

Land and Water Resource
Management Plan
For
Douglas County, WI

Douglas County Land Conservation Committee and
Land and Water Conservation Department

Review Draft September 2009

For Implementation 2010 - 2020

ACKNOWLEDGEMENTS

This plan was prepared under the authority of Chapter 92, Wisconsin Statutes and under the direction of the Douglas County Land Conservation Committee, Douglas County Board and the Land and Water Conservation Department

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Plan Approvals

Douglas County Land Conservation Committee on October 20, 2009
Douglas County Board on December 17, 2009
Wisconsin Land & Water Conservation Board on December 1, 2009

Initial Implementation Period

January 1, 2010 – December 31, 2015

DRAFT RESOLUTION

A RESOLUTION APPROVING THE DOUGLAS COUNTY LAND AND WATER RESOURCE MANAGEMENT PLAN

WHEREAS, Chapter 92.10 of the Wisconsin Statutes requires that all counties in the state of Wisconsin develop a Land and Water Resource Management Plan; and

WHEREAS, the Douglas County Board of Supervisors previously approved spending for revising the Land and Water Resource Management Plan; and

WHEREAS, the Douglas County Land Conservation Committee sent out surveys, hosted one informational session, two meetings open to the public, and one public hearing to explain the plan process, solicit public opinion, and to solicit participants for the revision of the Land and Water Resource Management Plan; and

WHEREAS, the Douglas County Land Conservation Committee had previously formed a volunteer workgroup to draft a county-wide comprehensive plan including goals, objectives, and activities for the topic of aquatic invasive species control, education, and prevention; and

WHEREAS, the citizen input and information gathered through the formulation of the aquatic invasive species plan is included in the revision of the Land and Water Resource Management Plan; and

WHEREAS, the resulting plan identifies land and water resource management goals, objectives, and activities for implementation by the Douglas County Land Conservation Committee and their staff for the next ten years, with a work plan revision after 5 years; and

WHEREAS, at their October 20, 2009 meeting, the Douglas County Land Conservation Committee approved the Land and Water Resource Management Plan and forwarded the approved plan to the Douglas County Board for their review and action; and

WHEREAS, the Douglas county Land Conservation Committee staff presented the revised Land and Water Resource Management Plan to the Wisconsin Land and Water Conservation Board, at their meeting December 1, 2009; and

WHEREAS, the Wisconsin Land and Water Conservation Board approved the Douglas County Land and Water Resource Management Plan at their meeting December 1, 2009.

NOW THEREFORE BE IT RESOLVED that the Douglas County Board of Supervisors, does approve the Douglas County Land and Water Resource Management Plan to be implemented for the next ten years, with a work plan revision after the first 5 years; effective until December 31, 2020.

EXECUTIVE SUMMARY

Douglas County Land & Water Resource Management Plan

Introduction

The Douglas County Land and Water Resource Management Plan was developed to meet requirements in Chapter 92 of the Wisconsin Statutes. The intent of the plan is to foster local water quality planning and increase public participation in natural resource management. The plans are intended to provide counties, through their Land Conservation Committees, the tools, flexibility and funding to be able to address both statewide goals as well as priorities identified at the local level. The Douglas County Land & Water Resource Management Plan contains realistic objectives and activities intended to meet the goals established by a workgroup of volunteer citizens from throughout the county. The resulting work plan will guide the work of the Land Conservation Committee and their staff through 2020.

Plan Organization

The Douglas County Land and Water Resource Management (LWRM) Plan is divided into two main volumes of information. Volume I provides a general overview of the county and an assessment of the county's resources. Volume II identifies the goals, objectives, and activities along with an education strategy to address each goal. Volume II addresses the implementation of the agricultural performance standards for nonpoint pollution reduction and outlines plan implementation and. It includes a detailed work plan and discussion of ongoing monitoring efforts in the county. Maps and other supporting information are found in the appendices.

Public Participation

The LWRM plan was developed through public informational meetings and hearings, surveys and the efforts of the Land Conservation Committee (LCC). An Aquatic Invasive Species (AIS) Strategic Planning workgroup was established to create an AIS Strategic Plan and provide input particular to that subject. The LCC held a public input session September 9, 2009 following the distribution of a public input survey. A public radio broadcast was used to publicize the public input meeting. The Land Conservation Committee held a public meeting September 17, 2009 to gather more information and a held public hearing October 20, 2009 where citizens had a chance to learn more about the land and water resource management plan and to offer comments on the plan. Land and Water Conservation Department (LWCD) staff also forwarded plan information materials to the Douglas County Towns Association on September 15, 2009 and to the Douglas County Board at their December 2009 meeting. Public participation will continue throughout the life of the LWRM plan at annual planning meetings, annual reports to the county board and other groups, newsletters, and press releases to Douglas County citizens. Groups, organizations and individuals will also be asked by the LCC to participate in project planning and/or implementation as necessary.

Resource Assessment

A comprehensive look at past planning efforts, detailed water quality data, and general county information and land use trends provided the workgroup with information necessary to look at where the LWCD should target their time and effort. Land and water concerns identified include:

- *Drinking water protection*
- *Wetland protection*
- *Urban development and inadequate stormwater management*
- *Erosion and sedimentation resulting from construction and maintenance activities (especially roads)*
- *Loss of vegetative buffers along rivers, streams, lakes and wetlands*
- *Need to address invasive and exotic species throughout the county*
- *Inadequate water quality data*
- *Need for cooperation between managing entities*
- *Insufficient information transfer from agencies to the public*
- *Groundwater contamination issues*
- *Changing agricultural practices*
- *Protection of resource values*

Goals Objectives and Activities

The objectives and activities are organized under three main goals:

- 1) Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions, and recreational and scenic values.
- 2) Protect and understand groundwater quality to supply clean water for drinking and recharging surface waters and wetlands.
- 3) Prevent the introduction and spread of aquatic and terrestrial invasive species to protect aquatic habitat and resource values.

The Land Conservation Committee and staff will implement the goals, objectives and activities of the land and water resource management plan using the following guiding principles:

Plan Guiding Principles

- Uphold the protection of natural resources while considering the importance of the Douglas County economy.
- Utilize limited staff and financial resources efficiently.
- Facilitate partnerships and support efforts of other organizations where consistent with land and water resource priorities.
- Emphasize education to increase understanding of natural resource concerns and the methods to address these concerns and encourage beneficial changes in behavior.
- Restore and protect native habitats while meeting water quality objectives.
- Utilize information and recommendations in partner organization water quality and habitat management plans.

Plan Implementation

Volume II outlines roles, responsibilities, funding and staffing needs, evaluation and a detailed work plan for each goal, objective and activity. Volume II also outlines the Douglas County priority farm strategy and agricultural and non-agricultural standards and prohibitions implementation. Priority areas will be targeted for voluntary and educational efforts based on their potential impacts to natural resources. Criteria for priority for cost-share and technical assistance include geographic, resource, and other criteria. The NR 151 performance standards

strategy capitalizes on education and voluntary compliance. An educational strategy has been developed for each resource goal which includes: newsletter articles, news releases, workshops, distribution of material, formulation of a directory of land and water conservation experts for the website, and conducting an annual orientation to land and water conservation issues for local officials.

It should be noted, that work planning will determine the amount of funding needed annually for plan implementation. The county is the most important source of funding and support for implementation of the plan. County funding is also the most limiting factor as funds from other sources often require a match commitment. However, funding may not be available to implement all of the activities outlined in the work plan. Funding for the plan can come from various sources and therefore, a combination of private, local, state and federal sources will be sought to implement the plan priorities.

Progress Tracking and Plan Evaluation

Plan evaluation is important as it assesses whether goals, objectives and activities are being accomplished. At this time, the LCC does not have adequate funding to perform in-depth studies to determine whether educational events and activities were effective or not. As a result, measures will be made only to determine if the project was completed. Other activities such as technical assistance will also be evaluated on whether they were completed and the protection received from installation of the conservation practice (estimated soil saved, runoff reduced, wetland acres created, etc.) A written annual report will be provided to the public, the county and DATCP. This evaluation will also appear in the department's annual budget packet as performance indicators.

The Land and Water Conservation Department staff will review progress toward plan completion on a yearly basis and provide bi-monthly staff reports to the LCC. Progress tracking will be made a part of every LCC meeting. Work planning sessions will also provide an opportunity for the LCC, citizens and staff to meet together, discuss progress and determine the next fiscal year's projects.

Conclusion

Land and water resources are very important to Douglas County. Unique resources including the St. Croix National Scenic Riverway, the Bois Brule River State Forest, and Lake Superior are a few of the treasures found in the county. These treasures need to be protected. The land and water resource management plans are intended to reflect local needs and encourage local leadership in protecting these important resources. These plans empower Land Conservation Committees to provide that local leadership for other agencies, private groups, organizations and individuals. The plans also serve to set the path the county will follow for more long range planning.

The implementation of this plan will provide the basis for the future of land and water conservation in Douglas County.

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Introduction

Authority

Chapter 92 of the Wisconsin Statutes authorizes the creation and lists duties and responsibilities of Land Conservation Committees (LCC.) Each county is required to have an LCC. The committees are responsible for administering soil and water conservation programs and for providing technical assistance and conservation education. The Wisconsin Department of Agriculture, Trade & Consumer Protection (DATCP) provides grant funding to aid counties in implementing their program through the Soil and Water Resource Management section.

The 1997-1999 biennial budget bill changed the way the State of Wisconsin allocated funds to counties for soil and water resource management. The intent of the change was to foster local water quality planning, termed *county land and water resource management plans*. These plans are intended to provide counties, through their land conservation committees, the tools, flexibility and funding to be able to address both statewide goals and priorities identified at the local level.

Plan Requirements

A county land and water resource management plan must include, at a minimum, the following:

- Public participation.
- Cropland soil erosion control plan or waiver from plan requirements approved by the Land and Water Conservation Board and DATCP.
- Coordinated implementation strategy.
- A resource assessment including water quality, soil erosion conditions and causes of nonpoint source water pollution.
- Water quality and soil erosion goals
- Standards for Farmland Preservation Program.
- A work plan describing objectives and activities for each goal.
- A progress tracking and evaluation method.
- A process for landowner notification if needed.
- A public hearing.
- Agricultural and non-agricultural performance standards.

Public Participation

Douglas County provided several opportunities (identified below) to provide input into land and water resource management over the past several years.

Surveys and Questionnaires

In 1997, 2000, and 2004 the Land Conservation Committee (LCC) authorized two informal customer surveys asking citizens the types of activities the LCC should be focusing money and efforts on. The Douglas County Board also surveyed citizens when beginning their land use planning process in 1999. The LCC distributed questionnaires during the informational sessions outlining the land and water resource management planning process in 2004. The results were reviewed and the major natural resource themes identified were:

- *Drinking water protection*
- *Land use (forestry, agriculture and development)*
- *Wetland protection*
- *Lakeshore protection*
- *County and town road maintenance and construction*
- *Education*
- *Exotic and invasive species control*
- *Public beach closings*
- *Deer herd management*

The most recent survey sent out by the LCC to gather input in 2009 is included as Appendix E.

Other Management Plans

An extensive review of over twenty-eight past planning efforts and natural resource management documents provided a background for information about the county's natural resources. Those sources were also used to identify where information was not available. A synopsis of the major plans reviewed is found in Appendix A.

Work Group

Public participation in the Land & Water Plan development in 2004:

- ◆ Three public informational sessions held in Lakeside, Solon Springs, and Superior to outline the existing Land & Water Resource Management Plan goals, review current resource concerns, and solicit volunteers to participate in an advisory workgroup.
- ◆ One local workgroup was formed. Efforts were made to involve citizens from varied backgrounds including agriculture, town and county government, lake associations, environmental education, contractors, real estate and forestry. Workgroup membership included interested stakeholders and agency staff from DNR.
- ◆ The local workgroup held one meeting to identify and prioritize issues, define goals & objectives and formulate activities.

- ◆ Other interested individuals (not able to serve on the workgroup) were included in a citizen advisory group. Members of this group were relied upon for review and comment and were encouraged to participate in workgroup efforts.
- ◆ Advisory agency staff, including DNR staff, and municipal representatives provided plan review.
- ◆ Press releases informed the public about the plan development and an informational program and subsequent public hearing was conducted to receive comments on the final plan.

Plan Update in 2009:

- ◆ A public meeting was held in Solon Springs September 8, 2009. Survey results were shared and priority goals and objectives were established at this meeting. Those who received surveys for input were invited to the meeting along with the general public.
- ◆ An LCC meeting open to the public was held on September 17th. NR151 priorities and cost share priorities were established at this meeting. Suggestions for priority activities were also solicited.
- ◆ The plan will be made available for information public review beginning September 28 and for formal public review in preparation for a public hearing in mid October. The public hearing will be held October 20th.

Local Cooperation

Although Ashland, Bayfield, Douglas and Iron County Land Conservation Departments are no longer administered cooperatively, the counties still conduct some activities together.

Basin priorities were solicited through the partner survey and via review of the draft plan. Lake Superior and St. Croix Basin priorities were considered in the development of this land and water plan.

Plan Organization

The Douglas County Land and Water Resource Management Plan is divided into two main volumes of information. Volume I is a general overview of the county and an assessment of the county's resources. Volume II identifies the goals, objectives and activities along with an education strategy to address each goal. This volume also outlines plan implementation and addresses the implementation of the agricultural performance standards for nonpoint pollution reduction. It includes a detailed work plan and discussion of ongoing monitoring efforts in the county.

Volume I. Plan Background

County Resource Information

General Description

Douglas County is located in northwestern Wisconsin and covers 1,309 square miles. It is the fourth largest county in Wisconsin. The county is bordered by Carlton County, Minnesota to the west, Burnett and Washburn Counties to the south, Bayfield County to the east and Lake Superior to the north.

Geology

Bedrock

Douglas County varies from Precambrian sandstone to igneous bedrock. The northern part of the county is underlain with Superior red sandstone over which is a thick mantle of clay and gravel forming an artesian slope. Crystalline igneous rock underlies the southern two-thirds of the county. Gabbro and basalt outcroppings are common along the Superior escarpment in northern Douglas County and Totagatic River of southeastern Douglas County. Figure 1 is a map of Douglas County bedrock.

Glacial Geology

The glacial geology of Douglas County is represented by four major units:
glacial lacustrine red clays or clay till

- glacial gravel, sand, boulders and clay
- large pitted outwash plain
- ground moraine

The first unit, made of glacial lacustrine red clays or clay tills, is found on an old lake plain adjoining Lake Superior. These clays were laid down under the waters of a much larger glacial lake that once occupied the Lake Superior Basin and surrounding areas. These calcareous red clay soils are finely textured, resulting in very poor drainage. These soils cover about one fourth of the total county area and deposits range from very thin portions near the Superior escarpment to over 600 feet in the St. Louis River Valley. Although these clays contain large quantities of ground water, the surface clay deposits effectively prevent the water from reaching the surface as springs and consequently create artesian conditions.

The second major unit is a noticeable end moraine extending northeast across the county from Patzau to Bayfield County. It lies just south of the Superior escarpment. It is a ridge-like accumulation of glacial gravel, sand, boulders and clay. The moraine consists of steep hills and short ridges interspersed with numerous kettle-like depressions.

The third major unit consists of large pitted outwash plain. This outwash plain lies south of the Brule River, south east of the St. Croix River and northwest of the Ounce River and is a flat, sandy plain resulting from the outwash of the melting glacier. There are many depressions in the

plain, and lakes are more numerous here than in the upland. This flat, sandy plain is locally known as the *Pine Barrens*.

The last major unit of Douglas County consists of ground moraine in the extreme southwest corner of the county and one small portion near the Superior escarpment. The ground moraine of Douglas County is characterized by elongated narrow watersheds separated by gravel eskers which lie in a northeast/southwest configuration.

Soil Associations

Whether you are a resource manager, elected official, developer, contractor, or naturalist, soil survey information is invaluable in making land use decisions. This information provides insight into landscape relationships that no other source of information can provide.

The USDA Natural Resources Conservation Service (NRCS) completed a digital soil survey for Douglas County in 2007. This information is available on-line at: <http://soils.usda.gov/survey>.

Table 1 describes the soil associations of the county.

Figure 2 is the soil associations map of Douglas County.

Table 1: Soil Associations of Douglas County

Sarwet-Metonga-Goodwit Association (13) - Moderately deep to very deep, gently sloping to moderately steep, moderately well and well drained, loamy and silty soil on glaciated bedrock (basalt and granite) controlled uplands.

Amnicon-Miskoaki-Rockmont Association (14) - Moderately deep to very deep, gently sloping to steep, well drained and moderately well drained, loamy and clayey soils on glaciated bedrock (basalt and granite) controlled uplands.

Sarona-Sarwet-Metonga Association (16) - Moderately deep to very deep, gently sloping to very steep, well drained and moderately well drained, loamy soils on glaciated bedrock (basalt and granite) controlled uplands.

Keweena-Pence Association (19) - Very deep, nearly level to steep, well drained and moderately well drained, sandy soils on disintegration moraines.

Vilas-Keweenaw-Sultz Association (20) - Very deep, nearly level to very steep, well drained to excessively drained, sandy soils on disintegration moraines.

Rubicon-Morganlake-Flink Association (26) - Very deep, nearly level to very steep, excessively drained to somewhat poorly drained, sandy and sandy over loamy soils on disintegration moraines and glacial thrust masses.

Sarona-Stambaugh-Moodig Association (35) - Very deep, nearly level to steep, well drained to somewhat poorly drained, loamy and silty soils on ground moraines.

Cuttre-Miskoaki-Amnicon Association (41) - Very deep, nearly level to steep, somewhat poorly drained to well drained, clayey soils on modified lacustrine moraines.

Anton-Borea-Bohemian Association (45) - Very deep, nearly level and gently sloping, somewhat poorly drained to well drained, clayey and silty soils on modified lacustrine moraines.

Grayling-Deerton-Brownstone Association (51) - Moderately deep to very deep, nearly level to steep, excessively drained, sandy soils on bedrock influenced stream terraces.

Vilas-Rubicon Association (52) - Very deep, nearly level to steep, excessively drained, sandy soils on collapsed outwash plains.

Vilas-Pence Association (53) - Very deep, nearly level to steep, excessively drained, to excessively drained, sandy soils on collapsed and uncollapsed outwash plains.

Menahga Association (55) - Very deep, nearly level to steep, excessively drained, sandy soils on collapsed outwash plains.

Mahtomedi-Menahga-Graycalm Association (56) - Very deep, nearly level to steep, well drained to excessively drained, sandy soils on collapsed outwash plains.

Grayling-Wurtsmith Association (66) - Very deep, nearly level to steep, excessively drained to moderately well drained, sandy soils on outwash plains and dunes.

Rubicon-Vilas Association (67) - Very deep, nearly level to steep, excessively drained to somewhat excessively drained, sandy soils on outwash plains.

Graycalm-Menahga-Mahtomedi Association (68) - Very deep, nearly level to steep, excessively drained to somewhat excessively drained, sandy soils on outwash plains.

Lupton-Tawas Association (87) - Very deep, nearly level, very poorly drained, organic soils on outwash plains, stream terraces, and moraines.

Grayling-Wurtsmith Association (66) - Very deep, nearly level to steep, excessively drained to moderately well drained, sandy soils on outwash plains and dunes.

Rubicon-Vilas Association (67) - Very deep, nearly level to steep, excessively drained to somewhat excessively drained, sandy soils on outwash plains.

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Lupton-Tawas Association (87) - Very deep, nearly level, very poorly drained, organic soils on outwash plains, stream terraces, and moraines.

Habitat Type Classifications

Habitat type classifications are important for resource management. They provide information about the vegetation, soils, climate and wildlife. This information can be used for shoreland vegetation restoration, forest plantings and wildlife habitat improvement plantings and in making land use decisions. Figure 3 is a map of the habitat types in Douglas County.

Township & Transportation System

Historically, road construction and maintenance has been a problem, especially in the Lake Superior Clay plain. Efforts such as the Red Clay Project and Nemadji River Basin project searched for answers on how to stabilize roads along the clayey till plain so that they wouldn't increase peak flows during snowmelt and storm events. The increased flows contribute a significant amount of sediment to waterways in the county. Figure 4 is a map of the Township & Transportation system in Douglas County.

Historical Vegetative Cover

Vegetative cover is an critical part of watershed management. In order to understand how watersheds function, it is important to look at the history of activities and their results on the watershed. Historical land use practices are especially important in understanding the Lake Superior Basin. Increased runoff results from the over-harvest of large stands of pine and the loss of the duff (organic) layer of the soil. Figure 5 is a map of Finley's Original Vegetation for Douglas County.

Land Ownership

Douglas County has very large blocks of county owned and industrial forest land, smaller blocks of state land, some municipal owned lands and the balance in privately owned lands. The key to implementation of this land and water resource management plan, will be to have all of the various landowners working together to manage their lands. This plan lays out common goals identified through this and many other planning processes. It also lays out direction for the Land Conservation Committee as to how to address the many land and water resource issues in Douglas County. Figure 6 is a map showing the distribution of land ownership in Douglas County.

Resource Assessment

Major Watershed Basins

Figure 7: Basin & Subwatershed Map

Figure 8: Hydrography map

Lake Superior Basin¹

Lake Superior is the deepest of the Great Lakes and, in surface area, is the largest fresh water lake in the world. The Lake Superior drainage basin in Wisconsin covers about 1.96 million acres or about 3,069 square miles, most of which is forested. Douglas County encompasses 753.5 square miles, nearly a quarter of the total Wisconsin portion of the Lake Superior Basin.

The original vegetation included huge tracts of forest made up of white spruce, balsam fir, hemlock, sugar maple, yellow birch and mixed pine. Forestlands were interspersed with wetland vegetation. Stands of 200-foot tall white pine held the soils together, shading streams in which fish spawned. The southern portions of the basin were (and are now) dotted with wetlands and lakes.

Most of the Wisconsin portion of the Lake Superior coastal area is composed of red clay deposits left behind by glaciers about 10,000 years ago. These geologically young deposits are highly erodible, especially in disturbed areas or on slopes. The red clay includes small particles of sand that remain behind in streambeds as the finer clay particles are carried out into the lake. Some sections of the southern portion of the basin are composed of rugged hill and kettle relief, formed by thick end moraine deposits and pitted outwash. These landforms dominate the upper reaches of the Brule River in Douglas County. On the southern edge of the old lake plain between the Nemadji and Iron Rivers, are several waterfalls, including Big Manitou Falls on the Black River in Pattison State Park. At 165 feet, these are the highest falls in the state.

The Lake Superior shoreline, including its valuable coastal wetlands, is a significant area of biological diversity. It is characterized by a cool climate, undulating and rolling plains, extensive wetlands and several unique natural features such as the drowned river mouths and estuaries on the Wisconsin shoreline. The presence of clay soils and lowland boreal forest also contribute to its biological diversity and are an important factor in shaping the coastal wetlands. Extensive peatlands have formed at the mouths of many of the streams entering Lake Superior, usually behind sand spits, providing habitat for many rare plant and animal species.

Four main subwatersheds make up the Lake Superior Basin in Douglas County.

- **St. Louis & Lower Nemadji Rivers Watershed.** 284 stream miles and 159 square miles. This watershed is located in the very northwestern corner of Douglas County and extends into Carlton County, Minnesota. Water quality data is available for the area in and around the city of Superior. Water quality data is not readily available in the upper

¹ Department of Natural Resources. *The Lake Superior Water Quality Management Plan*. PUBL-WT-278-99-REV. March 1999.

portions of the watershed. Because of the importance of the Great Lakes and especially Lake Superior, this watershed was selected as an Area of Concern (AOC) by the International Joint Commission. Increased dredging of contaminated sediments in the Duluth/Superior harbors led to its selection as an AOC. Phase 1 and 2 Remedial Action Plans and the Nemadji River Project were completed as part of the Area of Concern designation in order to determine steps to remediate water quality problems identified. Implementation of these plans has not yet begun on a major scale in Wisconsin. More detailed information can be found in the *Wisconsin DNR Lake Superior Basin Plan* (DNR, 2000) and the Nemadji River Basin project report *Erosion and Sedimentation in the Nemadji River Basin* (USDA-NRCS and FS, 1998.)

- **Black & Upper Nemadji Rivers Watershed.** This 125.6 square mile sub-watershed contains 179.5 stream miles, most of which run through red clayey till areas. Large wetlands divide the Lake Superior Basin from the St. Croix Basin in this watershed. Detailed water quality data is not readily available for this sub-watershed.
- **Amnicon & Middle Rivers Watershed.** This 288.9 square mile sub-watershed contains 384 stream miles. The upper portions of this watershed consist mainly of sand deposits before entering the red clayey tills of the Lake Superior clay plain. Many wetlands, that feed short streams draining to Lake Superior, dot the landscape. Detailed water quality data is not available for all of this sub-watershed.
- **Bois Brule Watershed.** This 180 square mile watershed is derived in sandy deposits and drains to Lake Superior through the clayey till plain. Most of this watershed is protected as part of the Bois Brule River State Forest.

St. Croix Basin²

The St. Croix River originates at Upper St. Croix Lake near Solon Springs and flows approximately 160 miles to join the Mississippi River at Prescott, Wisconsin. The entire basin drains 7,760 square miles in both Minnesota and Wisconsin (40% and 60%, respectively) (Henrich & Daniel, 1983.)

Four main subwatersheds make up the St. Croix Basin in Douglas County.

- **Upper Tamarack.** This watershed is located in the very southwestern corner of Douglas County and extends into a small part of Burnett County. Little water quality data is available on the waters within this area because lakes are small and public access is generally not allowed.
- **St. Croix & Eau Claire Rivers.** This narrow watershed includes all of the St. Croix River drainage below the Gordon Dam to Riverside in Burnett County. Much of the watershed contains poorly drained uplands with many wetlands. Little water quality data is available on the waters within this area because lakes are small and public access is generally not allowed.

² Department of Natural Resources. *The St. Croix River Water Quality Management Plan*. PUBL-WR-270-94-REV. February 1994. Pages 213-223, 229-235.

- **Upper St. Croix & Eau Claire Rivers.** This area is the headwaters of the St. Croix Basin. Intensive development threatens water quality in the lakes within this sub-watershed. Several lakes have been designated by the state under NR102 as *Outstanding Resource Waters*. Lakes are, however, exhibiting an increase in fertility and aquatic vegetation growth, along with a decrease in water clarity. The installation of the municipal waste collection system on Upper St. Croix Lake may reduce these levels over time. The Upper St. Croix & Eau Claire River subwatershed was designated as a priority watershed project in October 1994. A final management plan for the area was approved in October 1997, and implementation of the plan occurred from November 1997 through 2008.
- **Totogatic River.** This large watershed extends from Bayfield County, to Douglas, Sawyer and Washburn Counties. The landscape is dotted with lakes and wetlands. Intensive development on lakes in the watershed is causing increased turbidity, increases in fertility and aquatic vegetation, introduction of exotic species (Eurasian water milfoil) and changes in riparian habitats and shoreland communities.

Land in the St. Croix Basin is mostly forested, with small tracts of agricultural land interspersed. Overall, water quality in the basin is good. However, as the demand for recreational opportunities and shoreland property increases, a decline in water quality, habitat and natural scenic beauty can be expected.

Surface Water

Water is a very important part of Douglas County's economy and quality of life. Inland surface waters comprise 22,165 acres of Douglas County. These acres are divided into rivers and streams, natural lakes, impoundments (flowages) and wetlands. Shorelands are important ecosystems surrounding surface waters.

Rivers and Natural Streams

There are about 101 streams and rivers in the county totaling 705.4 miles and covering 8,153 acres. About two hundred thirty-four miles are trout waters which provide many fishing opportunities for anglers. Threats to these waters occur when pollutants enter the system. Pollutants can enter rivers and streams through two different avenues called point and nonpoint pollution. Runoff from various activities can carry pollutants through watersheds and deposit them in rivers and streams. This is known as nonpoint pollution. Point sources of pollution also exist, such as a discharge pipe from a manufacturing plant or wastewater treatment facility or an uncontrolled spill.

Stream assessments throughout the basins in Douglas County reveal that water quality in portions of the St. Croix Basin and the Lake Superior Basin is **threatened** by **increasing fertility, increased suspended solids, mercury, polychlorinated biphenyls (pcbs), petroleum** and **low biological oxygen demand**. Suspected pollutant sources include nonpoint pollution, runoff from construction sites, urban runoff and forestry. These pollutant sources affect swimming, aquatic life, and drinking water. Table 2 lists surface water rankings by subwatershed.

Water quality standards are set by states, territories and tribes. They identify the uses for each waterbody. Federal, state and local agencies and organizations regularly cooperate to obtain and update water quality data. Section 303(d) of the Clean Water Act requires each state to publish updated lists of streams and lakes that are not meeting water quality standards and designated uses (such as swimming, drinking water, fishing, etc.) because of excess pollutants. This list has become known as the *total maximum daily load (TMDL) or impaired waters list*. A TMDL is a calculation of the maximum amount of pollutant that a waterbody can receive, and still meet water quality standards. A TMDL is calculated for each waterbody under Section 303 of the Clean Water Act. Douglas County Lake Superior Basin waters cited on the impaired waters list include Allouez Bay Area of Concern (AOC), St. Louis Bay AOC, St. Louis River AOC, Superior Bay AOC, Hog Island Inlet AOC, Crawford Creek, Crawford Creek Tributary and Newton Creek. These waters must be brought into compliance or Wisconsin faces the possibility of losing funding for water quality efforts. A detailed listing of cited areas can be found in Table 13 in Appendix A (H).

Table 2: Surface Water Rankings for Nonpoint Source Pollution Control³

<i>Basin</i>	<i>Watershed Name</i>	<i>Stream Rank</i>	<i>Lakes Rank</i>
Lake Superior	St. Louis & Lower Nemadji River	Not Ranked	Not Ranked
	Black & Upper Nemadji Rivers	Not Ranked	Not Ranked
	Amnicon & Middle Rivers	Not Ranked	Not Ranked
	Bois Brule	Not Ranked	Not Ranked
St. Croix Basin	Upper Tamarack	Not Ranked	Not Ranked
	St. Croix & Eau Claire Rivers	Not Ranked	Not Ranked
	Upper St. Croix & Eau Claire Rivers	Not Ranked	Not Ranked
	Totagatic River	Not Ranked	Not Ranked

**not ranked due to lack of water quality data.*

Lakes

There are 431 lakes in Douglas County totaling about 14,012 acres. Eighty-two percent are natural lakes and eighteen percent are impounded waters. Douglas County lakes are very fragile, as 66% are less than 10 acres. Lakes are often categorized into four different types based on how water enters the lake and how water leaves the lake. Lake categories include seepage lakes, groundwater drainage lakes, drainage lakes and impoundments.

Lakes receive both point and nonpoint sources of pollution. Lakes are also deposition areas for pollutants from the atmosphere, such as mercury. Water quality studies from the 1970s and 80s found high levels of dissolved oxygen levels and overall good water quality. Mercury deposition, high nitrogen and increased suspended solids were found further downstream in the St. Croix Basin. It should be noted that little to no baseline information has been collected from the Douglas County portion of the St. Croix Basin.

Lakes were also considered for addition to the *impaired waters list*, under sec. 303(d) of the Clean Waters Act. Impaired waters identified in the St. Croix Basin include the Minong Flowage, Red Lake and the St. Croix Flowage, citing atmospheric deposition as the source for

³ Department of Natural Resources. *The State of the St. Croix Basin*. PUBL-WT-555-2002. March 2002.

the mercury contamination. Amnicon Lake in the Lake Superior basin was also included on the list for the same reasons. Since the development of the St. Croix Basin plan, fish advisories due to mercury have been placed on all lakes in Wisconsin.

Human influences have increased the rate at which nutrients and sediments are being deposited in lakes thereby degrading water quality and limiting uses. Sediments and pollutant sources include urban activities, construction site erosion, failing private septic systems, road salt, sand and gravel washing, forestry, and some agricultural activities.

Citizens concerned about the quality of lakes and streams in Douglas County joined together to form the *Douglas County Association of Lakes & Streams* (DCALS.) The mission for the group is *to protect and improve the water quality and shoreland of Douglas County lakes and streams by sharing knowledge, forming common goals and speaking with a unified voice to mutually benefit all Douglas County lakes and streams.* Many lake residents have formed lake associations in order to protect water quality near their homes. Douglas County lake associations, self help monitoring participants and special districts or associations are included in Table 3. Dedicated citizens devote their time and effort to collecting water quality information and educating their neighbors as well as themselves about water quality and lake management.

Table 3: Douglas County Lake Associations, Self-Help Monitoring Participants and Special Districts or Associations		
Lakes	Currently participating in Self Help Monitoring Programs (Y or N)	Sanitary District / Lake District or Lake Association
Beauregard Lake	N	None/ None
Crystal Lake	Y	None/ Association (shared)
Person Lake	Y	None/ Association (shared)
Red Lake	Y	None/ Association
Bond Lake	Y	None/ Association
Leader Lake	Y	None/ Association
Whitefish Lake	Y	None/ Association
Gordon - St. Croix Flowage	Y	District/ Association
Lower Eau Claire Lake	N	None/ Association
Upper St. Croix Lake	Y	District/ Association
Amnicon / Dowling Lake	Y	District / Association (shared)
Lake Nebagamon	Y	None / Association
Lake Minnesuing	Y	District / Association
Minong Flowage	N	None / Association

Wetlands

Wetlands are defined as areas where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and that contain soils indicative of wet conditions. Wetlands can be seasonal or permanent and are commonly referred to as potholes, wet meadow, bogs, swamps and marshes. Figure 9 shows the wetland distribution in Douglas County.

Although historically thought of as wastelands, it is now known that wetlands perform many important functions on the landscape. Wetlands filter pollutants before they enter surface and groundwater, provide critical habitat and increase diversity for both fish and wildlife, reduce flooding by storing and slowly releasing water from rain and snowmelt, reduce peak stormwater flows, reduce shore erosion by protecting banks from the effects of wave and wind action and serve as recharge and discharge areas for groundwater. Many rare, threatened and endangered species are found in wetlands. Draining and filling wetlands can remove these valuable functions.

Critical wetlands were identified in Priority Wetland Sites of Wisconsin's Lake Superior Basin developed by the DNR's Bureau of Endangered Resources in 1997 (Appendix A(K)). The Wisconsin portion of the Lake Superior basin contains rare coastal wetlands not found anywhere else in the basin. These areas are targeted for acquisition, special protections and consideration. This document identifies 30 priority wetland sites and 18 priority aquatic sites within the Lake Superior Basin. Information for the St. Croix Watershed is not yet available.

All construction projects involving wetlands should be reviewed to ensure they meet local, state and federal wetland regulations prior to construction. The US Army Corps of Engineers, under Section 404 of the Clean Water Act, is responsible for permitting activities in wetlands in nonagricultural situations, such as urban development or road construction. The Wisconsin DNR has water quality certification over wetlands governed by the Corps of Engineers. Agricultural wetlands are regulated by the USDA Natural Resources Conservation Service (NRCS). The USDA Farm Service Agency (FSA) keeps records of all agricultural wetland determinations made by NRCS. The Wisconsin DNR has mapped an inventory of wetlands that are two to five acres and larger. Because these inventories were generally completed through aerial photo interpretation, not on-site inspection, some wetlands may not appear on the inventory. Non-inventoried wetlands are still subject to all rules and regulations relating to wetland management and protection.

In addition to state and federal wetland regulation, the county has an existing Shoreland-Wetland Zoning Ordinance authorized by NR115, Wisconsin Administrative Code, that regulates activities in wetlands that are within 1000 feet of a lake and 300 feet (or the landward edge of the floodplain) of a river or stream. Cities and villages in the county have similar wetland rules authorized under NR117, Wisconsin Administrative Code.

New wetland regulations were enacted for Wisconsin as of May 8, 2001 in response to a U.S. Supreme Court ruling that small isolated wetlands across the country were no longer protected by federal law. This new law covers some of the most productive wetlands in the state, including sedge meadows, shallow marshes and seasonally flooded lands. With the passage of 2001 Wisconsin Act 6, Wisconsin became the first state in the nation to establish state authority to protect these important wetlands from filling and dredging. Wisconsin has always provided water quality certification to the US Army Corps of Engineers for activities in these and other types of wetlands. The new law will allow the water quality certification to continue and will cover at least 1 million acres of wetland in the state.⁴

⁴ DNR website/DNR News at <http://www.dnr.state.wi.us/org/water/fhp/wetlands/index.htm>

In 2004, Wisconsin Act 118 created a system intended to speed permit decisions without reducing protection of habitat, navigation, water quality, and scenic beauty. A number of activities in or along lakes that previously required a DNR permit are currently exempt under Act 118. To administer Act 118, the Natural Resources Board adopted a temporary rule NR1 that names areas of special natural resource interest, including ORW and ERW waters, where exemptions are not available. WI Act 118, along with greatly reduced numbers of state regulatory staff in the region, may reduce protection for many vital resource waters.

Shorelands

Shorelands include lands near lakes, rivers or streams and certain wetlands. Douglas County has 1,410.8 miles of stream frontage, of which about 37% are in public ownership. Lake frontage in the county totals 365.11 miles, with about 27% in public ownership. Douglas County contains diverse coastal wetlands and 23.8 miles of Lake Superior shoreland.

Shorelands are popular for residential development because of their scenic beauty and access they provide to water. However, shorelands provide much more than scenic beauty and water access. They provide valuable habitat for both aquatic and terrestrial animals and plants, they act as buffers by filtering pollutants before they enter surface water, and control erosion by protecting soil from the impacts of wave action and stormwater runoff.

Many shoreland property owners have removed vegetation in favor of lawn turf in order to maximize the view from the dwelling. Efforts have been made by local, state, and federal agencies to return shorelands to native vegetation. Shoreland restoration is designed to return native species, restore filtering capabilities, reduce peak flows, provide erosion control and restore natural scenic beauty to the lakes and rivers of Wisconsin.

The county has an existing Shoreland Zoning Ordinance authorized by NR115, Wisconsin Administrative Code, that regulates activities within shoreland areas. Counties may impose standards more restrictive than the state standards. In 1998, the Douglas County Board approved a Lake Classification System increasing minimum setbacks on the majority of Douglas County lakes and streams. In 2004, the Douglas County Board amended the Shoreland Zoning Ordinance to change the way legal pre-existing structures may be enlarged or structurally altered. Restoring shoreland vegetation buffers is an important component of this amendment. The *Lake Classification, Zoning Schedule* – containing dimensional requirements for property within shorelands, and the *Dimensional Requirements for Lake Classes* is found in Appendix B of this document. The complete Douglas County Shoreland Zoning Ordinance can be viewed on-line at www.douglascountywi.org or obtained from the Douglas County Zoning Department.

Groundwater

Groundwater is the primary source of drinking water for most Douglas County residents, with the exception of the City of Superior. The city utilizes Lake Superior as their drinking water supply. Wells in the Lake Superior Basin are generally deep and may be artesian. Wells in the St. Croix Basin tend to be shallow and may consist of sand points. Because of the sandy soils, shallow water table depth and shallow well depths in the St Croix Basin, groundwater is very susceptible to some types of contamination problems. Sandy soils allow rapid infiltration and

tend to be poor filters of some chemical contaminants. Chemical contaminants that can be a problem include nitrates, pesticides and volatile organic compounds. The DNR ranks groundwater contamination susceptibility or occurrences by watershed. Table 4 lists DNR groundwater rankings for watersheds in Douglas County.

Table 4: Ground Water Rankings for Douglas County Watersheds⁵

<i>Basin</i>	<i>Watershed Name</i>	<i>Groundwater Rank</i>
Lake Superior	St. Louis & Lower Nemadji Rivers	Low
	Black & Upper Nemadji Rivers	Medium
	Amnicon & Middle Rivers	Medium
	Bois Brule	Medium
St. Croix Basin	Upper Tamarack	Low
	St. Croix & Eau Claire Rivers	Low
	Upper St. Croix & Eau Claire Rivers	Low
	Totagatic River	Low

**A high ranking means the watershed is susceptible to groundwater contamination and/or there were instances where groundwater nitrate concentrations exceeded the drinking water standards.*

Contamination of groundwater by human activity is a severe problem because contaminants generally travel un-noticed, are difficult to remove and may persist indefinitely. Water percolating through the soil can pick up pollutants and transport them to the groundwater. Contaminants may also enter the groundwater through unused wells that are not properly sealed. Groundwater contamination comes from a variety of sources, including leaking underground petroleum pipes and tanks; failing septic systems; use and storage of road salt; improper use, disposal and storage of hazardous materials; and improper fertilizer, pesticide, herbicide and animal waste management. Figure 10 is a map modeling contamination susceptibility of groundwater in Douglas County.

Unique Resources

Special Values and Designations

In 1968, the St. Croix River was designated a *National Scenic Riverway* under the National Wild and Scenic Rivers Act, from the St. Croix Flowage dam to the northern boundary of the St. Croix Falls city limits. This same stretch was named a Wisconsin *Outstanding Resource Water*. This special designation recognizes some of the highest quality waters of the state, and provides a level of protection beyond the water quality standards that apply to all other state waters. The Bois Brule River is listed as a *State Wild and Scenic River*.

The *Northern Rivers Initiative River Classification*, developed under the leadership of DNR in 1998, extends the work of lake classification to rivers. It provides officials with a new tool to help determine the amount of protection rivers and streams should be provided. The draft list can be found in Appendix A(G), Table 7 of this plan.

⁵ Department of Natural Resources. *The State of the St. Croix Basin*. PUBL-WT-555-2002. March 2002.

Outstanding and Exceptional Resource Waters are protected through the Department of Natural Resources rules NR 102.1 and NR 102.11 of the Wisconsin Administrative Code. The quality of these waters cannot be lowered due to DNR permitted activities, such as wastewater treatment plants. Special designations for Douglas County waters can be found in Appendix A (M), Table 10.

- **Outstanding Resource Waters (ORW)** have the highest value as a resource, excellent water quality and high quality fisheries. They do not currently receive wastewater discharges, nor will point source discharges be allowed in the future, unless the discharge waters meet or exceed the quality of the receiving water. This classification includes national and state wild and scenic rivers and the highest quality Class I trout streams in the state.
- **Exceptional Resource Waters (ERW)** have excellent water quality and valued fisheries, but currently receive wastewater discharges or may receive future discharges necessary to correct environmental or public health problems.

Threatened and Endangered Resources

Every component of the ecosystem is important as an indicator of a healthy ecosystem. Rare, threatened and endangered species are those whose populations are at risk. Federal agencies, in cooperation with the Wisconsin Natural Heritage Inventory, identify plant, animal and natural communities that are threatened, rare, endangered or special concern. Special concern species are those for which some problem of abundance or distribution is suspected but not yet proven. Appendix A (L) Table 9 lists rare, threatened, endangered and special concern species and natural communities known to exist in Douglas County. The St. Croix Basin in Douglas County contains a high amount of rare, threatened and endangered species and plant communities.

Cultural Resources

Cultural resources are the physical remains of a people's way of life that provide researchers a picture or map of life during that time. These remains are important because they help us to understand other cultures and customs, and learn about past civilizations and communities.

Examples of cultural resources include a wide variety of man-made artifacts like prehistoric pottery, log cabins, logging camps or bridges. According the US Department of Agriculture, cultural resources can include both tangible artifacts and less tangible traces of our past such as dance forms, aspects of folk life, landscapes, vistas and cultural or religious practices.⁶

Ecologically Invasive Exotic Species

While rare or endangered species are those whose populations have decreased from a habitat, exotic species are plants and animals that are introduced (intentionally or accidentally) into habitats where they are not native. Exotics enter a habitat and destroy the balance by overpowering native species, out-competing them for food and habitat. Exotics are prone to rapid expansion when lake chemistry is out of balance (for example, a lake high in phosphorus allows Eurasian water milfoil to expand). Generally, an introduced species has no predators, pathogens and competitors to naturally control the populations allowing the exotics to become

⁶ USDA-NRCS, via <http://policy.nrcs.usda.gov/national/gm/title420/part401/subparta/index.htm.8/25/3000>

invasive - crowding out native plants and animals and affect the balance in native habitats.⁷ A listing of common aquatic invasive species can be found in Appendix A(N), Table 11.

Land Use and Management

Figure 11: Douglas County Land Cover

Agriculture

Agriculture in Douglas County was once a main source of income for residents. Over the years, the number of farmers and farmland has gone down, following the statewide trend. According to the 2007-2008 Wisconsin Blue Book, Douglas County had 391 farms in 2002, totaling 85,000 acres. The average farm size was 217 acres. In comparison with all other Wisconsin counties, Douglas County ranks 62nd in total acres devoted to agriculture.

Most farms in the county are dairy and beef farms. Within the last 10 years, other activities have moved to the area including goat dairy operations, fruit production and hobby farming. Douglas County continues to produce corn and forages for hay such as grass, trefoil, alfalfa, wheat, oats and red clover. Manure is generally stockpiled or stored and spread on fields when conditions allow. Cattle are allowed unlimited access to streams in many cases, causing erosion and sedimentation problems, nutrient loading and shoreland degradation. Cropland soils erosion is not generally an issue due to long hay rotations and limited row crop production. Refer to the Douglas County soil erosion waiver in Appendix D.

Douglas County's Farmland Preservation Plan (FPP) includes goals and policies regarding land use and agricultural preservation. Updated Farmland Preservation Soil and Water Standards are incorporated into this LWRM Plan, according to 92.104, 92.105, Wis. Statue, ATCP 50.16, Wis. Adm. Code, and related guidelines. Conformance with these standards is necessary for landowners to remain eligible for farmland tax credits. The Douglas County Land Conservation Committee submitted, draft standards to the Department of Agriculture, Trade, and Consumer Protection (DATCP) for review in September of 2004. The Land and Water Conservation Board approved the Douglas County Soil and Water Conservation Standards on April 5, 2005.

Douglas County's Zoning Ordinances are intended to regulate land uses and prevent soil loss from erosion. They are consistent with state standards set forth in applicable WI Statutes and Administrative Rules.

Even with the decline in farm numbers, agriculture still plays a major role in the economy and environment of Douglas County. Most Douglas County farmers recognize the environmental and economic benefits of proper use and management of nutrients and pesticides. Funding through local, state and federal agencies has been available to producers on a limited basis, yet fixed farm cost remain the same or increase. The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) along with the DNR, have completed legislation that will require more of farmers for manure and nutrient management, protection of soil resources and additional measures for shoreland management. The Land Conservation Committees and their

⁷ Minnesota DNR. *A Field Guide to Aquatic Exotic Plants and Animals*. Exotic Species Program- Minnesota Sea Grant. 1995.

staff are charged with implementing these requirements for the two state agencies. A list of priority farms will be developed based on conditions of storage structures and feed lots, cattle accessibility to streams, and nutrient management and soil erosion control. A program will be implemented to address these issues as well as a way to fund these projects and direct priorities. The land conservation staff will assist in implementing this program as time permits.

Forestry

Forests provide many sustainable economic benefits, habitat for plants and animals and recreational opportunities for Douglas County. Forest management is a vital component of the county’s economy. A properly managed forest can provide wildlife habitat and forest products and contribute to watershed health. The majority of forest land is held privately. Table 5 lists public ownership of lands in Douglas County:

TABLE 5: Publicly Owned Conservation & Recreation Land In Wisconsin⁸	
<i>Land type</i>	<i>Acres</i>
County Parks & Forests	270,813
Total DNR	52,432
Federal Government	0
Total Publicly Owned Land	323,245

Poor forest management practices and unmanaged forests can contribute to sedimentation and increased peak flows in a watershed. Soil compaction, poorly designed stream crossings, harvesting on steep slopes and over-cutting all degrade a watershed. Studies on the Nemadji River watershed indicate that over-cutting a watershed leaves too many young aged stands (0-15 yr) that will not adequately hold snow cover in the spring. This causes increased peak flow events and contributes to instability of streams in the watershed.

Forestry best management practices have been developed for areas such as the Nemadji River watershed through the Nemadji River Basin Project. The recommended basin-wide guidelines are available through the LWCD. Recommendations for properly managed forests also include the use of Wisconsin’s Forestry Best Management Practices for Water Quality. The Douglas County Forestry Department updated their 15-year forest management plan in 2008.

Recreation

Recreation and tourism are important to Douglas County. Visitors to the area are provided many recreational opportunities including trail riding, skiing, dog sledding, fishing, hunting, boating, swimming, hiking, canoeing and chances to enjoy the natural scenic beauty, to name a few.

Abundant and clean water draw many visitors to the area. Recreation can contribute to the degradation of these unique and generally high quality resources. Use of motorized equipment near water can pollute lakes, streams, wetlands and groundwater.⁹ Trails may experience erosion

⁸ Wisconsin Blue Book 2003-2004.

⁹ Wisconsin DNR. *Wisconsin’s Forestry Best Management Practices for Water Quality Field Manual*. Publication #FR093. 1995. Page 13.

resulting in situations where pristine resources may be affected. User conflicts may also arise. Specific examples of impacts from recreational activities include:

- Soil erosion on recreational trails, campsites, boat landings
- Soil erosion from improper planning, design and installation of trails
- Fuel and lubricant spills
- Improper use of chemical pesticides, herbicides or fertilizers
- Increased runoff from recreation based housing or urban development
- Failing septic systems for recreational based housing
- Disturbance or destruction of wetland or wildlife habitat

Recreational activities require careful thought and planning prior to installation. The use of best management practices for water quality can reduce negative impacts to Douglas County waters.

Urban

The 2000 population estimate for Douglas County is 43,287. About 63% of these people live in the City of Superior. Superior's population has remained fairly constant over the last ten years as it has throughout the rest of the county. However, increasing pressure to develop areas along shorelines has had an impact. The general trend of increasing seasonal residency continues, mostly in the St. Croix Basin around lakes and rivers. Much of what was once agricultural land in Douglas County has been converted to recreational land.

Urban areas pose many threats to water quality. Large scale development, addition of impervious surface, storm drains, and filling wetland areas all cause significant problems for the natural movement of water through a watershed. Additional pollutants from oil, petroleum, road salt, lawn fertilizers and herbicides, debris and industrial waste are carried down the storm drains and are generally untreated. These pollutants cause increased water temperatures, flooding, decreased oxygen levels, streambank erosion and increased sedimentation.

The City of Superior has special problems as most of the city is constructed on wetlands and because of its proximity to the mouth of the Nemadji River. Any development must go through extensive review. Efforts should be made to revitalize the downtown area of the city in order to reduce the acres of wetland that are filled in order to maintain as much of the wetlands in the watershed as possible. Both temporary and permanent erosion and sediment control best management practices must be installed and inspected during construction and maintenance of buildings and the city's infrastructure. Many of the impaired waters listed in Appendix A(I), are located within the city limits. Remediation of these waters must be addressed, both in the water and at the source of contamination.

Another urban issue of concern is the recent beach closings along portions of Lake Superior in and near the City of Superior. The beaches are closed when bacteria levels are found at concentrations that are unsafe for human contact. While the cause and effects of this problem are not yet known, this is an issue that concerns the residents of Douglas County. The term urban also refers to development around lakes, rivers and wetlands.

Soil and Water Regulations, Standards and Best Management Practices

Federal Regulations

The Environmental Protection Agency (EPA) is responsible for “protecting human health and to safeguard the natural environment – air, water and land – upon which life depends.” The EPA administers a number of major environmental laws including the Clean Air Act, Clean Water Act, Pollution Prevention Act and National Environmental Policy Act. The EPA also defines minimum standards for categories for water body uses (such as swimming, drinking water, etc.) DNR and DATCP administer EPA programs for the state of Wisconsin. In turn, these state agencies turn over implementation of many of these programs to the county land conservation committees and their staff.

State Regulations

Chapter 30, Wisconsin Statutes – Navigable Water.

DNR provides oversight for this important program. The LWCD staff provide assistance with restoration plans on upon request.

NR 216, WI Admin. Code

The NPDES program is designed to require stormwater management plans and erosion control plans for sites larger than one acre as required under the EPA’s Clean Water Act. The intent is to keep water leaving the construction site clean through filters, sediment basins and diversions and to plan for long term stormwater management. DNR stormwater specialists work with local land conservation and zoning departments to implement this program.

NR243

The NR243 animal waste and feedlot program is designed to provide financial and technical assistance to those operations that are impacting water quality. This is a complaint based program and participants are cited and ordered to repair an operation to meet water quality standards. Investigations and citations are issued by DNR, cost-sharing is administered by DATCP and LCC and LWCD are responsible for implementation of this program.

Cropland Soil Erosion Control Plan

Douglas County received a waiver from the requirement that they develop a cropland soil erosion control plan. In requesting the waiver, the county stated that due to minimal row cropping, soil erosion on cropland was not a major threat to the waters of Douglas County. The waiver was granted by the Wisconsin Land and Water Conservation Board and the Department of Agriculture, Trade & Consumer Protection January 29, 1998 and is found in Appendix D.

NR151 Performance Standards and Prohibitions

In 1998, the Animal Waste Advisory Committee (AWAC) developed four general animal waste prohibitions. The prohibitions were considered the basic animal waste guidelines needed to protect water quality. The Wisconsin Department of Natural Resources developed NR 151 beginning with the basic prohibitions developed by AWAC. This rule is part of 8 WDNR rules that address runoff pollution, the major cause of polluted waters in Wisconsin and the United States.

NR151 includes the following:

- **Subchapter I: Implementation and Enforcement Provisions**
- **Subchapter II: Agricultural Performance Standards**
 - ✓ Nutrient Management
 - ✓ Nonpoint Source Pollution Control
 - ✓ Cropland Soil Erosion Control
- **Subchapter III: Non-Agricultural Performance Standards**
 - ✓ Nutrient Management
 - ✓ Transportation Facility Performance Standards
- **Subchapter IV: Process to Develop and Disseminate Non-agricultural Standards**
 - ✓ Standards Oversight Council (SOC)

These standards and prohibitions were promulgated into law on October 1, 2002, under NR151, Wis. Admin. Code. Under this rule, each county may adopt any or all of the standards and prohibitions. The Non-Agricultural and Agricultural Performance Standards are included on following pages. The Douglas County approach to NR151 was developed during the 2004/05 planning process. The LCC intends to maintain the same general approach developed in the 2004 planning process through the year 2020.

Additional State Regulations

A companion rule, NR 154 of Wisconsin's Runoff Management Program entitled *Best Management Practices, Conditions, and Standards*, is an important tool for implementing NR 151. The Wisconsin Department of Agriculture, Trade & Consumer Protection (DATCP) administers ATCP 50 and assists the counties with implementation of this rule.

- NR 154: Best Management Practices, Conditions and Standards (mirrored in ATCP 50)

In addition, the following standards have been incorporated into the implementation section of Douglas County's Land & Water Resource Management Plan. Statewide program rules, to be implemented through the LWRM plan include:

- NR 120 Priority Watershed and Priority Lake Program
- NR151 Runoff Management (Performance Standards and Prohibitions)
 - Subchapter II: Agriculture Performance Standards
 - Subchapter III: Non-Agricultural Standards
 - Subchapter IV: Transportation Performance Standards
- NR152 Model Ordinances for Construction Site Erosion Control and Stormwater Management
- NR 153 Targeted Runoff Management Grant Program
- NR 154 Best Management Practices and Cost-Share Conditions
- NR 155 Urban Nonpoint Source Water Pollution and Stormwater Management Grant Program
- NR 216 Storm Water Discharge Permits
- NR 243 Animal Feeding Operations
- ATCP 50 Soil and Water Resource Management Program

AGRICULTURAL PERFORMANCE STANDARDS AND PROHIBITIONS

Agricultural Standards

For farmers who grow agricultural crops:

- a) Farmers growing agricultural crops must meet "T" (tolerable soil loss) on all cropped fields.
- b) Agricultural producers must follow a nutrient management plan designed to limit entry of nutrients into waters of the state in 2005 for high priority areas such as impaired or ORW/ERW and 2008 for all other areas.

For farmers who raise, feed or house livestock:

- a) Allow no direct runoff from feedlots or stored manure into state waters.
- b) Limit livestock access to waters of the state where high concentrations of animals prevent the maintenance of adequate sod cover.
- c) Agricultural producers must follow a nutrient management plan when applying or contracting to apply manure to limit entry of nutrients into waters of the state in 2005 for high priority areas such as impaired or ORW/ERW and 2008 for all other areas.

For farmers who have or plan to build a manure storage structure:

- a) Maintain a structure to prevent overflow, leakage and structural failure.
- b) Repair or upgrade a failing or leaking structure that poses an imminent health threat, or violates groundwater standards.
- c) Meet technical standards for newly constructed or substantially-altered structure.
- d) Close an existing structure according to accepted standards.

For farmers with land in a water quality management area:

(defined as 300 feet from a stream, or 1000 feet from a lake or areas susceptible to groundwater contamination)

- a) Do not stack manure in unconfined piles.
- b) Divert clean water away from feedlots, manure storage areas and barnyards located within this area.

Four Animal Waste Prohibitions

- No overflow of manure storage structures
- No unconfined manure piles in a water quality management area, 1,000 feet up-gradient from sinkholes, or less than 3 feet to groundwater or bedrock.
- No direct runoff from a feedlot with stored manure to waters of the state.
- No unlimited access by livestock to waters of the state in a location where high concentrations of animals prevent the maintenance of adequate sod cover.

Non-Agricultural Performance Standards and Prohibitions

The LCC determined that the state requirements and enforcement on the Non-Agricultural Performance Standards are adequate in Douglas County. There are activities included in this plan to assist other agencies in implementing the Non-Agricultural Performance Standards. LWCD will continue to provide plan review and technical recommendations to partner agencies and departments as time allows.

Adopted Non-Agricultural Performance Standards & Prohibitions

For new construction and redevelopment on sites of 1 acre or more:

- a) Implement an erosion and sediment control plan using Best management Practices (BMPs) to control sediment runoff.
- b) Educate local units of government and individuals about erosion and sediment control plans.

For most sites covered by construction site erosion control plan:

- a) Implement a written storm water management plan to control runoff pollution. These plans shall conform to standards for total suspended solids in runoff, peak discharge rates, infiltration, protective areas, fueling and vehicle maintenance areas, timing and location.

For developed urban areas (population densities of 1000 or more people per square mile):

- a) Implement a storm water management plan that includes public education, leaf and grass management where appropriate, nutrient application on municipally-owned land according to an application schedule and detection and elimination of illicit discharges.
- b) Permitted municipalities shall meet additional control requirements for reduction in total suspended solids.

For non-municipal property covering 5 or more acres of turf or other pervious surface:

- a) Apply nutrient in accordance with a nutrient management schedule.

For transportation facilities:

- a) Implement erosion and sediment control plans during construction and management plans for runoff after construction.

County Regulations

Appendix A(B) details specific county ordinance requirements along with Figure 12 showing the zoning districts in Douglas County. Douglas County has relatively few regulations relating to soil and water resource management. The county currently relies on state and federal regulations as well as voluntary BMPs for the protection of soil and water resources. Local regulations/ordinances currently in place include:

- Douglas County Shoreland Zoning Ordinance including Lakes Classification (Zoning)
- Non-Metallic Ordinance (Zoning & LCC)
- Private On-site Waste Treatment Systems Ordinance (POWTS) (Zoning)

In 2004, the Douglas County Board amended the Shoreland Zoning Ordinance to change the way legal pre-existing structures may be enlarged or structurally altered. Restoring shoreland vegetation buffers is an important component of this amendment. The *Lake Classification, Zoning Schedule* – containing dimensional requirements for property within shorelands, and the *Dimensional Requirements for Lake Classes* are found in Appendix B of this document. The complete Douglas County Shoreland Zoning Ordinance can be viewed on-line at www.douglascountywi.org or obtained from the Douglas County Zoning Department.

Other Voluntary Conservation Initiatives

In addition to state and local regulations, Douglas County relies upon voluntary standards such as Forestry Best Management Practices for Water Quality, Stormwater Management, and Construction Site Erosion Control, and technical standards outlined by DATCP and USDA-Natural Resources Conservation Service (NRCS). Many of these standards are referenced in a recent reference, “*Best Management Practice Guidelines for the Wisconsin portion of the Lake Superior Basin.*” These voluntary standards are strongly encouraged for use in regulatory and non-regulatory situations. Conservation practices that may incorporate voluntary standards are listed in Table 6.

Access roads and cattle crossings	Nutrient management
Animal trails and walkways	Pasture & hayland management
Barnyard runoff control systems	Pesticide management
Contour farming	Prescribed grazing
Critical area stabilization	Relocating/abandoning animal feeding operations
Diversions	Riparian buffers
Field windbreaks	Roof runoff systems
Filter strips	Soil & water protection & improvement
Fisheries habitat enhancement	Streambank & shoreline protection
Grade stabilization structures	Timber stand improvement
Grassed waterway	Water & sediment control basins
Heavy use protection	Well decommissioning
Livestock fencing	Wetland development or restoration
Livestock watering facilities	Wildlife habitat enhancement
Manure storage systems	Windbreak/hedgerow establishment

Conclusion

Volume I provides readers with background information about Douglas County. More detailed information regarding past plans, studies, management guides and initiatives is found in Appendix A of this document.

Volume II outlines the goals, objectives and activities for the Douglas County Land Conservation Committee and LWCD. An educational strategy is developed for each resource goal. While some activities are required by state statute, priorities were determined by work group participants and the Land Conservation Committee. Volume II also includes an implementation plan that prioritizes activities, and lists the partners and resources needed to implement each activity, along with annual benchmarks.

Volume II. Plan Implementation

Volume II addresses implementation of the NR151 standards in detail, presents goals, objectives and activities for plan implementation, and includes a detailed plan of work. The work plan lists partners, hours and funding needed, and annual benchmarks. Priority activities are identified in both the list of activities and in the work plan.

NR151 Implementation in Douglas County

Aside from an agricultural facility siting ordinance, Douglas County does not regulate animal waste facilities. The Land Conservation Committee has not pursued local regulation because of the desire for the LWCD to remain an agency that provides only voluntary programs, the limited number of farms in the county along with limited staff to implement a regulatory program. LCC members agreed that voluntary efforts, education, one-on-one meetings with farm operators, and collaboration with DNR would be the best route for NR151 implementation.

If a complaint is received regarding compliance, voluntary measures will be pursued to correct the identified concern. If enforcement seems warranted, the case including documentation and existing landowner information will be referred to DNR through the NR243 program. *(A method for documentation will be developed to eliminate legal concerns over shared record keeping.)* Traditionally, the Land Conservation Departments have assumed the role of technical provider for these projects and in return received an estimated 10% of the cost of conservation practice construction for their services.

The detailed NR 151 implementation strategy is included on following pages.

Douglas County will assume the lead role for the following components of the strategy:

- Information & education activities
- Records inventory
- Secure funding and provide technical assistance – voluntary component
- Administer funding and technical assistance – re-evaluate parcel
- Compliance monitoring
- Annual reporting

Priority projects

If needed, priority areas will be targeted for voluntary and educational efforts based on their potential impacts to natural resources. Landowners wishing to receive cost-sharing, compete for limited funds and technical support through the LWCD's annual ranking process. Ranking sheets are in place for agricultural projects, shoreland restoration projects, and miscellaneous projects. The ranking sheets will be updated to reflect the priorities shown in the implementation strategy below. The number of projects ranked in any given year is variable.

Implementation Strategy for NR 151 Agricultural Nonpoint Performance Standards

Implementation Considerations

The Douglas County Land and Water Conservation Department (LWCD) will work with the Department of Natural Resources (DNR) and other agencies to implement the agricultural performance standards. Implementation of each component of the strategy outlined below will be dependent upon receiving adequate staffing, support, and cost share funds for completion.

Implementation of the agricultural performance strategy will be guided by the following concepts:

- Encourage voluntary participation in an ongoing cost sharing program for agricultural conservation practices
- Implement cost effective practices like conservation plans, nutrient management plans, grazing plans, and streambank fencing over high-cost practices like barnyards and manure storage
- Encourage farmer-developed nutrient management plans
- Coordinate DATCP funding for conservation practices to meet the agricultural performance standards with other cost share opportunities such as the Federal EQIP (Environmental Quality Incentives Program of the Natural Resources Conservation Service)
- It is not necessary for a particular farm/site to address all Agricultural Performance Standards in order to qualify for cost sharing.

1. Conduct information and education activities

The LWCD will distribute information and educational material prepared by the DNR. The information may be distributed via news media, newsletters, handouts, public information meetings, and one-on-one contacts.

The educational materials will be designed to meet the following objectives:

- Educate landowners about Wisconsin's agricultural performance standards and prohibitions, applicable conservation practices, and cost share grant opportunities;
- Promote implementation of conservation practices necessary to meet performance standards and prohibitions.

2. Systematically select and evaluate parcels for compliance with standards and prohibitions

A. Records and map inventory

Records and map inventory will be completed only after landowners are identified for on-site visits. Landowners will be selected for inventory review based on the criteria below for offering on-site visits, technical assistance, and cost sharing.

There may be opportunity to supplement limited file information through requests for information from landowners. Landowners may be willing to voluntarily release information in federal files or from consultant-prepared nutrient management plans, especially if the information supports their compliance with agricultural performance standards.

Selecting Priority Farms for on-site visits, technical assistance, and cost sharing

The number of farms selected for detailed on-site review will be dependent upon available time and resources. Priority farms for on-site review will be identified in the following manner (in order of priority)

- 1) Voluntary requests for assistance
- 2) Respond to complaints
- 3) Support existing efforts (such as watershed plans)

Assistance will be available to both livestock and crop producers.

The priorities established below will also be used to offer on-site visits, provide technical assistance, and to distribute agricultural cost share funding. The most important priorities are highlighted in bold below. Cost share participants will receive an on-site review and status report under the agricultural performance standards prior to an offer of a cost share contract.

Location/Resource Considerations

Drains to an outstanding or exceptional resource water

Within a water quality management area (surface water)

Within a water quality management area (groundwater)

Drains to a 303(d) listed water

Cost effectiveness and Practice Implementation

Cost effectiveness of Best Management Practices (BMP)s

Additional funding sources available or committed

Project addresses more than one NR151 standard

Project includes nutrient management planning

Procedure for records and map inventory review

1. Develop a list of potential farms to visit.
2. Based on available map and file information, identify priority level of farm using criteria in list above. Update farm list in priority order.
3. From parcel records, evaluate which standards and prohibitions are likely to apply.
4. If possible based on above evaluations, determine which landowners are currently already meeting standards and prohibitions as a result of:
 - a. Installed or implemented BMPs under an existing state or federal cost share agreement; and/or
 - b. Maintaining compliance with local or state animal manure regulations (e.g. NR 243, WPDES, etc.).

Note: It is expected that most landowners identified as priorities above will require on-site visits.

B. Onsite evaluations procedure

1. Visit farms in priority order as staff time is available.
2. Contact owners of selected parcels and schedule site evaluations.
3. Conduct onsite evaluations:
 - a. Determine and document the extent of current compliance with each of the performance standards and prohibitions.
 - b. Where non-compliant, determine costs and eligibility for cost sharing.

Note: Cost share requirements are based upon whether or not the evaluated cropland or livestock facility is new or existing and whether or not corrective measures are eligible for cost sharing. See NR 151.09(4)(b-c) and 151.095(5)(b-c).

- c. An evaluation form will be developed as part of the implementation of the plan.

C. Maintaining voluntary cost share program

Douglas County plans to maintain a successful voluntary cost share program with modifications to incorporate the agricultural performance standards. Significant water quality improvements are made through this voluntary participation.

Voluntary cost sharing guidance

Applicant farms will be screened using the agricultural performance standards on-site evaluation procedure and compliance status documentation.

Applicants will receive on-site evaluations as described previously.

Cost sharing offered will be prioritized using the criteria for priority sites.

Scheduling of cost share practices will be based upon:

- ✓ State and federal cost share \$ available
- ✓ Farmer's desired timeframe and match availability
- ✓ Ability to meet agricultural performance standards at a relatively low cost

Cost sharing may be provided to exceed the agricultural performance standards if water quality benefits are achieved and practices are relatively low-cost.

3. Document and report compliance status

A) NR151 status report

Following completion of records review and on-site evaluation, prepare and issue NR 151 status report (developed by DNR and completed by the LWCD) to owners of the evaluated parcels. This report will convey the following information at a minimum:

- Current status of compliance of individual parcels with each of the performance standards and prohibitions.
- Corrective measure options and rough cost estimates to comply with each of the performance standards and prohibitions for which a parcel is not in compliance.
- Status of eligibility for public cost sharing.
- ¹⁰
- Grant funding sources and technical assistance available from federal, state, and local government, and third party service providers.
- An explanation of conditions that apply if public cost share funds are used. (*If public funds are used, applicable technical standards must be met.*)
- A timeline for completing corrective measures, if necessary.
- Signature lines indicating landowner agreement or disagreement with report findings.
- Process and procedures to contest evaluation results to county and or state. The Land Conservation Committee will review cases of contested compliance evaluation results at a regularly scheduled LCC meeting.
- (Optional) A copy of performance standards and prohibitions and technical design standards.

Note: A cover letter describing the ramifications and assumptions related to the status report will be attached.

Note: Cost sharing will be encouraged for voluntary compliance, regardless of status on priority list. Cost-effective practices such as fencing, watering facilities, nutrient management planning, conservation planning, grazing plans, and well abandonment will be emphasized.

B) Maintain public records

Keep and maintain evaluation and compliance information as public record.

Note: The primary objective of this step is to ensure subsequent owners are made aware of (and have access to) NR 151 information pertinent to their property. The method for maintaining these records and for ensuring relevant information is conveyed to subsequent owners will be discussed with the Douglas County Corporation Counsel.

¹⁰Livestock facilities constructed after October 1, 2002 are not eligible for DATCP cost sharing to reach compliance with the state agricultural performance standards.

4. Provide or arrange for the provision of technical assistance and cost sharing available for installation of BMPs

A) Voluntary component (Cooperative)

1. Receive request for cost-share and/or technical assistance from landowner.

Note: Landowners will be prompted to voluntarily apply for cost-sharing based on information provided in a NR 151 Compliance Status Report.

2. Confirm cost-share grant eligibility and availability of cost-share & technical assistance.
3. Develop and issue cost-share contract (including BMPs to be installed or implemented, estimated costs, project schedule, and notification requirements under NR 151.09(5-6) and/or 151.095(6-7).

Note: The DNR will assist in developing proper notification language.

B) Non-voluntary component (Non-Cooperative)

In the event that a landowner chooses not to install corrective measures either with or without cost sharing and the LCC wishes to request DNR assistance to achieve compliance, request that DNR issue landowner notification per NR 151.09(5-6) and/or 151.095(6-7). The LWCD will provide information including cost share money available and design assistance as requested by DNR. DNR will issue the notification if they choose to pursue it.

- If eligible costs are involved, this notification shall include an offer of cost sharing.
- If no eligible costs are involved, or if cost sharing is or was already made available, the notification will not include an offer of cost sharing.

The notification referenced above will be designed by the DNR and contain:

- a) A description of the performance standard or prohibition being addressed;
- b) The compliance status determination made in accordance with NR 151;
- c) The determination of which best management practices or other corrective measures are needed and which, if any, are eligible for cost sharing;
- d) The determination that cost sharing is or has been made available, including a written offer of cost sharing when appropriate;
- e) An offer to provide or coordinate the provision of technical assistance;
- f) A compliance period for meeting the performance standard or prohibition;
- g) An explanation of the possible consequences if the owner or operator fails to comply with provisions of the notice; and
- h) An explanation of state appeals procedures.

5. Administer funding and technical assistance

A) Execute cost-share agreement. If cost-sharing is involved, finalize and execute cost-share agreement including schedule for installing or implementing BMP(s).

B) Provide technical services and oversight.

- Provide conservation plan assistance
- Review conservation plans prepared by other parties
- Provide engineering design assistance

- Review engineering designs provided by other parties
- Provide construction oversight
- Evaluate and certify installation of conservation practices

C) Re-evaluate parcel. After corrective measures are applied, conduct evaluation to determine if parcel is now in compliance with relevant performance(s) standard or prohibition(s).

- If site is compliant with additional performance standards, update “NR 151 Status Report” (see component 3.A.) and issue “Letter of NR151 Compliance.”

Note: A letter of NR 151 compliance serves as official notification that the site has been determined to now be in compliance with applicable performance standards and prohibitions. This letter would also include an appeals process if a landowner wishes to contest the findings. When and where counties are not operating under a local ordinance, the issuance of a letter of NR 151 compliance would likely be a joint effort with the DNR in order to give it the significance and standing that it merits.

- If not compliant, seek non-regulatory remedies or initiate enforcement action.

Note: Follow-up measures at this stage will differ depending on the circumstances, including whether or not failure to comply is the fault of the landowner. If it is not the fault of the landowner, then non-regulatory remedies will likely be sufficient. If not (e.g., there is an intentional breach of contract) then enforcement action may be necessary under Component 6.

6. Issue required notices and conduct enforcement activities

A. Notify DNR of enforcement action needed

If a landowner refuses to respond appropriately to a notice under 4.B., or is in breach of a cost share contract under component 5.A., the LCC may choose to notify DNR who will prepare and issue “Notice of NR 151 Violation” letter.

Note: Enforcement begins with this letter. It may be pursued in circumstances where:

1. *A breach of contractual agreement including failure to install, implement, or maintain BMPs according to the provisions of the agreement occurs OR the landowner has failed to comply with a notice issued under component 4.B, AND*
2. *non-regulatory attempts to resolve the situation have failed.*

The county will not develop or create the forms or documents. The LWCD will provide information to the DNR who will complete and sign documents.

B. Schedule enforcement conference.

The DNR will set up any necessary enforcement conferences.

C. Participate in enforcement conference.

The LWCD will participate in an enforcement conference formally initiated by DNR.

D. Initiate enforcement action

Refer cases to DNR for enforcement. Priority list to request follow-up enforcement will be based upon the number and extent of performance standard violations and the priority criteria established in component 2A.

7. Monitoring compliance

- Conduct periodic evaluations to verify ongoing compliance. Landowners will be asked to complete a self-certification form annually and return it to the LWCD. The LWCD will also complete spot checks on 5-10 percent of sites on an annual basis.
- Respond to public complaints alleging noncompliance. LWCD will respond to complaints by investigating allegations with file review, telephone confirmation, and/or an on-site visit. If the review demonstrates significant violation(s) of the agricultural performance standards, staff will proceed with the strategy for compliance. This process will begin with documentation (Step 3), proceed to technical assistance (Step 4), administering funding (Step 5) then to enforcement actions (Step 6) if necessary.
- Noncompliance that threatens public health and safety will be immediately referred for enforcement action through appropriate county and state entities.
- Ensure new owners are made aware of (and have access to) NR 151 compliance information that may pertain to the property they have acquired. This may be accomplished through a query of the county tax parcel database.

8. Tracking and reporting program activities and progress

- Maintain and convey a record of annual site evaluations showing their location and compliance status.
- Maintain a record of estimated costs of corrective measures for each evaluated parcel.
- Maintain and convey a record showing parcels where public cost sharing has been applied to implement standards and prohibitions, the amount and source of those funds, and the landowner share.
- Maintain and convey a record and location of parcels referred to DNR for enforcement action.
- Maintain and convey a record of the annual cost of technical and administrative assistance needed to administer agricultural performance standards and prohibitions, as established in NR151.

Note: The LWCD will provide the above information to the Department of Agriculture, Trade, and Consumer Protection to meet minimum program requirements.

Goals, Objectives and Activities

This land and water management plan is developed to serve for a ten year period from 2010 through 2020. The plan goals, objectives, activities will be reviewed after 5 years as currently required by the state. A general definition of each term is provided below. A detailed plan of work follows the list of activities.

Goals – General statements of the desired overall result to be accomplished

Objectives – More specific, (ideally measurable) steps to reaching plan goals

Activities – Methods and actions to reach goals and objectives. All activities should have a tie to plan goals and objectives. *Or* there should be a clear, defensible explanation for why they are completed (e.g., for example, they are required by state statute). Additional activities consistent with plan objectives may be added during the plan implementation period.

Goals (2010 – 2020)¹¹

Goal 1. Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions, and recreational and scenic values.

Goal 2. Protect and understand groundwater quality to supply clean water for drinking and recharging surface waters and wetlands.

Goal 3. Prevent the introduction and spread of aquatic and terrestrial invasive species to protect aquatic habitat and resource values.

Guiding Principles

1. *Uphold the protection of natural resources while considering the importance of the Douglas County economy.*
2. *Utilize limited staff and financial resources efficiently.*
3. *Facilitate partnerships and support efforts of other organizations where consistent with land and water resource priorities.*
4. *Emphasize education to increase understanding of natural resource concerns and the methods to address these concerns, and encourage beneficial changes in behavior.*
5. *Restore and protect native habitats while meeting water quality objectives.*
6. *Utilize information and recommendations in partner organization water quality and habitat management plans.*

¹¹ These goals are listed in order of priority.

Objectives¹²

Surface Waters and Wetland Objectives

Wetlands

- A. Protect wetlands from the impacts of development (agriculture, forestry, residential).
- B. Support the preservation of tracts of land where priority wetlands are present.
- C. Restore wetlands.

Lakes and Streams

- A. Protect surface water from the impacts of development (agricultural, forestry, residential).
- B. Watersheds are inventoried and well understood (land use, groundwater flow and nutrients, habitat, hydrology).
- C. Lakes and rivers water quality and critical habitat area information is available.

Priorities for surface water protection and enhancement.

- ORW/ERW waters
- 303(d) listed waters
- Designated critical habitat areas
- Priority watersheds
- Priority lakes

Mitigating Impacts of Development

(Objective A for wetland, lakes, and streams)

- A1. Shorelands are managed to limit impacts of residential development.
 - Shoreland buffers that meet county standards are in place.
 - Septic systems are maintained appropriately.
 - Zoning development standards to protect waterways are met or exceeded.
 - Stormwater runoff and erosion are minimized in shoreland areas.
- A2. Impacts from road construction, maintenance and other activities on public lands are minimized.
- A3. The NR 151 Non Agricultural Standards are supported.

¹² Objectives are listed in order of priority.

- A4. Agricultural owners meet the NR 151 Performance Standards.
- A5. Impacts from nonmetallic mining are minimized.
- A6. Private and public landowners follow forestry best management practices for water quality protection.
- A7. Open land is converted to conifer forest to minimize the impacts of snowmelt runoff in the Lake Superior Basin. (recommendation from Comparative Analysis Project)

Groundwater Objectives

- A. A baseline inventory of drinking water quality is available in Douglas County.
- B. Potential impacts to groundwater are minimized (road salt, herbicides, etc.).
- C. Private wells are properly sealed and closed when not in use.
- D. Manure storage systems follow standards to protect groundwater.

Aquatic Invasive Species

Goal 1: Aquatic invasive species (AIS) infestations already existing in the county are controlled or eradicated and prevented from spreading; new AIS infestations are prevented.

Goal 2: Communication between lake and river residents, watershed groups, visitors, and other waterway organizations is improved and education is provided for all users.

Goal 3: The county and towns participate in the protection of water resources and understand how critical the resource is to the County, northern Wisconsin and the region.

Goal 4: Funding for AIS research, monitoring, planning, restoration and education activities are adequately provided by private, local, county, state, federal, and tribal sources.

Implementation Activities¹³

Goal 1. Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions, and recreational and scenic values.

Wetland Objectives

- A. Protect wetlands from the impacts of development (agricultural, forestry, residential).
- B. Support the preservation of tracts of land where priority wetlands are present.
- C. Restore priority wetlands.

Wetland Specific Activities

- 1. Support efforts to preserve priority wetlands. This may come in the form of letters of support for grant projects or facilitating transfer of ownership for conservation set aside of priority wetlands. (OBJ A C)**
2. Provide suggestions to mitigate the potential impacts to wetlands as requested by the Zoning Department, DNR, or private citizens. (OBJ A)
3. Provide technical assistance and cost sharing to private and public landowners for wetland restoration. (OBJ C)

WETLAND EDUCATION STRATEGY

Audiences

School groups
Public officials
Agricultural community
Landowners and managers
General public
Elected officials
Zoning committee members
Nonprofit organizations (for potential wetland acquisition)

Messages

Importance of wetlands as components of watersheds/basins
Economic/intrinsic values of coastal wetlands
Different types of wetlands have different values
Encourage increased wetland setbacks
Technical assistance is available to restore wetlands
Proper wetland restoration techniques and best management practices
Incentive programs such as the Wetland Reserve Program are available for wetland protection
Tools such as conservation easements, grants for land purchase, etc. are available for land protection

¹³ Priority activities are indicated in bold.

Education Activities

Newsletter articles (newsletters available for all strategies are listed below)

- Lake Superior grazing newsletter
- 4-County FSA/NRCS newsletter to registered producers
- Douglas County Extension newsletter (internal to Douglas Co departments and county board members)
- Northwest Wisconsin Extension newsletter (from Spooner office)
- Douglas County 4-H newsletter

News releases to local media

- Deliver presentations
- Develop county fair displays
- Landowner contacts to promote wetland restoration in targeted areas
- Workshops for contractors and developers

Lakes and Streams Specific Objectives

- A. Protect surface water from the impacts of development (agriculture, forestry, residential).
- B. Watersheds are inventoried and well understood (land use, groundwater flow and nutrients, habitat, hydrology).
- C. Lakes and rivers water quality and critical habitat area information is available.

Activities¹⁴

1. Review recommended actions of partner organization plans and support where consistent with water quality objectives. (OBJ A, B, and C)
2. **Identify water quality monitoring needs for lakes and streams and support volunteer monitoring efforts. (OBJ B)**
3. **Coordinate watershed plans for priority water bodies. (OBJ B and C)**
 - a. **Identify and prioritize focus areas**
 - b. **Solicit partners and funding sources**
 - c. **Gather study information**
 - d. **Develop management plans**
 - e. **Update cost share priorities to reflect plan recommendations**
4. Participate in the state and federal listing process by nominating new waters to these lists and providing supporting information where helpful for meeting water quality objectives. Examples include ORW/ERW waters, 303(d) lists, critical habitat designations, and wild and scenic rivers. (OBJ B and C)
5. Interpret, evaluate, and distribute water quality information to the county board, interested groups, and to the public via news releases. (OBJ C)

¹⁴ Priority activities are indicated in bold.

MEETING OBJECTIVE A

- A1. Shorelands are managed to limit impacts of residential development.
 - Shoreland buffers that meet county standards are in place.
 - Septic systems are maintained appropriately.
 - Zoning development standards to protect waterways are met or exceeded.
 - Stormwater runoff and erosion are minimized in shoreland areas.
- A2. Impacts from road construction, maintenance and other activities on public lands are minimized.
- A3. The NR 151 Non Agricultural Standards are supported.
- A4. Agricultural owners meet the NR 151 Performance Standards.
- A5. Impacts from nonmetallic mining are minimized.
- A6. Private and public landowners follow forestry best management practices for water quality protection.
- A7. Open land is converted to conifer forest to minimize the impacts of snowmelt runoff in the Lake Superior Basin. (recommendation from Comparative Analysis Project)

Residential Shorelands

- 6. Provide technical review of, or develop site plans for, shoreland zoning land use permit applicants. Provide on-site technical assistance as requested. (OBJ A1)**
- 7. Plan, design, and cost share practices to reduce nonpoint pollution. (OBJ A1)**
- 8. Provide on-site technical assistance (potentially including site plans) for properties in violation of the shoreland zoning ordinance. (OBJ A1)
- 9. Inspect previously installed best management practices. (OBJ A1)

Public Land

- 10. Identify erosion problems in public right of way or public lands and provide erosion control design assistance as requested. (OBJ A2)**
- 11. Inventory culverts for erosion and fish passage concerns and provide information for watershed planning efforts and/or notify landowners of potential problems. (OBJ A2)**
- 12. Provide cost sharing to address erosion and culvert concerns. (OBJ A2)**

Urban Stormwater Runoff

- 13. Assist other county departments in meeting stormwater requirements. (OBJ A3)**

- 14. Review and provide input on stormwater management plans as requested by the Zoning Department, DNR or private landowners. (OBJ A3)**

Agriculture

- 15. Provide cost sharing and technical assistance to agricultural producers to implement the NR151 agricultural performance standards. (OBJ A4)**

Note: see NR 151 agricultural implementation strategy [elsewhere in the plan]

16. Administer the Farmland Preservation Program. (OBJ A4)

17. Inspect previously installed agricultural best management practices (OBJ A4)

Nonmetallic mining

- 18. Provide technical review of NR 135 reclamation plans submitted by applicants as requested. (OBJ A5)**

- 19. Provide on-site technical assistance for NR 135 sites. (OBJ A5)**

Forestry

20. Coordinate and cooperate with DNR foresters to address soil and water issues through Forest Stewardship Management plans for the Managed Forest Law program. (OBJ A6)

21. Encourage farmers to plant trees, manage marginal pastures using forest management best management practices and participate in forest management programs. (OBJ A6)

22. Provide technical assistance to public and private land managers to implement forestry best management practices for water quality. (OBJ A6)

- 23. Assist with county, state, private industrial and forest cooperative owner's forest management plans to encourage implementation of recommendations from Phase II & III Comparative Analysis Project in the Lake Superior Basin. The main recommendation is conversion of open (grassland, wetland, young forest) to mature conifer forest. This may be implemented through CREP, Stewardship for Buffers Program, and NAWCA, among other programs. (OBJ A7)**

- 24. Seek funding in addition to the sources listed above to support mature conifer forest land cover. (OBJ A7)**

SURFACE WATER EDUCATION STRATEGY

Audiences

Elected officials
General public
Douglas County Association of Lakes and Streams
Individual lake associations
Agricultural community
Shoreland property owners
Prospective property owners
Realtors
Resource managers
Recreational users (ATV, jet ski)

Messages

Technical assistance is available for shoreland restoration
Buffers provide increased protection from runoff and nutrients, and help slow the flow of runoff water
Explain values of natural shorelands
Responsibilities of shoreland property owners
Failing septic systems impact surface water. Explain appropriate maintenance for septic systems.
What is stormwater runoff – it’s an urban & rural problem
“Slow the flow” - red clay soils and transition areas are susceptible to runoff
Manage open landscape (plant conifers) for watershed health
Promote use of Best Management Practices (BMPs) (shoreland, agriculture, forestry and construction site erosion control)
Encourage agricultural producers to implement agricultural performance standards
Conservation easements can be used to protect surface water
Promote local, state, and federal incentive programs
Buffers between agricultural activities and streams and lakes protect water quality.
Pesticides and herbicides impact surface water, but their impacts can be minimized.
Stream crossing and remote watering BMPs protect surface water.
Expand knowledge and involvement in ongoing watershed projects
Lessons/information from the Nemadji River Project
Promote DNR self help monitoring

Education Activities

Conduct workshops on the following topics:

Shoreland restoration and lawn care

Forest BMP workshops for private landowners (with field tours) (OBJ A7)

Roadside erosion control: culvert replacement and effects on stream habitat improvement

Comparative Analysis Project (for resource managers, planners, government officials)

Rural landownership in Douglas County

Newsletter articles, press releases

Provide information in the form of brochures and handouts at local zoning, UW Extension, and register of deeds offices

Develop presentations for outreach to agricultural landowners

Develop directory of regulatory, technical and financial assistance experts, and water quality links for website

Conduct an annual orientation for local officials about zoning and land conservation programs

Develop packets of information for agricultural landowners and distribute at agriculturally-focused events.

Goal 2. Protect and understand groundwater quality to supply clean water for drinking and recharging surface waters and wetlands.

Objectives

- A. A baseline inventory of drinking water quality is available in Douglas County.
- B. Potential impacts to groundwater are minimized (road salt, herbicides, etc.).
- C. Private wells are properly sealed and closed when not in use.
- D. Manure storage systems follow standards to protect groundwater.

Activities

- 1. **Develop and implement a home well sampling program - at a minimum test for nitrates and bacteria. Record the results in a data base and map in a GIS. (OBJ A)**
- 2. **Provide cost sharing and technical assistance for well closures. (OBJ C)**
- 3. Provide technical assistance in the planning, design, and construction or closure of manure storage facilities. (OBJ D)

GROUNDWATER EDUCATION STRATEGY

Audiences

General public
School students/teachers
Realtors
Elected officials

Messages

Groundwater quality is directly related to land use
Where does your drinking water come from?
Drinking water quality and effects land-use can have
Maintain and improve groundwater in Douglas County
It is easy and cost-effective to protect groundwater quality
Technical assistance and cost sharing is available for proper well abandonment
BMPs for hobby farms

Educational Activities

Newsletter articles, press releases and direct mail
Utilize groundwater models during presentations
Provide information packets to realtors regarding well closure
Coordinate with DCALS to distribute informational packets to lake and stream property owners

Goal 3. Prevent the introduction and spread of aquatic and terrestrial invasive species to protect aquatic habitat and resource values.

- 1. Distribute information regarding identification, threats, and appropriate actions to prevent introduction and spread of terrestrial invasive species such as the Emerald Ash Borer.**
- 2. Utilize native species in cost share practices and technical assistance recommendations whenever feasible. Prohibit the use of invasive species in cost share installations.**

Activities regarding aquatic invasive species are covered in detail in the Douglas County Aquatic Plant Management Strategic Plan.

Additional required activities assigned to the Land Conservation Department

- 1. Mitigate the impacts of wildlife damage to crops by implementing the Wildlife Damage Program.**
- 2. Administer the Environmental Reserve Project Fund Allocation.**

Land and Water Management Plan Implementation

1. Use the LWMP implementation chart to report progress toward meeting plan goals to the LCC, the Douglas County Board, DATCP, and potential grantors.
2. Identify and seek the resources needed to implement the LWRM plan. These resources may be in the form of grant support, DATCP funding, county funding, and partnerships.
3. Encourage citizen participation in LWMP activities through newsletter articles, web site, and other outreach tools.

Role of County in Plan Implementation

The Land Conservation Committee is responsible for oversight of the land and water resource management plan. Land and Water Conservation Department staff is responsible for implementation of the plan, based on annual review and prioritization by the LCC. The work plan identifies activities, hours, and funding for the LWCD only.

Role of other Agencies and Institutions in Plan Implementation

A list of potential partners for implementation of the Land and Water Management Plan are included on the following page. Other county departments are encouraged to work together with the LWCD as the department implements plan activities. Other agencies and organizations are also encouraged to use the plan when performing resource management activities in Douglas County. Partnerships will be actively sought by the LWCD and LCC.

The Department of Agriculture, Trade and Consumer Protection (DATCP) has oversight authority for the land and water resource management plans. DATCP also provides funding for implementation of the plan based on annual grant applications from counties.

The Department of Natural Resources, USDA-NRCS, USDA-FSA, and other agencies will play a critical role in plan implementation. Although few DNR staff are located in the area, the nature of many of the planned activities require collaborative relationships between DNR and county staff. Funding for projects identified in the plan may also be needed from existing or emerging programs.

Examples include the following activities:

- Implementation of the agricultural and non-agricultural performance standards
- Permitting for stabilization of lake and river frontage
- Permitting for town road crossings, other stabilization methods (USGS research)
- Access Management Plan for County Forestland
- Assistance/training with Conservation Reserve Enhancement Program
- Funding for Lake/River Planning and Protection
- Funding for cooperative projects with Carlton County Soil and Water Conservation District
- Funding for research to be conducted on new stabilization methods or geomorphic assessments proposed as part of an overall watershed study

List of LWMP Partners

CITY	City of Superior
DATCP	Wisconsin Department of Agriculture, Trade, & Consumer Protection
DCALS	Douglas County Association of Lakes & Streams
DCB	Douglas County Board of Commissioners
DCFD	Douglas County Forestry Department
DCFGL	Douglas County Fish & Game League
DCHD	Douglas County Highway Department
DCLCC	Douglas County Land Conservation Committee
DCUWEX	Douglas County University of Wisconsin Extension Department
DCZD	Douglas County Zoning Department
DNR	Wisconsin Department of Natural Resources
FOTBS	Friends of the Bird Sanctuary
FOTSCH	Friends of the St. Croix Headwaters
FSA	Farm Service Agency
GLC	Great Lakes Commission
LFC	Lake Superior Living Forest Cooperative
LSBP	Lake Superior Binational Program
LSRI	Lake Superior Research Institute
NOAA	National Oceanic & Atmospheric Agency
NRCS	Natural Resources Conservation Service
NWC	Northwoods Weed Cooperative
Pri-Ru-Ta	Pri-Ru-Ta Resource Conservation & Development
SLRA	St. Louis River Alliance (formerly SLRCAC, St. Louis River Citizens Action Committee)
T&V	Douglas County Towns and Villages
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
UWEX	University of Wisconsin Extension
UWS	University of Wisconsin Superior
WCMP	Wisconsin Coastal Management Program
WLWCA	Wisconsin Land & Water Conservation Association
WSG	Wisconsin Sea Grant
WWA	Wisconsin Wetlands Association
WWLT	West Wisconsin Land Trust

Monitoring and Assessment

Monitoring and assessment are important to assess the progress toward meeting plan goals and objectives. Without data and information, departments cannot characterize the condition of the environment, assess and solve problems, or evaluate the effectiveness of management and regulatory actions. The Clean Water Act and state of Wisconsin law and associated rules mandate monitoring of surface waters. The collection and dissemination of information is also essential in educating and increasing public awareness of the environment and environmental issues.

Wisconsin Department of Natural Resources monitoring programs are implemented to achieve a comprehensive understanding of the state of Wisconsin's surface waters. These types include ambient or baseline monitoring, special project monitoring, long-term trend monitoring, and total maximum daily load monitoring. The DNR assembled a monitoring strategy that describes the need for various chemical, physical, habitat, and biological monitoring data. This strategy placed special emphasis on the WDNR's use of the USEPA STORET system.

Douglas County has relatively little data collected for its surface and groundwater. Recommendations related to the availability of baseline data from which to recognize problems as they develop include the following:

1. DNR recommendations from the Water Quality Management Plans for Upper St. Croix and Lake Superior Basins (identified in Appendix A) should be followed. Additional resources should be invested in these efforts by the agency.
2. DNR and Douglas County should continue to support lake and river groups in their efforts to pursue water quality management projects.
3. DNR and Douglas County should initiate a joint coordinated monitoring program (surface water and groundwater) to begin building baseline information where it is needed.
4. DNR and Douglas County LWCD should continue to encourage and support Self-Help lake monitoring.
5. DNR and Douglas County LWCD should involve school groups in monitoring program efforts to the extent practicable to promote public understanding.

Activities which emphasize monitoring are highlighted in the Work Plan tables on following pages.

Ongoing Monitoring

The following is a partial list of known monitoring programs in Douglas County:

Resource	Program	Agency/group
Groundwater	Drinking Water Testing	UWEX, DNR, Zoning
Lakes	Self-Help Lake Monitoring	Lake Volunteers, DNR
Lakes	Purple Loosestrife Monitoring	Lake Volunteers, DNR
Lakes	Zebra Mussel Monitoring	Lake Volunteers, DNR, UWS
Lakes	Clean Boats, Clean Waters	Lake Volunteers, UWEX
Lakes/Streams	Lake Planning & River Grants	DNR, Lake/River Groups
Lakes/Streams	Chemical Measurements	DNR
Lakes/Streams	Biological Assessments	DNR
Lake Superior	Great Lakes Beach Testing	UWS, MN Sea Grant, Health Dept
Streams	Habitat Assessments	DNR
Wildlife	Loon Watch	Lake Volunteers, SOEI
Wildlife	Walleye Watch	Lake Volunteers

Citizen Monitoring

The following table shows existing citizen monitoring efforts in Douglas County. Volunteer citizen monitoring is encouraged to evaluate progress toward water quality goals. These efforts build awareness and appreciation for the quality of Douglas County's resources in the resident and non-resident public.

The DNR Self-Help Lakes Monitoring Program and other programs are encouraged and used as tools to raise environmental awareness while monitoring lake and habitat quality to establish baseline information. Several lake groups throughout the county take part in additional citizen monitoring projects. These projects include exotic species monitoring for Eurasian water milfoil, purple loosestrife and zebra mussels.

Douglas County Citizen WDNR Self-Help Monitoring Program	
LAKE NAME	YEAR STARTED
Amnicon Lake	1973
Bond Lake	1991
Coffee Lake	2007
Crystal Lake	1986
Cranberry Lake	2007
Crystal Lake	1999
Dowling Lake	1976
Gander Lake	2007
Lake Minnesuing	1972
Minong Flowage	2009
Person Lake	1999
Red Lake	1993
St. Croix Flowage	1993
Upper St. Croix Lake	1995
Whitefish Lake	1989

Results from these programs will be used as feasible to monitor progress toward improving surface water quality and to help determine if land and water conservation efforts are successful. These and other signs of success will be reported in the annual plan accomplishment report.

LWCD Work Plan for Implementation in 2010-2011

Table 6: Goal 1. Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions and recreational and scenic values.⁶					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools (Annual Benchmarks)
Wetland Activities					
A and C	1. Support preservation of priority wetlands	DATCP DCFD DCHD DNR FOTSCH NRCS USACE WWA WWLT	40	\$100	Wetlands preserved (1)
A	2. Provide suggestions to mitigate impacts to wetlands	DCFD DCHD DCZD DNR DCB	20	\$100	As requested
C	3. Provide technical assistance and cost sharing for wetland restoration	DATCP DNR NRCS USACE USFWS	80	\$200	As requested
Lake and Stream Activities					
A, B, C	1. Consider and support recommended actions in partner plans	ALL PARTNER S	20	-	-

⁶ Priority activities are shown in bold.

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 6: Goal 1. Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions and recreational and scenic values.⁶

Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools (Annual Benchmarks)
B	2. Identify and support water quality monitoring <i>MONITORING</i>	DCALS DNR SLRA LSRI UWS LSRI	50	\$375	Water quality monitoring projects supported (1)
OBJ B and C	3a. Identify and prioritize focus areas for watershed plans	DNR DCALS DCFGL FOTSCH LSRI NRCS USFWS UWS	75	\$100	Identify top three priority areas and choose one with partner input
OBJ B and C	3b. Identify partners and funding sources for watershed plan	DNR EPA GLC NOAA USFWS WCMP	15	\$100	List of partners created (1) Funding established for initial studies (\$ as need is identified)
OBJ B and C	3c. Identify studies needed, develop methodologies and gather study information <i>MONITORING</i>	DNR NRCS LSRI USFWS UWS	150	\$25,000	Studies identified (1) Methodologies established (1) Inventories/studies completed (1)
OBJ B and C	4. Participate in listing of water bodies	DNR DCALS DCFGL FOTSCH	10	\$100	List of recommended waterbodies created (1)

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LWCD Work Plan for Implementation in 2010-2011

Table 6: Goal 1. Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions and recreational and scenic values.⁶					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools (Annual Benchmarks)
OBJ C	5. Interpret, evaluate, and distribute water quality information	DNR DCALS DCUWEX DCZD FOTSCH UWEX	30	\$250	As needed
Residential Shorelands					
OBJ A1	6. Review or develop site plans for land use permits	DCZD DNR	100	\$400	Plans reviewed as requested Method for site plan development established (1)
OBJ A1	7. Plan, design and cost share BMPs	DATCP DNR	100	\$35,000	Prioritized BMPS installed as requested
OBJ A1	8. Review or develop site plans for zoning violations	DCZD DNR	30	\$400	Plans reviewed as requested Site plans developed (10)
OBJ A1	9. Inspect previously installed BMPs	DCZD DNR	200	\$3,000	Inspect 30% of BMPs installed from 2004-2009 (contingent on ability to obtain funding for intern)
Public Land					
OBJ A2	10. Erosion control assistance for public land	DCHD T&V DCFD	75	\$125	As requested
OBJ A2	11a. Culvert inventory	DCHD T&V FOTSCH DCFGL WCMP	250	\$2,250	Complete inventory of 20% of county (contingent on ability to obtain funding for intern and participation by volunteers)

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 6: Goal 1. Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions and recreational and scenic values.⁶					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools (Annual Benchmarks)
OBJ A2	11b. Share culvert inventory information	DCHD DNR DCFGL DCB FOTSCH T&V	15	\$125	Presentations to share culvert information (2)
OBJ A2	12. Provide cost sharing to replace culverts and address erosion concerns	DATCP DNR DCHD DCB USFWS T&V WCMP	75	\$10,000	Culverts installed (10 per year) Critical areas stabilized as requested
Urban Stormwater Runoff					
OBJ A3	13. Assist county departments in meeting stormwater requirements	DCHD DCFD CITY	50	\$125	Designs reviewed as requested Designs prepared as requested
OBJ A3	14. Review stormwater management plans	DCZD DNR	15	\$100	Plans reviewed as requested
Agriculture					
OBJ A4	15a. Provide on-site visits for the NR 151 implementation	DATCP DNR	75	\$200	On site visits (10)
OBJ A4	15b. Design and cost share BMPs	DATCP DNR NRCS	250	\$35,000	BMPs designed (5) BMPs installed (5)
OBJ A4	15c. Complete NR151 compliance reviews	DATCP DNR	30	\$200	Compliance reviews completed (10)
OBJ A4	16. Administer the Farmland Preservation Program	DATCP	30	\$125	Self-reporting forms completed (16)

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 6: Goal 1. Protect and enhance surface waters and wetlands to preserve and restore their water quality, ecological functions and recreational and scenic values.⁶					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools (Annual Benchmarks)
OBJ A4	17. Inspect previously installed BMPs	DATCP NRCS	125	\$200	Inspections completed of 30% of BMPs installed from 2004 – 2009 per year
Non-metallic mining					
OBJ A5	18. Review NR135 reclamation plans	DCZD DNR	60	\$100	Plans reviewed as requested
OBJ A5	19. Provide on-site technical assistance for NR135 plans	DCZD DNR	50	\$125	Site visits completed as requested
Forestry					
OBJ A6	20. Support MFL plans	DNR	8	\$50	Provide assistance as requested
OBJ A6	21. Encourage farm tree planting	DNR UWEX NRCS	10	\$250	Provide newsletter article (1) Provide info to FPP participants Discuss during all farm visits
OBJ A6	22. Provide technical assistance for forestry WQ BMPs	DNR NRCS	80	\$125	Provide assistance as requested
OBJ A7	23. Encourage conifer tree planting (comparative analysis project) in forest plans	DNR LSRI NRCS LFC UWEX	120	\$125,000	Provide plan input as requested; Distribute info to landowners in targeted watershed; Provide cost sharing in targeted watershed to re-forest 500 acres
OBJ A7	24. Seek funding to support conifer tree planting	DNR LSRI NRCS UWEX USFWS	20	\$100	Funding secured (\$)
	TOTAL		2,258	\$214,125	

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 7: Goal 2. Protect and understand groundwater quality to supply clean water for drinking and recharging surface waters and wetlands.					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools (Annual Benchmarks)
OBJ A	1. Develop home well sampling program <i>MONITORING</i>	UWEX DCB DNR DCB UWS	120	\$10,000	Number of wells sampled (100)
OBJ C	2. Provide cost sharing and technical assistance for well closures	DATCP NRCS DCZD	40	\$1,500	Number of wells closed (3)
OBJ D	3. Manure storage system installation or closure	DATCP NRCS	75	\$250	As needed
	TOTAL		235	\$10,175	

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 8: Goal 3. Prevent the introduction and spread of aquatic and terrestrial invasive species to protect aquatic habitat and resource values.					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools
	1. Distribute information regarding ID, threats, and actions to prevent terrestrial IS	UWEX DNR NWC	10	\$500	Brochures distributed (500) Locations of distribution (LWCD, DCZD, DCFD, DCUWEX, CITY)
	2. Utilize native species and not invasives in cost share practices	NRCS DNR DCB	-	-	All BMP installations will use native species
ADDITIONAL ACTIVITIES AND COSTS DETAILED IN AIS STRATEGIC PLAN					
Program to be funded through grant dollars to be identified in Strategic Plan.					

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 9: Implementing Educational Strategies				
Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools
Newsletter articles	DCUWEX UWEX DCALS	10	-	Articles submitted (4)
News releases to local media	DCUWEX UWEX DCALS	10	-	News releases submitted (4)
Workshops a) Shoreland BMPs b) Culvert Inventory	a) CITY DCALS LSRI DNR b) DCHD T&V FOTSCH DNR	a) 50 b) 30	a) \$1,000 b) \$1,000	Workshops completed (2)
Distribute handouts and brochures	All partners	10	\$1,500	Locations for distribution (CITY, DCZD, DCFD, DNR, DCUWEX, NRCS, UWEX)) Direct mail pieces distributed (250)
Presentations for agricultural landowners	NRCS Pri-Ru-Ta FSA UWEX	10	\$250	Presentations completed (1)
Directory of experts and web links	All partners	10	-	Directory completed (date)
Conduct annual orientation of local officials	DCLCC DCB LSRI T&V	24	\$500	Orientation completed (1)
TOTAL		154	\$4,250	

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 10: Additional required LWCD Activities					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools
	1. Administer the Wildlife Damage Program	DNR	0	\$35,000 (Contract costs)	Farmers assisted as requested
	2. Administer the Environmental Reserve Project Fund Allocation	DCLCC DCB	30	\$250	Highest ranking projects supported
	3. Administration of LWCD	DCLCC	830	\$12,500	
	TOTAL		860	\$47,750	

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 11: Land and Water Management Plan Implementation					
Objective	Activity	Partners	Staff Hours Needed (annually)	Additional Costs (Annual \$)	Evaluation Tools
	1. Use the LWMP implementation plan to track and report progress	DCB DCLCC	20		
	2. Identify and seek resources needed for the plan	DATCP DNR DCB DCLCC	40		
	3. Encourage citizen participation in plan activities		20		
	TOTAL		60		

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.

LWCD Work Plan for Implementation in 2010-2011

Table 12: Summary of Land and Water and General LWCD Work Plan.

Goal	LWCD Hours Needed (annually)	Funding Needed Annually (not including staff)	Funds Available	Unmet Funding Needs (not including staff)
<i>Wetland and Surface Water</i>	2,258	\$214,125		
<i>Groundwater</i>	235	\$10,175		
<i>Invasive Species</i>	10	\$500		
<i>Education Strategies</i>	154	\$4,250		
<i>Other Priorities and Admin.</i>	860	\$47,750		
<i>LWMP Implementation</i>	60	\$0		
<i>TOTAL</i>	3,577	\$276,800		

Objectives are listed in Volume II along with more detailed description of each action. Hours are estimated for Douglas County Land and Water Conservation Department only. Staff costs are not reported here. They may range from \$10 - \$40 per hour depending upon how needs are met.

A list of partners is found on page 45.