Douglas County

Comprehensive Local Water Management Plan

2009-2019

Implementation Plan Update: 2017

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Table of Contents

Figures and Tables

Abbreviations

ALASD	Alexandria Lakes Area Sanitary District
AIS	Aquatic Invasive Species
BMP	Best Management Practice
BWSR	Board of Water and Soil Resources
CSP	Conservation Security Program
CRP	Conservation Reserve Program
CCRP	Continuous Conservation Reserve Program
CNMP	Comprehensive Nutrient Management Plan
CREP	Conservation Reserve Enhancement Program
CRWP	Chippewa River Watershed Project
CWA	Clean Water Act
CWL	Clean Water Legacy
DCLA	Douglas County Lakes Association (COLA)
DNR	Minnesota Department of Natural Resources
DWSMA	Drinking Water Supply Management Area
EPA	Environmental Protection Agency
EQB	Environmental Quality Board
EQIP	Environmental Quality Incentives Program
GIS	Geographic Information System
LGU	Local Government Unit
LID	Low Impact Development
LPA	Lake Protection Analysis
LRM	Douglas County Land and Resource Management
LWM	Local Water Management
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MN	Minnesota
MPCA	Minnesota Pollution Control Agency
NEMO	Nonpoint Education for Municipal Officials
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PdTJPB	Pomme de Terre Joint Powers Board
PTM	Prioritize, Target, Measure
RIM	Reinvest in Minnesota
SCPP	Minnesota Statewide Conservation and Preservation Plan
SGCN	Species of Greatest Conservation Need
SIZ	Shoreland Impact Zone
SWCD	Soil and Water Conservation District
SWMP	Stormwater Management Plan
SRWD	Sauk River Watershed District
SSTS	Subsurface Sewage Treatment Systems
TMDL	Total Maximum Daily Load
TSI	Trophic State Index
USFWS	United States Fish and Wildlife Service
WCA	Wetland Conservation Act Administration
WPTF	Water Plan Task Force
WRP	Wetland Reserve Program
WRAPS	Watershed Restoration and Prioritization Strategies

I. Executive Summary

A. Purpose of the Local Water Plan

The Douglas County LWM Plan is developed and written under the legislative authority of the "Comprehensive Local Water Management Act" (Minnesota Statutes sections 103B.301 to 103b.355). The purpose of the Douglas County Comprehensive Local Water Management Plan is to:

- Identify existing and potential problems and opportunities for the protection, management, and development of water and related land resources;
- Identify priority concerns to be addressed during the effective time frame of the plan;
- Develop goals and implement actions that improve water quality and quantity and related resource management and planning in the County.

The goal of the Douglas County Comprehensive Local Water Management (LWM) Plan is to serve as a guide for resource protection and preservation in Douglas County for the next 10 years. An assessment of the progress made toward the completion of the goals will be completed in 2016 to revise or update any necessary implementation actions.

In addition, this plan will become effective upon final approval by the Board of Soil and Water Resources and after official adoption by the Douglas County Board of Commissioners. The LWM Plan will be in effect through 2019 and covers the entire county.

B. A Description of Douglas County's Priority Concerns

The priority concerns for Douglas County were selected after tabulating survey responses, reviewing agency comments, and through discussion with the Water Plan Task Force. The priority concerns are: Development Pressures and Land Use, Natural Habitat Destruction, Waste and Stormwater Management, and Water Quality (note: these issues are not ranked). A complete assessment of each Priority Concern as well as Goals, Objectives and Action items can be found in later sections of this Plan. See the Priority Concerns Scoping Document for more detailed information about the selection process (II. Appendix A).

1. Development Pressures and Land Use
    a. Assist landowners with identifying priority sites to implement and promote Best Management Practices to reduce soil erosion and sedimentation
    b. Sustainable balance of social, economic and environmental objectives for existing and future development
2. Natural Habitat Destruction
    a. Protect or enhance existing natural habitat areas by encouraging the establishment of healthy and diverse native vegetation
    b. Restore previously impacted natural habitat which provide crucial habitat for aquatic and terrestrial plants and animals
3. Waste and Stormwater Management
    a. Improve Stormwater runoff quality by increasing utilization of BMPs
    b. Prevent SSTS failure and related sewage pollution in Douglas County

4. Water Quality
    a. Protect Douglas County's surface waters from being listed on MPCA's 303(d) list of Impaired Waters
    b. Target and prioritize surface water quality issues using tools and resources. Assist with monitoring efforts, development of implementation plans and implementation activities
    c. Provide assistance to implement best management practices on feedlot and livestock sites
    d. Control and prevent the spread of Aquatic Invasive Species in Douglas County
    e. Maintain and promote plans and partnerships to protect and monitor ground water
    f. Educate and provide local citizens with material on the importance of surface and ground water quality
    g. Engage local partners with current water quality topics regarding the Douglas County Water Management Plan

C. Summary of Goals, Objectives, Action Items, and Estimated Costs

Development Pressures and Land Use

Douglas County is continuing to experience strong residential and commercial development pressures. The LWM Plan seeks to strategically plan for continued growth while protecting the County's natural resources. The goal is to balance open space and development in Douglas County in such a way as to maintain and/or improve the region's water quality. The following is a partial list of the intended action items:

- Assist landowners with identifying priority sites to implement BMPs to reduce soil erosion and sedimentation
- Revise Stormwater zoning ordinance to incorporate low impact design standards
- Review core conservation areas to establish special protection districts
- Develop a guidebook for shoreland property owners

Projected Total Cost: $238,000 / year

Natural Habitat Destruction

Natural fish and wildlife habitat has been declining with development sprawling into more rural parts of the county, around natural environment lakes and large wetlands, and with the conversion of agricultural land to rural housing. The goal is to preserve, restore, and enhance natural habitat in Douglas County. The following is a partial list of the intended action items:

- Promote conservation programs including pollinator habitat to protect or enhance natural habitat areas
- Restore Crooked Lake basin
- Restore high priority wetlands in targeted subwatersheds

Projected Total Cost: $406,000 / year

Waste and Stormwater Management

As the population of Douglas County increases, so do the impacts waste and stormwater have on the overall water quality of the region. Large populations increase the need for higher capacity sewage treatment facilities. As current infrastructure ages, there may be an increase in the amount failing septic systems. The construction of buildings, roads, and parking lots increases the

amount of impervious surface. The result is an increase in runoff and erosion that can cause negative changes to stream flow, aquatic habitat, and water quality. The goals are to improve waste and stormwater runoff management in Douglas County. The following is a partial list of the intended action items:

- Pursue funding to provide assistance to landowners for the installation of conservation drainage practices
- Assist landowners with the planning, implementation, and tracking of buffer legislation
- Pursue grants and low-interest loans to assist with SSTS upgrades

Projected Total Cost: $252,000 / year

Water Quality

The LWM Plan recognizes that there are a myriad of issues that contribute to the degradation of water quality. Many of these issues are examined in more length in the previously listed Priority Concerns. However items such as trend analysis of lake data, advanced water quality monitoring, ground water protection plans, TMDL, and WRAPS for the ever increasing amount of listed impaired water bodies have not yet been addressed elsewhere in the Plan. The goals that the LWM plan focuses on include: protecting and maintaining surface water quality from further degradation; improving or restoring impaired surface waters; and protecting and maintaining ground water resources. The following is a partial list of the intended action items:

- Collect water quality data on currently unmonitored lakes
- Assist lake associations with lake management plans
- Determine priority subwatersheds through LPA, PTM, GIS information and water quality data
- Implement actions outlined in Watershed Restoration and Protection Strategies for each Watershed
- Provide technical and financial assistance to feedlot and livestock sites through County Feedlot Program, CNMPs, manure management and inventories
- Increase public awareness of AIS through events, watercraft inspections, decontamination units, and task force
- Monitor groundwater quality by hosting clinics, monitoring wells, and financial assistance for BMPs
- Educate community on water quality through media, events, task force, and reports

Projected Total Cost: $1,644,500 / year

D. Relationship to other Plans

A number of plans were considered in the development of this plan. The Douglas County Comprehensive Local Water Management Plan is consistent with other local and state plans.

Local Water Management Plans– Todd, Stearns, Otter Tail, Grant, and Pope Counties
Comprehensive Plans – Douglas County
Wellhead Protection Plans – Alexandria, Carlos, Evansville, and Osakis
Stormwater Pollution Plan – Alexandria

Recommendations to Other Plans and Official Controls

The Minnesota Department of Natural Resources (DNR) oversees the Shoreland Management program. Shallow lakes are particularly sensitive to the impacts of development. It is recommended that shallow lakes be given additional protection in the Shoreland Management program.

The Douglas County LRM has a Joint Powers agreement to permit and inspect NPDES construction sites. Given the significant impacts that can occur if the permits are not followed, it is important that an assertive inspection and enforcement program remains in effect. It is recommended that the MPCA continues to fund this program on an ongoing basis.

The MPCA has given responsibility of administering the feedlot program to Douglas County. It is recommended that the County continue with the county delegation for the feedlot program.

In the November 2008 election, Minnesotans approved a constitutional amendment (Minnesota Constitution, Article XI, Sec. 15) dedicating sales tax funds to outdoor heritage, clean water, parks and trails, and arts and cultural heritage effective July 1, 2009 to June 30, 2034. It is the recommendation of this plan that these dedicated funds be used to supplement, not replace the current funding mechanisms and state appropriations regardless for the economic status of the state. It is also recommended that these dedicated funds be awarded to specific projects or credible organizations based on sound science, logic, and environmental benefit to the state.

Chapter One: Douglas County Priority Concerns Scoping Document

Section One: Introduction to Douglas County and Past Achievements

A. Douglas County Profile

Douglas County is located in west-central Minnesota approximately 130 miles northwest of Minneapolis. The county comprises of 20 townships and 11 cities. Douglas County shares borders with Pope to the south; Grant to the west; Otter Tail to the north; and Todd to the east. Rich in water resources, Douglas County is home to over 200 lakes over 40 acres in size. The major watersheds within the county include Sauk, Chippewa, Long Prairie, and Pomme de Terre. A sliver of the Red Eye River watershed occupies the NE corner of the County. The City of Alexandria serves as the county seat nestled within the Chain of Lakes area. The county's population in 2005 was estimated at 35,467, an 8.1% increase since 2000, and it is projected that the population will increase 41% by 2030. Douglas County experiences the common struggle of working to accommodate rapid growth and development while protecting valuable water resources. Agriculture, in the form of cultivated land, is the dominant land use within the county.

B. Water Plan Accomplishments

The following lists some of Douglas County's Water Plan accomplishments in 2009-2016:

2009

- Kids' Groundwater Festival, Envirothon, Soil Stewardship Program, Poster and Mural Contests, Essay Contest, Douglas County Fair, Tastefully Simple's Going Green Day
- 9.7 miles of fabric installed
- 8 sediment blocks installed
- 4 wetland restorations
- 15 shelterbelts installed

2010

- Envirothon, Kids' Groundwater Festival, Soil Stewardship Program, Poster and Mural Contests, Essay Contest, Douglas County Fair, Douglas County Eco Fair
- 13.8 miles of fabric installed
- 5 sediment blocks
- 14 shelterbelts installed
- 7 wetland restorations
- 1 grassed waterway installed
- 10 water and sediment control basins installed
- 195 acres of prescribed grazing

2011

- Envirothon, Kids' Groundwater Festival, Soil Stewardship Program, Poster and Mural Contests, Essay Contest, Douglas County Fair, Douglas County Eco Fair, Nitrate Well Water Testing Clinic
- 10.5 miles of fabric installed
- 4 sediment blocks installed
- 16 wetland restorations
- 8 shelterbelts installed
- 4 water and sediment control basins installed
- 2 wells sealed
- 2 closures of waste impoundments
- 300 acres of prescribed grazing

2012

- Envirothon, Kids' Groundwater Festival, Soil Stewardship Program, Poster and Mural Contests, Essay Contest, Douglas County Fair, Douglas County Eco Fair, Nitrate Well Water Testing Clinic
- 12 miles of fabric installed
- 9 sediment blocks installed
- 7 wetland restorations
- 2 manure storage facilities installed
- 1 gully repair
- 10 shelterbelts installed

- 7 water and sediment control basins installed
- 3 waste impoundments closed
- 1 comprehensive nutrient management plan
- 43.7 acres of prescribed grazing
- 174.2 acres of nutrient management

2013

- Envirothon, Kids' Groundwater Festival, Soil Stewardship Program, Poster and Mural Contests, Essay Contest, Douglas County Fair, Douglas County Eco Fair
- 8 miles of fabric installed
- 4 sediment blocks installed
- 7 shoreland erosion projects
- 5 wetland restorations
- 10 shelterbelts installed
- 12 water and sediment control basins installed
- 1 waste impoundment closure
- 131.6 acres of cover crop
- 1 comprehensive nutrient management plan
- 120.1 acres of prescribed grazing
- 1240.2 acres of nutrient management

2014

- Envirothon, Kids' Groundwater Festival, Soil Stewardship Program, Poster and Mural Contests, Essay Contest, Douglas County Fair, Douglas County Eco Fair
- 6 shelterbelts installed
- 1 sediment block installed
- 1 rain garden installed
- 2 shoreland erosion projects

2015

- Envirothon, Kids' Groundwater Festival, Soil Stewardship Program, Poster and Mural Contests, Essay Contest, Douglas County Fair, Douglas County Eco Fair
- 10,100 ft of fabric installed
- 16 sediment blocks installed
- 12 wetland restorations
- 1 water and sediment control basin installed
- 1 rain garden installed
- 1shoreland erosion project
- 7 ag waste pit closures

2016

- Envirothon, Kids' Groundwater Festival, Poster and Mural Contests, Douglas County Fair, Nitrate Well Water Testing Clinic, Mill's Fleet Farm Kids' Fishing Day, Viking Sportsman/Pheasants Forever Kids' Day
- 9 townships Douglas County Nitrate Testing
- 9 sediment blocks installed
- 2 terraces installed
- 16 lakes samples for AIS Zebra mussel
- 8 septic system loans
- 550 acres of cover crops

Section Two: Priority Concerns Scoping Document Planning Process

C. Water Plan Survey Results

CITIZEN SURVEY
SUMMARY OF RESULTS

1. Which watershed is your home/land located in?

Long Prairie	21
Chippewa	19
Don't Know	14
Sauk	5
Pomme de Terre	2

2. What are the top three water resource issues in Douglas County?

Development pressures/issues	32
Natural habitat destruction	25
Contaminated runoff	25
Failing septic systems	20
Declining water clarity	17
Urban stormwater/drainage management	14
Agriculture erosion	12
Need for more environmental education	9
Ground water contamination	9
Over-application of fertilizers	6
Lack of regulation	5
Other: Tiling	1
Other: Ditch cleanout	1

3. Which resource is the most threatened? Rank 1-5, with 1 being most threatened.

Lakes	85
Wetlands	109
Streams/Rivers	122
Ground water	134
Other	247

4. Additional Comments/Suggestions:

- Wasn't listed, but sustained agricultural drainage & downstream impacts should be identified as a priority concern. Also concerned about potential conversion of CRP acres back into corn production to satisfy ethanol production and animal feed demands. Tends to be HEL soils.

- Douglas County Land and Resource Management needs to expand their staff with a dedicated person for enforcement issues and to add a Final Inspection when a Land Use Permit is issued on a lake.

- It was SO hard to pick the top three!! Even adults need environmental education. I just talked to a shore owner who was delighted to learn he SHOULDN'T be clearing the vegetation from his riprap. He thought he was being a "good neighbor"!!

- Over-development of area lakes. Poor enforcement of regulations. Poor leadership to protect lakes (once developed improperly there's no going back.) Rubber stamping easements by county commissioners-constantly.

- Lake Victoria has a junk yard right on the lake, its contaminating the lake.

- From what I see happening the developers are allowed to build almost anywhere.

- Conservation plans for county should have more aggressive goals and objectives for restoration and protection of our water related natural resources.

- I support whatever needs to be done to leave clear water for the next generations.

- Weeds increased each year in Le Homme Dieu

- Wish we could get our lake cleaned up of the blue algae-it is bad-and the weeds are getting so thick in the lake

- Living on the Chain of Lakes for the past 15 years has been enjoyable. I noted with interest the changes in water clarity due to the Federal Farm programs taking farmland out of production (specifically in the Lake Ida/Miltona/Darling area). As some of this land has come back into production I have noticed more algae blooms on the lakes. A concern not listed in question 2 was fertilizer runoff from farm fields. This is as important as the land use changes occurring in Douglas County. Suggestion: The SWCD hire a limnologist and a hydraulic engineer to begin quantifying lake Water Quality trends, documenting hydrology and hydrologic trends, creating nutrient and hydrologic budgets for target lakes. Developing water management plans (models). Until this is done the impacts of urbanization and changes in agricultural production cannot be quantified. I am way too tired of hearing "generalizations" about water issues in this county with no facts to back them up.

Survey Period: August 1-August 20, 2007
Completed Paper Surveys: 49
Completed On-line Surveys: 14
Total Number of Respondents: 63

Paper surveys were available at Douglas County Land & Resource, Library, SWCD, Alexandria City Hall, and during the County Fair. The on-line version was available through a link on the DouglasSWCD.com and was created using Survey Monkey.

D. State and Local Stakeholder Comments

Board of Soil and Water Resources

Priority Concern 1: Protection of Water Quality during and after land development in riparian areas.

- County leadership on lake water quality protection issues.
- Consistent application and enforcement of Douglas County shoreland rules.
- Continue work to develop new voluntary and regulator tools to protect water quality.
- Continue strong administration of the Wetland Conservation Act.
- Shoreland revegetation, develop strong working relationships between the county and lake associations through the water plan, track impervious by lake watershed, develop tools to protect mapped sensitive areas around lakes, conservation easements.

Priority Concern 2: Erosion and sediment control on developing areas throughout Douglas County.

- Vigilant inspection of sites where disturbance is occurring.
- Continue to develop the SWCD's expertise in the area of stormwater management technical assistance.
- Work to train realtors, developers, contractors, and local officials to the need of stormwater management.

Priority Concern 3: The trend towards development of marginal lands.

- Protection of key sensitive areas with conservation easements.
- Promote lake associations to develop conservation committees that work to protect critical areas with conservation easements.
- Continue to use the sensitive areas map as a key tool in plat and other development reviews.

Priority Concern 4: Agricultural soil erosion.

- Application of traditional best management practices can significantly reduce erosion and sediment from agricultural fields.
- Tillage practices play a major role in soil vulnerability to erosion.
- Buffers adjacent to receiving waters have proven to be effective at reducing nutrients and sediment in runoff.
- Wetland restorations can help improve the quality of runoff waters after it has left the field.

Minnesota Department of Agriculture

Priority Concern 1: Manure Management and ISTS.

- Seek additional funding sources to help assist landowners in upgrading ISTS in the county.
- Continue education and outreach efforts on manure management in the County.
- Provide technical and financial assistance for producers to assist them in adopting practices to reduce the impacts from manure runoff.

Priority Concern 2: Impaired waters and TMDLs (Chippewa River TMDL-Fecal Coliform, Long Prairie River Watershed TMDL-Low Dissolved Oxygen, Pomme de Terre-Fecal coliform).

- Continue education and outreach efforts on manure management in the County. Provide technical and financial assistance to producers to assist them in adopting practices to reduce the impacts of manure runoff.
- The following pollution reduction practices by landowners and local resource managers can help reduce pathogen transport and survival: feedlot runoff controls, effective subsurface sewage treatment systems, municipal wastewater disinfection, proper land application of manure, erosion control, rotational grazing, and urban stormwater management.

Minnesota Pollution Control Agency

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

- Identify the priority the County places on addressing impaired waters, and how the County plans to participate in the development of TMDL pollutant allocations or implementation of TMDLs for impaired waters.
- Include maps of impaired waters and identification of the pollutant(s) causing the impairment(s).
- Address the commitment of the County to submit any data it collects to the MPCA for use in identifying impaired waters and data entry into the U.S. Environmental Protection Agency's STORET database. Projects funded through the MPCA's Clean Water Partnership, Section 319 and TMDL programs need to have this data entered into this database.
- Provide plans, if any, for monitoring as yet unmonitored waters for a more comprehensive assessment of waters in the County and
- Describe actions and timing the County needs to take to reduce the pollutants causing the impairment, including those actions that are part of an approved implementation plan for TMDL's.

Priority Concern 2: Alternative Shoreland Standards

- The County should consider adopting the DNR Alternative Shoreland Standards in order to provide for more flexible and innovative standards to accommodate the rapid development in the area.

Priority Concern 3: Best Management Practices

- Implementation of a rigorous program to increase buffering of water resources, improved tillage practices and other best management practices is recommended.

Priority Concern 4: Stormwater Management

- Improving stormwater management in rural areas and small communities within the County is recommended. Recommended actions include preparation of county wide, or township and city ordinances.

Priority Concern 5: Educational Opportunities

- Providing educational opportunities for the Douglas County Lakes Association regarding issues relating to water quality and land and water stewardship practices, should be

considered to help retain high quality surface water resources within the County. Recommended actions are to establish educational seminars and the distribution of appropriate educational materials.

Minnesota Department of Natural Resources

Priority Concern 1: Outdated Land Use Plan

- The Local Water Management Plan should strongly promote a county land use plan redraft with greater sensitivity to potential environmental impacts, alternative designs or waste management systems, and site-specific "no build" areas.

Priority Concern 2: Runoff management and drainage

- The Water Plan should promote overhaul of State ditch laws and as possible, establish an active liaison with the County Ditch Board to promote alternatives to open ditches and tile inlets, abandonment and plugging of old non-maintained ditches, wetland restorations to retain runoff waters, incentive programs to sustain marginal croplands and CRP or other conservation programs, and other similar initiatives.

Priority Concern 3: Sewer service expansion

- Pros and cons of "big pipe" sewer treatment infrastructure should be identified and discussed in the county Water Plan. Plan actions could include supporting the County Land Use Plan to prepare for and guide development, identification and evaluation of feasible service alternatives, and ensuring completion of a comprehensive TMDL to determine potential water quality and hydrologic alterations to downstream basins in advance of proposed expansion of the ALASD treatment plant.

Chippewa River Watershed Project

Priority Concern 1: Reducing priority pollutants, focusing on erosion, sediment, bacteria, nitrogen, and phosphorus

- Work with the Chippewa River Watershed Project and the MPCA to get waters off the Clean Water Acts's TMDL 303d list of impaired waters.
- Establish a strategy to promote the use of phosphorous free fertilizer on lawns. Encourage municipalities to adopt ordinances that limit or prevent the use of phosphorous-based fertilizers.
- Assist with developing conservation plans to promote farming and recognize alternative farming methods.
- Through nutrient and pesticide management planning, such as precision agriculture, promote the timing rate, and placement of synthetic and/or organic fertilizers and pesticides using incentives.
- Promote practices to reduce stream-bank and ditch-channel erosion through developing a strategy identifying priority sites for alternative practices such as willow planting or stream barbs in critical areas.
- Seek __# of acres?__ new acres of filters/buffers along ditches and streams to capture sediment as it leaves the field. Enforce the minimum one-rod grassed area as it applies to drainage policy.

- Continue to support the upgrading of ISTS with the use of the state revolving fund low interest loans. Inventory the upgraded systems and through the use of the watershed monitoring, assess the areas that are showing high fecal coliform bacteria and seek additional funding to assist with upgrading systems in those critical areas.

Priority Concern 2: Water/drainage management

- Continue to digitize the drainage systems. Gather the history of each system to include the following: system name, watershed size, outlets to, date established, system type, repair history, construction improvement history, flow data, demonstration capacity, and monitoring data available. Assess the history to identify the erodible areas, flooding problem areas and storage potential.
- Promote the use of alternative intakes or the installation of intakes that promote efficient trapping of sediments and nutrients that enter drainage systems.

Priority Concern 3: Flooding

- Emphasize the need to protect non-farm wetlands (types 3, 4, and 5) and support the no-net-loss of wetlands. Promote voluntary restoration of drained wetlands.

Priority Concern 4: Education & Outreach

- Raise public awareness on a number of key water-planning issues.
- Continue to support watershed planning and implementation activities by providing financial and technical assistance. Annually review monitoring data and implementation accomplishment to continue coordinating future initiatives.
- Annually review MPCA's "State of the Minnesota River" report documenting annual monitoring results and long-term trend. Provide input and response to the report if necessary.

Priority Concern 5: Storm water management

- Meet with the local municipalities to determine which cities have adopted official controls to deal with storm water management.
- Raise public awareness on storm water pollution and ways to prevent/minimize it.
- In cooperation with the cities and neighboring counties, address common storm water issues and assess the need to be more proactive promoting storm water management
- Develop an educational program on the installation and removal of construction best management practices (i.e. for temporary erosion control structures).

Millerville Township Board

Priority Concern1: Mill Pond Dam (Section 13 of Millerville Township)

- Restrictions need to be placed to take it out of private controls. The level needs to be kept down lower so it doesn't also damage township road in event of heavy rains.

Priority Concern 2: Cleaning of old existing ditches

- Anyone along ditches should be allowed to clean ditches on their land as long as they are playing ditch taxes without the 7 year restriction.

Minnesota Department of Health

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

- Acknowledgement and support of public water supply wellhead protection areas within the county. Currently there are four public water supply systems (Alexandria, Carlos, Evansville, and Osakis) with wellhead protection plans. Work with public water suppliers in development and implementation of wellhead protection activities. Upon request of public water supplier, support implementation of wellhead protection management activities.

Priority Concern 2: Sealing unused, unsealed wells

- Inventory where unused, unsealed wells may be located. Develop a cost share program to aid property owners in sealing unused, unsealed wells.

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

- Evaluate the possibility of establishing a ground water database using local data.

Section Three: Douglas County Priority Water Planning Issues

E. Water Plan Task Force

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Lynn Nelson	Sauk River Watershed District
Bud Nielson	Lake Ida
Kylene Olson	Chippewa River Watershed Project
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Emily Siira	Water Planner, Douglas SWCD
Rebecca Sternquist	Land & Resource Management
Gary Stevenson	Douglas County Surveyor
Dan Steward	Board Conservationist, BWSR
Gary Thoennes	Douglas SWCD Supervisor, La Grande Township
Mike Weber	City of Alexandria

Vern Weiss	Lake Irene Preservation Association
Jerry Wendlandt	DNR
Scot Spranger	Alexandria Lakes Area Sanitary District

F. Priority Water Planning Issues

Priority Concern Selection

The priority concerns for Douglas County were selected after tabulating survey responses, reviewing agency comments, and discussion by the Water Plan Task Force. The results are as follows: development pressures/issues, natural habitat destruction, contaminated runoff, failing septic systems, and declining water clarity. After further review by the Task Force, several of the concerns were combined and reworded to help make Water Plan more clear and concise. These changes do not present any conflict between agency comments, survey results, or information gathered during the public information meeting. The following is the final list of Priority Concerns to be addressed in the updated Douglas County Local Water Management Plan.

Priority Concern 1: Development Pressures and Land Use
Priority Concern 2: Natural Habitat Destruction
Priority Concern 3: Wastewater and Stormwater Management
Priority Concern 4: Water Quality

The update committee and Task Force will continue to meet over the next six months to assist in the development objectives and tasks for each of the priority concerns.

List of Water Resource Concerns

Failing septic systems
Development pressures/issues
Need for more environmental education
Natural habitat destruction
Declining water clarity
Agricultural erosion
Over-application of fertilizers
Urban stormwater/drainage management
Contaminated runoff
Lack of regulations
Ground water contamination

Priority Concern Identification

Timeline of Douglas Water Plan update:

April 5, 2007 Water Plan Task Force met to discuss upcoming Water Plan related activities, local grant projects, and the Water Plan update process. A sub-

	committee was established to determine how public input would be gathered. See Appendix D.
May 7, 2007	Dan Steward, Board Conservationist, met with Jerome Haggenmiller, District Coordinator and Emily Siira, Water Plan Technician to discuss the water plan update process.
June 26, 2007	Douglas County Board of Commissioners passed a resolution to update the Local Water Management Plan.
July 11, 2007	Water Plan Update Committee met to determine how public input should be gathered. It was decided that in addition to a paper survey, an on-line survey should be made available to Douglas County residents. After the survey period, a public information meeting will be held.
July 23, 2007	Priority Concerns Input form mailed out. The parties were given 45 days to respond. The form was sent to 11 municipalities, 20 townships, four watershed organizations, four Soil and Water Conservation Districts, planning and zoning offices in the surrounding counties and representatives of BWSR, DNR, MPCA, MDA, MDH, EQB. In addition, forms were also sent to Vikingland Builders Association, Douglas County Lakes Association, Douglas County Farm Bureau, MN Corn Growers Assn, MN Soybean Growers Assn, Midwest Dairy Assn-Douglas County Board, MN Beef Council, MN Pork Producers Assn, and the Cattlemen's Assn.
August 2, 2007	Press release was sent to local media requesting public input via paper or on-line survey.
August 1-20, 2007	Survey period. Surveys were distributed to various public buildings in Alexandria including: City Hall, Douglas County Public Library, Douglas County Land and Resource Management (County Courthouse) and the Douglas Soil and Water Conservation District (USDA Service Center). Paper surveys were also available during the Douglas County Fair at the SWCD booth. The online survey was created using SurveyMonkey.com and could be accessed through a link on the Douglas SWCD website. Only one survey could be completed per computer. Total paper surveys: 49. Total completed online surveys: 14. Total number of respondents: 63.
Sept. 10, 2007	Water Plan Update Committee met to discuss results of the survey and determine a date for the public information meeting.
Sept. 25, 2007	Press release sent out to local media advertising the public information meeting. The article appeared in the October 5 issue of the Echo Press.
October 18, 2007	Public information meeting was held at the Public Works Building at 7 p.m. Representatives from BWSR, DNR, MPCA, and Douglas County Land & Resource Management Office were also invited to attend. Participants

were asked to make additional comments regarding the issues/concerns that received the highest "votes" during on the survey. The intention was to get a better understanding of the public perception behind the survey results. The discussion was transcribed on to large sheets of paper for all participants to view through out the meeting. All participants were asked for final comments or changes before the meeting adjourned. The transcribed discussion notes can be found in Appendix C-Public Information Meeting Minutes.

Participants included Jerome Haggenmiller-Douglas SWCD, Mike Weber-City of Alexandria, Rebecca Sternquist-Land & Resource Management, Bud Nielson-Lake Ida Association, Darren Hungness-Landteam, Inc., Sue Engstrom-Douglas County Lakes Assn (DCLA), Dick Kuehn-DCLA & Task Force, Kyle Hopkins, Gary Thoennes-La Grande Twp., Gary Larson-Urness Twp., Dave Rush-Director Land & Resource Management, Jon Schneider-Douglas SWCD Supervisor, and Dan Steward-BWSR.

October 31, 2007 Water Plan Task Force reviewed comments from the Public Information meeting, survey, and agency/LGU comments. Selected and reworded the top four priority concerns.

G. Priority Issues Not addressed by this Water Plan

Some water management issues will not be addressed in the updated plan. As with the previous Water Plan, development pressures and land use issues quickly came to the foreground in most discussions and responses. Other concerns will be re-examined for higher prioritization at the next plan update or addressed as funding opportunities arise.

Chapter Two: Douglas County Watersheds

Douglas County is divided into five major watersheds: the Chippewa River Watershed, the Long Prairie River Watershed, the Pomme de Terre River Watershed, the Sauk River Watershed and a very small piece of the Redeye River Watershed.

Section One: Chippewa River Watershed

The Chippewa River Watershed is the second largest of Douglas County's watersheds. Within Douglas County the majority of the subwatershed is defined by the Upper Chippewa, but the county's southern border encompasses a sliver of the Middle Chippewa subwatershed. According to the Minnesota Pollution Control Agency's Chippewa River Watershed Restoration and Protection Strategy Report (https://www.pca.state.mn.us/sites/default/files/wq-ws4-24a.pdf), Gilbert Lake, Jennie Lake, Long Lake, and Red Rock Lake are impaired for nutrients. Additionally, the Stowe Lake to Little Chippewa River reach is impaired for aquatic life and aquatic recreation. Douglas County, a primary partner, supports the prioritized regions and practices of restoration and protection of the watershed.

The Chippewa River Watershed Project (http://www.chippewariver.org/) is a non-regulatory, cooperative partnership and citizen based approach focused on improving water quality and

watershed life in the Chippewa River and its tributaries. The CRWP is currently funded with state Clean Water Partnership Grants, Federal 319 Grant dollars, and local water plan contributions. The CRWP also relies heavily on volunteerism and commitment of their partners.

Section Two: Long Prairie River Watershed

The Long Prairie River Watershed is the largest watershed within Douglas County, encompassing about 12 townships. The Alexandria Chain of Lakes resides within the Long Prairie River Watershed. Major lakes include Lobster, Le Homme Dieu, Carlos, Miltona, Mary, and Ida. Specifically, Lake Latoka, Victoria, Carlos, Cowdry, Le Homme Dieu and Ida were ranked high or outstanding by the Minnesota Department of Natural Resources for Lakes of Biological Significance.

According to the MPCA's Long Prairie River Watershed Restoration and Protection Strategies and the MN DNR Lakes of Phosphorus Sensitivity Significance, high quality unimpaired lakes at the greatest risk of becoming impaired were selected to focus efforts. Miltona, Ida, Latoka, Nelson, Lobster, Round, Mary, and Pocket lake have the highest priority ranking. WRAPS and TMDL (D.O. and the Nutrient and Bacteria) documents can be found at https://www.pca.state.mn.us/water/watersheds/long-prairie-river#restoration

The Long Prairie River Watershed requires a partnership between Douglas County, Morrison County, Todd County, Otter Tail County as well as other state and local agencies. The prioritization and strategy development provided by the WRAPS report develops restoration and protection strategies for implementation planning.

Section Three: Pomme de Terre Watershed

The Pomme de Terre River Watershed spans into the northwestern part of Douglas County comprising about 19,390 acres. Only about 3.56% of the county is covered by the Pomme de Terre Watershed incorporation a portion of Lund township. Lake Christina, a major lake within the Pelican Creek subwatershed, is currently impaired for impacts to aquatic recreation. Lake Christina is approximately 3,971 acres with a maximum depth of 14 feet. Due to a Wildlife Management Lake designation involving the Minnesota Department of Natural Resources and the University of St. Thomas, the lake is closed to fishing.

According to the Minnesota Pollution Control Agency (MPCA), Pomme de Terre River Watershed Restoration and Protection Strategies and Implementation Plan (https://www.pca.state.mn.us/sites/default/files/wq-ws4-01.pdf) restoration and implementation strategies are outline for priority zones and practices. The WRAPS report is a primary tool for local partners to use in planning or project conception.

The Pomme de Terre River (http://www.pdtriver.org/) association is a voluntary and non-conventionally grant funded organization. The PDTRA consists of a Technical Advisory Committee and a Joint Powers Board. Douglas County and Douglas SWCD are active members of the PDTRA.

Section Four: Sauk River Watershed

The Sauk River Watershed extends into eastern portions of Douglas County covering approximately 58,171 acres or 8.9% of the watershed. The drainage area completely spans over Osakis and Orange township but reaches into Belle River, Carlos, Alexandria and Hudson townships. The Lake Osakis, a major lake within the Headwaters Sauk River subwatershed, is currently impaired for aquatic recreation along with Smith and Fallie lakes. Lake Osakis is approximately 6,361 acres with a maximum depth of 73 feet. A portion of Douglas' County JD#2, does not meet state water quality standards for E. coli. or biotic integrity. Inherently, in 2012, Lake Osakis was 303d listed for nutrient impairment.

According to the MPCA's Sauk River Watershed Restoration and Protection Strategy Report (https://www.pca.state.mn.us/sites/default/files/wq-ws4-08a.pdf), the 'Headwater Sauk River' subwatershed, focuses on the Lake Osakis TMDL and meeting the annual TP reductions. Another primary project within the watershed is the restoration of the Crooked Lake Basin. Partnering with Sauk River Watershed District, the project will acquire parcels for wetland and buffer restoration.

The Sauk River Watershed District (http://srwdmn.org/index.html) is a non-profit organization formed by a petition to protect water resources and address water quality issues in the Sauk River Chain of Lakes. The SRWD is the Ditch Authority under Minnesota Statues Chapter 103D in Stearns and Pope Counties. Education, monitoring and cost-share/financial assistance are also provided by the district.

Chapter Three: Assessment of Priority Concerns

This section will provide a general assessment of the four concerns as they relate to Douglas County. This will include what the concern is, why it was selected, potential risks of not addressing the concern, and the specific geographical area it addresses (if more specific than county-wide).

Section One: Development Pressure and Land Use

Development Pressure is the implied results of and demand for subdividing land and construction of new dwellings and other structures. This pressure may be attributed to economic incentives to sell and divide property due to high land values, potential investment returns, demand for riparian properties, and diminishing agricultural returns. Development impacts include land use changes due to population growth, increasing population densities, and associated management behaviors that affect natural resources.

Douglas County has grown from a population of 22,910 in 1970 to an estimated 35,827 in 2007. The Minnesota State Demographic Center forecasts the county population to grow at a rate of 32% between 2005 to 2035. See Appendix C-Population Growth in Douglas County from 1990-2000. It is expected that development will continue to be concentrated around lakes, primarily the remaining areas of General Development and Recreational Development lakes, followed by small, shallow Natural Environment lakeshore. The Douglas County Planning Advisory Commission has reviewed an average of fifty preliminary plats each year since 1999. Sixty-two percent of land use permits were issued in residential shoreland areas versus all other zoning classifications (residential, agricultural, etc.) in 2007. In 2006, the Douglas County Board of Commissioners approved recommendations made by the LRM and the Douglas SWCD to establish

criteria for sensitive feature mapping. The sensitive features included fish spawning areas, aquatic vegetation, wetlands, biodiversity significance, hydric soils, shallow soils, steep slopes, and bluffs. The criteria have since been used to create static maps from existing GIS data that are used as a tool for making informed land use decisions. See Appendix D-Sensitive Area Map.

With a majority of development occurring in shoreland areas, effects on water quality are a concern. Overall surface water quality throughout the county is generally good but some basins and streams are showing signs of degradation. Water quality degradation can be largely attributable to land use conversions and extensive shoreland development. Such land use activities set the stage for infrastructure construction to support rural growth, increases in impervious surfacing, landscape modifications that have included drainage and filling, natural habitat encroachment or destruction, and increased surface water use. Evidence of declining water quality may suggest that some lakes have reached or exceeded capacity to adsorb such environmental disturbances. Sustainability of these valued surface waters will be increasingly threatened with further population growth. See Appendix E for a list of Douglas County's Impaired Waters.

Continued water quality monitoring and data analysis are needed throughout the county to maintain a long term database and identify trends. Several lakes have been identified as having a measured declining water clarity trend. In many cases, a majority of the shoreland properties around these lakes have been sewered by the Alexandria Lake Area Sanitary District (ALASD) as early as 1976, which theoretically would have triggered the abandonment of individual septic systems. Lake Mary, a 2,371 acre lake south of Alexandria, has had a statistically significant declining water clarity trend for several years. The shoreland of this lake has centralized sewer and there is very little livestock within the watershed. More information is needed to understand this and other lakes' pollution sources in order to determine effective implementation strategies and prevent further degradation. Existing water quality data on all monitored lakes in Douglas County can be found on the Pollution Control Agency's website: www.pca.state.mn.us

Although growth and land use change is inevitable in the county, the way in which growth takes place affects its impact on water quality. With careful planning and a commitment to protect streams, rivers, and ground water, land use practices can be implemented that balance the need for jobs and economic development with protection of the natural environment. Development that takes place without such considerations, however, can lead to significant degradation of streams and ground water, and loss of aquatic life.

Section Two: Natural Habitat Destruction

Human impact on the landscape has been a concern for many decades. As shorelines are developed, agricultural lands are drained and ditched, forests are cleared, and urban sprawl continues, there will continue to be a marked decline in wildlife diversity and abundance. Current land use practices have led to habitat loss, degradation, and fragmentation. See Appendix F-Pre-settlement Vegetation and Appendix G-Restorable Wetlands.

The newly published Minnesota Statewide Conservation and Preservation Plan (SCPP) has identified the key issues, which if addressed, would benefit the greatest number of natural resources to the greatest degree. The SCPP recognizes continued economic prosperity depends

on a healthy and sustainable environment, and vise versa. To foster the conditions we value, we must balance long-term plans for conserving and protecting our priceless natural resources with those ensuring a healthy public and healthy economy (SCPP Executive Summary, 2008). The Final Plan addresses four key issues for which recommendations are made, they are:

- Land and water habitat fragmentation, degradation, loss, and conversion
- Land use practices
- Transportation
- Energy production and use, and mercury as a toxic contaminant related to energy production

See Appendix H-Natural Resource Values Assessment of Recommendations.

Habitat loss refers to the complete eradication of a parcel of habitat, such as conversion of native wetlands, lake and stream shoreline plant communities, prairies, forests, or brushlands to agricultural, residential or industrial uses. **Habitat degradation** occurs when the habitat is still present but its value to native plant, wildlife, and aquatic communities has been impaired or changed significantly. **Habitat fragmentation** is the breakup of large contiguous areas of habitat into smaller and smaller parcels and fragments. The fragments are no longer close enough or sufficiently connected to allow fish, wildlife, or other native organisms to move freely among habitats in order to use optimal breeding and rearing sites. Fragmentation may degrade the genetic capacity of wild populations to adapt to future environmental change because it fragments larger populations—which harbor more genetic variation into smaller breeding groups. A cumulative effect of habitat loss, degradation, and fragmentation is large declines in abundance and productivity of wild populations, threatening their ability to adapt to future environmental changes and to persist for the enjoyment of future generations. Source: SCPP, 31.

Shoreland issues are specifically addressed in Habitat Recommendation 2 of the SCPP Final Plan: Protect critical shorelands of streams and lakes. "A holistic approach is needed for shoreline protection that integrates acquisition with diverse private-land protection strategies such as conservation tax credits, trading of conservation tax credits, BMPs, shoreland regulations and incentives, zoning ordinances, conservation development, and technical guidance for shoreland owners (SCPP, 67)."

The complete SCPP can be found online at:
www.lccmr.leg.mn/statewideconservationplan/SCPP_FinalPlan.html

The establishment and protection of shoreline buffers is one of the best ways to reduce the negative impacts on aquatic systems and water quality. Buffers protect water quality by filtering runoff that contains excess nutrients, sediment, and other pollutants. Shoreline buffers also stabilize banks, reduce erosion, and provide important habitat for shoreline species. Vegetation native to Minnesota is well adapted to our climate and moisture conditions. It can withstand moderate flooding and drought. Native vegetation has deep fibrous or tap roots that anchor the soil and increase water infiltration.

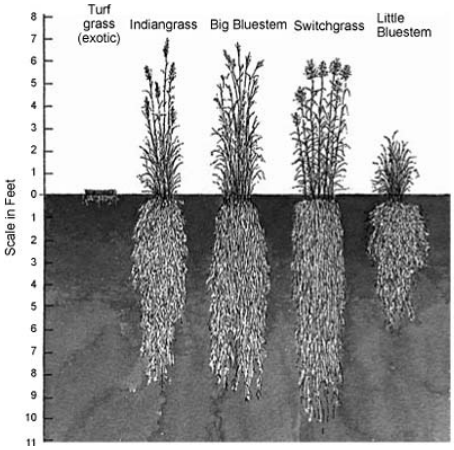


Figure 1 Root system of common native grasses

In Minnesota, 292 species meet the definition of species in greatest conservation need (SGCN). This set of SGCN includes mammals, birds, reptiles, amphibians, fishes, insects, and mollusks, and represents about one-quarter of the nearly 1,200 animal species in Minnesota that were assessed for this project. (Source: www.dnr.state.mn.us)

Species in Greatest Conservation Need (SGCN)
Definition: *Animal species whose populations are rare, declining, or vulnerable in Minnesota and meet one or more of the following criteria:*

A. Species whose populations are identified as being rare, declining, or vulnerable in Minnesota

B. Species at risk because they depend upon rare, declining, or vulnerable habitats (such as native prairies and grasslands; lakeshores and riparian corridors; wetlands; brushlands; unimpounded river and stream channels; unfragmented interior forest).

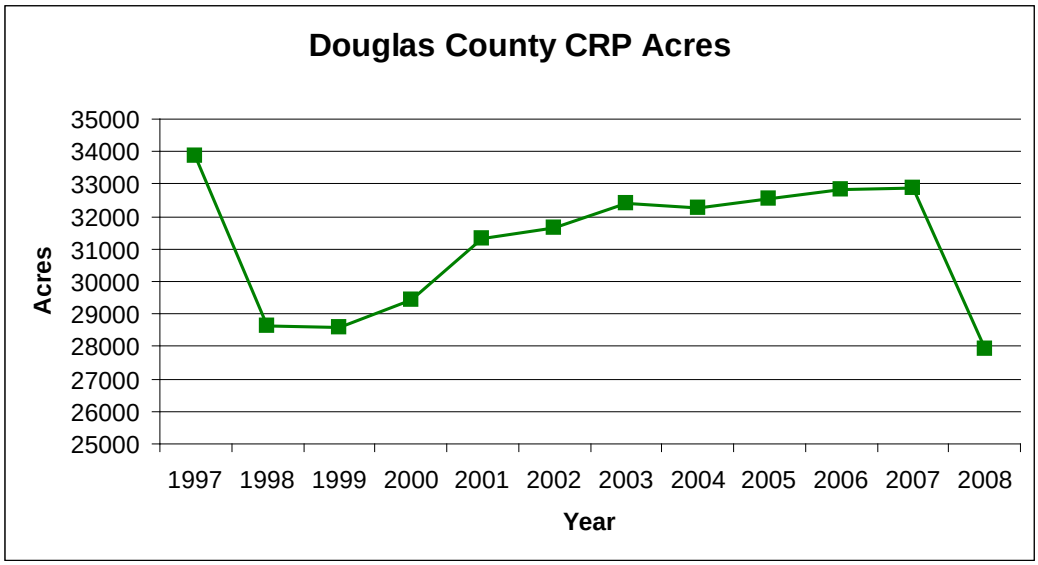
C. Species subject to other specific threats that make them vulnerable, such as:
   - Over-exploitation
   - Invasive species
   - Disease
   - Contaminants
   - Lack of citizen understanding and stewardship (such as killing large snakes thought to be venomous).

D. Species with certain characteristics that make them vulnerable, such as species that:
   - Require large home ranges/use multiple habitats
   - Depend upon large habitat patch sizes
   - Need special resources
   - Depend upon an ecological process (e.g. fire) that no longer operates within the natural range of variation
   - Are limited in their ability to recover on their own due to low dispersal ability or low reproductive rate
   - Have a highly localized or restricted distribution (Endemics)
   - Concentrate their populations during some time of the year (such as bats clustering in hibernacula and migratory stop-overs).

Tomorrow's Habitat for the Wild and Rare (a collaborative group of conservation professionals led by the DNR) identifies habitat loss and degradation as the primary problem facing species in greatest conservation need in Minnesota. It recommends a simple and direct approach to this problem: conserve key habitats used by Minnesota's SGCN in order to conserve the majority of Minnesota's wildlife. (Source: www.dnr.state.mn.us).

Douglas County has also seen a marked decline in the number of acres enrolled in the Conservation Reserve Program (CRP). In 2008, farmers saw record high corn prices, coupled with near record high wheat and soybean prices, setting up a scenario with which set aside programs just couldn't compete. Many expiring CRP contracts were not re-enrolled and instead thousands of acres were plowed and farmed for the first time in 10-15 years.

Figure 2 Douglas County CRP Acres



Source: Douglas County FSA (September 3, 2008)

Conservation and Habitat Programs:

CRP (Conservation Reserve Program)

CRP is a voluntary program for agricultural landowners administered through the Farm Service Agency (FSA). Through CRP, landowners can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland.

CCRP (Continuous Conservation Reserve Program)

Environmentally desirable land devoted to certain conservation practices may be enrolled in CRP at any time under continuous sign-up. Offers are automatically accepted provided the land and producer meet certain eligibility requirements. Continuous sign-up contracts are 10 to 15 years in duration.

RIM (Reinvest in Minnesota)

The RIM program is a state program administered through the SWCD office. It protects and improves water quality, reduces soil erosion, and enhances fish and wildlife habitat by retiring private marginal cropland from agricultural production, planting permanent native vegetation, and restoring previously drained wetlands. Other benefits include flood control and ground water recharge. Landowners are paid a percentage of the assessed value of their land to voluntarily enroll it in a conservation easement. A variety of land types are eligible, including wetland restoration areas, riparian agricultural lands, marginal cropland, pastured hillsides, and sensitive ground water areas. After land is enrolled, it is managed under a conservation plan, which generally includes items like wetland restoration (for areas with drained wetlands), native grass plantings, and tree plantings.

CREP (Conservation Reserve Enhancement Program)

CREP is a combination of the federal CRP program and the state RIM program. The land owner receives annual CRP payments for 15 years, a one-time RIM payment, and cost-share for

enrolling in a 50 year or perpetual easement. These acres are planted to native grasses and forbs, or trees and shrubs. Wetlands can be restored through this program.

WRP (Wetland Reserve Program)
The WRP program is a federal program administered through the Natural Resources Conservation Service (NRCS) office. The landowner receives a one-time payment and cost-share.

RIM-WRP
Combining these two easement programs allows state funds to leverage federal funds for conservation that are available through the recently enacted 2008 Federal Farm Bill. Competitive payment rates have been established for this partnership using township estimated market values.

Working Lands for Wildlife Initiative
The Working Lands program is a public/private partnership for wildlife development on working farms. In some cases, land might be set aside to restore wildlife habitat. Other projects might involve changes in certain agricultural practices in ways that support both wildlife and the economic vitality of the farming operation. The program is administered through the Minnesota Department of Natural Resources (DNR).

The **United States Fish and Wildlife Services (USFWS)** also serves the purpose of restoring and protecting vital habitat through the acquisition of federal land and establishing easements with private landowners.

Conservation Lands Summary	
	Acres
CRP	24,052.10
CCRP	3,246.00
CREP	2,341.80
RIM	1,684.40
RIM-WRP	23.60
WRP	677.90
USF&W Ease./Acq.	16,153.38
DNR WMA	5,429.60
Natural Lands	188,906.32
Total Resource Acres	32,025.80
Cropland Acres	236,375.00
Percent Enrolled	**13.5%**
County Size Total	460,928.00
Percent Conserving	**52.6%**
BWSR Prepared: 08/01/08	

Table 1 Summary of land enrolled in conservation programs

Specifically, the Fergus Falls Wetland Management District's mission is to identify, protect, and restore the tallgrass prairie/wetland ecosystem and associated habitats and to provide opportunities for outdoor recreation and environmental education. For this purpose, the district currently manages 216 waterfowl production areas (WPAs) totaling 44,499 acres, and 1,148 perpetual easements protecting 24,015 acres of wetlands on private land. Thirty-nine perpetual wildlife habitat easements covering 4,185 acres of wetland and grassland habitats on private land have also been obtained.

The Douglas County Water Plan Task Force fully supports all state and federal conservation and habitat programs, and the funding that backs them. The programs support the preservation, restoration, and creation of essential habitat for wildlife all the while protecting our vital water resources from erosion, nutrient loading, and pollution.

Section Three: Wastewater and Stormwater Management

<u>Wastewater Management</u>
Wastewater is any water that has been negatively impacted by human activity. It is made up of

liquid waste discharged from residences, commercial properties, industry, and/or agriculture and can encompass a wide range of potential contaminants and concentrations. The term most often refers to the management (storage, treatment, and discharge) of wastewater from municipalities or subsurface sewage treatment systems (SSTS).

A failing individual sewage treatment system is defined in MN Rules Chapter 7080 as "…a seepage pit, cesspool, drywell, leaching pit or other pit, a tank that obviously leaks below the designated operating depth or any system with less than the required vertical separation..." (between the bottom of the treatment system and saturated soil). A failing system is considered an "imminent health threat" if it discharges onto ground surfaces or into surface waters, or if sewage backs up into a dwelling or other establishment. Douglas County has adopted MN Rules Chapter 7080 as part of the Douglas County Zoning Ordinance.

Failing sewage systems discharge untreated waste water into the environment where it contaminates ground water supplies, degrades surface waters, or poses a serious pathogenic health threat on the ground surface. Untreated waste water contains harmful bacteria (measured in fecal coliform), high levels of nutrients (such as phosphorus), and other compounds that consume dissolved oxygen in water. Fecal coliform is an indicator used to measure the amount of potential harmful bacteria that may be present in a water sample. Phosphorus is the limiting nutrient in freshwater ecosystems; additions of this nutrient can significantly increase the amounts of algae and macrophytes leading to "weedy" and green waters. Untreated sewage contains organic compounds that as they decay, or are bacterially digested, consume oxygen. This consumption can reduce the amount of oxygen available for fish and other aquatic species.

Failing septic systems continue to be a problem throughout the county. A recent evaluation by Wenck Associates estimated failure rates to be as high as 30-40%. Rural areas, unsewered lake developments, and unsewered towns are present throughout the County and require additional attention to improve SSTS compliance. The central part of the County, within the Long Prairie River Watershed, has centralized sewer through ALASD. The location of ALASD boundaries are depicted on Appendix C-Population Growth.

Some measures are in place to reduce failure rates. Ordinance revisions may reveal many failing septic systems through a point of transfer compliance requirement. Since 2003, any property transfer must be accompanied by an inspection of the system and/or certificate of compliance. This requirement along with requiring a certificate of compliance with building permits, will identify many failing systems.

Homeowner education on septic system maintenance and day-to-day use play an important role in improving system life expectancy and treatment efficiency. Douglas County also recognizes that correcting failing SSTS will not be effective without proper disposal of septage by pumpers. Further information is needed to determine risks and potential alterations needed in this aspect.

Stormwater Management

Stormwater discharge is defined as precipitation and snowmelt runoff from roadways, parking lots, and roof drains that is collected in gutters and drains. Stormwater management is the activities within a watershed or region done to remedy existing stormwater problems and/or prevent the occurrence of new problems. Stormwater management applies to agricultural and

urbanized land uses and includes quality and quantity considerations.

According to EPA's National Water Quality Inventory: 2000 Report, prepared under Section 305(b) of the Clean Water Act, urban stormwater runoff and discharges from storm sewers are a primary cause of impaired water quality in the United States. "The surest way to improve water quality in Minnesota is to better manage stormwater. Unmanaged stormwater can have devastating consequences on the quality of lakes, streams and rivers we enjoy. Stormwater often contains oil, chemicals, excess phosphorous, toxic metals, litter, and disease-causing organisms. In addition, stormwater frequently overwhelms streams and rivers, scours stream banks and river bottoms and hurts or eliminates fish and other aquatic organisms."
Source: http://www.pca.state.mn.us/water/stormwater/index.html

Home to over 200 lakes over 40 acres in size, Douglas County has abundant surface waters. A map of surface waters in Douglas County is available in Appendix B. Many of these lakes are at risk of degradation due to inadequate or nonexistent stormwater management. Under a joint powers agreement with the MPCA, LRM has regulatory authority for stormwater management within the County. This includes permitting and enforcing NPDES requirements where greater than one acre is disturbed or impervious surfaces over one acre are created.

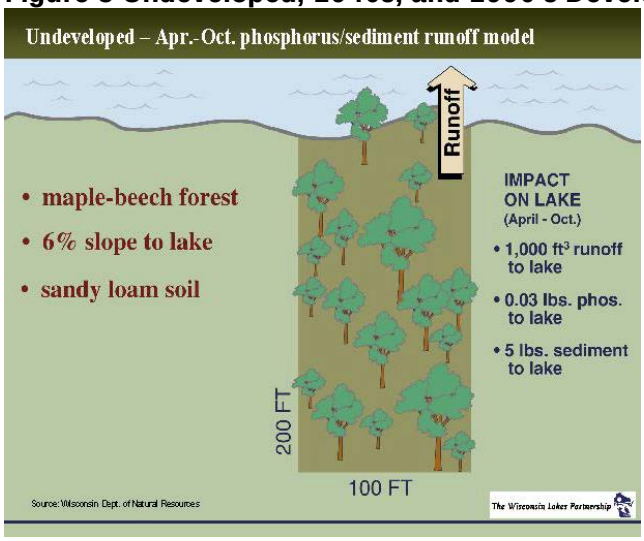
100 Year Storms

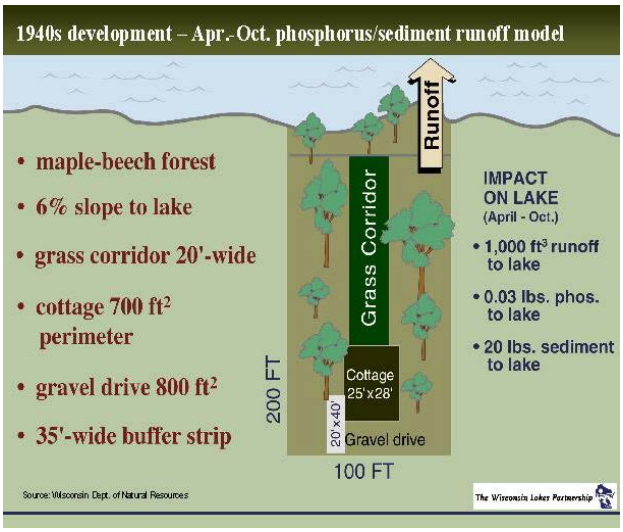
A 100 year storm event represents a probability that a particular amount of rain will fall within a given time period. In Douglas County, a rain event in which 5.57 inches fell in a twenty-four hour period would be considered a 100 year rain. A 100 year rain has 1% probability of occurring in a particular location. A 500 year rain has a probability of 0.2% of occurring.

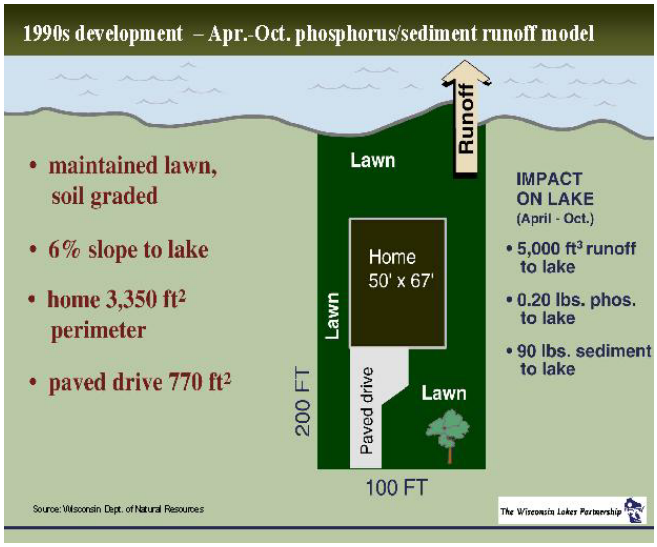
Increased development in combination with apparent climate change has created conditions of greater stormwater runoff. Three or more 100-year storm events have occurred in Douglas County in the last decade. A 500-year, 72-hour, storm event dropped 9.21 inches in June of 2003.

The construction of additional impervious surfaces (buildings, pavement, etc.), decrease in forested areas, filling of wetlands, road construction and related drainage, and reduction in the amounts of native vegetation have also supplied greater volumes of storm water. The shift from seasonal cabins to year-round homes contributes significantly to runoff and nutrient loading as illustrated in Figure 3 below (Source: Wisconsin Department of Natural Resources).

Figure 3 Undeveloped, 1940s, and 1990's Development, Runoff Impact on Lakes







Douglas County permits approximately 60-75 shoreland alterations every year. Many alterations eliminate or reduce the effectiveness of riparian buffers and stabilizing native vegetation.

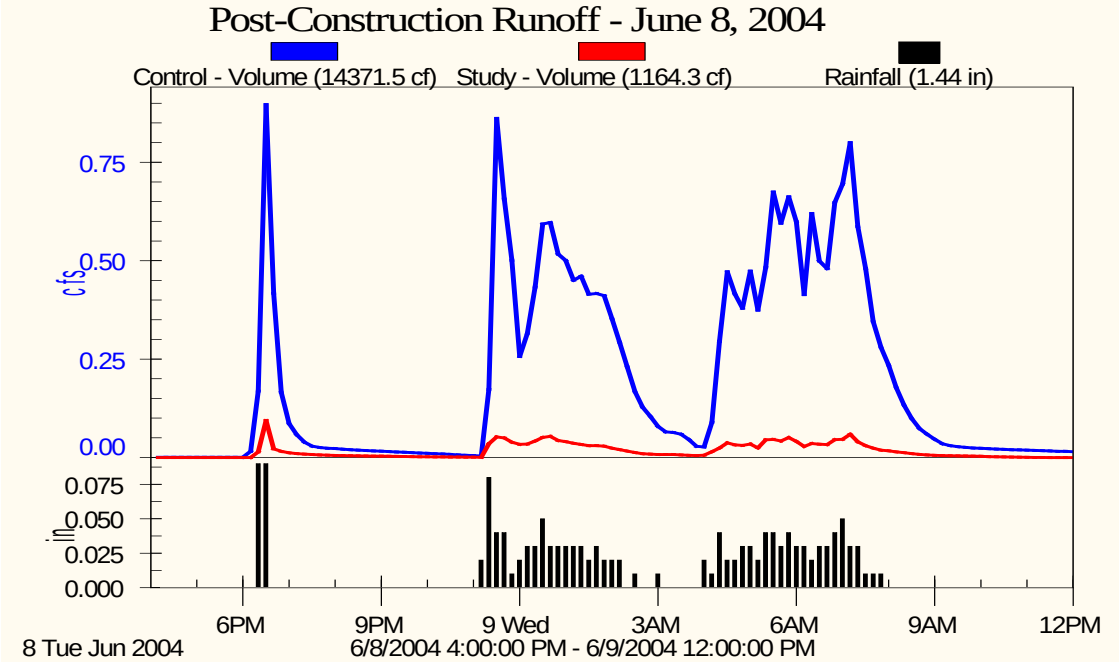
Many long-time lakeshore owners attest to changes in water clarity and the amounts of aquatic vegetation. Land values are affected by changes in water clarity as proven by a 2003 Bemidji State University study, "Lakeshore Property Values and Water Quality." A decrease in overall property values will harm the county's economy.

An area largely overlooked until recent years has been urban and residential stormwater management. With increasing shoreline development and alteration, water quality degradation continues to occur despite the removal of numerous failing septic systems. Improving stormwater management will encompass the reestablishment of vegetative buffers along lakes and rivers, maintenance of retention ponds and other stormwater management facilities, and continued education to modify property owner behaviors.

Recognizing the link between property values and water clarity shown by the Bemidji State University study, citizens should become mobilized to utilize erosion and sediment control measures, lakescaping, and preservation of aquatic vegetation as a means to reduce the impacts of additional pollutant loading created by higher stormwater volumes. As riparian and second tier development continue, stormwater management will become a higher priority in preserving or improving existing water quality

Rain gardens, vegetated swales, wet ponds and other bioretention practices have been proven to

effectively reduce runoff, filter pollution, and bind up excess nutrients. A study done by the City of Burnsville and Barr Engineering demonstrates nearly 90% reduction in stormwater volume in a side by side comparison of traditional street design with that of one retrofitted with 17 roadside rain gardens. The hydrograph below shows runoff discharge after receiving 1.44 inches of rainfall over nine hours.

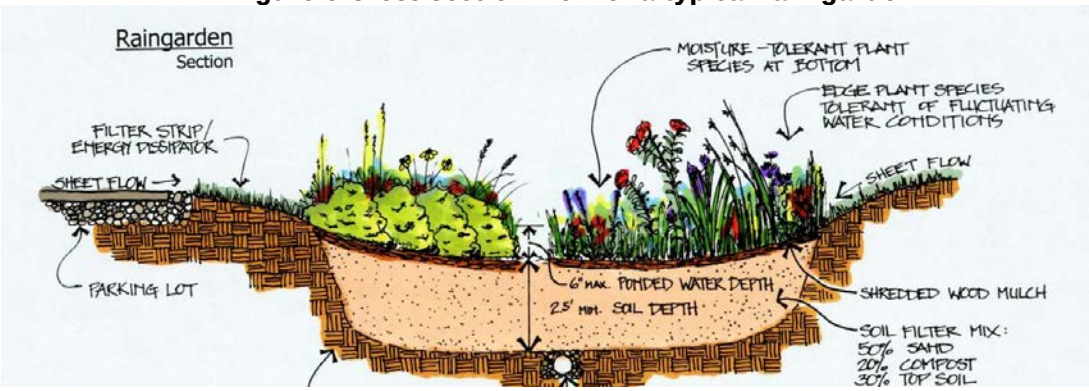


Source: City of Burnsville, Barr Engineering

Figure 4 Stormwater reduction after installation of rain gardens

A **rain garden** is a shallow depression where water gathers from rain or snowmelt that is planted with native wetland or wet prairie wildflowers and grasses. Rain gardens collect, store, and filter stormwater runoff from impervious areas such as roofs, parking lots, sidewalks, driveways, or patios. Rain gardens fill with a few inches of water and allow the water to slowly infiltrate into the ground rather than running off into storm drains, and eventually into streams and lakes.

Figure 5 Cross section view of a typical rain garden



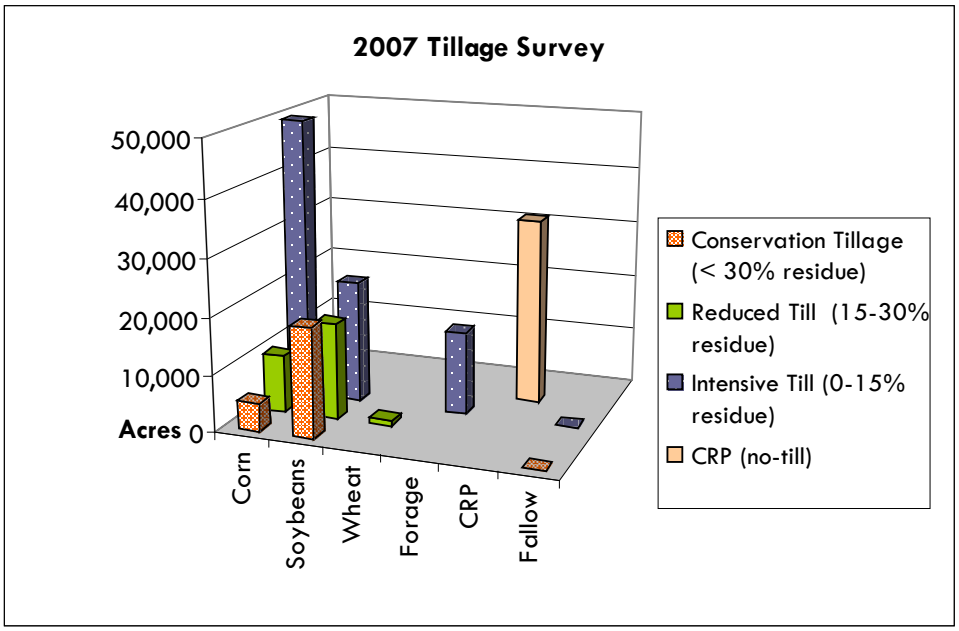
Rain Barrels can also reduce a small portion of the runoff that enters storm drains. A rain barrel can be any type of container that is used to catch water flowing from a downspout and store it for future use. The stored rain water provides a low-cost alternative to using tap or well water for watering lawns and gardens. Rain water can actually improve the health of your plants because it's naturally soft and does not contain minerals, chlorine, and other chemicals found in city water supplies. The rain barrel pictured on the right was made during a Douglas Soil and Water Conservation District workshop. Homeowners had the opportunity to build their own rain barrels using discarded, food grade 55-gallon drums from a local vendor. The other supplies were purchased for approximately $15 from various local hardware retailers. Pre-assembled barrels are now available for purchase by request at the SWCD office and "Make Your Own" instructions are available free of charge.

In September 2008, the City of Alexandria initiated a Comprehensive Stormwater Management Plan (SWMP). Once completed (Spring 2009) the SWMP will provide the city, contractors, residents and businesses concise guidelines, education, capital improvements and programs to address the current and future challenges of protecting the city's water and natural resources through stormwater management. The Plan will be different from a traditional stormwater management approach, which stressed detention and conveyance facilities, to comprehensive watershed management. This method adds innovative techniques that treat stormwater as a resource instead of a waste product.

Stormwater management in agricultural areas has been fairly well executed through use of best management practices, nutrient management plans, and feedlot regulation. Many existing conservation programs need to be maintained to continue pollution reductions and additional efforts are needed to reach specific problem areas with greater emphasis.

Practices such as no-till seeding, leaving adequate crop residue, buffering drainage ditches, maintaining grassed waterways, and replacing open tile intakes with buried inlets will further assist in reducing sediment and nutrient loading to receiving waters, thereby improving water quality. Douglas Soil and Water Conservation District and the Natural Resource Conservation Service have many cost-share and loan opportunities available for similar conservation practices and projects already in place. Feedlot runoff issues will be addressed through the Douglas County Feedlot Program. Douglas County is a delegated feedlot authority and has a work plan that is reviewed annually by the Pollution Control Agency. This work plan is available at the Land and Resource Management Office and outlines implementation and monitoring activities of the feedlot program. See Appendix A-Watersheds of Douglas County.

Figure 6 Roadside Tillage Survey by Douglas SWCD (Source: BWSR)



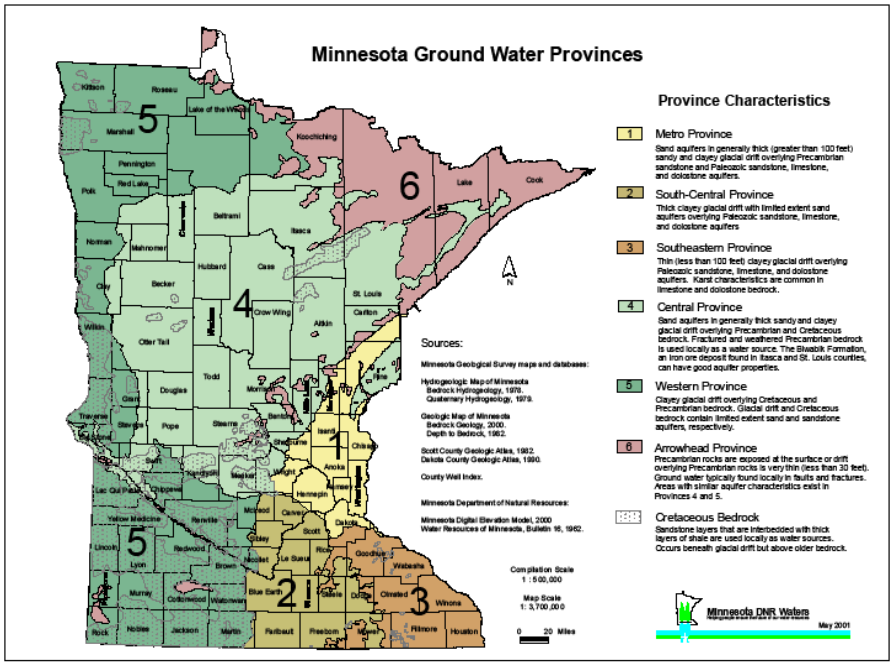
With a majority of growth occurring in the Long Prairie Watershed, residential stormwater management will be a high priority. The remaining watersheds will also have residential stormwater concerns, but at a lesser intensity. Rural areas throughout the county will continue to require agricultural stormwater management until remaining problem areas are resolved. All watersheds will require greater protection when managing stormwater in riparian areas. LMR is designated to do construction stormwater permitting for the MPCA.

Section Four: Water Quality

Ground Water

Development, sand and gravel mining, and drainage may also impact ground water resources by reducing recharge areas and decreasing recharge volumes while increasing the volume pumped from local aquifers. Most, if not all, drinking water is supplied from ground water in Douglas County. Figure 7 shows the six ground water provinces of the state based on bedrock and glacial geology. Areas within each province exhibit similar ground-water sources and the availability of ground water for drinking water, industrial, and agricultural uses. According to the DNR Waters, the aquifers within these provinces occur in two general geologic settings: bedrock comprising a wide range of rock types and ages, and unconsolidated sediments deposited by glaciers, streams, and lakes. Douglas County is within Province 4 (Central) which is characterized by sand aquifers that are thick and yield large quantities of water. When these aquifers are near the land surface, they may be vulnerable to contamination.

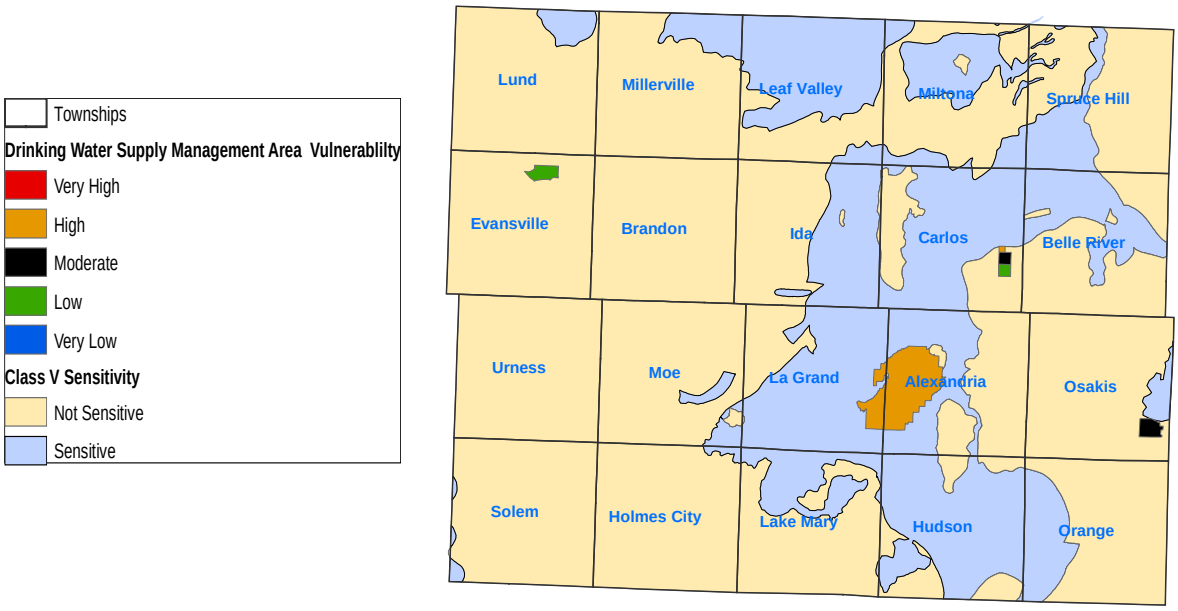
Figure 7 Minnesota Ground Water Provinces (Source: DNR Waters)



Ground water contamination can come in many forms including bacteria, nitrate, arsenic, and other chemicals (fertilizers, pesticides, etc.). The Minnesota Department of Health (MDH) recommends testing private wells for nitrate because of the potential health risks it possess to infants (blue baby syndrome). Nitrate and nitrite are naturally occurring sources of pollution and can be found in ground water, although high nitrate levels are usually due to human activities. Human introduced nitrate-nitrite enters environment from fertilizer, sewage, and human or farm-animal waste. In agricultural settings, risks of potential contamination can be reduced by proper nutrient management and manure storage. The MDH has developed nitrate-nitrogen probably maps for several counties in Minnesota. These maps can help with state and local water quality planning efforts. Douglas County has not yet been mapped. Contaminated ground water can also impact irrigated crops, livestock, and surface waters.

Wellhead protection is a method developed by the MDH to prevent well contamination by managing potential contaminant sources within a well's recharge area. Wellhead protection plans have now been completed for Alexandria, Carlos, Evansville, and Osakis. The MDH required these municipalities to complete wellhead protection plans because of their vulnerability rating. The vulnerability assessments must address three components: 1) geologic sensitivity, 2) well construction, maintenance, and use, and 3) water chemistry and isotopic composition (age dating). Wells classified as "moderately vulnerable" must manage all point source contamination risks and address land use activities that threaten the aquifer. Figure 8 shows the vulnerability of drinking water supply management areas in the county. All Douglas County citizens depend on ground water for drinking water and will benefit if public water suppliers develop and implement Wellhead Protection plans. Appendix I contains lists of all public water suppliers in this county.

Figure 8 Drinking Water Vulnerability in Douglas County



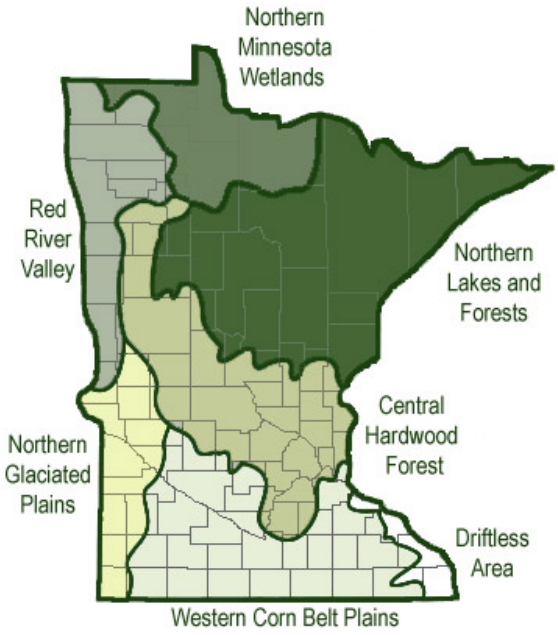
The City of Alexandria has been expanding through orderly annexation over the last several years and will continue to doing so; enlarging the borders will make a public water supply available to a greater number of people. As a result, fewer wells will be used and more wells will be abandoned in this area. Residents are encouraged to take advantage of the free well sealing program provided by the water supplier, Alexandria Light & Power. Other private wells in the County can be protected by maintaining proper setbacks to potential contaminant sources and related land use education efforts. Additional information about drinking water supplies can be found at: www.health.state.mn.us/divs/eh/water/swp/swa/index.htm.

Surface Water

Douglas County is located within the Central Hardwood Forest and Northern Glaciated Plains Ecoregions.

> Lakes and rivers within ecoregions, because they occur in an area of similar land type, often have similar physical characteristics, water chemistry, and biological communities. It is often said that, "A lake is a reflection of its watershed," and therefore of its ecoregion. In other words, what happens on the land and the basic characteristics of the land (soil, geology, vegetation, drainage, etc.) affects the quality and health of a lake or stream. The number, appearance, and condition of lakes vary among ecoregions because of glacial history, geology, soil type, land use, and climate. Typical values for chemical and physical measurements have been compiled for the four lake-rich ecoregions by evaluating information from minimally impacted lakes and rivers. These values provide a "yardstick" for comparing other lakes and rivers in the same ecoregion. Source: Minnesota Shoreland Management Resource Guide (www.shorelandmanagement.org).

Figure 9 Ecoregions of Minnesota



Typical values for chemical and physical parameters have been compiled for the seven ecoregions by monitoring unimpacted water bodies (lakes or streams with minimal human disturbance). See Table 3 below. These values help us identify what conditions might have existed before human settlement and help us develop realistic expectations for how lakes or streams might be restored to a more "natural" state. It is unrealistic to expect a shallow, southern Minnesota lake to have the same water clarity or productivity, for example, as a northern Minnesota lake. Ecoregions help us understand these differences.

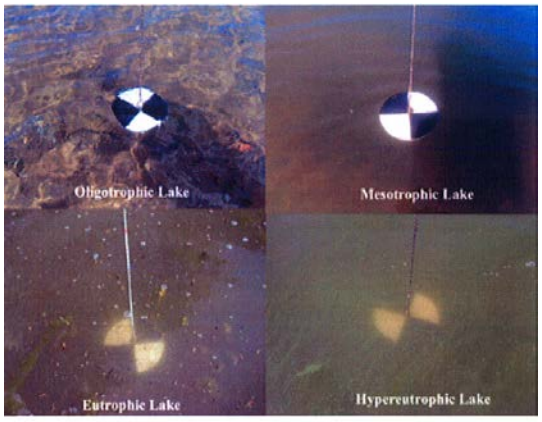
	Red River Valley	Northern Minnesota Wetlands	Northern Lakes and Forests	North Central Hardwood Forests	Northern Glaciated Plains	Western Corn Belt Plains	Driftless Area*
pH	8.6 – 8.8	7.2 – 8.3	7.2 – 8.3	8.6 – 8.8	8.3 – 8.6	8.2 – 9.0	N/A
TSS (in mg/L)	2 – 6	<1 – 2	<1 – 2	2 – 6	10 – 30	7 – 18	N/A
NO_x (in mg/L)	<0.01	<0.01	<0.01	<0.01	.01 – .1	0.01 – 0.02	N/A
TP (in mg/L)	0.023 – 0.050	0.014 – 0.027	0.014 – 0.027	0.023 – 0.050	0.130 – 0.250	0.065 – 0.150	N/A
Turb (in NTU)	1 – 2	<2	<2	1 – 2	6 – 17	3 – 8	N/A
Secchi (in m)	1.5 – 3.2	2.4 – 4.6	2.4 – 4.6	1.5 – 3.2	0.3 – 1.0	0.5 – 1.0	N/A
Chl-a (in µg/L)	5 – 22	<10	<10	5 – 22	30 – 55	30 – 80	N/A
TKN (in mg/L)	<0.60 – 1.2	<0.75	<0.75	<0.60 – 1.2	1.8 – 2.3	1.3 – 2.7	N/A

Table 2 Water quality variability by Ecoregion (Source: MPCA)

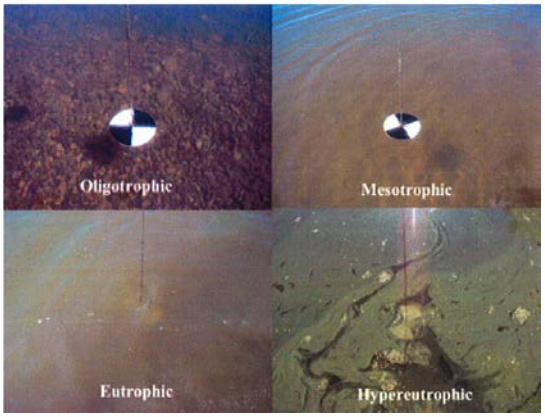
Water Quality can be easily assessed by looking at several of indicators. Currently volunteers, most of which are members of the Douglas County Lakes Association (DCLA), monitor approximately 30 lakes in Douglas County throughout the summer. These volunteers collect Secchi disk readings and water samples that are later analyzed at a lab for Total Phosphorus (TP) and Chlorophyll a (Chl a). This data is easily collected and fairly inexpensive to analyze.

Phosphorus, Chlorophyll-a (algae concentration) and Secchi depth are related. When phosphorus increases, that means there is more food available for algae, so algal concentrations increase. When algal concentrations increase, the water becomes less transparent and the Secchi depth decreases. The overall trophic state index (TSI) of a lake is the average of the TSI for phosphorus, the TSI for chlorophyll-a and the TSI for secchi depth; therefore, it can be thought of as the lake condition taking into account phosphorus, chlorophyll-a and secchi depth.

Figure 10 Seasonal changes in Secchi disk readings (Source: MPCA)



Early summer



Late summer

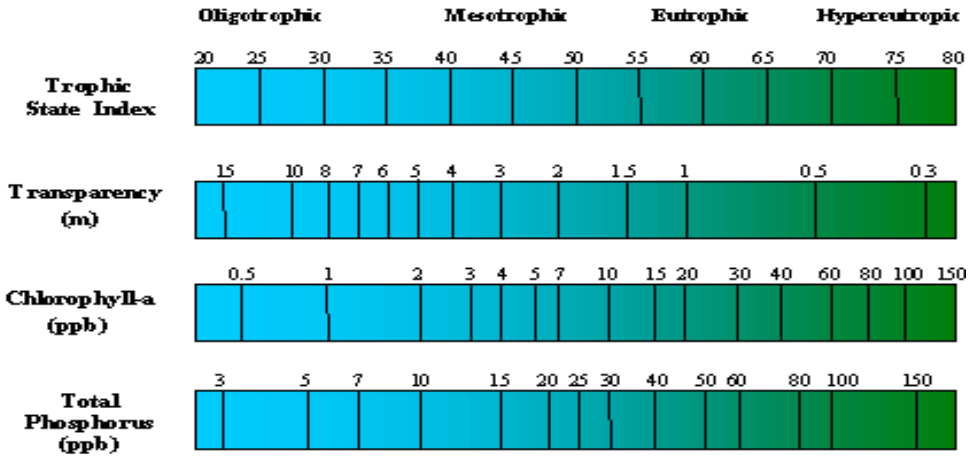


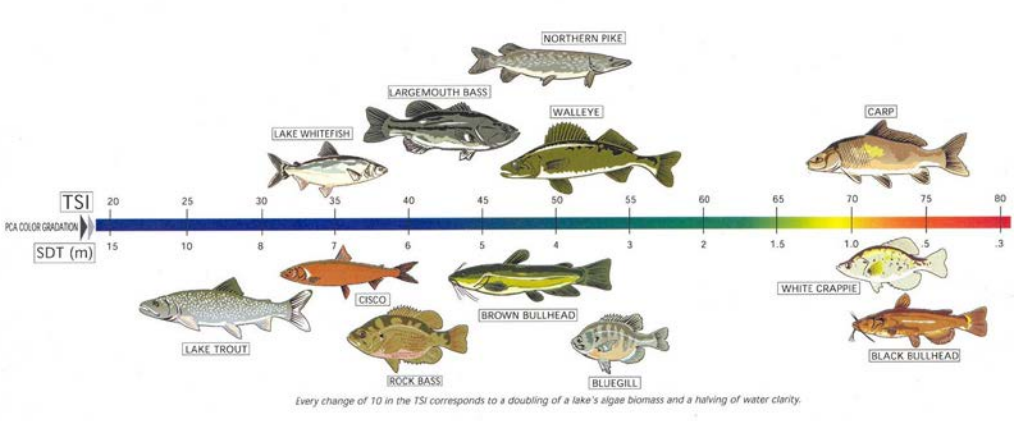
Figure 11 Trophic States (Source: MPCA)

It is important to understand that Trophic States are defined divisions of a continuum in phosphorus and algal concentration. The TSI ranges from 0-100. 0-30 is Oligotrophic, where water is very clear, phosphorus is low, and algae is sparse. 30-50 is an in-between stage where the number of aquatic plants and algae increase due to more available phosphorus.

A TSI of over 50 describes a lake that is eutrophic, with a high density of plants and algae that could be unpleasant for swimming at certain times in the summer. Some lakes may be naturally eutrophic, having a TSI of 50 or greater for the last 100 years. Other lakes have gradually increased in TSI as a result of human activities. The Minnesota Pollution Control Agency recommends 8-10 years of quality long term data on a lake for the determination of increasing or decreasing TSI trends.

TSI is not necessarily interchangeable with water quality. Water quality is subjective and depends on how you intend to use the water body. A lake that is good for duck hunting is not necessarily good for water skiing. In turn, a lake that is great for swimming may not be great for bass fishing.

Figure 12 Fish species vary by lake TSI (Source: DNR)



Continued water quality monitoring and data analysis are needed throughout the county to maintain a long term database and identify trends. Several lakes have been identified as having a measured declining water clarity trend. In 2008, historical data showed a declining trend in TSI for lakes Aaron, Andrew, Darling, Freeborn, Geneva, Gilbert, Ida, Irene, Jessie, Louise, North Union, Red Rock, Smith, Oscar, and Stowe according to reporting by the RMB Environmental Laboratories at the primary monitoring site. More information is needed to understand this and other lakes' pollution sources in order to determine effective implementation strategies and prevent further degradation. Existing water quality data on all monitored lakes in Douglas County can be found on the Pollution Control Agency's website: www.pca.state.mn.us.

Water quality monitoring could be expanded to help resource managers better identify contributing factors in declining water conditions. Measuring stream clarity in lake inlets is one area of monitoring that could be expanded. Also a focused effort to monitor lakes within impaired watersheds could begin to lead to answers about potential sources of internal loading within the system. Biological monitoring could also be added for both streams and wetlands. Traditional water chemistry parameters like dissolved oxygen or total phosphorus can be highly

variable in wetlands and often of little direct use in assessing wetland impacts or quality. However, wetland organisms and plants have adapted to the variable wetland environment and proven to be useful indicators of wetland quality.

Biological monitoring is often able to detect water quality impairments that other methods may miss or underestimate. It provides an effective tool for assessing water resource quality regardless of whether the impact is chemical, physical, or biological in nature. To ensure the integrity of surface waters, we must understand the relationship between human induced disturbances and their effect on aquatic resources. MPCA has monitoring protocol for sampling fish, aquatic invertebrates, and algae in streams, as well as plants and aquatic invertebrates in wetlands.

The federal Clean Water Act (CWA) requires states to adopt water-quality standards to protect waters from pollution. These standards define how much of a pollutant can be in the water and still allow it to meet designated uses, such as drinking water, fishing and swimming. The standards are set on a wide range of pollutants, including bacteria, nutrients, turbidity and mercury. A water body is "impaired" if it fails to meet one or more water quality standard. Section 303(d) of the CWA requires states to assess all of their waters for impairments and publish a list of impaired waters every two years, called the Total Maximum Daily Load (TMDL) List.

Currently all the major watersheds in Douglas County have impaired stream/river reaches. See Figure 14 below. TMDL studies are completed or in progress for each impairment. The Chippewa River watershed has a completed and approved for fecal coliform TMDL; a turbidity TMDL began in 2009. Pomme de Terre watershed has a completed TMDL and implementation plan for Fecal Coliform, as well as a TMDL study for turbidity in progress. The Long Prairie River watershed has a completed TMDL and implementation plan for low dissolved oxygen. In addition to the stream/river impairments, several lakes area also listed. A TMDL was started in 2008 on Lakes Osakis, Smith, and Clifford all within the Sauk River Watershed. See Appendix E for the complete list of impaired water bodies in Douglas County.

Figure 13 Flow diagram of the TMDL process (Source: MPCA)

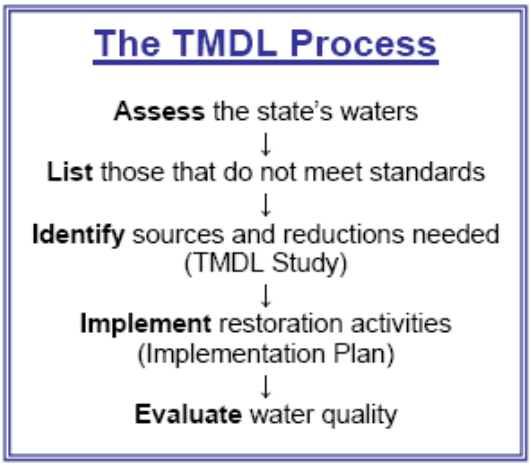
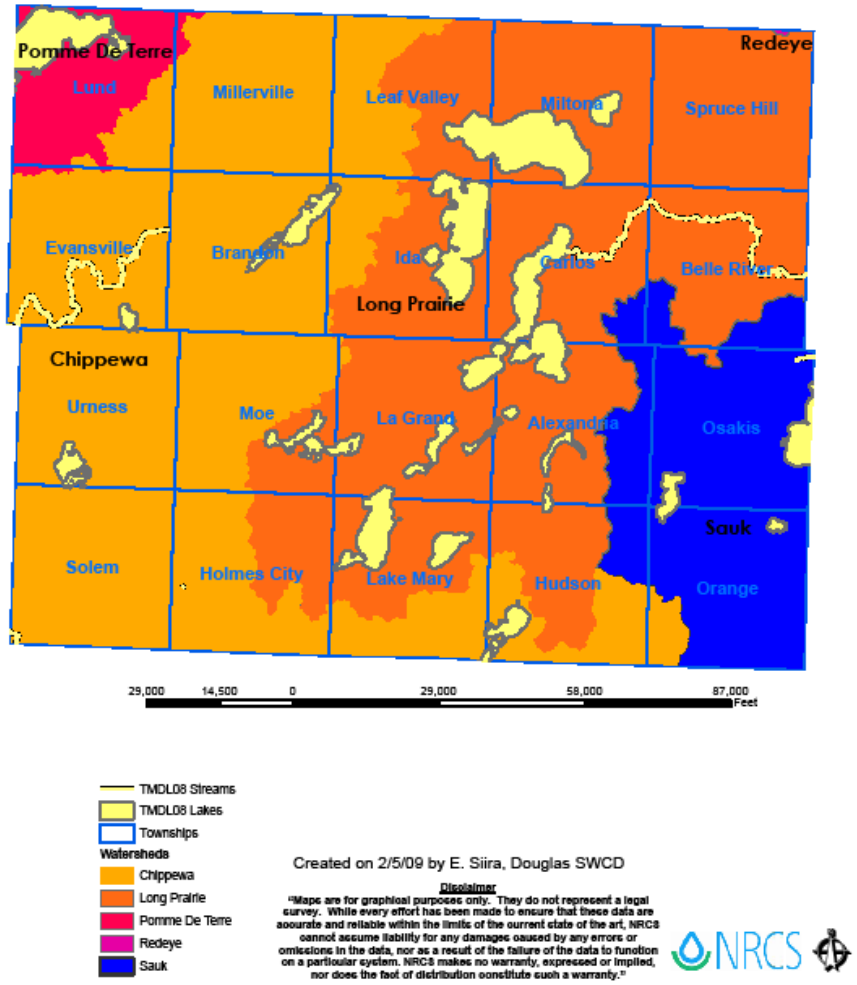


Figure 14 Map of Impaired Waters (Source: MPCA)



Chapter Four: Goals, Objectives, and Action Items

This chapter establishes the Douglas County's Water Plan goals, objectives and action items. The Douglas County Local Water Management Plan will cover a span of 10 years (2009-2019). Each action step has been assigned specific implementation information including priority watershed, stakeholders involved, and an estimated cost to implement the activity.

Section One: Implementation Schedule

Implementation Schedule

Responsible Parties for Implementation

ALP: Alexandria Light and Power
ALASD: Alexandria Lakes Area Sanitary District
DCLA: Douglas County Lakes Association
DNR: Minnesota Department of Natural Resources
DU: Ducks Unlimited
MDA: Minnesota Department of Agriculture
LRM: Douglas County Land and Resource Management
NRCS: Natural Resources Conservation Service
MPCA: Minnesota Pollution Control Agency
SWCD: Douglas Soil and Water Conservation District
WPTF: Water Plan Task Force
BWSR: Board of Water and Soil Resources
SRWD: Sauk River Watershed District
CRWP: Chippewa River Watershed Project
PdTRA: Pomme de Terre River Association
PW: Public Works
USFWS: U.S. Fish and Wildlife Service

Priority Concern: Development Pressures and Land Use				
Goal 1: Implement and promote land use practices that will minimize the impact on surface and ground water resources.				
Priority Watershed	**Action Step**	**Stakeholders**	**Estimated Annual Cost**	**Completion Date**
Objective A: Assist landowners with identifying priority sites to implement and promote Best Management Practices to reduce soil erosion and sedimentation.				
Countywide	**1.A.1. Conservation Practices.** ▪ Implement conservation projects such as shoreland buffers, filter strips, streambank stabilization, windbreaks; water and sediment control basins. ▪ Install 6 practices per year.	SWCD, LRM, NRCS	$150,000	2019
Countywide	**1.A.2. Conservation Tillage.** ▪ Promote conservation tillage by providing a no-till drill rental service. A Douglas SWCD technician will assist landowners with delivery, calibration, and depth adjustments. ▪ Establish 1,400 no till acres annually. ▪ Publish bi-annual conservation articles in digital and print sources. ▪ Douglas SWCD is a local distributer of seed mixes for native grasses and forbs.	SWCD	$20,000	2019
Countywide	**1.A.3. SWCD Tree Program.** ▪ Provide landowners with local program to purchase trees and shrubs for conservation practices, such as windbreaks, shelterbelts, living snowfences, and wildlife habitat. ▪ Plant 20,000 trees annually. ▪ Douglas SWCD offers project designs and custom tree planting.	SWCD	$40,000	2019
Countywide	**1.A.4. Minnesota Agricultural Water Quality Certification Program (MAWQP).** ▪ Promote voluntary opportunity for farmers and agricultural landowners to implement conservation practices that protect water quality. ▪ Educate landowners by holding an education workshop annually ▪ Enroll at least one producer/landowner annually.	SWCD, MDA	$5,000	2019
Objective B: Sustainable balance of social, economic and environmental objectives for existing and future development.				
Countywide	**1.B.1. Stormwater Zoning.** ▪ Revise Stormwater Zoning Ordinance to incorporate low impact design standards and current BMPs. Support sustainable development practices that incorporate conservation development standards and low impact development strategies.	LRM	$10,000	2019

Countywide	**1.B.2. Special Protection Districts.** ▪ Review core conservation areas as well as rare or sensitive natural area maps with a goal to establish special protection districts. The districts would discourage or prevent activities that would compromise the ecological integrity of the areas.	LRM	$5,000	2019
Countywide	**1.B.3. Shoreland Management.** ▪ Develop a guide book for Douglas County shoreland property owners on restoring native buffers, local ordinances, invasive species, aquatic vegetation, water quality BMPs and funding opportunities. Make available in both digital and traditional print.	LRM, SWCD, DCLA	$8,000	2019
Priority Concern: Natural Habitat Destruction				
Goal 1: Preserve, restore, and enhance natural habitat in Douglas County.				
Priority Watershed	**Action Step**	**Stakeholders**	**Estimated Annual Cost**	**Completion Date**
Objective A: Protect or enhance existing natural habitat areas by encouraging the establishment of healthy and diverse native vegetation.				
Countywide	**1.A.1. Conservation Programs.** ▪ Develop contracts, administration and provide assistance for the Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP), and Conservation Stewardship Program (CSP). ▪ Enroll 400 acres annually.	SWCD, NRCS, LRM	$80,000	2019
Countywide	**1.A.2. Pollinator Habitat.** ▪ Promote pollinator habitat through the Conservation Reserve Programs (CRP), Environmental Quality Incentive Program (EQIP) and Conservation Technical Assistance (CTA). ▪ Enroll 150 acres annually.	SWCD, NRCS	$20,000	2019
Objective B: Restore previously impacted natural habitat which provide crucial area for aquatic and terrestrial plants and animals.				
Sauk River Watershed (Crooked Lake Ditch subwatershed)	**1.B.1. Crooked Lake Basin Project.** ▪ Restore the Crooked Lake basin, approximately 2000 acres, by partnering with 6 primary landowners to secure permanent wetland easements and provide technical and financial assistance to identify locations to improve sediment reduction, increase water storage, and establish native plantings.	SWCD, SRWD	$6,000	2019
Countywide	**1.B.2. RIM-WRP.** ▪ Promote restoration of wetlands, riparian agricultural lands, marginal cropland,	NRCS, BWSR, SWCD	$200,000	2019

	pastured hillsides, and sensitive groundwater areas. ▪ Enroll 50 acres annually.			
Countywide	**1.B.3. Wetland Restorations.** ▪ Actively restore high priority wetlands in targeted subwatersheds. ▪ Develop contracts, administration and provide assistance for the Reinvest in Minnesota (RIM) easement program. ▪ Restore 25 acres annually.	SWCD, NRCS	$100,000	2019
Priority Concern: Waste and Stormwater Management				
Goal 1: Improve stormwater runoff management in Douglas County.				
Priority Watershed	**Action Step**	**Stakeholders**	**Estimated Annual Cost**	**Completion Date**
Objective A: Improve Stormwater runoff quality by increasing utilization of BMPs.				
Countywide	**1.A.1. Conservation Drainage Practices.** ▪ Pursue funding to provide educational, technical and financial assistance to landowners for the installation of conservation drainage practices. No-till, buffer strips, terraces, sediment blocks, cover crops, nutrient application, sediment ponds, holding ponds, rain gardens, alternative tile intakes, etc. ▪ Implement 10 projects, annually.	SWCD, NRCS, LRM	$25,000	2019
Countywide	**1.A.2. Buffer and Soil Loss Legislation.** ▪ Assist landowners with planning, technical assistance, implementation of approved alternative practices, and tracking progress toward compliance. Provide information regarding local, state or federal cost-share grants, contracts, or loans. o Public Waters - November 1, 2017. 50-ft average, 30-ft minimum width, continuous buffer of perennially rooted vegetation. o Public Drainage Systems - November 1, 2018. 16.5-ft minimum width, continuous buffer.	SWCD, LRM, BWSR, DNR	$150,000	2018
Goal 2: Improve wastewater management in Douglas County.				
Objective A: Prevent SSTS failure and related sewage pollution in Douglas County.				
Countywide	**2.A.1. Noncompliant Upgrades.** ▪ Pursue funds to provide financial assistance for homeowners to upgrade noncompliant	LRM, SWCD	$75,000	2019

	SSTSs. ▪ Upgrade 5 noncompliant SSTS annually.			
Countywide	**2.A.2. Low Income Loans.** ▪ Secure a local financial lender to provide low income loans for homeowners to upgrade noncompliant systems.	SWCD, LRM, MPCA	$2,000	2019
Priority Concern: Water Quality				
Goal 1: Protect and maintain surface water quality in Douglas County from further degradation.				
Priority Watershed	**Action Step**	**Stakeholders**	**Estimated Annual Cost**	**Completion Date**
Objective A: Protect Douglas County's surface waters from being listed on MPCA's 303(d) list of Impaired Waters.				
Countywide	**1.A.1. Prioritize, Target, Measure (PTM).** ▪ Seek opportunities to refine watershed analysis and management strategies using detailed PTMApp, ACPF or other spatial analysis tools and water quality data to guide plan actions and target implementation. Consider biology, hydrology, connectivity, geomorphology, and water quality. o Lakes of Phosphorus Sensitivity Significance (DNR) classified as "high quality, unimpaired lakes at greatest risk of becoming impaired" to nutrient pollution in Douglas County. Prioritize for phosphorus reduction projects in watersheds. Includes Geneva, Miltona, Chippewa, Andrew, Latoka, Aaron, Rachel, Ida, Vermont, Mary, Blackwell, Spring, Maple, Union, Pocket, Moses, Irene, Freeborn, South Oscar, Indian, Burgen, Kruegers Slough, Little Oscar, Pelican, Lobster, Le Homme Dieu, and Grants lakes.	SWCD, LRM, BWSR, DNR	$15,000	2019
Countywide	**1.A.2. Lake Protection Analysis Grant.** ▪ Isolate the direct contributing area of major lakes in Douglas County to prioritize, target activities, and develop measurable goals.	SWCD	$15,000	2018
Countywide	**1.A.3. Surface Water Quality Monitoring.** ▪ Collect water quality data by Volunteer Lakes Monitoring Program through RMB Laboratories on the following lakes: Carlos, Chippewa, Cowdry, Darling, Geneva, Ida, Irene, Latoka, Le Homme Dieu, Lobster, Mary, Miltona, Pocket, Rachel, Smith, Vermont and Victoria. Annually review data to develop trophic status and trends. Evaluate list annually for demand of additional monitoring efforts.	SWCD, MPCA, DCLA	$10,000	2019
Long Prairie River	**1.A.4. Lake Ida.** ▪ Target and implement 10 water quality BMPs (urban, shoreland, feedlot, gully erosion,	SWCD, DNR, LRM, PW	$200,000	2019

Watershed (Lake Ida subwatershed)	etc.). ▪ Continue surface water monitoring stations along County Ditch #23 upstream and downstream of the Lake Ida AMA – collect flow, precipitation, and water quality data. ▪ Complete a full assessment of Lake Ida contributions. Pursue Clean Water Funding to implement priority projects.			
Long Prairie River Watershed (Lake Mary subwatershed)	**1.A.5. Lake Mary.** ▪ Pursue funding to obtain feasibility study and develop a design to implement BMPs and strategies to reduce the transport of nutrients to the lake, with special focus on County Ditch #9. ▪ Partner with USFWS to restore or improve wetlands within lakeshed. ▪ Continue water quality monitoring efforts. ▪ Provide technical and financial assistance to property owners to implement BMPs.	SWCD, USFWS, PW	$100,000	2019
Long Prairie River Watershed (Lake Le Homme Dieu subwatershed)	**1.A.6. Lake Le Homme Dieu and Henry Control Structure.** ▪ Pursue funding for the construction/reconstruction of a water control structure and carp barrier on the watercourse between Lake Henry and Lake Le Homme Dieu. Previously, the Minnesota DNR provided a feasibility study and design.	DNR, SWCD	$98,000	2019
Objective B: Target and prioritize surface water quality issues using tools and resources. Assist with monitoring efforts, development of implementation plans and activities through long term partnerships.				
Long Prairie River Watershed	**1.B.1. Long Prairie River Watershed Restoration and Protection Strategy / Long Prairie River Watershed Pollutant Reduction Project TMDL** Lakes identified for water quality restoration or protection strategies in need of management or reduction. Including nutrient, stormwater, erosion, manure, shoreline buffers, TP, pasture, feedlot, in-lake nutrient, sediment, and cropland. ▪ Subwatershed Lake Carlos: Carlos, Darling. o Implement five stormwater BMPs, and five agricultural BMPs. ▪ Subwatershed Lake Mary: Pocket, Andrew, Mary. o Implement at least three urban BMPs (rain garden, shoreline buffer). o County Ditch #9: Continuous monitoring stations upstream and downstream. Collect flow, precipitation and water quality data. ▪ Subwatershed Lobster Lake: Echo, Mill, Crooked East, Crooked West, Round, Lobster, Crooked. o Implement at least one agricultural BMP, one feedlot BMP, two active erosion reduction projects, one urban (rain garden, shoreline buffer) BMP, and one shoreline or wetland restoration.	SWCD, MPCA, DNR, MDA	$185,000	2026

	▪ Subwatershed Lake Latoka: Nelson, Latoka, Brophy, Charley, Louise, Mina, Cowdry. o Implement at least two urban BMPs (rain garden, shoreline buffer) and two shoreline or wetland restorations. ▪ Subwatershed Lake Ida: Ida. o Implement at least one urban BMP (rain garden, shoreline buffer), three shoreline or wetland restorations, two erosion reduction projects, and one feedlot BMP. o County Ditch #23: Continuous monitoring stations upstream and downstream. Collect flow, precipitation and water quality data. ▪ Subwatershed Lake Miltona: Miltona, Spring, Vermont, Irene. o Implement at least three urban BMPs (rain garden, shoreline buffer) and two erosion reduction projects. ▪ Subwatershed Lake Victoria: Jessie, Union, Burgen, Victoria. o Implement at least two urban BMPs (rain garden, shoreline buffer), one agricultural BMP, and one feedlot BMP. ▪ Subwatershed Lake Le Homme Dieu: Winona, Agnes, Henry, Le Homme Dieu, Geneva. o Implement three stormwater BMPs, and five agricultural BMPs.			
Sauk River Watershed	**1.B.2. Sauk River Watershed Restoration and Protection Strategy.** Lakes and tributaries (ditches) in need of management or protection. Strategies include upgrading noncompliant SSTS, manure and livestock management, and vegetation management. ▪ Septic System Upgrades: Target loan funds for properties abutting Lake Osakis. Upgrade 10-20 sub-surface treatment systems in Lake Osakis annually. ▪ Nutrient Management: Implement manure management, conservation tillage, filter strips, buffers and restore wetlands on approximately 7,000 acres. ▪ Subwatershed Clifford Lake. o Clifford Lake. ▪ Subwatershed Osakis Lake. o Lake Osakis. ▪ 9,416 pounds Phosphorus reduction/year. ▪ Subwatershed Crooked Lake Ditch. o Smith Lake. ▪ 1,556 pound Phosphorus reduction/year. o Unnamed cr to Lk Osakis / Judicial Ditch #2: Implement livestock and manure management plans, agricultural waste pit closures, and feedlot runoff. o Crooked Lake Basin Project: Acquire property and assist landowners to target wetland reserve and RIM funds to area. Implement BMPs to improve water	SWCD, SRWD, MPCA, DNR, MDA	$100,000	2026

	quality and reduce sedimentation.			
Chippewa River Watershed	**1.B.3. Chippewa River Watershed Restoration and Protection Strategy.** Stressors include turbidity, bacteria, dissolved oxygen, phosphorus, connectivity, habitat, altered hydrology and nutrients. Strategies include cover crops, conservation tillage, nutrient management, water and sediment control basins, streambank stabilization, buffers, urban BMPs, septic system upgrades, livestock management, and buffers. ▪ Chippewa River: 42% TSS reduction and 13% TP reduction. Implement conservation tillage, water and sediment control basins, livestock management, and riparian buffers. ▪ Subwatershed Lake Moses: Aaron, Moses, Stockhaven, Stockhousen. ▪ Subwatershed Chippewa Lake: Private, Whiskey, Devils, Chippewa, Indian. o Private Lake: Pursue funding for water quality monitoring efforts. o County Ditch #10: Prioritize implementing BMPs including buffer strips, water and sediment ponds, and grade stabilization. ▪ Subwatershed Stowe Lake – Chippewa River: Stowe, Long. o Long Lake: 6,938 pound Phosphorus reduction. o Stowe Lk to Little Chippewa R: Livestock and manure management, SSTS upgrades, bank stabilization. ▪ Subwatershed Peterson Lake – Chippewa River: Jennie o Jennie Lake: 136 pound Phosphorus reduction. ▪ Subwatershed Lake Oscar: Venus, Little Oscar, South Oscar, Gilbert. o Gilbert Lake: 387 pound Phosphorus reduction. ▪ Subwatershed Red Rock Lake – Chippewa River: Red Rock. o Red Rock Lake: 809 pound Phosphorus reduction. ▪ Subwatershed Freeborn Lake: Freeborn. o Unnamed Creek Freeborn Lake Inlet (-901): 35% TSS reduction. ▪ Subwatershed Erickson Lake: Mattson. ▪ Subwatershed Lake Reno – Little Chippewa Rive: Rachel, Turtle, Maple.	SWCD, CRWP, MPCA, DNR, MDA	$150,000	2026
Pomme de Terre River Watershed	**1.B.4. Pomme de Terre River Watershed Restoration and Protection Strategy.** Impaired for impacts to aquatic recreation. Strategies include nutrient, in-lake management of internal loading, shoreland and floodplain, and septic system management. • Subwatershed Pelican Creek: Lake Christina. o Reduction of TP by at least 31% through wetland restorations, shoreline stabilization, and implementation of agricultural BMPs such as conservation tillage, grassed waterways, manure pit closures, and water and sediment control basins.	USFWS, SWCD, PdTRA, MPCA, DNR, MDA	$50,000	2026

Long Prairie River Watershed (Lake Le Homme Dieu subwatershed)	**1.B.5. Lake Winona TMDL.**
	Listed in 2002 as impaired water due to elevated phosphorus levels.
	▪ 2,535-pound total phosphorus (TP) reduction
	  ▪ Reduce TP by 50% to Lake Winona south basin
	  ▪ Reduce TP by 51% to Lake Winona north basin
		City of Alexandria, ALASD, Douglas County, LaGrand Twp, MPCA	$5.6M	2026

Objective C: Provide assistance to implement best management practices on feedlot and livestock sites.				
Countywide	**1.C.1. County Feedlot Program.** ▪ Registration or re-registration of all Douglas County feedlots by 1/1/2018. ▪ Complete 36-44 feedlot inspections per year. ▪ Annual feedlot meeting corresponding with approximately 90 participants.	LRM, MPCA	$100,000	2019
Countywide	**1.C.2. Comprehensive Nutrient Management Plan.** ▪ Pursue financial and technical assistance for producers to manage and maintain waste management systems through incentives and cost-share programs. ▪ Write one CNMP annually.	LRM, SWCD	$8,000	2019
Chippewa River Watershed (Upper Chippewa River)	**1.C.3. Manure Management.** ▪ Provide technical and financial assistance to upgrade or close two manure waste pits annually. ▪ Inspect and inventory at least 20 Douglas County manure storage areas. ▪ Provide assistance to unpermitted pits to meet compliance through soil investigations.	LRM, SWCD, NRCS, CRWP	$20,000	2019
Objective D: Control and prevent the spread of Aquatic Invasive Species in Douglas County.				
Countywide	**1.D.1. County AIS Program.** ▪ Employment of 18 Watercraft Inspectors, 3 mobile decontamination units. ▪ Perform approximately 9,500 inspections/interactions annually. ▪ Implement the Douglas County Aquatic Invasive Species Plan.	LRM, SWCD	$268,000	2019
Countywide	**1.D.2. Education and Outreach.** ▪ Increase public awareness at classrooms, fairs, events, meetings, and social media. Includes advertising, billboards, print materials and promotional items.	LRM, SWCD, DCLA	$100,000	2019
Countywide	**1.D.3. AIS Task Force.** ▪ Quarterly meetings held by LRM. Various representatives provide input on strategies and goals regarding prevention, management and education of aquatic invasive species. ▪ Review plan to ensure species relevance and program success.	LRM, SWCD	$2,500	2019

Goal 2: Protect and maintain groundwater resources in Douglas County.				
Objective A: Maintain and promote plans and partnerships to protect and monitor ground water.				
Countywide	**2.A.1. Nitrate Well Water Clinic.** ▪ Annually host a free nitrate testing clinic. ▪ Promote clinic and alternative testing options in through digital/print media. ▪ Test 75 private well water samples.	MDA, SWCD, MDH	$1,000	2019
Countywide	**2.A.2. Monitoring Wells.** ▪ Maintain seven monitoring wells to measure static water levels.	SWCD	$3,000	2019
Chippewa River Watershed	**2.A.3. Liquid Manure Storage.** ▪ Pursue grants and cost-share programs to provide financial and technical assistance to perform soil boring investigations to demonstrate a resource concern for eligibility for LMSA upgrades.	SWCD, LRM	$70,000	2019
City of Alexandria	**2.A.4. City of Alexandria Well Sealing Grant.** ▪ Partner with Alexandria Light and Power to target and close unused wells within the Drinking Water Supply Management Area for sealing through grant monies. ▪ Seal 2,000 unused private wells.	SWCD, LRM, ALP	$100,000	2018
Countywide	**2.A.5. Drinking Water Supply Management Areas (DWSMAs).** ▪ Develop a local ground-water quality database ▪ Educate landowners (digital or print media) within DWSMAs of programs and funding resources available to protect groundwater quality. Including WHP, RIM, EQIP, CRP, CWF grants, or MDH grants.	SWCD, MDH, NRCS, LRM, BWSR	$25,000	2019
Goal 3: Engage local citizens and stakeholders on water planning issues and implementation opportunities.				
Objective A: Educate and provide local citizens with material on the importance of surface and ground water quality.				
Countywide	**3.A.1. Water Quality Education Events**. ▪ Partner and participate at community educational events including Kids' Groundwater Festival, Envirothon, Douglas County Fair, and annual poster contest.	SWCD, LRM, DCLA	$25,000	2019
Countywide	**3.A.2. Programs and Presentations.** ▪ Annually host workshops on water and soil conservation practices. Biannually promote BMPs and financial programs through newsletters, radio and websites. Provide information by attending county, township, city, and lake association meetings.	SWCD, LRM	$12,000	2019

Objective B: Engage local partners with current water quality topics regarding the Douglas County Water Management Plan.				
Countywide	**3.B.1. Water Plan Task Force.** ▪ Partner with watershed districts, SWCDs, government agencies, and stakeholder groups to discuss key water plan concerns. Meet biannually to review water plan progress and discuss current and upcoming activities and projects.	SWCD, LRM, DCLA, DNR, MPCA, BWSR, PdTRA, SRWD, CRWP	$2,000	2019
Countywide	**3.B.2. Water Quality Technical Team.** ▪ Discuss current and upcoming water/soil conservation programs, projects, and activities within Douglas County region. Held by SWCD. Meet quarterly.	SWCD, LRM, BWSR, DNR, MPCA, NRCS	$2,000	2019
Countywide	**3.B.3. Water Quality Report.** ▪ Raise awareness of important soil and water conservation news. ▪ Update Douglas SWCD website. ▪ Biannually publish SWCD newsletter, approximately 4,500 recipients.	SWCD, LRM	$8,000	2019

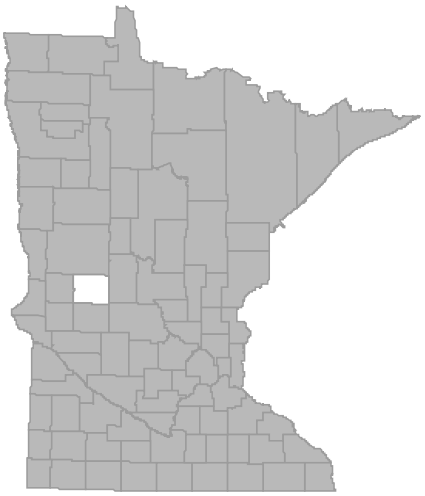
Section Two: Ongoing Activities

Ongoing Activities			
The following activities support the goals of the Douglas County Comprehensive Local Water Management Plan. These activities/programs should be supported and implemented on an ongoing basis.			
Priority Watershed	**Action Step**	**Stakeholders**	**Estimated Annual Cost**
All	Wetland Conservation Act (WCA) Administration	SWCD	$50,000
All	County Feedlot Program	LRM, SWCD	$80,000
All	Subsurface Sewage Treatment System Administration	LRM	$125,000
All	Shoreland Management	LRM, SWCD, DNR	$170,000
All	Zoning Administration	LRM	$275,000
All	Biennial Budget Request	SWCD, BWSR	$1,240,000
All	Ground water Monitoring	SWCD, MDH, MDA, DNR	$1,000
All	Wellhead Protection Program	MDH	$5,000

II. Appendix A.

Douglas County

Priority Concerns Scoping Document



Local Water Management Plan

January 1, 2009- December 31, 2019

Douglas County Local Water Management
Priority Concerns Scoping Document

Introduction

Douglas County is located in west-central Minnesota approximately 130 miles northwest of Minneapolis. Rich in water resources, Douglas County is home to nearly 200 lakes over 40 acres in size. The City of Alexandria serves as the county seat nestled within the Chain of Lakes area. The county's population in 2005 was estimated at 35,467, an 8.1% increase since 2000, and it is projected that the population will increase 41% by 2030. Douglas County experiences the common struggle of working to accommodate rapid growth and development while protecting valuable water resources. Agriculture, in the form of cultivated land, is the dominant land use within the county.

In 2005, the Douglas Soil and Water Conservation District (SWCD) became is the local government unit (LGU) responsible for the implementation of the Local Water Management Plan. All previous updates had been completed by Douglas County Land and Resource Management Department (LRM). The original Comprehensive Local Water Plan (CLWP) was adopted by the Douglas County Board of Commissioners on March 20, 1990. Resolutions to update the Plan were approved on November 23, 1994; August 3, 2004; and June 26, 2007. The current Plan expires on December 31, 2008.

List of Water Resource Concerns

Failing septic systems
Development pressures/issues
Need for more environmental education
Natural habitat destruction
Declining water clarity
Agricultural erosion
Over-application of fertilizers
Urban stormwater/drainage management
Contaminated runoff
Lack of regulations
Ground water contamination

Priority Concern Identification

Timeline of Douglas Water Plan update:

April 5, 2007	Water Plan Task Force met to discuss upcoming Water Plan related activities, local grant projects, and the Water Plan update process. A sub-committee was established to determine how public input would be gathered. See Appendix D.

May 7, 2007	Dan Steward, Board Conservationist, met with Jerome Haggenmiller, District Coordinator and Emily Siira, Water Plan Technician to discuss the water plan update process.
June 26, 2007	Douglas County Board of Commissioners passed a resolution to update the Local Water Management Plan.
July 11, 2007	Water Plan Update Committee met to determine how public input should be gathered. It was decided that in addition to a paper survey, an on-line survey should be made available to Douglas County residents. After the survey period, a public information meeting will be held.
July 23, 2007	Priority Concerns Input form mailed out. The parties were given 45 days to respond. The form was sent to 11 municipalities, 20 townships, four watershed organizations, four Soil and Water Conservation Districts, planning and zoning offices in the surrounding counties and representatives of BWSR, DNR, MPCA, MDA, MDH, EQB. In addition, forms were also sent to Vikingland Builders Association, Douglas County Lakes Association, Douglas County Farm Bureau, MN Corn Growers Assn, MN Soybean Growers Assn, Midwest Dairy Assn-Douglas County Board, MN Beef Council, MN Pork Producers Assn, and the Cattlemen's Assn.
August 2, 2007	Press release was sent to local media requesting public input via paper or on-line survey.
August 1-20, 2007	Survey period. Surveys were distributed to various public buildings in Alexandria including: City Hall, Douglas County Public Library, Douglas County Land and Resource Management (County Courthouse) and the Douglas Soil and Water Conservation District (USDA Service Center). Paper surveys were also available during the Douglas County Fair at the SWCD booth. The online survey was created using SurveyMonkey.com and could be accessed through a link on the Douglas SWCD website. Only one survey could be completed per computer. Total paper surveys: 49. Total completed online surveys: 14. Total number of respondents: 63.
Sept. 10, 2007	Water Plan Update Committee met to discuss results of the survey and determine a date for the public information meeting.
Sept. 25, 2007	Press release sent out to local media advertising the public information meeting. The article appeared in the October 5 issue of the Echo Press.
October 18, 2007	Public information meeting was held at the Public Works Building at 7 p.m. Representatives from BWSR, DNR, MPCA, and Douglas County Land & Resource Management Office were also invited to attend. Participants were asked to make additional comments regarding the issues/concerns that received the highest "votes" during on the survey. The intention was to get a better understanding of the public perception behind the survey results. The discussion was transcribed on to large sheets of paper for all

participants to view through out the meeting. All participants were asked for final comments or changes before the meeting adjourned. The transcribed discussion notes can be found in Appendix C-Public Information Meeting Minutes.

Participants included Jerome Haggenmiller-Douglas SWCD, Mike Weber-City of Alexandria, Rebecca Sternquist-Land & Resource Management, Bud Nielson-Lake Ida Association, Darren Hungness-Landteam, Inc., Sue Engstrom-Douglas County Lakes Assn (DCLA), Dick Kuehn-DCLA & Task Force, Kyle Hopkins, Gary Thoennes-La Grande Twp., Gary Larson-Urness Twp., Dave Rush-Director Land & Resource Management, Jon Schneider-Douglas SWCD Supervisor, and Dan Steward-BWSR.

October 31, 2007 Water Plan Task Force reviewed comments from the Public Information meeting, survey, and agency/LGU comments. Selected and reworded the top four priority concerns.

Priority Concern Selection

The priority concerns for Douglas County were selected after tabulating survey responses, reviewing agency comments, and discussion by the Water Plan Task Force. The results are as follows: development pressures/issues, natural habitat destruction, contaminated runoff, failing septic systems, and declining water clarity. After further review by the Task Force, several of the concerns were combined and reworded to help make Water Plan more clear and concise. These changes do not present any conflict between agency comments, survey results, or information gathered during the public information meeting. The following is the final list of Priority Concerns to be addressed in the updated Douglas County Local Water Management Plan.

Priority Concern 1: Development Pressures and Land Use
Priority Concern 2: Natural Habitat Destruction
Priority Concern 3: Wastewater and Stormwater Management
Priority Concern 4: Water Quality

The update committee and Task Force will continue to meet over the next six months to assist in the development objectives and tasks for each of the priority concerns.

Priority Concerns not addressed by the Plan

Some water management issues will not be addressed in the updated plan. As with the previous Water Plan, development pressures and land use issues quickly came to the foreground in most discussions and responses. Other concerns will be re-examined for higher prioritization at the next plan update or addressed as funding opportunities arise.

PCSD Appendix A.

LOCAL UNITS of GOVERNMENT and STATE AGENCIES
SUMMARY OF CONCERNS

Board of Soil and Water Resources

Priority Concern 1: Protection of Water Quality during and after land development in riparian areas.

- County leadership on lake water quality protection issues.
- Consistent application and enforcement of Douglas County shoreland rules.
- Continue work to develop new voluntary and regulator tools to protect water quality.
- Continue strong administration of the Wetland Conservation Act.
- Shoreland revegetation, develop strong working relationships between the county and lake associations through the water plan, track impervious by lake watershed, develop tools to protect mapped sensitive areas around lakes, conservation easements.

Priority Concern 2: Erosion and sediment control on developing areas throughout Douglas County.

- Vigilant inspection of sties where disturbance is occurring.
- Continue to develop the SWCD's expertise in the area of stormwater management technical assistance.
- Work to train realtors, developers, contractors, and local officials to the need of stormwater management.

Priority Concern 3: The trend towards development of marginal lands.

- Protection of key sensitive areas with conservation easements.
- Promote lake associations to develop conservation committees that work to protect critical areas with conservation easements.
- Continue to use the sensitive areas map as a key tool in plat and other development reviews.

Priority Concern 4: Agricultural soil erosion.

- Application of traditional best management practices can significantly reduce erosion and sediment from agricultural fields.
- Tillage practices play a major role in soil vulnerability to erosion.
- Buffers adjacent to receiving waters have proven to be effective at reducing nutrients and sediment in runoff.
- Wetland restorations can help improve the quality of runoff waters after it has left the field.

Minnesota Department of Agriculture

Priority Concern 1: Manure Management and ISTS.

- Seek additional funding sources to help assist landowners in upgrading ISTS in the county.
- Continue education and outreach efforts on manure management in the County.
- Provide technical and financial assistance for producers to assist them in adopting practices to reduce the impacts from manure runoff.

Priority Concern 2: Impaired waters and TMDLs (Chippewa River TMDL-Fecal Coliform, Long Prairie River Watershed TMDL-Low Dissolved Oxygen, Pomme de Terre-Fecal coliform).

- Continue education and outreach efforts on manure management in the County. Provide technical and financial assistance to producers to assist them in adopting practices to reduce the impacts of manure runoff.
- The following pollution reduction practices by landowners and local resource managers can help reduce pathogen transport and survival: feedlot runoff controls, effective subsurface sewage treatment systems, municipal wastewater disinfection, proper land application of manure, erosion control, rotational grazing, and urban stormwater management.

Minnesota Pollution Control Agency

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

- Identify the priority the County places on addressing impaired waters, and how the County plans to participate in the development of TMDL pollutant allocations or implementation of TMDLs for impaired waters.
- Include maps of impaired waters and identification of the pollutant(s) causing the impairment(s).
- Address the commitment of the County to submit any data it collects to the MPCA for use in identifying impaired waters and data entry into the U.S. Environmental Protection Agency's STORET database. Projects funded through the MPCA's Clean Water Partnership, Section 319 and TMDL programs need to have this data entered into this database.
- Provide plans, if any, for monitoring as yet unmonitored waters for a more comprehensive assessment of waters in the County and
- Describe actions and timing the County needs to take to reduce the pollutants causing the impairment, including those actions that are part of an approved implementation plan for TMDL's.

Priority Concern 2: Alternative Shoreland Standards

- The County should consider adopting the DNR Alternative Shoreland Standards in order to provide for more flexible and innovative standards to accommodate the rapid development in the area.

Priority Concern 3: Best Management Practices

- Implementation of a rigorous program to increase buffering of water resources, improved tillage practices and other best management practices is recommended.

Priority Concern 4: Stormwater Management

- Improving stormwater management in rural areas and small communities within the County is recommended. Recommended actions include preparation of county wide, or township and city ordinances.

Priority Concern 5: Educational Opportunities

- Providing educational opportunities for the Douglas County Lakes Association regarding issues relating to water quality and land and water stewardship practices, should be considered to help retain high quality surface water resources within the County. Recommended actions are to establish educational seminars and the distribution of appropriate educational materials.

Minnesota Department of Natural Resources

Priority Concern 1: Outdated Land Use Plan

- The Local Water Management Plan should strongly promote a county land use plan redraft with greater sensitivity to potential environmental impacts, alternative designs or waste management systems, and site-specific "no build" areas.

Priority Concern 2: Runoff management and drainage

- The Water Plan should promote overhaul of State ditch laws and as possible, establish an active liaison with the County Ditch Board to promote alternatives to open ditches and tile inlets, abandonment and plugging of old non-maintained ditches, wetland restorations to retain runoff waters, incentive programs to sustain marginal croplands and CRP or other conservation programs, and other similar initiatives.

Priority Concern 3: Sewer service expansion

- Pros and cons of "big pipe" sewer treatment infrastructure should be identified and discussed in the county Water Plan. Plan actions could include supporting the County Land Use Plan to prepare for and guide development, identification and evaluation of feasible service alternatives, and ensuring completion of a comprehensive TMDL to determine potential water quality and hydrologic alterations to downstream basins in advance of proposed expansion of the ALASD treatment plant.

Chippewa River Watershed Project

Priority Concern 1: Reducing priority pollutants, focusing on erosion, sediment, bacteria, nitrogen, and phosphorus

- Work with the Chippewa River Watershed Project and the MPCA to get waters off the Clean Water Acts's TMDL 303d list of impaired waters.

- Establish a strategy to promote the use of phosphorous free fertilizer on lawns. Encourage municipalities to adopt ordinances that limit or prevent the use of phosphorous-based fertilizers.
- Assist with developing conservation plans to promote farming and recognize alternative farming methods.
- Through nutrient and pesticide management planning, such as precision agriculture, promote the timing rate, and placement of synthetic and/or organic fertilizers and pesticides using incentives.
- Promote practices to reduce stream-bank and ditch-channel erosion through developing a strategy identifying priority sites for alternative practices such as willow planting or stream barbs in critical areas.
- Seek __# of acres?__ new acres of filters/buffers along ditches and streams to capture sediment as it leaves the field. Enforce the minimum one-rod grassed area as it applies to drainage policy.
- Continue to support the upgrading of ISTS with the use of the state revolving fund low interest loans. Inventory the upgraded systems and through the use of the watershed monitoring, assess the areas that are showing high fecal coliform bacteria and seek additional funding to assist with upgrading systems in those critical areas.

Priority Concern 2: Water/drainage management

- Continue to digitize the drainage systems. Gather the history of each system to include the following: system name, watershed size, outlets to, date established, system type, repair history, construction improvement history, flow data, demonstration capacity, and monitoring data available. Assess the history to identify the erodible areas, flooding problem areas and storage potential.
- Promote the use of alternative intakes or the installation of intakes that promote efficient trapping of sediments and nutrients that enter drainage systems.

Priority Concern 3: Flooding

- Emphasize the need to protect non-farm wetlands (types 3, 4, and 5) and support the no-net-loss of wetlands. Promote voluntary restoration of drained wetlands.

Priority Concern 4: Education & Outreach

- Raise public awareness on a number of key water-planning issues.
- Continue to support watershed planning and implementation activities by providing financial and technical assistance. Annually review monitoring data and implementation accomplishment to continue coordinating future initiatives.
- Annually review MPCA's "State of the Minnesota River" report documenting annual monitoring results and long-term trend. Provide input and response to the report if necessary.

Priority Concern 5: Storm water management

- Meet with the local municipalities to determine which cities have adopted official controls to deal with storm water management.
- Raise public awareness on storm water pollution and ways to prevent/minimize it.

- In cooperation with the cities and neighboring counties, address common storm water issues and assess the need to be more proactive promoting storm water management
- Develop an educational program on the installation and removal of construction best management practices (i.e. for temporary erosion control structures).

Millerville Township Board

Priority Concern1: Mill Pond Dam (Section 13 of Millerville Township)

- Restrictions need to be placed to take it out of private controls. The level needs to be kept down lower so it doesn't also damage township road in event of heavy rains.

Priority Concern 2: Cleaning of old existing ditches

- Anyone along ditches should be allowed to clean ditches on their land as long as they are playing ditch taxes without the 7 year restriction.

Minnesota Department of Health

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

- Acknowledgement and support of public water supply wellhead protection areas within the county. Currently there are four public water supply systems (Alexandria, Carlos, Evansville, and Osakis) with wellhead protection plans. Work with public water suppliers in development and implementation of wellhead protection activities. Upon request of public water supplier, support implementation of wellhead protection management activities.

Priority Concern 2: Sealing unused, unsealed wells

- Inventory where unused, unsealed wells may be located. Develop a cost share program to aid property owners in sealing unused, unsealed wells.

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

- Evaluate the possibility of establishing a ground water database using local data.

PCSD Appendix B.

CITIZEN SURVEY
SUMMARY OF RESULTS

1. Which watershed is your home/land located in?

Long Prairie	21
Chippewa	19
Don't Know	14
Sauk	5
Pomme de Terre	2

2. What are the top three water resource issues in Douglas County?

Development pressures/issues	32
Natural habitat destruction	25
Contaminated runoff	25
Failing septic systems	20
Declining water clarity	17
Urban stormwater/drainage management	14
Agriculture erosion	12
Need for more environmental education	9
Ground water contamination	9
Over-application of fertilizers	6
Lack of regulation	5
Other: Tiling	1
Other: Ditch cleanout	1

3. Which resource is the most threatened? Rank 1-5, with 1 being most threatened.

Lakes	85
Wetlands	109
Streams/Rivers	122
Ground water	134
Other	247

4. Additional Comments/Suggestions:

Wasn't listed, but sustained agricultural drainage & downstream impacts should be identified as a priority concern. Also concerned about potential conversion of CRP acres back into corn production to satisfy ethanol production and animal feed demands. Tends to be HEL soils.

Douglas County Land and Resource Management needs to expand their staff with a dedicated person for enforcement issues and to add a Final Inspection when a Land Use Permit is issued on a lake .

It was SO hard to pick the top three!! Even adults need environmental education. I just talked to a shore owner who was delighted to learn he SHOULDN'T be clearing the vegetation from his riprap. He thought he was being a "good neighbor"!!

Over-development of area lakes. Poor enforcement of regulations. Poor leadership to protect lakes (once developed improperly there's no going back.) Rubber stamping easements by county commissioners-constantly.

Lake Victoria has a junk yard right on the lake, its contaminating the lake.

From what I see happening the developers are allowed to build almost anywhere.

Conservation plans for county should have more aggressive goals and objectives for restoration and protection of our water related natural resources.

I support whatever needs to be done to leave clear water for the next generations.

Weeds increased each year in Le Homme Dieu

Wish we could get our lake cleaned up of the blue algae-it is bad-and the weeds are getting so thick in the lake

Living on the Chain of Lakes for the past 15 years has been enjoyable. I noted with interest the changes in water clarity due to the Federal Farm programs taking farmland out of production (specifically in the Lake Ida/Miltona/Darling area). As some of this land has come back into production I have noticed more algae blooms on the lakes. A concern not listed in question 2 was fertilizer runoff from farm fields. This is as important as the land use changes occurring in Douglas County. Suggestion: The SWCD hire a limnologist and a hydraulic engineer to begin quantifying lake Water Quality trends, documenting hydrology and hydrologic trends, creating nutrient and hydrologic budgets for target lakes. Developing water management plans (models). Until this is done the impacts of urbanization and changes in agricultural production cannot be quantified. I am way too tired of hearing "generalizations" about water issues in this county with no facts to back them up.

Survey Period: August 1-August 20, 2007
Completed Paper Surveys: 49
Completed On-line Surveys: 14
Total Number of Respondents: 63

Paper surveys were available at Douglas County Land & Resource, Library, SWCD, Alexandria City Hall, and during the County Fair. The on-line version was available through a link on the DouglasSWCD.com and was created using Survey Monkey.

PCSD Appendix C.

PUBLIC INFORMATION MEETING

October 18, 2007

Present: Jon Schneider, David Rush, Gary Larson, Gary Thoennes, Kyle Hopkins, Dick Kuehn, Sue Engstrom, Darren Hungness, Bud Nielsen, Rebecca Sternquist, Mike Weber, Jerry Haggenmiller, and Emily Siira.

Development Pressures/Issues:

- Sensitive water resources are being targeted for development (wetlands, shallow lakes)
- Currently there is no model for planned growth within the county (for example 1 in 40 acre model, concentrate growth around existing infrastructure)
- Some newer developments have been built with shallow wells that have been running dry during recent droughts.
- Water Plan should work to minimize impacts on water resources
- Water Plan should promote low impact development (LID) and conservation development

Natural Habitat Destruction:

- Development of shore impact zones, wetlands, shallow lakes have lead to further habitat loss and/or fragmentation
- Water Plan should work to promote the setting aside of land, easements, CRP, buffers, etc. through financial incentives or the transfer of development rights. Also promote woodland incentive program (SFIA)-Dan Steward, BWSR.
- Water Plan should work to increase the public's awareness of the benefits of emergent vegetation
- Water Plan should deter the use of rip rap for shoreland erosion control
- Water Plan should increase its wetland restoration goal

Contaminated Runoff:

- Sources viewed as:
    - failed ISTS
    - development
    - lakeshore owners (fertilizer, removal of natural vegetation)
    - sediment (carrying pest waste, road chemicals, phosphorus, etc.)

- Water Plan should address the need for better enforcement and stricter sediment/erosion control measures during construction
- Water Plan should promote "zero runoff on new developments"
- Phosphorus coefficient (as land goes from natural vegetation to development, TP increases exponentially)-Dan Steward, BWSR

Failing Septic Systems:

- Water Plan should promote county-wide incentives/low interest loans/tax assessments
- Educate landowners about how septic systems work, definition of a "failed" system, maintenance schedules

Declining Water ~~Clarity~~ Quality:

- Promote shoreland restoration/habitat creation
- Effect on fisheries
- Rough fish (i.e. Carp)
- Introduction of non-native species (curly pondweed, Eurasian milfoil, zebra mussels, etc.), reintroduction of natives

Other Concerns/Issues:

- Need for more environmental education
    - Through lake associations
    - Newspaper articles
    - Repeat efforts

- Look into decreasing % impervious surfaces
- Enforcement on Erosion control
- Water Plan should recommend changes to any state programs (RIM, etc.)

Prevention of winter kill in shallow lakes disrupts natural processes

PCSD Appendix D.

WATER PLAN TASK FORCE

Julie Aadland	Area Hydrologist, DNR Waters
Tom Anderson	County Ditch Inspector
Marilyn Bayerl*	Bayerl Water Resources
Dean Beck	Area Supervisor, DNR Fisheries
Jim Casper	Le Homme Dieu Lake Association
Mark Dybdal	District Conservationist, NRCS
Sue Engstrom	Lake Darling/Douglas County Lake Association
Del Glanzer	Glanzer Consulting
Jerry Haggenmiller*	District Coordinator, Douglas SWCD
Jennifer Hoffman	Chippewa River Watershed Project
Bonnie Huettl	Lobster Lake/Douglas County Lake Association
Darren Hungness*	LandTeam Inc.
Lisa Scheirer	MPCA
Jerry Johnson	County Commissioner
Dick Kuehn*	Douglas County Lake Association
Vern Lorsung	Lake Latoka
Lynn Nelson*	Sauk River Watershed District
Bud Nielson	Lake Ida
Kylene Olson	Chippewa River Watershed Project
Chuck Pugh	Winona Shore Owners Association
Dave Rush*	Director, Land & Resource Management
Jon Schneider	Douglas SWCD Supervisor
Emily Siira*	Water Planner, Douglas SWCD
Rebecca Sternquist	Land & Resource Management
Gary Stevenson	Douglas County Surveyor
Dan Steward	Board Conservationist, BWSR
Gary Thoennes	Douglas SWCD Supervisor, La Grande Township
Mike Weber*	City of Alexandria
Vern Weiss	Lake Irene Preservation Association
Jerry Wendlandt	DNR
Scot Spranger	Alexandria Lakes Area Sanitary District

***Water Plan Update Committee**

PSCD Appendix E.

Douglas County Comprehensive Local Water Management Plan Input Documents for Amendment:

Minnesota Board of Water and Soil Resources
Minnesota Department of Agriculture
Minnesota Department of Natural Resources
Pomme de Terre River Association
Sauk River Watershed District

Minnesota Board of Water & Soil Resources

November 18, 2015

Mr. Steve Henry
Water Plan & Land Use Technician
Douglas SWCD
900 Robert St, Suite 102,
Alexandria, MN

RE: Douglas County Local Water Plan 5-year Amendment

Dear Steve,

As you know, Douglas County has a State approved and locally adopted Comprehensive Local Water Management Plan that is effective until May 27, 2019, with the 5-year amendment required by December 31, 2014, as per the Board of Water and Soil Resources (BWSR) Order dated May 27, 2009.

Douglas County requested and BWSR approved a request to extend the deadline to complete the 5-year amendment from December 31, 2014 to January 31, 2017. The justification for the extension was the following:

- Enable Douglas County to participate in and effectively utilize the Minnesota Pollution Control Agency's Watershed Restoration and Protection Strategy (WRAPS), which were scheduled to be completed in the County by December of 2015. The following table shows the WRAPS schedules at the time of the request and Major Watersheds of the County:

Watershed	% of County	Scheduled Completion Date
Pomme de Terre	4.3%	July 2013
Sauk	12.8%	August 2014
Chippewa	40.6%	December 2014
Long Praire	42.2%	December 2015

- The Douglas Soil and Water Conservation District (SWCD) was completing a Lake Protection Analysis with a fiscal year 2014 Clean Water Fund grant, which expires December 31, 2016. This analysis utilizes LiDAR data to identify lake-based contributing areas for land-use based stress estimates, and documents additional protection and risk factors for each contributing area.

Bemidji
403 Fourth Street NW
Suite 200
Bemidji, MN 56601
(218) 755-2600

Brainerd
1601 Minnesota Drive
Brainerd, MN 56401
(218) 203-4470

Detroit Lakes
26624 N. Tower Road
Detroit Lakes, MN 56501
(218) 846-8400

Duluth
394 S. Lake Avenue
Suite 403
Duluth, MN 55802
(218) 723-4752

Mankato
12 Civic Center Plaza
Suite 3000B
Mankato, MN 56001
(507) 344-2821

Marshall
1400 East Lyon Street
Marshall, MN 56258
(507) 537-6060

New Ulm
21371 State Hwy 15
New Ulm, MN 56073
(507) 359-6074

Rochester
3555 9th Street NW
Suite 350
Rochester, MN 55901
(507) 206-2889

Central Office / Metro Office 520 Lafayette Road North Saint Paul, MN 55155 Phone: (651) 296-3767 Fax: (651) 297-5615
www.bwsr.state.mn.us TTY: (800) 627-3529 An equal opportunity employer

I encourage the pertinent information from the WRAPS be utilized in the amendment (reduction goals and implementation actions/strategies) as well as the relevant lake protection analysis (priority lakes, developed maps, land-use based stress estimates for protection and risk factors) and any other necessary information to provide prioritized, targeted and measurable implementation.

Please review and consider the Nonpoint Priority Funding Plan for Clean Water Implementation Funding (http://www.bwsr.state.mn.us/planning/npfp/index.html) while prioritizing implementation actions/efforts of your LWP, particularly:

The three high-level priorities for investing Clean Water Fund nonpoint implementation money:

- Restore those impaired water that are closest to meeting state water quality standards.
- Protect those high-quality unimpaired waters at greatest risk of becoming impaired.
- Restore and protect water resources for public use and public health, including drinking water.

and

Keys to Implementation:

- Accelerate Watershed-Scale Implementation
- Prioritize and Target at the Watershed Scale
- Measure Results at the Watershed Scale

In addition, new 2015 legislation related to the Buffer Initiative and the Soil Loss Law should be reviewed as part of the amendment process. Additional information related to the 2015 Buffer Legislation is available at http://bwsr.state.mn.us/buffers/

Please feel free to contact me if you have additional questions.

Sincerely,

Pete Waller

Pete Waller
BWSR Board Conservationist

Below is a website that MDA has developed to discuss and illustrate priority concerns. The MDA realizes that recommendations are implemented based on staff, financial and technical resources and that this is an amendment at this point in time. In addition to the website recommendations, the MDA is providing additional information below to highlight priorities.

MDA Water Planning Assistance Website:
http://www.mda.state.mn.us/en/protecting/waterprotection/waterplanning.aspx

1. Drainage Water Management (DWM) - The MDA recommends additional effort be focused on encouraging landowners and farmers to implement DWM practices and management plans. The Douglas SWCD can play a important role in working with drainage authorities, landowners and agricultural groups to determine how best to promote and implement DWM practices. Attached are drainage related recommendations from the MDA, which are also being updating. A fact sheet from the Red River Watershed Management Board regarding ditch system maintenance is also attached. Please distribute this factsheet when appropriate as you work with area farmers and landowners and water management partners.
The MDA also recommends that Douglas County consider the development of a Multipurpose Drainage Management Plan in conjunction with its partners and below is a recent example that you are probably aware of. While this is just one recent example, it may serve as a model for Douglas County:
http://www.co.martin.mn.us/images/Ditch%20Admin/Martin%20County%20Multipurpose%20Drainage%20Management%20Plan.pdf

2. Water Storage - The MDA recommends that Douglas County along with its water management partners consider the development of a water storage plan for both public drainage systems and for private on-farm water storage. This plan may build off of existing water or drainage management plans and may include but not be limited to the following:

- Communication of the development of a water storage plan with private landowners in Douglas County.
- Obtaining flow data and setting flow goals agreed upon by landowners within each public ditch systems or sub-watersheds.
- Prioritizing public ditch systems or sub-watersheds based on flow goals with input from landowners.
- Assessment of where short-term and long-term water storage projects can be located. This may include several types of water storage, including smaller scale (wetland restorations) or larger scale projects such as constructed impoundments. However, larger scale projects are costly and require significant financial resources to engineer, construct, operate and maintain.
- Development of an implementation plan or schedule that would include discussion of funding considerations, again with landowner input.
- Operation and maintenance plans for each project.

The MDA is also aware of the sensitivity regarding past efforts to manage water on a regional basis and further recognizes that local policy-makers have difficult decisions to make regarding how to address these important issues.

3. Wind and Water Erosion - Attached is a map of prime soils that was recently updated by the USDA NRCS and please share this with your partners. The SWCD may have opportunities in the future to create additional awareness about prime soils by sharing and distributing this map. The MDA recommends that the Douglas County water plan focus and renew efforts to reduce wind and water

erosion and that efforts continue to implement more conservation practices such as WASCOBs, grassed waterways, etc., in priority areas.

Field windbreaks, farmstead windbreaks and small areas of trees or other vegetation have been removed from the landscape at unprecedented levels in recent years. However, the MDA also realizes that many of the field windbreaks that have been removed were beyond their lifespan. Windbreaks and vegetative plantings that also incorporate pollinator habitat can serve dual purposes. It is also critical that cover crops, residue management and other soil health initiatives be implemented at an increased levels. The MDA recommends that tools such as PTMAPP (website below) be used as your county continues its important water quality efforts: http://www.rrbdin.org/prioritize-target-measure-application-ptmapp

4. Lake Management - The MDA recommends that a process be considered for development to prioritize lake management and protection efforts in Douglas County. As an example, Crow Wing County developed a process (attached) to prioritize lake protection efforts. Recently two additional counties have adopted components of this process or have created similar lake protection efforts.

5. Nitrogen Issues - The MDA website below will direct you to the Nitrogen Fertilizer Management Plan, which includes a wealth of information about the plan, township testing, prevention, etc.: http://www.mda.state.mn.us/nfmp

6. MN Agricultural Water Quality Certification Program (MAWQCP) - This program is a volunteer opportunity for farmers and agricultural landowners to implement BMPs that protect water. Technical and financial assistance is available to those participating in the program and once certified, participants are granted regulatory certainty for 10 years.
The MAWQCP is positioned to identify and treat agricultural risks to water quality throughout Minnesota. The MDA operates the MAWQCP in collaboration with the MPCA, BWSR and DNR. Through these partnerships the MAWQCP is aligned with other nonpoint and water quality projects across multiple agencies.
Implementing new on-farm conservation practices that address nonpoint issues is best achieved on the local level and is designed to be delivered through Minnesota's 91 SWCDs. Implemented on the local level with these local partners, MAWQCP-certification is a key strategy local water plans can utilize when writing integrated management plans.
The Douglas County SWCD can provide MAWQCP information and encourage participation in the program to access technical and/or financial assistance to county landowners and operators implementing agricultural BMP's on working lands to reduce soil erosion, protect stream banks and improve water resources. MAWQCP website: http://www.mda.state.mn.us/awqcp

7. General Information about the MDA - you may wish to incorporate the following language if there is a need to illustrate state agency duties and responsibilities:

The MDA is statutorily responsible for the management of pesticides and fertilizer other than manure to protect water resources. The MDA implements a wide range of protection and regulatory activities to ensure that pesticides and fertilizer are stored, handled, applied and disposed of in a manner that will protect human health, water resources and the environment. The MDA works with the University of Minnesota to develop pesticide and fertilizer Best Management Practices (BMPs) to protect water resources, and with farmers, crop advisers, farm organizations, other agencies and many other groups to educate, promote, demonstrate and evaluate BMPs, to test and license applicators, and to enforce rules and statutes. The MDA has broad regulatory authority for pesticides and has authority to regulate the use of fertilizer to protect groundwater. The MDA is the lead agency for all aspects of pesticide and fertilizer environmental and regulatory functions as directed in the Groundwater Protection Act (Minnesota Statute 103H). These include but are not limited to the following:

- Serve as lead agency for groundwater contamination from pesticide and fertilizer nonpoint source pollution.
- Conduct monitoring and assessment of agricultural chemicals (pesticides and nitrates) in ground and surface waters.
- Oversee agricultural chemical remediation sites and incident response.
- Regulate use, storage, handling and disposal of pesticides and fertilizer.

Thank you for the opportunity to comment. Please do not hesitate to contact me if you have any questions.

Robert L. Sip
Environmental Policy Specialist
Pesticide and Fertilizer Management Division
Minnesota Department of Agriculture
3725 12Th Street North
St. Cloud, MN 56303
320-223-6531
rob.sip@state.mn.us

Issues:

Exotics, specifically zebra mussels and proliferation in lakes within the LP River Watershed & ecological/social impacts
Pattern tiling/Private ditches
Growing groundwater appropriations for irrigation
Expanding city limits of Alexandria and lake impacts
- Lake Andrew PUD, build up in SE city limits & impacts to Burgen & Victoria
- Adequacy of City shoreland zoning ordinances in addressing shoreland management issues

Climate change & adequacy of existing engineering and stormwater management practices/policies
- High water/flooding experiences and assessments (2003,2011, 2014)
- Surface water changes/shoreline erosion (Alex Chain, Maple, Little Chippewa Lake, others?)
- Outlet capacity, dam conditions, channel restrictions (hybrid cattails)

Loss of CRP /conservation set aside acres
Changes in watercraft size, use, surface water pressures, safety, wave erosion (wakeboarding)
Feedlot expansions & manure management/gravel pits/sed. basin maintenance
Riparian wetland alterations & loss of functions with shoreland alterations

New Information:

MPCA shift from TMDLs & Lake Assessments to watershed-scale approach
- Chippewa and Long Prairie River WRAPS reports – stressors

Zebra mussel infestations (Keep them out of the Chippewa R. watershed lakes)
SLICE (Sentinel Lakes Monitoring program) information – Lake Carlos
Sufficient Long term water quality monitoring data on many lakes to assess trends/establish catchment management strategies to address declines (DCLA, RMB Labs, Paul Radomskis' modeling work)
One Watershed-One Plan concept and work out governmental/administrative linkages in the Water Plan
Buffer Law & Implementation strategies (educational opportunity to explain functions)
Lake Winona TMDL – Brandon WTTP NPDES permit review
Available funding sources & mechanisms (Clean Water Fund) & most favorable funding scenarios

Dean Beck
DNR Area Supervisor
Minnesota Department of Natural Resources
Glenwood Area Fisheries Office
10 First Ave. SW
Glenwood, MN 56334

DOUGLAS COUNTY LAKES OF PHOSPHORUS SENSITIVITY SIGNIFICANCE

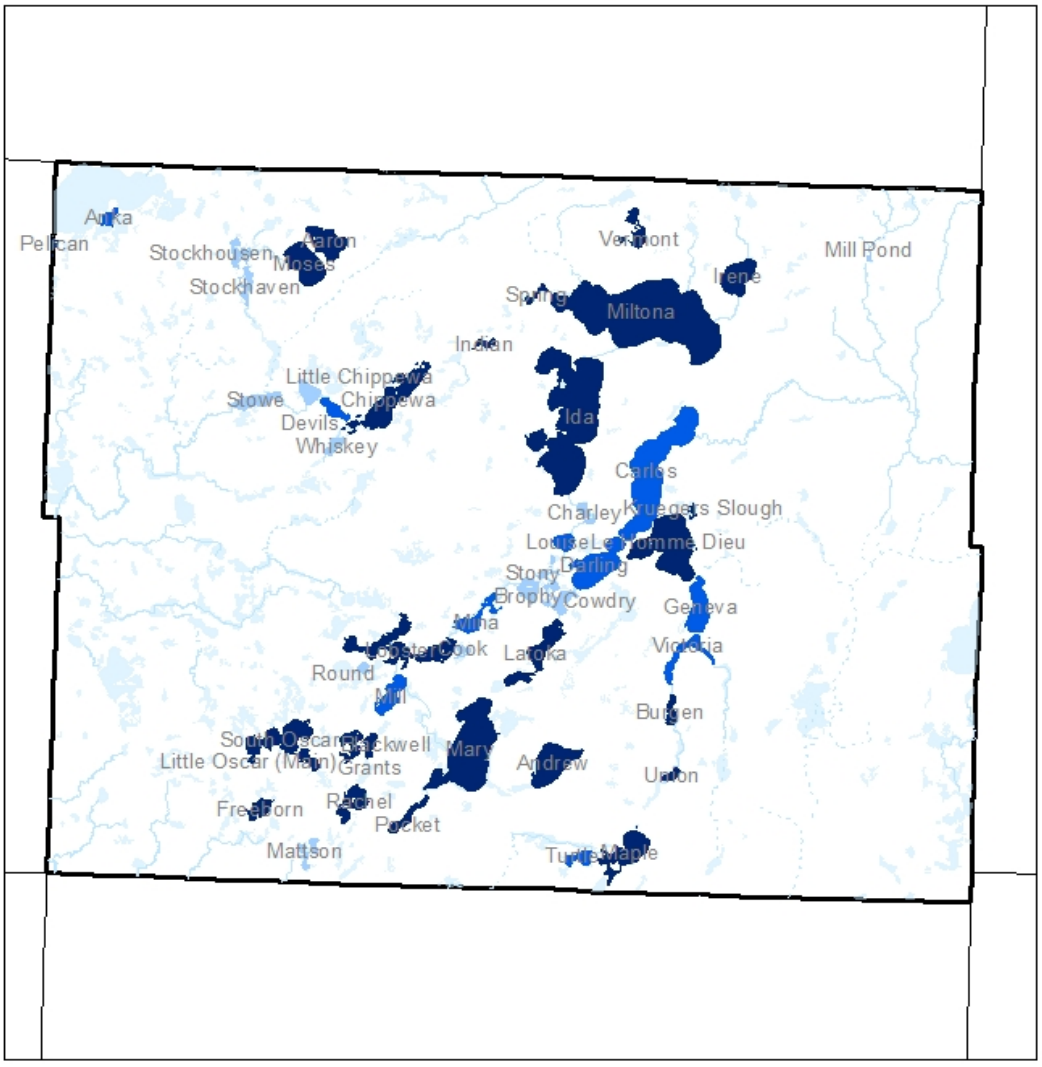
PW ID #	PW Name	Acres	Shoreline Miles	Sensitivity	Sensitivity Significance	Priority Category	Target Total P	Predicted	Target Load
21008300	Miltona	5724.30	17.31	1.73	90.00	Highest	16.62	3847.11	3133.28
21014500	Chippewa	1175.04	13.77	7.11	90.00	Highest	14.15	885.73	679.33
21008500	Andrew	918.37	5.60	13.77	90.00	Highest	17.95	439.64	369.43
21010600	Latoka	766.63	8.57	17.06	90.00	Highest	14.16	359.83	222.52
21024200	Aaron	610.31	4.92	12.64	90.00	Highest	24.22	367.46	363.33
21016000	Rachel	442.07	6.24	32.53	90.00	Highest	17.75	145.20	125.75
21012300	Ida	4426.84	22.32	1.51	80.64	Highest	14.07	4558.82	3639.35
21007300	Vermont	337.58	6.37	53.80	79.31	Highest	12.98	76.41	65.92
21009200	Mary	2450.44	11.70	2.60	76.34	Highest	23.97	1972.00	1633.81
21015100	Blackwell	307.37	5.22	28.98	68.70	Highest	22.82	136.70	134.77
21013000	Spring	117.18	2.75	41.76	64.11	Highest	21.44	73.56	71.02
21007900	Maple	830.87	9.09	6.92	61.29	Highest	15.13	915.66	790.52
21004100	Union	107.31	1.76	31.34	56.30	Highest	17.52	123.13	110.43
21014000	Pocket	263.44	4.28	18.71	51.03	Highest	32.75	185.55	166.38
21024500	Moses	823.82	4.53	3.66	50.68	Highest	15.56	1750.98	1652.85
21007600	Irene	639.26	4.17	7.02	48.72	Highest	23.13	690.78	569.01
21016200	Freeborn	247.64	3.46	17.08	43.79	Highest	28.50	204.50	183.88
21025702	South Oscar	957.78	9.61	7.02	43.70	Highest	25.95	641.05	582.87
21013600	Indian	98.96	2.35	30.09	43.44	Highest	19.06	103.27	80.47
21004900	Burgen	174.19	2.71	12.66	38.19	Highest	19.94	366.63	312.77
21006000	Kruegers Slough	55.28	2.46	87.09	38.13	Highest	7.86	38.53	30.09
21015601	Little Oscar (Main)	171.27	2.70	11.18	37.23	Highest	46.64	224.03	220.15
26000200	Pelican	3760.63	27.78	0.56	36.60	Highest	40.16	6748.33	5792.40
21014400	Lobster	1329.03	17.31	2.43	36.25	Highest	19.04	2249.68	1893.82
21005600	Le Homme Dieu	1800.96	10.07	1.29	35.18	Highest	17.13	3619.18	1976.98
21015000	Grants	176.76	2.51	23.91	30.92	Highest	21.26	183.17	181.19
21005200	Geneva	639.81	5.21	2.07	20.70	Higher	18.66	2041.29	1106.56
21010800	Mina	411.42	6.90	4.54	20.51	Higher	13.04	1485.08	1305.94
21005700	Carlos	2605.12	12.83	0.58	18.49	Higher	13.83	10336.35	7161.05
21005400	Victoria	416.81	6.53	2.57	17.78	Higher	20.39	1681.76	1033.42
21018000	Mill	450.30	5.25	1.31	13.15	Higher	34.69	2799.30	2282.37
21021300	Devils	233.62	3.15	4.09	13.01	Higher	29.61	1003.04	947.97
21009000	Turtle	218.04	3.07	2.38	12.33	Higher	39.78	1450.87	1380.71
21008000	Darling	1050.00	6.80	0.65	7.35	Higher	18.78	7428.47	5176.60
21035300	Anka	130.07	2.60	6.82	7.11	Higher	30.53	451.04	331.85
21009400	Louise	214.46	2.16	2.62	6.09	Higher	16.10	2341.03	2096.61
21010200	Brophy	292.58	3.37	1.24	3.82	High	20.70	3182.84	1823.10
21012000	Charley	138.24	3.15	2.57	3.73	High	18.40	2249.10	1952.13
21011100	Cook	100.80	3.20	7.25	3.47	High	6.69	309.70	28.94
21019700	Round	81.19	1.44	4.12	3.40	High	20.09	1298.49	1200.90
21026500	Stockhousen	253.22	4.99	1.13	2.88	High	31.44	3307.54	2590.05
21021200	Little Chippewa	269.35	2.67	1.04	2.87	High	26.78	2911.05	1405.58
21024600	Stockhaven	221.12	5.09	1.17	2.56	High	31.44	3233.82	2525.36
21009500	North Union	113.15	3.95	2.11	2.47	High	19.02	3027.24	2965.93
21017100	Mattson	223.94	4.94	2.60	2.42	High	93.53	654.74	510.01
21010100	Stony	86.76	2.01	2.67	2.39	High	15.79	2618.24	2476.67
21010300	Cowdry	242.55	3.05	0.80	2.07	High	19.00	6001.37	4087.44
21010500	Lottie	46.37	2.17	3.17	1.45	High	14.32	2302.91	1764.39
21021600	Whiskey	159.52	2.39	2.28	1.19	High	36.78	821.24	237.47
21026400	Stowe	376.03	4.02	0.30	1.18	High	48.86	10438.74	8943.86
[illegible]00	Mill Pond	54.41	3.30	2.32	1.07	High	23.90	1600.63	911.13

MNDNR

v:\gdrs\data\pub\us_mn_state_dnr\env_lakes_phosphorus_sensitivity\fgdb\env_lakes_phosphorus_sensitivity.gdb (8/20/15)

Douglas County

Lakes of Phosphorus Sensitivity Significance



Lakes of Phosphorus Sensitivity Significance

Priority Class

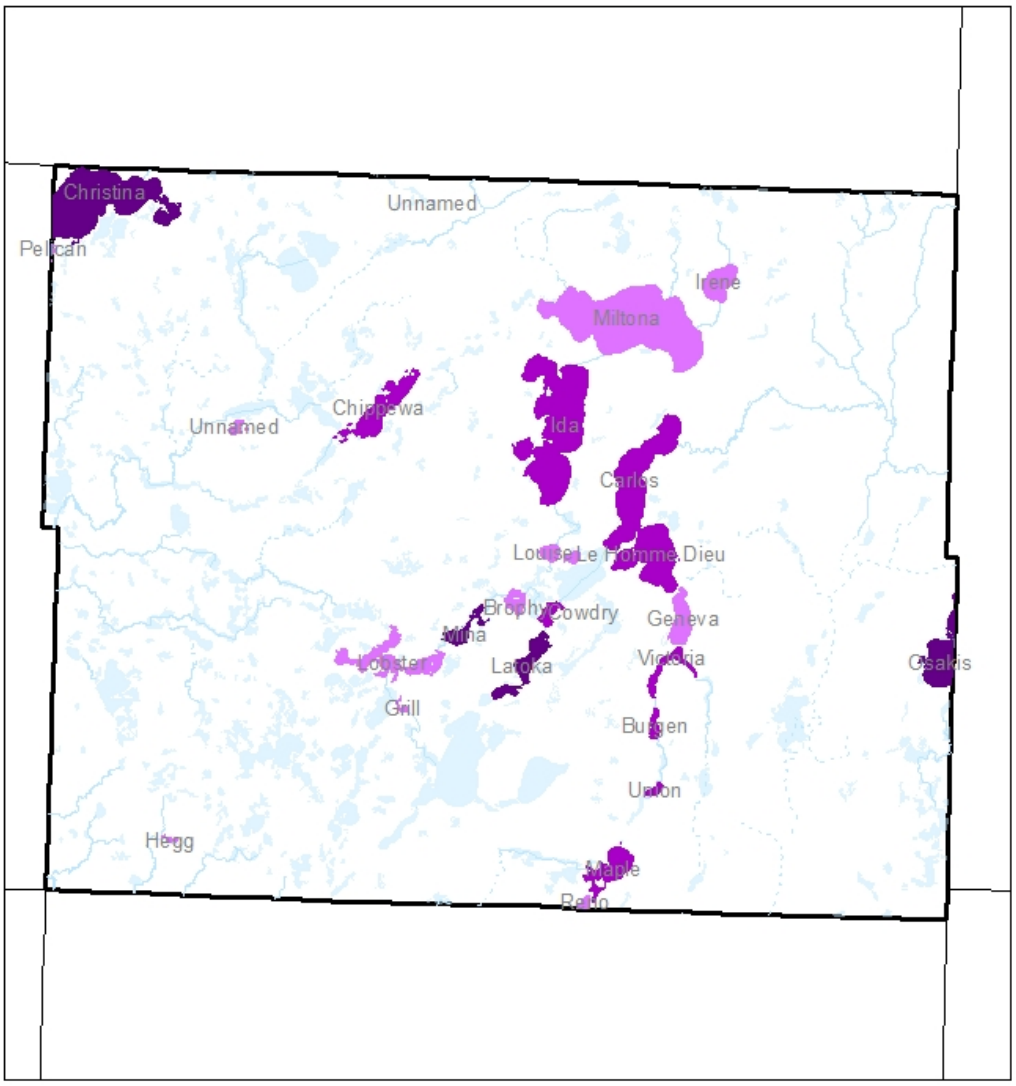
- Highest
- Higher
- High
- Public Water Watercourse
- Public Ditch/Altered Natural Watercourse
- Public Water Basins
- Douglas County

MNDNR

DOUGLAS COUNTY LAKES OF BIOLOGICAL SIGNIFICANCE								
PW ID #	PW Name	Acres	Shoreline Miles	LBS Classification	Plant Rank	Fish Rank	Amphibian Rank	Bird Rank
77021500	Osakis	6389.00	26.77	Outstanding	0	0	0	1
21037500	Christina	3971.18	17.84	Outstanding	0	0	0	1
21010600	Latoka	766.63	8.57	Outstanding	0	1	2	0
21010800	Mina	411.42	6.90	Outstanding	0	1	0	0
21012300	Ida	4426.84	22.32	High	0	2	0	0
21005700	Carlos	2605.12	12.83	High	0	3	2	0
21005600	Le Homme Dieu	1800.96	10.07	High	0	3	2	0
21014500	Chippewa	1175.04	13.77	High	0	0	2	0
21007900	Maple	830.87	9.09	High	0	2	0	0
21005400	Victoria	416.81	6.53	High	0	0	2	0
21010300	Cowdry	242.55	3.05	High	0	3	2	0
21004900	Burgen	174.19	2.71	High	0	0	2	0
21004100	Union	107.31	1.76	High	0	2	0	0
21008300	Miltona	5724.30	17.31	Moderate	0	3	0	0
61007800	Reno	3793.72	11.51	Moderate	0	0	0	3
26000200	Pelican	3760.63	27.78	Moderate	0	0	0	3
21014400	Lobster	1329.03	17.31	Moderate	0	3	0	0
21005200	Geneva	639.81	5.21	Moderate	0	3	0	0
21007600	Irene	639.26	4.17	Moderate	0	3	0	0
21010200	Brophy	292.58	3.37	Moderate	0	3	0	0
21009400	Louise	214.46	2.16	Moderate	0	3	0	0
21055600	Unnamed	138.10	3.34	Moderate	0	0	0	3
21009300	Alvin	119.44	2.05	Moderate	0	3	0	0
21020400	Grill	66.92	2.51	Moderate	0	3	0	0
21028300	Hegg	55.14	1.68	Moderate	0	0	0	3
21014700	Unnamed	7.06	0.49	Moderate	0	0	0	3

Douglas County

Lakes of Biological Significance



Lakes of Biological Significance

Biological Significance Class

- Outstanding
- High
- Moderate
- Public Water Watercourse
- Public Ditch/Altered Natural Watercourse
- Public Water Basins
- Douglas County

MNDNR

DOUGLAS COUNTY
LAKES OF PHOSPHORUS SENSITIVITY SIGNIFICANCE AND BIOLOGICAL SIGNIFICANCE

PW ID#	PW NAME	ACRES	SHORELINE MILES	P SENSITIVITY	P SENSITIVITY SIGNIFICANCE	PRIORITY CATEGORY	TARGET TOTAL P	PREDICTED	TARGET LOAD	LBS CLASSIFICATION	PLANT RANK	FISH RANK	AMPHIBIAN RANK	BIRD RANK
21010600	Latoka	766.63	8.57	17.06	90.00	Highest	14.16	359.83	222.52	Outstanding	0	1	2	0
21012300	Ida	4426.84	22.32	1.51	80.64	Highest	14.07	4558.82	3639.35	High	0	2	0	0
21005600	Le Homme Dieu	1800.96	10.07	1.29	35.18	Highest	17.13	3619.18	1976.98	High	0	3	2	0
21014300	Chippewa	1175.04	13.77	7.11	90.00	Highest	14.15	885.73	679.33	High	0	0	2	0
21007900	Maple	830.87	9.09	6.92	61.29	Highest	15.13	915.66	790.52	High	0	2	0	0
21004900	Burgen	174.19	2.71	12.66	38.19	Highest	19.94	366.63	312.77	High	0	0	2	0
21004100	Union	107.31	1.76	31.34	56.30	Highest	17.52	123.13	110.43	High	0	2	0	0
21008300	Miltona	5724.30	17.31	1.73	90.00	Highest	16.62	3847.11	3133.28	Moderate	0	3	0	0
26000200	Pelican	3760.63	27.78	0.56	36.60	Highest	40.16	6748.33	5792.40	Moderate	0	0	0	3
21014400	Lobster	1329.03	17.31	2.43	36.25	Highest	19.04	2249.68	1893.82	Moderate	0	3	0	0
21007600	Irene	639.26	4.17	7.02	48.72	Highest	23.13	690.78	569.01	Moderate	0	3	0	0
21010800	Mina	411.42	6.90	4.54	20.51	Higher	13.04	1485.08	1305.94	Outstanding	0	1	0	0
21005700	Carlos	2605.12	12.83	0.58	18.49	Higher	13.83	10336.35	7161.05	High	0	3	2	0
21005400	Victoria	416.81	6.53	2.57	17.78	Higher	20.39	1681.76	1033.42	High	0	0	2	0
21005200	Geneva	639.81	5.21	2.07	20.70	Higher	18.66	2041.29	1106.56	Moderate	0	3	0	0
21009400	Louise	214.46	2.16	2.62	6.09	Higher	16.10	2341.03	2096.61	Moderate	0	3	0	0
21010300	Cowdry	242.55	3.05	0.80	2.07	High	19.00	6001.37	4087.44	High	0	3	2	0
21010200	Brophy	292.58	3.37	1.24	3.82	High	20.70	3182.84	1823.10	Moderate	0	3	0	0

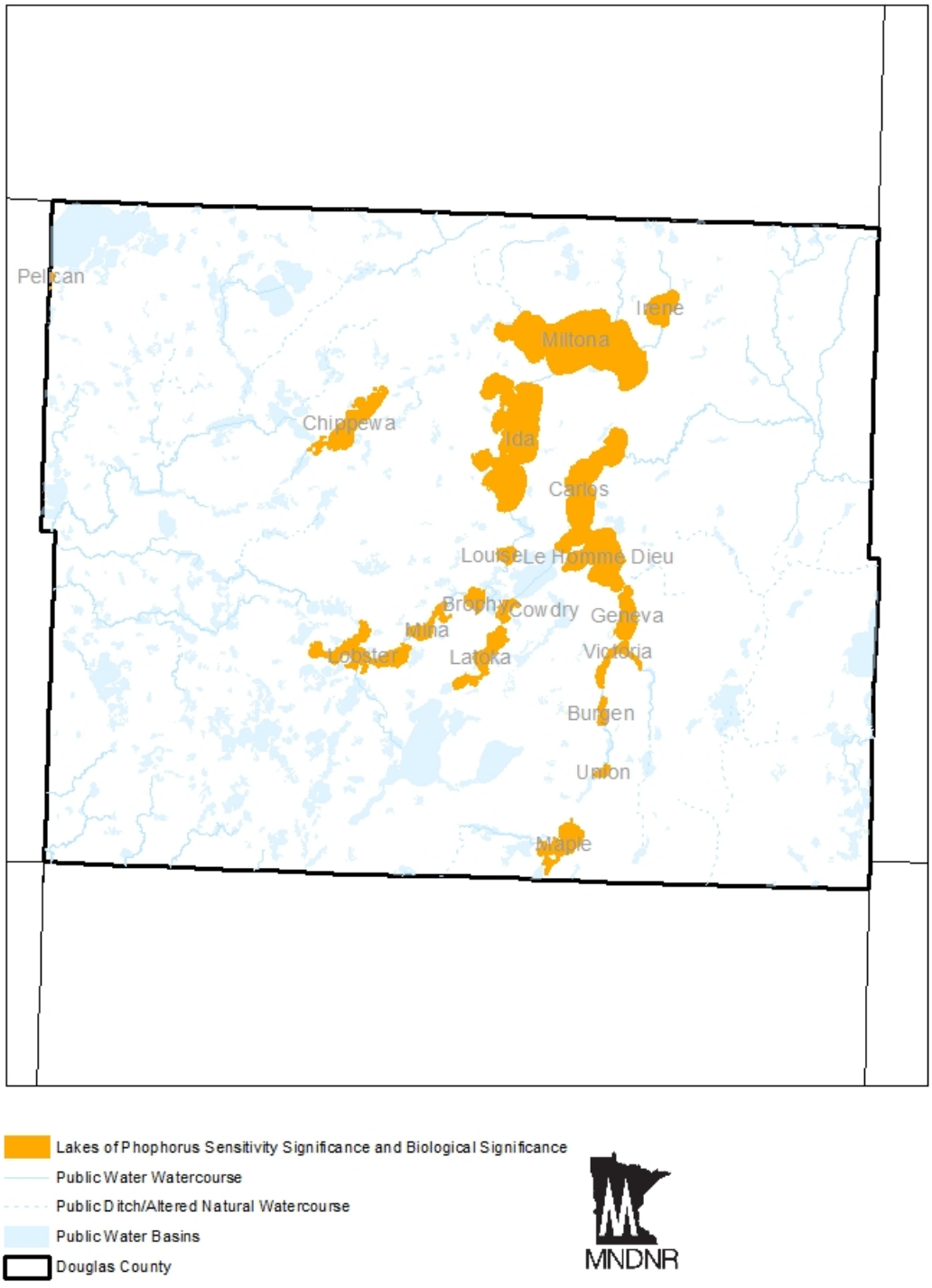
MNDNR

v:\gdnr\data\pub\us_mn_state_dnr\env_lakes_of_biological_signific\fgdb\env_lakes_of_biological_signific.gdb (4/23/15)
v:\gdnr\data\pub\us_mn_state_dnr\env_lake_phosphorus_sensitivity\fgdb\env_lakes_phosphorus_sensitivity.gdb (8/20/15)

Emily Siira
DNR Area Hydrologist
Division of Ecological and Water Resources
1509 1st Avenue, North
Fergus Falls, MN 56537
218.739.7576 x 232

Douglas County

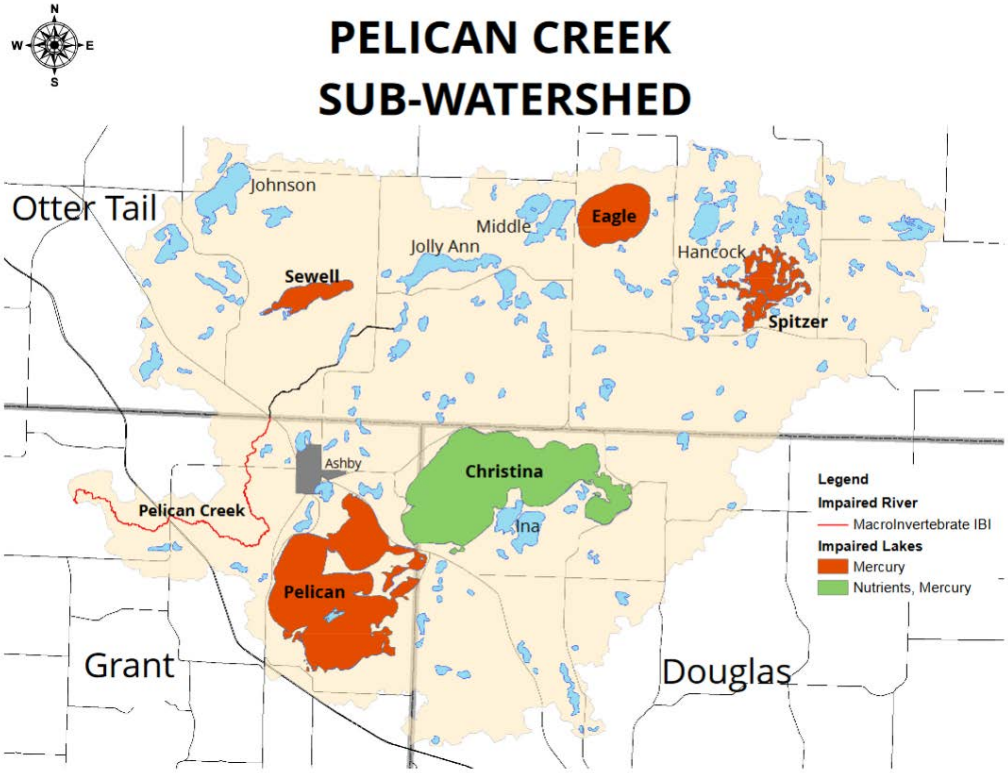
Lakes of Phosphorus Sensitivity Significance and Biological Significance



Douglas County Impairments and Priority areas

The Pomme de Terre River Watershed in Douglas County (Pelican Creek Sub-Watershed; HUC 0702000202) has an impairment on Lake Christina. Below is a table of the impairments and the subsequent stressors that have influenced the impairment in this region outlined in the Pomme de Terre WRAPS Report.

Impaired Waterbody	Reach Description ('from – 'to')	Affected Use	Impairment Parameter	Stressor
Christina	Lake	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	Fertilizer and manure run-off, Wildlife, Internal Sources



Map showing impaired areas within Pelican Creek Sub-Watershed

According to the Pomme de Terre WRAPS Report (https://www.pca.state.mn.us/sites/default/files/wq-ws4-01.pdf), there are two primary restoration and protection strategies for Lake Christina. They are nutrient management and In-lake management of internal loading. The management is a primary

responsibility for landowners, PdT River Association, SWCDS, and counties. The goal is to reduce total phosphorous by 31% within the lake.

Pomme de Terre WRAPS Implementation Plan

The priority areas for the Pomme de Terre River Association in Douglas County are the regions bordering Lake Christina. The Pomme de Terre River Major Watershed Restoration and Protection Strategies and Implementation Plan (http://www.pdtriver.org/wp-content/uploads/2015/10/PdT_Major-Watershed-Plan.pdf) outlines the Priority Managements Zones and practices the association would like to restore and implement, respectively (Chpt. Pelican Creek Watershed, Pg. 12-13). Below is a table that outlines the restorative areas and practices in that plan for Douglas County.

Priority Practice	Practice Description	Area
Wetlands	Implement wetland restorations to provide water storage and increase wildlife habitat. Water storage helps alleviate the effects of runoff, and lessens pressure on associated buffers to help reduce pollutants from entering surface waters. Wetlands also provide wildlife habitat to fish, birds, macroinvertebrates, and many other life forms.	Multiple wetland restorations around Lake Christina in Lund twp. See attached map (Exhibit #23) for detail
Shoreline Stabilization	Lake Christina is an area that has been identified as having shoreline stabilization or erosion prone areas.	Lake Christina
Ag. BMP Activities	Implement Ag. BMPs such as nutrient management, conservation tillage, grassed waterways, pit closures, terraces, and water and sediment control basins within the contributing watersheds to vegetated buffers and wetland restorations identified within the wetland PMZ site areas.	See Wetland Areas

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Morris, MN 56267
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Priority Areas of Concern for the Douglas County:

Lake Osakis represents the headwaters of Sauk River and has a relatively large drainage area (88,722 acres). A majority of the lake is located in Todd County, however most of the watershed is located in Douglas County. The Judicial Ditch #2 watershed west of Lake Osakis is approximately 26,702 acres and accounts for a large portion (30%) of the lake's total watershed. The remainder of the Lake Osakis watershed in Douglas County is made up of direct drainage to the lake (23%) and outflow from Faille Lake (17%) and Smith Lake (13%). Lake Osakis is a large, deep (max depth 73 feet) lake with an extremely long residence time of approximately five years. About half of the lake is shallow enough to support submerged aquatic vegetation. The lake is highly sought by recreationalists, particularly anglers, sail boaters and water skiers.

A majority of the Lake Osakis phosphorus budget comes from direct drainage to the lake (52%) which includes inputs from Judicial Ditch #2 and several smaller tributaries which flow directly to Lake Osakis. The remainder of the phosphorus load to Lake Osakis comes from 4 upstream lakes (22%), failing septic systems (14%), atmospheric deposition (10%) and internal loading (2%). TMDL allocations for the lakes to meet state water quality standards were 1,566 pounds per year (35% reduction) for Smith Lake, 903 pounds per year (70% reduction) for Faille Lake, and 9,416 pounds per year (38% reduction) for Lake Osakis.

Smith Lake. Implementation activities for Smith Lake should focus primarily on watershed phosphorus load reductions including upgrading all noncompliant SSTSs. Remaining reductions in watershed loading will need to come from land practices including manure and livestock management. Another important factor in restoring Smith Lake will be vegetation management.

Faille Lake. Implementation activities for Faille Lake should focus on a multitude of areas including upgrading SSTSs, manure and livestock management and potentially vegetation and/or carp management. Load reductions from Clifford Lake restoration will also have a large benefit for Faille Lake.

Lake Osakis. Implementation activities for Lake Osakis should focus on upgrading SSTSs, manure and livestock management along with vegetation and carp management. Load reductions from all impaired lakes throughout the watershed including Faille Lake, Maple Lake and Smith Lake will also benefit Lake Osakis.

Strategies and Actions to Achieve Goals:

1. **Protect and improve water quality in the lakes, streams, and rivers in the watershed.**
   a. Identify practices to protect and improve water quality and implement them.
   b. Target water quality practices based on contaminant load reduction to a priority water body and cost efficiency instead of landowner willingness to participate.
   c. Identify and implement practices to achieve load reductions in accordance with approved TMDLs, TMDL Implementation Plans, and Water Resources Protection Plans.
   d. Improve and increase the understanding and knowledge of the water resources in the Sauk River watershed.
   e. Partner with local, regional, and state agencies and other interested parties to identify and implement practices to protect and improve water quality in the watershed.
   f. Maintain and enforce Administrative Rules to protect and improve water quality in the watershed.

g. Provide technical assistance to local governments undertaking comprehensive planning identifying methods to protect water resources from impacts associated with land use and land development.
h. Work in coordination with other agencies to prevent contaminants from entering into the public drinking water supplies.

2. Protect groundwater resources in the watershed.

a. Identify and implement practices to protect groundwater resources in the Sauk River watershed.
b. Improve and increase the understanding and knowledge of the groundwater resources in the Sauk River watershed.
c. Partner with local, regional, and state agencies and other interested parties to identify and implement practices to protect and improve groundwater in the watershed.

The District will give special consideration to projects and programs that conserve nutrients and can provide a cost benefit for producers or are cost-neutral.

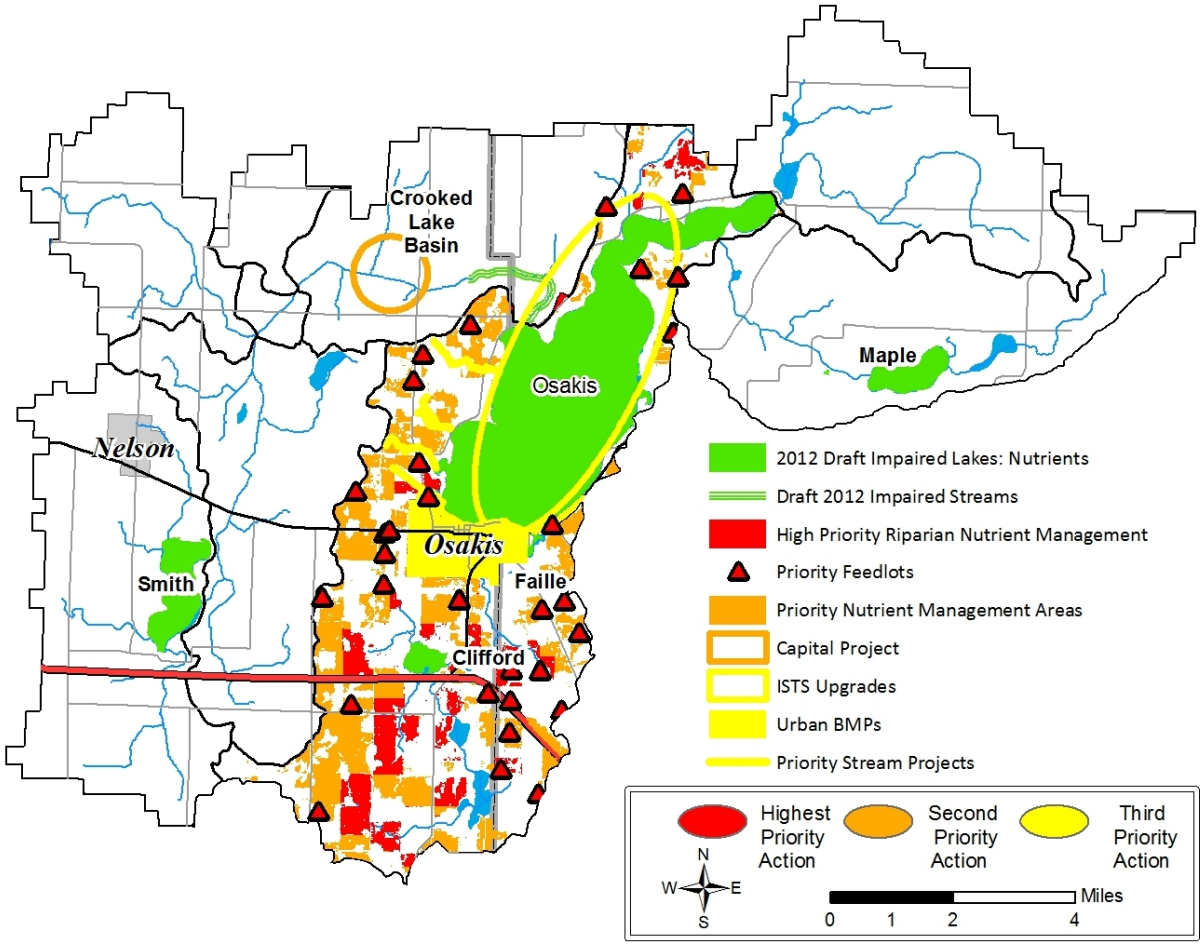
Partner Activities

1. Partner with agencies to *complete the Crooked Lake Basin project*. The Douglas SWCD is the lead agency on this project. The District will work with partners to acquire property where appropriate and assist them to target wetland reserve and RIM funds to this area. The District will provide cost-share in this project to incorporate design elements that will provide water quality treatment, and assist with acquisition of property if necessary. This will improve downstream water quality and reduce sedimentation in the JD #2 sediment pond downstream. The District would fund the acquisition of 2,500 acres of land.

2. Partner with the Todd and Douglas SWCDs to *target nutrient management actions* on approximately 7,000 acres in the high potential delivery areas identified on **Error! Reference source not found.**. These actions may include manure management plans; conservation tillage; filter strips and enhanced buffers; and restored wetlands. The District will assist the SWCDs with promotion of these programs and assist in identifying participants. The District may provide cost-share to supplement other funds available to the SWCDs for these programs to reduce participant out of pocket cost. Of highest priority are approximately 1,800 acres with a high nutrient delivery potential that are riparian to streams and channels and about 30 registered feedlots located in the areas directly tributary to the lake.

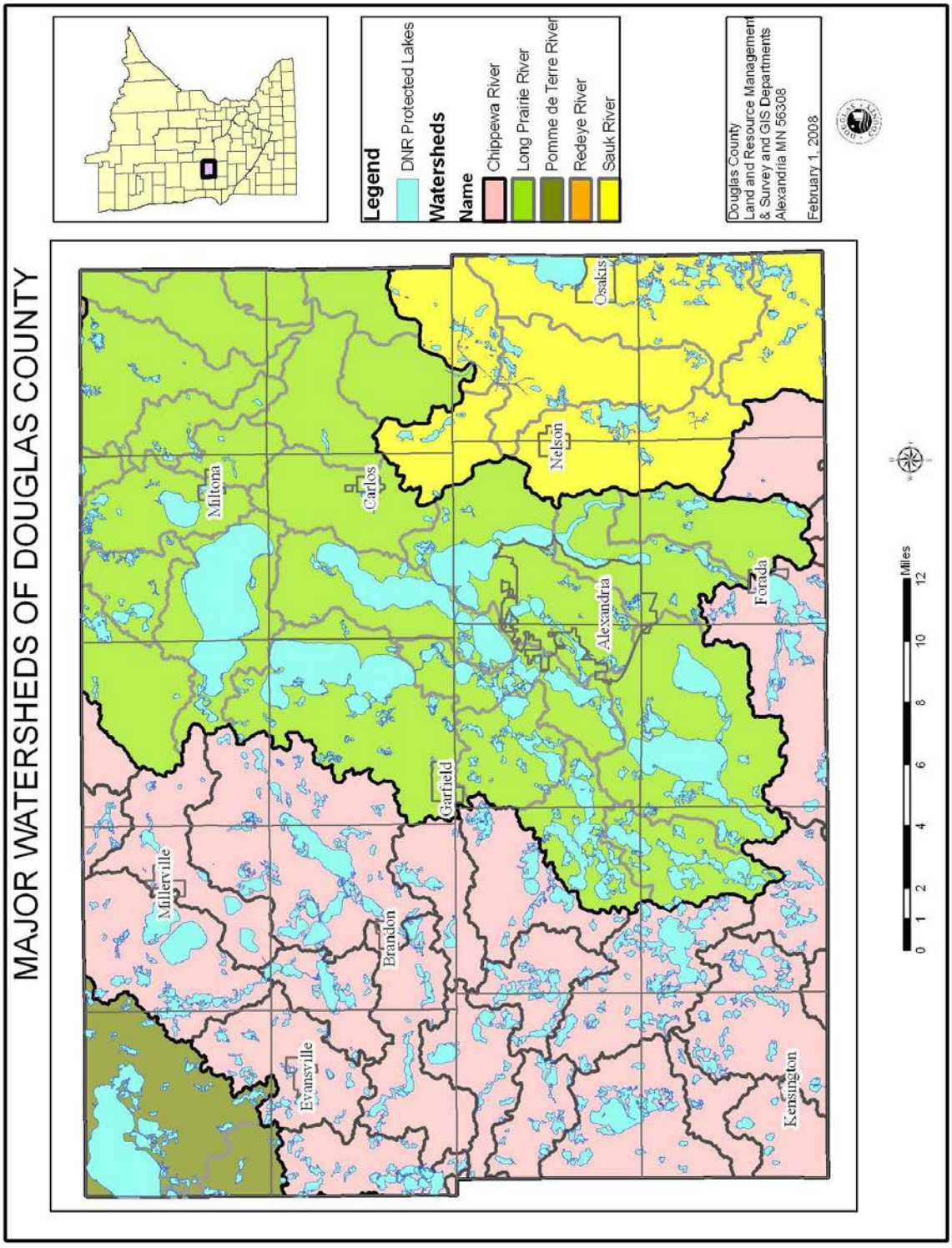
3. Target *loan funds for septic systems* on properties abutting Lake Osakis. Continue to make available loan funds for upgrades. Each year the target will be funding 10-20 Sub- Surface Treatment System (SSTS) upgrades in the Lake Osakis direct drainage area and an additional 5-10 in the balance of the MU.

4. Support the City of Osakis if they choose to identify source areas and undertake *urban BMPs* that demonstrate high cost-benefit in terms of nutrient load reduction.
5. Continue to partner with the City of Osakis, the MPCA, and other parties to investigate options to reduce nutrient loading from the Osakis WWTP. The future Clifford Lake TMDL will likely provide an opportunity to frame these discussions.

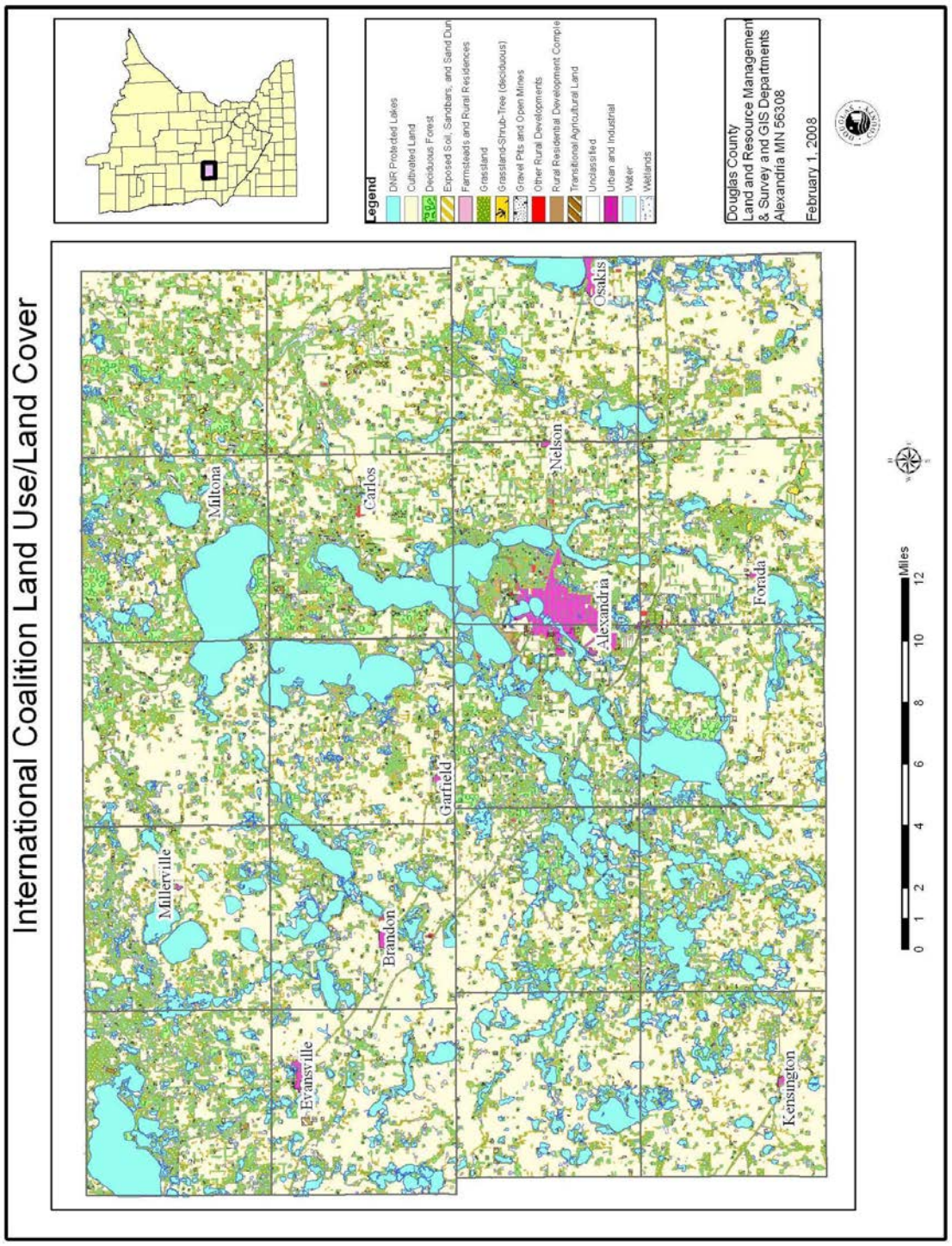


Lynn Nelson
Water Resource Manager
Sauk River Watershed District
524 4th Street South
Sauk Centre, MN 56378
Phone: 320-352-2231

PCSD Map A.

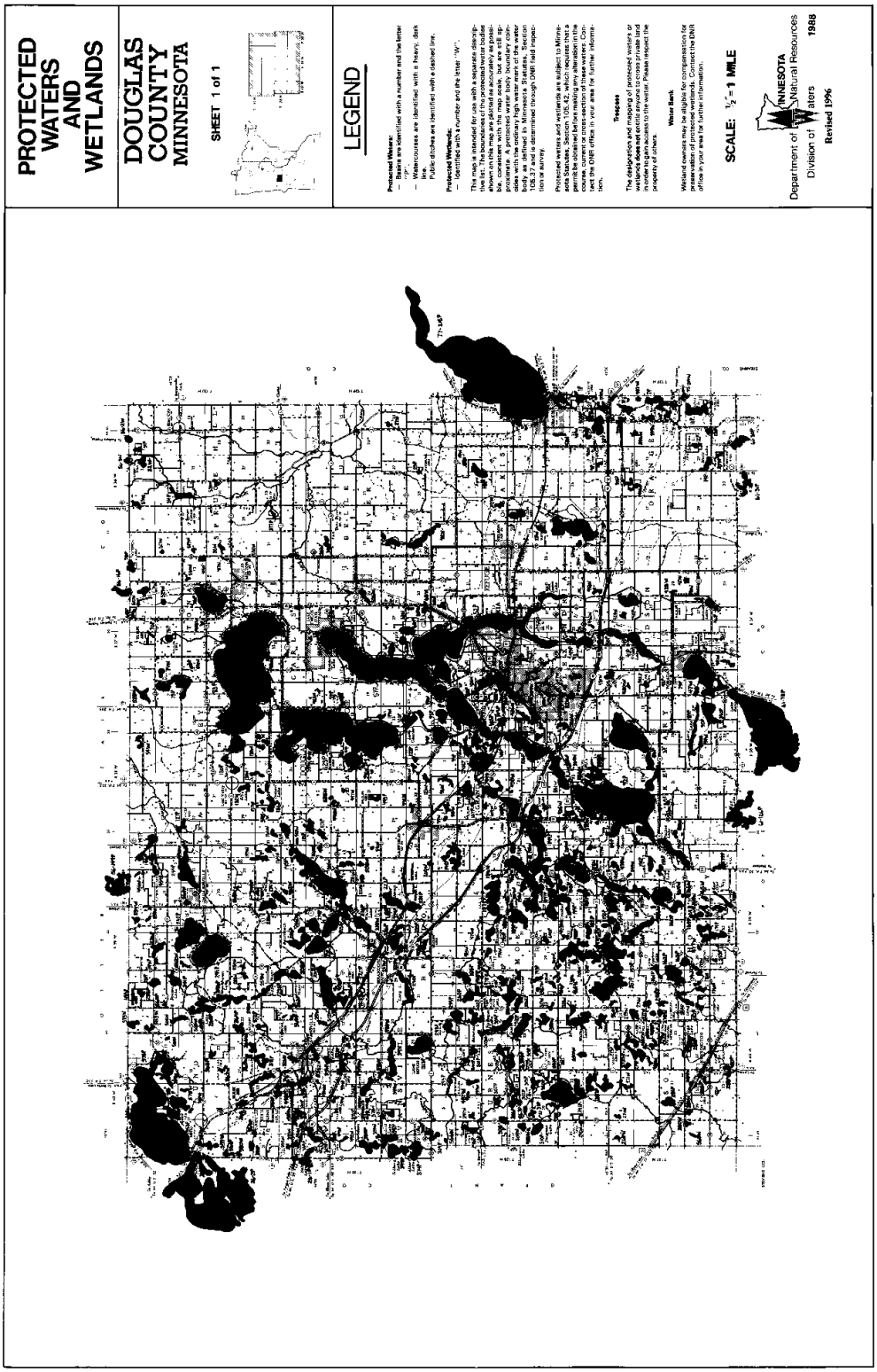

MAJOR WATERSHEDS OF DOUGLAS COUNTY
Legend
DNR Protected Lakes
Watersheds
Name
Chippewa River
Long Prairie River
Pomme de Terre River
Redeye River
Sauk River
Douglas County
Land and Resource Management
& Survey and GIS Departments
Alexandria MN 56308
February 1, 2008
Miles
0 1 2 4 6 8 10 12
Osakis
Nelson
Carlos
Miltona
Alexandria
Forada
Garfield
Millerville
Brandon
Evansville
Kensington

PCSD Map B.

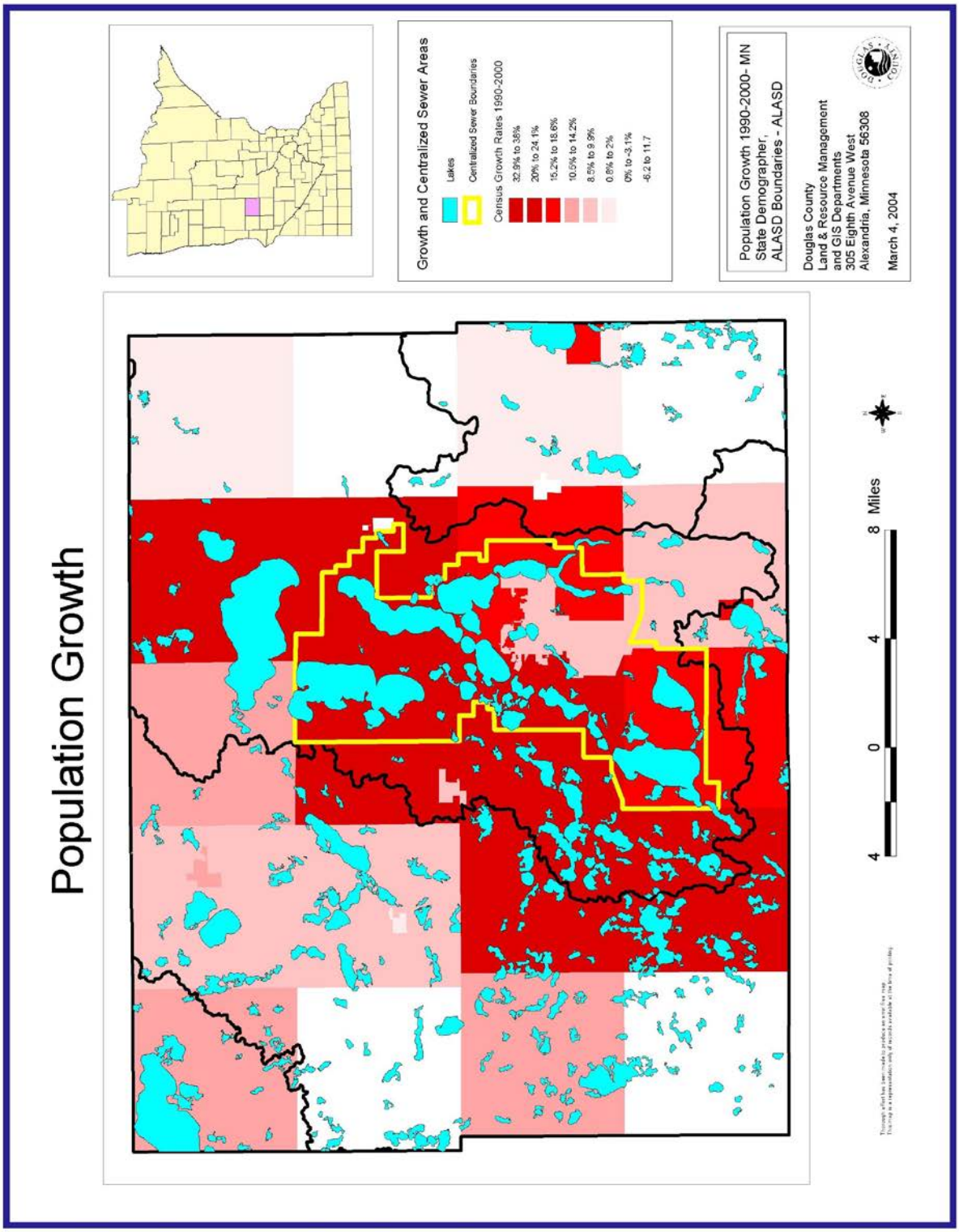

International Coalition Land Use/Land Cover
Legend
DNR Protected Lakes
Cultivated Land
Deciduous Forest
Exposed Soil, Sandbars, and Sand Dun
Farmsteads and Rural Residences
Grassland
Grassland-Shrub-Tree (deciduous)
Gravel Pits and Open Mines
Other Rural Developments
Rural Residential Development Comple
Transitional Agricultural Land
Unclassified
Urban and Industrial
Water
Wetlands
Douglas County
Land and Resource Management
& Survey and GIS Departments
Alexandria MN 56308
February 1, 2008
Miles
0 1 2 4 6 8 10 12
Osakis
Nelson
Carlos
Miltona
Alexandria
Forada
Garfield
Millerville
Brandon
Evansville
Kensington

III. Appendix B – I. Additional Resource Information

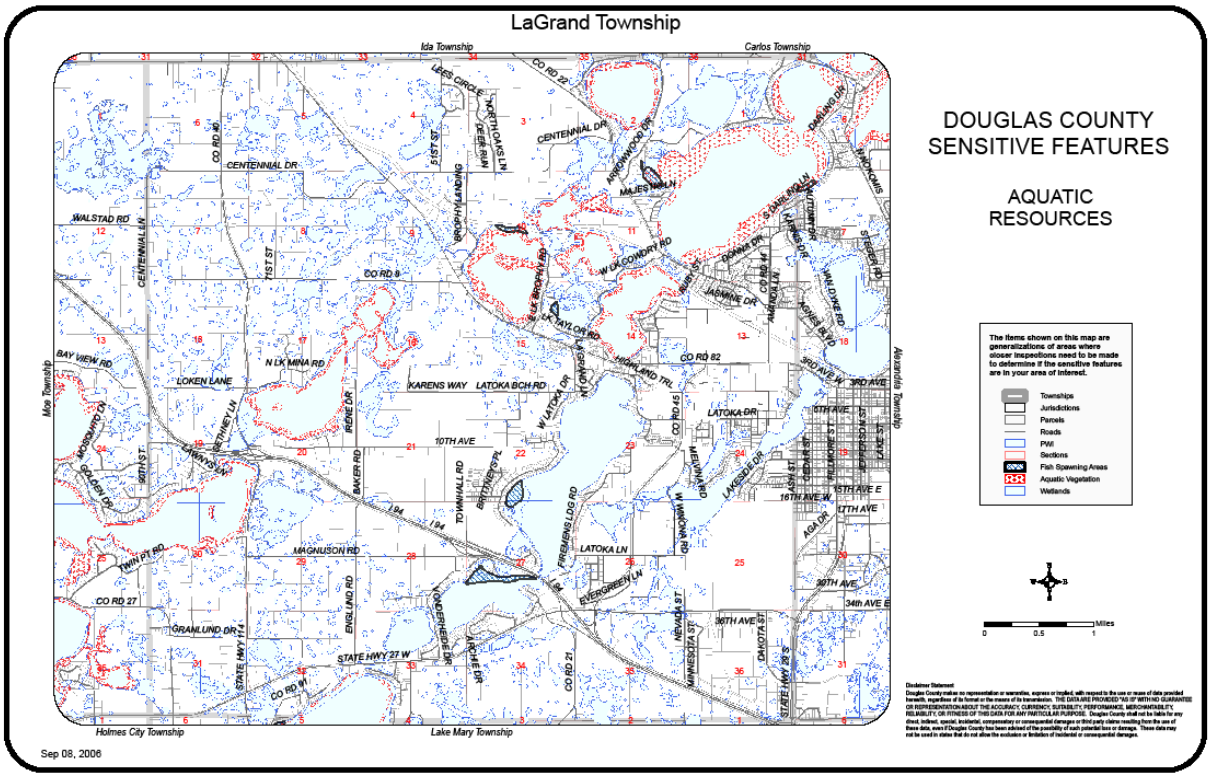
Appendix B. Douglas County Protected Waters and Wetlands (Source: DNR)

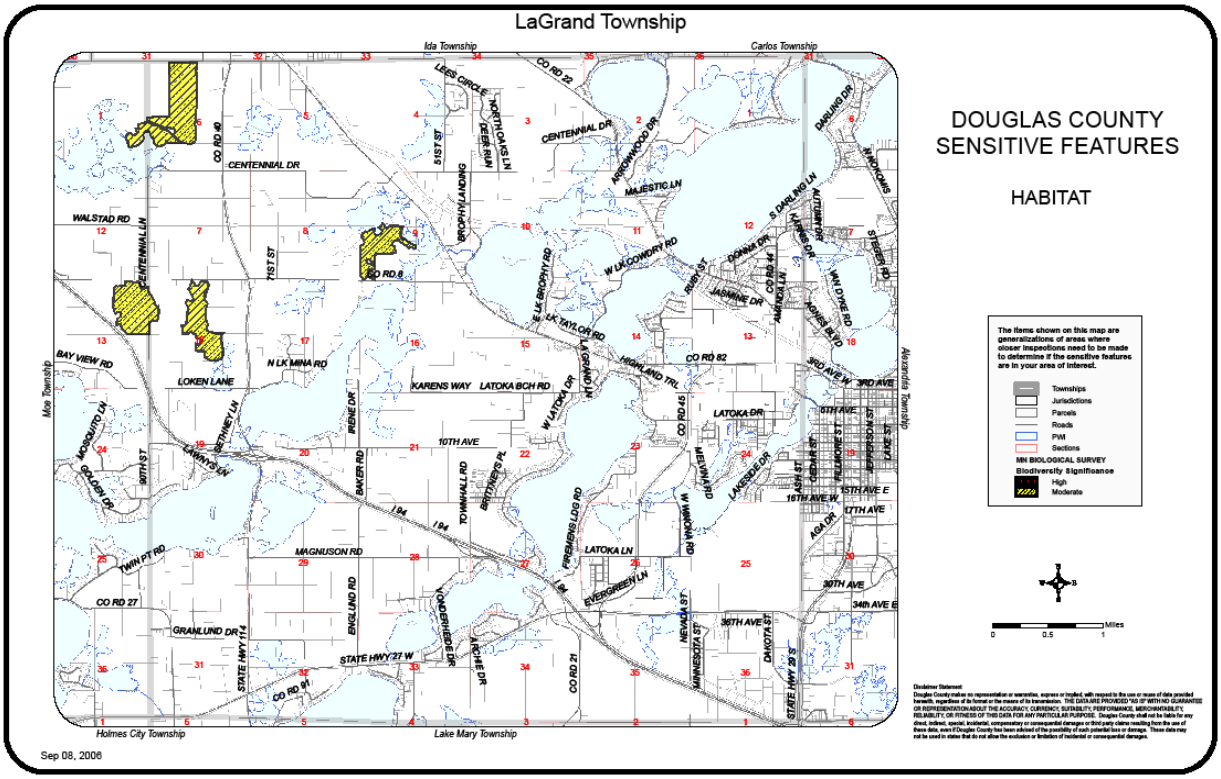


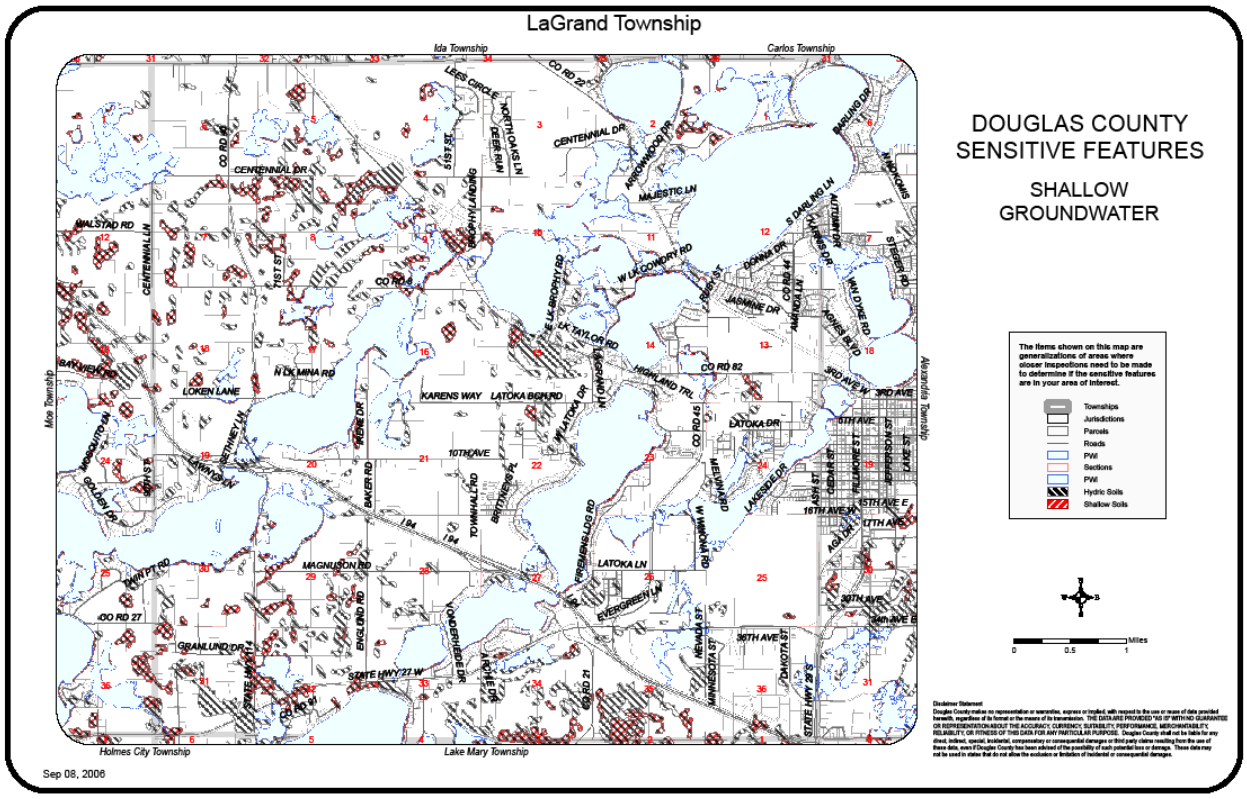
Appendix C. Population Growth (Source: 2004 Douglas County Local Water Management Plan)

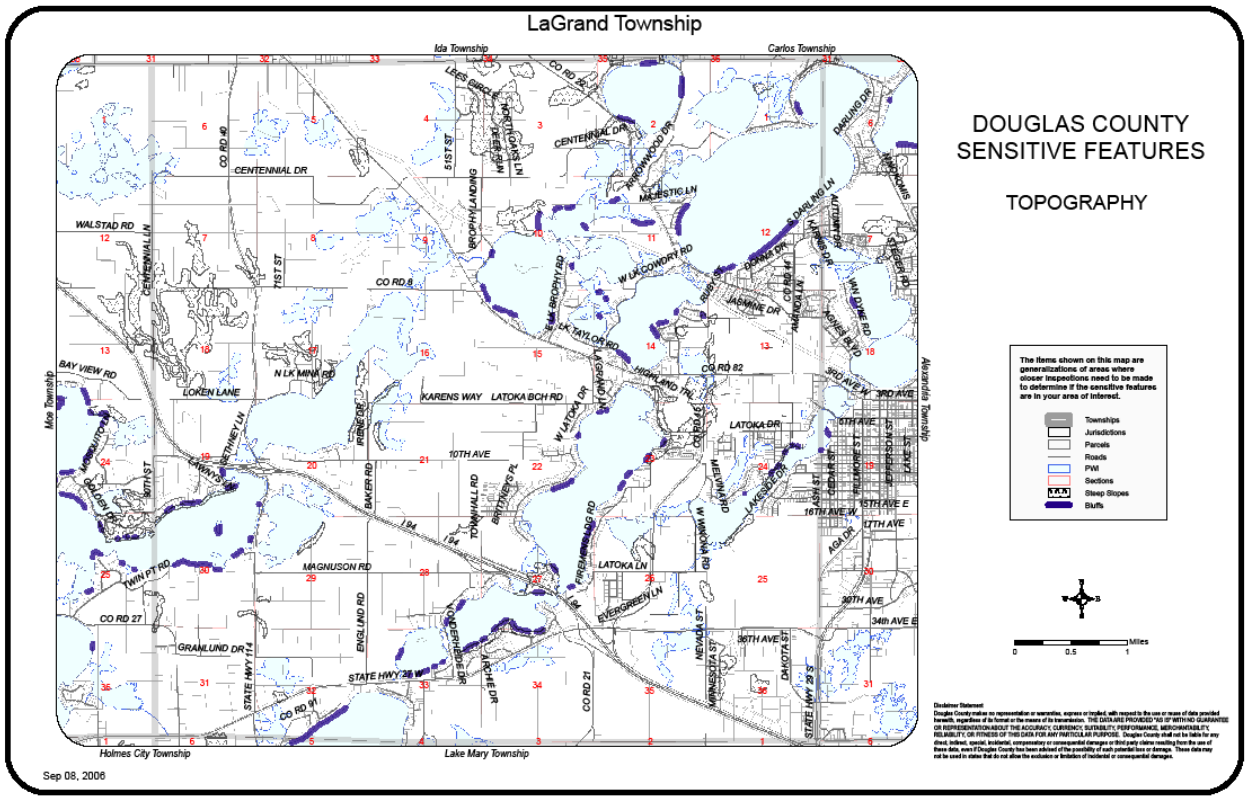


Appendix D. Sample of Sensitive Areas Maps available on County website (Source: www.co.douglas. mn.us)






LaGrand Township
Ida Township
Carlos Township
Moe Township
Alexandria Township
Holmes City Township
Lake Mary Township
DOUGLAS COUNTY
SENSITIVE FEATURES
SHALLOW
GROUNDWATER
The items shown on this map are generalizations of areas where closer inspections need to be made to determine if the sensitive features are in your area of interest.
Townships
Jurisdictions
Parcels
Roads
PWI
Sections
PWI
Hydric Soils
Shallow Soils
Miles
0
0.5
1
Sep 08, 2006


LaGrand Township
Ida Township
Carlos Township
Moe Township
Alexandria Township
Holmes City Township
Lake Mary Township
DOUGLAS COUNTY
SENSITIVE FEATURES
TOPOGRAPHY
The items shown on this map are generalizations of areas where closer inspections need to be made to determine if the sensitive features are in your area of interest.
Townships
Jurisdictions
Parcels
Roads
PWI
Sections
Steep Slopes
Bluffs
Miles
0
0.5
1
Sep 08, 2006

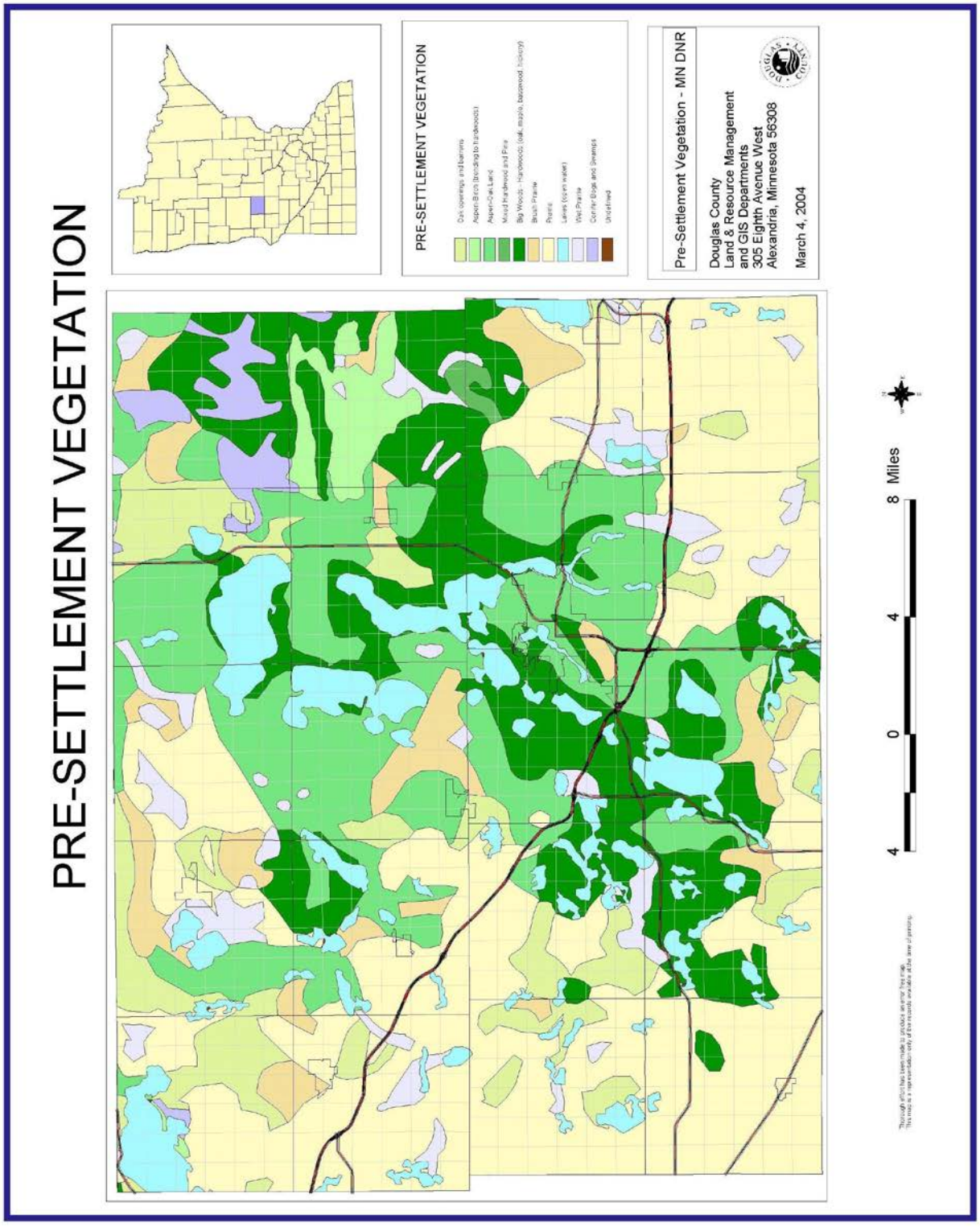
Appendix E: Impaired Waters List (Source: MPCA)

Name	Description	Lake AUID	Stream AUID	Affected Use	Pollutant/Stressor
Clifford	Lake or Reservoir	21-0003-00		AQR	Nutrients
Smith	Lake or Reservoir	21-0016-00		AQC, AQR	HgF, Nutrients
Burgen	Lake or Reservoir	21-0049-00		AQC	HgF
Henry	Lake or Reservoir	21-0051-00		AQL, AQR	Cl-, Nutrients
Geneva	Lake or Reservoir	21-0052-00		AQC	HgF
Agnes	Lake or Reservoir	21-0053-00		AQC, AQL, AQR	Cl-, HgF, Nutrients
Victoria	Lake or Reservoir	21-0054-00		AQC	HgF
Jessie	Lake or Reservoir	21-0055-00		AQR	Nutrients
Le Homme Dieu	Lake or Reservoir	21-0056-00		AQC	HgF
Carlos	Lake or Reservoir	21-0057-00		AQC	HgF
Irene	Lake or Reservoir	21-0076-00		AQC	HgF
Maple	Lake or Reservoir	21-0079-00		AQC	HgF
Darling	Lake or Reservoir	21-0080-00		AQC	HgF
Winona	Lake or Reservoir	21-0081-00		AQL, AQR	Cl-, Nutrients
Miltona	Lake or Reservoir	21-0083-00		AQC	HgF
Andrew	Lake or Reservoir	21-0085-00		AQC	HgF
Mary	Lake or Reservoir	21-0092-00		AQC	HgF
LATOKA (NORTH BAY)	Lake or Reservoir	21-0106-01		AQC	HgF
LATOKA (SOUTH BAY)	Lake or Reservoir	21-0106-02		AQC	HgF
Mina	Lake or Reservoir	21-0108-00		AQC	HgF
Ida	Lake or Reservoir	21-0123-00		AQC	HgF
LOBSTER (EAST BAY)	Lake or Reservoir	21-0144-01		AQC	HgF
LOBSTER (WEST BAY)	Lake or Reservoir	21-0144-02		AQC	HgF
Chippewa	Lake or Reservoir	21-0145-00		AQC	HgF
Echo	Lake or Reservoir	21-0157-00		AQR	Nutrients
Mill	Lake or Reservoir	21-0180-00		AQC	HgF
Gilbert	Lake or Reservoir	21-0189-00		AQR	Nutrients
Crooked (East Crooked)	Lake or Reservoir	21-0199-02		AQR	Nutrients
Whiskey	Lake or Reservoir	21-0216-00		AQC	HgF
Moon	Lake or Reservoir	21-0226-00		AQC	HgF
Moses	Lake or Reservoir	21-0245-00		AQC	HgF
North Oscar	Lake or Reservoir	21-0257-01		AQC	HgF
South Oscar	Lake or Reservoir	21-0257-02		AQC	HgF
Red Rock	Lake or Reservoir	21-0291-00		AQC, AQR	HgF, Nutrients

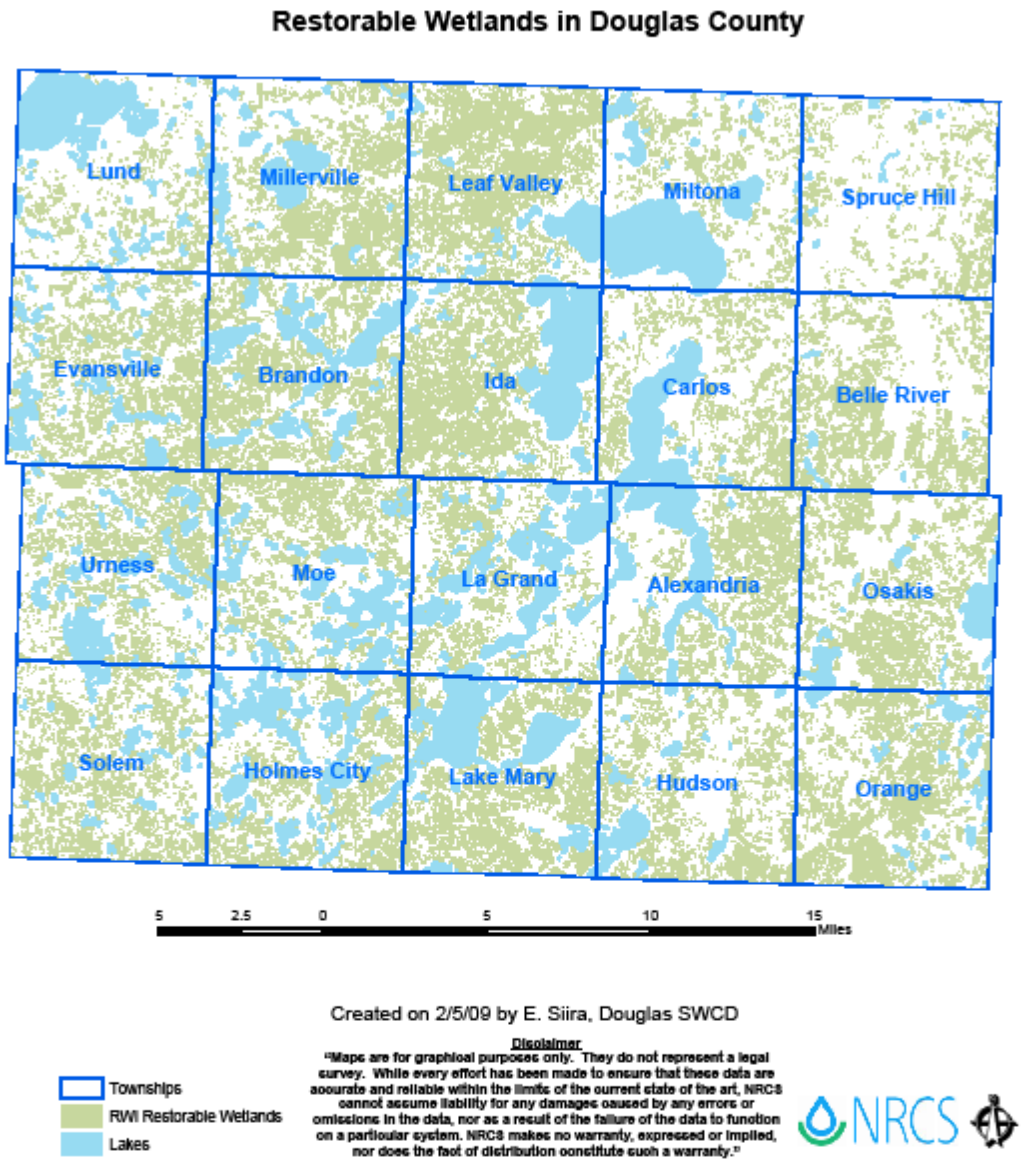
Jennie	Lake or Reservoir	21-0323-00		AQR	Nutrients
Long	Lake or Reservoir	21-0343-00		AQR	Nutrients
Christina	Lake or Reservoir	21-0375-00		AQC, AQR	HgF, Nutrients
Long Prairie River	Spruce Cr to Eagle Cr		07010108-505	AQC, AQL	DO, F-IBI, HgF
Long Prairie River	Headwaters (Lk Carlos 21-0057-00) to end of Wetland		07010108-534	AQC, AQL	DO, HgF
Long Prairie River	End of Wetland (CSAH 65) to Spruce Cr		07010108-535	AQC, AQL	DO, HgF
Unnamed creek	CD 11 to Lk Miltona		07010108-552	AQR	E.coli
Unnamed creek	Headwaters to Lk Miltona		07010108-595	AQL	F-IBI, M-IBI
Crooked Lake Ditch	Unnamed cr to Lk Osakis		07010202-552	AQL, AQR	E.coli, M-IBI
Chippewa River	Stowe Lk to Little Chippewa R		07020005-503	AQC, AQL, AQR	FC, HgF, M-IBI, T
Unnamed creek	Unnamed lk to Unnamed lk		07020005-638	AQL	F-IBI, M-IBI
Unnamed creek (Freeborn Lake Inlet)	Headwaters to Freeborn Lk		07020005-901	AQL	T

AQL – Aquatic Life
AQC – Aquatic Consumption
AQR – Aquatic Recreation
HgF - Mercury
T – Turbidity
M-IBI – Aquatic macroinvertebrate bioassessments
F-IBI – Fishes bioassessments
DO – Dissolved oxygen
E.coli - Escherichia coli
HgF – Mercury in fish tissue
Cl- -- Chloride
FC – Fecal coliform

Appendix F. Pre-settlement Vegetation



Appendix G. Restorable Wetlands



Appendix H. Natural Resource Values (Source: Minnesota Statewide Conservation and Preservation Plan)

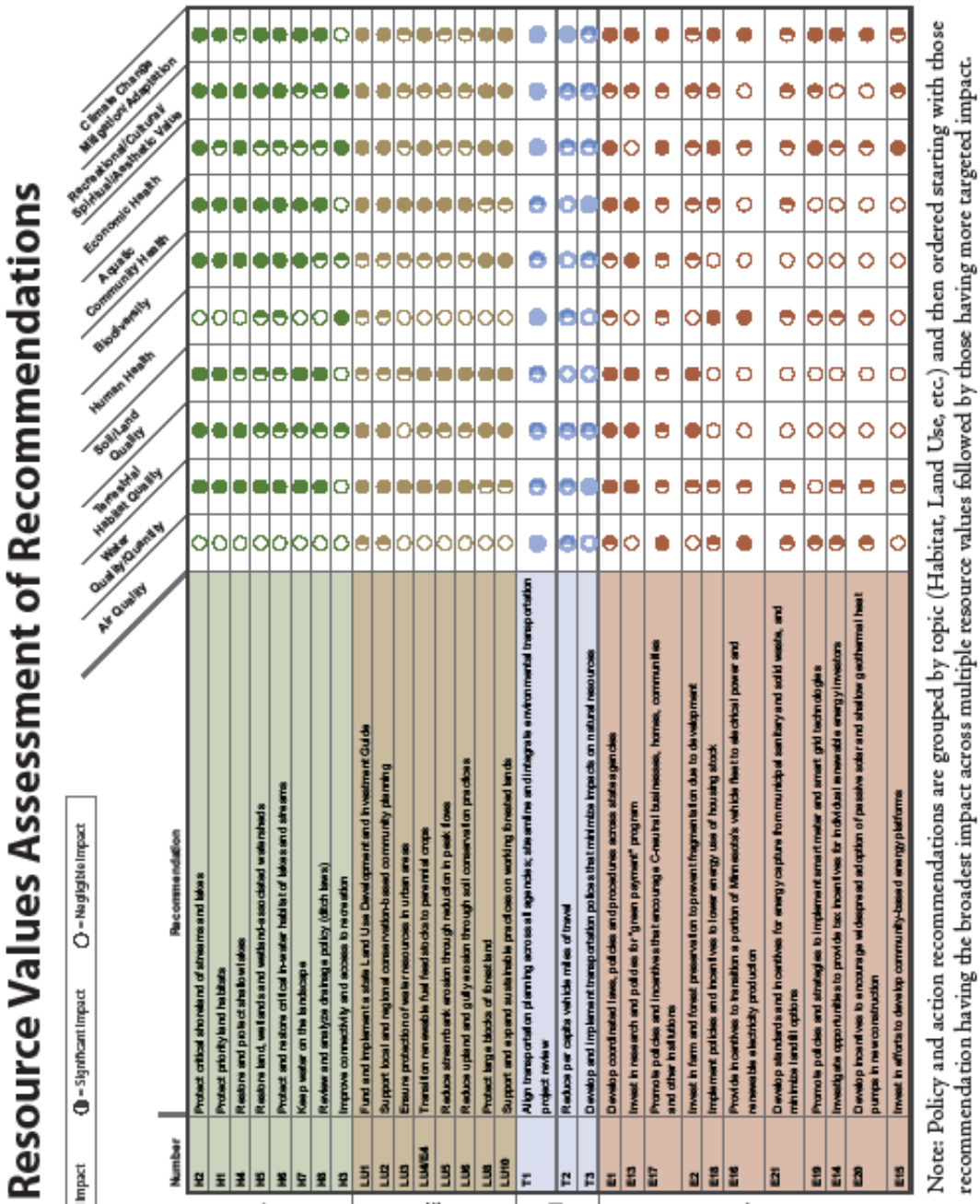


Figure 2. Natural resource values assessment of policy and action recommendations

Note: Policy and action recommendations are grouped by topic (Habitat, Land Use, etc.) and then ordered starting with those recommendation having the broadest impact across multiple resource values followed by those having more targeted impact.

Appendix I. Public Water Suppliers (Source: MDH)

PWS CODE	PWS ID	NAME	ADDRESS	CITY
Community	1210001	Alexandria	316 Fillmore Street	Alexandria
Community	1210002	Hi View Park	2208 Highway 29 North, Lot A3	Alexandria
Community	1210009	Brandon	Brandon City Hall	Brandon
Community	1210010	Carlos		Carlos
Community	1210013	Evansville		Evansville
Community	1210017	Kensington	City Hall	Kensington
Community	1210020	Osakis	14 Nokomis Street East	Osakis
Community	1210021	Garfield		Garfield
Nonpublic	5210041	Sundown Shores	5168 Fish Hook Drive SW	Alexandria
Nonpublic	5210219	Windjammer Inn Resort	4860 County Road 42 NE	Alexandria
Nonpublic	5210407	Ida Rather Be Fishin'	7842 Lake Ida Way NW	Alexandria
Nonpublic	5210438	Smith Lake Mobile Home Park	3375 Smith Lake Road SE	Osakis
Nonpublic	5210533	Lakes Area Assisted Living	1313 County Road 22 NW	Alexandria
Nontransient Noncommunity	5210108	Miltona Elementary School	27 Dale Avenue	Miltona
Nontransient Noncommunity	5210298	New Testament Church and School	2505 Highway 29 North	Alexandria
Nontransient Noncommunity	5210332	Douglas County DAC	524 Willow Drive	Alexandria
Nontransient Noncommunity	5210333	Arrowwood Resort	2100 Arrowwood Lane NW	Alexandria
Nontransient Noncommunity	5210355	Contech	8301 State Highway 29 North	Alexandria
Nontransient Noncommunity	5210364	Brenton Engineering Company	4750 County Road 13 NE	Alexandria
Nontransient Noncommunity	5210473	SunOpta	601 Third Avenue West	Alexandria

Nontransient Noncommunity	5210476	Pro-Fab	8210 State Highway 29 North	Alexandria
Transient Noncommunity	5210001	Christina Lake Lutheran Church	22156 County Road 24 NW	Evansville
Transient Noncommunity	5210003	St. Nicholas Catholic Church	9473 County Road 3 NE	Carlos
Transient Noncommunity	5210006	Trinity Lutheran Church	5760 County Road 4W SW	Holmes City
Transient Noncommunity	5210009	Sheila's Place	17866 County Road 18 NE	Eagle Bend
Transient Noncommunity	5210010	Rose City Evangelical Free Church	16241 County Road 14 NE	Eagle Bend
Transient Noncommunity	5210014	Red Rock Golf Club	5167 County Road 25 SW	Hoffman
Transient Noncommunity	5210016	Sun Valley Resort Association	10045 State Highway 27 West	Alexandria
Transient Noncommunity	5210022	Shady Creek Resort	14563 Lakes Road NW	Brandon
Transient Noncommunity	5210034	Geneva Beach Resort	105 Linden Avenue	Alexandria
Transient Noncommunity	5210035	Lilac Lodge Resort	114 Lilac Lane	Alexandria
Transient Noncommunity	5210039	Lake Andrew Resort Association	8018 County Road 28 SW	Alexandria
Transient Noncommunity	5210044	Elmwood Resort Association	6567 State Highway 114 SW	Alexandria
Transient Noncommunity	5210057	Viking Trail Resort	2301 County Road 22 NW	Alexandria
Transient Noncommunity	5210060	Burgen Lake Wayside Rest MNDOT	I-94, Mile Point 105.1	Alexandria
Transient Noncommunity	5210066	Maryview Beach Resort	6082 North Lake Mary Drive SW	Alexandria
Transient Noncommunity	5210077	Berg's Resort	1315 Berg Avenue NE	Alexandria
Transient Noncommunity	5210081	Lazy Day Villa	250 Three Havens Drive NE	Alexandria
Transient Noncommunity	5210086	Weston Station	4417 East Highway 27	Alexandria
Transient Noncommunity	5210099	Corral Supper Club	117 Nelson Street North	Nelson
Transient Noncommunity	5210100	Diamond Jim's	221 North Nelson Street	Nelson
Transient Noncommunity	5210111	Jarheads	147 Main Street	Miltona

Transient Noncommunity	5210112	Mount Calvary Lutheran Church	149 Fourth Avenue	Miltona
Transient Noncommunity	5210114	Smith Lake Resort	3189 Smith Lake Road SE	Osakis
Transient Noncommunity	5210116	Church of Seven Dolors	16921 County Road 7 NW	Brandon
Transient Noncommunity	5210119	Miltona Municipal Liquor Store	223 Main Street	Miltona
Transient Noncommunity	5210121	Lake Lakota Rest Area MNDOT	I-94, Mile Point 99.4	Alexandria
Transient Noncommunity	5210124	Westwood Beach Resort	10397 Chippewa Heights NW	Brandon
Transient Noncommunity	5210133	Betsy Ross Resort	3791 Betsy Ross Road NW	Alexandria
Transient Noncommunity	5210138	Lake Miltona Golf Club	3868 County Road 5 NE	Miltona
Transient Noncommunity	5210140	Tip Top Cove Resort	13430 East Lake Miltona Drive NE	Miltona
Transient Noncommunity	5210141	St. Paul's Lutheran Church	19020 West Miltona Road NE	Parkers Prairie
Transient Noncommunity	5210154	Leaf Valley Mercantile	15233 County Road 6 NW	Garfield
Transient Noncommunity	5210155	Valley Creamery Association	5562 County Road 5 NW	Leaf Valley
Transient Noncommunity	5210156	Big Horn Cove Association	2548 Big Horn Bay Road NW	Alexandria
Transient Noncommunity	5210157	Ebenezer Lutheran Church	13070 Highway 6	Alexandria
Transient Noncommunity	5210158	Lucky Acres Campground	15133 Spring Lake Road NW	Miltona
Transient Noncommunity	5210162	Forada Supper Club	1380 County Road 4 SE	Forada
Transient Noncommunity	5210164	Sunset Beach Resort	11876 Forada Beach Road SE	Alexandria
Transient Noncommunity	5210194	Lake Geneva Christian Center	715 Birch Avenue	Alexandria
Transient Noncommunity	5210198	Floding's Resort	1532 Brophy Park Road NW	Alexandria
Transient Noncommunity	5210225	Vacationers Inn	1327 West Lake Cowdry Road NW	Alexandria
Transient Noncommunity	5210228	Viking Bay Resort	12844 East Lake Miltona Drive NE	Miltona
Transient Noncommunity	5210235	Shady Lawn Resort	1321 South Lake Darling Drive NW	Alexandria

Transient Noncommunity	5210252	Tamarac Bay Campground	1660 North Lake Miltona Drive NE	Miltona
Transient Noncommunity	5210256	Luther Crest Bible Camp	8231 County Road 11 NE	Alexandria
Transient Noncommunity	5210257	Pilgrim Point Camp	2059 Pilgrim Point Road NW	Alexandria
Transient Noncommunity	5210304	Forada Liquor Bar and Grill	1531 Fourth Street SE	Forada
Transient Noncommunity	5210312	Woodland Resort	13270 East Lake Miltona Drive	Miltona
Transient Noncommunity	5210314	First State Bank	229 Oak Street N	Miltona
Transient Noncommunity	5210323	Lake Brophy County Park	County Road 82 NW	Alexandria
Transient Noncommunity	5210324	Runestone County Park	8755 County Road 103	Kensington
Transient Noncommunity	5210325	Memorial Park	2547 County Road 42 NW	Alexandria
Transient Noncommunity	5210326	Spruce Hills County Park	13148 Spruce Hill Park Road NE	Miltona
Transient Noncommunity	5210327	Le Homme Dieu Beach	North Highway 29	Alexandria
Transient Noncommunity	5210328	Casey's Amusement Park	1305 Nokomis Street North	Alexandria
Transient Noncommunity	5210330	Chippewa Farms	10295 Nursery Lane NW	Brandon
Transient Noncommunity	5210334	Buttweiler's Do-All	4298 State Highway 114 SW	Alexandria
Transient Noncommunity	5210336	East Moe Lutheran Church	3531 East Moe Road	Garfield
Transient Noncommunity	5210337	West Moe Lutheran Church	16249 County Road 8 NW	Brandon
Transient Noncommunity	5210341	Lion's Club Park	County Road 3 South	Osakis
Transient Noncommunity	5210346	Our Savior's Lutheran Church	West Mill & South Nelson	Nelson
Transient Noncommunity	5210350	Miltona Auto Sales	109 Main Street	Miltona
Transient Noncommunity	5210352	Iverson Insurance Agency	119 Main Street	Miltona
Transient Noncommunity	5210356	Pearl Plaza Building	1309 Highway 29 North	Alexandria
Transient Noncommunity	5210358	North Branch Plaza	901 Highway 29 North	Alexandria

Transient Noncommunity	5210360	Gas Mart	8170 State Highway 29 NE	Alexandria
Transient Noncommunity	5210361	United Parcel Services	4603 Highway 27 East	Alexandria
Transient Noncommunity	5210365	Chippewa County Park	9461 County Road 108 NW	Brandon
Transient Noncommunity	5210366	Lake Carlos State Park	2601 County Road 38 NE	Carlos
Transient Noncommunity	5210371	Big Foot Resort	8231 State Highway 114 SW	Alexandria
Transient Noncommunity	5210375	Lookers	7919 Highway 29 North	Carlos
Transient Noncommunity	5210378	Casa Lago Association	9491 South Park Drive NE	Carlos
Transient Noncommunity	5210379	Chet's Lakeside Inn	15681 County Road 102 NE	Parkers Prairie
Transient Noncommunity	5210380	Chippewa Hills Resort	9991 Chippewa Heights Northwest	Brandon
Transient Noncommunity	5210385	Cottage Grove Resort Association	7870 Cottage Lane SW	Alexandria
Transient Noncommunity	5210386	Eden Acres Estates Association	5181 Fish Hook Drive SW	Alexandria
Transient Noncommunity	5210387	Eden Acres Hide-A-Way Resort	6153 State Highway 114 SW	Alexandria
Transient Noncommunity	5210394	Happy's Landing Co-op Association	8951 Twin Point Road Southwest	Alexandria
Transient Noncommunity	5210396	Hardees	509 50th Avenue West	Alexandria
Transient Noncommunity	5210399	Anderson's Outpost	9462 Highway 29 North	Alexandria
Transient Noncommunity	5210404	The Muddy Boot Bar and Grill	11070 Toby's Avenue SE	Forada
Transient Noncommunity	5210406	Johnson's RV Park	15344 Dittberner's Creek Road NW	Miltona
Transient Noncommunity	5210415	Millerville Municipal Liquor Store	County Road 7 Northwest	Millerville
Transient Noncommunity	5210416	Miltona Bay Estates	12935 Miltona Bay Road	Alexandria
Transient Noncommunity	5210417	Minnesouri Homes Association of Cottages	12852 Minnesouri Club Road NE	Alexandria
Transient Noncommunity	5210419	Mount Carmel Family Camp	998 Mount Carmel Drive NE	Alexandria
Transient Noncommunity	5210420	Nordic Trails Golf Course	4343 - 39th Avenue NE	Alexandria

Transient Noncommunity	5210421	Oak Park Campground	9561 County Road 8 NW	Garfield
Transient Noncommunity	5210424	Miltona Beach Resort Association	2481 North Lake Miltona Drive NE	Miltona
Transient Noncommunity	5210427	Eddy's Interlachen Inn	4960 County Road 42 NE	Alexandria
Transient Noncommunity	5210434	Shady Oaks Campground	3139 County Road 78 SE	Osakis
Transient Noncommunity	5210439	Sunset Camping	11970 Forada Beach Road Southeast	Alexandria
Transient Noncommunity	5210441	The Hayloft	7931 State Highway 29 North	Carlos
Transient Noncommunity	5210442	Melby Outpost	24033 County Road 24	Evansville
Transient Noncommunity	5210447	Val Halla Villa Resort	1301 South Darling Drive NW	Alexandria
Transient Noncommunity	5210452	Westridge Shores Resort	6907 State Highway 114 Southwest	Alexandria
Transient Noncommunity	5210453	Two Mile Trailer Park	451 County Road 10 SE	Osakis
Transient Noncommunity	5210469	Good Shepherd Lutheran Church	2702 Highway 29 North	Alexandria
Transient Noncommunity	5210470	Fahlun Lutheran Church	3550 County Road 74	Nelson
Transient Noncommunity	5210474	Midwest Clinic of Dermatology	110 County Road 44 NW	Alexandria
Transient Noncommunity	5210479	Nokomis Market	1700 North Nokomis NE	Alexandria
Transient Noncommunity	5210480	Lee Motors, Inc.	5803 State Highway 29 South	Alexandria
Transient Noncommunity	5210483	Alexandria Golf Club	2300 North Nokomis NE	Alexandria
Transient Noncommunity	5210484	Broken Arrow Resort	3408 Highway 27 E	Alexandria
Transient Noncommunity	5210486	Living Waters Assembly of God	1310 North Nokomis NE	Alexandria
Transient Noncommunity	5210487	Pine Ridge Golf Course	13955 County Road 16 NW	Evansville
Transient Noncommunity	5210491	Arrowwood Resort-Golf Pro Shop	3421 Arrowwood Lane NW	Alexandria
Transient Noncommunity	5210492	Hilltop Lumber	1405 North Nokomis NE	Alexandria
Transient Noncommunity	5210497	House of Prayer Christian Outreach Cntr.	3020 Rosewood Lane SE	Alexandria

Transient Noncommunity	5210501	Trophy's	350 State Highway 27 West	Nelson
Transient Noncommunity	5210504	Faith Lutheran Church	310 County Road 14	Miltona
Transient Noncommunity	5210506	Andes Tower Hills	4505 Andes Road SW	Kensington
Transient Noncommunity	5210508	Smokey Timbers	15567 NW Smokey Timbers Road	Miltona
Transient Noncommunity	5210510	Mill Lake Resort	3551 West Mill Lake Road SW	Farwell
Transient Noncommunity	5210511	Geneva Golf Club	4181 Geneva Golf Club Drive	Alexandria
Transient Noncommunity	5210513	Green Iguana Bar and Grill	14566 State Highway 29 South	Glenwood
Transient Noncommunity	5210514	Bug-A-Boo Bay	2800 North Nokomis Street NE	Alexandria
Transient Noncommunity	5210515	Oscar Lake Lutheran Church	14619 Church road	Farwell
Transient Noncommunity	5210516	East Mill Nine	8446 County Road 27 SW	Alexandria
Transient Noncommunity	5210517	Nelson Memorial Ballpark	Hope Road	Nelson
Transient Noncommunity	5210518	Alexandria Shooting Park	6527 County Road 87 SE	Alexandria
Transient Noncommunity	5210521	Lake Geneva Estates	1080 East Lake Geneva Road NE	Alexandria
Transient Noncommunity	5210524	Jim & Judy's	12321 Highway 29 North	Alexandria
Transient Noncommunity	5210525	Miltona Custom Meats	Second Street West	Miltona
Transient Noncommunity	5210526	Three Havens General Store	3907 County Road 42 NE	Alexandria
Transient Noncommunity	5210527	Jim and Joan's Campground	10196 County Road 36 NE	Miltona
Transient Noncommunity	5210529	Jill's Gas and Grocery	550 South Nelson Street	Nelson
Transient Noncommunity	5210530	Wildridge RV Association	2221 Reuben's Lane Southwest	Farwell
Transient Noncommunity	5210531	Clara's Place		Alexandria
Transient Noncommunity	5210532	Long Lake Lodge	16021 Long Lake Road	Brandon
Transient Noncommunity	5210534	Brophy Bay Village RV Park	4178 County Road 82 SW	Alexandria

Transient Noncommunity	5210535	Runestone Office Center	910 Highway 29 North, No. 103	Alexandria
Transient Noncommunity	5210536	Sharon's Senior Service Inc.	1441 Rosewood Lane SE	Alexandria
Transient Noncommunity	5210537	Angelina's	1215 Highway 29 North	Alexandria
Transient Noncommunity	5210540	Country Garden B& B	360 Karens Way NW	Alexandria
Transient Noncommunity	5210541	Friends Forever Retreat	904 County Road 56	Garfield
Transient Noncommunity	5210542	Geneva Lodge	4301 Geneva Golf Club Drive	Alexandria
Transient Noncommunity	5210543	Miltona Outpost	4350 County Road 14 NE	Miltona
Transient Noncommunity	5210544	Carlos Creek Winery	6693 County Road 34 NW	Alexandria
Transient Noncommunity	5210545	Miltona Community unity Center	300 County Road 14	Miltona

IV. Glossary of Terms

Source: BWSR (July 2008)

303(d) - The section of the Clean Water Act that has the TMDL requirements. The 303(d) list is a list of all impaired or threatened waters within the jurisdiction of a State, Territory, or authorized Tribe.

305(b) - The section of the Clean Water Act requiring states to report on progress in meeting the "fishable, swimmable" goals of the act.

Adaptive Management – Adaptive management incorporates research into conservation action. Specifically, it is the integration of design, management, and monitoring to systematically test assumptions in order to adapt and learn.

Biotic impairment - A divergence from the expected biological condition of a lake, stream, or wetland. Practical methods exist for assessing impairment to a biological community, and they must be tested and refined for application to Minnesota. The methodology for Minnesota is being used as it is developed.

Clean Water Act – An act passed by the U.S. Congress to control water pollution (formerly referred to as the Federal Water Pollution Control Act of 1972). Public Law 92-500, as amended. 33 U.S.C. 1251 et seq.

Clean Water Legacy Act – The purpose of the Clean Water Legacy Act is to protect, restore, and preserve the quality of Minnesota's surface waters by providing authority, direction, and resources to achieve and maintain water quality standards for surface waters as required by section 303(d) of the federal Clean Water Act, United States Code, title 33, section 1313(d), and applicable federal regulations.

Condition monitoring - The purpose of this monitoring is to establish status and trends. Condition monitoring is designed to assess the condition of the state's waters, both in general and specific. This monitoring will identify problems, but may not collect enough data to identify the causes or sources of the problems. With adequate design considerations, condition monitoring can be used to determine trends over time or across areas of the state.

Designated Uses - Specific uses identified for all water bodies in the state, both surface water and ground water. Waters of the state are protected for multiple uses and water quality standards exist to protect those uses. Examples of designated uses are drinking water, aquatic life and recreation, agriculture, wildlife, industrial consumption, aesthetic enjoyment, and navigation.

DO - dissolved oxygen. Oxygen is necessary to maintain a healthy ecosystem for fish and other aquatic life in a water body.

Effectiveness monitoring - The purpose of this monitoring is to determine the extent to which purposeful interventions had an effect on water conditions.

Eutrophic - high in nutrients, with high organic production. Eutrophic lakes contain more phytoplankton (algae) than other lakes, and are common among more naturally fertile lowland regions in which human activity provides an increased supply of nutrients.

Exceedences - The number of times a water quality standard or a permit limit was exceeded. Violations of a permit limit or a water quality standard.

Fecal Coliform bacteria - Bacteria that originate in the intestinal tract of a mammal. Not all fecal coliform bacteria cause disease, but this relatively simple test is used as an indicator that fecal matter is getting into the water body, and that other potentially harmful contaminants may be also be entering the water body. The main sources of these bacteria are from animal and human waste. Animal sources of bacteria include feedlot and manure runoff, urban runoff, and wildlife. Improperly treated human waste may come from overflows from sewage treatment systems in cities and towns, unsewered areas with inadequate community or individual wastewater treatment, or a single home with a failing septic system.

Geometric Mean - The geometric mean of 'n' fecal coliform samples is the nth root of their product. For example, the geometric mean of 5 values is the 5th root of the product of the 5 values.

IBI - The index of biotic integrity is a regionally based index used to measure the integrity of rivers and streams, and to determine the level of their biotic impairment. The IBI relies on multiple parameters (termed "metrics") based on fish community structure and function, to evaluate a complex biotic system. In order to implement biological criteria, a formal method for sampling the biota of streams, evaluating the resulting data, and clearly describing the condition of sampled stream reaches is needed. The IBI incorporates professional judgment with quantitative criteria that enables determination of a continuum between very poor and excellent conditions. An important key to successful restoration, mitigation and conservation efforts is having an objective way to assess and compare the biological integrity of damaged sites. The IBI provides a tool for doing so and, at the same time, allows managers to set specific biological integrity targets for restoration programs.

Impaired water body - A water body that does not meet water quality standards and designated uses because of pollutant(s), pollution, or unknown causes of impairment.

Load - The quantity that is or can be carried at one time, as compared to a concentration. A pollutant load is the quantity of a pollutant that a water body is carrying measured at a point in time.

Mercury - A metal that recycles between land, air and water. Mercury accumulates in fish and often results in fish consumption advisories for lakes and rivers. Mercury can have toxic effects on the nervous system of animals, including humans that eat large quantities of fish. Mercury is naturally occurring, but most of the mercury entering water bodies comes from mercury released by human activities. The main pathway of mercury to surface water is through atmospheric

deposition. Major sources of mercury to the atmosphere include the burning coal and petroleum, metal smelting, and the use of mercury in manufacturing and products (such as switches, dental amalgam, and measuring instruments).

MN R Ch 7050 & 7052 - Minnesota Rules Chapters 7050 and 7052. These chapters contain the water quality standards for all waters of the state, both surface water and ground water. Chapter 7050 has the overall water quality standards for the state as well as specific standards for water bodies, and Chapter 7052 has the water quality standards for waters in the Lake Superior Basin.

Nonpoint Sources - Pollution in runoff and seepage from land areas. The major origins of nonpoint source pollution include agricultural runoff; pesticide and fertilizer use; feedlot runoff; urban runoff from streets, yards, and construction sites; leachate from septic systems; runoff from forestry and mining activities; highway de-icing chemicals; and dredging and drainage activities.

NTU - nephelometric turbidity units. A unit of measure for turbidity values. Turbidity measured in NTU uses nephelometric methods that depend on passing specific light of a specific wavelength through the sample.

Point Sources - Pollution from municipal and industrial facilities, usually entering a water body via discharge from a pipe or a discrete channel.

Pollutant - Any sewage, industrial waste, or other wastes, discharged into a disposal system or to waters of the state.

Pollution - Pollution of water, water pollution, or pollute the water means: (a) the discharge of any pollutant into any waters of the state or the contamination of any waters of the state so as to create a nuisance or render such waters unclean, or noxious, or impure so as to be actually or potentially harmful or detrimental or injurious to public health, safety or welfare, to domestic, agricultural, commercial, industrial, recreational or other legitimate uses, or to livestock, animals, birds, fish or other aquatic life; or (b) the alteration made or induced by human activity of the chemical, physical, biological, or radiological integrity of waters of the state. [Mn. Chapter 115.01; Subd. 5]

Reference conditions - The chemical, physical, or biological quality or condition exhibited at either a single site or an aggregation of sites that are representative of the least-impacted and attainable condition. Reference conditions are used to describe reference sites.

Suspended Solids - Suspended solids limit sunlight, inhibit oxygen uptake by fish and alter aquatic habitat.

TMDL - Total maximum daily load. The maximum amount of a pollutant that a water body can receive and still meet water quality standards. TMDL also refers to the process of allocating pollutant loadings among point and nonpoint sources. EPA's proposed definition is: "A written plan and analysis of an impaired water body established to ensure that the water quality standards will be attained and maintained throughout the water body in the event of reasonably foreseeable increases in pollutant loads."

TMDL Implementation Plan – An implementation plan is a document, guided by an approved TMDL, that provides details of the actions needed to achieve load reductions, outlines a schedule of those actions, and specifies monitoring needed to document action and progress toward meeting water quality standards.

Turbidity - Measures particles in the water, such as sediment and algae. Related to the depth sunlight can penetrate into the water. Higher turbidities reduce the penetration of sunlight in the water and can affect species of aquatic life that survive in the water body.

Un-ionized Ammonia (NH_3) - A form of ammonia that is toxic to fish.

V. Resources

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Legislative-Citizen Commission on Minnesota Resources, 2008. *Minnesota Statewide Conservation and Preservation Plan.* www.lccmr.leg.mn/statewideconservationplan/SCPP_FinalPlan.html

Minnesota Department of Natural Resources, 2006. *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife,* Comprehensive Wildlife Conservation Strategy. Division of Ecological Services, Minnesota Department of Natural Resources.
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