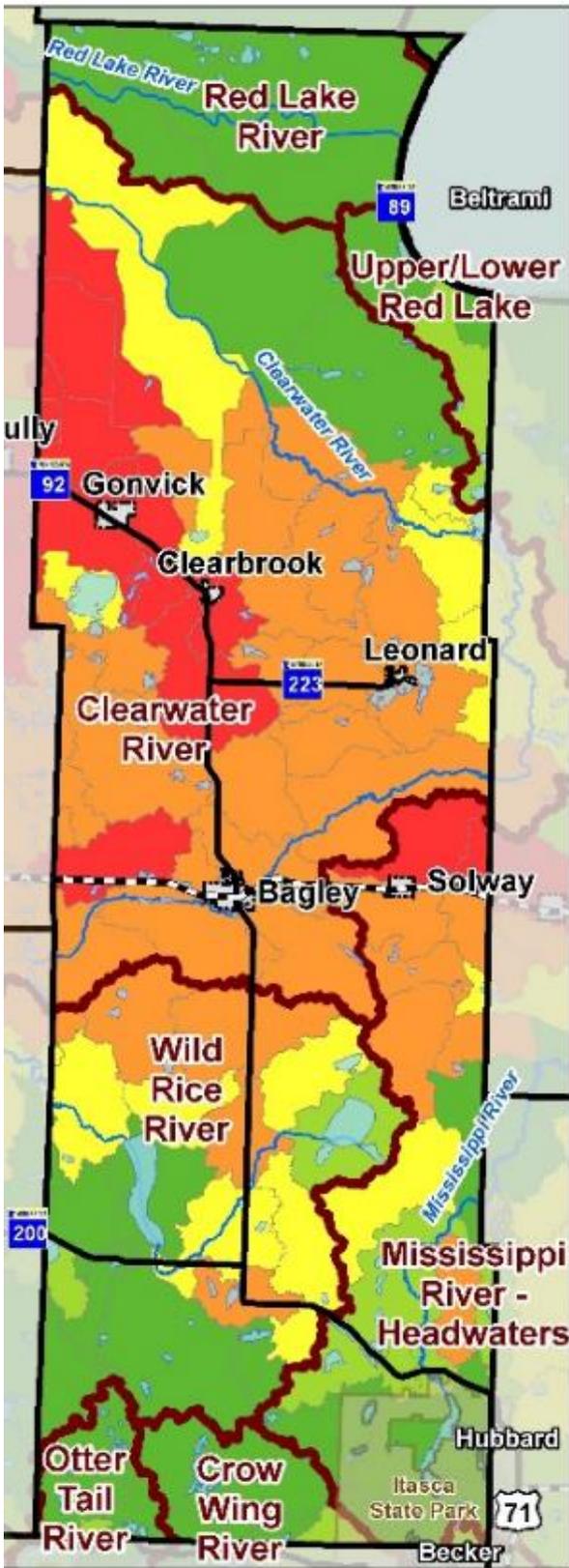


Figure 3: Percent of disturbed land



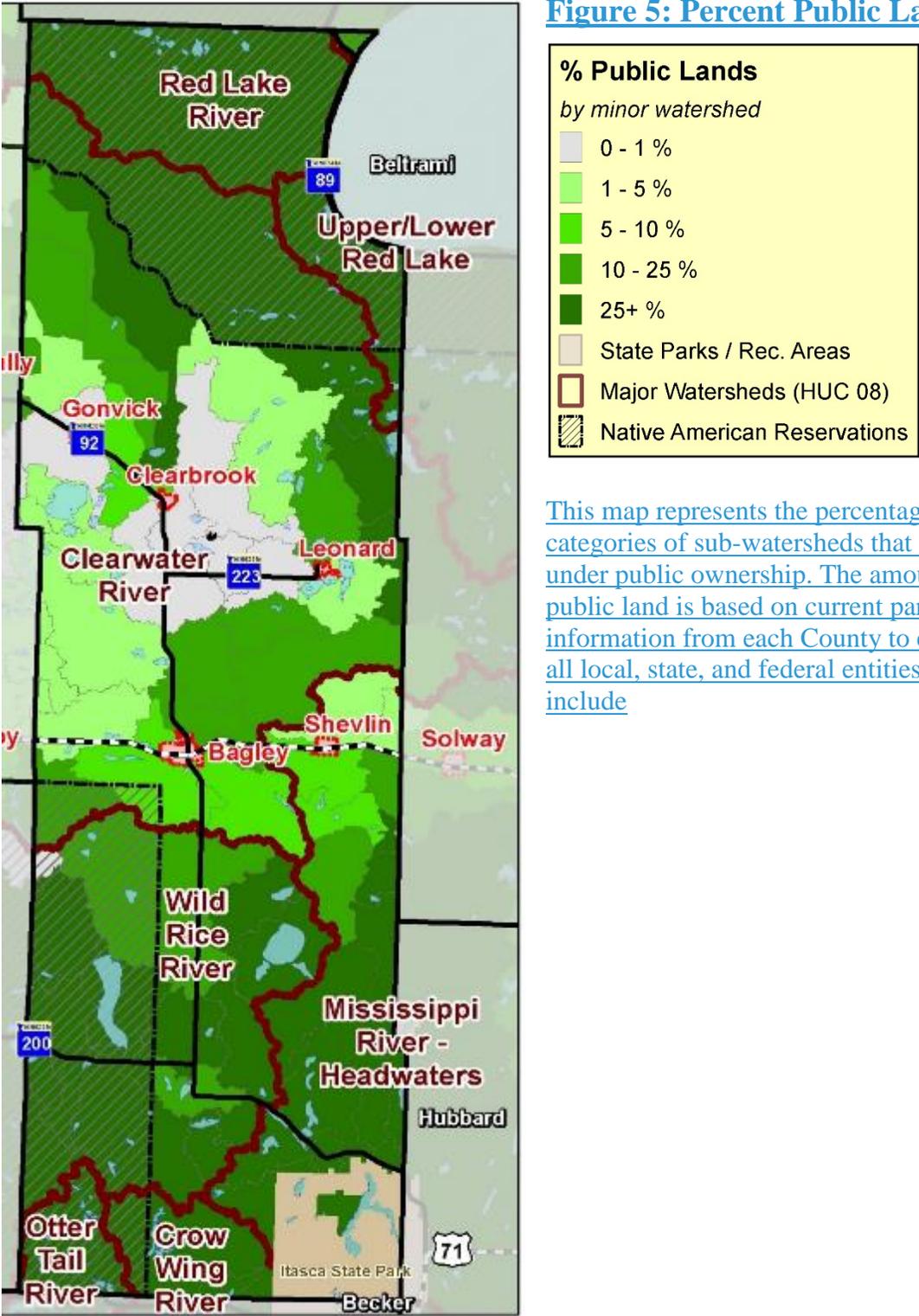
This map shows land disturbance as a percentage category for sub-watersheds. Land use disturbance is determined by comparing the percentage of area within each sub-watershed that is classified as a type other than its natural state, such as: developed, cultivated, pasture, or grassland.

Figure 4: Percent Protected



This map represents percentage categories for sub-watersheds that have some level of protection from disturbances. For purposes of this plan, public land is considered to be already in a “protected” state. Public water bodies, such as lakes and streams, are also “protected” in that they cannot generally be filled or drained. Wetlands on private lands are also protected by the Minnesota Wetland Conservation Act (WCA), which also generally prohibits draining or filling of wetland areas. Many counties also have land with perpetual conservation easements, which are also considered to be protected. These areas added together form the basis for calculating percentage categories.

Figure 5: Percent Public Lands



This map represents the percentage categories of sub-watersheds that are under public ownership. The amount of public land is based on current parcel information from each County to ensure all local, state, and federal entities are include

~~V. Specific implementation strategies were selected by the Water Plan Task Force and County to protect, enhance, and restore the County's water and natural resources for the next five years. This planning effort represents the strong commitment by Clearwater County of the protection of its waters and natural resources as well as the County's economic and social well-being.~~

~~Administration, Coordination, and Maintenance~~

~~The discussion of these components of the County Water Plan follows the Plan of Action at the End of this Document. This section lays out the responsibilities and procedures for the inclusion of other planning efforts, plan implementation, evaluation, amendment, and conflict resolution.~~

B. **Priority Concerns & Actions**

1. **Identification of Priority Concerns**

Priority Concern 1: Surface Water Quality Protection and Enhancement

Clearwater County is blessed with an abundance of lakes and rivers, many of which have a high appeal for recreational purposes. With fifteen percent (15%) of the land in our county considered wetland, and 80% of our pre-settlement wetlands remaining, Clearwater County has a substantial amount of valuable natural wetlands. Protecting wetlands and unique features is essential to maintaining and improving water quality.

Thusly named, Clearwater County, our citizens have given high priority to keeping our surface waters clean and clear.

However, as of 2012 the MN Pollution Control Agency listed eight (8) separate stretches of our rivers and streams as impaired. Figure 6 below shows the currently approved list of impairments. These impairments highlight the need to take actions to protect and enhance our surface waters. Utilizing tools such as Lake Protection Screening Reports produced by RMB Environmental Laboratories will be a valuable way of targeting and selecting best management practices on lakes that are experiencing declining water quality (See Appendix D). These documents identify a host of activities that would best address watershed specific issues that are impacting the quality of these surface water resources.

Agriculture was a top concern for many people as it relates to water quality. Agricultural land covers approximately 20% of the county (see Figure 7 below), with pasturelands and livestock operations making up the largest share (see also Additional Map 4 in Appendix A). Activities on crop and pastureland without proper best management practice implementation can impact water quality much more significantly, than land where best management practices have been utilized. The land use in the watersheds of our rivers and streams in Clearwater County has changed dramatically in the past 100 years. More efficient drainage and tiling, loss of wetlands, and a decrease in perennial vegetative cover on the landscape, all convey water, sediment and contaminants off of the land faster, and often in greater quantities, into our ditches, streams, rivers and lakes. Soil erosion from all sources contributes to surface water quality degradation, removes valuable and productive topsoil, and a loss in fish and wildlife habitat. Due to our County's position at the top of many of these watersheds, we should protect and restore the water we are sending to our neighbors downstream.

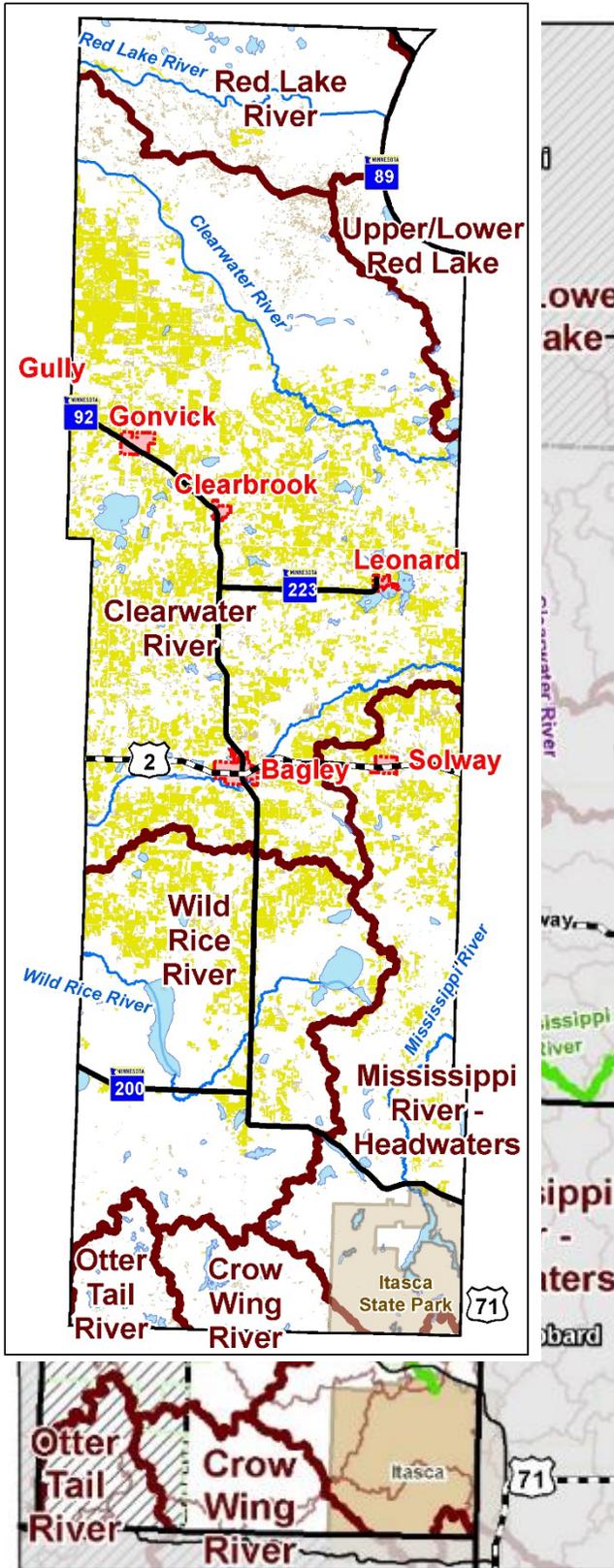
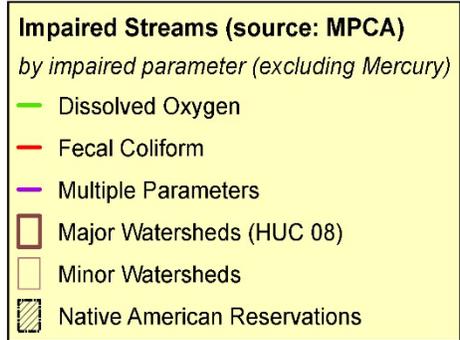


Figure 6: Impaired Streams



This map highlights the streams within the county that are listed as impaired by the MN Pollution Control Agency (MPCA). Water is sampled for a variety of things (transparency, chemistry, turbidity, bacteria, etc.). These measurements are summarized and reported to the MPCA, who is mandated by the federal Environmental Protection Agency to maintain water quality standards for Minnesota’s lakes and streams. Those water bodies that do not meet standards are deemed to be impaired and require total maximum daily load (TMDL) studies in order to set pollutant reduction goals needed to restore these waters. Impairments are mapped by parameter (especially streams, where more variability exists).

Figure 7: Pasture or Cultivated Lands



This map shows the land use within the county that falls under the above categories of cultivation. The National Land Cover Database was used for this purpose, which was created through a cooperative project conducted by the Multi-Resolution Land Characteristics (MRLC) Consortium. The MRLC Consortium is a partnership of federal agencies to deliver land cover classification data, such as this 2011 iteration of the National Land Cover Database at 30m resolution (30 meter by 30 meter squares of land are classified to create a pixel-map of the land surface).

Objective A: Monitoring Water Quality in Clearwater County

Strategies:

#1:

#1: Continue SWCD Soil & Water Conservation District monthly water quality data collection on five (5) area lakes throughout the summer months.

Funding: \$5,000 / year

Source: MN Pollution Control Agency, Board of Water & Soil Resources

Responsibility: Lead: Soil & Water Conservation District
Supporting: MN Pollution Control Agency, RMB
Labs, Minnesota Department of Health

Evaluation: #2: _____

- Lakes to be tested will be determined by Soil & Water Conservation District using information such as population density, recreational use, water quality impairments, and irregularities in water quality.
- Make data available for use in the MN Pollution Control Agency Environmental Quality Information System.

#2: Expand & promote Citizen Volunteer Water Quality Monitoring on our area lakes and rivers. ~~Continue the collection of Phosphorous, Chlorophyll A, and Water Clarity data on the nineteen lakes currently being monitored with funding though the Clean Water Legacy Surface Water Assessment Grant.~~

#3: _____ Create database
Funding: \$5,000
/year Source: Board of Water &
Soil Resources, Pollution Control
Agency, Red Lake Watershed
District

Responsibility: Lead: Soil & Water Conservation District
Supporting: Pollution Control Agency, Lake
Associations, Mississippi Headwaters Board, Red
Lake Watershed District

Evaluation:

- Work to collect baseline data of all recreational lakes and sufficient data to support trend analysis on priority recreational lakes.
- Develop management plans for lakes and rivers found with water quality ~~data~~ issues and ~~expand~~ continue monitoring those lakes to assess success of best management practice implementation.
- Work with Lake Associations on ongoing water quality testing activities, such as secchi-disk readings, and provide support in being a drop off point for samples and storage of water quality data.
- Start early morning D.O. monitoring of sites ~~and frequency~~ near Bagley on the Clearwater River.
- Expand monitoring to target waters within ½ mile of pollution risk areas.

Objective B: Educate Clearwater County citizens about water quality enhancement practices and soil stewardship.

Strategies:

~~#1: Encourage and promote best management practices to property owners who have developed or are in process of developing in or near riparian areas.~~

~~#2:~~

#1: Educate property owners along shoreland ~~shore-land~~ on the potentially negative impacts of developing those areas (i.e. ~~storm water run-off, chemical run-off, loss of natural vegetation, erosion of shoreland and stream banks, and sedimentation of our surface waters~~), and promote best management practices to these individuals.

Funding: \$2,500 / year

Source: Board of Water and Soil Resources, Northwest Minnesota Foundation

Responsibility:

Lead: Soil & Water Conservation District, Lake Associations

Support: Board of Water & Soil Resources, Northwest Minnesota Foundation, University of Minnesota Extension, Department of Natural Resources

Evaluation: #3: Encourage and promote Agricultural Best Management Practices (BMPs)

- All Lake Associations receive the *Clearwater County Shore-land Homeowners Guide to Lake Stewardship* in 1st year. Develop lake management plans with Lake Associations in 2 years, implement plan in next 3 years. The goal is to have all Lake Associations in Clearwater County use the guide and encourage them to develop lake management plans; currently there are five active Lake Associations in the county. Clearwater Lake and Long Lost Lake have lake management plans but the other three do not.
- Ensure that property owners who are developing or in the process of developing in shore-land/riparian areas receive a copy of *Clearwater County Shore-land Homeowners Guide to Lake Stewardship*. There will be a link on-line to the Homeowners Guide on both the Soil & Water Conservation District and Environmental Services' websites. Copies of the Guide will also be available in paper copy at the Soil & Water Conservation District and Environmental Services Offices. To ensure homeowners receive the Shore-land Homeowners Guide, it will

be given to the realtors to provide to the new owner at the time of property transfer.

- Continue distribution of the Soil & Water Conservation District quarterly newsletter, in addition to the above, and attend lake association meetings

#2: Encourage and promote Agricultural Best Management Practices to landowners throughout Clearwater County to help reduce surface water contamination, sedimentation, and bank erosion.

Funding: \$2,000 / year

Source: Minnesota Department of Agriculture, Board of Water & Soil Resources, Pollution Control Agency, Natural Resources Conservation Service

Responsibility:

Lead: Soil & Water Conservation District, Natural Resources Conservation Service
Support: Minnesota Department of Agriculture, Board of Water & Soil Resources, Pollution Control Agency

Evaluation:

- Promote Ag best management practices through multiple media outlets annually. Promotion should include the utilization of the State Cost-Share Program, the No-till-Soil Health Program, Natural Resources Conservation Service programs, and other conservation opportunities from partnering agency partners. Promotion of pasture management/rotational grazing will be key activities being the dominate land use in the county.
- Develop seminars and tours as needed to create awareness about best management practices.

#3: Target and Promote Agricultural Best Management Practices in 3 priority watersheds: Clearwater River Watershed, Upper Mississippi Watershed, and Wild Rice River Watershed.

Funding: \$20,000 / year

Source: Minnesota Department of Agriculture, Board of Water & Soil Resources, Pollution Control Agency, Natural Resources Conservation Service

Responsibility:

Lead: Soil & Water Conservation District, Natural Resources Conservation Service

Support: Minnesota Department of Agriculture,
Board of Water & Soil Resources, Pollution
Control Agency

Evaluation:

- Produce targeted mailings and outreach to landowners in these watersheds.
- Efforts can be refined by increasing promotion efforts to individuals residing or managing lands within prioritized sub-watersheds. Further targeting efforts will be made by utilizing the Prioritize, Target & Measure Application (PTMApp) and other conservation planning tools.

#4: Continue to educate property owners about the importance of wetlands, and the state and federal regulations that pertain to wetlands.

Funding: \$1,500 / year **Source:** Board of Water & Soil Resources

Responsibility: **Lead:** Environmental Services Department
Support: Soil & Water Conservation District,
Board of Water & Soil Resources, U.S. Army
Corps of Engineers, Natural Resources
Conservation Service

Evaluation: #4: —Continue to educate property owners about the importance of wetlands, and the state and federal regulations that pertain to wetlands.

- Help reduce the number of wetland violations on yearly basis by posting public notices about wetland regulations and who to contact in paper 1 time per year as well as in newsletters.

Objective C: Identification and Implementation of projects that improve surface water quality.

Strategies:

#1: Identify and inventory point source and non-point sources pollutants in targeted areas.

Funding: \$25,000 / year **Source:** Board of Water & Soil Resources, MN Pollution Control Agency, Red Lake Watershed District, Wild Rice River Watershed District

Responsibility: **Lead:** Soil & Water Conservation District, Red Lake Watershed District, Wild Rice River Watershed District
Support: Board of Water & Soil Resources, MN Pollution Control Agency,

Evaluation: #2:

- Identify and assess sources of pollution in those areas with concerns identified in the watershed assessments above (Clearwater Watershed & Upper Mississippi Headwaters, Wild Rice River Watersheds); work with landowners to identify and/or reduce pollution loading to those waters as a higher priority.

#2: Implementation of Agricultural Best Management Practices (BMPs best management practices), storm water treatment/management, and erosion control projects.

Funding: \$60,000 / year **Source:** Board of Water & Soil Resources, Natural Resources Conservation Service, Cities

Responsibility: **Lead:** Soil & Water Conservation District, Natural Resources Conservation Service

Support: Board of Water & Soil Resources,
Department of Natural Resources, U.S.
Army Corps of Engineers, County

Evaluation: #3:

- Identify ~~critical wetlands~~, monitor, and assess issues continuously
- Support the planting of 1,000 linear feet of windbreak a year
- Support the establishment 100 linear feet of shoreline protection with natural buffers annually
- Support the establishment of 5 acres of riparian forest buffer annually
- Support a new storm-water ~~resources that are key to maintaining and improving water quality~~best management practice with each city annually.

#3: Identify critical wetlands and water resources that are key to maintaining and improving water quality.

Funding: Unknown **Source:** Environmental Services
Department, U.S. Army Corps of
Engineers, Department of Natural
Resources

Responsibility: Lead: Soil & Water Conservation District,
Environmental Services Department
Support: U.S. Army Corps of Engineers,
Board of Water & Soil Resources,
Department of Natural Resources, MN
Pollution Control Agency, U.S. Fish &
Wildlife Service

Evaluation:

- Identify critical wetlands areas that are critical to keeping excess nutrients out of our waters.
- Evaluate approaches to maintain or manage of those areas

#4: Implement projects/practices that preserve and/or restore drained and/or degraded wetlands in Clearwater County to help restore hydrology.

Funding: \$20,000 / year **Source:** Board of Water & Soil
Resources, Natural Resources
Conservation Service

Responsibility: Lead: Soil & Water Conservation District, Natural Resources Conservation Service, U.S. Fish & Wildlife Service
Support: Board of Water & Soil Resources, Department of Natural Resources, U.S. Army Corps of Engineers

Evaluation: #4: ~~Implement projects/practices that preserve and/or restore drained and/or degraded wetlands in Clearwater County.~~

Assessment of wetlands

- ~~Objective D: Coordinate~~ and ~~cooperate~~ their status in County
- Implement projects on drained/degraded wetlands, where practicable, through coordinated efforts with other governing partner agencies — or organizations

#5: Address state Buffer-Law implementation through coordination with local government and surrounding tribal reservations/landowners.

Funding: \$20,000

Source: Board of Water & Soil Resources, Natural Resources Conservation Service

Responsibility: Lead: Soil & Water Conservation District
Support: Board of Water & Soil Resources,
Department of Natural Resources, Red Lake
Watershed District

Evaluation:

- Coordinate the mapping of additional priority waters with input from local stakeholders.
- Provide technical expertise and assist with project development and execution where required.

#6: Utilize Lake Protection Screening Reports to implement protection and restoration efforts for county lakes.

Funding: Unknown **Source:** Board of Water & Soil Resources, Natural Resources Conservation Service

Responsibility: Lead: Soil & Water Conservation District
Support: Board of Water & Soil Resources,
Department of Natural Resources

Evaluation:

- Evaluate reports to identify which areas are most suitable for protection efforts and promote programs that provide it
- Provide technical expertise and assist with project development and execution on prioritized lakes.

Objective D: Coordinate and cooperate with other governing agencies and surrounding tribal reservations.

Strategies:

#1: Seek out beneficial and maintain partnerships, programs, and funding sources to reduce soil erosion and improve water quality in Clearwater County.

Funding: Unknown **Source:** Unknown

Responsibility: Lead: #2: Utilize Board of Water and Soil Resources Local Water Management Challenge Grant funds for special projects.

#3: Encourage conservation programs to reduce erosion such as CRP, EQIP, and CREP, with cooperation from NRCS.

~~#4: Support Red Lake Watershed Soil & Water Conservation District and other~~

Support: All agencies, groups and departments apply

~~**Evaluation: with Total Maximum Daily Load (TMDL) studies.**~~
Continued

- Continue to diversify revenue streams on a yearly basis – seeking new partnerships is continuous, but will be specific in dealing with a certain project.
- Pursue and utilize Surface Water Assessment Grants, Clean Water Assistance Grants, and other grant funding when available.
- Work with cooperating agencies to complete at least two cost-share projects annually.
- Continue cooperation & utilization of special project funds from the Red Lake Watershed District.

~~#2: #5: Coordinate~~
Encourage conservation programs that reduce erosion, such as Conservation Reserve Program, Environmental Quality Incentives Program, and Conservation Stewardship Program, with cooperation from Natural Resources Conservation Service.

Funding: Unknown **Source:** Natural Resources Conservation Service

Responsibility: Lead: Soil & Water Conservation District, Natural Resources Conservation Service
Supporting: Board of Water & Soil Resources

Evaluation: other agencies/districts

- On every Soil & Water Conservation District project site we will be looking at how we could partner with the Natural Resources Conservation Service to levy federal and state dollars for implementation of ~~practices identified by completed TMDL studies in our County that improve water quality of those impaired water bodies~~the project – continuous.

#3: Contribute to the Total Maximum Daily Load and Watershed Restoration and Protection process, utilize additional planning tools, and coordinate with participating agencies, landowners, and other stakeholders.

Funding: Unknown **Source:** Unknown

Responsibility: Lead: Soil & Water Conservation District

Supporting: Red Lake Watershed District, MN
Pollution Control Agency, Board of Water & Soil
Resources

Evaluation:

- Utilize additional planning tools, such as Stream Power Index, Hydrological Simulation Program - FORTRAN (HSPF), Soil & Water Assessment Tool (SWAT), Prioritize, Target & Measure Application (PTMApp), and Water Quality Decision Support Application (WQDSA), to target areas for additional protection.
- Increase participation in the Total Maximum Daily Load and WRAP process and coordinate with contributors.

#4:#6: Continued cooperation with Clearwater County Office of Environmental Services on ~~shoreland~~shore-land, wetland, and Individual Sewer Treatment Systems (ISTS) programs, issues, and/or concerns.

Funding: \$10,000 / year **Source:** Board of Water & Soil Resources

Responsibility: **Lead:** Environmental Services Department, Soil & Water Conservation District
Supporting: County, Minnesota Department of Agriculture, Pollution Control Agency, Board of Water & Soil Resources, U.S. Army Corps of Engineers

Evaluation:

- Continue to come up with publications, educational materials and seminars with Environmental Services Department.
- Continue to implement Water Plan in conjunction with Environmental Services Department and County.
- Promote available financial incentives for homeowners to update failing systems in both shore-land and other areas.

#5: Participate in the Red Lake Watershed Districts development of Flood Damage Reduction projects within the county.

Funding: \$1,500 / year **Source:** Red Lake Watershed District

Responsibility: **Lead:** Red Lake Watershed District, Environmental Services Department
Supporting: Soil & Water Conservation District, Board of Water & Soil Resources, U.S. Army Corps of Engineers

Evaluation:

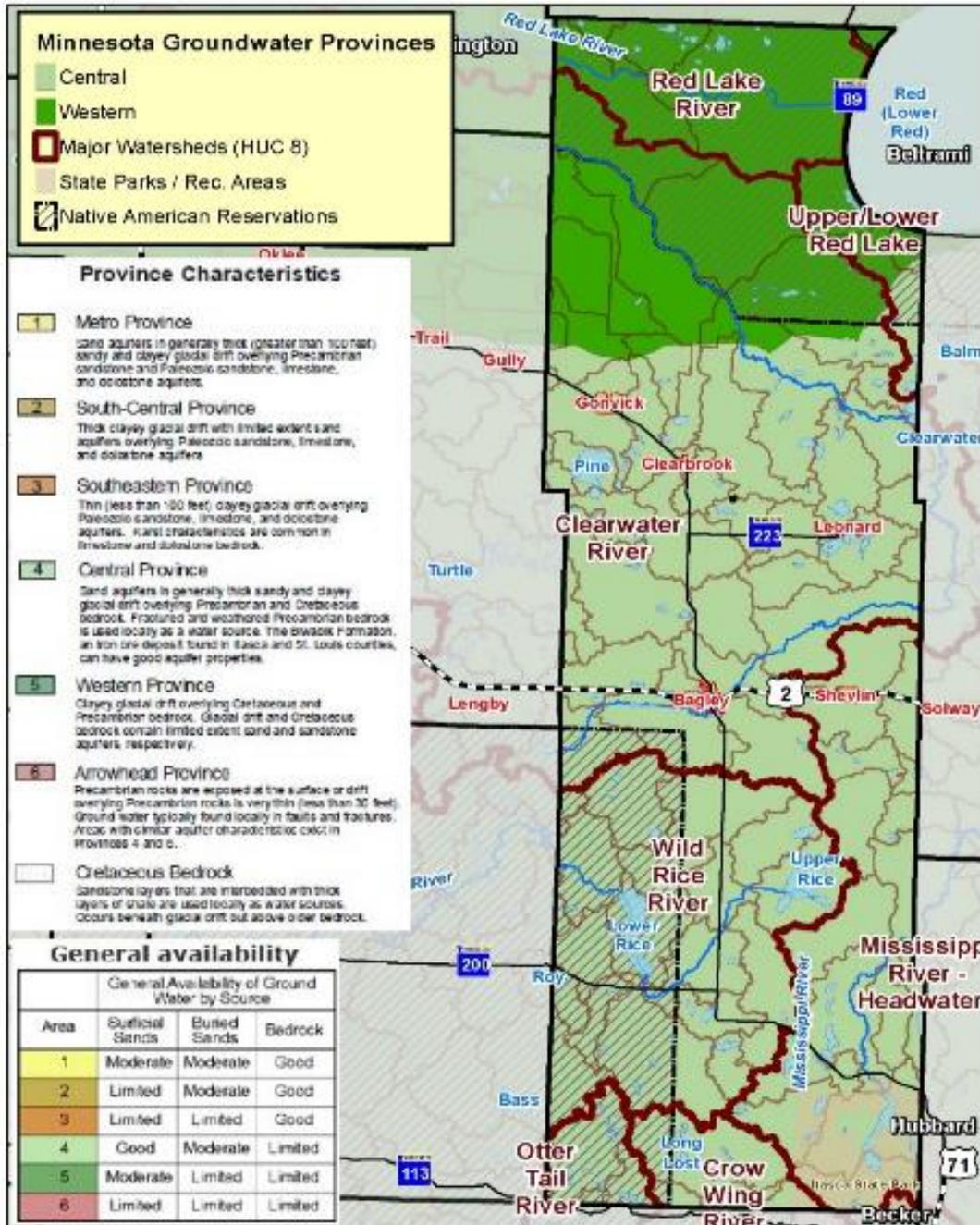
- Continue to attend flood damage reduction work team meetings led by the Red Lake Watershed District.
- Provide input related to the protection of water quality and quantity issues from a local perspective.

Priority 2: Drinking Water Source Protection

Ground water is also a large concern in Clearwater County. All of Clearwater County's residents rely on ground water from either of two provinces (Figure 8) for their drinking water source. For this reason, the protection and management of our ground water resources is a major concern. The cities of Bagley, Clearbrook, Gonvick, and Rice Lake supply their citizen's drinking water through a public drinking water supply and municipal wells. Only one of these municipalities, Bagley, has a designated Drinking Water Supply Management Area with a Wellhead Protection Plan in place (Figure 9 & Additional Map 11 in Appendix A). There is a need to better understand local ground water quality. This can lead to better understanding of drinking water issues such as nitrate contamination or areas of arsenic in the county and the ability to track these contaminants. ~~Watersheds: Watersheds Listed as impaired by the MPCA~~

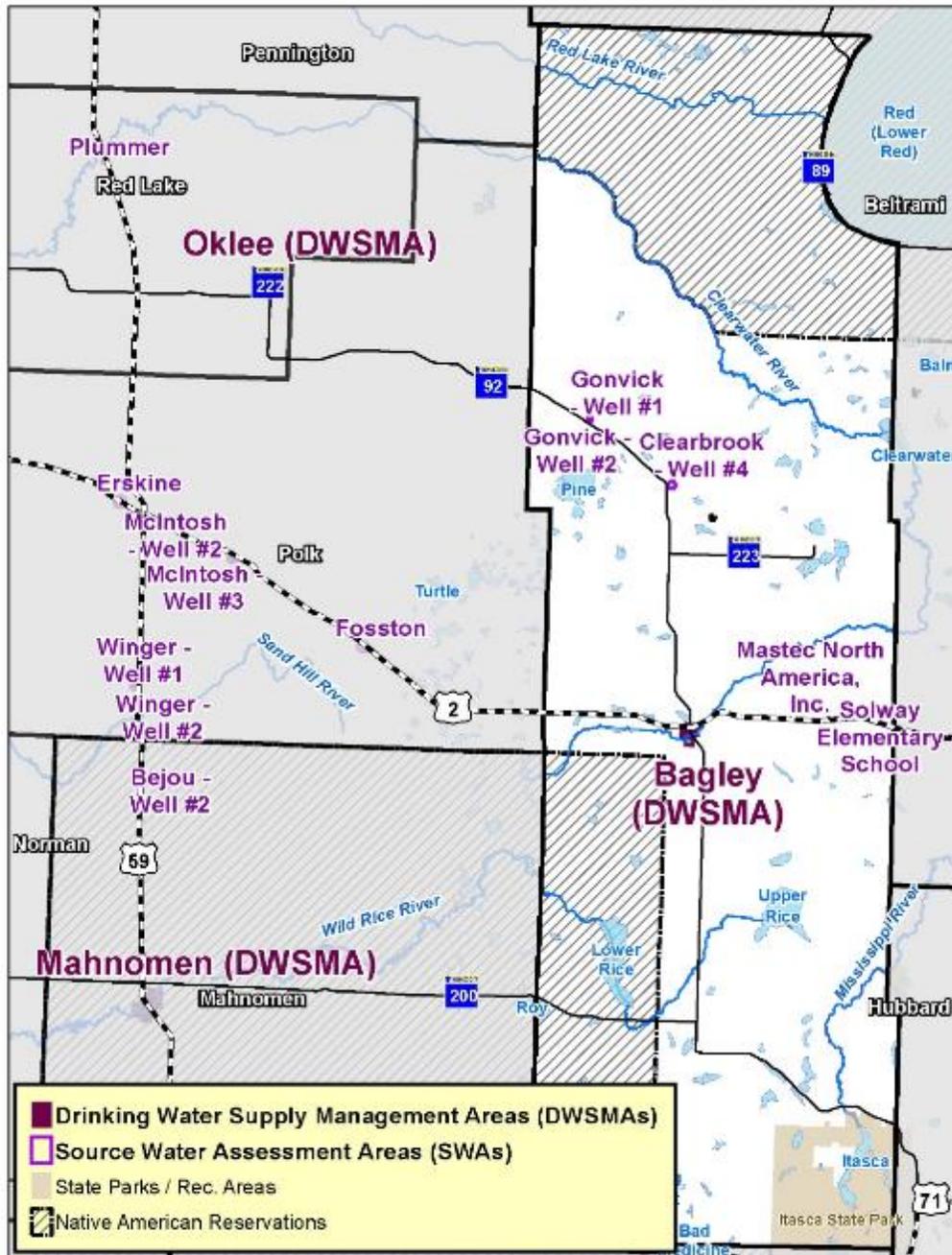
Priority 2 Currently, there is a limited amount of data available.

Figure 8: Groundwater Provinces



[This map shows the general ground-water zones of the state as they intersect with the boundaries of the county. Provinces 4 and 5 are seen here.](#)

Figure 9: Drinking Water Supplies



The above map shows the sources of drinking water within the county as they relate to Drinking Water Supply Management Areas (City of Bagley) or areas where Source Protection Water Assessments are performed (Gonvick, Clearbrook, Solway, etc.)

Objective A: Protect drinking water sources throughout Clearwater County

Strategies:

#1: ~~#1: Provide~~ Promote Sub-Surface Sewage Treatment System compliance and provide technical assistance to landowners who have questions or concerns on non-compliant or failing septic systems.

Funding: \$30,000 / year **Source:** County, Pollution Control Agency, U.S. Department of Agriculture

Responsibility: **Lead:** Environmental Services Department
Supporting: Soil & Water Conservation District, Pollution Control Agency, County, Minnesota Department of Agriculture

Evaluation:

- Ensure property owners in shore-land areas are aware of septic rules and regulations as well as the County Shore-land Ordinance through existing outreach efforts, such as the district newsletter.
- Ensure property owners are aware of available funding mechanisms to get their system upgraded.
- Provide landowners with guide to replacing failing septic systems, septic system maintenance, and funding available to replace failing systems.
- Promote the Septic System Fix-up grant through the County Environmental Services Department.

#2: Promote the Agricultural Best Management Practice Loan program offering low-interest loans to replace failing septic systems.

Funding: \$5,000 / year **Source:** Minnesota Department of Agriculture

Responsibility: **Lead:** Environmental Services Department, Soil & Water Conservation District
Supporting: Minnesota Department of Agriculture, Board of Water & Soil Resources, MN Pollution Control Agency, Technical Service Area 2

Evaluation:

- Utilize this revenue source where other funding options are not available or not entirely sufficient, or to supplement other funding options.

#3: Seal known abandoned /unsealed wells throughout the county; promote the Soil & Water Conservation District cost-share program to help fix this problem.

Funding: \$1,500 / year **Source:** Board of Water & Soil Resources, Natural Resources Conservation Service

Responsibility: **Lead:** Soil & Water Conservation District
Supporting: Minnesota Department of Health, Minnesota Department of Agriculture, Municipalities

Evaluation:

- Publicize in paper and newsletters available cost-share program (Agricultural Best Management Practice Loan Program) and EQIP (Environmental Quality Incentives Program).
- Goal of sealing an average of 3 abandoned wells per year through different government programs.
- Contact MN Department of Health on an annual basis to determine the extent of outstanding unsealed wells.

#4: Support the Wellhead Protection Plan for the City of Bagley.

Funding: Unknown **Source:** MN Department of Health

Responsibility: **Lead:** City of Bagley
Supporting: Soil & Water Conservation District

Evaluation:

- Support WHPP for City of Bagley, provide technical assistance to City as needed – continuous.

#5: Continue to monitor the five (5) Department of Natural Resources and one (1) City of Shevlin observation wells.

Funding: \$1,500 / year **Source:** Department of Natural Resources

Responsibility: **Lead:** Soil & Water Conservation District
Support: Department of Natural Resources

Evaluation:

- Continuation of existing/functioning program to measure groundwater levels.

#6: Develop a ground water quality monitoring program. Increase the frequency and number of tests of Clearwater County's ground water resources

Funding: \$15,000 / year **Source:** Minnesota Department of Agriculture, Pollution Control Agency, Minnesota Department of Health

Responsibility: **Lead:** Soil & Water Conservation District
Support: Minnesota Department of Agriculture, Pollution Control Agency, Minnesota Department of Health

Evaluation:

- Promote the monitoring program and seek volunteers willing to do monitoring in each of the three priority watersheds or on within each city.
- Provide groundwater quality educational programs to interested parties and at annual events.
- Consider water quality monitoring of Department of Natural Resources Observation Wells we are already monitoring for groundwater levels.
- Pursue adding additional water quality monitoring sites through partnership with the Department of Health.
- Continue to offer well testing clinics to county residents at County Fair.
- Target landowners in areas where pollutant loads are more likely to infiltrate into groundwater, through evaluation of available data layers that describe soil characteristics and land disturbance.
- Work with the Minnesota Department of Agriculture to schedule times to use their nitrate testing equipment, particularly during or around the same time as the County

Fair. This free event should be advertised widely to get as much participation as possible.

#7: Characterize aquifers of concern and evaluate factors contributing to water quality problems within them.

Funding: \$5,000 / year **Source:** Minnesota
Department of Health

Responsibility: Lead: Soil & Water Conservation District
Support: MN Department of Natural Resources Minnesota Department of Health, MN Pollution Control Agency

Evaluation:

- Encourage and support the planning and development of the MN Hydrogeologic Atlas with the county for future utilization in evaluating groundwater quality problems.

#8: Identify areas on the landscape that can be used to increase recharge to aquifers through retention or other means.

Funding: Unknown **Source:** Unknown

Responsibility: Lead: Soil & Water Conservation District, U.S. Army Corps of Engineers, Department of Natural Resources
Support: Natural Resources Conservation Service, Red Lake Watershed District

Evaluation:

- Coordinate efforts with local water planners and hydrologists to identify projects that add to the overall quality and quantity of available groundwater.
- Participate in planning of groundwater recharge projects, if proposed, and work to identify other projects, such as storm water retention or flood damage reduction, that provide positive externalities for ground water health.

Priority Concern 3: Exotic and Invasive Species Management

Noxious weeds have and are becoming prolific in areas of Clearwater County. Spotted Knapweed and Leafy Spurge, for example, are very successful at establishing themselves in the light sandy soils that cover a large portion of our county. These weeds reduce biodiversity of native species, and are much less effective at stabilizing soil than native species. In addition, management of these pests can include application of herbicides or burning of fields, which can lead to increased levels of pollutant runoff.

Although only a few aquatic invasive species have been identified in any Clearwater County waters, a larger number of aquatic invasive species have been identified outside of, and in close proximity to, the county boundaries and highways. While Clearwater County has developed an AIS plan, work done by the Soil & Water Conservation District is crucial to supporting the goals stated within it. The impacts from exotic and invasive species will be economic and/or environmental as native species are displaced from their natural place in the ecosystem. Understanding the risk posed by these invaders will help to establish actions that can be taken to keep them from the County's water resources.

Objective A: Exotic and Invasive Species Management

Strategies:

#1: Identify any new or undiscovered invasive species that have moved into Clearwater County.

Funding: \$5,000

Source: Unknown

Responsibility: Lead: Environmental Services Department
Support: Soil & Water Conservation District, Lake Associations, Volunteers, Environmental Services Department, Department of Natural Resources

Evaluation:

- Minimize the movement of invasives into parts of Clearwater County that currently do not contain these invasives through education of county residents.
- Through education of county residents, promptly address invasive species if they have been moved into Clearwater County.

#2: Work to educate citizens on understanding the potential risks of invasive or exotic species and other noxious weed types in the County

Funding: \$2,500

Source: Department of Natural Resources,

Minnesota Department of
Agriculture , Board of Water
& Soil Resources,
Environmental Services
Department

Responsibility: Lead: Environmental Services Department
Support: Soil & Water Conservation
District, Department of Natural Resources,
Minnesota Department of Agriculture,
Board of Water & Soil Resources, Lake
Associations, Natural Resources
Conservation Service

Evaluation:

- Produce educational press releases annually,
- Provide educational materials at the County Fair
- Include an article in the Soil & Water Conservation District
newsletters (quarterly).

#3: Work with Clearwater County, Townships and MN Department of
Natural Resources Invasive Species Specialists to help identify
problem areas around the County.

Funding: \$5,000 / year

Source: Board of Water &
Soil Resources, County,
Minnesota Department of
Agriculture, Department of
Natural Resources

Responsibility: Lead: Environmental Services Department,
Soil & Water Conservation District,
Department of Natural Resources
Support: Board of Water & Soil Resources,
County, Minnesota Department of
Agriculture

Evaluation:

- Minimize and control the impact of invasives around the
County, locating and mapping these problem areas so we
can focus time/funds in those areas for the eradication of
those species.
- Development of plan for treatment of invasives and priority
areas throughout the county.

#4 Coordinate and support activities identified in the Clearwater County Aquatic Invasive Species Prevention Plan.

Funding: Unknown

Source: Department of Natural Resources

Responsibility:

Lead: County

Support: Soil & Water Conservation

District, Department of Natural Resources

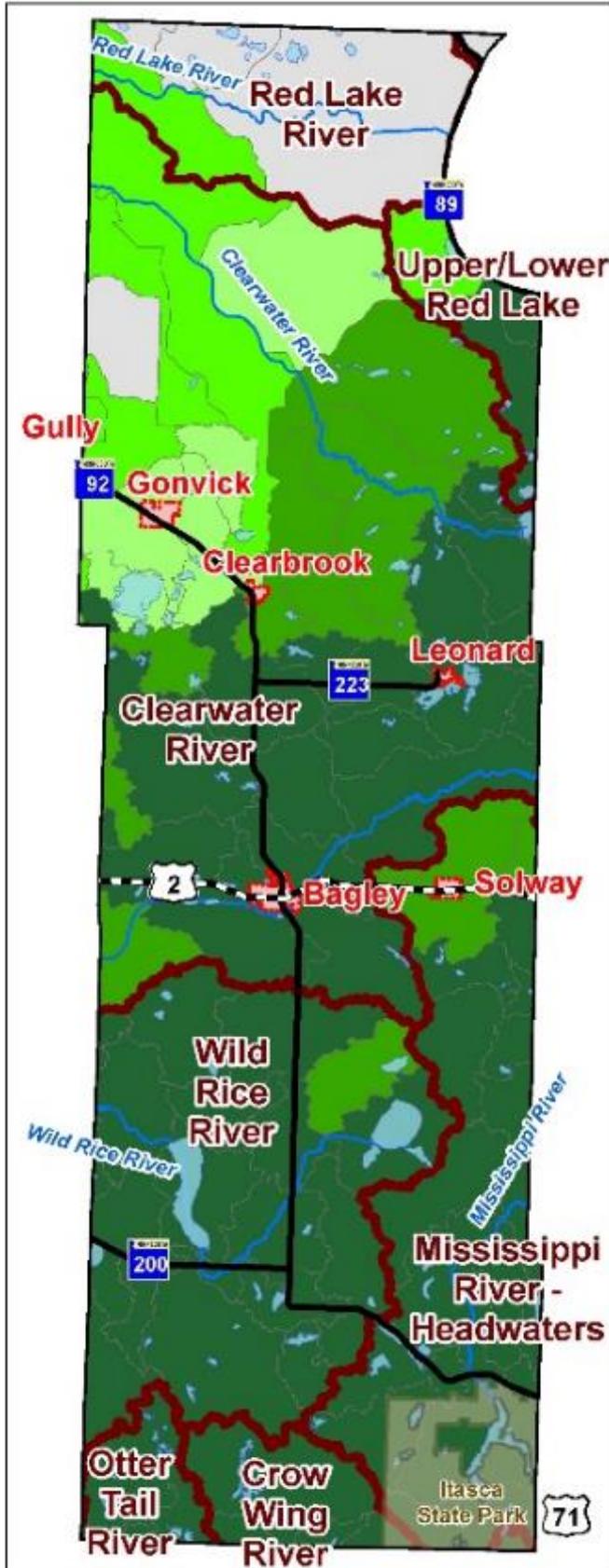
Evaluation:

- Execute planned activities within the Clearwater County AIS Plan (Appx. E). Project is continuous.

Priority Concern 4: Land Use Impacts on Water Quality

Agricultural land, forested land, and developed areas have the potential for negative impacts on the water resources in Clearwater County. Forested land covers 48% of the land in Clearwater County (Figure 10) and encompasses the largest land cover type in the County, of which a many portions are under private ownership (Figure 11). Logging and harvesting of these forest resources is very important to the economy of Clearwater County. Poor implementation of timber harvesting best management practices can result in environmental degradation. Agricultural land covers 20% of land in Clearwater County, with a large portion of that managed as pasture and grazing land (see Figure 7 above and Additional Map 4 in appendix A). Agricultural activities on crop and pasture land without proper best management practice implementation can have extensive negative impacts on water quality. Best management practices can serve to reduce these impacts significantly.

Figure 10: Percent Forested Land



This map shows the percentage category of the total area of each sub-watershed that is forested. The forest maps produced pull out all upland forest types from the 2011 National Land Cover Data Set (NLCD).

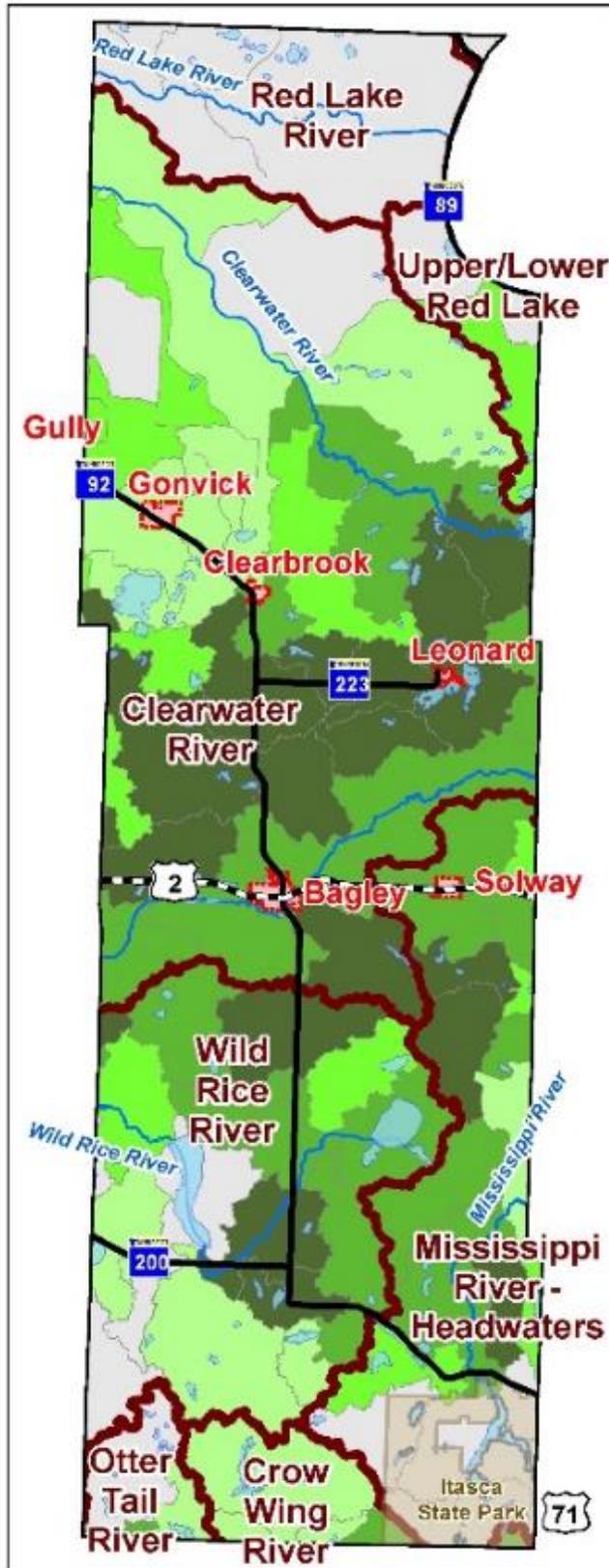
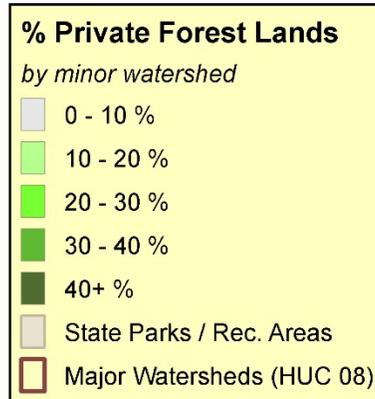


Figure 11: Percent Private Forested Land



This map is based on the previous map (Figure 10), but shows only those forest cover percentages that constitute private land ownership. Although many watersheds in North-central MN have vast amounts of public forests, which are effectively managed by local, state, and federal government, it is the forested lands on private property that provide one of the largest opportunities to maintain high water quality in the watershed.

Objective A: Proper Land Management on Agricultural Lands.

Strategies:

#1: Reduce the impact that runoff from feedlots or other livestock operations can have on our water resources, especially those in close proximity to impaired waters.

Funding: \$20,000 / year

Source: Board of Water & Soil Resources, Red Lake Watershed District, Natural Resources Conservation Service, Pollution Control Agency

Responsibility: **Lead:** Soil & Water Conservation District, Natural Resources Conservation Service
Supporting: Board of Water & Soil Resources, Red Lake Watershed District, Pollution Control Agency

Evaluation:

- Use upcoming Total Maximum Daily Load studies to focus on waters with fecal coliform or *E. coli* impairments.
- Once problem sites are located, design a solution, locate funding sources and implement projects – this is continuous.
- Promote the use of best management practices, such as rotational grazing, and the results of projects as an educational effort through publishing those stories in newsletters.
- Focus on implementing conservation practices referred to on pages 12-16 of this plan.

#2: Installation and utilization of Agricultural Best Management Practices through the use of existing and future state and federal cost share programs to protect resources from runoff and nutrient loading.

Funding: \$20,000 / year

Source: Board of Water & Soil Resources, Red Lake Watershed District, Natural Resources Conservation Service, Pollution Control Agency, Wild Rice River Watershed District, Minnesota Department of Agriculture

Responsibility: Lead: Soil & Water Conservation District
Supporting: Board of Water & Soil
Resources, Red Lake Watershed District,
Natural Resources Conservation Service,
Wild Rice River Watershed District,
Minnesota Department of Agriculture,
Pollution Control Agency

Evaluation:

- Continuously locate and fix problem with cost-share dollars.
- Focus on areas where water bodies are impaired and there are known sources of runoff or nutrient loading.
- Advocate for long-term solutions and easements that offer lasting protection of surface waters, such as Reinvest In Minnesota or Buffer Law projects, wherever possible.
- Support the installation of three new side water inlets annually
- Support the installation of five acres of riparian buffer annually
- Promote voluntary water quality monitoring of outputs from tiled farm fields and wild-rice paddies.

#3: Manage an equipment rental program designed to improve soil health and reduce runoff pollutant loads through increased infiltration and retention of storm waters.

Funding: Unknown **Source:** Unknown

Responsibility: Lead: Soil & Water Conservation District
Supporting: Natural Resource Conservation
Service,

Evaluation:

- Purchase and maintain rental equipment that promotes best management practices on pasture and hay-grounds, such as the Great Plains No-Till-Drill and RanchWorx Aerator.
- Promote their use in improving soil health, and provide outreach to the public to increase usage through: displays at the County Fair, newspaper and SWCD article ads.
- Provide incentives to landowners to offset the cost of the rental.
- Work to utilize the no-till drill for 250 acres of hay-land/pastureland renovation annually.

#4: Promote the Minnesota Agricultural Water Quality Certification Program.

Funding: \$4,000 **Source:** Department of Agriculture

Responsibility: Lead: Soil & Water Conservation District
Supporting: Department of Agriculture,
Board of Water and Soil Resources,
Department of Natural Resources, Pollution
Control Agency

Evaluation:

- Utilize funding from the Department of Agriculture to promote this program.
- Work to sign up 5 landowners for this program annually

Objective B: Proper Management of Forest Resources

Strategies:

#1: Support the recently adopted Clearwater County Resource Management Plan that addresses management concerns and strategies for the 95,000 acres of County managed land in Clearwater County.

Funding: Unknown **Source:** Unknown

Responsibility: Lead: County Land Department
Supporting: Environmental Services
Department, Department of Natural
Resources, Soil & Water Conservation
District

Evaluation:

- Continued support of Resource Management Plan

#2: Promote the development and implementation of forest management plans for both private and public lands to address water quality impacts to downstream resources.

Funding: \$5,000 / year **Source:** Department of
Natural Resources

Responsibility: Lead: Soil & Water Conservation District
Supporting: Department of Natural
Resources, County Land Department,

County, Natural Resources Conservation Service

Evaluation:

- Ensure that landowners know what forestry best management practice options that they have before/after they harvest timber.
- Inform any interested landowners of the forest best management practices they can use on their land.
- Promote the use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines* to all parties involved in forestry practices.
- Promote enrollment of land into the Sustainable Forest Incentive Act.
- Maintain a list of certified plan writers for distribution to interested land owners.
- Continue to promote and manage the Soil & Water Conservation District Tree Program.

#3: Promote state & federal cost share programs to assist landowners in implementing forest best management practices that protect or improve water quality

Funding: \$2,500 / year

Source: Department of Natural Resources, Board of Water & Soil Resources, Natural Resources Conservation Service

Responsibility: Lead: Soil & Water Conservation District
Supporting: County Land Department, Board of Water & Soil Resources, Department of Natural Resources,

Evaluation:

- Promote forest management programs offered through the Natural Resource Conservation Service and Department of Natural Resources.

#4: Prioritize protection of forest resources that provide water quality benefit to surface water resources.

Funding: \$5,000 / year

Source: Department of Natural Resources, Board of Water & Soil Resources,

Natural Resources
Conservation Service

Responsibility: Lead: Soil & Water Conservation District
Supporting: Board of Water & Soil Resources, Department of Natural Resources

Evaluation:

- Utilize conservation planning tools to identify forest resources that are critical to the protection of priority surface waters.
- Target the Sustainable Forestry Incentive Act program in these areas along with other conservations programs that provide protection to forest resources.

#5: Utilize the Reinvest In Minnesota Wild Rice program to protect prioritized wild rice resources in the county.

Funding: \$100,000 / year **Source:** Board of Water & Soil Resources, Department of Natural Resources

Responsibility: Lead: Soil & Water Conservation District
Supporting: Board of Water & Soil Resources, Department of Natural Resources

Evaluation:

- Promote the protection of prioritized wild rice lakes (see Appendix Map 7). Long term protection of these sites should be consistent with program and county goals. Highest priority waters include: Mallard, Sucker, Upper Rice, Mud, Second, Clearwater River, and Wild Rice River.

Objective C: Proper Land Management in Developed and Developing Areas

Strategies:

#1: Reduce the pollution impact from city storm-water entering our waterways.

Funding: \$30,000 / year **Source:** Board of Water & Soil Resources, Red Lake Watershed District, cities

Responsibility: Lead: Soil & Water Conservation District
Supporting: Board of Water & Soil Resources, Red Lake Watershed District, Cities

Evaluation:

- Work with Clearbrook, Gonvick, Leonard, Shevlin to install low impact bio-retention basins where practicable
- Work with cities to install storm-water retention ponds.
- Explore alternative storm-water treatment options.
- Work with City of Bagley to assess effectiveness of existing storm-water ponds.
- Install two new rain gardens annually, and promote/advertise them in subsequent newsletters.

#2: Reduce the amount of soil erosion from new construction sites with increased utilization of erosion control measures at these sites.

Funding: \$2,000 / year **Source:** Soil & Water Conservation District, Board of Water & Soil Resources

Responsibility: Lead: Soil & Water Conservation District
Supporting: Board of Water & Soil Resources

Evaluation:

- Work with contractors on new construction sites on a continuous basis to reduce erosion from their construction sites and help with technical assistance on types of best management practices they should consider when doing new construction to reduce erosion runoff.
- Soil & Water Conservation District staff should be actively involved with contractors on the use of best management practices as well as be abreast of current regulations and standards.

#3: Promote Best Management Practices that reduce pollutant loading into the County's waters, and the range of options available to County Residents.

Funding: \$1,000 / year **Source:** Unknown

Responsibility: Lead: Soil & Water Conservation District
Supporting: Board of Water & Soil
Resources, Red Lake Watershed District,
Natural Resources Conservation Service,
Pollution Control Agency

Evaluation:

- Encourage county residents to manage lands using the best available best management practices for their particular land-uses.
- Educate residents on rain-garden or barrel design and location, native buffers, and other practices that reduce land-management or development related impacts to waters.
- Advertise existing projects to highlight best management practices in use, through ‘spot-lights’ in existing publications.
- Compile and publish master-list of various/general best management practices annually, using practices recommended by the Environmental Protection Agency.

V. Clearwater County Implementation Schedule: 2016 Amendment

Priority Concern 1: Surface Water Quality Protection and Enhancement

Objective A: Monitoring Water Quality in Clearwater County

<u>Timeline</u>	<u>Strategies</u>	<u>Watersheds</u>	<u>Priority</u>	<u>Lead Agency</u>	<u>Partners</u>	<u>Expenses</u>	<u>Funding Sources</u>
2016-2020	1. Continue SWCD monthly water quality collection on five area lakes throughout the summer months	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD	MPCA, RMB Labs, MNDH	5,000	MPCA, BWSR
Ongoing	2. Expand & promote volunteer water quality monitoring on lakes and rivers.	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD	MPCA, BWSR, LAs, MHB, RLWD	5,000	BWSR, MPCA, RLWD

Objective B: Monitoring Water Quality in Clearwater County

Ongoing	1. Educate property owners along shoreline of the potentially negative impacts of developing those areas and promote best management practices to these individuals	All watersheds	High	Clearwater SWCD, LAs	BWSR, NWMNF, U of M Extension, MNDNR	2,500	BWSR, NWMNF
Ongoing	2. Encourage and promote Agricultural Best Management Practices to landowners throughout Clearwater County to help reduce surface water contamination, sedimentation, and bank erosion	All watersheds	High	Clearwater SWCD, NRCS	MNDA, BWSR, MPCA	2,000	MNDA, BWSR, MPCA, NRCS
Ongoing	3. Target and promote Agricultural Best Management Practices in 3 priority watersheds: Clearwater River, Upper Mississippi, and Wild Rice River	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD, NRCS	MNDA, BWSR, MPCA	20,000	MNDA, BWSR, MPCA, NRCS
Ongoing	4. Continue to educate property owners about the importance of wetlands, and the state and federal regulations that pertain to wetlands	All watersheds	Medium	ESD	BWSR, USACE, NRCS, SWCD	1,500	BWSR

Objective C: Identification and Implementation of Projects that Improve Surface Water Quality

2019-2020	1. Identify and inventory sources pollutants in targeted areas.	Clearwater, Mississippi, Wild Rice	Medium	Clearwater SWCD, RLWD, WRRWD	BWSR, MPCA	25,000	BWSR, MPCA, RLWD, WRRWD
Ongoing	2. Implementation of Agricultural Best Management Practices, storm water treatment/management, and erosion control projects	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD, NRCS	BWSR, MNDNR, USACE, Clearwater County	60,000	BWSR, NRCS, Cities
2017-2018	3. Identify critical wetlands and water resources that are key to maintaining and improving water quality	Clearwater, Mississippi, Wild Rice	Low	Clearwater SWCD, ESD	BWSR, MNDNR, USACE, MPCA, USFWS	Unknown	ESD, USACE, MNDNR
2019-2020	4. Implement projects/practices that preserve and/or restore drained and/or degraded wetlands in Clearwater County to help restore hydrology	Clearwater, Mississippi, Wild Rice	Medium	Clearwater SWCD, NRCS, USFWS	BWSR, MNDNR, USACE	20,000	BWSR, NRCS
Ongoing	5. Address state Buffer-Law implementation through coordination with local government and landowners	Clearwater, Mississippi	Medium	Clearwater SWCD	BWSR, MNDNR, RLWD	20,000	BWSR, NRCS
Ongoing	6. Utilize Lake Protection Screening Reports to implement protection and restoration efforts for county lakes	All watersheds	Medium	Clearwater SWCD	BWSR, MNDNR	Unknown	BWSR, NRCS

Priority Concern 1: Surface Water Quality Protection and Enhancement							
Objective D: Identification and Implementation of Projects that Improve Surface Water Quality							
Timeline	Strategies	Watersheds	Priority	Lead Agency	Partners	Expenses	Funding Sources
Ongoing	1. Seek out and maintain partnerships, programs, and funding sources to reduce soil erosion and improve water quality in Clearwater County	All watersheds	Low	Clearwater SWCD	All agencies, groups, departments	Unknown	Unknown
Ongoing	2. Encourage conservation programs to reduce erosion, such as Conservation Reserve Program, EQIP, and CSP, with cooperation from the Natural Resources Conservation Service	All watersheds	Medium	Clearwater SWCD, NRCS	BWSR	Unknown	NRCS
Ongoing	3. Contribute to the Total Maximum Daily Load and WRAP process, utilize additional planning tools, and coordinate with participating agencies, landowners, and other stakeholders	Clearwater, Mississippi, Wild Rice	Medium	Clearwater SWCD	All agencies, groups, departments	Unknown	Unknown
Ongoing	4. Continued cooperation with Clearwater County Office of Environmental Services on shore-land, wetland, and Individual Sewer Treatment Systems programs, issues, and/or concerns	All watersheds	High	Clearwater SWCD, ESD	Clearwater County, MNDA, MPCA, BWSR, USACE	10,000	BWSR, Clearwater County
Ongoing	5. Participate in the Red Lake Watershed District's development of Flood Damage Reduction projects within the county.	Clearwater	Medium	Red Lake Watershed District	Clearwater SWCD, BWSR, USACE	1,500	RLWD

Priority Concern 2: Drinking Water Source Protection							
Objective A: Protect Drinking Water Sources							
Timeline	Strategies	Watersheds	Priority	Lead Agency	Partners	Expenses	Funding Sources
Ongoing	1. Promote Sub-Surface Sewage Treatment System compliance and provide technical assistance to landowners who have questions or concerns on non-compliant or failing septic systems	Clearwater, Mississippi, Wild Rice	High	ESD	Clearwater SWCD, MPCA, Clearwater County, MNDA	30,000	Clearwater County, MPCA, USDA
Ongoing	2. Promote the Agricultural Best Management Practice Loan program offering low-interest loans to replace failing septic systems	All watersheds	Low	ESD, Clearwater SWCD	MNDA, BWSR, MPCA	5,000	MNDA
Ongoing	3. Seal known abandoned/unsealed wells throughout the county; promote the SWCD cost share program to help fix the problem	All watersheds	High	Clearwater SWCD	MNDH, MNDA, Municipalities	1,500	BWSR, NRCS
Ongoing	4. Support the Wellhead Protection Plan for the City of Bagley	Clearwater	Medium	City of Bagley	Clearwater SWCD	Unknown	MNDH
Ongoing	5. Continue to monitor the five (5) MN Department of Natural Resources and one (1) City of Shevlin groundwater observation wells	Clearwater, Mississippi	Medium	Clearwater SWCD	MNDNR	1,500	MNDNR

Priority Concern 2: Drinking Water Source Protection							
Objective A: Protect Drinking Water Sources							
Timeline	Strategies	Watersheds	Priority	Lead Agency	Partners	Expenses	Funding Sources
	6. Develop a ground water quality monitoring program. Increase the frequency and number of tests of Clearwater County's ground water resources	Clearwater, Mississippi	Medium	Clearwater SWCD	MNDA, MNDH, MPCA	15,000	MNDA, MNDH, MPCA
	7. Characterize aquifers of concern and evaluate factors contributing to water quality problems within them	All watersheds	Low	Clearwater SWCD	MNDNR, MNDH, MPCA	5,000	MNDH, BWSR
	8. Identify areas on the landscape that can be used to increase recharge to aquifers through retention or other means	All watersheds	Low	Clearwater SWCD, USACE, MNDNR	NRCS, RLWD	Unknown	Unknown

Priority Concern 3: Exotic and Invasive Species Management							
Objective A: Exotic and Invasive Species Management							
Timeline	Strategies	Watersheds	Priority	Lead Agency	Partners	Expenses	Funding Sources
	1. Identify any new or undiscovered invasive species that have moved into Clearwater County	All watersheds	Low	ESD	LAs, Volunteers, ESD, MNDNR, Clearwater SWCD	5,000	Unknown
Ongoing	2. Work to educate citizens on understanding the potential risks of invasive species and other noxious weed types in the County	All watersheds	Medium	ESD	MNDNR, BWSR, LAs, NRCS, Clearwater SWCD	2,500	MNDNR, MNDA, BWSR, ESD
2017-2018	3. Work with Clearwater County, Townships, and the MNDNR Invasive Species Specialists to help identify problem areas around the County	All watersheds	Medium	ESD, Clearwater SWCD, MNDNR	BWSR, Clearwater County, MNDA	5,000	BWSR, Clearwater County, MNDA, MNDNR
Ongoing	4. Coordinate and support activities identified in the Clearwater County Aquatic Invasive Species Prevention Plan	All watersheds	Medium	Clearwater County	Clearwater SWCD, MNDNR	Unknown	MNDNR

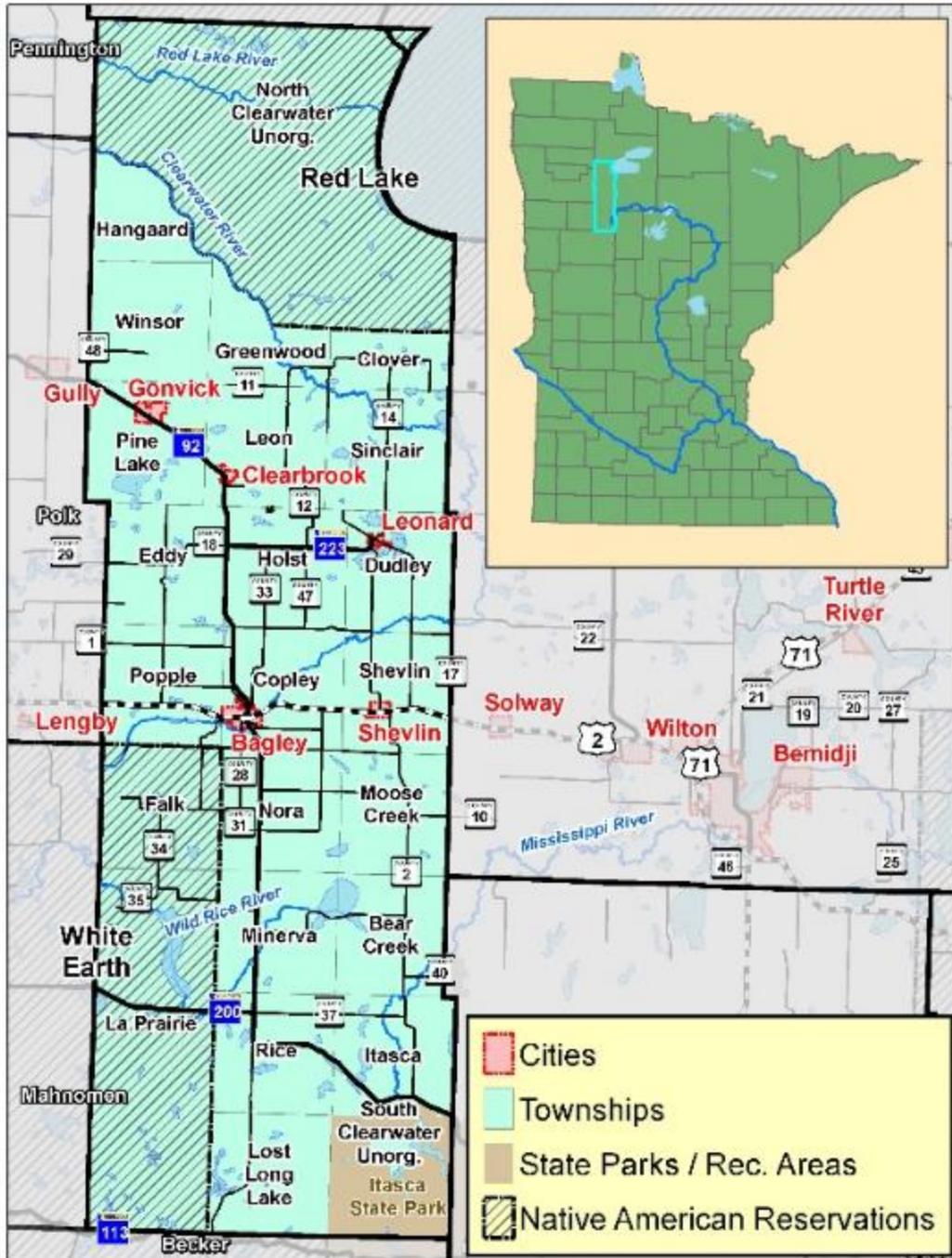
Priority Concern 4: Land Use Impacts on Water Quality							
Objective A: Proper Land Management on Agricultural Lands							
Timeline	Strategies	Watersheds	Priority	Lead Agency	Partners	Expenses	Funding Sources
Ongoing	1. Reduce the impact that runoff from feedlots or other livestock operations have on our water resources, especially those in close proximity to impaired waters	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD, MRCS	BWSR, RLWD, MPCA	20,000	BWSR, RLWD, NRCS, MPCA
Ongoing	2. Installation and utilization of Agricultural BMPs through the use of existing and future state and federal cost share programs to	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD	BWSR, RLWD, WRRWD, NRCS, MNDA, MPCA	20,000	BWSR, RLWD, WRRWD, NRCS, MPCA, MNDA

	protect resources from runoff and nutrient loading						
Priority Concern 4: Land Use Impacts on Water Quality							
Objective A: Proper Land Management on Agricultural Lands							
Timeline	Strategies	Watersheds	Priority	Lead Agency	Partners	Expenses	Funding Sources
Ongoing	3. Manage an equipment rental program designed to improve soil health and reduce runoff pollutant loads through increased infiltration and retention of storm waters	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD	NRCS	10,000	BWSR, Clearwater SWCD
Ongoing	4. Promote the Minnesota Agricultural Water Quality Certification Program	Clearwater, Mississippi, Wild Rice	Medium	Clearwater SWCD	MNDA, BWSR, MNDNR, MPCA	4,000	MNDA
Objective B: Proper Management of Forest Resources							
Ongoing	1. Support the recently adopted Clearwater County Resource Management Plan that addresses management concerns and strategies for the 95,000 acres of county managed land	Clearwater, Mississippi, Wild Rice	Medium	County Land Department	Clearwater SWCD, ESD, MNDNR, MASWCDs	Unknown	Unknown
Ongoing	2. Promote the development and implementation of forest management plans of private landowners that address water quality impacts to downstream resources	Clearwater, Mississippi, Wild Rice	Medium	Clearwater SWCD	MNDNR, County Land Department, Clearwater County, NRCS	2,500	MNDNR
Ongoing	3. Promote state and federal cost share programs to assist landowners in implementing forest best management practices that protect or improve water quality	Clearwater, Mississippi, Wild Rice	High	Clearwater SWCD	County Land Department, BWSR, MNDNR, MASWCDs, NRCS	2,500	MNDNR, BWSR, NRCS
2018-2019	4. Prioritize protection of forest resources that provide water quality benefit to surface water resources.	All watersheds	Medium	Clearwater SWCD	BWSR, MNDNR	5,000	MNDNR, BWSR, NRCS
Ongoing	5. Utilize the Reinvest In Minnesota Wild Rice program to protect prioritized wild rice resources in the county.	Clearwater, Mississippi, Wild Rice	Medium	Clearwater SWCD	BWSR, MNDNR	100,000	BWSR, MNDNR
Objective C: Proper Land Management in Developed or Developing Areas							
Ongoing	1. Reduce the pollution impact from city storm-water entering our waterways	Clearwater, Wild Rice	High	Clearwater SWCD	BWSR, RLWD, Cities	30,000	BWSR, RLWD, Cities
Ongoing	2. Reduce the amount of soil erosion from new construction sites with increased utilization of erosion control measures at these sites	Clearwater, Mississippi, Wild Rice	Medium	Clearwater SWCD	BWSR	2,000	SWCD, BWSR
Ongoing	3. Promote best management practices that reduce pollutant loading into the county's waters, and the range of options available to county residents	All watersheds	Medium	Clearwater SWCD	BWSR, RLWD, NRCS, MPCA	1,000	Unknown

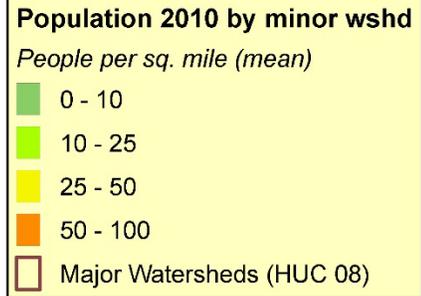
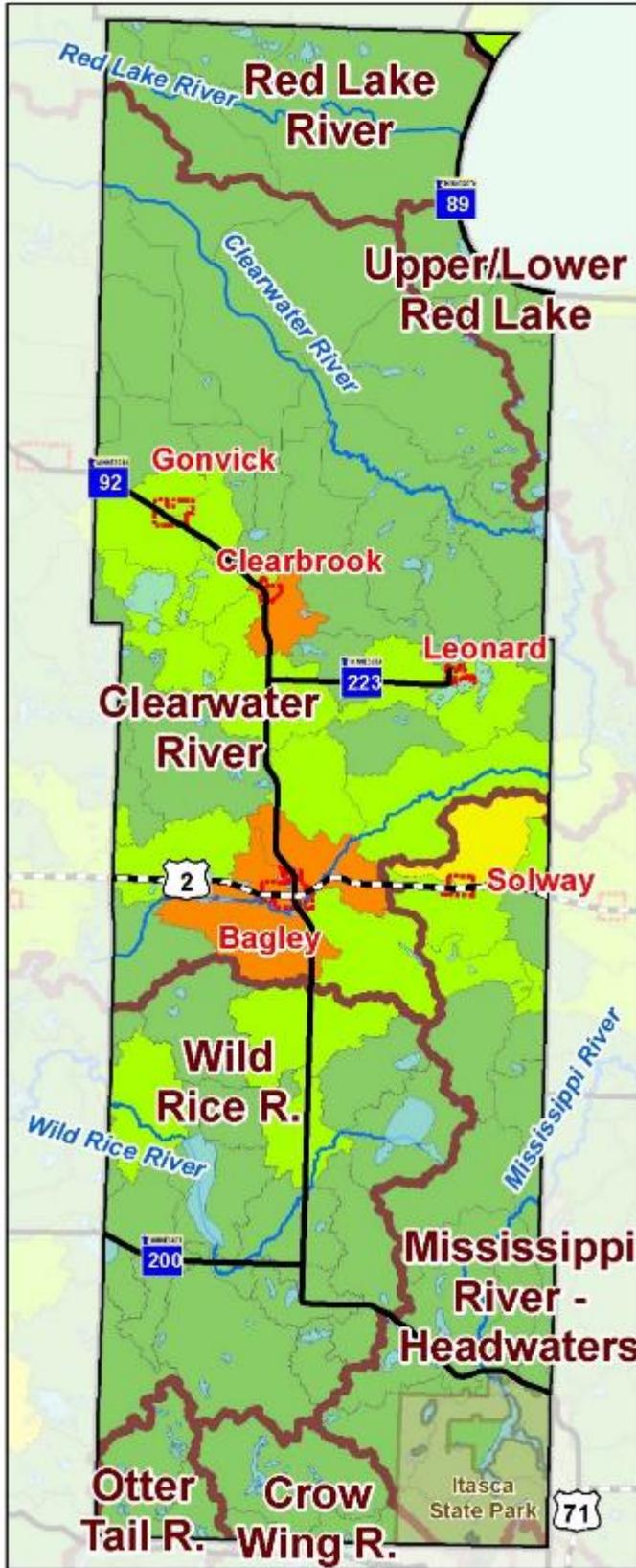
VII. Appendices

Appendix A: Additional Maps

1: General Location Map

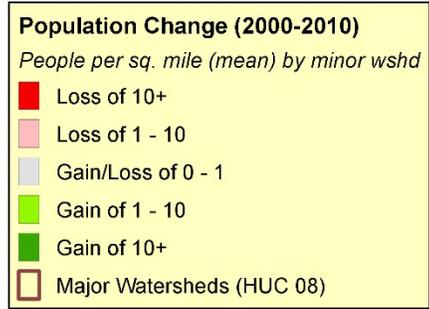
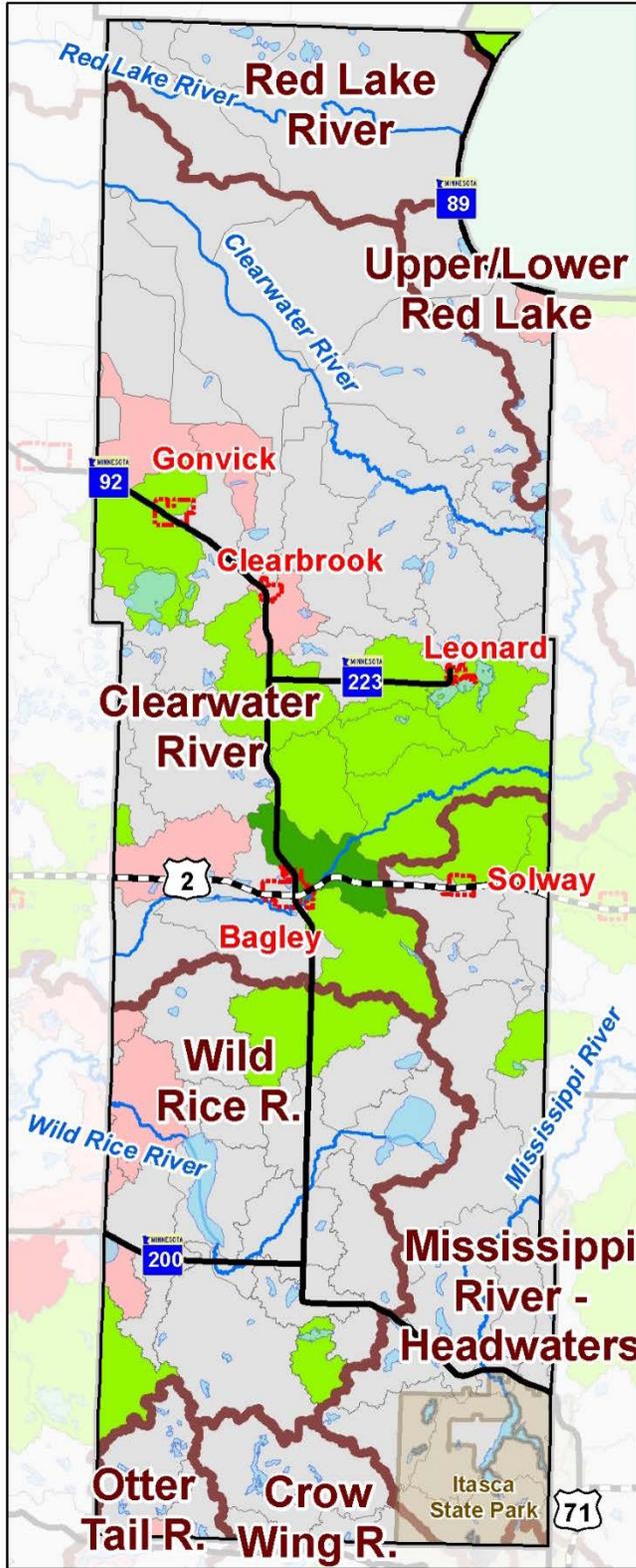


2: Population Map (2010 Census)



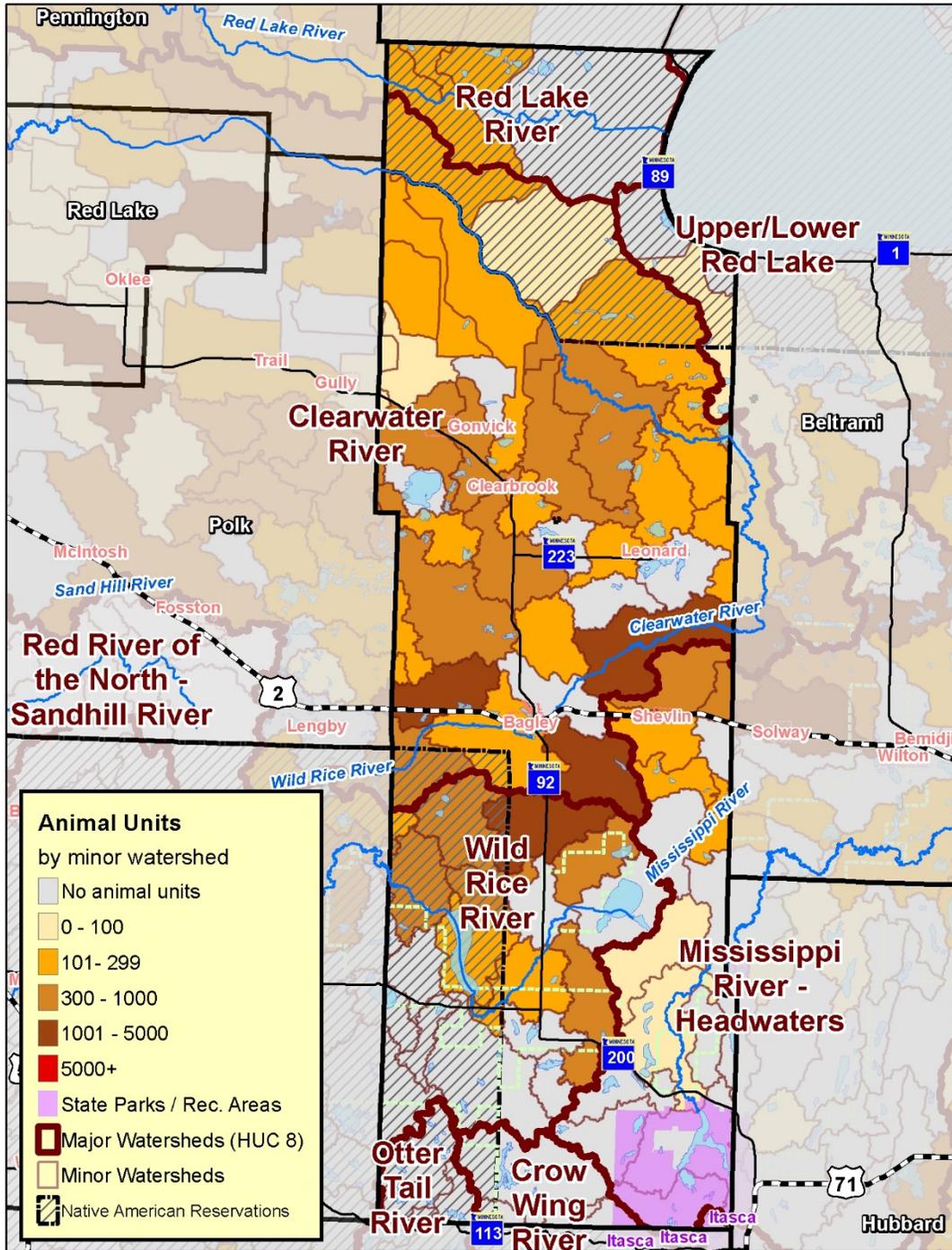
This map shows the general population of each sub-watershed within the county in units of people per square mile, as provided in the most recent Census data from 2010.

3: Population Change



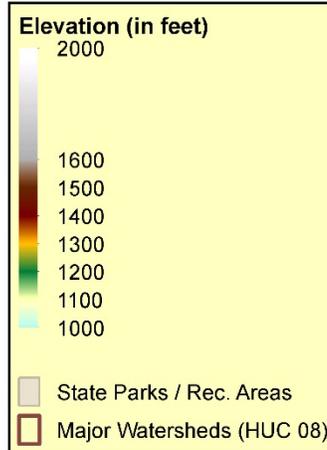
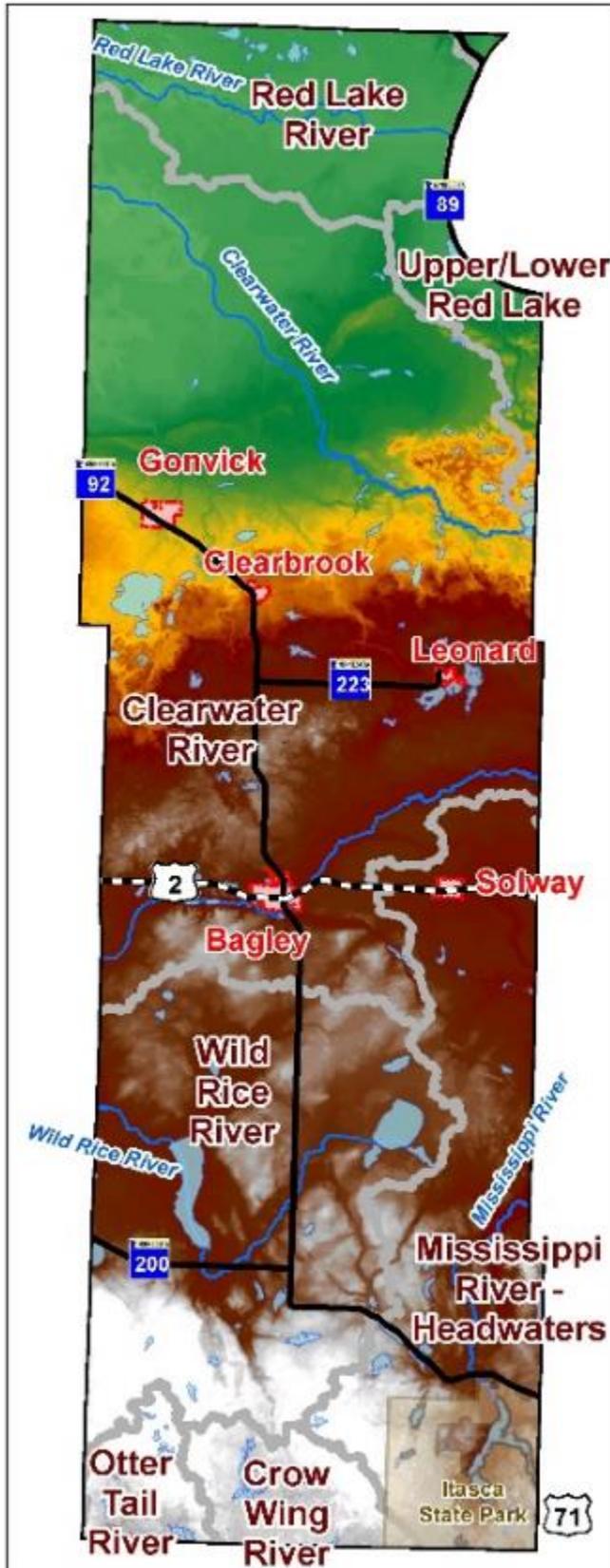
This map, based on data from the [previous map \(#2\)](#) and Census data from the year 2000, shows the change in population in units of people per square mile. It shows the gains and losses for the years from 2000 to 2010.

4: Animal Units per minor watershed



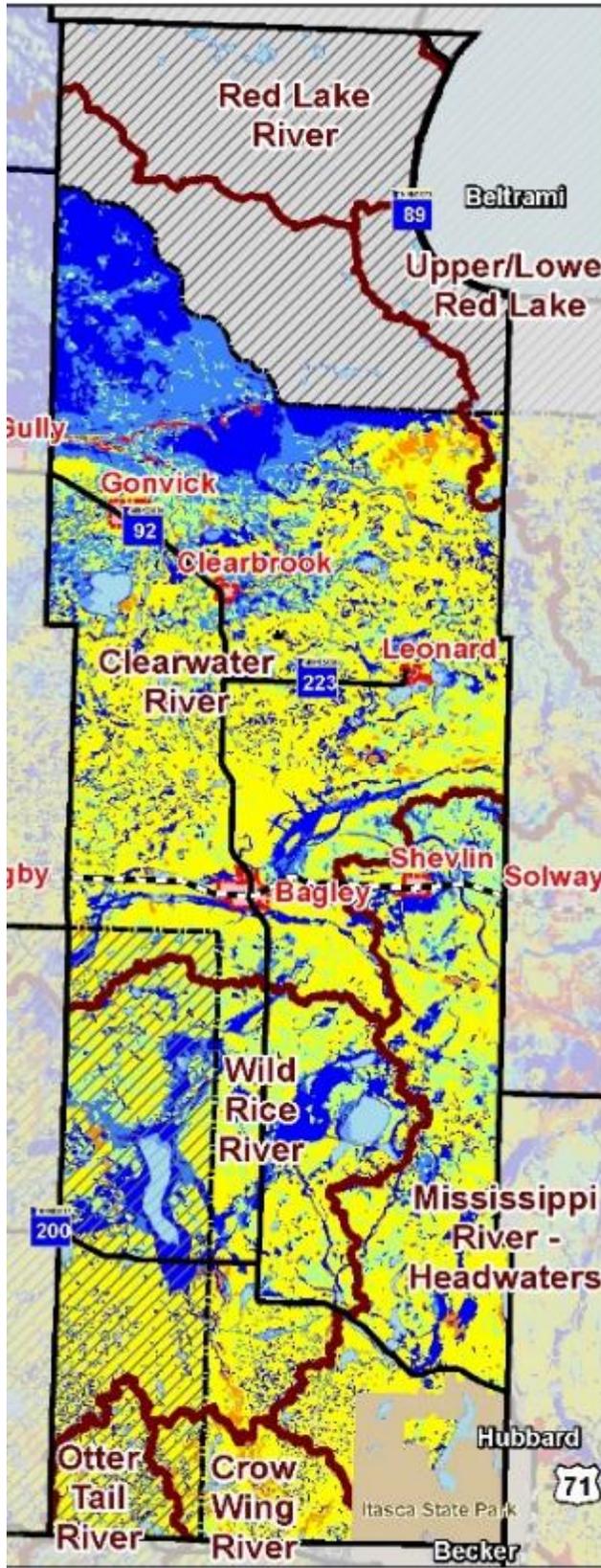
This map shows the breakdown of animal units per minor watershed. Each animal unit is defined as approximately equal to 1,000 pounds of grazing cow.

5: General Elevation



[This general elevation map shows the topographic relief of the county. A statewide elevation layer exists that represents elevation using an average elevation of the land surface within each tile of a 30 meter x 30 meter grid, which is contained in an overall dataset called a Digital Elevation Model \(DEM\).](#)

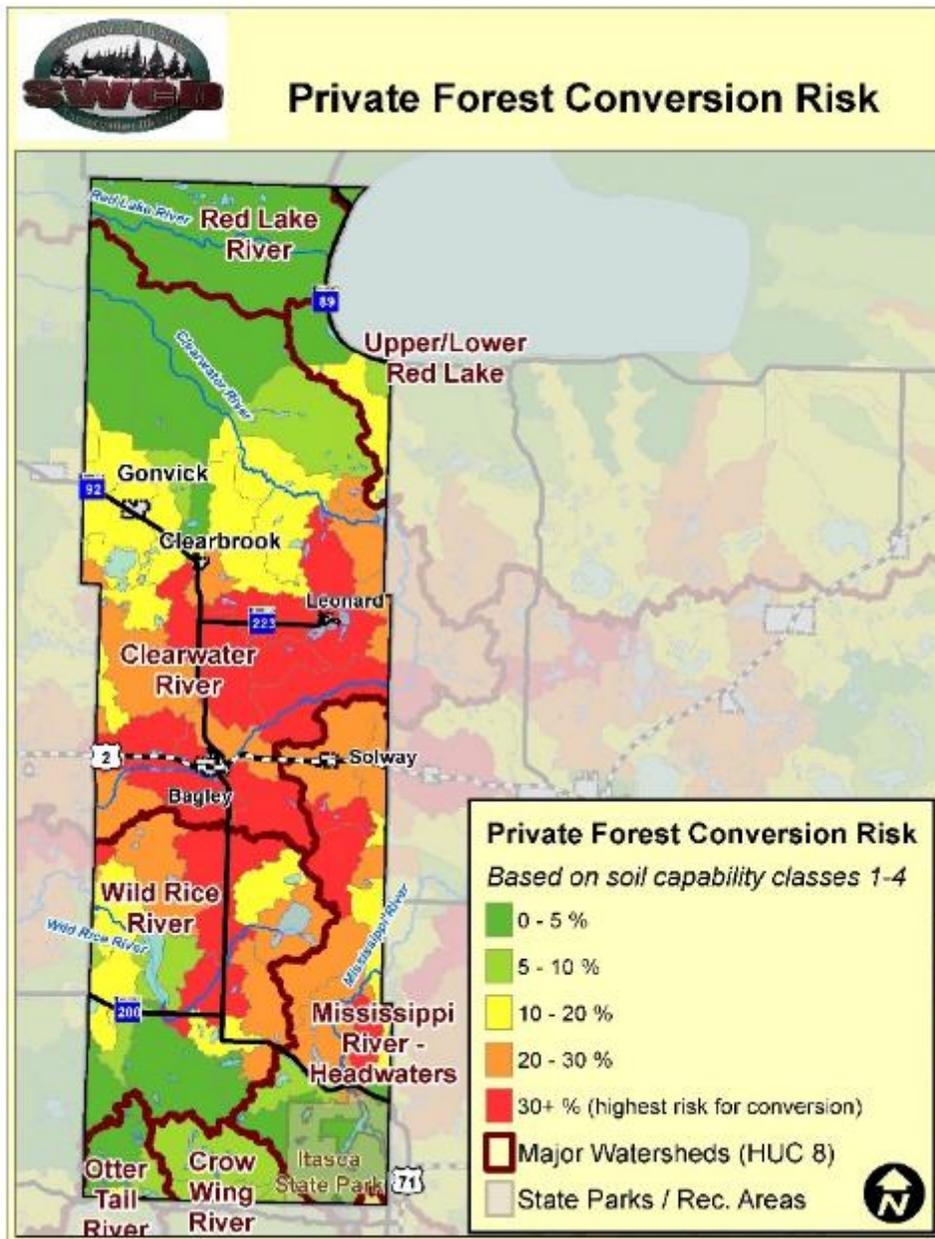
6: Soil Drainage Classes



Soils - Drainage Class	
■	Excessively drained
■	Somewhat excessively drained
■	Well drained
■	Moderately well drained
■	Somewhat poorly drained
■	Poorly drained
■	Very poorly drained
■	Not rated or not available
■	State Parks / Rec. Areas
■	Major Watersheds (HUC 08)
■	Native American Reservations

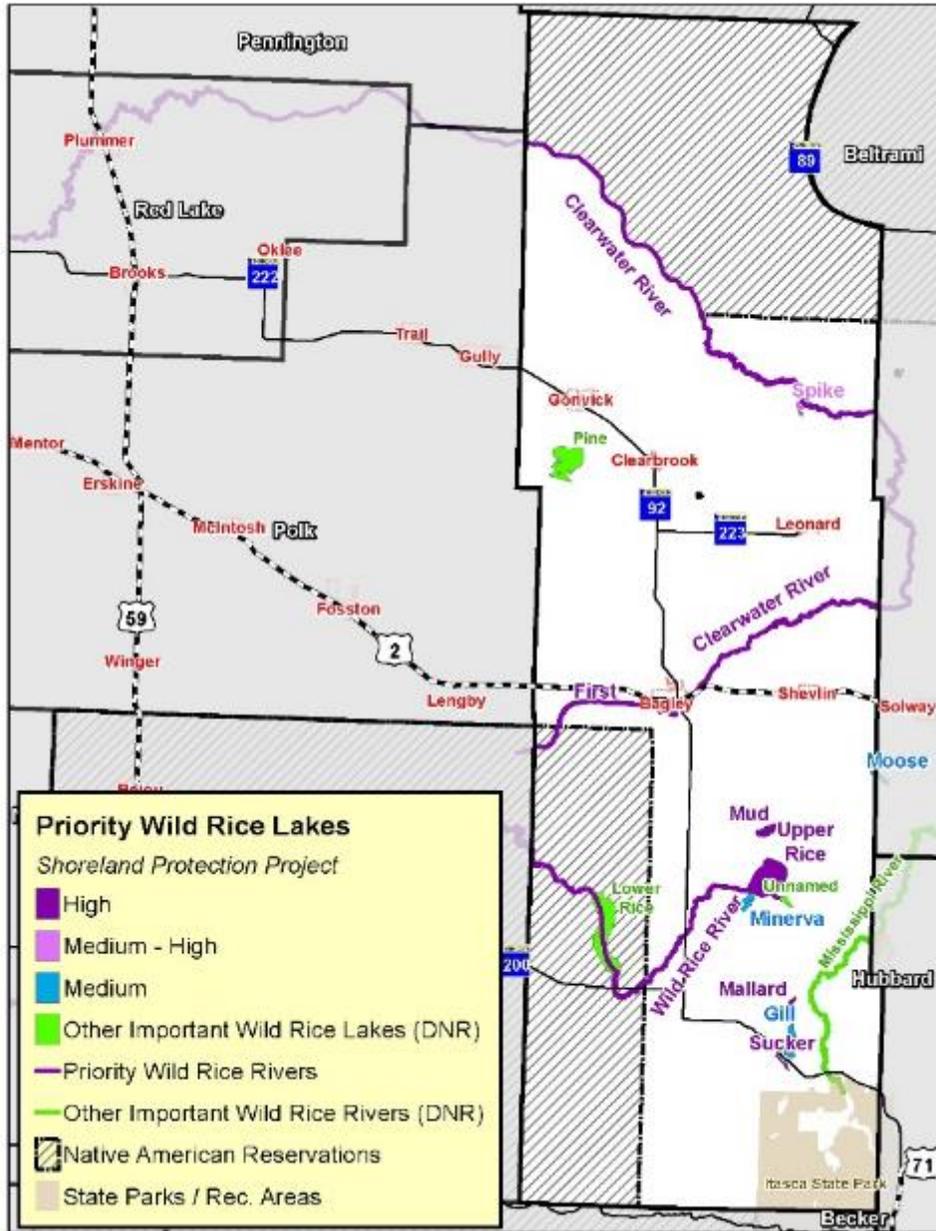
This map shows a visualization of the general ability of soils throughout the county to drain excess water, which is in part tied to soil texture and depth to a confining layer (bedrock, clay, significant hardpans, etc.) Soils to the north of the county (and around lake-wetland complexes) are often rich in organic material, holding onto water more effectively. Such soils do not allow water to flow through as fast, causing ponding and impoundments that can be seen here as many of the blue areas.

7: Private Forest Conversion Risk



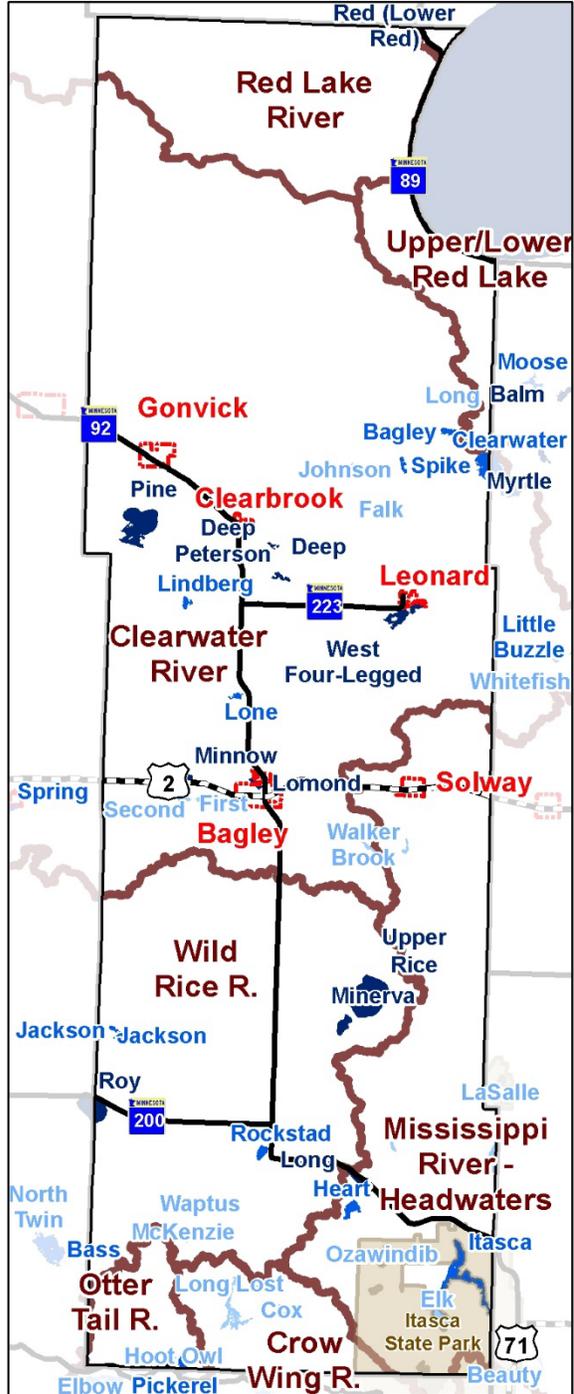
The map above was developed to look at the risk for private forest lands to be converted to agriculture. Private lands, all forest classes from the NLCD, and certain soil classes (below) were selected as risk factors. The end result was mapped by minor watershed, with the higher percentage of these qualifying lands having a higher risk for conversion. Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops: Class 1 soils have few limitations that restrict their use. Class 2 soils have moderate limitations that reduce the choice of plants or that require special conservation practices. Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both. Class 4 soils have very severe limitations that reduce the choice of plans or that require very careful management, or both.

8: Wild-Rice Priority Lakes (and Rivers)



[This map highlights the streams and lakes within the county that have been identified by the MN Department of Natural Resources as high priority Wild Rice resources. The DNR has a layer of all lakes/streams with wild rice, which was combined with a list of their top 350 wild rice lakes/streams and local SWCD rankings to determine low, medium, and high priority wild rice lakes/streams for protection.](#)

9: Lakes of Phosphorus Sensitivity Significance



Lakes of Phosphorus Sensitivity Significance	
Priority Class (DNR)	
	Highest
	Higher
	High
	State Parks / Rec. Areas
	Major Watersheds (HUC 08)

This map shows the lakes and rivers within the county that have a high sensitivity to Phosphorus runoff. The underlying data was created by the Department of Natural Resources to identify lakes with this particular sensitivity throughout the state. Available lake data were analyzed to classify lakes based on sensitivity to nutrient pollution. Phosphorus sensitivity was estimated for each lake by predicting how much water clarity would be reduced with additional phosphorus loading to the lake, and an index was made from factors such as phosphorus sensitivity, lake size, lake total phosphorus concentration, proximity to MPCA's phosphorus impairment thresholds, and watershed disturbance.

10: Percent Forest Lands Enrolled in SFIA Program



[Land enrolled in the Sustainable Forest Incentives Act \(SFIA\) program, sorted by percentage categories of land area enrolled in the program within each sub-watershed.](#)

11: Bagley Well-head Protection Zone and Drinking Water Supply Management Areas

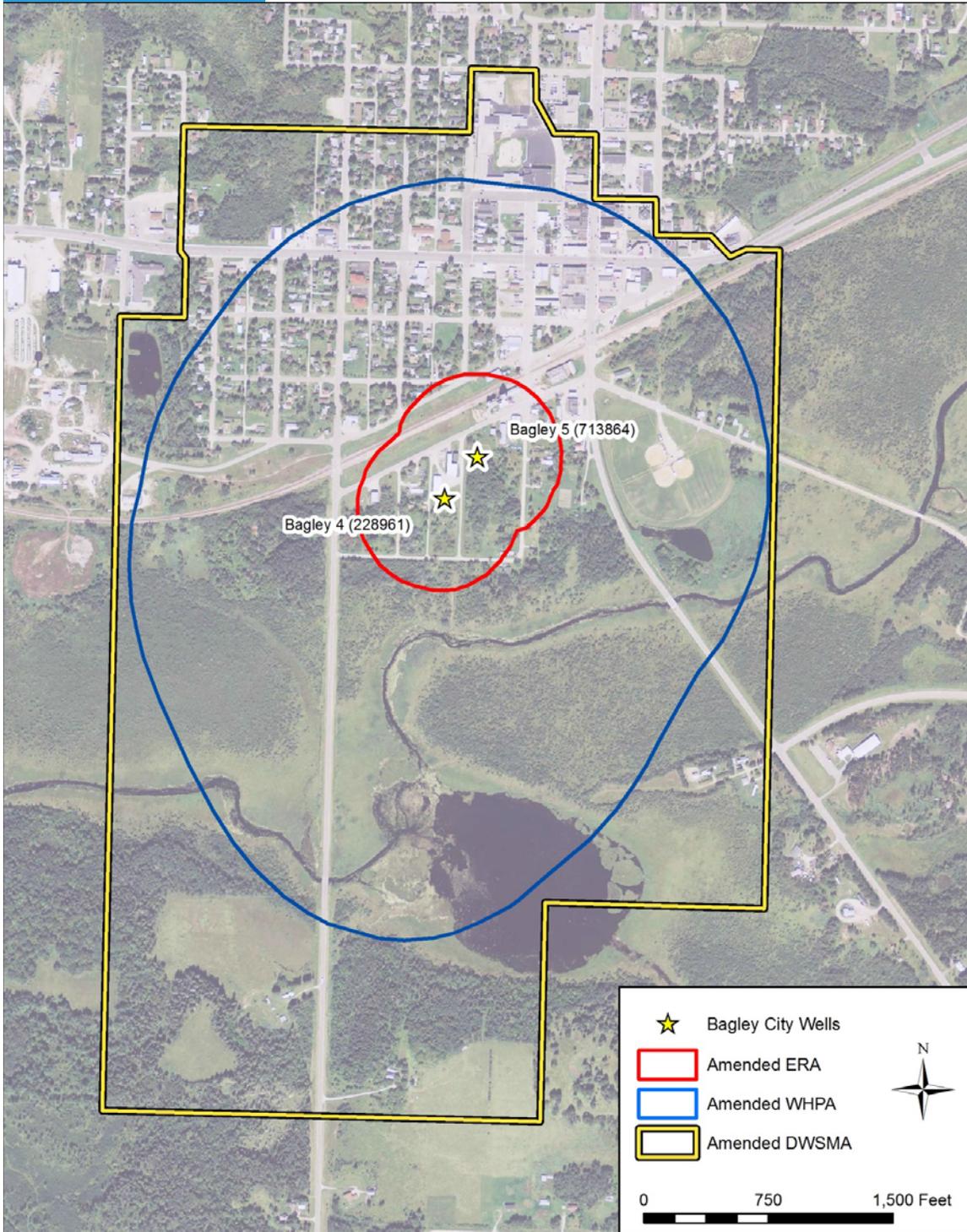
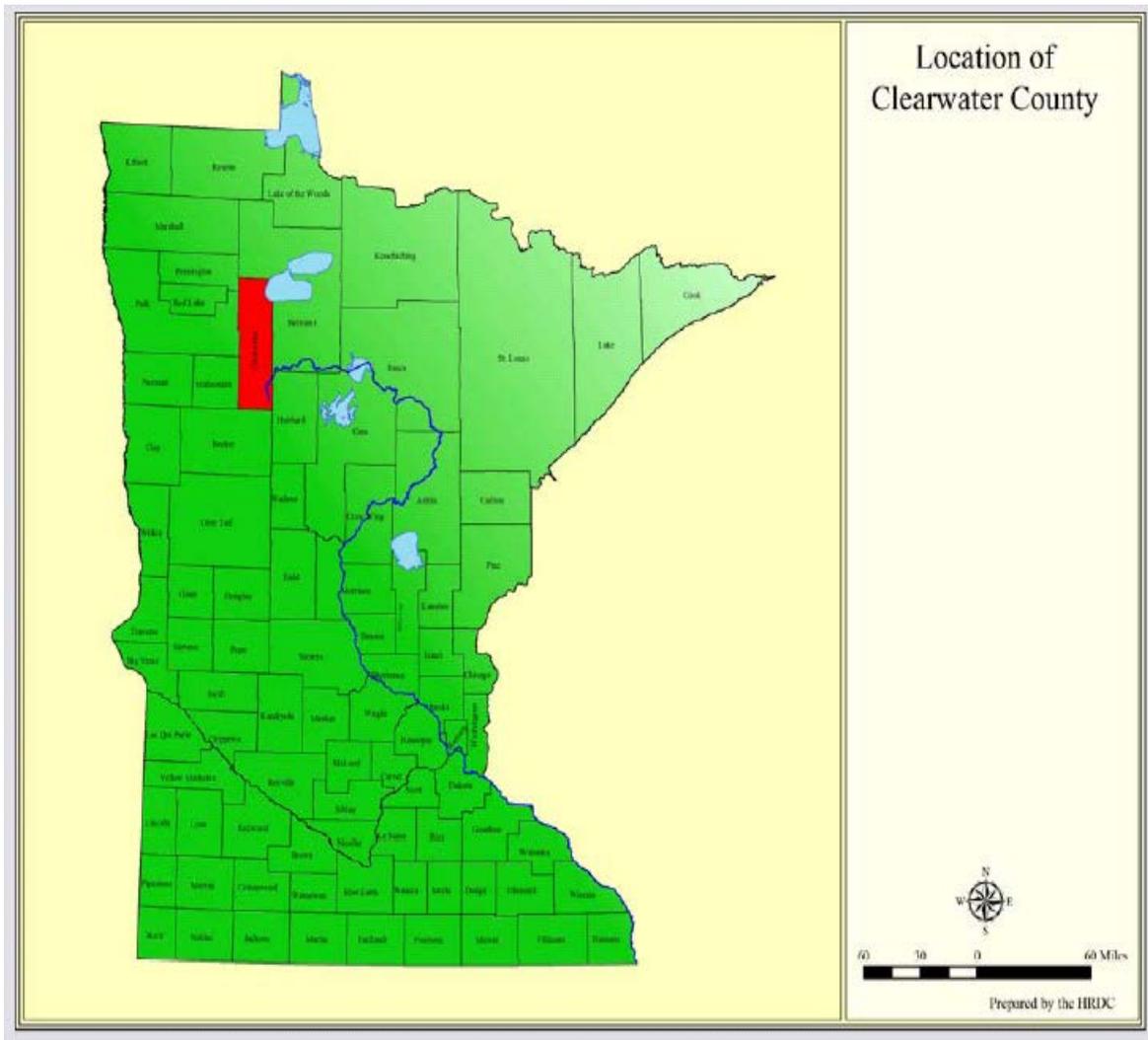


Figure 1
Map of the Amended Wellhead Protection and Drinking Water Supply Management Areas
City of Bagley

Appendix B
Comprehensive Local Water Management Plan
Clearwater County, Minnesota

Priority Concerns Scoping Document
2010- 2015

FINAL DRAFT



County Background

Clearwater County is located in North Central Minnesota. The City of Bagley is the county seat. With over 650,000 acres and a population slightly more than 8,400 people, Clearwater County is sparsely populated. Clearwater County is 60 miles in its length lying north to south, and 18 miles wide. The county's topography is unique, with the northern and western part being drained through the Clearwater River and eventually the waters going into the Hudson Bay, while the southeastern part of the county has its drainage into the Mississippi River and then to the Gulf of Mexico. Undoubtedly the most famous fact about Clearwater County is that it is home to the source of the mighty Mississippi River whose headwaters are located in Lake Itasca which lies inside the equally famous Itasca State Park. Itasca State Park still contains over 3,000 acres of old growth pine, which in earlier years was abundant throughout the County. Northern Clearwater County is also home to the largest concentration of Cultivated Wild Rice Producers in the State of Minnesota. Clearwater County also has a substantial number of beef cattle producers and an increasing number of acres being put into cultivated crops such as soybeans and corn. With a strong agricultural community on the northern end of the county and acres upon acres of forested land in the southern portion of the county, Clearwater County encompasses many different landscapes. These diverse and unique landscapes make Clearwater County a wonderful place to live, work, and play. A healthy environment requires a healthy economy. A sustainable economy requires a sustainable environment. Citizens of Clearwater County value their quality of life and standards of living, and desire the same for their children. Continued economic prosperity depends on a healthy and sustainable environment. Balancing our long-term plans for conserving and protecting our priceless natural resources with those for ensuring a healthy public and healthy economy is what this document attempts to do.

Dominant Land Use and Trends

Clearwater County is rural in nature. The Land Use Map on the following page shows that the southern part of the County is primarily public land, much of it covered by forest. The majority of the agricultural land can be found in the northern half of Clearwater County. Residential properties are spread relatively evenly throughout the County, with a few areas of increased density in the cities of Bagley, Clearbrook, Gonvick, Leonard, Shevlin and the Rice Lake community.

The distribution of land ownership in Clearwater County is split between private land owners, the County, the State of Minnesota, and the Federal Government. Private landowners account for over half (56.4 percent) of the land ownership in the County. The County manages 95,507 acres (14.9 percent) of land.

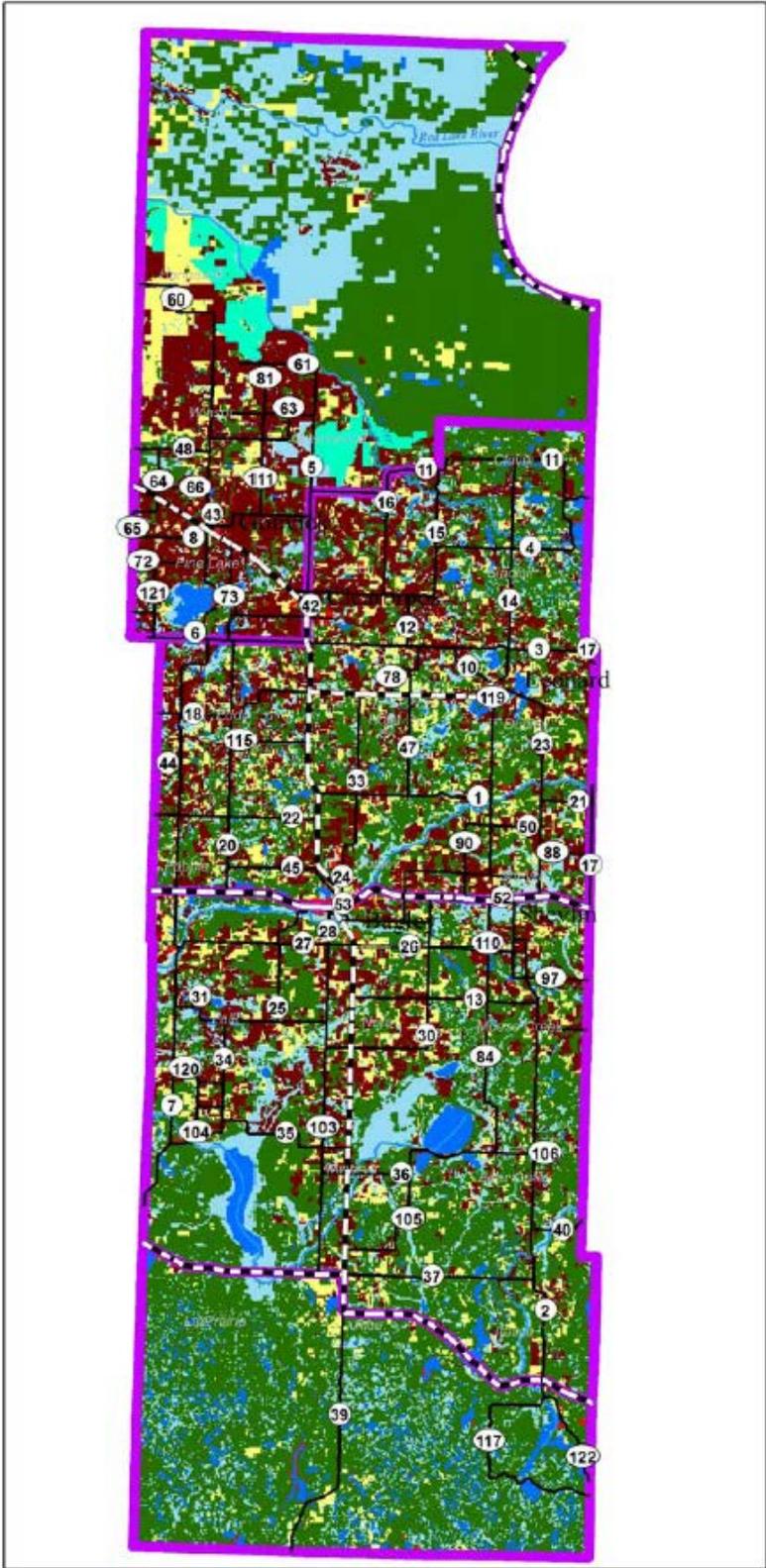
<u>Land Ownership in Clearwater County</u>		
<u>Manager</u>	<u>Acres</u>	<u>Percent</u>
<u>Private</u>	<u>360,636</u>	<u>56.4%</u>
<u>County</u>	<u>95,507</u>	<u>14.9%</u>
<u>State</u>	<u>54,432</u>	<u>8.5%</u>
<u>Federal</u>	<u>129,308</u>	<u>20.2%</u>
<u>Total</u>	<u>639,883</u>	<u>100%</u>

Population

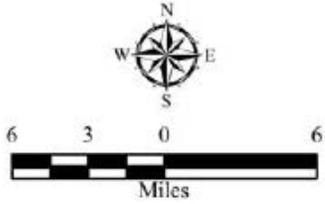
The table below shows the U.S. Census population in Clearwater County from 1920 to 2000. Population growth has been relatively insignificant for the past four decades. The population estimate for the County in 2005 was 8,564 and is estimated to reach 8,790 in 2010 according to the Minnesota State Demographic Center.

<u>Clearwater County Population 1920 to 2000</u>								
<u>1920</u>	<u>1930</u>	<u>1940</u>	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
<u>8,569</u>	<u>9,546</u>	<u>11,153</u>	<u>10,204</u>	<u>8,864</u>	<u>8,013</u>	<u>8,761</u>	<u>8,309</u>	<u>8,423</u>

Clearwater County Land Cover



Cover Type	Acres	Percent
Ag Related	119,894	18.2%
Developed	10,508	1.6%
Forested	314,270	47.7%
Open Water	29,908	4.5%
Open Shrub or Grassland	65,126	9.9%
Rice Paddies	8,799	1.3%
Wetland	110,255	16.7%



Plan Responsibility and Updates

The responsibility of administrating and coordinating implementation of the Clearwater County Comprehensive Local Water Management Plan (CLWMP) is assigned to the Clearwater Soil and Water Conservation District. The Clearwater County Local Water Management Task Force provided assistance in the process of updating the CLWMP. There were a total of 27 people on the Task Force, which is made up of a wide variety of interests, including lake associations, agriculture producers, citizens; as well as a wide range of public agencies, including the MN Department of Natural Resources, MPCA, U of M Extension Service, Red Lake and White Earth Reservations, and city and county representatives.

Comprehensive local water planning began in Clearwater County in 1989 and has been updated every five years, with a few extensions. The current CLWP started in 2003, was granted a couple of extensions, and was adopted on April 19th, 2005 by the Clearwater County Board of Commissioners. The current plan expires on March 23, 2010. This process has brought awareness to water resources in the County. Many studies have been completed and many grants have been utilized to learn more about water quality in this area.

List of Priority Concerns

The purpose of the Priority Concerns Scoping Document is to provide Clearwater County with direction for water planning over the next five years. Several agencies provided feedback about water quality in the County, including the Task Force, State Agencies, and other groups. A Citizen Survey was also conducted to reach out to the general public. The groups that were included in the public engagement process all come with different viewpoints because they have a certain interest in water quality. There are, however, some common themes that emerged from this process.

The Task Force met on April 16, 2008 to develop the List of Priority Concerns for the 2008 Clearwater County Comprehensive Local Water Management Plan Update. The value of this section of the document comes from understanding some common issues that emerged from the public engagement process. The following are some of the *Key Points* of the Priority Concerns Scoping Document.

Priority Concern 1: Surface Water Quality Protection and Enhancement

Clearwater County is blessed with an abundance of lakes and rivers, many of which have a high appeal for recreational purposes. With fifteen percent (15%) of the land in our county considered wetland, and 80% of our pre-settlement wetlands remaining, Clearwater County has a substantial amount of valuable natural wetlands. Protecting wetlands and unique features is essential to maintaining and improving water quality.

Thusly named, Clearwater County, our citizens have given high priority to keeping our surface waters clean and clear. However, as of 2008 the MPCA listed eight (8) separate stretches of our rivers and streams as impaired, one of which is the 16 mile stretch of the Mississippi River which runs through Clearwater County. Agricultural activities on crop and pastureland without proper Best Management Practice implementation can impact water quality much more significantly, than land without the use of best management practices.

Agricultural land covers approximately 19% of our County. Agriculture was a top concern for many people as it relates to water quality. The land use in the watersheds of our rivers and streams in Clearwater County has changed dramatically in the past 100 years. More efficient drainage and tiling, loss of wetlands, and a decrease in perennial vegetative cover on the landscape, all convey water, sediment and contaminants off of the land faster, and often in greater quantities, into our ditches, streams, rivers and lakes. Soil erosion from all sources contributes to surface water quality degradation, removes valuable and productive topsoil, and a loss in fish and wildlife habitat. Due to our County's position at the top of many of these watersheds, we should protect and restore the water we are sending to our neighbors downstream.

Objective A: Monitoring Water Quality in Clearwater County

- Continue Soil & Water Conservation District monthly water quality data collection on five (5) area lakes throughout the summer months.
- Expand & promote Citizen Volunteer Water Quality Monitoring on our area lakes and rivers. Continue the collection of Phosphorous, Chlorophyll A, and Water Clarity data on the nineteen lakes currently being monitored with funding through the Clean Water Legacy Surface Water Assessment Grant.
- Create database of water quality data and expand monitoring sites and frequency.

Objective B: Educate Clearwater County citizens about water quality enhancement practices and soil stewardship.

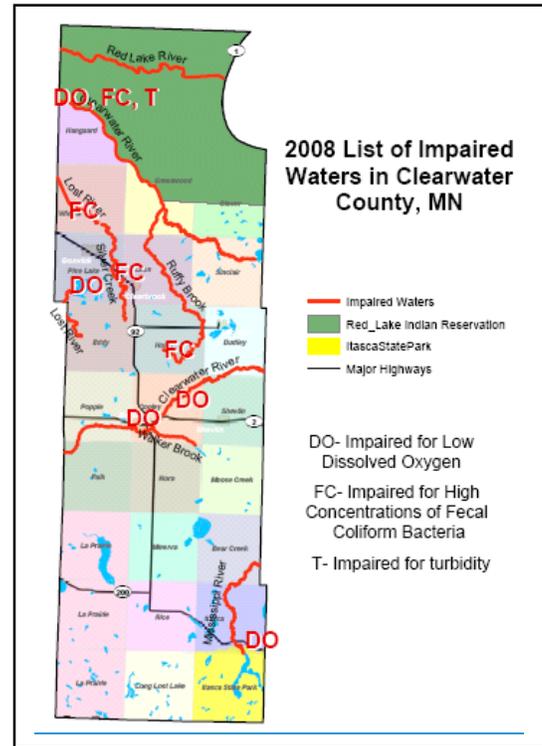
- Encourage and promote best management practices to property owners who have developed or are in process of developing in or near riparian areas.
- Educate property owners along shoreland on the potentially negative impacts of developing those areas (i.e. storm water run-off, chemical run-off, loss of natural vegetation, erosion of shoreland and stream banks, and sedimentations of our surface waters).
- Encourage and promote Agricultural Best Management Practices to landowners throughout Clearwater County to help reduce surface water contamination, sedimentation, and bank erosion.
- Continue to educate property owners about the importance of wetlands, and the state and federal regulations that pertain to wetlands.

Objective C: Identification and Implementation of projects that improve surface water quality.

- Identify and inventory point source and non-point source pollutants.
- Implementation of Agricultural Best Management Practices, storm water treatment/management, and erosion control projects.
- Identify critical wetlands and water resources that are key to maintaining and improving water quality.
- Implement projects/practices that preserve and/or restore drained and/or degraded wetlands in Clearwater County.

Objective D: Coordinate and cooperate with other governing agencies and surrounding tribal reservations.

- Seek out other beneficial partnerships, programs, and funding sources to reduce soil erosion and improve water quality in Clearwater County.
- Utilize Board of Water and Soil Resources Local Water Management Challenge Grant funds for special projects.
- Encourage conservation programs to reduce erosion such as Conservation Reserve Program, EQIP, and CREP, with cooperation from NRCS.
- Support Red Lake Watershed District and other agencies with Total Maximum Daily Load (TMDL) studies.
Continued cooperation & utilization of special project funds from the Red Lake Watershed District.
- Coordinate with other agencies/districts with the implementation of practices identified by completed TMDL studies in our County that improve water quality of those impaired water bodies.
- Continued cooperation with Clearwater County Office of Environmental Services on shore land, wetland, and Individual Sewer Treatment Systems (ISTS) programs, issues, and/or concerns.



Priority Watersheds: Watersheds Listed as impaired by the MPCA.

Priority 2: Drinking Water Source Protection

Ground water is also a large concern in Clearwater County. All of Clearwater County's residents rely on ground water as a drinking water source. For this reason the protection and management of our ground water resources is a major concern. The cities of Bagley, Clearbrook, Gonvick, and Rice Lake supply their citizens drinking water through a public drinking water supply and municipal wells. Only one of these municipalities, Bagley, has a Wellhead Protection Plan in place. There is a need to better understand local ground water quality. This can lead to better understanding of drinking water issues such as nitrate contamination or areas of arsenic in the county and the ability to track these contaminants. Currently, there is a limited amount of data available.

Objective A: Protect drinking water sources throughout Clearwater County

- Provide technical assistance to landowners who have questions or concerns on non-compliant or failing septic systems.
- ~~#2:~~ Encourage property owners in Clearwater County to get non-compliant or failing septic systems up-to-date and in compliance.
- ~~#3:~~ Promote the Agricultural ~~BMP~~ Best Management Practice Loan ~~program~~ Program offering low-interest loans to replace failing septic systems.
- ~~#4:~~ Seal known abandoned/unsealed wells throughout the county; promote the SWCD Soil & Water Conservation District cost-share program to help fix this problem.
- Encourage the cities of Gonvick, Clearbrook, and Rice Lake to develop and implement a Wellhead Protection Plan.
- ~~#5: Encourage the cities of Gonvick, Clearbrook, and Rice Lake to develop and implement a Wellhead Protection Plan.~~
- ~~#6:~~ Support the Wellhead Protection Plan for the City of Bagley.
- ~~#7:~~ Consider the development of a water quality database for private wells that are compatible with the County Well Index.
- ~~#8:~~ Continue to monitor the five (5) ~~DNR~~ Department of Natural Resources and one (1) City of Shevlin observation wells.
- ~~#9:~~ Use the Minnesota Department of Health (~~MDH~~) groundwater quality monitoring program to look for concentrations of pesticides used on crops.

- ~~#10:~~ — Develop a ground water quality monitoring program.
Increase the frequency and number of tests of Clearwater County's ground water resources

Develop and use a ground water quality database to: 1) show the distribution of water quality problems, 2) characterize aquifers of concern and 3) identify factors contributing to water quality problems.
~~Increase the frequency and number of tests of Clearwater County's ground water resources~~

~~#11: — Develop and use a ground water quality database to: 1) show the distribution of water quality problems, 2) characterize aquifers of concern and 3) identify factors contributing to water quality problems.~~

- _____

Priority Watersheds: All Watersheds are a priority

Priority Concern 3: Exotic and Invasive Species Management

Noxious weeds have and are becoming prolific in areas of Clearwater County.

Objective:

Strategies:

- ~~#1: Identify any new or undiscovered aquatic invasive species that have moved into Clearwater County.~~
- ~~#2: Work to educate citizens on understanding the potential risks of aquatic invasive or exotic species and other noxious weed types in the County~~
- ~~#3: Work with the Clearwater County Weed Task Force, County Weed Specialist, and MN DNR Invasive Species Specialists to help identify problem areas around the County.~~

Priority Watersheds: All Watersheds are a priority

Priority Concern 4: Land Use Impacts on Water Quality

Objective A: Proper Land Management on Agricultural Lands.

Strategies:

- ~~#1: Reduce the impact that runoff from feedlots can have on our water resources, especially those in close proximity to impaired waters.~~
- ~~#2: Installation and utilization of Agricultural BMPs through the use of existing and future state and federal cost share programs to protect resources from runoff and nutrient loading.~~

Objective B: Proper Management of Forest Resources

Strategies:

- ~~#1: Support the recently adopted Clearwater County Resource Management Plan that addresses management concerns and strategies for the 95,000 acres of County managed land in Clearwater County.~~
- ~~#2: Promote Forest Stewardship plans to private landowners.~~
- ~~#3: Encourage landowners to look at Forest BMPs for forestry management and other types of forest management programs.~~

~~#4: Promote state & federal cost share programs to assist landowners in implementing forest management BMPs that protect or improve water quality~~

~~Objective C: Proper Land Management in Developed and Developing Areas~~

~~Strategies:~~

~~#1: Reduce the pollution impact from city stormwater entering our waterways.~~

~~#2: Reduce the impacts Individual Sewer Treatment Systems (ISTS) can have on our ground water and surface water.~~

~~#3: Reduce the amount of soil erosion from new construction sites with increased utilization of erosion control measures at these sites.~~

~~Priority Watersheds: All watersheds listed as impaired by MPCA.~~

~~2. Assessment of the Priority Concerns~~

~~The Priority Concerns Scoping Document (See Appendix) summarizes the process used and responses collected in the public input process. There was a diverse group of people that filled out the survey, although some consistent trends emerged.~~

~~All parties involved addressed the following three questions:~~

~~#1: What are the top four problems with water quality in your area of Clearwater County?~~

~~#2: Which water resource is the most threatened, followed by Wetlands, Streams/Rivers, and Groundwater?~~

~~#3: Additional Comments?~~

~~It was through the responses to the above stated questions that the Water Plan Task Force developed the Priority Concerns Scoping Document. For each Priority Concern, relevant data as well as existing policies and plans were analyzed by the Water Plan Task Force. In all meetings public comments and concerns were deemed legitimate and genuine. The following is a list of the Priority Concerns that were developed out of the public survey.~~

Priority Concern 1: Surface Water Quality Protection and Enhancement

~~Clearwater County is blessed with an abundance of lakes and rivers, many of which have a high appeal for recreational purposes. With fifteen percent (15%) of the land in our county considered wetland, and 80% of our pre-settlement wetlands remaining, Clearwater County has a substantial amount of valuable natural wetlands. Protecting wetlands and unique features is essential to maintaining and improving water quality. Thusly named, Clearwater County, our citizens have given high priority to keeping our surface waters clean and clear. However, as of 2008 the MPCA listed eight (8) separate stretches of our rivers and streams as impaired, one of which is the 16-mile stretch of the Mississippi River which runs through Clearwater County. Agricultural activities on crop and pastureland without proper Best Management Practice (BMP) implementation can impact water quality much more significantly, than land without the use of BMPs. Agricultural land covers approximately 19% of our County. Agriculture was a top concern for many people as it relates to water quality. The land use in the watersheds of our rivers and streams in Clearwater County has changed dramatically in the past 100 years. More efficient drainage and tiling, loss of wetlands, and a decrease in perennial vegetative cover on the landscape, all convey water, sediment and contaminants off of the land faster, and often in greater quantities, into our ditches, streams, rivers and lakes. Soil erosion from all sources contributes to surface water quality degradation, removes valuable and productive topsoil, and a loss in fish and wildlife habitat. Due to our County's position at the top of many of these watersheds, we should protect and restore the water we are sending to our neighbors downstream.~~

Priority 2: Drinking Water Source Protection

~~Ground water is also a large concern in Clearwater County. All of Clearwater County's residents rely on ground water as a drinking water source. For this reason the protection and management of our ground water resources is a major concern. The cities of Bagley, Clearbrook, Gonvick, and Rice Lake supply their citizens drinking water through a public drinking water supply and municipal wells. Only one of these municipalities, Bagley, has a Wellhead Protection Plan in place. There is a need to better understand local ground water quality. This can lead to better understanding of drinking water issues such as nitrate contamination or areas of arsenic in the county and the ability to track these contaminants. Currently, there is a limited amount of data available.~~

Priority Concern 3: Exotic and Invasive Species Management

~~Noxious weeds have and are becoming prolific in areas of Clearwater County. Spotted Knapweed and Leafy Spurge, for example, are very successful at establishing themselves in the light sandy soils that cover a large portion of our county. These weeds reduce biodiversity of native species, and are much less effective at stabilizing soil than native species. ~~These weeds reduce biodiversity of native species, and are much less effective at stabilizing soil than native species.~~~~

Although only a few aquatic invasive species have been identified in any Clearwater County waters, a larger number of aquatic invasive species have been identified outside of, and in close proximity to, the county boundaries. The impacts will be economic and/or environmental as native species are displaced from their natural place in the ecosystem. ~~Although only a few aquatic invasive species have been identified in any Clearwater County waters, a larger number of aquatic invasive species have been~~

~~identified outside of, and in close proximity to, the county boundaries. The impacts will be economic and/or environmental as native species are displaced from their natural place in the ecosystem.~~

Understanding the risk posed by these invaders will help to establish actions that can be taken to keep them from the County's water resources.

- Identify any new or undiscovered aquatic invasive species that have moved into Clearwater County.
- Work to educate citizens on understanding the potential risks of aquatic invasive or exotic species and other noxious weed types in the County
- Work with the Clearwater County Weed Task Force, County Weed Specialist, and MN Department of Natural Resources Invasive Species Specialists to help identify problem areas around the County.

Priority Watersheds: All watersheds are considered priority

Priority Concern 4: Land Use Impacts on Water Quality

Agricultural land, forested land, and developed areas have the potential for negative impacts on the water resources in Clearwater County. ~~Agricultural land, forested land, and developed areas have the potential for negative impacts on the water resources in Clearwater County.~~ Forested land covers 48% of the land in Clearwater County; this constitutes the largest land cover type in the County. Logging and harvesting of these forest resources is very important to the economy of Clearwater County. Poor implementation of timber harvesting ~~BMPs~~ best management practices can result in environmental degradation.

Agricultural land covers 18% of land in Clearwater County. Agricultural activities on crop and pasture land without proper best management practice implementation can have extensive negative impacts on water quality. ~~BMPs~~ Best management practices can serve to reduce these impacts significantly. Although the developed areas are minute in Clearwater County their potential to negatively impact water quality is

great. Poorly planned development can negatively affect surface and ground water quality.

Objective A: Proper Land Management on Agricultural Lands.

- Reduce the impact that runoff from feedlots can have on our water resources, especially those in close proximity to impaired waters.
- Installation and utilization of Agricultural Best Management Practices through the use of existing and future state and federal cost share programs to protect resources from runoff and nutrient loading.

Objective B: Proper Management of Forest Resources

- Support the recently adopted Clearwater County Resource Management Plan that addresses management concerns and strategies for the 95,000 acres of County managed land in Clearwater County.
- Promote Forest Stewardship plans to private landowners.
- Encourage landowners to look at Forest Best Management Practices for forestry management and other types of forest management programs.
- Promote state & federal cost share programs to assist landowners in implementing forest best management practices that protect or improve water quality

Objective C: Proper Land Management in Developed and Developing Areas

- Reduce the pollution impact from city storm-water entering our waterways.
- Reduce the impacts Individual Sewer Treatment Systems (ISTS) can have on our ground water and surface water.
- Reduce the amount of soil erosion from new construction sites with increased utilization of erosion control measures at these sites.

Priority Watersheds: All watersheds listed as impaired by MPCA.

Priority Concern Identification

Clearwater County Local Water Management Task Force

The Task Force for the Clearwater County Water Plan Update met on January 30, 2008.

The agenda for the meeting included the following:

- History of Clearwater County Water Planning
- Review of 2007 water plan activities
- Overview of the Issues and Accomplishments of the last water plan
- Overview of the process and expectations for the new water plan

Selection of priority concerns for the new water plan

Priority Concerns

Members of the Task Force were asked to answer the following question:

What are the *Priority Concerns* for water resources in Clearwater County?

Each member was given the opportunity to provide a priority concern. The responses were written down so participants could view all answers. Each member was then given one orange dot and two red dots. The orange dot represented their top priority and the red dots represented high priority concerns. The issues could be lumped into three broad categories: **Surface Water, Groundwater, and Knowledge/Education**. It is important to note that all answers received are important. The following is the list of ranked priorities based on the number of votes received:

Top Priorities

- Finding and implementing solutions to water quality problems - 11 votes
- Agricultural activities - 8 votes
- Coordination between agencies, government, associations, etc. - 7 votes
- Buffers for shore land development - 6 votes
- Local awareness/education to solve water problems (i.e. legal, regulatory, informational, etc.) - 6 votes
- Maintain a high quality of life and economic viability - 5 votes

Middle Priorities

- Educate the public on how everyday activities affect water quality - 4 votes
- Flooding (i.e. City of Clearbrook) - 4 votes
- Data (i.e. water quality analysis) - 3 votes
- Implementing best practices for improving water quality (i.e. buffers) - 3 votes
- Enforcement Issues - 2 votes
- Local contact (staff support) between MPCA and Clearwater County of feedlot issues - 2 votes
- Water quality on Long Lost Lake (i.e. high water level, erosion concerns, etc.) - 2 votes

Lower Priorities

- Forestry management - 1 vote
- Septic systems - 1 vote
- Surface water quality - 1 vote
- Water quality in Itasca State Park - 1 vote
- Water rights - 1 vote
- Address high quality streams that have naturally low oxygen levels - 0
- Ground water quality and quantity - 0 votes
- Having a useful, working water plan - 0 votes
- Impact of land use changes on water quality - 0 votes
- Water quality of Clearwater Lake - 0 votes

Summary of Agency Input

Agency: Red Lake Department of Natural Resources

Priority Concern 1: Land Use Impacts on Water Quality in the Clearwater River

Priority Concern 2 Storm water Management

Agency: White Earth Department of Natural Resources

Priority Concern 1: Ensuring pollution/runoff is not entering Lower Rice Lake.

Priority Concern 2: Wetland protection/education

Priority Concern 3: Groundwater

Priority Concern 4: Surface water

Agency: Minnesota Board of Water and Soil Resources

Priority Concern 1: Waters listed as impaired for fecal coliform.

Priority Concern 2: Forest Land Management.

Priority Concern 3: Land Use Impacts on Lake and Stream Water Quality.

Agency: Minnesota Department of Agriculture

Priority Concern 1: Manure Management and ISTS

Priority Concern 2: Agricultural chemical use and potential impacts to unconfined shallow groundwater.

Priority Concern 3: Agricultural chemical use and potential impacts to surface water.

Agency: Minnesota Department of Health

Priority Concern 1: Protect ground water-based drinking water sources within Clearwater County

Priority Concern 2: Sealing unused, unsealed wells

Priority Concern 3: Develop a local ground-water quality data base.

Agency: Minnesota Department of Natural Resources

Priority Concern 1: Aquatic invasive species

3. Goals and Objectives

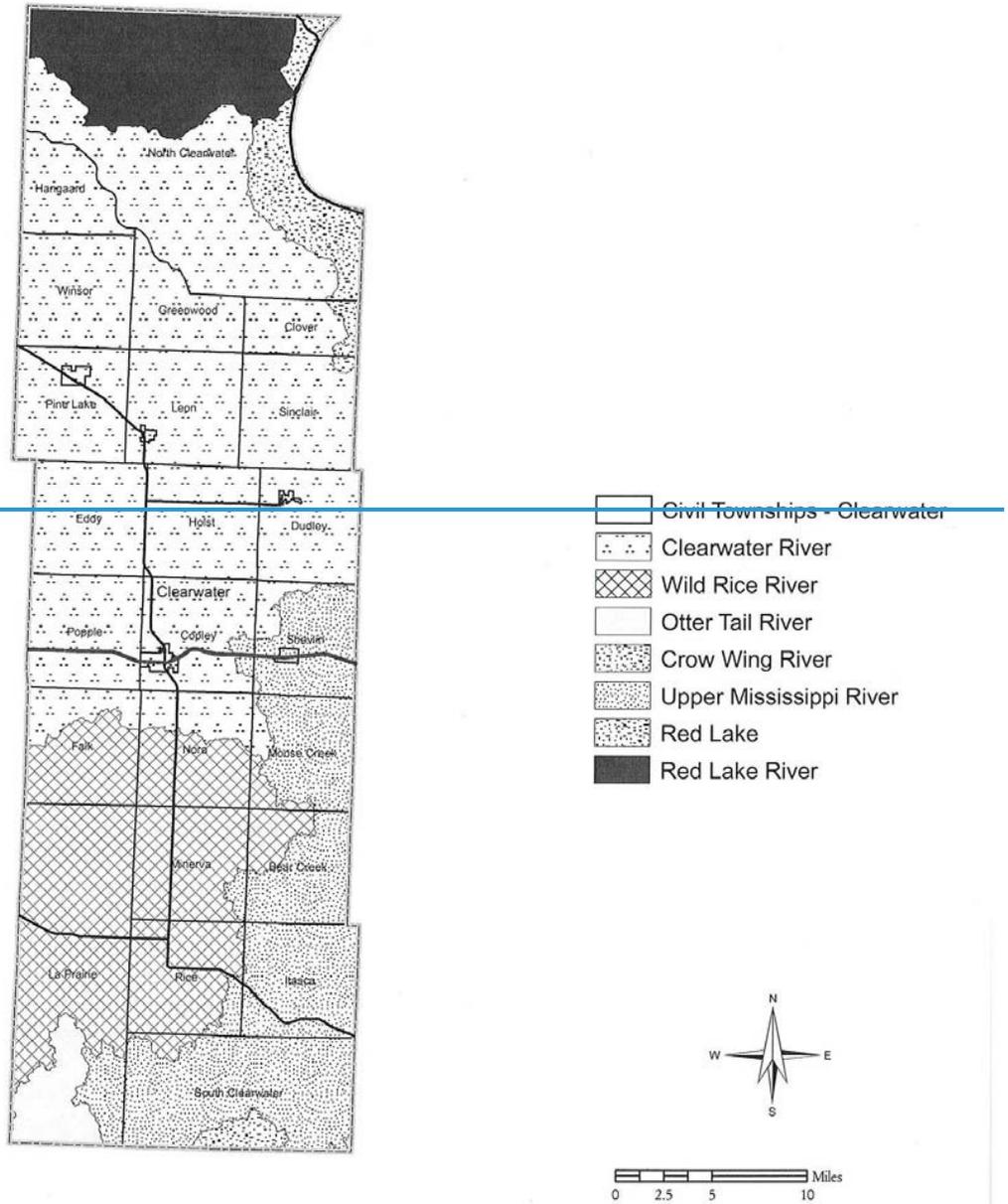
The Detailed Assessment of this document describes the seven major watersheds located within the boundaries of Clearwater County. Each watershed has a description of the types of land use, population, and water impairments. Using these parameters it was decided what watersheds in the county this water plan should focus on most, those are: the Upper Mississippi, the Clearwater River, and the Wild Rice Watersheds. It is within these three watersheds that most of population, diversity of land use, and water bodies occur within the county.

The Action Plan of this document identifies issues as both county-wide and per watershed and the appropriate actions needed to respond to those concerns. Each item has an issue statement, a specific concern or objective, followed by one or more response strategies with a rough cost estimate, partners in the concern, potential funding sources, and lead

agencies/groups to implement the project. Under each concern there is also a timeline that would be used to implement the project, but this is only contingent on proper funding for that concern.

4. Detailed Assessments of Major Watersheds

Major Watersheds



Assessment of Watersheds-~~Priority Concern 2: Water level management and preservation of the shallow lakes~~ in Clearwater County-~~Crow Wing Watershed~~

Agency: Minnesota Pollution Control Agency

Priority Concern 1: Impaired Waters/Total Maximum Daily Loads (TMDL)

Priority Concern 2: Environmental Data Access System

Priority Concern 3: Water Quality Monitoring Coordination

Public Meeting

A public meeting was held at the Clearwater County Courthouse on March 18, 2008, at 6:00 pm. Public service announcements were in the Farmers Independent on March 5 and March 12. Local radio stations also announced the meeting. Despite efforts to inform the public, nobody showed up at the meeting.

Citizen Survey

A survey was developed for the general public. In an effort to reach as many people as possible in the County, surveys were made available at the offices of the Soil and Water Conservation District, various County offices, and on-line at: <http://www.hrdc.org/>. Surveys were also sent to all townships and also lake associations in the County. A total of 28 surveys were returned by the deadline of March 28, 2008. The results provide a voice for citizens of Clearwater County on the issue of water quality. The following is a summary of the Citizen Survey.

(Question 1) What are the top four problems with water quality in your area of Clearwater County?

- The top problem identified was "Water Clarity," followed closely by "Erosion" and "Runoff."
- Another issue that emerged, listed as "Other" was the overwhelming concern about Aquatic Invasive plants entering our area lakes.

(Question 2) Which water resource is most threatened in your area?

- Lakes were identified as the resource most threatened, followed by Wetlands, Streams/Rivers, and Groundwater.

(Question 3) Additional Comments?

- Several of the additional comments were clarifications or additions concerning surface water issues.
- Other additional comments included concerns about chemicals and groundwater contamination, regulations and over-management, and wetlands.

~ Below is a summary of the survey answers.

Census 2000 data indicates that almost no people live in this major watershed. The section of the watershed that is in Clearwater County is only about 4,800 acres in size and consists of approximately 68% forest land and 26% being either wetlands or open water. Nearly all of

~~the land in this watershed in the County is under public ownership (90%) and being actively managed by the County Land Department of which they are using the Resource Management Plan for Clearwater County. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesotas Forest Resources: Voluntary Site Level Management Guidelines*.~~

~~Ottertail Watershed~~

~~Like the Crow Wing River Watershed, this area of watershed in the county is very small, approximately 12,200 acres in size. The majority of land cover in this watershed is forest land (73%) and/or open water or wetlands (25%). There is very little intensive use in this area of the county as well as very little population. Nearly all of the land in the watershed is public owned and managed by the County Land Department and White Earth Indian Reservation or the State of Minnesota. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesotas Forest Resources: Voluntary Site Level Management Guidelines*.~~

~~Red Lakes/Red Lake Watershed:~~

~~These watersheds are very similar in characteristics; both have very low populations and very high public land ownership. Approximately 50% of the land is forested, 42% is wetland or open water and only about 2-3% ag-related.~~

~~The watersheds listed above are not of the highest priority for the County to consider in their **Comprehensive Local Water Management Plan**, although issues in these areas would be addressed by the proper authorities if they would arise.~~

Mississippi Headwaters:

The Mississippi Headwaters Watershed is approximately 123,300 acres in size and is one of the three major watersheds in Clearwater County that contains substantial human activity; this area is home to over 1,000 people. The watershed contains 22 lakes and approximately 56 miles of protected streams and tributaries. A section of the Upper Mississippi River in Clearwater County has been deemed impaired with low dissolved oxygen (DO) readings by the MPCA.

Much of this watershed is forested (60%), open water or wetlands (19%), or ag-related (10%); the rest of the land is mixed in use. The watershed has seen steady development of its shoreland areas and it is projected that those development trends will continue into the future. Because of the amount of shoreland and population, concerns for surface water should focus on areas such as shoreland development and the use of BMP's in those areas, promoting BMP's for timber harvesting while using the County Resource Management Plan, and the promotion of agricultural BMP's. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines* and in the shoreland and riparian areas we should promote the use of the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*". Other surface water concerns in this watershed include road construction and maintenance, flooding, sedimentation concerns, and recreation in the areas lakes and forest lands. Agriculture in this watershed is primarily cattle and pasture related in nature, although there is a bit of row cropping as well in the area. Best management practices for this type of agriculture fits very well with both state and federal conservation programs and are readily available to agricultural producers. Although many of the concerns in this watershed are non-point source pollutants, it is an area of the county that is vital for tourism and rich in natural resources. Protection and enhancement of this watershed should always be considered when thinking of this watershed. Groundwater concerns in the area would be due to the high water table, dump areas, potential of leeching from failing septic systems, and agricultural activities that take place in this area. Below is a list of conservation practices that should be considered in the Mississippi Headwaters Watershed.

Conservation Practices:

- State Cost Share Programs
 - Critical Area Plantings
 - Unused Well Sealing
 - Filter Strips
 - Grade Stabilization
 - Grassed Waterways
 - Livestock Exclusion from streams and waterways
 - Channel Stream Stabilization
 - Streambank and Shoreline Protection
 - Tree/Shrub Establishment
 - Wastewater & Feedlot Runoff Control
 - Sediment Basins
 - Riparian Buffers

- ~~Forestry Stewardship Management Planning/Forestry BMP's and use the *Sustaining Minnesotas Forest Resources: Voluntary Site Level Management Guidelines*~~
- ~~Continuation of Stream/Lake Water Quality Testing~~
- ~~NRCS Conservation Practices~~
- ~~Use of County Shoreland Ordinance and the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*~~
- ~~Fixing Failing Septic Systems~~

Supporting Activity:

- ~~Establishment of Lake Associations and develop lake management plans for area lakes~~
- ~~Healthy Lakes & Rivers Initiatives~~
- ~~Continuously seek grant and other funding opportunities to implement conservation practices~~

Wild Rice River Watershed

The Wild Rice River Watershed within Clearwater County is the second largest watershed at approximately 131,000 acres, with nearly ½ of the land being privately owned. There are around 1,200 people living in this watershed, but these numbers have remained static for the last few decades with little variation. Just over 50% of the land cover in the watershed is forested and around 13% is in agriculture. Like the Mississippi Headwaters Watershed, the Wild Rice contains over 31,000 acres of open water or wetlands (18% of land cover in watershed). Logging and agriculture are the predominant human activities that occur in the watershed.

The Wild Rice River Watershed in Clearwater County does contain a significant amount of lakes, at 27 lakes, but many of these lakes have not seen as much recent development as in other watersheds within the County. There is a significant amount of recreational activity that takes place in the watershed on both the public lands and public waters, which makes managing properly and protecting these areas an important issue. There are also a number of recreational and park lands, wildlife management lands, and boat accesses to public waters in this area of the County.

This watershed is similar to the Mississippi Headwaters Watershed in land use, population, and number of lakes, but has not seen as much ongoing development of its shoreland areas. In assessing this watershed we should focus our efforts on the development of new and existing shoreland areas as well as the recreational water use on these lakes. Forest management BMP's on large tracts of forest land and forest stewardship plans for smaller, privately owned tracts of land remain important to protecting the surface water resources in the area.

The newly developed County Resource Management Plan, developed by the County Land Office, should be used when possible. In forested areas in this watershed we should continue the support and use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*. Road and bridge construction and maintenance, agricultural activities, ditches, lake and river levels, and the recreation and wildlife areas are also very important to consider when addressing surface water issues. Agriculture in this watershed is primarily cattle and pasture related in nature, although there is a bit of row cropping as well in the area. Best management practices for this type of agriculture fits very well with both state and federal conservation programs and are readily available to agricultural producers.

Below is a list of the conservation practices that should be considered in the Wild Rice River Watershed.

Conservation Practices:

- State Cost Share Programs
 - Critical Area Plantings
 - Unused Well Sealing
 - Filter Strips
 - Grade Stabilization
 - Grassed Waterways
 - Livestock Exclusion from streams and waterways

- ~~○ Channel Stream Stabilization~~
- ~~○ Streambank and Shoreline Protection~~
- ~~○ Tree/Shrub Establishment~~
- ~~○ Wastewater & Feedlot Runoff Control~~
- ~~○ Sediment Basins~~
- ~~○ Riparian Buffers~~
- ~~Forestry Stewardship Management Planning/Forestry BMP's and use the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*~~
- ~~Continuation of Stream/Lake Water Quality Testing~~
 - ~~NRCS Conservation Practices~~
- ~~Use of County Shoreland Ordinance and the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*~~
- ~~Fixing Failing Septic Systems~~

Supporting Activities:

- ~~Establishment of Lake Associations and develop lake management plans for area lakes~~
- ~~Healthy Lakes & Rivers Initiatives~~
- ~~Continuously seek grant and other funding opportunities to implement conservation practices~~

Answer Options	Response Percent	Response Count
Failing septic systems	25.0%	7
Development pressure/impacts	25.0%	7
Lack of environmental education	21.4%	6
Natural habitat destruction	28.6%	8
Declining water clarity	39.3%	11
Erosion	32.1%	9
Over-application of fertilizers	17.9%	5
Stormwater/Drainage management	17.9%	5
Contaminated runoff	32.1%	9
Lack of regulations	7.1%	2
Groundwater contamination	28.6%	8
Other*	39.3%	11
	Other (please specify)	11
	<i>answered question</i>	28
	<i>skipped question</i>	0

***Responses to "Other"**

Number	Other (please specify)
1	control of invasive aquatic species in lake
2	aquatic weed growth
3	Surface water contamination
4	stricter regulations on what goes into City water supply
5	abandoned buildings in water on LLL
6	None
7	Control of exotic and invasive species
8	Control of exotic and invasive species (aquatic and/or terrestrial)
9	Control of exotic and invasive species (aquatic and/or terrestrial)
10	Control of exotic and invasive species AND the increasing amount of weeds and lily pads
11	Control of exotic and invasive species (aquatic and/or terrestrial)

Appendix C

Clearwater River Watershed Detailed Assessment

The Clearwater River Watershed is the largest watershed in Clearwater County, consisting of approximately 315,000 acres. ~~More than three fourths of this watershed in the County is privately owned and is populated by just over 6,000 people. Although there are significant amounts of forested land in the watershed (37% of watershed) the majority of the county's~~

~~agriculture is produced here, with almost 100,000 acres in ag-related land use. In addition to agriculture, this area of the county also contains the majority of the county's lakes and river systems. The Clearwater River Watershed is also home to three communities that use urban stormwater systems and have municipal wells including the city of Bagley, Clearbrook and Genvick.~~

~~Since this watershed contains most of the human activity in the county as well as having a large amount of natural resources it is the area of the county that presents the most concern in protecting our water and soil resources. There are five stretches of river in this watershed that have been listed as impaired, they are: Clearwater River (turbidity impairment), (took off Lost River and fecal/low DO impairments off Clearwater River) Silver Creek (fecal coliform/*E. coli* impairment), Walker Brook (low dissolved oxygen impairment), and Ruffy Brook (fecal coliform/*E. coli* impairment). Below are conservation practices that should be considered in the Clearwater River Watershed.~~

~~Conservation Practices:~~

- ~~• All State Cost Share Programs be considered~~
- ~~• Forestry Stewardship Management Planning/Forestry BMP's and use the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines*~~
- ~~• Continuation of Stream/Lake Water Quality Testing~~
- ~~• NRCS Conservation Practices~~

Total Maximum Daily Load Studies:

- ~~• Use of County Shoreland Ordinance and the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*~~
- ~~• Fixing Failing Septic Systems~~
- ~~• Recommendations by the Silver Creek, Clearwater River and Lost River TMDL Studies~~
- ~~• Recommendations by the SWAT Model done on Silver Creek~~

Supporting Activities:

- ~~• Establishment of Lake Associations and develop lake management plans for area lakes~~
- ~~• Healthy Lakes & Rivers Initiatives~~
- ~~• Total Maximum Daily Load: Continuously seek grant and other funding opportunities to implement conservation practices~~

Clearwater River Watershed Detailed Assessment

TMDL Studies:

Clearwater River TMDL: Low Dissolved Oxygen

Location: The Clearwater River watershed is a major ~~subwatershed~~sub-watershed in the Red River of the North Basin that is a main tributary of the Red Lake River in northwestern Minnesota. The target reach for this study begins in Clearwater County, flows through portions of Polk and Pennington Counties, and ends in Red Lake County. Along the way it flows by the town of Plummer.

303(d) Listing Information:

- Clearwater River, Ruffy Brook to Lost River, 09020305-510
- Aquatic life impairment (low dissolved oxygen), wq-iwl-03
- Pollutant of concern: chemical oxygen demand
- Priority ranking: 2004-2009 target start/completion
- Original listing year: 2002

Applicable Water Quality Standards/Numeric Targets:

- No more than 10% of measured daily minimum dissolved oxygen concentrations may be below 5 mg/L

Summary of Impairment:

The Clearwater River is a tributary of the Red Lake River in northwest Minnesota. The river lies within the Red River of the North Basin. While there are several listings on the 303(d) List of Impaired Waters for reaches of the Clearwater River, this report will focus on just one of the listings on one of the reaches. This reach extends between the Clearwater River's confluences with Ruffy Brook (east end) and the Lost River (west end). The reach was listed as impaired by low dissolved oxygen concentrations based upon data collected in 1992 and 1993 for the Clearwater River Nonpoint Study.

Intensive monitoring was conducted in 2007 and 2008 to collect as many dissolved oxygen readings as possible. Continuous dissolved oxygen equipment was installed to collect periods of true daily minimum dissolved oxygen readings. Monitoring done specifically for this study was done at the Plummer [USGS United States Geological Survey](#) Gauge site (S002-144), and at a site within the channelized reach (S002-121). In addition to this intensive monitoring, concurrent long-term condition monitoring by the Red Lake Watershed District and the Red Lake County Soil and Water Conservation District at sites S002-144 and S003-174 added to the data set that could be used for verification of this impairment. The end result of the assessment showed that, while low dissolved oxygen levels still occur occasionally, this reach of the Clearwater River currently meets the state dissolved oxygen standard for protection of aquatic life (5 mg/L).

Stakeholders' advisory group meetings were held periodically throughout the project. The consensus of the stakeholders' group, Minnesota Pollution Control Agency, and the [RLWDRed Lake Watershed District](#) was that the [TMDLTotal Maximum Daily Load](#) report should be completed for this reach to ensure that is protected into the future. The alternative would have been delisting the reach with the possibility that it could return to the 303(d) List of Impaired Waters and would require a repeat of this study. [TMDLload](#) [Total Maximum Daily Load](#) capacities and allocations were calculated for the Plummer [USGSUnited States Geological Survey](#) Gauge as this is the only site within the reach that has a [USGSUnited States Geological Survey](#) gauge and a long term record of continuous flow measurement. A SWAT model for the Clearwater River watershed was developed by the University of North Dakota Energy and Environmental Research Center. [BMPBest management practice](#) implementation scenarios were tested using the model.

Many improvements have been made within to improve water quality within the Clearwater River since the Clearwater Nonpoint Study that caused the original listing. The [RLWDRed Lake Watershed District](#) implemented erosion control and buffer strip projects. Soil and Water Conservation Districts continue to implement best management practices ([BMPs](#)) throughout the watershed. The intensive monitoring conducted during the [TMDLTotal Maximum Daily Load](#) study confidently shows that the reach currently meets the state water quality standards. There is still room for improvement, as low dissolved oxygen concentrations occur periodically. [The EPA The Environmental Protection Agency](#), however, does not approve [TMDL'sTotal Maximum Daily Load's](#) for reaches that meet state water quality standards. The [TMDLTotal Maximum Daily Load](#) reports for this reach, therefore, [will](#) be used as a protection plan.

Implementation:

The Soil and Water Assessment Tool was used to create a water quality model of the Clearwater Watershed. This model is able to identify areas contributing the most sediment, nutrients, and other pollutants. As part of a sub-contract with the EERC for SWAT modeling, several [BMPbest management practice](#) implementation scenarios were modeled to determine their effectiveness. Future implementation efforts can build upon past projects that have already been successful in the Clearwater River.

Applicable Recommendations from the Red Lake Watershed District 10-Year Planning Process:

- Support activities that reduce the flashiness of the river and enhance base flows
- Stabilize stream banks in areas of accelerated erosion
- Buffer corridors
- Increase habitat complexity, especially within channelized stream segments
- Reduce sediment load in streams
- Strategies include improved ditches with side inlets, buffer and grassed waterways, residue management, tree plantings, and reduction of farming in road ditches
- Protect and enhance existing wetland habitats
- Support efforts to retain WRP acres

- Support WCA enforcement
- Target [CRP Conservation Reserve Program](#) and WRP to increase the number of wetland complexes

Clearwater River Watershed Detailed Assessment ~~TMDL~~

Total Maximum Daily Load Studies:

Silver Creek ~~TMDL~~: Total Maximum Daily Load: *E. coli*

Location: Silver Creek is a tributary of the Clearwater River, a major ~~subwatershed-sub-~~watershed of the Red River of the North watershed in northwestern Minnesota. Silver Creek lies completely within Clearwater County.

303(d) Listing Information:

- Silver Creek, Headwaters to Anderson Lk, 09020305-527
- Aquatic recreation impairment
- Pollution of concern: *E. coli* bacteria
- Priority ranking of the water body: 2006-2009 targeted start and completion dates
- Original listing year: 2006

Applicable Water Quality Standards/Numeric Targets:

- 126 cfu/100ml 30-day geometric mean
- 10% of values not exceed 1260 cfu/100ml

Summary of Impairment:

Silver Creek is a stream in northwestern Minnesota that begins southwest of Clearbrook, Minnesota and flows north to where it joins the Lost River at Anderson Lake, north of the town of Gonvick, Minnesota. The entire main channel of the river, from the headwaters to Anderson Lake (assessment ID 09020305-527) has been listed as impaired for aquatic recreation by fecal coliform on the 303(d) List of Impaired Waters. The impairment was discovered during the 2005 statewide water quality assessment that used data collected through 2004 and was first listed on the 2006 303(d) List of Impaired Waters.

The Clearwater River Dissolved Oxygen & Fecal Coliform Study was completed by the Red Lake Watershed District (~~RLWD~~) under a contract with the Minnesota Pollution Control Agency (MPCA). The project covered multiple impaired reaches on the Clearwater River and its tributaries, including Silver Creek. A switch from fecal coliform to *E. coli* as the official State standard for aquatic recreation was anticipated at the beginning of the study and became a reality in 2008. Although Silver Creek was originally listed as impaired by high fecal coliform concentrations, the Total Maximum Daily Loads (TMDLs) will be set using *E. coli* as the pollutant of concern. The State standard for *E. coli* is a 126 MPN/100ml monthly geometric mean or a 1260 MPN/100 ml daily mean.

Intensive *E. coli* sampling was conducted at two sites in the Silver Creek watershed to verify the impairment. The monitoring found that the reach is still quite impaired. The aquatic

recreation impairment was first identified by monitoring conducted near the downstream end of the Silver Creek watershed. This long term monitoring site (S002-082, a.k.a. 81) remains impaired, particularly for the month of July. Another site monitored for the TMDL study was a new site located just downstream of Silver Creek's confluence with Clear Brook. This level of impairment at this site was severe. Nearly every sample collected during the 2007 – 2008 monitoring effort exceeded 126 MPN/100 ml.

Because temperature affects the growth rates of bacteria, the *E. coli* impairment on Silver Creek is seasonal. Concentrations are higher during the warm summer months. Therefore, the load allocations are categorized by calendar month. Flow and load duration curve development were useful in identification of potential sources and in the calculation of margins of safety (MOS) (percent difference between the median and minimum flow in each zone). The average relative percent difference between duplicate samples collected within the watershed provided a greater level of protection than the flow duration curve based MOS for most months and was used where it would provide ~~the~~ a greater level of protection than the flow duration-based MOS.

Some pollutant reductions will be needed for Silver Creek to meet the aquatic recreation water quality standard at the downstream end of the watershed. At mid-reach, however, major pollutant reductions will be needed (nearly 100%). Fortunately, local government has been very active in implementing projects within the Silver Creek watershed to improve water quality. Water quality improvement projects and this TMDL study have been backed by strong public support.

Implementation:

Silver Creek is a priority watershed in Clearwater County and has been receiving attention for years. Below is a list of partnerships and Water Quality Improvement Projects that will be implemented by agencies and local landowners.

Project Partners:

- Red Lake Watershed District
- Natural Resources Conservation Service
- Minnesota Pollution Control Agency
- Minnesota Board of Water and Soil Resources
- Private Landowners

Projects that improve water quality and reduce agricultural and bank erosion:

State Cost-Share Program

Cost share is available for landowners to help with the cost of establishing a variety of conservation practices which help protect and restore water and soil resources in the county. Up to 75% cost of implementing the conservation practice may be covered by cost share dollars.

Eligible conservation practices commonly used in this area:

- Windbreak Establishment/Renovation
- Filter strips
- Critical Area Planting
- Grassed Waterway
- Streambank, Shoreland and Roadside Protection
- Shelterbelt Planting/Renovation
- Sediment Basins
- Feedlot Water/Wastewater Runoff Control

Projects currently underway and awaiting project implementation:

Clearbrook Stormwater Storm-water Ponds: In 2006 the Clearwater SWCD Soil & Water Conservation District received \$19,200 to do an assessment of runoff for the City of Clearbrook and the surrounding watershed to help find solutions to the runoff issues for the city and its tributary to Silver Creek. The project analyzed the watershed, determined flow contributions, prioritized sub-watersheds, and sought active input from the community in identifying problem areas and sites for sediment and other pollutant control. We then conducted an engineered survey and designed two stormwater storm-water retention ponds in the city of Clearbrook as well as the installation of one rain catchment basin at the Good Samaritan Building in Clearbrook. The stormwater storm-water ponds are scheduled to be installed in the construction season of 2010.

Agricultural Watershed Restoration Grant – SWAT Modeling:

In 2008 the Clearwater SWCD received the Agricultural Watershed Restoration Grant (Clean Water Legacy) for \$80,425 to develop of SWAT Model of the sub-watershed and implement projects based on the findings of the model we are able to determine the most suitable water quality projects that would reduce fecal coliform concentrations in Silver Creek. Below are the results of the SWAT model.

SWAT Model:

The goal of this project was to assess the factors that contribute to the water quality impairments identified within the Silver Creek Watershed (SCW) and to evaluate the effectiveness of several BMPs best management practices using hydrologic models. The SCW is impaired for fecal coliform that affects the designated use of aquatic recreation. The focus of this project was to evaluate the effectiveness of various BMP best management practice scenarios in order to decide which practices will provide the most benefit to water quality.

To better understand the source of fecal coliform impairments within this watershed, a hydrologic model developed with SWAT was utilized. A SWAT model was previously

developed and calibrated for the Clearwater River Watershed by the Energy & Environmental Research Center (EERC). However, a more detailed study of the SCW, found within the Clearwater River Watershed, was needed to analyze the water quality at a more detailed scale.

The modeling conducted for this project focused on long-term (i.e., 15- to 30-year) simulations of water and sediment loading at multiple points of interest within the watershed. The modeling results will be used to gain a better understanding of water quality issues within the watershed and to aid the Clearwater Soil and Water Conservation District (CSWCD) in implementing [BMPbest management practices](#) for the impaired reaches.

[BMPBest Management Practice](#) Implementation Results:

The results of the [BMPbest management practice](#) implementation scenarios are shown in Table 7 and Figures 21–34.

All of the reductions shown are for the SCW outlet located in [SubbasinSub-basin](#) 1. In the rotational grazing scenario, there was an increase in fecal coliform concentration. This is most likely the result of cattle being rotated into new fields that were smaller than the original grazing field. The smaller area results in higher concentrations of manure applied to the landscape, which would result in the model indicating higher fecal coliform concentrations at the outlet. The SWAT model showed that when we have sound livestock management techniques in the riparian areas in and around the stream we significantly reduce the amount of fecal coliform in the stream. We are not recommending removing cattle operations altogether, rather reducing cattle operation nutrient contributions to the water body. “Cattle Exclusion” in this study simply means keeping the livestock out of the water body, not eliminating livestock production in the designated watershed. One should not assume this is a guarantee that fecal coliform would be completely eliminated under this scenario; however, it is clear that cattle exclusion would significantly reduce fecal coliform concentrations to meet water quality standards. The data input into the model were based on the assumption that cattle had access to the streams at these operation locations. Field verification of these operations would be important when considering actual [BMPbest management practice](#) implementation on the ground. Additional fecal coliform sources should also be considered.

In the Clearwater River SWAT model, wildlife was considered within the model. Assumptions were made that waterfowl was contributing, particularly near wild rice paddies. Waterfowl were not considered in this particular study since wild rice paddies were not in this watershed. Deer population was also considered, although the calculated contributions of deer were too small for the model to consider.

	Sediment Concentration	Sediment Loading	Fecal Coliform
BMPBest Management Practice Scenario	Reduction, %	Reduction, %	Concentration Reduction, %
Rotational Grazing	0.04	0.04	-1.22
Conservation Tillage	4.19	3.66	0.07
Wetland Restoration	0.18	0.28	4.08
Streambank Stabilization	9.12	1.99	0.68
Cover Crop – Soybean Only	9.8	9.78	0.49
Cover Crop – Soybean and Spring	9.5	9.15	0.91
Wheat	-	-	-
Grassed Waterways	6.64	5.35	13.45

Biofuel – 25% Implementation	9.05	1.85	0.9
Biofuel – 50% Implementation	9.07	1.91	0.86
Biofuel – 75% Implementation	9.12	1.98	0.73
Buffer 50 ft – High Slope	0	0	0
Buffer 80 ft – High Slope	0	0	0
Buffer 120 ft – High Slope	0	0	0
Buffer 50 ft – 25% Implementation	8.58	10.74	0.08
Buffer 50 ft – 50% Implementation	23.08	28.33	0.08
Buffer 50 ft – 75% Implementation	23.15	28.44	0.08
Buffer 80 ft – 25% Implementation	10.14	12.52	0.08
Buffer 80 ft – 50% Implementation	28.66	34.02	0.08
Buffer 80 ft – 75% Implementation	28.78	34.18	0.08
Buffer 120 ft – 25% Implementation	10.83	13.31	0.08
Buffer 120 ft – 50% Implementation	31.47	36.68	0.08
Buffer 120 ft – 75% Implementation	31.66	36.9	0.08
Cattle Exclusion (two sites)	0	0	30.84
Cattle Exclusion (eliminate all)	0	0	100
Residue Management	3.87	5.36	0.47

Wheat			
Grassed Waterways	6.64	5.35	13.45
Biofuel—25% Implementation	9.05	1.85	0.9
Biofuel—50% Implementation	9.07	1.91	0.86
Biofuel—75% Implementation	9.12	1.98	0.73
Buffer 50 ft—High Slope	0	0	0
Buffer 80 ft—High Slope	0	0	0
Buffer 120 ft—High Slope	0	0	0
Buffer 50 ft—25% Implementation	8.58	10.74	0.08
Buffer 50 ft—50% Implementation	23.08	28.33	0.08
Buffer 50 ft—75% Implementation	23.15	28.44	0.08
Buffer 80 ft—25% Implementation	10.14	12.52	0.08
Buffer 80 ft—50% Implementation	28.66	34.02	0.08
Buffer 80 ft—75% Implementation	28.78	34.18	0.08
Buffer 120 ft—25% Implementation	10.83	13.31	0.08
Buffer 120 ft—50% Implementation	31.47	36.68	0.08
Buffer 120 ft—75% Implementation	31.66	36.9	0.08
Cattle Exclusion (two sites)	0	0	30.84
Cattle Exclusion (eliminate all)	0	0	100
Residue Management	3.87	5.36	0.47

This model was based on possible known fecal coliform contributions; however, other possible fecal coliform sources, such as failing septic systems, were not included in the model but are important to reducing fecal coliform in Silver Creek. Unknown sources from the town of Clearbrook could also be investigated.

Discussion:

BMP Best management practice implementation costs are an important factor to consider during the planning process.

When analyzing the results of the SWAT model, it is clear that certain practices provide the most benefit to water quality. Cattle exclusion, grassed waterways, and wetland restoration provided the most benefit in terms of reduction of fecal coliform at the watershed outlet.

Buffer strips, streambank stabilization, cover crops, biofuels, and grassed waterways provided the most benefit to sediment reduction. However, project costs are an important consideration when focused **BMP** best management practice implementation efforts are chosen. While it is impossible to determine the exact cost analysis for each **BMP** best management practice scenario, a general estimation of project costs may provide some useful insight. The cost for implementing **BMP** best management practices is highly variable and will need to be calculated on a case-by-case basis. Every situation will be unique, so exact costs will be impossible to determine. Based on project cost information provided by the CSWCD, the following **BMP** best management practice costs were estimated based on the modeled scenario and following assumptions:

- **Wetland restoration**
 - Four wetlands installed at [Subbasins](#) Sub-basins 4, 12, 19, and 35
 - Excavation cost of \$3000/acre
 - Assumed one water control structure (\$1250/ea) on each wetland
 - Assumed \$2000 to cover extra cost of ditch plugs, tile breaks, and embankments

- **Streambank stabilization**
 - Two sites selected by CSWCD at [Subbasins Sub-basins](#) 5 and 38
 - Based on three sample projects, average cost assumed to be \$93.07/ft.
 - Assumed both sites needed 200 feet of stabilization work

- **Buffer strips**
 - 50-, 80-, and 120-foot buffers
 - Each width implemented randomly along crop fields at implementation rates of 25%, 50%, and 75%
 - Crop fields averaged 230.4 acres in the model
 - Total of 82 crop fields in the model
 - Based on average field size, estimated acres needed for each buffer strip width
 - ⊖ 50-foot buffers would equal 3.23 acres/field
 - ⊖ 80-foot buffers would equal 4.84 acres/field
 - ⊖ 120-foot buffers would equal 7.41 acres/field
 - Calculated cost for native grass planting at \$524/acre, introduced grass and legumes at \$468/acre, and trees/shrubs and grass planting at \$750/acre

Additional [BMPbest management practice](#) scenario costs were not calculated because of one or more of the following:

- Lack of cost information
- Highly variable project costs
- Lack of impact on fecal coliform or sediment reductions

The cost-benefit analysis in Table 8 shows that the most cost-effective [BMPbest management practice](#) to reduce fecal coliform is wetland restoration. However, this analysis does not include cattle exclusion.

Cattle exclusion costs are very difficult to determine without going through each livestock operation on a case-by-case basis. Each cattle exclusion [BMPbest management practice](#) scenario will have to include the cost of several different elements including, but not limited to, fencing, items for new freshwater source (i.e., tanks, pipes, pumps, wells, etc.), and native plantings or other restoration activities to restore previously trampled areas. Other [BMPbest management](#) practices that are difficult to model but should be considered are manure management plans, manure spreader calibration, and correct timing of manure application. These additional [BMPsbest management practices](#) are known to be effective at reducing the amount of fecal material that reaches the waterways.

Table 8. Cost-Benefit Analysis for Selected BMP Scenarios

BMP Scenario	Cost, \$	Fecal Coliform Reduction, %	Cost/% Reduction, \$	Sediment Load Reduction, %	Cost/% Reduction, \$	Sediment Concentration Reduction, %	Cost/% Reduction, \$
Wetland Restoration	126,460.00	4.08	30,995.10	0.28	451,642.86	0.18	702,555.56
Streambank Stabilization	37,228.00	0.68	54,747.06	1.99	18,707.54	9.12	4082.02
Buffer (50 ft, 25%, natural grass)	35,542.92	0.08	444,286.50	10.74	3309.40	8.58	4142.53
Buffer (50 ft, 25%, grass/legume)	31,744.44	0.08	396,805.50	10.74	2955.72	8.58	3699.82
Buffer (50 ft, 50%, natural grass)	71,085.84	0.08	888,573.00	28.33	2509.21	23.08	3079.98
Buffer (50 ft, 50%, grass/legume)	63,488.88	0.08	793,611.00	28.33	2241.05	23.08	2750.82
Buffer (50 ft, 75%, natural grass)	106,628.76	0.08	1,332,859.50	28.44	3749.25	23.15	4605.99
Buffer (50 ft, 75%, grass/legume)	95,233.32	0.08	1,190,416.50	28.44	3348.57	23.15	4113.75
Buffer (80 ft, 25%, natural grass)	53,259.36	0.08	665,742.00	12.52	4253.94	10.14	5252.40
Buffer (80 ft, 25%, grass/legume)	47,567.52	0.08	594,594.00	12.52	3799.32	10.14	4691.08
Buffer (80 ft, 50%, natural grass)	106,518.72	0.08	1,331,484.00	34.02	3131.06	28.66	3716.63
Buffer (80 ft, 50%, grass/legume)	95,135.04	0.08	1,189,188.00	34.02	2796.44	28.66	3319.44
Buffer (80 ft, 75%, natural grass)	159,778.08	0.08	1,997,226.00	34.18	4674.61	28.78	5551.71
Buffer (80 ft, 75%, grass/legume)	142,702.56	0.08	1,783,782.00	34.18	4175.03	28.78	4958.39
Buffer (120 ft, 25%, natural grass)	81,539.64	0.08	1,019,245.50	13.31	6126.19	10.83	7529.05
Buffer (120 ft, 25%, grass/legume)	72,825.48	0.08	910,318.50	13.31	5471.49	10.83	6724.42
Buffer (120 ft, 50%, natural grass)	163,079.28	0.08	2,038,491.00	36.68	4446.00	31.47	5182.06
Buffer (120 ft, 50%, grass/legume)	145,650.96	0.08	1,820,637.00	36.68	3970.85	31.47	4628.25
Buffer (120 ft, 75%, natural grass)	244,618.92	0.08	3,057,736.50	36.9	6629.24	31.66	7726.43
Buffer (120 ft, 75%, grass/legume)	218,476.44	0.08	2,730,955.50	36.9	5920.77	31.66	6900.71
Buffer (50 ft, 25%, trees/shrubs)	50,872.50	0.08	635,906.25	10.74	4736.73	8.58	5929.20
Buffer (50 ft, 50%, trees/shrubs)	101,745.00	0.08	1,271,812.50	28.33	3591.42	23.08	4408.36
Buffer (50 ft, 75%, trees/shrubs)	152,617.50	0.08	1,907,718.75	28.44	5366.30	23.15	6592.55
Buffer (80 ft, 25%, trees/shrubs)	76,230.00	0.08	952,875.00	12.52	6088.66	10.14	7517.75
Buffer (80 ft, 50%, trees/shrubs)	152,460.00	0.08	1,905,750.00	34.02	4481.48	28.66	5319.61
Buffer (80 ft, 75%, trees/shrubs)	228,690.00	0.08	2,858,625.00	34.18	6690.75	28.78	7946.14
Buffer (120 ft, 25%, trees/shrubs)	116,707.50	0.08	1,458,843.75	13.31	8768.41	10.83	10,776.32
Buffer (120 ft, 50%, trees/shrubs)	233,415.00	0.08	2,917,687.50	36.68	6363.55	31.47	7417.06
Buffer (120 ft, 75%, trees/shrubs)	350,122.50	0.08	4,376,531.25	36.9	9488.41	31.66	11,058.83

\$

Table 8. Cost-Benefit Analysis for Selected BMP Scenarios

BMP Scenario	Cost, \$	Fecal Coliform Reduction, %	Cost/% Reduction, \$	Sediment Load Reduction, %	Cost/% Reduction, \$	Sediment Concentration Reduction, %	Cost/% Reduction, \$
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Succumbank Stabilization	37,228.00	0.68	54,747.06	1.99	11,707.54	9.12	4082.00
Buffer (50 ft, 25%, natural grass)	35,542.92	0.08	444,286.50	10.74	1309.40	8.58	4142.53
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Buffer (120 ft, 25%, natural grass)	81,539.64	0.08	1,019,345.50	13.31	6126.19	10.83	7529.05
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Buffer (120 ft, 75%, trees/shrubs)	350,122.50	0.08	4,376,531.25	36.9	9488.41	31.66	11,058.83

Sediment reduction cost-benefit analysis clearly indicates that buffer strips are the most [economiceconomical](#) solution to reducing sediment in the waterways. When looking at the cost between buffer strip widths, 50- or 80-foot buffers would yield the most benefit per dollar spent. The added cost of 120-foot buffers does not amount to enough of a reduction in sediment to make up for the added expense. The native grass planting and introduced grass and legume plantings were shown simply to give a range for the costs of implementing the practice. The SWAT model does not differentiate between the two types of plantings, so there is no difference in reduction of sediment.

Conclusion of Study:

According to the results of this study, significant reductions in fecal coliform and sediment loading can be achieved through implementation of the [BMPsbest management practices](#) evaluated. The optimum scenario to significantly reduce fecal coliform concentrations and meet water quality standards would be achieved through cattle exclusion from streams and waterways.

Grassed waterways and wetland restoration also showed potential to reduce fecal coliform concentrations. Given that these two [BMPsbest management practices](#) were implemented at random locations, it is likely that the benefits would be even greater if a targeted approach were

taken with respect to the implementation of these practices. Other [BMPs best management practices](#) that were not modeled should also be considered for fecal coliform reductions. Manure management plans, manure spreader

calibration, and correct timing of manure application and other such [BMPs](#) [best management practices](#) are known to be effective fecal coliform- reducing practices and should be considered for Silver Creek.

Buffer strip implementation resulted in significant reductions in sediment concentrations in the watershed. Given that buffer strips were randomly selected around agricultural crop fields, a targeted approach would likely result in higher sediment reductions. Buffer strips— located around grazing areas would also result in reductions of fecal coliform concentrations, particularly if implemented between livestock operation locations and waterways.

To better improve the accuracy of the SWAT model developed through this project, additional data are needed to better document the sources of fecal coliform. Field observations of livestock operation practices including the number and locations of direct cattle access to streams would help to determine the total fecal coliform contributions.

Additional information on failing septic systems and potential wildlife contributions could also be added to the SWAT model to determine their concentrations.

Clearwater River Watershed Detailed Assessment ~~TMDL~~

Total Maximum Daily Load Studies:

Lost River ~~TMDL~~: Total Maximum Daily Load: *E. coli*

Location: The Lost River is a tributary of the Clearwater River in northwestern MN. The Lost River Flows through Clearwater, Polk and Red Lake Counties.

303(d) Listing Information:

- Lost River, Anderson Lake to Hill R, 09020305-507
- Aquatic recreation impaired by fecal coliform on the 303(d) List of Impaired Waters
- Pollution of concern: *E. coli* bacteria
- Priority Ranking: 2006/2009 targeted start/completion
- Original listing year: 2002

Applicable Water Quality Standards/Numeric Targets:

- 126 cfu/100ml 30-day geometric mean
- 10% of values not exceed 1260 cfu/100ml

Summary of Impairment:

The Lost River is a tributary of the Clearwater River in northwest Minnesota. The Clearwater River is a tributary of the Red Lake River, which is part of the Red River of the North watershed. The reach of the Lost River that extends from its confluence with Silver Creek at Anderson Lake to its confluence with the Hill River has been listed as impaired by high fecal coliform levels and in the 303(d) List of Impaired Waters.

~~A TMDL~~ A Total Maximum Daily Load Study was conducted in 2007 – 2009 to verify the impairment, define current loads, estimate desired loads, and suggest strategies for attaining water quality goals. *E. coli* sampling was conducted on each end of the reach that yielded five samples per month at each of the two sites. The increased number of samples decreased the influence of occasional high fecal coliform/*E. coli* results. Applying Minnesota State water quality standards to the data collected from the most recent years (through 2008) shows that the Lost River no longer has an aquatic recreation impairment based on bacteria concentrations. High levels of *E. coli* still occur, however, and the Clearwater River Total Maximum Daily Load (TMDL) Stakeholders Group, the Minnesota Pollution Control Agency, and the Red ~~lake~~Lake Watershed District agreed that it was wise to proceed with the writing of this TMDL report. ~~The EPA~~ The Environmental Protection Agency does not approve TMDL reaches that currently meet state standards. The Lost River *E. coli* TMDL does meet state standards so the TMDL will be used as a protection plan and the reach will be delisted.

A Soil and Water Assessment Tool (SWAT) model for the Clearwater River was developed as part of this TMDL study. After an extensive and successful calibration effort, the model was used to predict reductions in sediment, nutrient, and bacteria loads that can be achieved with different levels of best management practice (~~BMP~~) implementation. For example, a

25% application rate of the three most effective [BMPsbest management practices](#) (no-till, residue management, and channel/grade stabilization) would yield a 22.4% decrease in fecal coliform loading. The intensive monitoring conducted during the TMDL study confidently shows that the reach currently meets the state water quality standards. There is still room for improvement, as *E. coli* concentrations occur periodically. The [EPAEnvironmental Protection Agency](#), however, does not approve TMDL's for reaches that meet state water quality standards. The TMDL reports for this reach determined that there is no impairment, therefore the TMDL report shall be used as a protection plan.

Implementation:

Public involvement and outreach will be important to the success of implementation efforts and funding in the watershed. The stakeholders' advisory group was involved in discussion of acceptable implementation strategies. They provided input on what people would be willing to do and what might discourage people from participating.

The SWAT modeling process identified and mapped areas of the watershed that are contributing the most to each pollutant's loading.

Local water management plans have objectives for the improvement of the water quality in the Clearwater River and Lost River Watersheds. These plans include the Clearwater County Comprehensive Local Water Management Plan, Red Lake County Comprehensive Water Management Plan, East Polk County Comprehensive Water Management Plan, and the Red Lake WSD 10-year plan.

List of successful [BMP'sbest management practices](#) identified through the [stakeholdersstakeholder](#) meetings. These [BMP'sbest management practices](#) were evaluated by the SWAT model for their effectiveness and include the following:

- Field Buffers
- Exclusion of cattle from streams and waterways
- Channel/grade stabilization
- No-till farming
- Grassed Waterways
- Rotational Grazing
- Residue Management
- Riparian Buffers
- [StormwaterStorm-water](#) Management

III. Plan of Action

Priority Concern 1: Surface Water Quality Protection and Enhancement

~~Clearwater County is blessed with an abundance of lakes and rivers, many of which have a high appeal for recreational purposes. With fifteen percent (15%) of the land in our county considered wetland, and 80% of our pre-settlement wetlands remaining, Clearwater County has a substantial amount of valuable natural wetlands. Protecting wetlands and unique features is essential to maintaining and improving water quality.~~

~~Thusly named, Clearwater County, our citizens have given high priority to keeping our surface waters clean and clear. However, as of 2008 the MPCA listed eight (8) separate stretches of our rivers and streams as impaired, one of which is the 16 mile stretch of the Mississippi River which runs through Clearwater County. Agricultural activities on crop and pastureland without proper Best Management Practice (BMP) implementation can impact water quality much more significantly, than land without the use of BMPs. Agricultural land covers approximately 19% of our County. Agriculture was a top concern for many people as it relates to water quality. The land use in the watersheds of our rivers and streams in Clearwater County has changed dramatically in the past 100 years. More efficient drainage and tiling, loss of wetlands, and a decrease in perennial vegetative cover on the landscape, all convey water, sediment and contaminants off of the land faster, and often in greater quantities, into our ditches, streams, rivers and lakes. Soil erosion from all sources contributes to surface water quality degradation, removes valuable and productive topsoil, and a loss in fish and wildlife habitat. Due to our County's position at the top of many of these watersheds, we should protect and restore the water we are sending to our neighbors downstream.~~

Objective A: Appendix D Lake Protection Screening Reports

Big LaSalle Lake

Key Findings / Recommendations

Monitoring Water Quality in Clearwater County Strategies: Recommendations

Transparency monitoring at site 201 should be continued annually. It is important to continue transparency monitoring weekly or at least bimonthly every year to enable year-to-year comparisons and trend analyses. Total Phosphorus and chlorophyll a monitoring should continue, as the budget allows, to track trends in water quality.

If the inlet is suspected as a major phosphorus source, it could be monitored. After reviewing the lake data and lakeshed cover along the inlet though, monitoring is probably not necessary due the inlet's location in protected public land.

Overall Summary

Big LaSalle Lake is a lower mesotrophic lake (TSI = 42) with good water quality. The total phosphorus, chlorophyll a and transparency ranges are within than the ecoregion ranges.

Only two percent (2%) of the Big LaSalle Lake lakeshed is disturbed by development and agriculture. The threshold of disturbance where water quality tends to decline is 25%. Big LaSalle Lake is well under this threshold. Three quarters (73%) of the lakeshed is publicly owned, which protects that land from development.

Big LaSalle Lake has the advantage of a very small watershed, with no other lakes or lakesheds flowing into it. This means that the main nutrient source to the lake is the surrounding lakeshore and lakeshed. The majority of the lakeshed along the lake's inlet is public land, so it is very well protected.

Septic system compliance checks have been completed on Big LaSalle Lake by the county. All systems were brought into compliance during that time; therefore, they should be in good working order.

Priority Impacts to the Lake

The priority impact to Big LaSalle Lake would be the expansion of residential housing development in the lakeshed and second tier development along the lakeshore. The conversion of small lake cabins to year-round family homes increases the impervious surface and runoff from the lake lots. Some of the private land around the lake has been developed in the first tier, mainly on the eastern shore. Much of the shoreline remains in large parcels and has not been subdivided for development. This means that it is vulnerable to future development.

Overall, the development pressure for Big LaSalle Lake appears low, as the future population growth extrapolations for the bordering townships is negative. Data from 1990-2000 and 2001-2011 show there wasn't much increase in development during that period of time.

Best Management Practices Recommendations

The management focus for Big LaSalle Lake should be to protect the current water quality and lakeshed. Efforts should be focused on managing and/or decreasing the impact caused by additional development and impervious surface area on existing lots (conversion of seasonal cabins to year-round homes). Future development should occur in large parcels (>5 acres) instead of small subdivisions to minimize impervious surface.

The current lakeshore homeowners can lessen their negative impact on water quality by installing or maintaining the existing trees on their properties. Forested uplands contribute significantly less phosphorus (lbs./acre/year) than developed land cover. In addition, filter strips or native vegetative buffers could be installed to decrease or slow the runoff reaching the water's edge. Septic systems should be pumped and inspected regularly.

Project Implementation

The best management practices above can be implemented by a variety of entities. Some possibilities are listed below.

Individual property owners

- Shoreline restoration
- Rain gardens
- Aquatic plant bed protection (only remove a small area for swimming)
- Conservation easements

Lake Associations

- Lake condition monitoring
- Ground truthing – visual inspection upstream on stream inlets

- Watershed runoff mapping by a consultant
- Shoreline inventory study by a consultant
- Conservation easements

Soil and Water Conservation District (SWCD) and Natural Resources Conservation Service (NRCS)

- Shoreline restoration
- Stream buffers
- Wetland restoration
- Work with farmers to
 - Restore wetlands
 - Implement conservation farming practices
 - Land retirement programs such as Conservation Reserve Program

Clearwater Lake

Key Findings / Recommendations

Monitoring Recommendations

Transparency monitoring at site 204 should be continued annually. It is important to continue transparency monitoring weekly or at least bimonthly every year to enable year-to-year comparisons and trend analyses.

Phosphorus monitoring in the lake and at the inlet will show the effectiveness of upstream projects in the watershed.

~~**Priority #1: Continue SWCD monthly water quality data collection on five (5) area lakes throughout the summer months.**~~

~~**Funding:** \$10,000 / year **Source:** PCA, BWSR **Impacts to the lake**~~

~~Clearwater Lake has a very large catchment and watershed (109:1 watershed to lake area ratio). Immediate catchment and watershed is well protected by public land and a perpetual easement protecting trout habitat in the Clearwater River. Further upstream, the watershed is more disturbed. Agricultural acreage increases along the Clearwater River towards Bagley.~~

Best Management Practices Recommendations

Projects that would have the best chance of improving the water quality of Clearwater Lake include runoff and sedimentation reduction in the Bagley area, and buffer strips along the whole Clearwater River, especially in the area downstream of Bagley.

General Recommendations

There is no evidence of a declining

~~**Responsibility:** _____ **Lead:** SWCD~~

~~Supporting: MPCA, RMB Labs, MDH~~

~~**Evaluation:** Develop a plan for lakes with water quality issues, following timelines developed by the TMDL guidelines; implement a plan within 5 years after a plan is developed. Lakes to be tested will be determined by SWCD using information such as population density, recreational use, water quality impairments, and if there are specific abnormal occurrences in that water body.~~

~~**#2: Expand & promote Citizen Volunteer Water Quality Monitoring on our area lakes and rivers. Continue the collection of Phosphorous,**~~

~~Funding:~~ \$15,000 / year ~~Source:~~ SWCD, BWSR, PCA, RLWSD

~~Responsibility:~~ ~~Lead:~~ SWCD
Supporting: PCA, LA, MHB, RLWD

~~Evaluation:~~ Develop management plans for lakes and rivers found with water quality issues and well and continuing monitoring those lakes for results of implementation of BMP's. Work with LA's on ongoing water quality testing activities and provide support in being a drop-off point for samples and storage of water quality data. ~~4st~~ year and implement the plan in the following 5 years.

~~#3: Create database of water quality data and expand monitoring sites and frequency.~~

~~Funding:~~ \$25,000 ~~Source:~~ PCA, SWCD, BWSR ~~trend~~
~~Responsibility:~~ ~~Lead:~~ SWCD
Supporting: PCA, BWSR, LA, RLWD, BSU

~~Evaluation:~~ Develop GIS layers of monitoring sites, water quality and monitoring frequency for each site continuously through 5 years. Data will be made available through the SWCD website with GIS mapping tools along with analysis of the data and its implications on those waters. Input data that has not been recorded in STORET into that program.

~~Objective B: Educate Clearwater County citizens about water quality enhancement practices and soil stewardship.~~

~~Strategies:~~

~~#1: Encourage and promote best management practices to property owners who have developed or are in process of developing in or near riparian areas.~~

~~Funding:~~ Dependent on materials requested ~~Source:~~ County, MHB, NMF

~~Responsibility:~~ ~~Lead:~~ SWCD, NRCS, ESD
Supporting: DNR, County, TWPs, UMEX

~~Evaluation:~~ Ensure that property owners who are developing or in the process of developing in shoreland/riparian areas receive a copy *Clearwater County Shoreland Homeowners Guide to Lake Stewardship*. There will be a link on-line to the Homeowners Guide on

both the SWCD and Environmental Services' websites. Copies of the Guide will also be available in paper copy at the SWCD and Environmental Services Offices. To ensure homeowners receive the Shoreland Homeowners Guide, it will be given to the realtors to provide to the new owner at the time of property transfer.

#2: _____ Educate property owners along shoreland on the potentially negative impacts of developing those areas (i.e. storm water run-off, chemical run-off, loss of natural vegetation, erosion of shoreland and stream banks, and sedimentations of our surface waters).

~~Funding:~~ \$7,000 / year ~~Source:~~ BWSR, NMF

~~Responsibility:~~ _____ ~~Lead:~~ SWCD, LA

~~Support:~~ BWSR, NMF, UMEX, DNR

~~Evaluation:~~ All LA's receive the *Clearwater County Shoreland Homeowners Guide to Lake Stewardship* in 1st year. Develop lake management plans with LA in 2 years, implement plan in next 3 years. The goal is to have all LA's in Clearwater County use the guide and encourage them to develop lake management plans; currently there are three active LA's in the county, Clearwater Lake already has a lake management plan but the other two do not. We would encourage the LA's to consider joining the Healthy Lakes and Rivers Partnership to help with plan development and project implementation.

#3: _____ Encourage and promote Agricultural Best Management Practices (BMPs) to landowners throughout Clearwater County to help reduce surface water contamination, sedimentation, and bank erosion.

~~Funding:~~ \$2,000 / yr ~~Source:~~ MDA, BWSR, PCA, SWCD, NRCS

~~Responsibility:~~ _____ ~~Lead:~~ SWCD, NRCS

~~Support:~~ MDA, BWSR, PCA

~~Evaluation:~~ Provide 1 seminar on Ag BMPs per year for 5 years; implement state cost-share program continuously, assess site 1st year, implement project in year 2. Sponsor and develop a county-wide tour of Ag. BMP projects for county residents so there is a better awareness of the projects being implemented in the county and also the recognition of those conserving our soil and water resources. Tour would take place every 3 years starting in 2012.

~~#1: #4: Continue to educate property owners about the importance of wetlands, and the state and federal regulations that pertain to wetlands.~~
~~Funding: \$1,000 / yr Source: SWCD, ESD~~
~~Responsibility: Lead: SWCD, ESD~~
~~Support: BWSR, USACE, NRCS~~

~~**Evaluation:** Reduce number of wetland violations on yearly basis; public notice about wetland regulations and who to contact in paper 1 time per year as well as in newsletters.~~

~~**Objective C: Identification and Implementation of projects that improve surface water quality.**~~

~~**Strategies:**~~

~~**#1: Identify and inventory point source and non-point source pollutants.**~~

~~**Funding:** \$25,000 / year **Source:** BWSR, MPCA, RLWD, WRWD~~

~~**Responsibility:** **Lead:** SWCD, RLWD, WRWD
Support: BWSR, MPCA,~~

~~**Evaluation:** Completion of project. Identify and assess those point/non-point sources of pollution in those areas with TMDL impaired waters (Clearwater Watershed & Upper Mississippi Headwaters Watersheds) and work with landowners to reduce pollution loading to those waters as a higher priority. Areas outside these watersheds will be assessed as well, but is not as high a priority.~~

~~**#2:** Implementation of Agricultural Best Management Practices (BMPs), storm water treatment/management, and erosion control projects.~~

~~**Funding:** \$60,000 / year **Source:** SWCD, BWSR, NRCS, Cities~~

~~**Responsibility:** **Lead:** SWCD, NRCS
Support: BWSR, DNR, USACE, County~~

~~**Evaluation:** Identify, monitor, and assess issues continuously for 5 years. 1st year, identify/assess problem, 2nd year implement project, implement TMDL plans in impaired waters especially in the Silver Creek Watershed, Clearwater River Watershed, and.~~

~~**#1: #3: Identify critical wetlands and water resources that are key to maintaining and improving water quality.**~~

~~**Funding:** Unknown **Source:** ESD, USACE, SWCD, DNR~~

~~**Responsibility:** **Lead:** SWCD, ESD
Support: USACE, BWSR, DNR, MPCA, USFWS~~

~~**Evaluation:** Identifying critical wetlands can help us understand what areas are critical to keeping excess nutrients out of our waters.~~

Maintenance of those wetlands may be little but necessary; the cost of losing those wetlands would require far more work and money to replace that wetland and its hydrological function in the watershed. Completion of task.

~~#4: Implement projects/practices that preserve and/or restore drained and/or degraded wetlands in Clearwater County to help restore hydrology.~~

~~Funding: \$15,000 / project Source: BWSR, NRCS~~

~~Responsibility: Lead: SWCD, NRCS, USFWS
Support: BWSR, DNR, USACE~~

~~Evaluation: 1-2 years assessment of wetland status in County, 3-5 years implement projects on drained/degraded wetlands.~~

~~Objective D: Coordinate and cooperate with other governing agencies and surrounding tribal reservations.~~

Strategies:

~~#1: Seek out beneficial partnerships, programs, and funding sources to reduce soil erosion and improve water quality in Clearwater County. Lake. The~~

~~Funding: Unknown Source: SWCD, County~~

~~Responsibility: Lead: SWCD
Support: All agencies, groups and departments apply~~

~~Evaluation: Continue to diversify revenue streams on a yearly basis—seeking new partnerships is continuous, but will be specific in dealing with a certain project.~~

~~#2: Encourage conservation programs to reduce erosion such as CRP, EQIP, and CREP, with cooperation from NRCS.~~

~~Funding: Dependent on project Source: NRCS~~

~~Responsibility: Lead: SWCD, NRCS
Supporting: BWSR~~

~~Evaluation: On every SWCD project site we will be looking at how we could partner with the NRCS to levy federal and state dollars for implementation of the project—continuous.~~

~~#3: Support Red Lake Watershed District and other agencies with Total Maximum Daily Load (TMDL) studies. Continued cooperation & utilization of special project funds from the Red Lake Watershed District.~~

~~**Funding:** \$15,000 / year **Source:** RLWSD, PCA~~

~~**Responsibility:** **Lead:** RLWD, SWCD
Supporting: MPCA~~

~~**Evaluation:** 1st year review completed TMDL studies, 2–5 years locate problem sites and implement projects. The SWCD intends to be an active member of the TMDL Implementation Plan and serve as a local contact for the planning and implementation process.~~

~~#4: Coordinate with other agencies/districts with the implementation of practices identified by completed TMDL studies in our County that improve water quality of those impaired water bodies.~~

~~**Funding:** \$25,000 **Source:** RLWD, WRWD, BWSR, PCA~~

~~**Responsibility:** **Lead:** SWCD, PCA
Supporting: RLWSD, WRWSD, BWSR, other SWCD's~~

~~**Evaluation:** Completed TMDL studies as per TMDL completion schedule. SWCD will partner with other agencies/districts to complete projects as TMDL's indicate certain issues. At least a half-time position would be needed to implement identified projects in TMDL plan.~~

~~#5: Continued cooperation with Clearwater County Office of Environmental Services on shore land, wetland, and Individual Sewer Treatment Systems (ISTS) programs, issues, and/or concerns.~~

~~**Funding:** \$10,000 / year **Source:** SWCD, County~~

~~**Responsibility:** **Lead:** SWCD, ESD~~

~~**Supporting:** County, MDA, PCA, BWSR, USACE~~

~~**Evaluation:** Continue to come up with publications, educational materials and seminars with ESD. Continue to implement Water Plan in conjunction with ESD and County. Promote available financial incentives for homeowners to update failing systems in both shoreland and non-shoreland areas.~~

Priority Watersheds: Watersheds Listed as impaired by the MPCA.

Priority 2: Drinking Water Source Protection

~~Ground water is also a large concern in Clearwater County. All of Clearwater County's residents rely on ground water as a drinking water source. For this reason the protection and management of our ground water resources is a major concern. The cities of Bagley, Clearbrook, Convik, and Rice Lake supply their citizen's drinking water through a public drinking water supply and municipal wells. Only one of these municipalities, Bagley, has a Wellhead Protection Plan in place. There is a need to better understand local ground water quality. This can lead to better understanding of drinking water issues such as nitrate contamination or areas of arsenic in the county and the ability to track these contaminants. Currently, there is a limited amount of data available.~~

Objective A: Protect drinking water sources throughout as implemented many projects along the Clearwater County

Strategies:

- ~~● #1: Provide technical assistance to landowners who have questions or concerns on non-compliant or failing septic systems.~~

~~**Funding:** \$30,000 / year **Source:** County, PCA, USDA River and~~

~~**Responsibility:** **Lead:** ESD~~

~~Supporting: SWCD, PCA, County, MDA~~

~~**Evaluation:** Property owners in shoreland areas are aware of septic rules and regulations as well as the county Shoreland Ordinance. Property owners are aware of available funding mechanisms to get their system upgraded. Provide landowners with guide to replacing failing septic systems, septic system maintenance, and funding available to replace failing systems.~~

- ~~#2: Encourage property owners in Clearwater County to get non-compliant or failing septic systems up to date and in compliance.~~

~~**Funding:** \$1,000 / year **Source:** County, PCA~~

~~**Responsibility:** **Lead:** ESD~~

~~Supporting: SWCD, PCA, County, MDA~~

~~**Evaluation:** 1st-year create easy reading homeowner's guide to updating septic, how it's failing and why and available funding mechanisms to get the system updated or replaced.~~

- ~~#3: Promote the Agricultural BMP Loan program offering low interest loans to replace failing septic systems.~~

~~**Funding:** \$5,000 / year **Source:** MDA~~

~~**Responsibility:** **Lead:** ESD, SWCD~~

~~Supporting: MDA, BWSR, MPCA, TSA2~~

~~**Evaluation:** 1st year — promote Ag BMP loan programs through news briefs, newsletters and website. 2-5 years have a sign-up period for property owners to apply to get Ag BMP funds on a yearly basis. SWCD will apply to the TSA2 for Ag BMP loan funds. When the funds are received, the loans will be disbursed appropriately. Continuously seek funds through other agencies to promote and fix failing systems.~~

~~**#4: Seal known abandoned/unsealed wells throughout the county; promote the SWCD cost-share program to help fix this problem.**~~

~~**Funding:** \$500 / well **Source:** BWSR, NRCS~~

~~**Responsibility:** ~~Lead:~~ SWCD~~

~~Supporting:~~ MDH, MDA, Municipalities

~~**Evaluation:** Publicize in paper and newsletters available cost-share program (Ag BMP Loan Program) and EQIP (Environmental Quality Incentives Program). When we get responses from landowners and will give applications to TSA2 for funds to help cost share seal those wells, provide 2 year loan through local bank chosen by TSA2. Goal of sealing an average of 3 abandoned wells per year through different government programs.~~

~~**#5: Encourage the cities of Gonvick, Clearbrook, and Rice Lake to develop and implement a Wellhead Protection Plan.**~~

~~**Funding:** \$6,000 / city **Source:** Municipality, SWCD, BWSR, EPA, MDA~~

~~**Responsibility:** ~~Lead:~~ SWCD, Municipality~~

~~Supporting:~~ NRCS, County, MDH, MDA

~~**Evaluation:** Use MDH phasing list to help municipalities start developing WHPP, year 1 — WHPP for each city having 2-5 years for development of WHPP's INSERT PHASING Dates for Clearbrook and Gonvick — waiting to hear from MDH~~

~~**#6: Support the Wellhead Protection Plan for the City of Bagley to improve the**~~

~~**Funding:** None **Source:** None~~

~~**Responsibility:** ~~Lead:~~ City of Bagley~~

~~Supporting:~~ SWCD

~~**Evaluation:** Support WHPP for City of Bagley, provide technical assistance to City as needed — continuous.~~

~~#7: Consider the development of a water quality database for private wells that are compatible with the County Well Index.~~

~~Funding: \$2,000 / year Source: MHD, SWCD. Continued~~

~~Responsibility: Lead: SWCD
Support: MHD~~

~~Evaluation: Continue to provide free well testing kits through the SWCD office for residents in Clearwater County. 1 year — ask for water quality data from residents who pick up the testing kits from our office. Develop a database and input that data when it's received — continuous.~~

~~#8: Continue to monitor the five (5) DNR and one (1) City of Shevlin observation wells.~~

~~Funding: \$600 / year Source: DNR~~

~~Responsibility: Lead: SWCD
Support: DNR~~

~~Evaluation: Continuation of existing/functioning program.~~

~~#9: Use the Minnesota Department of Health (MDH) groundwater quality monitoring program to look for concentrations of pesticides used on crops.~~

~~Funding: unknown Source: MDH, MDA, UMEX will~~

~~Responsibility: Lead: SWCD, Volunteers
Support: MDH, MDA~~

~~Evaluation: Come up with database of chemical concentrations in graduation related to pesticide applications — 5 year. Seek MDH Grants to help fund well tests taken through UMEX in County — this program had been discontinued but could be possible once again — more info is needed.~~

~~#10: Develop a ground water quality monitoring program. Increase the frequency and number of tests of Clearwater County's ground water resources~~

~~Funding: \$5,000 / year Source: MDA, PCA, MDH~~

~~Responsibility: Lead: SWCD
Support: MDA, PCA, MDH~~

~~Evaluation: 1 year promote the monitoring program and seek volunteers willing to do monitoring in each of the 3 main watersheds or on TMDL impaired waters. Continue program for 5 years. Consider water quality monitoring of DNR Ob. Wells we~~

are already monitoring for groundwater levels. Continue to offer well testing clinics to county residents at County Fair.

~~#11: Develop and use a ground water quality database to: 1) show the distribution of water quality problems, 2) characterize aquifers of concern and 3) identify factors contributing to water quality problems.~~

~~Funding: \$5,000 / year Source: MDA, SWCD, MDH~~

~~Responsibility: Lead: SWCD~~

~~Support: MDA, MDH, MPCA~~

~~Evaluation: Completion of project.~~

~~Priority Watersheds: All Watersheds are a priority~~

~~Priority **Concern 3: Exotic and Invasive Species Management**~~

~~Noxious weeds have and are becoming prolific in areas of Clearwater County. Spotted Knapweed and Leafy Spurge, for example, are very successful at establishing themselves in the light sandy soils that cover a large portion of our county. These weeds reduce biodiversity of native species, and are much less effective at stabilizing soil than native species.~~

~~Although only a few aquatic invasive species have been identified in any Clearwater County waters, a larger number of aquatic invasive species have been identified outside of, and in close proximity to, the county boundaries. The impacts will be economic and/or environmental as native species are displaced from their natural place in the ecosystem. Understanding the risk posed by effectiveness of these invaders will help to establish actions that can be taken to keep them from the County's water resources.~~

Objective:

Strategies:

~~#1: Identify any new or undiscovered aquatic invasive species that have moved into Clearwater County.~~

~~Funding: \$5,000 Source: Unknown~~

~~Responsibility: Lead: SWCD~~

~~Support: LA, Volunteers, ESD, DNR~~

~~Evaluation: Minimize the movement of aquatic invasives into water bodies in Clearwater County that currently do not contain these invasives through education of LA's, and county residents. Signs and materials can be available for the public's use and education at public access' to waterbodies. Thru education of~~

LA's and county residents, promptly address aquatic invasives if they have been moved into Clearwater County water bodies.

~~#2: Work to educate citizens on understanding the potential risks of aquatic invasive or exotic species and other noxious weed types in the County~~

~~Funding: \$5,000 Source: DNR, MDA, BWSR, ESD~~

~~Responsibility: Lead: SWCD, ESD Support: DNR, MDA, BWSR, LA, NRCGS~~

~~Evaluation: Host yearly seminars on the status of aquatic invasives or exotic species in Clearwater County, hold yearly weed tour on noxious weeds in Clearwater County and measures to control them.~~

~~#3: Work with the Clearwater County Weed Task Force, County Weed Specialist, Townships and MN DNR Invasive Species Specialists to help identify problem areas around the County.~~

~~Funding: \$5,000 / year Source: BWSR, County, MDA, DNR~~

~~Responsibility: Lead: ESD, SWCD, Weed Task Force, DNR Support: BWSR, County, MDA~~

~~Evaluation: Minimize and control the impact of invasives around the County, locating and mapping these problem acres so we can focus time/funds in those areas to dedicate time to eradication of the invasive specie. Development of plan for treatment of invasives and priority areas throughout the county. Removal of invasives will be primarily lead by the County Weed Task Force, DNR, and Townships.~~

~~Priority Watersheds: All watersheds are considered priority~~

~~Priority Concern 4: Land Use Impacts on Water Quality~~

~~Agricultural land, forested land, and developed areas have the potential for negative impacts on the water resources in Clearwater County. Forested land covers 48% of the land in Clearwater County; this constitutes the largest land cover type in the County. Logging and harvesting of these forest resources is very important to the economy of Clearwater County. Poor implementation of timber harvesting BMPs can result in environmental degradation. Agricultural land covers 18% of land in Clearwater County. Agricultural activities on crop and pasture land without proper best management practice implementation can have extensive negative impacts on water quality. BMPs can serve to reduce these impacts significantly. Although the developed areas are minute in~~

Clearwater County their potential to negatively impact water quality is great. Poorly planned development can negatively affect surface and ground water quality.

~~Objective A: Proper Land Management on Agricultural Lands~~

~~Strategies:~~

~~#1: Reduce the impact that runoff from feedlots can have on our water resources, especially those in close proximity to impaired waters.~~

~~Funding:~~ \$20,000 / year ~~Source:~~ BWSR, RLWD, NRCS, PCA

~~Responsibility:~~ ~~Lead:~~ SWCD, NRCS
~~Supporting:~~ BWSR, RLWD, PCA

~~Evaluation:~~ Use TMDL studies to focus on waters with fecal coli form or ecoli impairments. Work with RLWSD, PCA, and other agencies in implementing TMDL plans for impaired waters. Once problem sites are located, design fix, locate funding sources and implement projects — this is continuous. Focus on implementing conservation practices referred to on pages 11-22 of this plan.

~~#2: Installation and utilization of Agricultural BMPs through the use of existing and future state and federal cost share programs to protect resources from runoff and nutrient loading.~~

~~Funding:~~ \$20,000 / year ~~Source:~~ BWSR, RLWD, NRCS, PCA, WRWD, MDA

~~Responsibility:~~ ~~Lead:~~ SWCD
~~Supporting:~~ BWSR, RLWD, NRCS, WRWD, MDA, PCA

~~Evaluation:~~ Continuously locate and fix problem with cost share dollars. Focus on areas where water bodies are impaired and there are known sources of runoff or nutrient loading.

~~Objective B: Proper Management of Forest Resources~~

~~Strategies:~~

~~#1: Support the recently adopted Clearwater County Resource Management Plan that addresses management concerns and strategies for the 95,000 acres of County managed land in Clearwater County.~~

~~Funding:~~ Unknown ~~Source:~~ Unknown

~~Responsibility:~~ ~~Lead:~~ County Land Dept
~~Supporting:~~ EDS, DNR, MASWCD, SWCD

~~**Evaluation:** Continued support of Resource Management Plan~~

~~**#2: Promote Forest Stewardship plans to private landowners.**~~

~~**Funding:** \$5,000 / year **Source:** DNR~~

~~**Responsibility:** **Lead:** SWCD
Supporting: DNR, County Land Dept,
County, NRCS~~

~~**Evaluation:** On a yearly basis we will write forest stewardship plans for private landowners seeking them. We will do as many plans as time and money allow.~~

~~**#3: Encourage landowners to look at Forest BMPs for forestry management and other types of forest management programs.**~~

~~**Funding:** \$5,000 / year **Source:** DNR, County~~

~~**Responsibility:** **Lead:** SWCD, County Land Dept
Supporting: County, DNR, MASWCD~~

~~**Evaluation:** That landowners know what forestry BMP options that they have before/after they harvest timber. Inform any interested landowners of the forest BMPs they can use on their land. Promote the use of the *Sustaining Minnesota's Forest Resources: Voluntary Site Level Management Guidelines* to all parties involved in forestry practices.~~

~~**#4:** Promote state & federal cost share programs to assist landowners in implementing forest management BMPs that protect or improve water quality~~

~~**Funding:** \$5,000 / year **Source:** DNR, BWSR, NRCS~~

~~**Responsibility:** **Lead:** SWCD
Supporting: County Land Dept, BWSR,
DNR, MASWCD~~

~~**Evaluation:** Year 1, promotion in newspaper, newsletter, online current cost share programs available for forest management BMPs. Develop list of BMPs on the land. This will be continuous.~~

~~**Objective C: Proper Land Management in Developed and Developing Areas**~~

~~**Strategies:**~~

~~#1: Reduce the pollution impact from city stormwater entering our waterways.~~

~~Funding: \$5,000 / year Source: BWSR, SWCD, RLWD, cities~~

~~Responsibility: Lead: SWCD
Supporting: BWSR, RLWD, Cities~~

~~Evaluation: Work with Clearbrook, Gonvick, Leonard, Shevlin to install low impact bio-retention basins. For larger projects, work with cities to install stormwater retention ponds. Currently we are working with the City of Clearbrook to install two stormwater retention ponds.~~

~~#2: Reduce the amount of soil erosion from new construction sites with increased utilization of erosion control measures at these sites.~~

~~Funding: \$1,000 / year Source: SWCD, BWSR~~

~~Responsibility: Lead: SWCD
Supporting: BWSR~~

~~Evaluation: Work with contractors on new construction sites on a continuous basis to reduce erosion from their construction sites and help with technical assistance on types of BMPs they should consider when doing new construction to reduce erosion runoff. SWCD staff should be actively involved with contractors on the use of BMP's as well as be abreast of current regulations and standards.~~

~~Priority Watersheds: All watersheds listed as impaired by MPCA.~~

~~V. Ongoing Activities~~

~~The SWCD will conduct an evaluation of this water plan on a yearly basis through our Annual Plan process. The evaluation will focus on compliance with the plan and the impact it has on soil and water quality in the county. The evaluation will be sent to Water Plan Task Force members and presented to the County Board.~~

~~Water Plan Amendment Process~~

~~Proposals and recommendations to alter, enhance, or otherwise change the Comprehensive Local Water Plan (CLWP) will first be presented to the Water Plan Task Force at one of their regularly scheduled meetings. The Water Plan Task Force may request the Local Water Plan Coordinator to gather additional information before making a decision.~~

~~If the Water Plan Task Force feels the issue warrants an official amendment to the CLWP, they will record such in the official minutes, and their recommendation for an amendment will be considered by the Clearwater County Board. If the County Board concurs that an amendment is required, they will:~~

- ~~1) Examine the associated fiscal or policy effects of the proposal.~~
- ~~2) Examine and describe any potential conflicts with existing controls.~~
- ~~3) Request the Headwaters Regional Development Commission to review the proposed amendment.~~

~~Before final adoption of the amended CLWP by the Clearwater County Board, the following process will be followed:~~

- ~~1) All local agencies will have a 60 day period in which to review the proposed, amended CLWP, and submit any written comments to the Water Plan Coordinator.~~
- ~~2) Any comments received during the local review period will be reviewed by the Water Plan Coordinator, who will respond to each comment received. This person will communicate the comments to the Water Plan Task Force which may recommend incorporating the comments into the amended CLWP.~~
- ~~3) A public hearing will be conducted pursuant to M.S. section 375.51, where the general public will be given the opportunity to officially comment on the proposed amendments.~~
- ~~4) The Water Plan Task Force will make recommendations based on the public hearing to the Clearwater County Board, who will direct the Water Plan Coordinator to incorporate the comments into the CLWP.~~

- 5) ~~After conducting the public hearing, but before final adoption, the County Board will submit the proposed plan amendment, all written comments, a record of the public hearing, and a summary of changes incorporated in the proposed amendment as a result of the review process to the Board of Water and Soil Resources (BWSR) for review.~~
- 6) ~~All State agencies will have 90 days to review the proposed amendments and provide written comments to the Water Plan Coordinator. Ten copies of the amended CLWP will be mailed to the BWSR in St. Paul, Minnesota, who will be responsible for distributing them to the appropriate reviewing agency.~~
- 7) ~~After the 90 day State review is completed, the Water Plan Task Force will present any necessary recommendations for change to the Clearwater County Board, who will consider adopting the amended CLWP by formal County Resolution.~~

~~Relationship to Other Planning Efforts and Resolution of Conflict~~

~~Clearwater County's Water Plan has been designed to identify priority water resource issues in the county; its intent is to provide policy direction to other planning efforts undertaken for the county.~~

~~In order to fulfill this intent, Clearwater SWCD will, on a regular basis, communicate the county's priorities to other organizations involved in the management of Clearwater County's water resources.~~

~~In the event a conflict may arise between one or more organizations, the Water Plan Coordinator will implement steps to resolve the conflict. This will be done through meetings with the organizations where conflicts of interest shall be identified and alternative options explored that are acceptable to all parties.~~

~~Appendices~~

County Background

Clearwater County is located in North Central Minnesota. The City of Bagley is the county seat. With over 650,000 acres and a population slightly more than 8,400 people, Clearwater County is sparsely populated. Clearwater County is 60 miles in its length lying north to south, and 18 miles wide. The county's topography is unique, with the northern and western part being drained through the Clearwater River and eventually the waters going into the Hudson Bay, while the southeastern part of the county has its drainage into the Mississippi River and then to the Gulf of Mexico. Undoubtedly the most famous fact about Clearwater County is that it is home to the source of the mighty Mississippi River whose headwaters are located in Lake Itasca which lies inside the equally famous Itasca State Park. Itasca State Park still contains over 3,000 acres of old growth pine, which in earlier years was abundant throughout the County. Northern Clearwater County is also home to the largest concentration of Cultivated Wild Rice Producers in the State of Minnesota. Clearwater County also has a substantial number of beef cattle producers and an increasing number of acres being put into cultivated crops such as soybeans and corn. With a strong agricultural community on the northern end of the county and acres upon acres of forested land in the southern portion of the county, Clearwater County encompasses many different landscapes. These diverse and unique landscapes make Clearwater County a wonderful place to live, work, and play. A healthy environment requires a healthy economy. A sustainable economy requires a sustainable environment. Citizens of Clearwater County value their quality of life and standards of living, and desire the same for their children. Continued economic prosperity depends on a healthy and sustainable environment. Balancing our long term plans for conserving and protecting our priceless natural resources with those for ensuring a healthy public and healthy economy is what this document attempts to do.

Dominant Land Use and Trends

Clearwater County is rural in nature. The Land Use Map on the following page shows that the southern part of the County is primarily public land, much of it covered by forest. The majority of the agricultural land can be found in the northern half of Clearwater County. Residential properties are spread relatively evenly throughout the County, with a few areas of increased density in the cities of Bagley, Clearbrook, Convick, Leonard, Shevlin and the Rice Lake community.

The distribution of land ownership in Clearwater County is split between private land owners, the County, the State of Minnesota, and the Federal Government. Private landowners account for over half (56.4 percent) of the land ownership in the County. The County manages 95,507 acres (14.9 percent) of land.

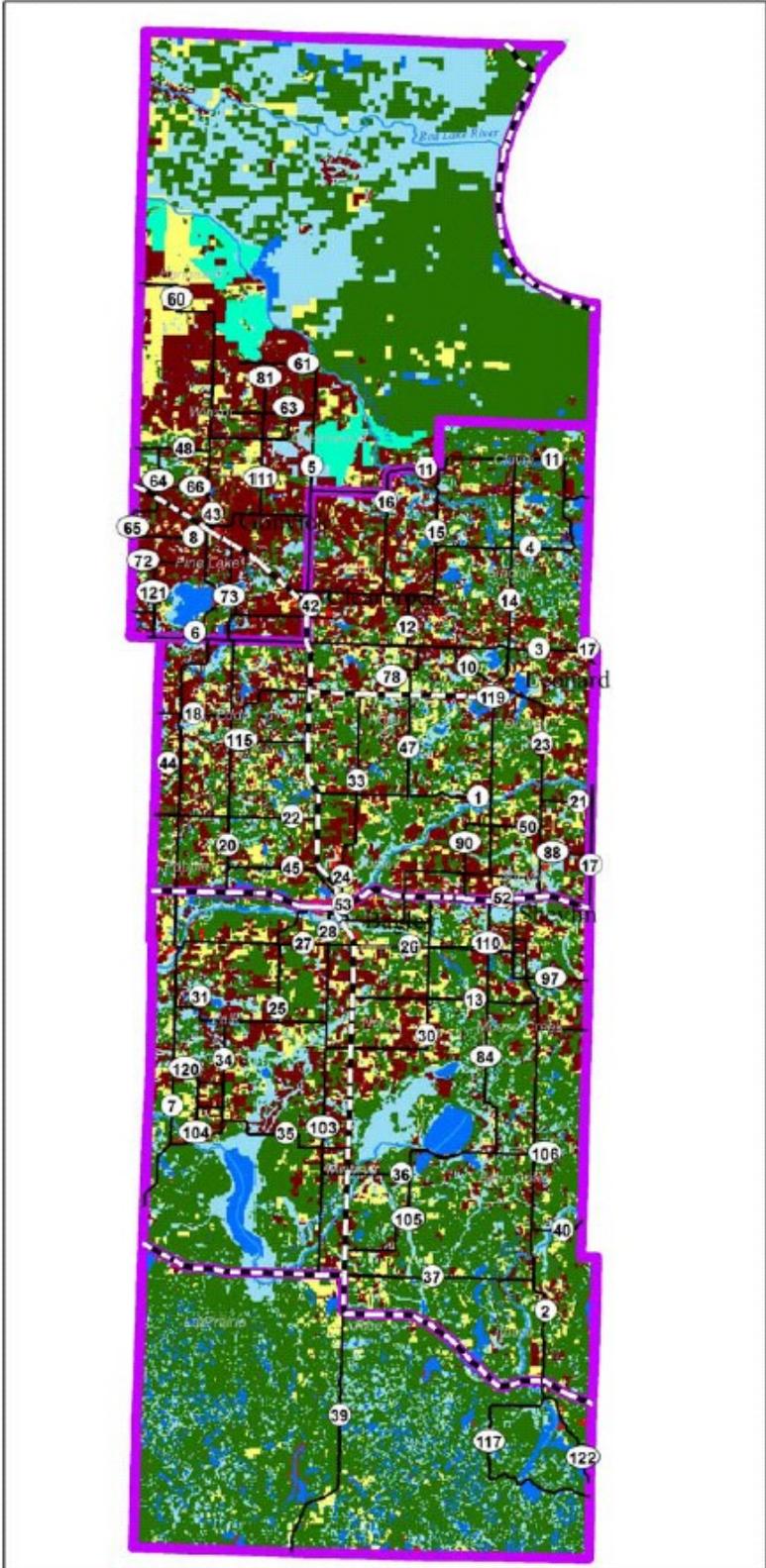
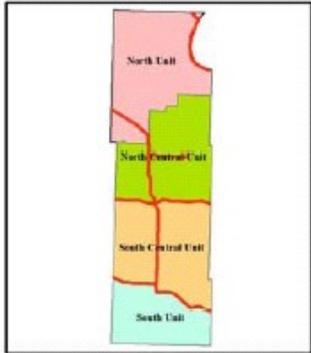
Land Ownership	Acres	Percent
Private	360,636	56.4%
County	95,507	14.9%
State	54,432	8.5%
Federal	129,508	20.2%
Total	639,883	100%

Population

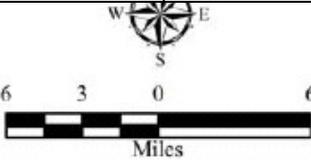
The table below shows the U.S. Census population in Clearwater County from 1920 to 2000. Population growth has been relatively insignificant for the past four decades. The population estimate for the County in 2005 was 8,564 and is estimated to reach 8,790 in 2010 according to the Minnesota State Demographic Center.

Clearwater County Population 1920 to 2000								
1920	1930	1940	1950	1960	1970	1980	1990	2000
8,569	9,546	11,153	10,204	8,864	8,013	8,761	8,309	8,423

Clearwater County Land Cover



Cover Type	Acres	Percent
Ag-Related	119,894	18.2%
Developed	10,508	1.6%
Forested	314,270	47.7%
Open Water	29,908	4.5%
Open Shrub or Grassland	65,126	9.9%
Rice Paddies	8,799	1.3%
Wetland	110,255	16.7%



Plan Responsibility and Updates

The responsibility of administrating and coordinating implementation of the Clearwater County Comprehensive Local Water Management Plan (CLWMP) is assigned to the Clearwater Soil and Water Conservation District (SWCD). The Clearwater County Local Water Management Task Force provided assistance in the process of updating the CLWMP. There were a total of 27 people on the Task Force, which is made up of a wide variety of interests, including lake associations, agriculture producers, citizens, as well as a wide range of public agencies, including the MN DNR, MPCA, U of M Extension Service, Red Lake and White Earth Reservations, and city and county representatives.

Comprehensive local water planning began in Clearwater County in 1989 and has been updated every five years, with a few extensions. The current CLWP started in 2003, was granted a couple of extensions, and was adopted on April 19th, 2005 by the Clearwater County Board of Commissioners. The current plan expires on March 23, 2010. This process has brought awareness to water resources in the County. Many studies have been completed and many grants have been utilized to learn more about water quality in this area.

List of Priority Concerns

The purpose of the Priority Concerns Scoping Document is to provide Clearwater County with direction for water planning over the next five years. Several agencies provided feedback about water quality in the County, including the Task Force, State Agencies, and other groups. A Citizen Survey was also conducted to reach out to the general public. The groups that were included in the public engagement process all come with different viewpoints because they have a certain interest in water quality. There are, however, some common themes that emerged from this process:

The Task Force met on April 16, 2008 to develop the List of Priority Concerns for the 2008 Clearwater County Comprehensive Local Water Management Plan Update. The value of this section of the document comes from understanding some common issues that emerged from the public engagement process. The following are some of the *Key Points* of the Priority Concerns Scoping Document:

Priority Concern 1: Surface Water Quality Protection and Enhancement

Clearwater County is blessed with an abundance of lakes and rivers, many of which have a high appeal for recreational purposes. With fifteen percent (15%) of the land in our county considered wetland, and 80% of our pre-settlement wetlands remaining, Clearwater County has a substantial amount of valuable natural wetlands. Protecting wetlands and unique features is essential to in maintaining and improving water quality in the Clearwater River and in Clearwater Lake.

Thusly named, Clearwater County, our citizens have given high priority to keeping our surface waters clean and clear. However, as of 2008 the MPCA listed eight (8) separate stretches of our rivers and streams as impaired, one of which is the 16 mile stretch of the Mississippi River which runs through Clearwater County. Agricultural activities on crop and pastureland without proper Best Management Practice (BMP) implementation can impact water quality much more significantly, than land without the use of BMPs.

~~Agricultural land covers approximately 19% of our County. Agriculture was a top concern for many people as it relates to water quality. The land use in the watersheds of our rivers and streams in Clearwater County has changed dramatically in the past 100 years. More efficient drainage and tiling, loss of wetlands, and a decrease in perennial vegetative cover on the landscape, all convey water, sediment and contaminants off of the land faster, and often in greater quantities, into our ditches, streams, rivers and lakes. Soil erosion from all sources contributes to surface water quality degradation, removes valuable and productive topsoil, and a loss in fish and wildlife habitat. Due to our County's position at the top of many of these watersheds, we should protect and restore the water we are sending to our neighbors downstream.~~

Objective A:

Long Lake

Key Findings / Recommendations

Monitoring ~~Water Quality in Clearwater County~~ Recommendations

- ~~• Continue SWCD monthly water quality data collection on five (5) area lakes throughout the summer months.~~
- ~~• Expand & promote Citizen Volunteer Water Quality Monitoring on our area lakes and rivers. Continue the collection of Phosphorous, Chlorophyll A, and Water Clarity data on the nineteen lakes currently being monitored with funding through the Clean Water Legacy Surface Water Assessment Grant.~~
- ~~• Create database of water quality data and expand monitoring sites and frequency.~~

Objective B: ~~Educate Clearwater County citizens about water quality enhancement practices and soil stewardship.~~

- ~~● Encourage and promote best management practices to property owners who have developed or are in process of developing in or near riparian areas.~~
- ~~● Educate property owners along shoreland on the potentially negative impacts of developing those areas (i.e. storm water run-off, chemical run-off, loss of natural vegetation, erosion of shoreland and stream banks, and sedimentations of our surface waters).~~
- ~~● Encourage and promote Agricultural Best Management Practices (BMPs) to landowners throughout Clearwater County to help reduce surface water contamination, sedimentation, and bank erosion.~~
- ~~● Continue to educate property owners about the importance of wetlands, and the state and federal regulations that pertain to wetlands.~~

Transparency monitoring at site 101 should be continued annually. It is important to continue transparency monitoring weekly or at least bimonthly every year to enable year-to-year comparisons and trend analyses. Total Phosphorus and chlorophyll a monitoring should continue (site 101), as the budget allows, to track trends in water quality.

Overall Summary

Long Lake has excellent water quality. It is an oligotrophic lake (TSI = 35) with excellent lake user perceptions. Long Lake was rated as “crystal clear” or not quite crystal clear” 100% of the time during secchi depth readings in 2008 , 2009 and 2011. Long Lake is known for its scuba recreational opportunities. Long Lake does not currently have enough data to run trend analysis on transparency, chlorophyll a or total phosphorus data. This mirrors the chlorophyll a data, with the majority of results at or below 2 ug/L.

About half of the lakeshed is in private ownership (52%). The other area is open water (20%) and public ownership (28%). The majority of the private ownership is forested uplands (43.1%). The majority of public land is categorized under Clearwater County ownership (22.8%). The large area of public land south of the lake is a County Memorial Forest. The public land north of the lake is a mix of county land (Long Lake County Park) and state-owned land. The county land may be misleading as “protected” because this area is developed as a campground and park.

Long Lake is at an advantage in that it is a headwaters lakeshed and also does not have any inlets. This means that the main sources of phosphorus to the lake come from the surrounding shoreline.

Long Lake is unique in that it supports a stream trout fishery. The dissolved oxygen profile shows that the hypolimnion is well-oxygenated. If these oxygen levels were to decline in the future, loss of trout could indicate eutrophication and/or climate change.

Priority Objective C: Identification and Impacts to the lake

The priority impact to Long Lake is the existing lakeshore development and the potential for future developments. Long Lake is fortunate to have very low levels of phosphorus. When land transitions from forested uplands to developed land use, the runoff coefficient of estimated pounds of phosphorus/acre/year increases dramatically. Without proper ordinances in place and best management practices installed to mitigate the effect of development, it could have a dramatic negative effect on Long Lake’s water quality.

Fortunately, it appears that the current parcel subdivisions are quite large, limiting the number of driveways and buildings, which are one of the reasons for the higher runoff coefficients. In addition, Highway 200 runs fairly close to the lake along the north side. Ideally, this land between the road and the lake should stay forested as it provides a buffer to containments from the road. Much of the land between Long Lake and Highway 200 is owned by the State of MN Department of Transportation. If this narrow strip of land is ever plotted for development, strict ordinances need to be in place to minimize the effect it would have on water quality.

Current lakeshore homeowners can minimize their impact on water quality by maintaining the existing tree canopies on their properties and installing buffers and native vegetation. Septic systems should be pumped regularly and maintained to ensure they are working properly.

Best Management Practices Recommendations

The management focus for Long Lake should be to protect the current water quality and maintain the low level of disturbed land use in the lakeshed. Efforts should be focused on managing and/or decreasing the impact caused by additional development, including second tier development, and impervious surface area. Project ideas include protecting land with conservation easements, enforcing county shoreline ordinances, smart development, shoreline restoration, rain gardens, and septic system maintenance. In addition, Long Lake would benefit from the development of a lake management plan.

Project Implementation

The best management practices above can be implemented by a variety of entities. Some possibilities are listed below.

Individual property owners

- Shoreline restoration
- Rain gardens
- Aquatic plant bed protection (only remove a small area for swimming)

Lake Associations

- Lake condition monitoring
- Internal loading monitoring
- Ground truthing – visual inspection upstream on stream inlets
- Watershed mapping by a consultant
- Shoreline inventory study by a consultant

Soil and Water Conservation District (SWCD) and Natural Resources Conservation Service (NRCS)

- Shoreline restoration
- Stream buffers
- Work with farmers to
 - Restore wetlands
 - Implement conservation farming practices
 - Land retirement programs such as Conservation Reserve Program

Long Lost Lake

Key Findings / Recommendations

Monitoring Recommendations

Transparency monitoring should be continued annually at sites 201 and 207 in order to track water quality changes. It is important to continue transparency monitoring weekly or at least bimonthly every year to enable year-to-year comparisons and trend analyses. Total phosphorus and chlorophyll a monitoring should continue, as the budget allows, to track trends in water quality.

Overall Summary

Long Lost Lake is a high quality water resource with excellent water quality (TSI=38). A long-term trend analysis showed transparency readings improving since 1986, but stabilizing in recent years (2001-2011). Long Lost Lake was rated as “beautiful, could not be better” 99% of the time during 242 sampler observations from 1989 to 2011.

The surrounding watershed area is also in excellent condition for water quality. Eighty-one percent (81%) of the land is in public ownership and not developed. According to the MN Department of Natural Resources analysis, 83.6% of the lakeshed is protected and should have a vigilance management focus for water quality. Most of the public land is a part of the Clearwater County’s Memorial Forest. In addition, the surrounding lakeshed is a headwaters catchment, which means no additional water flows in from other upstream lakesheds.

The lakeshed is dominantly forested uplands, which has a very low estimated phosphorus loading (0.09 lbs. of phosphorus/acre/year) and 7.7% is categorized as wetlands. The little development that is present in the lakeshed is near the lake itself. There is some forestry occurring in the lakeshed, that is managed by the Clearwater County Resource Management Plan.

It is often difficult to determine why a lake has an improving trend in transparency. Usually improving transparency corresponds with declining clarity due to increased shoreline erosion. In the case of Long Lost Lake, the improving clarity could just be due to the fact that the water is deeper due to increased water levels. The lakeshed is well forested, so it could be that the increased water levels did not cause significant shoreline erosion.

Priority of projects that improve Impacts to the lake

The priority impact to Long Lost Lake’s water quality is probably lakeshore development. The lake has a high shoreline development index (Table 9), which means it has an irregular shoreline, allowing for more development compared to a perfectly round lake. Fortunately, the development that has occurred along the shoreline consists of larger size properties (200-300 ft. frontage).

Numerous concerns arise as lakeshore develops, related to water quality, including increased impervious surfaces, increased inputs to maintain traditional turf lawns, removal of near shore, native plant beds, and proper maintenance of septic systems. Long Lost Lake has the added concern that increased lake levels could submerge developed lots. A setback ordinance on new development would help alleviate concerns will near-shore contamination.

Though Long Lost Lake has a maximum depth of approximately 53 feet, the mean lake depth is about 9.5 feet. Most of the outer bays are considered littoral zone (less than 15 feet). The shallow mean depth of Long Lost Lake could also impact water quality.

Protecting native aquatic plant beds is extremely important for shallow lakes. The higher chlorophyll a TSI and lower total phosphorus TSI could reflect a loss of rooted vegetation. Plant beds function in several ways to protect water quality including, holding bottom sediment in place, utilizing available nutrients, and providing fish habitat. One of the most common variables found in shallow lakes with exceptional water clarity is healthy, submerged aquatic vegetation.

Best Management Practices Recommendations

The management focus for Long Lost Lake should be to protect the current water quality and the level of undisturbed land use in the lakeshed. Efforts should be focused on managing and/or decreasing the impact caused by additional development and impervious surface area. Project ideas include protecting land with conservation easements, enforcing county shoreline ordinances, smart development, shoreline restoration, rain gardens, and septic system maintenance.

Native aquatic plants stabilize the lake's sediments and tie up phosphorus in their tissues. When aquatic plants are uprooted from a shallow lake, the lake bottom is disturbed, and the phosphorus in the water column gets used by algae instead of plants. This contributes to "greener" water and more algae blooms. Protecting native aquatic plant beds will ensure a healthy lake and healthy fishery.

Project Implementation

The best management practices above can be implemented by a variety of entities. Some possibilities are listed below.

Individual property owners

- Shoreline restoration
- Rain gardens
- Aquatic plant bed protection (only remove a small area for swimming)
- Conservation easements

Lake Associations

- Lake condition monitoring
- Ground truthing – visual inspection upstream on stream inlets
- Watershed mapping by a consultant
- Shoreline inventory study by a consultant
- Conservation easements

Soil and Water Conservation District (SWCD) and Natural Resources Conservation Service (NRCS)

- Shoreline restoration
- Stream buffers
- Wetland restoration

Pine Lake

Key Findings / Recommendations

Monitoring Recommendations

The transparency data for Pine Lake is very inconsistent. Transparency monitoring at site 203 should be continued annually. It is important to continue transparency monitoring weekly or at least bimonthly every year to enable year-to-year comparisons and trend analyses.

Phosphorus monitoring in the lake and at the inlet will show the effectiveness of upstream restoration/protection projects in the watershed.

Priority Impacts to the lake

There is not enough data to perform a trend analysis on Pine Lake, so it is unknown if the lake is improving, steady, or declining. The main disturbance in Pine Lake's watershed is agriculture, which makes up the largest percentage (18.8%) of land cover in privately-owned land. Agricultural lands are concentrated in the northeast portion of the lakeshed and runoff from this section drains into Pine Lake through a network of public drainage ditches. In addition, because Pine Lake is a shallow lake, it is very important to protect native aquatic plant beds to preserve fish habitat and water clarity.

Best Management Practices Recommendations

Projects that would have the best chance of improving the water quality of Pine Lake include assisting area farmers with best management practices such as restoring wetlands, preserving their land through conservation easements, and education about protecting native aquatic plant beds.

Native aquatic plants stabilize the lake's sediments and tie up phosphorus in their tissues. When aquatic plants are uprooted from a shallow lake, the lake bottom is disturbed, and the phosphorus in the water column gets used by algae instead of plants. This contributes to "greener" water and more algae blooms.

Roy Lake

Findings / Recommendations

Monitoring Recommendations

Transparency monitoring at site 202 should be continued annually. It is important to continue transparency monitoring weekly or at least bimonthly every year to enable year-to-year comparisons and trend analyses. Total Phosphorus and chlorophyll a monitoring should continue, as the budget allows, to track trends in water quality.

The inlets to Roy Lake appear to be minor, but if they are suspected as phosphorus sources to the lake they could be monitored for phosphorus.

Overall Summary

Roy Lake is a eutrophic lake (TSI = 51) with evidence of a declining trend in water clarity. The total phosphorus, chlorophyll a and transparency ranges are within the ecoregion ranges. Because Roy is a shallow lake with only light development, it is most likely a natural eutrophic lake.

Only two percent (2%) of the Roy Lake lakeshed is disturbed by development and agriculture. The threshold of disturbance where water quality tends to decline is 25%. Roy Lake is well under this threshold. More than half (63%) of the lakeshed is publicly owned, which protects that land from development. The Department of Natural Resources reports that the lake does have the potential to winterkill, and did so in 1996. The fisheries report from 2007 indicates that the fish species have rebounded from the 1996 kill. Winterkill is an issue for shallow lakes when the winter is long and cold, with heavy ice and snow cover.

Roy Lake has the advantage of a very small watershed. The lake does not have any major inlets, which means that it is probably groundwater fed.

The lake has a declining trend in clarity, but it is unclear what could be causing this trend because there appear to be no imminent threats to the lake. It could be occurring naturally due to the precipitation, groundwater and climate patterns of the last decade.

Lake-wide septic system compliance checks were completed by the county on Roy Lake between 1999-2001. All systems were brought into compliance during that time; therefore, they should be in good working order.

Priority Impacts to the Lake

The priority impact to Roy Lake would be the expansion of residential housing development in the lakeshed and second tier development along the northern lakeshore. The conversion of small lake cabins to year-round family homes increases the impervious surface water quality and runoff from the lake lots. Most of the private land around the lake has been developed in the first tier. Some of the second tier remains in large parcels and has not been subdivided for development.

- Identify and inventory point source and non-point source pollutants.

Implementation of Agricultural

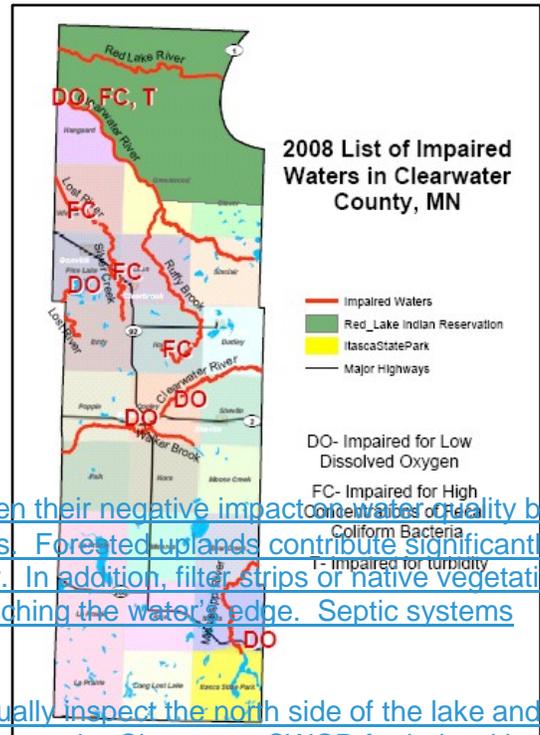
Overall, the development pressure for Roy Lake appears low due to the abundance of public land and wetlands surrounding the lake. Data from 1990-2000 and 2001-2011 show there wasn't much increase in development during that period of time.

Best Management Practices (BMPs), storm water treatment/Recommendations

- The management, and erosion control projects, focus for Roy Lake should be to protect the current water quality and lakeshed. Efforts should be focused on managing and/or decreasing the impact caused by additional development, including second tier development on the north shore, and impervious surface area on existing lots (conversion of seasonal cabins to year-round homes).
 - ~~Identify critical wetlands and water resources that are key to maintaining and improving water quality.~~
- ~~Implement projects/practices that preserve and/or restore drained and/or degraded wetlands in Clearwater County.~~

Objective D: Coordinate and cooperate with other governing agencies and surrounding tribal reservations.

- Seek out other beneficial partnerships, programs, and funding sources to reduce soil erosion and improve water quality in Clearwater County.
- Utilize Board of Water and Soil Resources Local Water Management Challenge Grant funds for special projects.
- Encourage conservation programs to reduce erosion such as CRP, EQIP, and CREP, with cooperation from NRCS.



Support Red Lake The current lakeshore homeowners can lessen their negative impact on water quality by installing or maintaining the existing tress on their properties. Forested uplands contribute significantly less phosphorus (lbs./acre/year) than developed land cover. In addition, filter strips or native vegetative buffers could be installed to decrease or slow the runoff reaching the water's edge. Septic systems should be pumped and inspected regularly.

Because the lake has a declining trend in transparency, visually inspect the north side of the lake and the inlets for potential runoff sources. If runoff is suspected, contact the Clearwater SWCD for help with wetland restoration, shoreline restoration, rain gardens, grassed waterways, filter strips and other best management practices to address overland flow and erosion.

Project Implementation

The best management practices above can be implemented by a variety of entities. Some possibilities are listed below.

Individual property owners

- Shoreline restoration
- Rain gardens
- Aquatic plant bed protection (only remove a small area for swimming)
- Conservation easements

Lake Associations

- Lake condition monitoring
- Ground truthing – visual inspection upstream on stream inlets
- Watershed runoff mapping by a consultant
- Shoreline inventory study by a consultant
- Conservation easements

Soil and Water Conservation District (SWCD) and Natural Resources Conservation Service (NRCS)

- Shoreline restoration
- Stream buffers
- Wetland restoration
- Work with farmers to
 - Restore wetlands
 - Implement conservation farming practices
 - Land retirement programs such as Conservation Reserve Program

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Walker Brook Lake

Key Findings / Recommendations

Monitoring Recommendations

Transparency monitoring at sites 101 and other agencies 201 should be continued annually. It is important to continue transparency monitoring weekly or at least bimonthly every year to enable year-to-year comparisons and trend analyses. Site 201 has 22 years of historical data and site 101 is located over the deepest spot (45 feet) in the lake. Total Phosphorus and chlorophyll a monitoring should continue, as the budget allows, to track trends in water quality. Chemical data historically has been collected at site 101. Future chemical data collection should occur at the same location.

- Walker Brook Lake has very high total phosphorus in the lake sediments, which is unusual for a headwaters catchment lake. If budget allows, additional monitoring of the inlets could be done to assess whether phosphorus feeding the lake's biomass is primarily an internal or external source. A detailed flow analysis, using available LIDAR data could help pin point the major water flow paths entering the lake and their individualized drainage areas. Hypolimnion monitoring could indicate whether internal loading is causing the high phosphorus in Walker Brook Lake. This monitoring consists of collecting dissolved oxygen and temperature profiles along with Total Maximum Daily Load (TMDL) studies water samples just above the bottom of the lake. These water samples should be analyzed for total phosphorus and ortho phosphorus. If the bottom samples have higher phosphorus than the surface samples, it shows internal loading is occurring.

Overall Summary

Walker Brook Lake is a eutrophic lake (TSI = 51) with no evidence of a trend in transparency from 1989-2011. Total phosphorus and chlorophyll a data results are poorer than the expected ecoregion range, but transparency readings are within the expected range. Benthic total phosphorus readings indicate internal loading is a major source of nutrients for biomass growth.

The total watershed area to lake area ratio is small (0.009:1). In addition, this particular lakeshed is unique in that the pour point of the watershed is downstream of the lake, so only the upstream portion of the lakeshed actually contributes water to Walker Brook Lake. Eighty-eight percent (88%) of the lakeshed is in private ownership, with 44.8% of the area categorized as forested uplands. The public ownership makes up 11.6% of the lakeshed. A portion of the county land is the County Memorial Forest and most of the State land is Trust Fund Land.

Priority Continued cooperation &

~~utilization of special project funds from the Red Lake~~ **Impacts to the lake**

The reason the lakeshed is rated as "full restoration (Figure 20)" is the surrounding agriculture. Agriculture land use covers 26% of the lakeshed. Based on the USDA's National Agricultural Statistics Service, the majority of crop cover is either alfalfa or other hay/pasture. Usually this type of crop has little, if any, inputs and the permanent ground cover is more beneficial for water quality than row crops. A few acres of row crops (i.e. soybeans or spring wheat) are present in the lakeshed. One of the main impacts on Walker Brook Lake's water quality is the internal loading source of phosphorus. Walker Brook Lake is slightly deeper than a shallow lake (max depth = 45 feet), which means that it stratifies in the summer, but a few windy days can cause the lake to mix. This mixing brings phosphorus up from the lake's bottom, and fuels algae blooms.

Lakeshore development could also have an impact on Walker Brook Lake. Currently the lakeshore development is light, mostly along the south shore off of White Pine Drive. The north shore actually only has a couple extremely large, private parcels. If these parcels were subdivided in the future and developed, best management practices should be installed to mitigate the negative effect lakeshore

development has on water quality. The southeast inlet to the lake is owned by the county and state and is undeveloped. It is beneficial for the lake's water quality to maintain the existing forested and wetland area around the inlet.

The current lakeshore homeowners can lessen their negative impact on water quality by installing or maintaining the existing trees on their properties. Forested uplands contribute significantly less phosphorus (lbs./acre/year) than developed land cover. In addition, filter strips or native vegetative buffers could be installed to decrease or slow the runoff reaching the water's edge. Septic systems should be pumped and inspected regularly.

Best Management Practices Recommendations

The management focus for Walker Brook Lake should be to protect the current water quality and restore the lakeshed. This can be done by partnering with farmers in the lakeshed to implement conservation farming practices, increase shoreline buffers, restore wetlands, or place priority parcels into land retirement programs to decrease the impacts of agriculture in the lakeshed.

In addition, efforts should be focused on managing and/or decreasing the impact caused by additional development, including second tier development, and impervious surface area. Project ideas include protecting land with conservation easements, enforcing county shoreline ordinances, smart development, shoreline restoration, rain gardens and septic system maintenance.

Project Implementation

The best management practices above can be implemented by a variety of entities. Some possibilities are listed below.

Individual property owners

- Shoreline restoration
- Rain gardens
- Aquatic plant bed protection (only remove a small area for swimming)
- Conservation easements

Lake Associations

- Lake condition monitoring
- Hypolimnion monitoring for internal loading
- Ground truthing – visual inspection upstream on stream inlets
- Watershed mapping by a consultant
- Shoreline inventory study by a consultant
- Conservation easements

Soil and Water Conservation District: (SWCD) and Natural Resources Conservation Service (NRCS)

- ~~Coordinate with other agencies/districts with the implementation of practices identified by completed TMDL studies in our County that improve water quality of those impaired water bodies.~~
- ~~Continued cooperation with Clearwater County Office of Environmental Services on shore land, wetland, and Individual Sewer Treatment Systems (ISTS) programs, issues, and/or concerns.~~

Priority Watersheds: Watersheds Listed as impaired by the MPCA.

Priority 2: Drinking Water Source Protection

Ground water is also a large concern in Clearwater County. All of Clearwater County's residents rely on ground water as a drinking water source. For this reason the protection and management of our ground water resources is a major concern. ~~The cities of Bagley, Clearbrook, Convik, and Rice Lake supply their citizens drinking water through a public drinking water supply and municipal wells. Only one of these municipalities, Bagley, has a Wellhead Protection Plan in place. There is a need to better understand local ground water quality. This can lead to better understanding of drinking water issues such as nitrate contamination or areas of arsenic in the county and the ability to track these contaminants. Currently, there is a limited amount of data available.~~

- Objective A: Protect drinking water sources throughout Shoreline restoration
- Stream buffers
- Wetland restoration

Appendix E

Clearwater County AIS Plan

- ~~Provide technical assistance to landowners who have questions or concerns on non-compliant or failing septic systems.~~
- ~~Encourage property owners in Clearwater County to get non-compliant or failing septic systems up to date and in compliance.~~
- ~~Promote the Agricultural BMP Loan program offering low interest loans to replace failing septic systems.~~
- ~~Seal known abandoned/unsealed wells throughout the county; promote the SWCD cost-share program to help fix this problem.~~
- ~~Encourage the cities of Convick, Clearbrook, and Rice Lake to develop and implement a Wellhead Protection Plan.~~
- ~~Support the Wellhead Protection Plan for the City of Bagley.~~
- ~~Consider the development of a water quality database for private wells that are compatible with the County Well Index.~~
- ~~Continue to monitor the five (5) DNR and one (1) City of Shevlin observation wells.~~

Use the

Local AIS Plan

Aquatic Invasive Species Prevention Plan for Clearwater County

Date March 10, 2015

Guidelines for using Aquatic Invasive Species Prevention Aid (MN Statute 477A.19)

INTRODUCTION

Aquatic invasive species (AIS) are threatening Minnesota waters. These nonnative species harm fish populations, water quality, and water recreation. This plan outlines the efforts that Clearwater County will undertake to help prevent the spread of harmful AIS within Minnesota. Presently, there are no known infestations or populations in our lakes of AIS except for curly leaf pondweed in Clearwater Lake. Clearwater Lake is a border lake with Beltrami County.

Areas of concern and possible routes of introduction of AIS include Itasca State Park at the southern end of the county, our larger, higher use lakes, and the two private resorts located on Hoot Owl Lake/Pickerel Lake, and Heart Lake.

Fishing is the primary recreational use on our lakes and streams. Other use on selected lakes and ponds and streams includes wild rice harvesting, leeching and pleasure boating.

Apart from a few larger, well known lakes including Pine, Clearwater, Upper LaSalle, Long, Long Lost and Lomond, Clearwater County lakes are generally smaller lakes nearly unknown outside of the county and receive variable recreational use primarily from local residents. This reduces the risk of infection for many of our lakes.

Up to this time Clearwater County has not taken an active role in AIS prevention. Surveys of residents, traffic counters at lakes and risk assessments of key lakes could help Clearwater County better understand the issues and risks for our lakes and be more effective in our AIS Prevention activities.

ACTIONS

Table 1. Actions Clearwater County plans to implement in order to help prevent the spread of AIS. In the following table, where applicable, related actions and elements from the state plan are cross-referenced.

<u>Assess the county's resources and risk of AIS introduction</u>						
<u>Action for county plan</u>	<u>How action supports AIS prevention</u>	<u>Element in state plan</u>	<u>Action in state plan</u>	<u>Timeline</u>	<u>Actions</u>	<u>Budget Estimate</u>
<u>Understand the variety of pathways of introduction to local waters.</u>	<u>Knowing the common pathways by which AIS can be spread is essential to effective prevention.</u>	<u>Prevention – Understand Risks</u>	<u>I-1-c</u>	<u>2015 - ongoing</u>	<u>Attend training, workshops</u>	<u>\$2,000.00</u>
<u>Create a comprehensive list (using MNDNR, USFS and other lists) of water bodies that are designated as infested, if any, in the county. Develop an AIS risk assessment rating for county lakes to aid in prioritization. Contract with RMB to help with this. Identify linkages to other water bodies. Work with GIS resources to complete this.</u>	<u>Some AIS travel or are more easily transported between infested waters and other connected water bodies; knowing these linkages will help prioritize prevention resources.</u>	<u>Prevention – Understand Risks</u>	<u>I-1-c</u>	<u>2015</u>	<u>GIS/field checks 12 hours @50 = \$600; RMBEL lake assessment \$150/lake for ~ 20 lakes</u>	<u>\$3,600.00</u>
<u>Install traffic counters at select public accesses. Coordinate with the County Highway Dept/MnDOT to obtain traffic counters for no/little cost.</u>	<u>This action will help the county prioritize resources in the future by quantifying the frequency of use at different water bodies.</u>	<u>Prevention – Understand Risks</u>	<u>I-1-c</u>	<u>2015- ongoing</u>	<u>traffic counters - \$3800; tablet - \$2000; 750 miles - \$420</u>	<u>\$7,750.00</u>

AIS Prevention and Enforcement Activities and Resources

Action for county plan	How action supports AIS prevention state plan	Element in state	Action in	Timeline	Actions	Budget Estimate
<p>A. Ensure the county's peace officers, volunteers, water safety patrol staff etc., have been trained to enforce and educate about AIS laws. Increase the number of inspectors within the county.</p> <p>B. Ensure that local authorities are aware of state regulations that prohibit transport and/or harvesting of prohibited invasive species, aquatic plants, and water from designated infested waters..</p>	<p>This action will extend the capacity of local enforcement to ensure compliance with and understanding of AIS laws.</p> <p>Consistent enforcement of AIS regulations aimed at containment will help to prevent the further spread of AIS.</p>	<p>Prevention –</p> <p>Enforcement Early</p> <p>Detection, Rapid</p> <p>Response, and</p> <p>Containment –</p> <p>Enforcement</p>	<p>I-6-b</p> <p>II-10-c</p>	<p>2015</p>	<p>organize ais training for enforcement personnel 8 staff x 16 hours @ \$50/hr</p>	<p>\$6,400.00</p>
<p>Initiate watercraft inspection program within the county by hiring authorized watercraft inspectors through a delegation agreement with the MNDNR. Utilize employment agency for the inspector program. 2015 hours would be for ~120/week, divided amongst Lakes Itasca, 28 hrs (see appendix A); Long, 20 hrs; LLL 10 hrs; Lomond, 20 hrs; Pine, 20 hrs, LaSalle, 12 hrs; Clearwater 10 hrs. This may be adjusted during the summer.</p>	<p>Watercraft inspectors can help spread <i>Stop Aquatic Hitchhikers!</i> and other prevention messages to boaters and anglers to help prevent the spread of AIS.</p>	<p>Early Detection,</p> <p>Rapid Response,</p> <p>and Containment</p> <p>– Public</p> <p>Awareness</p>	<p>II-8-a</p>	<p>2015</p>	<p>120 inspector hours/week @ \$16.42/hr for 19 weeks plus 100 floating hours = \$39080 at Itasca, long, lomond, LaSalle, clearwater, pine, LLL - :supplies \$360 per site: SWCD time @ \$35/hr</p>	<p>\$42,200.00</p>
<p>Investigate the cost and feasibility of renting decontamination trailers for use in cleaning boats and equipment used in infested lakes coming to/within the county during special events or times. Investigate feasibility to upgrade a local carwash to meet decontamination standards. Promote boat washing with a simple garden hose when possible.</p>	<p>Boat washing and decontamination of watercraft is a key tool in preventing AIS spread.</p>		<p>N/A</p>		<p>cost unknown</p>	

Increase public awareness and participation in prevention

Action for county plan	How action supports AIS prevention	Action in state plan	Timeline	Actions	Approximate Budget	
<u>Train county/city field staff (e.g., zoning, septic system, land department, highway department) on practices to avoid spreading invasive species. Also train on management practices that will maintain and/or create diverse, native landscapes that are resilient to invasive species. Develop methods and local training sessions to reduce risk of invasive species introduction through government activities.</u> <u>operations that could contribute to AIS spread.</u>	County staff can take simple steps to prevent AIS spread or new introductions, and can also set an example for and broaden partnerships with businesses and individuals in the county. Making the environment more resistant to AIS can help prevent AIS infestation. The county will help prevent AIS spread by developing and sharing new risk-reduction methods and by identifying actions and	Prevention – Research and Technologies	I-7-d I-10-a	May-15	organize 2 training opportunities for 5 staff @ 10 hours each @ \$50/hr	\$2,500.00
<u>Ensure that local businesses are reducing/eliminating the risk of AIS spread in their operations; for example, lake service providers are now required to be certified by the MNDNR. Include contractors and Companies that might be engaged in risk operations such as shoreline restorations, pipeline maintenance and installation, utilities, road construction, etc.</u>	The day-to-day operations of some businesses, whether regulated or not, can pose a risk of AIS spread.	Prevention – Research and Technologies	I-7-d	2015	8 hours- organize 1 training event for business groups, providers, lake associations and others; develop contact list: 30 hours@ \$35.	\$1,500.00
<u>Develop/distribute educational materials targeted to buyers and sellers of aquatic plants, animals, boats, docks etc.</u> <u>messages using proven marketing, communication, and education strategies.</u>	Target AIS prevention efforts using developed or existing (e.g. <i>Stop Aquatic Hitchhikers!</i>) logos and prevention		II-8-e			

Develop or adopt existing programs for schools and informal education materials for events to support youth education about AIS. promote community engagement through youth stewardship projects.	Encourage use of K-12 and non- formal education resources (e.g., <i>Nab the Aquatic Invader</i>) in science-based education, and	Prevention – Public Awareness	I-8-g	2015	prepare curricula for presentations and materials for distribution 75 hours to prepare and present	\$3,750.00
Develop and distribute AIS prevention messages targeting those who launch watercraft from their own private residential access.	Many watercraft enter lakes and rivers from private residential property and are not reached by education and prevention efforts directed at public accesses and cooperating private non- residential accesses. Work to enlist lake associations, environmental and conservation organizations, resorts and their associations, and realtors to promote and coordinate AIS prevention messages.	Prevention – Public Awareness	I-8-a & e	2015		
Collaborate with other counties, watershed groups, and/or jurisdictions whose water bodies connect to the county’s to develop a regional approach to AIS prevention. Complete an AIS prevention outreach campaign with local appeal, working with nearby counties to produce media clips for use in movie theaters, radio ads, websites, TV infomercials, etc. Also include targeting nonresidents in the outreach campaign.	Because AIS and the individuals who could transport them do not stay inside county borders, effective coordination is necessary to prevent AIS spread. Cross county coordination will help to leverage resources. Ensuring that individuals (both residents and nonresidents) are aware of AIS prevention measures that they can take in the course of their daily activities will help to reduce the risk of AIS spread.	Prevention – Regional Approaches Early Detection, Rapid Response, and Containment – Public Awareness	I-9-a	2015	produce video footage/images for use in public media info -base cost @\$15,000 Additional costs to target local lake users @ \$00.00 . 18 hours @\$35/hr	\$15,630.00
Train and utilize seasonal volunteer educators, trained by the MNDNR and/or Minnesota Sea Grant, to distribute educational materials at selected public access points particularly at high priority landings during peak usage times (holidays and weekends).	Targeting educational efforts (e.g. <i>Stop Aquatic Hitchhikers!</i>) to the users of a water body may help prevent AIS spread from or into that water body.		II-8-a	May-15		\$300.00

<p><u>Inventory current signage at watercraft launches, roadways and county entry points. Make sure signage is present, current and consistent.</u></p>	<p><u>Knowing which bodies of water have appropriate signage is an essential component to educating the public about AIS.</u></p>	<p><u>2015</u></p>	<p><u>staff time and mileage (\$160)24 hours @ \$35 = \$840</u></p>	<p><u>\$1,000.00</u></p>	
<p><u>Work with the Stop Aquatic Hitchhikers campaign to strengthen awareness of AIS issues in the county.</u></p>	<p><u>Consistent messaging such as that from the Stop Aquatic Hitchhikers! ads will help educate individuals about their role and actions for AIS prevention.</u></p>	<p><u>II-8-d</u></p>		<p><u>??</u></p>	
<p><u>Develop tailored messages aimed at lake-related businesses (e.g., home builders, developers) and local government staff (e.g., county planners) regarding AIS prevention.</u></p>	<p><u>Ensuring that individuals are aware of AIS prevention measures that they can take in the course of their daily work will help to reduce the risk of AIS spread.</u></p>	<p><u>II-8-f</u></p>		<p><u>??</u></p>	
<p><u>Coordinate with the MNDNR, Clearwater County, Itasca Park and others to publicize new infestations at access sites, in lake association newsletters, and other local publications.</u></p>	<p><u>Timely and accurate notice of new AIS infestations empowers the public to help prevent the further spread of AIS.</u></p>	<p><u>Early Detection, Rapid Response, and Containment – Public Awareness Early Detection, Rapid Response, and Containment – Risk Reduction</u></p>	<p><u>II-8-i II-15-c</u></p>	<p><u>on-going</u></p>	<p><u>??</u></p>

Increase available resources and leverage partnerships

Action for county plan	How action supports AIS prevention	Action in state plan	Timeline	Actions	Approximate Budget
<u>Assist with funding local outreach and monitoring efforts by entities other than the county including (but not limited to) volunteers, DNR, USFS, Lake Associations, Minnesota Sea Grant, Grand Portage, outfitters, universities, colleges, wilderness camps, NRRi, commercial fisherman and special interest fishing groups.</u>	<u>Overall AIS prevention efforts can be strengthened by building the capacity of other local organizations (and nearby counties) to conduct AIS outreach and monitoring activities.</u>	<u>II-1-h</u>	<u>II-1-h</u>	<u>on-going</u>	<u>\$2,000.00</u>
<u>Investigate the possibility of a grant program to support local efforts to prevent the spread of AIS.</u>	<u>By leveraging existing capacity of other local organizations, the county can maximize the effectiveness of its AIS prevention funds.</u>	<u>IV-3-c</u>	<u>fall 2015-2016</u>		
<u>Develop and maintain contacts with other local organizations, businesses, lake associations, environmental and conservation organizations, resorts and their associations, realtors, and government entities</u>	<u>The participation of local partners is necessary for a county's AIS prevention plan to be effective.</u>	<u>IV-3-a</u>			
<u>Support the viability of local organizations such as Lake Associations to create partners in implementing the county's AIS prevention plan.</u>	<u>Additional partnerships among local organizations will increase the county's capacity to implement its AIS prevention plan.</u>	<u>IV-3-b</u>		<u>2015 - ongoing</u>	
<u>Seek additional funds to implement unfunded actions in county prevention plan. Be conscious of matching funding opportunities.</u>	<u>The effectiveness of AIS prevention actions can be limited by inadequate financial resources.</u>	<u>I-11-a</u>	<u>ongoing</u>		

Early Detection and Rapid Response Activities

Action for county plan	How action supports AIS prevention state plan	Element in state plan	Action in	Timeline	Actions	Approximate Budget
Obtain and distribute Watch ID cards from the Minnesota Sea Grant Program or other similar materials. Reach out to bait shops.	Finding new infestations of AIS early is key to preventing further spread, and ensuring that many people who use water resources know what, where and how to look for AIS maximizes the chance of early detection.					
			II-1-b			
Encourage county staff, businesses, and individuals to submit samples of suspected AIS to the MNDNR.	The county can support early detection and prevention efforts by helping the MNDNR to quickly confirm new infestations of AIS.	Early Detection, Rapid Response	II-1-d			
Perform aquatic vegetation surveys to identify unknown sources of AIS and to assess plant community health in lakes and rivers.	Identifies infestations of AIS so they are not spread to other local lakes or rivers. Allows for early management response to lessen impact of discovered AIS.	Early Detection		2015	veg rake; \$1500/lake for 6 lakes	\$9,500.00
Perform veliger sampling on area lakes to identify presence of zebra mussels in area lakes and rivers.	Identifies infestations of AIS so they are not spread to other local lakes or rivers. Allows for early management response to lessen impact of discovered AIS.	Early Detection		2015-ongoing	4 veliger nets; \$200/sample x 2 for 6 lakes	\$3,200.00
Approve an early detection and rapid response program with county acting in a resource support agreement with the MNDNR.	This program will ensure that new infestations are properly reported and rapid response is deployed, if required.	Early Detection, Rapid Response, and Containment – Detection	II-1-d		unknown cost/timeline	
Augment communication and reporting mechanisms for citizen monitoring of lakes and rivers.	Ensuring that local discoveries of AIS are quickly communicated to the right people will maximize prevention efforts related to new infestations.	Early Detection, Rapid Response, and Containment – Detection	II-1-j			

<u>Cultivate and maintain partnerships with organizations interested in AIS prevention (e.g., lake associations) to support AIS surveys in water bodies (infested and non-infested) and on docks and lifts. Veliger monitoring</u>	<u>Leveraging the resources of existing organizations will help to find new AIS infestations more efficiently and to prevent further spread of those AIS.</u>	<u>Early Detection, Rapid Response, and Containment</u> <u>– Prioritize</u>	<u>II-3-b</u>	<u>volunteer training, materials (\$1/cement block x 100 blocks), SWCD time @\$35/hr</u>	<u>\$1,000.00</u>
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AIS Planning and Activities for Future Consideration

Action for county plan	How action supports AIS prevention	Element in state plan	Action in state plan	Timeline	Actions	Approximate Budget
<u>Evaluate AIS prevention efforts and cooperative relationships for possible improvements. Use post event evaluations.</u>	<u>Participants at all levels can share input and new ideas to continuously improve the AIS prevention plan for the local area.</u>					\$0.00
<u>Investigate new tools and ideas (such as log books for boats) for identifying AIS pathways.</u>	<u>Identifying pathways is a key tool in preventing AIS spread.</u>	N/A				

\$102,330.00

2015,
2014 **\$100,104**
\$45,046

IMPLEMENTATION

It is the intent of the County that at least for the first year, the County will maintain the funds and be the fiscal manager and the Clearwater SWCD shall coordinate and implement the plan actions. The SWCD shall invoice to the County for reimbursement of their time and other expenses associated with action implementation.

Fund Reserve

State AIS Prevention Aid funds not budgeted for, or used will be maintained in an AIS fund to be used for unexpected expenses or events, such as detection of AIS in the county, to augment plan item budgets if needed, or to engage in other new activates which may arise and added to the plan.

UPDATING AND AMENDING THE PLAN

This plan will be reviewed annually and updated as needed.

APPENDICES

Appendix A: 2015 Lakes to be Inspected

2015 hours would be for ~120/week, divided amongst Lakes Itasca, 28 hrs; Long, 20 hrs; LLL 10 hrs; Lomond, 20 hrs;

Pine, 20 hrs, LaSalle, 12 hrs; Clearwater 10 hrs. This may be adjusted.

Per Board

review 3/31/2015, Lake Itasca will be managed by Itasca State Park. Up to \$6384 will be directed to Itasca State Park for inspections.

Appendix B: County water resources

Table 3. Characterization of Lakes in Clearwater County.

<u>Number of lakes more than 10 acres in size</u>	
<u>Number of lakes designated as infested with aquatic invasive species</u>	<u>none</u>
<u>Total number of public water accesses</u>	<u>14 Carry-in +30 Trailer Total</u>
<u>Number of public accesses owned or operated by MNDNR</u>	
<u>Number of public accesses owned or operated by Clearwater County</u>	
<u>Number of public accesses owned or operated by a township</u>	
<u>Number of public accesses owned or operated by a city</u>	
<u>Number of public accesses concrete pads</u>	
<u>Number of public accesses with gravel</u>	
<u>Number of public accesses dirt</u>	
<u>Number of Resorts</u>	
<u>Estimated number of non-public water accesses</u>	<u>Currently</u>

Appendix C: Glossary of Acronyms used in plan:

- MNDNR: Minnesota Department of Health (MDH) groundwater quality monitoring program to look for concentrations of pesticides used on crops. Natural Resources
 - ~~Develop a ground water quality monitoring program. Increase the frequency and number of tests of Clearwater County's ground water resources~~
 - ~~Develop and use a ground water quality database to: 1) show the distribution of water quality problems, 2) characterize aquifers of concern and 3) identify factors contributing to water quality problems.~~

Priority Watersheds: All Watersheds are a priority

~~Priority Concern 3: Exotic and Invasive Species Management~~

~~Noxious weeds have and are becoming prolific in areas of Clearwater County. Spotted Knapweed and Leafy Spurge, for example, are very successful at establishing themselves in the light sandy soils that cover a large portion of our county. These weeds reduce biodiversity of native species, and are much less effective at stabilizing soil than native species.~~

~~Although only a few aquatic invasive species have been identified in any Clearwater County waters, a larger number of aquatic invasive species have been identified outside of, and in close proximity to, the county boundaries. The impacts will be economic and/or environmental as native species are displaced from their natural place in the ecosystem. Understanding the risk posed by these invaders will help to establish actions that can be taken to keep them from the County's water resources.~~

- ~~• Identify any new or undiscovered aquatic invasive species that have moved into Clearwater County.~~
- ~~• Work to educate citizens on understanding the potential risks of aquatic invasive or exotic species and other noxious weed types in the County~~
- ~~• Work with the Clearwater County Weed Task Force, County Weed Specialist, and MN DNR Invasive Species Specialists to help identify problem areas around the County.~~

~~Priority Watersheds: All watersheds are considered priority~~

Priority ~~Concern 4: Land Use Impacts on Water Quality~~

~~Agricultural land, forested land, and developed areas have the potential for negative impacts on the water resources in Clearwater County. Forested land covers 48% of the land in Clearwater County; this constitutes the largest land cover type in the County. Logging and harvesting of these forest resources is very important to the economy of Clearwater County. Poor implementation of timber harvesting BMPs can result in environmental degradation. Agricultural land covers 18% of land in Clearwater County. Agricultural activities on crop and pasture land without proper best management practice implementation can have extensive negative impacts on water quality. BMPs can serve to reduce these impacts significantly. Although the developed areas are minute in Clearwater County their potential to negatively impact water quality is great.~~

~~Poorly planned development can negatively affect surface and ground water quality.~~

~~Objective A: Proper Land Management on Agricultural Lands.~~

- ~~• Reduce the impact that runoff from feedlots can have on our water resources, especially those in close proximity to impaired waters.~~
- Installation and utilization of Agricultural BMPs through the use of existing and future state and federal cost share programs to protect resources from runoff and nutrient loading.

~~Objective B: Proper Management of Forest Resources~~

- ~~• #1: Support the recently adopted Clearwater County Resource Management Plan that addresses management concerns and strategies for the 95,000 acres of County managed land in Clearwater County.~~
- Promote Forest Stewardship plans to private landowners.
- Encourage landowners to look at Forest BMPs for forestry management and other types of forest management programs.
- Promote state & federal cost share programs to assist landowners in implementing forest management BMPs that protect or improve water quality

~~Objective C: Proper Land Management in Developed and Developing Areas~~

- Reduce the pollution impact from city stormwater entering our waterways.
- Reduce the impacts Individual Sewer Treatment Systems (ISTS) can have on our ground water and surface water.

- ~~Reduce the amount of soil erosion from new construction sites with increased utilization of erosion control measures at these sites.~~

~~Priority Watersheds: All watersheds listed as impaired by MPCA.~~

~~Priority Concern Identification~~

~~Clearwater County Local Water Management Task Force~~

~~The Task Force for the Clearwater County Water Plan Update met on January 30, 2008.~~

~~The agenda for the meeting included the following:~~

- ~~History of Clearwater County Water Planning~~
- ~~Review of 2007 water plan activities~~
- ~~Overview of the Issues and Accomplishments of the last water plan~~
- ~~Overview of the process and expectations for the new water plan~~

~~Selection of priority concerns for the new water plan~~

~~Priority Concerns~~

~~Members of the Task Force were asked to answer the following question: *What are the Priority Concerns for water resources in Clearwater County?* Each member was given the opportunity to provide a priority concern. The responses were written down so participants could view all answers. Each member was then given one orange dot and two red dots. The orange dot represented their top priority and the red dots represented high priority concerns. The issues could be lumped into three broad categories: *Surface Water, Groundwater, and Knowledge/Education*. It is important to note that all answers received are important. The following is the list of ranked priorities based on the number of votes received:~~

~~*Top Priorities*~~

- ~~Finding and implementing solutions to water quality problems — 11 votes~~
- ~~Agricultural activities — 8 votes~~
- ~~Coordination between agencies, government, associations, etc. — 7 votes~~
- ~~Buffers for shore land development — 6 votes~~
- ~~Local awareness/education to solve water problems (i.e. legal, regulatory, informational, etc.) — 6 votes~~
- ~~Maintain a high quality of life and economic viability — 5 votes~~

Middle Priorities

- ~~• Educate the public on how everyday activities affect water quality — 4 votes~~
- ~~• Flooding (i.e. City of Clearbrook) — 4 votes~~
- ~~• Data (i.e. water quality analysis) — 3 votes~~
- ~~• Implementing best practices for improving water quality (i.e. buffers) — 3 votes~~
- ~~• Enforcement Issues — 2 votes~~
- ~~• Local contact (staff support) between MPCA and Clearwater County of feedlot issues — 2 votes~~
- ~~• Water quality on Long Lost Lake (i.e. high water level, erosion concerns, etc.) — 2 votes~~

Lower Priorities

- ~~• Forestry management — 1 vote~~
- ~~• Septic systems — 1 vote~~
- ~~• Surface water quality — 1 vote~~
- ~~• Water quality in Itasca State Park — 1 vote~~
- ~~• Water rights — 1 vote~~
- ~~• Address high quality streams that have naturally low oxygen levels — 0~~
- ~~• Ground water quality and quantity — 0 votes~~
- ~~• Having a useful, working water plan — 0 votes~~
- ~~• Impact of land use changes on water quality — 0 votes~~
- ~~• Water quality of Clearwater Lake — 0 votes~~

Summary of Agency Input

~~Agency: Red Lake Department of Natural Resources~~

~~Priority Concern 1: Land Use Impacts on Water Quality in the Clearwater River~~

~~Priority Concern 2: Storm water Management~~

~~Agency: White Earth Department of Natural Resources~~

~~Priority Concern 1: Ensuring pollution/runoff is not entering Lower Rice Lake.~~

~~Priority Concern 2: Wetland protection/education~~

~~Priority Concern 3: Groundwater~~

~~Priority Concern 4: Surface water~~

1

~~Agency: Minnesota Board of Water and Soil Resources~~

~~Priority Concern 1: Waters listed as impaired for fecal coliform.~~

~~Priority Concern 2: Forest Land Management.~~

~~Priority Concern 3: Land Use Impacts on Lake and Stream Water Quality.~~

~~AgencyMnDOT: Minnesota Department of Agriculture **Priority Concern 1:** Manure Management and ISTS~~

~~**Priority Concern 2:** Agricultural chemical use and potential impacts to unconfined shallow groundwater.~~

~~**Priority Concern 3:** Agricultural chemical use and potential impacts to surface water.~~

~~Agency: Minnesota Department of Health~~

~~**Priority Concern 1:** Protect ground water based drinking water sources within Clearwater County~~

~~**Priority Concern 2:** Sealing unused, unsealed wells~~

~~**Priority Concern 3:** Develop a local ground water quality data base.~~

~~Agency: Minnesota Department of Natural Resources Transportation MPCA **Priority Concern**~~

~~**1:** Aquatic invasive species~~

~~**Priority Concern 2:** Water level management and preservation of the shallow lakes in Clearwater County.~~

~~Agency: Minnesota Pollution Control Agency SWCD: Soil and Water Conservation District GIS Geographical Information~~

~~**Priority Concern 1:** Impaired Waters/Total Maximum Daily Loads (TMDL)~~

~~**Priority Concern 2:** Environmental Data Access~~

~~System NRRI: Natural Resources Research Institute~~

~~**Priority Concern 3:** Water Quality Monitoring Coordination~~

Public Meeting

~~A public meeting was held at the Clearwater County Courthouse on March 18, 2008, at 6:00 pm. Public service announcements were in the Farmers Independent on March 5 and March 12. Local radio stations also announced the meeting.~~

~~Despite efforts to inform the public, nobody showed up at the meeting.~~

Citizen Survey

~~A survey was developed for the general public. In an effort to reach as many people as possible in the County, surveys were made available at the offices of the Soil and Water Conservation District, various County offices, and on-line at: <http://www.hrdc.org/>. Surveys were also sent to all townships and also lake associations in the County. A total of 28 surveys were returned by the deadline of March 28, 2008. The results provide a voice for citizens of Clearwater County on the issue of water quality. The following is a summary of the Citizen Survey:~~

~~(Question 1) What are the top four problems with water quality in your area of Clearwater County?~~

- ~~• The top problem identified was "Water Clarity," followed closely by "Erosion" and "Runoff."~~

- ~~Another issue that emerged, listed as "Other" was the overwhelming concern about Aquatic Invasive plants entering our area lakes.~~

~~(Question 2) Which water resource is most threatened in your area?~~

- ~~Lakes were identified as the resource most threatened, followed by Wetlands, Streams/Rivers, and Groundwater.~~

~~(Question 3) Additional Comments?~~

- ~~Several of the additional comments were clarifications or additions concerning surface water issues.~~
- ~~Other additional comments included concerns about chemicals and groundwater contamination, regulations and over management, and wetlands.~~

~~Below is a summary of the survey answers.~~

Answer Options	Response Percent	Response Count
Failing septic systems	25.0%	7
Development pressure/impacts	25.0%	7
Lack of environmental education	21.4%	6
Natural habitat destruction	28.6%	8
Declining water clarity	39.3%	11
Erosion	32.1%	9
Over-application of fertilizers	17.9%	5
Stormwater/Drainage management	17.9%	5
Contaminated runoff	32.1%	9
Lack of regulations	7.1%	2
Groundwater contamination	28.6%	8
Other*	39.3%	11
	Other (please specify)	11
	<i>answered question</i>	28
	<i>skipped question</i>	0

*Responses to "Other"

Number	Other (please specify)
1	control of invasive aquatic species in lake
2	aquatic weed growth
3	Surface water contamination
4	stricter regulations on what goes into City water supply
5	abandoned buildings in water on LLL
6	None
7	Control of exotic and invasive species
8	Control of exotic and invasive species (aquatic and/or terrestrial)
9	Control of exotic and invasive species (aquatic and/or terrestrial)
10	Control of exotic and invasive species AND the increasing amount of weeds and lily pads
11	Control of exotic and invasive species (aquatic and/or terrestrial)

[Appendix D: Selected Minnesota Laws Related to Water-related Equipment,](#)

Watercraft Inspections, and Decontamination (August 1, 2013)

M.S. 84D.01 DEFINITIONS.

Subdivision 1. Terms. For the purposes of this chapter, the following terms have the meanings given them.

Subd. 2. Aquatic macrophyte. "Aquatic macrophyte" means a macroscopic non-woody plant, either a submerged, floating leafed, floating, or emergent plant that naturally grows in water .

Subd. 3a. Decontaminate.

"Decontaminate" means to wash, drain, dry, or thermally or otherwise treat water-related equipment in order to remove or destroy aquatic invasive species using the "Recommended Uniform Minimum Protocols and Standards for Watercraft Interception Programs for Dreissenid Mussels in the Western United States" (September 2009) prepared for the Western Regional Panel on Aquatic Nuisance Species, or other protocols developed by the commissioner.

Subd . 8a . Introduce .

"Introduce" means to place, release, or allow the escape of a nonnative species into a free-living state . Introduce does not include: the immediate return of a nonnative species to waters of the state from which the nonnative species was removed; or the seasonal return of nonnative species attached to water-related equipment, such as a dock or boat lift, that has been stored on riparian property and directly returned to the same waters of the state from which the water- related equipment was removed .

Subd. 8b. Inspect.

"Inspect" means to examine water-related equipment to determine whether aquatic invasive species, aquatic macrophytes, or water is present and includes removal, drainage, decontamination, or treatment to prevent

the transportation and spread of aquatic invasive species, aquatic macrophytes, and water

.Subd. 8c. Inspector.

“Inspector” means: (1) an individual trained and authorized by the commissioner to inspect water-related equipment under section 84D.105, subdivision 2, paragraph (a); or (2) a conservation officer or a licensed peace officer.

Subd. 16. Transport.

“Transport” means to cause or attempt to cause a species to be carried or moved into or within the state, and includes accepting or receiving the species for transportation or shipment . Transport does not include:

- (1) the movement of infested water or a nonnative species within a water of the state or to a connected water of the state where the species being transported is already present; or
- (2) the movement of a nonnative species attached to water-related equipment or other water-related structures from a water of the state to the shore of riparian property on that water or the return of water-related equipment or structures from the shore into the same water of the state .

Subd. 18a. Water-related equipment.

“Water-related equipment” means a motor vehicle, boat, watercraft, dock, boat lift, raft, vessel, trailer, tool, implement, device, or any other associated equipment or container, including but not limited to portable bait containers, live wells, ballast tanks except for those vessels permitted under the Pollution Control Agency vessel discharge program, bilge areas, and water-hauling equipment that is capable of containing or transporting aquatic invasive species, aquatic macrophytes, or water.

M.S. 84D.02 INVASIVE SPECIES MANAGEMENT PROGRAM FOR AQUATIC PLANTS AND WILD ANIMALS . Subdivision

1. Establishment.

The commissioner shall establish a statewide program to prevent and curb the spread of invasive species of aquatic plants and wild animals . The program must provide for coordination among governmental entities and private organizations to the extent practicable . The commissioner shall seek available federal funding and grants for the program.

M.S. 84D.05 PROHIBITED INVASIVE SPECIES. Subdivision 1. Prohibited activities.

A person may not possess, import, purchase, sell, propagate, transport, or introduce a prohibited invasive species, except:

- (1) under a permit issued by the commissioner under section 84D.11;
- (2) in the case of purple loosestrife, as provided by sections 18.75 to 18.88;
- (3) under a restricted species permit issued under section 17.457;
- (4) when being transported to the department, or another destination as the commissioner may direct, in a sealed container for purposes of identifying the species or reporting the presence of the species;
- (5) when being transported for disposal as part of a harvest or control activity under a permit issued by the commissioner according to section 103G.615, when being transported for disposal when specifically authorized under a commercial fishing license issued by the commissioner according to section 97A.418, 97C.801, 97C.811, 97C.825, 97C.831, or 97C.835, or when being transported as specified by the commissioner;
- (6) when the specimen has been lawfully acquired dead and, in the case of plant species, all seeds are removed or are otherwise secured in a sealed container;
- (7) in the form of herbaria or other preserved specimens;
- (8) when being removed from watercraft and equipment, or caught while angling, and immediately returned to the water from which they came; or
- (9) as the commissioner may otherwise prescribe by rule .

Subd. 2. Seizure.

Under section 97A.221, the commissioner may seize or dispose of all specimens of prohibited invasive species unlawfully possessed, imported, purchased, sold, propagated, transported, or introduced in the state.

M.S. 84D.07 REGULATED INVASIVE SPECIES.

Except as provided in rules adopted under section 84D.12, subdivision 2, clause (1), a person may not introduce a regulated invasive species without a permit issued by the commissioner.

M.S. 84D.09 AQUATIC MACROPHYTES.

Subdivision 1. Transportation prohibited.

Unless specifically authorized under a license or permit issued by the commissioner, a person may not transport aquatic macrophytes except as provided in this section .

Subd. 2. Exceptions.

Unless otherwise prohibited by law, a person may transport aquatic macrophytes:

- (1) that are duckweeds in the family Lemnaceae;
- (2) for purposes of constructing shooting or observation blinds in amounts sufficient for that purpose, provided that the aquatic macrophytes are emergent and cut above the waterline;
- (3) when legally purchased or traded by or from commercial or hobbyist sources for aquarium, wetland or lakeshore restoration, or ornamental purposes;
- (4) when harvested for personal or commercial use if in a motor vehicle;
- (5) to the department, or another destination as the commissioner may direct, in a sealed container for purposes of identifying a species or reporting the presence of a species;
- (6) that are wild rice harvested under section 84.091;

- [\(7\) in the form of fragments of emergent aquatic macrophytes incidentally transported in or on watercraft or decoys used for waterfowl hunting during the waterfowl season; or](#)
- [\(8\) when removing water-related equipment from waters of the state for purposes of cleaning off aquatic macrophytes before leaving a water access site .](#)

[M.S. 84D.10 WATERCRAFT REQUIREMENTS AND PROHIBITIONS.](#)

[Subdivision 1. Launching prohibited.](#)

[A person may not place or attempt to place into waters of the state a watercraft, a trailer, or aquatic plant harvesting or control equipment that has aquatic macrophytes or prohibited invasive species attached except as provided in this section.](#)

[Subd. 3. Removal and confinement.](#)

[\(a\) A conservation officer or other licensed peace officer may order:](#)

- [\(1\) the removal of aquatic macrophytes or prohibited invasive species from water-related equipment before it is placed into waters of the state;](#)
- [\(2\) confinement of the water-related equipment at a mooring, dock, or other location until the water-related equipment is removed from the water;](#)
- [\(3\) removal of water-related equipment from waters of the state to remove prohibited invasive species if the water has not been designated by the commissioner as being infested with that species .; and](#)
- [\(4\) a prohibition on placing water-related equipment into waters of the state when the water-related equipment has aquatic macrophytes or prohibited invasive species attached in violation of subdivision 1 or when water has not been drained or the drain plug has not been removed in violation of subdivision 4 .\(b\) An inspector who is not a licensed peace officer may issue orders under paragraph \(a\), clauses \(1\), \(3\), and \(4\) .](#)

[Subd. 4. Persons transporting water-related equipment.](#)

[\(a\)When leaving waters of the state a person must drain water-related equipment holding water and live wells and bilges by removing the drain plug before transporting the water-related equipment off the water access site or riparian property.](#)

[\(b\)Drain plugs, bailers, valves, or other devices used to control the draining of water from ballast tanks, bilges, and live wells must be removed or opened while transporting water-related equipment .](#)

[\(c\) Emergency response vehicles and equipment may be transported on a public road with the drain plug or other similar device replaced only after all water has been drained from the equipment upon leaving the water body.](#)

[\(d\)Portable bait containers used by licensed aquatic farms, portable bait containers when fishing through the ice except on waters designated infested for viral hemorrhagic septicemia, and marine sanitary systems are exempt from this subdivision.](#)

[\(e\) A person must not dispose of bait in waters of the state .](#)

[\(f\) \) A boat lift, dock, swim raft, or associated equipment that has been removed from any water body may not be placed in another water body until a minimum of 21 days have passed .](#)

[\(g\)A person who transports water that is appropriated from non-infested surface water bodies and that is transported by a commercial vehicle, excluding watercraft, or commercial trailer, which vehicle or trailer is specifically designed and used for water hauling, is exempt from paragraphs \(a\) and \(b\), provided that the person does not discharge the transported water to other surface waters or within 100 feet of a surface water body.](#)

[\(h\)A person transporting water from non-infested surface water bodies for firefighting or emergencies that threaten human safety or property is exempt from paragraphs \(a\) and \(b\) .](#)

[M.S. 84D.105 INSPECTION OF WATER-RELATED EQUIPMENT.](#)

[Subdivision 1. Compliance inspections.](#)

[Compliance with aquatic invasive species inspection requirements is an express condition of operating or transporting water-related equipment . An inspector may prohibit an individual from placing or operating water-related equipment in waters of the state if the individual refuses to allow an inspection of the individual's water-related equipment or refuses to remove and dispose of aquatic invasive species, aquatic macrophytes, and water .](#)

[Subd. 2. Inspector authority.](#)

[\(a\) The commissioner shall train and authorize individuals to inspect water-related equipment for aquatic macrophytes aquatic invasive species, and water . The commissioner may enter into a delegation agreement with a tribal or local government where inspection authority as provided under paragraphs \(b\), \(g\), and \(h\) is delegated to tribal and local governments that assume all legal, financial, and administrative responsibilities for inspection programs on some or all public waters within their jurisdiction.](#)

[\(b\) Inspectors may visually and tactilely inspect watercraft and water-related equipment to determine whether aquatic invasive species, aquatic macrophytes, or water is present . If a person transporting watercraft or water-related equipment refuses to take required corrective actions or fails to comply with an order under section 84D.10, subdivision 3, an inspector who is not a licensed peace officer shall refer the violation to a conservation officer or other licensed peace officer.](#)

[\(c\) In addition to paragraph \(b\), a conservation officer or other licensed peace officer may inspect any watercraft or water-related equipment that is stopped at a water access site, any other public location in the state, or a private location where the watercraft or water-related equipment is in plain view, if the officer determines there is reason to believe that aquatic invasive species, aquatic macrophytes, or water is present on the watercraft or water-related equipment.](#)

[\(d\)Conservation officers or other licensed peace officers may utilize check stations in locations, or in proximity to locations, where watercraft or other water-related equipment is placed into or removed from waters of the state . Any check stations shall be operated in a manner that minimizes delays to vehicles, equipment, and their occupants.](#)

M.S. 84D.13 ENFORCEMENT; PENALTIES. Subdivision 1. Enforcement.

Unless otherwise provided, this chapter and rules adopted under section 84D.12 may be enforced by conservation officers under sections 97A.205, 97A.211, and 97A.221 and by other licensed peace officers .

Subd. 2. Cumulative remedy.

The authority of conservation officers and other licensed peace officers to issue civil citations is in addition to other remedies available under law, except that the state may not seek penalties under any other provision of law for the incident subject to the citation .

Subd. 3. Criminal penalties.

(a) A person who violates a provision of sections 84D.03 or 84D.06 to 84D.11, or a rule adopted under section 84D.12, is guilty of a misdemeanor .

(b) A person who possesses, transports, or introduces a prohibited invasive species in violation of section 84D .05 is guilty of a misdemeanor . A person who imports, purchases, sells, or propagates a prohibited invasive species in violation of section 84D.05 is guilty of a gross misdemeanor .

(c) A person who refuses to obey an order of a peace officer or conservation officer to remove prohibited invasive species or aquatic macrophytes from any water-related equipment is guilty of a gross misdemeanor .

Subd. 4. Warnings; civil citations.

After appropriate training, conservation officers, other licensed peace officers, and other department personnel designated by the commissioner may issue warnings or citations to a person who:

(1) unlawfully transports prohibited invasive species or aquatic macrophytes;

(2) unlawfully places or attempts to place into waters of the state water-related equipment that has aquatic macrophytes or prohibited invasive species attached;

(3) intentionally damages, moves, removes, or sinks a buoy marking, as prescribed by rule, Eurasian water milfoil;

(4) fails to remove plugs, open valves, and drain water water-related equipment before leaving waters of the state or when transporting water-related equipment as provided in section 84D.10, subdivision 4; or

(5) transports infested water, in violation of rule, off riparian property .

Subd. 5. Civil penalties.

A civil citation issued under this section must impose the following penalty amounts:

(1) for transporting aquatic macrophytes in violation of section 84D.09, \$100;

(2) for placing or attempting to place into waters of the state water-related equipment that has aquatic macrophytes attached, \$200;

(3) for unlawfully possessing or transporting a prohibited invasive species other than an aquatic macrophyte, \$500;

(4) for placing or attempting to place into waters of the state water-related equipment that has prohibited invasive species attached when the waters are not designated by the commissioner as being infested with that invasive species, \$500 for the first offense;

(5) for intentionally damaging, moving, removing, or sinking a buoy marking, as prescribed by rule, Eurasian water milfoil, \$100;

(6) for failing to remove plugs, open valves, and drain water from water-related equipment, other than marine sanitary systems, before leaving waters of the state, \$100; and

(7) for transporting infested water off riparian property without a permit as required by rule, \$200 .

Subd. 6. Watercraft license suspension.

A civil citation may be issued to suspend, for up to a year, the watercraft license of an owner or person in control of a watercraft or trailer who refuses to submit to an inspection under section 84D.105 or who refuses to comply with a removal order given under this section .

Subd. 7. Satisfaction of civil penalties.

A civil penalty is due and a watercraft license suspension is effective 30 days after issuance of the civil citation. A civil penalty collected under this section must be paid to either: (1) the commissioner if the citation was issued by a conservation officer and must be credited to the invasive species account; or (2) the treasury of the unit of government employing the officer who issued the civil citation.

M.S. 86B.811 CRIMINAL PENALTIES. Subd. 1a. Petty misdemeanor.

A watercraft owner who fails to obtain or display an aquatic invasive species rules decal or a person who operates a watercraft that does not display an aquatic invasive species rule decal in violation of section 86B.508 is guilty of a petty misdemeanor.

MINNESOTA RULES 6216.0250 PROHIBITED INVASIVE SPECIES.

Subpart 1. Designation. The species in subparts 2 to 5 and any hybrids, cultivars, or varieties of the species are designated as prohibited invasive species .

Subp. 2. Aquatic plants. The following aquatic plants are designated as prohibited invasive species:

A. African oxygen weed (Lagarosiphon major) (Ridley) Moss ex Wagner; B. aquarium watermoss or giant salvinia (Salvinia molesta) Mitchell; C . Australian stonecrop (Crassula helmsii) (Kirk) Cockayne; D . brittle naiad (Najas minor) Allioni; E . curly-leaf pondweed (Potamogeton crispus) Linnaeus; F. Eurasian water milfoil (Myriophyllum spicatum) Linnaeus; G . European frog-bit (Hydrocharis morsus-ranae) Linnaeus; H . flowering rush (Butomus umbellatus) Linnaeus; I . hydrilla (Hydrilla verticillata) (Carl von Linnaeus) Royle; J. Indian swampweed (Hygrophila polysperma) (Roxburgh) T . Anders; K . purple loosestrife (Lythrum salicaria, Lythrum virgatum, or any variety, hybrid, or cultivar thereof) Linnaeus; L . water aloe or water soldiers (Stratiotes aloides) Linnaeus; and M . water chestnut (Trapa natans) Linnaeus.

N. the aquatic plants listed in Code of Federal Regulations, title 7, section 360 .200, are also designated as prohibited invasive species except for Chinese water spinach (Ipomoea aquatica)

Subp. 3. Fish. The following fish are designated as prohibited invasive species:

A. bighead carp (Hypophthalmichthys nobilis) Richardson; B . black carp (Mylopharyngodon piceus) (Richardson) Peters; C . grass carp (Ctenopharyngodon idella) Valenciennes; D . largescale silver carp (Hypophthalmichthys harmandi) Sauvage; E . northern snakehead fish (Channa argus);

F . round goby (Neogobius melanostomus); G . rudd (Scardinius erythrophthalmus) Linnaeus; H . ruffe (Gymnocephalus cernuus) Linnaeus; I . sea lamprey (Petromyzon marinus) Linnaeus; J . silver carp (Hypophthalmichthys molitrix) Valenciennes; K . tubenose goby (Proterorhinus marmoratus) Pallas;

L . western mosquitofish (Gambusia affinis) Baird & Girard; M . white perch (Morone americana) Gmelin; and N . zander (Stizostedion lucioperca) Linnaeus .

Subp. 4. Invertebrates. The following invertebrates are designated as prohibited invasive species: A . faucet snail (Bithynia tentaculata); B . New Zealand mud snail (Potamopyrgus antipodarum); C . quagga mussel (Dreissena bugensis); D . red swamp crayfish (Procambarus clarkii); and E . zebra mussel (Dreissena spp.) .

6216.0260 REGULATED INVASIVE SPECIES.

Subpart 1. Designation. The species in subparts 2 to 5 are designated as regulated invasive species .

Subp. 2. Aquatic plants. The following aquatic plants are designated as regulated invasive species: A . Brazilian waterweed (Egeria densa) Planchon; B . Carolina fanwort or fanwort (Cabomba caroliniana) A . Gray; C . Chinese water spinach (Ipomoea aquatica) Forsskal; D . parrot's feather (Myriophyllum aquaticum) (da Conceicao Vellozo) Verdcourt; E . nonnative waterlilies (Nymphaea spp.) Linnaeus, or any variety, hybrid, or cultivar thereof Native Minnesota waterlilies are: Nymphaea odorata Aiton subsp. odorata Aiton, N. leibergii Morong, and N. odorata Aiton subsp. tuberosa (Paine) Wiersema & Hellquist; and F . yellow iris or yellow flag (Iris pseudacorus) Linnaeus .

Subp. 3. Fish.

A . alewife (Alosa pseudoharengus) Wilson; B . common carp, koi (Cyprinus carpio) Linnaeus; C . goldfish (Carassius auratus) Linnaeus; D . rainbow smelt (Osmerus mordax) Mitchell; and E . tilapia (Tilapia, Oreochromis, Sartheradon spp.) .

Subp. 5. Invertebrates. The following invertebrates are designated as regulated invasive species:

A . banded mystery snail (Viviparus georgianus) I . Lea;

B . Chinese mystery snail, Japanese trap door snail (Cipangopaludina spp.) Hannibal; C . rusty crayfish (Orconectes rusticus) Girard; and D . spiny waterflea (Bythotrephes longimanus) Leydig .

Appendix E: Omnibus Tax Bill

Chapter 308, H.F.No. 3167: Omnibus tax bill 2014 Minnesota Session Laws

Article 1: Property Tax Aids and Credits

Sec. 11. Counties funded for aquatic invasive species prevention aid and required to develop guidelines for use of proceeds and provide to MNDNR.

Sec. 11. [477A.19] AQUATIC INVASIVE SPECIES PREVENTION AID.

Subdivision 1. Definitions. (a) When used in this section, the following terms have the meanings given them in this subdivision.

(b) "Aquatic invasive species" means nonnative aquatic organisms that invade water beyond their natural and historic range.

(c) "Watercraft trailer launch" means any public water access site designed for launching watercraft.

(d) "Watercraft trailer parking space" means a parking space designated for a boat trailer at any public water access site designed for launching watercraft.

Subd. 2. Distribution. The money appropriated to aquatic invasive species prevention aid under this section shall be allocated to all counties in the state as follows: 50 percent based on each county's share of watercraft trailer launches and 50 percent based on each county's share of watercraft trailer parking spaces.

Subd. 3. Use of proceeds. A county that receives a distribution under this section must use the proceeds solely to prevent the introduction or limit the spread of aquatic invasive species at all access sites within the county. The county must establish, by resolution or through adoption of a plan, guidelines for the use of the proceeds. The guidelines set by the county board may include, but are not limited to, providing for site-level management, countywide awareness, and other procedures that the county finds necessary to achieve compliance. The county may appropriate the proceeds directly, or may use any portion of the proceeds to provide funding for a joint powers board or cooperative agreement with another political subdivision, a soil and water conservation district in the county, a watershed district in the county, or a lake association located in the county. Any money appropriated by the county to a different entity or political subdivision must be used as required under this section. Each county must submit a copy of its guidelines for use of the proceeds to the Department of Natural Resources by December 31 of the year the payments are received.

Subd. 4. Payments. The commissioner of revenue must compute the amount of aquatic invasive species prevention aid payable to each county under this section. On or before August 1 of each year, the commissioner shall certify the amount to be paid to each county in the following year. The commissioner shall pay aquatic invasive species

prevention aid to counties annually at the times provided in section 477A.015. For aid payable in 2014 only, the commissioner shall certify the amount to be paid to each county by July 1, 2014, and payment to the counties must be made at the time provided in section 477A.015 for the first installment of local government aid.

Subd. 5. Appropriation. \$4,500,000 in 2014, and \$10,000,000 each year thereafter, is appropriated from the general fund to the commissioner of revenue to make the payments required under this section.

EFFECTIVE DATE. This section is effective beginning with aid payable in 2014.