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# 2008 Crow Wing County Comprehensive Local Water Plan

To Protect, Preserve & Improve Water Resources  
in Crow Wing County for 2008 – 2013



Prepared by the Crow Wing Soil and Water Conservation District and the  
Crow Wing County Local Water Plan Advisory Committee

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# 2008 Water Plan Update

Crow Wing County, Minnesota

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# Executive Summary

## Introduction

Water is this Central Minnesota County's lifeblood. Of its 731,000 acres, 14 percent or approximately 102,000 acres are covered by this liquid heritage – scenic lakes, rivers and streams – and an additional 14 percent of the county is covered by wetlands. This great abundance of surface water is what attracts people to Crow Wing County. Crow Wing County is located 100 miles northwest of the Twin Cities Metropolitan Area (Figure 1). Its length, north to south, is 45 miles and its width, east to west, stretches 27 miles. To the north and west, Cass County borders Crow Wing County; to the south and southeast, lies Morrison and Mille Lacs Counties; and to the east is Aitkin County.

What is now a booming tourism industry started with the fur traders and trappers, followed by harvesters of white and red pines. Iron mining has come and gone as well. Crow Wing County's natural resources have been exploited by previous generations and we may be in the process of doing the same thing to our lakes. Population in the county is estimated to increase by 40,000 people by the year 2030 (2004 Crow Wing County Comp Plan); up to a 60 percent increase per state demographics. As population and development increase, it is important to manage our natural resources the best we can to accommodate for this increase, but without degradation of our water quality. Development may be good for the County's economy, but it puts a strain on its natural resources. Currently the County is fortunate to have good ground and surface water quality, and most of the waters in the County are designated as fishable and swimmable. Development, stormwater runoff, and surface and groundwater pollution are all issues that need to be addressed in order to protect the valuable water resources of Crow Wing County. As an increase in population is inevitable, there are steps that we can take to lessen the negative impacts and the overuse of our natural resources. Every generation has its resource challenges and opportunities; we have a great opportunity in this Comprehensive Water Plan to look well into the future and protect our vast water resources as a sustainable resource. This Comprehensive Local Water Plan is in effect during the timeframe of 2008 to 2013.

## County Water Planning History

The Crow Wing County Comprehensive Local Water Plan (CLWP) is a comprehensive analysis of water and related land resources coupled with a recommended series of action strategies designed to achieve maximum water resource use and achieve water management goals. The plan has been developed under the legislative authority and mandate of the Comprehensive Local Water Management Act (Minnesota Statutes, Chapter 110B) and its associated State Rule (MCAR, Chapter 9300).

The first Water Plan (was authorized by resolution of the Crow Wing County Board of Commissioners. A Water Management Plan Task Force, comprised of 12 county residents, was appointed to provide citizen input, help analyze data and assist in plan preparation. The County, together with the Task Force, sponsored a public hearing to gain input relative to management and preservation of the County's water resources. The original Water Plan was adopted in 1990.

In 1997, the CLWP was updated. This update was built upon the framework of the original Plan and added three additional areas of assessment, wellhead protection, wetland prioritization, and storm water management, and it created new goals and objectives. Numerous implementation efforts have taken place in the past several years. (Note: Use a dash, not a hyphen to set apart the 3 areas of assessment.)

The original Water Plan Advisory Board (WPAB) was made up of five members who were appointed by each of the County Commissioners. In 1998, the WPAB was expanded to a 16-member board representing the following sectors of the community: municipalities, business, area planning and zoning, ISTS field, agricultural, resorts, township supervisors, public education, lakeshore owners, forestry, well drillers, the Lakes and Rivers Alliance, County Planning Commission/Board of Adjustment, SWCD Board of Supervisors, an interested citizen from the northern part of the county and an interested citizen from the southern part of the county.

The process to update the CLWP in preparation for the third five-year interval began in the summer of 2001. The 2002 CLWP aimed at promoting better planning and management of our shared natural resources by working in conjunction with neighboring communities and internally with planning county-wide.

The current CLWP update process started in 2006. This is the third update of the original plan that was completed in 1990. The name of the WPAB was changed to the WPAC (Water Plan Advisory Committee). The WPAC is a 16 member committee that currently has nine members. The County Board is reviewing the WPAC structure and may change it in the future.

The goal of this update is to protect Crow Wing County's groundwater and surface water resources by addressing a number of priority concerns in Crow Wing County that the plan will focus on. This update was expected to be completed in 2007, but a two year extension was granted and the plan was completed in 2008.

## Purpose of Local Water Planning

The purpose of Local Water Planning, by statute, is to:

- Identify existing and potential problems and opportunities for the protection, management, and development of water and related land resources; and
- Develop objectives and carry out a plan of action to promote sound hydrologic management of water and related land resources, effective environmental protection and efficient management.

## Evaluation of Past Water Plan Efforts

Water planning in Crow Wing County has been quite successful. The following goals from the 1991-1996 Water Plan were achieved:

- A clearinghouse for monitoring data was established using Data-Ease software;
- Over 32 lakes and rivers were routinely monitored for water level;
- Numerous lakes are involved in the MPCA's Citizen Lake Monitoring Program (CLMP) and Lake Assessment Programs (LAPs);
- The WPAB assisted the City of Baxter in mapping and prioritizing wetlands for planning;
- Bay Lake Township was assisted with mapping of water resources to help them build local capability in planning and managing wise use of water resources;

- Over 2000 acres of forest stewardship plans were written by the Crow Wing Soil and Water Conservation District (SWCD);
- Over 300 private wells were tested for nitrates with help from the Crow Wing County Extension Office, SWCD, and Minnesota Department of Agriculture;
- A pilot project to promote septic system upgrades was conducted on Mission Lake;
- A drained wetland inventory was developed for a majority of the townships in the County. These sites may be used as restoration sites that will assist the implementation of the Wetland Conservation Act (WCA);
- A challenge grant was secured from BWSR in 1994 to assist livestock producers in implementing water protection strategies;
- Water quality on the Crosby-area Mine Pit Lakes was monitored.

As water planning became more established, the list of accomplishments from the original Water Plan grew substantially. There was a period from 1999 to 2000 when the Water Planner position was vacant. Then, the Water Planner position was reclassified from a half-time employee to a three-quarter time employee. It was at about that same time, the WPAB was expanded from a 5-member board to a 16-member board. Subcommittees were established and by-laws were revised.

**Below is a list of the accomplishments from the 1997-2002 CLWP:**

- The WPAB became a member of the Mille Lacs Lake Clean Water Partnership (CWP), where a 3-year position was funded in addition to funding for CWP Phase 1 monitoring and education;
- A wellhead protection plan was created for the City of Brainerd and was designed to be used as a template for other municipalities;
- The shoreland ordinance was modified to prohibit wetland fill within the first (lakeward) ½ of the lake setback;
- The Highway #371 Commercial Corridor Plan was developed, which addresses storm water management;
- Riverwatch was implemented in the Crosby-Ironton, Pequot Lakes, and Brainerd School Districts;
- A feedlot inventory was conducted;
- An erosion inventory was conducted on the Mississippi River, the Whitefish Chain of Lakes, Ross-Twin-Stark Lakes, Platte Lake, and Mille Lacs Lake;
- A GIS database of all the lakes within the County was developed, which provides the following information (when available):
  - Lake Association Contact
  - Water Quality Data (morphometric and chemical)
  - Monitoring Status (CWP, LAP, CLMP, etc.)
  - Sampling Schedule for upcoming years
- Over 3,500 wells were located with a GPS unit to assist the Minnesota Department of Health (MDH) with the County Well Index;
- Additional private wells were sampled for nitrates;
- Septic system inventories were conducted on the following lakes: the Whitefish Chain (16 lakes), North Long Lake, and Portage-Crooked Lake. As a result, 2,682 properties

were inspected and 580 failing systems were identified (22%). The failing systems have been upgraded or are in the process of being upgraded;

- An enforcement officer was hired in 1998 by the Planning & Zoning office;
- An Upland Suitability Model was developed for the Pine River Watershed, which shows areas suitable for development;
- Over 5,000 table tents advertising water quality Best Management Practices (BMPs) were distributed to county restaurants;
- A “Water Day” was held for local 5<sup>th</sup> and 6<sup>th</sup> grade students during which they went to Deep Portage Conservation Reserve, and rotated through different stations where they learned about water resource protection;
- Twelve microscopes were purchased for the Paul Bunyan Nature Learning Center to aid in its water quality education class;
- Over 50 lakes in the County were sampled for trophic status by local youth in cooperation with the County Extension Office;
- Water quality monitoring was conducted on Whisky Creek, which runs through the Northland Arboretum and ultimately into the Mississippi River, was conducted to establish baseline data and document impacts of runoff from adjacent land;
- A shoreline buffer workshop was held by the local SWCD and Water Plan with over 50 people attending;
- The County contracted with the Minnesota Geological Survey (MGS) and Department of Natural Resources (DNR) to develop a Geological Atlas for the County.;
- Bay Lake Township received funding to prevent erosion from a roadway into an adjacent wetland;
- Additional forest stewardship plans were created by the SWCD;
- Over 16 County lake associations have completed lake management plans after participating in the Initiative Foundation’s Healthy Lakes and Rivers Partnership Program.

Due to the workload in the planning and zoning office the County Board delegated administration of the CLWP to the Crow Wing SWCD on February 8, 2005.

Below is a list of the accomplishments from the 2002-2008 CLWP:

- More than ten additional County lake associations participated in the Healthy Lakes and Rivers Partnership program in cooperation with the Initiative Foundation and Cass County.
- The Water Plan assisted with funding to begin an update of the Crow Wing County Soil Survey.
- The County received a three county (Aitkin, Cass, and Crow Wing) BWSR Challenge Grant to assist private landowners with assistance in paying the closing costs and incentives for conservation easements. A total of \$100,000 was received (\$25,000 from an unused Cass County Challenge Grant and \$75,000 directly from BWSR).
- The County partnered with Aitkin and Cass County Water Plans on a \$56,000 BWSR Challenge Grant to determine priority parcels on ten Crow Wing County lakes for conservation easements to be completed.

- The Water Plan sponsored training for golf course maintenance personnel on water quality protection practices.
- Funding was provided for a pervious pavement demonstration site in the USDA office parking lot.
- The County received a Minnesota Waters grant to assist 12 lake associations with water quality monitoring to meet assessment goals of the MPCA..
- A volunteer water quality monitoring training workshop was held in cooperation with Minnesota Waters to train volunteers on sampling techniques. Thirty-one people from 18 lake associations attended the training.
- The Water Plan sponsored and helped fund lakescaping and rain garden demonstration sites on Shirt Lake.
- Helped fund the Nokasippi Watershed Group's public hearings regarding plan development.
- Funding was provided for a Serpent Lake rain garden demonstration site.
- Worked with the Outdoor Corps to provide water quality monitoring services to lakes that had not been previously monitored.
- Assisted in establishing a County Ordinance prohibiting the use of Phosphorus fertilizer by providing funding towards advertising.
- Helped the Crow Wing County Planning and Zoning Office to fund an enforcement intern to work on enforcement of shoreland violations.
- Helped fund septic system surveys on Lower, Middle, and Upper Cullen Lakes, South Long Lake, and Round Lake.
- Helped fund a demonstration rain garden at Arboretum.
- Provided funding for the Crow Wing County Geologic Atlas.
- Assisted with the Brainerd Lakes Area Conservation Collaborative to identify sensitive areas of the county for resource protection.
- Supported the BWSR Envirothon for 9<sup>th</sup>-12<sup>th</sup> Grade students.
- Facilitated incorporation of the Water Plan into the 2004 revision of the Crow Wing County Comprehensive Plan.
- Cooperated with the Minnesota Lakes Association to get elementary teachers to use the Lake Ecology curriculum.
- Provided Planning and Zoning with shoreland Information brochures, that were stapled to shoreland permits.
- Partnered with LARA to sponsor wastewater workshops for 2003 elected and appointed officials.
- Sponsored a shoreline landscaping demonstration on Portage Crooked Lake & Serpent Lake.
- Assisted the City of Pequot Lakes with planning for wellhead protection .
- In cooperation with the Crow Wing SWCD, Region Five, and MN Department of Agriculture, provided low interest loans for ISTS upgrades.
- Provided funding towards the demonstration rain garden at the Crow Wing County Campus.

- Helped fund Mission Lakes Association's water quality monitoring for two years to provide data to the DNR in collaboration with Mission lakes Association's participation in the DNR's pilot program for whole lake treatments of Curly leaf pondweed, an aquatic invasive plant.
- Provided funding towards three shoreline restoration projects on Serpent Lake.
- Provided funding towards a Bio-retention rain garden demonstration project at the old Franklin School site.
- Provided funding towards a Bio-retention Pond in the City of Crosby to help improve Serpent Lake water quality by preventing direct storm water run off from Crosby city streets.
- Helped fund a shoreline restoration project at the Parker Boy Scout Camp on North Long Lake.
- Helped fund a bio-retention pond at the Fairview Office Park.
- Provided funding to the Lakes Area Clean Water Team to help with the costs of establishing a website and to help promote their 1,000 rain garden project.
- Funded water quality monitoring for two years on Rice Lake and Star Lake.
- Two volunteer water quality monitoring training workshops were held to train volunteers on sampling techniques. One session was held to train new monitoring volunteers. The second workshop was a refresher workshop held in cooperation with Minnesota Waters for existing volunteers. A total of 50 volunteers attended the workshops.
- Started putting together a *Crow Wing County Landowner's Guide to Lake Stewardship*. 15,000 copies of the guide will be printed and distributed to landowner's in Crow Wing County.

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# Priority Concerns & Action Steps

Priority concerns, as defined in M.S. 103B.305, subd. 5, means issues, resources, subwatersheds, or demographic areas that are identified as a priority by the plan authority (2005 BWSR Local Water Mgt. Plan Guidance).

The priority concerns for Crow Wing County were selected after the evaluation of public surveys, comments received from local and state agencies, and discussion by the Water Plan Advisory Committee. See the Priority Concerns Scoping Document for more detailed information on the selection process. Below is the list of priority concerns that were selected for Crow Wing County.

## **Goal: Protect surface water and groundwater quality in Crow Wing County**

### **1) Establish and maintain an organized countywide surface water quality monitoring program**

Action 1: Gather all existing surface water data available and organize it into a database maintained and updated annually by the County.

Action 2: Identify minimal data needed to fully assess surface water quality.

Action 3: Identify gaps in existing water quality data, including: 1) incomplete assessment and 2) unassessed or unmonitored lakes in Crow Wing County over 100 acres.

Action 4: Obtain missing data by working with lake associations, property owners, volunteers, student groups, etc.

Action 5: Implement a schedule to update water quality data on fully assessed lakes.

Action 6: Monitor trends in the trophic status of county lakes assist when significant degradation trends are noted.

Action 7: Based on water quality data, identify priority lakes that need protection strategies.

Action 8: Submit all data to the MPCA Storet Database.

Action 9: Complete the Enhanced Portion of the CLWP.

### **2) Address Stormwater Runoff to Minimize Impacts to Water**

Action 1: Educate riparian and non-riparian property owners on stormwater issues and support best management practices (BMPS) to prevent/correct stormwater runoff and erosion. (e.g. raingardens, shoreland revegetation, vegetative swales, etc.)

Action 2: Encourage LGUs to require stormwater management plans for all riparian development and redevelopment before issuing permits.

Action 3: Encourage LGUs to require shoreland mitigation for all variances on riparian properties.

Action 4: Encourage LGUs to ensure that Phase II Stormwater permits have been obtained, where applicable, before issuing local building permits.

Action 5: Encourage LGUs to monitor and ensure compliance with the best management practices or other requirements of stormwater management plans and pursue appropriate enforcement measures for violations of the permit.

Action 6: Encourage and support innovative stormwater management techniques.

Action 7: Provide education for contractors, developers, realtors, the business community, and local officials on stormwater management.

### **3) Protect Ground Water Quality**

Action 1: Utilize the completed County Geologic Atlas in regulatory planning, ordinance development, and land use decision-making.

- Action 2: Work with community and non-community public water suppliers in the development and implementation of wellhead protection strategies.
- Action 3: Encourage LGUs to consider wellhead protection areas when making land use decisions.
- Action 4: Ensure all unused wells are located and sealed; identify and provide financial incentives to encourage private land owner well sealing.
- Action 5: Offer private well testing for nitrate and arsenic contamination.

**4) Address Wastewater needs throughout the County**

- Action 1: Ensure all Subsurface Sewage Treatment Systems (SSTS) have certificates of compliance as required by Minnesota Statute 7080 and system upgrades are completed when noncompliance is identified.
- Action 2: Ensure that LGUs maintain current records of SSTS compliance that are tied to real estate parcel records.
- Action 3: Support low-interest loans for upgrading non-conforming SSTS.
- Action 4: Educate property owners on SSTS compliance requirements and promote education on proper system maintenance and operation.
- Action 5: Assist small communities (e.g. small towns, rural developments, cluster developments, subdivisions, etc) in identifying wastewater treatment options and identify land for application of septage.

**5) Minimize the adverse effects of development on water quality countywide**

- Action 1: Identify sensitive shorelands countywide using DNR criteria.
- Action 2: Develop new regulatory tools to protect water quality, including the establishment of special protection zones for sensitive shorelands and wetland setbacks.
- Action 3: Ensure consistent application and enforcement of Crow Wing County land use regulations.
- Action 4: Establish a county/state agency shoreland technical evaluation panel (STEP) to advise the Planning Commission and Board of Adjustment on land use decisions that have water quality impacts.
- Action 5: Develop surface water quality protection strategies for lakes in Crow Wing County.
- Action 6: Implement surface water quality protection strategies.
- Action 7: Encourage the use of land conservation options (e.g. conservation easements, protection of undeveloped shoreland, land acquisition, etc.).
- Action 8: Enforce the Wetland Conservation Act.
- Action 9: Encourage and support forest management plans that protect the integrity of private, public, and corporate forest land.
- Action 10: Support public/private partnerships with lake associations and other groups to protect water quality.

**6) Coordinate the development and implementation of educational programs on water quality protection**

- Action 1: Support youth education on water quality protection.
- Action 2: Develop and/or distribute materials on shoreland best management practices.
- Action 3: Utilize the mass media to educate the public on water quality protection.
- Action 4: Support workshops for targeted audiences on water quality protection strategies.

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# Assessment of Priority Concerns

This next section provides a general assessment of each priority concern. It describes what the concern is and why it is a concern in Crow Wing County. Each of these priority concerns will be addressed throughout the County.

## **Priority Concern 1: Establish and maintain an organized countywide surface water quality monitoring program.**

Crow Wing County contains 416 lakes which are a valuable resource to the County and its residents socially, recreationally, and economically. It is the extraordinary water quality of a large number of these lakes that has created the tourism attraction and the desire to live in this area, feeding the local economy. Tourism is a \$150 million industry in Crow Wing County, with every dollar spent circulating throughout the communities many times over. In addition, shoreland property taxes comprise over 75 percent of the tax base of Crow Wing County. In terms of current surface water quality, Crow Wing County is fortunate to be faced with protecting water quality instead of restoring impaired waters. However, with continued development pressures, that scenario could change. By monitoring water quality, information will be obtained to protect the high quality resources of the County and identify potential threats before they cause impairment.

### **Lake Classifications and Size**

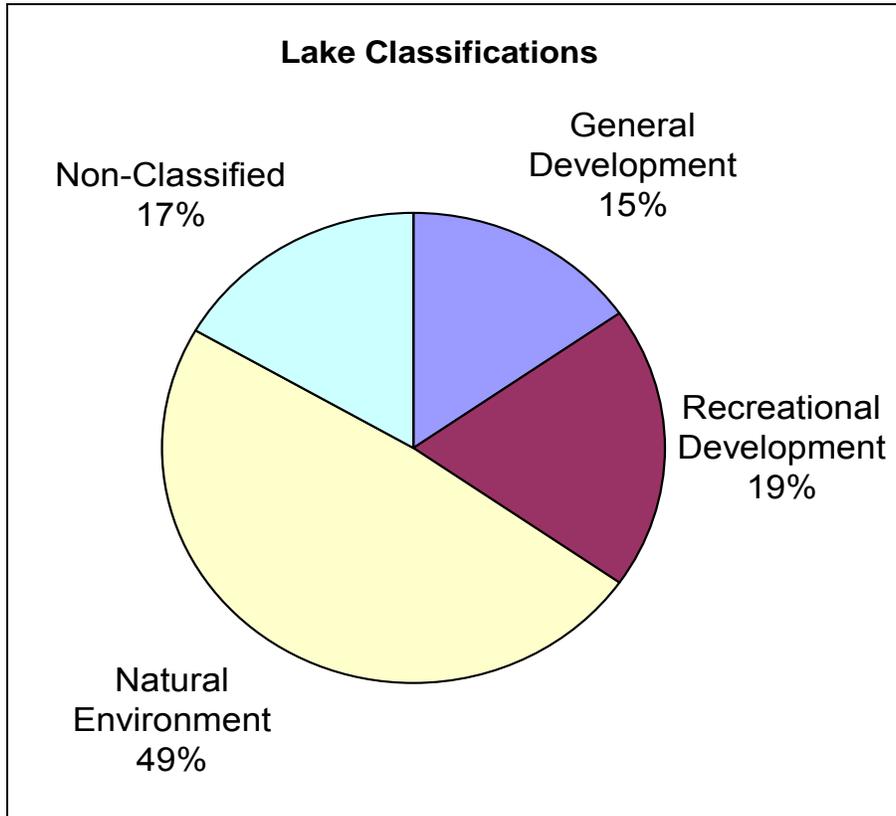
Lakes in Crow Wing County are organized into three different development classifications or they are considered non-classified.

**Table 1. Number of Lakes in each Classification**

Classification	Number of Lakes
General Development	64
Recreational Development	81
Natural Environment	202
Non-Classified	69

Source: Crow Wing County 2006 Zoning Ordinance  
[www.co.crow-wing.mn.us/planning\\_zoning/ordinances\\_plans.html](http://www.co.crow-wing.mn.us/planning_zoning/ordinances_plans.html)

**Graph 1. Percentage of Crow Wing County's Lakes by Category**



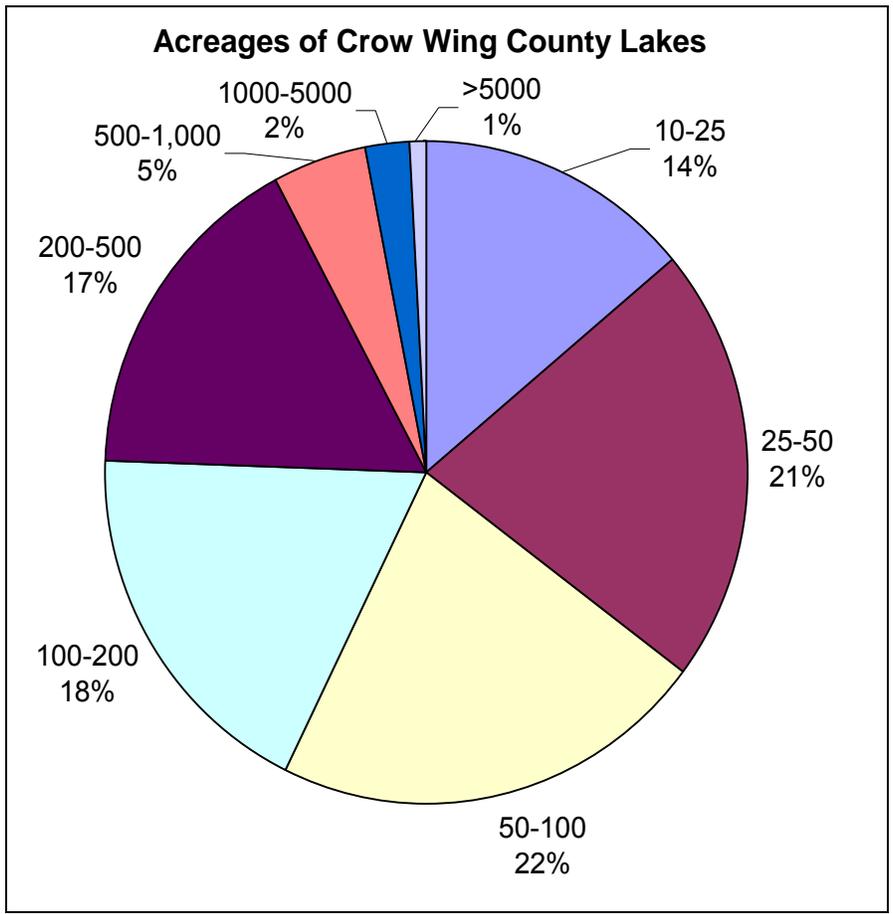
Source: Crow Wing SWCD 2007

**Table 2. Number of Lakes by Lake Size (Acres) in Crow Wing County**  
(does not include lakes located in more than one county)

Lake Size (Acres)	Number of Lakes
10-25	58
25-50	89
50-100	91
100-200	76
200-500	70
500-1,000	19
1,000-5,000	10
Greater than 5,000	3

Source: MN Conservation Dept. 1968. "An inventory of Minnesota Lakes: Bulletin #25"

**Graph 2. Percentage of Lakes in Each Size Category**



Source: Crow Wing SWCD 2007

## Water Quality Standards and Assessments

Water quality standards are tools that have been developed to help protect Minnesota’s water resources. Beneficial uses are one component of water quality standards and consist of the identification of the uses our water resources provide to people and wildlife.

Surface water assessment monitoring enables state 303(d) and 305(b) assessments, which determines if a water body meets water quality standards. Assessments also provide a better understanding of lakes being monitored. Currently, a lake becomes fully assessed by MPCA standards when ten consecutive samples are taken of Total Phosphorus, chlorophyll a, and Secchi disk readings in the last ten years. The MPCA is in the process of changing the assessment rules so that a lake will become fully assessed when eight consecutive samples are taken over a two year period in the last ten years.

Only about 15 percent of Minnesota’s lakes and 10 percent of Minnesota’s streams are assessed. Of those waters assessed, 40 percent of them are listed for at least one type of impairment. Crow Wing County is fortunate that most of the waters that have been assessed are not impaired. There are still a large number of lakes that have not been assessed and it is not known if the water in them is safe for fishing, swimming, or other designated uses.

**Table 3. Beneficial Uses of Minnesota’s Water Resources**

• Class 1	• Drinking water
• Class 2	• Aquatic life and recreation
• Class 3	• Industrial use and cooling
• Class 4A	• Agricultural use, irrigation
• Class 4B	• Agricultural use, livestock and wildlife watering
• Class 5	• Aesthetics and navigation
• Class 6	• Other uses
• Class 7	• Limited Resource Value Waters

Source: 2008 MPCA [www.pca.state.mn.us/water/standards/index.html](http://www.pca.state.mn.us/water/standards/index.html)

Crow Wing County’s surface waters are protected for multiple uses. Most of the lakes in Crow Wing County are classified as Class 2, but there are a small number of lakes in the County that are classified as Class 1. Both Class 2 and 7 waters are also protected for the classes listed beneath them. See Table 4 for clarification.

**Table 4. Protection for Multiple Uses**

All surface waters are protected for multiple uses:

- Most are Class 2 – protected for aquatic life and recreation
- Some are Class 7 – Limited Resource Value Waters
- Both Class 2 and 7 waters are protected for:
  - Class 3 – industrial uses
  - Class 4 – agricultural uses
  - Class 5-aesthetics and navigation
  - Class 6-other uses
- In addition, some surface waters are also protected for drinking (Class 1)

Source: 2008 MPCA [www.pca.state.mn.us/water/standards/index.html](http://www.pca.state.mn.us/water/standards/index.html)

### **Trophic Status**

Current water quality monitoring on Crow Wing County lakes involves determining their trophic status, which refers to the lake's level of productivity. For example, a lake may have high nutrient levels (eutrophic), moderate nutrients (mesotrophic), or it may be nutrient poor (oligotrophic). The level of nutrients correlates with the lakes ability to sustain aquatic organisms. The most popular lakes in Crow Wing County are primarily mesotrophic or oligotrophic; in other words, they are clean and clear in appearance due to their lack of algal growth.

### **TSI Monitoring**

TSI measurements (or trophic static indexes) are a common and efficient way to assess a lake's trophic status. The lake TSI is determined by monitoring it's levels of chlorophyll a, total phosphorous and clarity (Secchi disk readings). Phosphorus is a critical measurement because it is the nutrient that most commonly limits algal growth. It has been found that one pound of phosphorus can produce up to 500 pounds of algae (Vallentyne, 1974). The abundance of algae is expressed in terms of chlorophyll a. The amount of algae in the water will determine how deep light penetrates and this clarity can be measured by Secchi disk readings. Qualitative and quantitative data of this caliber can help determine water quality sufficiently enough to assign and protect a lake's designated water use, which is typically fishable, swimmable, or drinkable.

There are three primary uses for surface water quality monitoring data.

- The first use is to gather baseline information to determine the current water quality of a lake. With the increase in population and development in the County, it is important to gather good baseline data now and compare it to data collected later to assess changes in water quality. Baseline data can also be used to determine whether surface waters are meeting their designated uses as defined by the Federal Clean Water Act. Most of the waters in the County are designated fishable and swimmable, and it will be important to follow this data over time, to observe any changes in water quality.
- The second use is for condition monitoring. Once baseline data and historical data have been obtained, it can be compared to a less extensive ongoing monitoring regime to assess any changes to a lake that are occurring over time. When followed over time, water quality data can reveal trends in water quality that can be compared to events or lake usage during the same time frame to isolate specific sources of change or impairment. Actions at this level may be required to preserve the existing condition of a lake. Actions may include applying stewardship concepts and basic management tools to prevent degradation.
- The third use is for project/implementation monitoring. If the water quality is deteriorating on a lake after good stewardship and management skills have been applied, restoration may be needed. This may include managing a serious water quality problem such an excessive and frequent algal growth. With increasing development, it is important to evaluate the quality of the lakes to ensure that quality is not diminished as a result of such activities. The main value in gathering this data will be for use in land-use decisions and as justification to conserve and restore Crow Wing County lakes.

### **Assessment and Data Utilization**

In Crow Wing County, 82 lakes were monitored in 2005 by Citizen Lake Monitoring Program (CLMP) volunteers through the MPCA. This was the second highest number of lakes monitored in a county through the CLMP. The CLMP requires Secchi disk readings be taken, but not total phosphorous or chlorophyll a, so not all of these 82 lakes are fully assessed. It shows that there is good public participation and that water quality is important to Crow Wing County's citizens. With the data that is available, it appears that there are approximately 60 to 70 lakes in the County that are fully assessed or are actively monitoring to achieve full assessment. This may not be a true representation of the number of lakes that are sampling, because not all water quality data is recorded into a public database.

There are 32 lakes of 500 acres or more in size in the county that are all classified as either recreational or general development. These 32 lakes make up 50 percent of the surface water in Crow Wing County. It will be important to gather existing data on these lakes and provide assistance by

interpreting the data and using it in watershed models and lake management plans. If data does not exist, it will be important to target these lakes for surface water monitoring programs. The 146 lakes of 100 to 500 acres are mostly classified as recreational development or general development with a few classified as natural environment lakes. There is more work to be done to determine which lakes have been assessed. The County's remaining 238 lakes are less than 100 acres and they are mainly either unclassified or classified as natural environment lakes. These smaller lakes often lack lake associations since they are less populated; this makes it more difficult to get their water monitored. As the demand for lake shore real estate puts more pressure on these smaller lakes, it will be crucial to monitor them since they are some of the County's most sensitive lakes.

Water quality standards are fundamental tools that help protect Minnesota's abundant and valuable surface and ground water resources. "Beneficial uses" are the uses that states decide to make of their water resources. The process of determining beneficial uses is spelled out in the federal rules implementing the Clean Water Act. States then determine what beneficial uses they want to assign to their waters. Seven beneficial uses are defined in Minn. R. 7050.02009 (Minnesota Pollution Control Agency).

### **Lake Associations**

Of the 400 plus lakes in the County, approximately 50 to 75 lakes have active lake associations. Lake associations play a key role in providing the coordination and structure to organize and accomplish the lake management goals on a particular lake. Complete lake assessment can be difficult if a lake association and/or active citizen monitors are not available. Establishing more lake associations will be essential to creating a countywide water quality monitoring program, which, in turn enhances communication between lakeshore owners and County staff. It also facilitates better distribution of education and information on good lake stewardship.

### **Data Storage**

One of the first steps in establishing a countywide water quality monitoring program is to determine which lakes are currently being monitored and those that have already been fully assessed for meeting water quality standards. This is difficult to do in Crow Wing County because there is not a common database for storing all data that has been or is being collected. Water quality data is reported to different places, such as watershed districts, testing laboratories, and to the MPCA. Some lakeshore owners are not even aware that their lakes are being monitored. This may be due to the lack of lake associations, which creates a void in communication. Also, not all lakeshore owners belong to their lake association. The average property owner membership is about 60 percent. Other lakeshore owners know that their lake is being monitored, but they do not know where to find the data. By facilitating the submittal of water quality data to the MPCA's Storet database, it can be found in one place and will be available to the public.

The MPCA is working with the Crow Wing SWCD to develop a database that will store all of the surface water quality data in Crow Wing County. The new database will include past monitoring data from MPCA's Storet and will be updated with future data as it becomes available. The database will be maintained by the Crow Wing SWCD. The new database will easily display TSI levels for each lake, it will be easy to observe if any water quality issues are present or developing. This database will help in that, many times when lakes are monitored, interested members of the public do not receive the results or, more importantly, do not know what they mean. Eventually this database will be made to available to the public.

The purpose of collecting water quality data is to create baseline information and provide an aid in decision making for conservation or restoration of water quality. Collecting and not utilizing the data is a wasted effort. It is the actions taken, as a result of the data that will make a difference in the end.

## **Priority Concern 2: Address and minimize the effects of stormwater runoff**

There is extensive scientific research that shows a direct correlation between the percentage of impervious surface and degradation of ground and surface waters. The cause of this impact is the combination of runoff from construction sites during development and runoff from developed land. The Environmental Protection Agency has determined that the combination of these factors to be the leading causes of impairments to surface waters. With the projected growth of permanent residents and seasonal visitors to Crow Wing County, these impacts, if not mitigated, will have dramatic negative impacts to our surface and ground waters.

### **Urban Stormwater Runoff**

Currently Crow Wing County has approximately 300 sites permitted under the MPCA's National Pollution Discharge Elimination System (NPDES) Construction Stormwater Program. This program only includes construction sites that disturb more than one acre of soil, and it often does not apply to development in shoreland riparian areas, which can deliver nutrients and sediment directly to Crow Wing County's high value surface waters. Each NPDES permitted construction site in Crow Wing county is inspected by a SWCD stormwater inspector. Site inspections of construction sites can ensure erosion control measures have been properly placed and maintained and erosion and sedimentation can greatly be reduced.

Past research has shown several practices to be beneficial in reducing stormwater runoff.

- Conservation development can be an important tool in areas with sensitive resources. High value resource areas are set aside and development credits traded to areas more suitable to development. These areas could include lakeshore, streams, wetlands, parks, and endangered species habitat.
- Stormwater treatment and bio-retention methods such as green roofs, rain gardens, pervious pavement, and cisterns capture water where it falls and utilize it as an asset. Not only does this conserve and protect water resources, but it can have long term economic benefits.
- Properly designed stormwater basins can be an effective, low cost treatment method. These must be properly designed with sediment trapping forebays, safety and vegetation shelves.

If planned properly, permanent stormwater treatment can effectively mitigate the negative effects of runoff on water quality.

The cold climate in Crow Wing County is another factor in dealing with stormwater runoff. During the winter months, the accumulation of water and pollutants build up over an extended period of time. Roads and parking lots are plowed and snow is usually piled into a concentrated area, such as a corner of a parking lot. In the spring, when melt occurs, water and pollutants are quickly released and enter the drainage system carrying salt and other pollutants.

Chlorides from road salt is a special concern because they stay suspended in water for long periods and can flush through traditional stormwater treatment systems. An abundance of "salty water" entering a lake can create temperature barrier that limits a lake's natural turnover and can eventually create hypoxic conditions in the lake.

The use of sand, salts and other deicers on roads is important in creating safe driving conditions, but it also has the potential to increase the amount of phosphates in the stormwater runoff that enters lakes and rivers. Studies have found that sand and deicers other than standard rock salt can contain very high levels of phosphorus, which is the most common limiting nutrient for aquatic plants. When phosphorus enters aquatic ecosystems, it results in increased algae and aquatic vegetation growth. Unchecked algal growth can lead to a number of water quality concerns, including but not limited to fish kills, recreational use limitations, and foul odors and tastes. Most of the roads in Crow Wing County receive sand and small amounts of deicers, road through though some of the more populated areas receive large amounts of sand and deicers during the winter. It will be important to encourage continuing education on the most current BMP's for application of road deicers to minimize the impact to public waters.

A major concern about stormwater runoff is the limited treatment by conventional stormwater utilities. Although the negative impacts of development can cause serious degradation to ground and surface waters, the technology to mitigate these impacts exist. Proper Best Management Practices (BMPs), if implemented, can and do effectively mitigate the impacts of construction stormwater runoff.

### Landowner Runoff

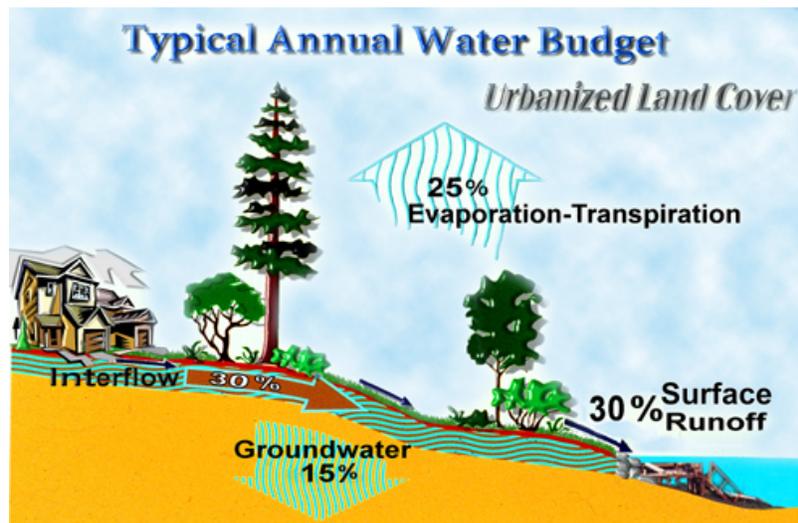
It is also important for private landowners to individually manage their stormwater. Activities such as improper lawn maintenance, animal waste, and disposal of hazardous material produce pollutants that can contribute to beach closures, algal growth in lakes, increased aquatic vegetation, impacts to and fisheries, and the contamination of groundwater. Impervious surfaces such as roofs, sidewalks and driveways, produce runoff which carries sediments and other pollutants to surface waters. Simple practices such as planting trees, creating a rain garden, using a rain barrel, and installing pervious pavement can reduce stormwater runoff by 67 percent (Ramsey-Washington Watershed District).

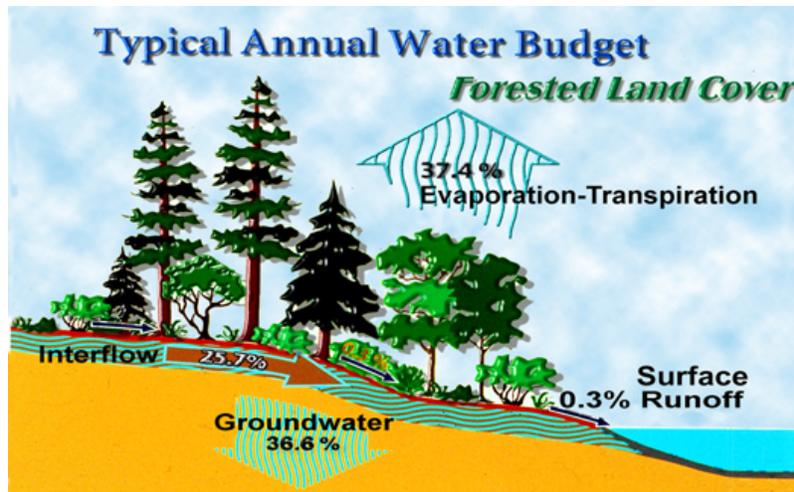
### Agricultural

There are many new technologies and conservation programs designed to manage agricultural runoff. Conservation reserve and environmental quality incentive programs, tillage techniques and buffer strips all help reduce the quantity and amount of contaminants within agricultural runoff

### Shoreline Property

Buffer strips of natural vegetation in the shore impact zone, use of pervious surfaces, and application of phosphorous free fertilizer should continue to be promoted and supported to reduce stormwater runoff from individual properties. Forest Stewardship Plans are a good way to preserve forest habitat and should be made available for smaller parcels of land that commonly line the shores of area lakes. Maintaining lawns down to the waters edge can allow five to ten times the amount of runoff to reach surface waters compared to a forested shoreline or vegetated shoreline. This excess runoff from mowed shorelines can carry seven to nine times more phosphorus into surface waters (Radomski and Schultz, 2005).





Source: Courtesy of University of Wisconsin

It is important that both the public and private sectors are educated on the most current technologies and practices for sediment and erosion control, and treating stormwater runoff. Local government units need to develop ordinances that address stormwater runoff on existing as well as new developments. To be effective, these ordinances must be enforced. It is imperative that Crow Wing County be a leader in this area if we are going to protect our soil and water resources for future generations, especially in light of increasing population growth.

### Priority Concern 3: Protect Ground Water Quality

Most of Crow Wing County's citizens rely on groundwater for drinking water. Groundwater is also important to lake levels, livestock, agriculture and industry. Because of the County's projected population increase, it is important to make sure there will continue to be safe and sustainable drinking water supplies. Crow Wing County is dominated by soils such as sand and gravel, which have fast rates of water infiltration and low cation exchange capabilities. These types of soils are more susceptible to allowing pollutants to enter groundwater. The Minnesota Geological Survey mapped Crow Wing County in 2004 to identify areas with high susceptibility for groundwater pollution. A groundwater study by the MN DNR Waters Division has been completed. The Natural Resources Conservation Service is updating the Crow Wing County Soil Survey. This information can be used to plan development in a way that will protect surface water and groundwater resources. The information will help local government units to identify soils that are suitable for development and areas that are unsuitable.

There are a number of stressors that can affect the quality and quantity of groundwater. These include:

#### 1. Ground Water Uptake

An increase in population and development can increase the rate at which water is withdrawn from the ground. Permits are issued for large scale uses of groundwater when withdrawal levels reach 10,000 gallons per day or 1 million gallons per year. In Crow Wing County the majority of these permits are issued for municipalities with public water supplies and for golf course and crop irrigation (Fig 1) uses. When looking at the average reported pumping of groundwater from 1988-2005, shown in (Fig. 2), most permitted pumping is done by municipalities, followed by major crop irrigation and golf course irrigation. Groundwater drawn from individual private wells is not reported, but it is a very significant use of groundwater. Drawing groundwater through a well can cause an induced recharge of the groundwater from nearby bodies of water. If this phenomenon occurs near polluted surface waters, there is the potential for groundwater contamination. Monitoring water table levels plays an integral part in determining groundwater allocations. If water is withdrawn from the ground faster than the natural recharge rate, the aquifer can empty (Inventory & Assessment of Natural Resources in CWC).

### Crow Wing County DNR Water Appropriation Permits (Ground Water)

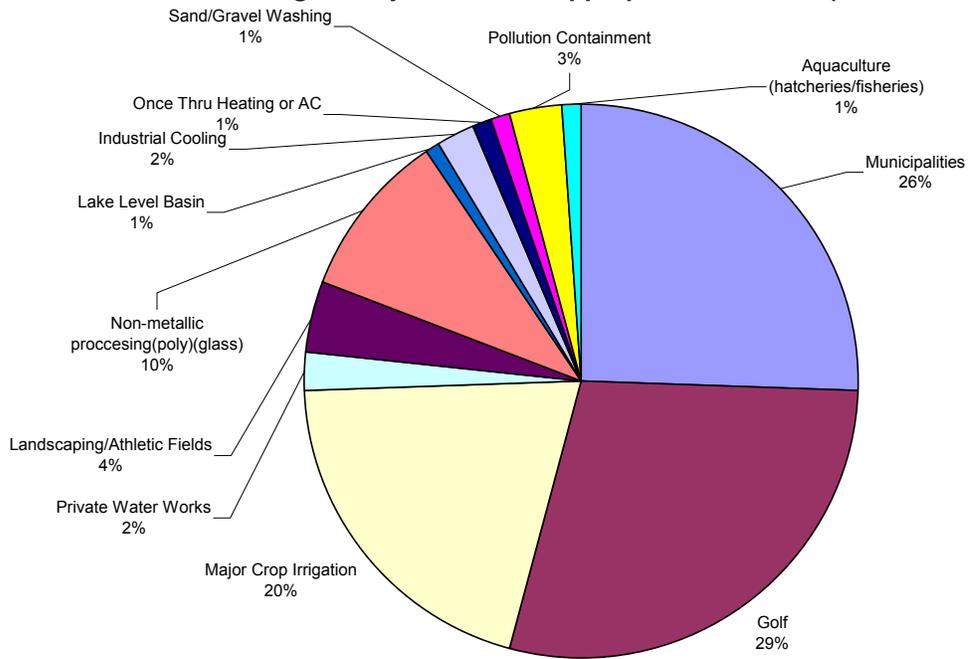
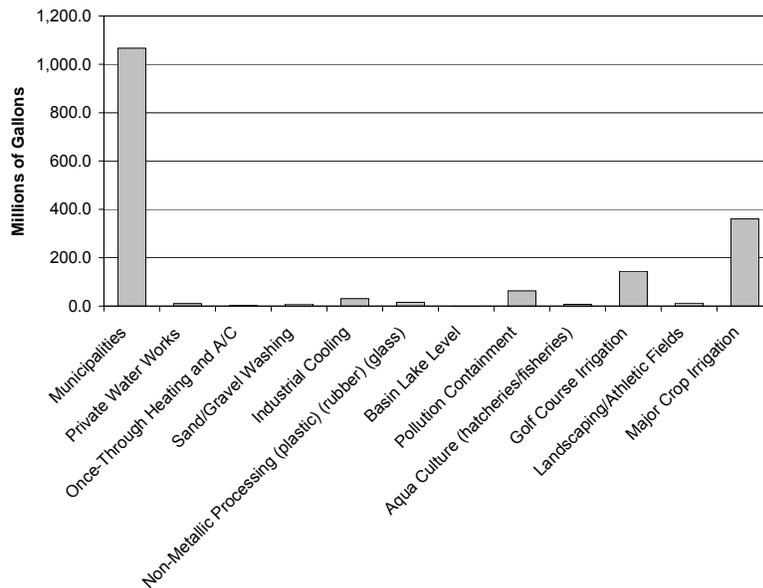


Figure 2.

### Average Reported Pumping in Crow Wing County 1988-2005



## **2. Runoff and Impervious Surfaces**

Runoff from construction and impervious surfaces exposes surface water to increased opportunities for contamination before the runoff is able to reach groundwater. It ultimately can affect the aquifers natural ability to recharge. Impervious surfaces prevent precipitation from being absorbed by the ground where it falls. To manage this stormwater, it is generally diverted to nearby ponds or waterways such as rivers or ditches making it unavailable for recharging aquifers. Urban areas contain high densities of impervious surfaces and have a large demand on groundwater supplies at the same time. The best approach for allowing precipitation to recharge groundwater supplies would be to allow precipitation to percolate into the ground where it falls. This could be accomplished by using BMPs such as pervious pavements and rain gardens. Implementing BMPs would also prevent runoff from picking up contaminants before it has a chance to reach groundwater.

## **3. SSTS**

Subsurface sewer treatment systems (SSTS) that do not function properly pose a major threat to groundwater since they are designed to have wastewater drain down into the soil. In 1998 the MPCA conducted a study of the effects of septic systems on the groundwater quality in Baxter. The study found that pH and concentrations of nitrate, dissolved organic carbon, and total organic carbon were greater in unsewered areas than in sewer areas of Baxter ([www.pca.state.mn.us/water/groundwater/gwmap/septic.pdf](http://www.pca.state.mn.us/water/groundwater/gwmap/septic.pdf)). The hydrological properties of groundwater allow for pollution or contamination from specific sites to affect far greater areas than the geographical area where a pollutant originates.

## **4. Irrigation**

The combined use of fertilizers and irrigation for maintaining golf course landscaping and crop production contributes to the infiltration of groundwater contaminants. The need for irrigation within Crow Wing County stems from the low water retention rate of sandy soils. Since sandy soils also do a poor job of retaining nutrients, irrigation acts as a double-edged sword promoting the leaching of nutrients. In order to grow marketable grass for golf courses and crops for agriculture within the soils that dominate Crow Wing County, nutrients and water must be repeatedly added due to fast infiltration rates.

## **5. Landfills/Dumps/Leaking Underground Storage Tanks**

The presence of landfills, open dumps and leaky underground storage tanks in the County creates the risk of improper use and disposal of hazardous waste. A large majority of Crow Wing County consists of soils that do little to prevent pollution from infiltrating to groundwater. According to maps in the Inventory and Assessment of Natural Resources in Crow Wing County, nearly 75 percent of the landfills and leaking underground storage tanks within the study region as well as around 25 percent of the feedlots are located in areas with a high susceptibility to groundwater pollution. Monitoring should be focused on these areas of overlapping threats to groundwater quality. By using the historical soil survey, MSGS data and the incoming data from the current soil survey, future construction of waste disposal sites and underground storage sites can be directed towards areas of better suitability.

## **6. Abandoned/Broken Wells**

Abandoned or broken off wellheads can act like a big sink drain for surface water runoff, allowing unfiltered and unchecked water to enter an aquifer. For this reason, it is important to cap or permanently seal any abandoned wells. Since wells lead underground, and therefore out of sight and out of mind, it is important to raise public awareness of issues surrounding their potential to contribute to groundwater pollution.

These factors increase the necessity for monitoring wells in areas of high risk to groundwater quality. It is also notable to mention that surface related groundwater pollution is most dangerous for water drawn for human consumption from shallow wells. The high volume of current and expected development in the County can also impact groundwater quality. Since groundwater is not restricted to man-made boundaries, it will be beneficial to monitor groundwater in areas with overlapping threats in order to provide an early indication of contamination before it spreads. Many of the different state and local units of government are and have been monitoring groundwater along with developing wellhead

protection plans. This information can be useful in developing local ordinances and plans to protect and conserve groundwater within Crow Wing County. Potential recommendations could include restricting certain activities and construction in areas with a high risk for pollution.

#### **Priority Concern 4: Address Wastewater needs throughout the County**

With the increase in development and population in the County, the number of SSTs (subsurface sewage treatment systems, or septic systems) is increasing. It is estimated that there are 60,000 septic systems in the County. Compliant SSTs can effectively treat sewage if they are designed and maintained properly, but non-complying SSTs can pose a potential problem for human health and the environment. Of the estimated 60,000 septic systems within Crow Wing County, inspections have shown that for those near lake shore, up to 20 percent of the systems are in non-compliance with County regulations (2004 CWC Comp. Plan). Sewage may contain bacteria, viruses, parasites, chemicals, and many other harmful agents that can cause disease. If an SST is not functioning properly, these agents may be transmitted through groundwater, which is where Crow Wing County's citizens get their drinking water, and may eventually leach into surface waters, where high levels of nutrients can lead to increased algae and aquatic plant growth. With the costly expense of a system upgrade or replacement and the lack of knowledge of the negative effects, many non-conforming SSTs remain in non-compliance. Limited enforcement personnel to do regular SST inspections is another issue of concern in Crow Wing County.

SSTS failure can occur in many ways including:

- Using them past their capacity. As more seasonal and weekend residents are moving to their lake homes full time, SSTs become increasingly burdened. When a SST is overused, there is a potential for its drain field to be overloaded or saturated, causing wastewater to rise to the surface rather than leaching into the ground. Wastewater that makes it to the surface can flow to bodies of water either of its own accord or with other surface water runoff and can pose health hazards.
- SST failure can also stem from over taxation due to leaking water utilities or over watering lawns laid over drain fields.
- Misuse of the drain field (e.g. compacting the soil by driving or parking on the drain field).
- Not pumping septic systems regularly.
- Not enough bacteria in the septic system.
- Improper design

#### **Septage Disposal**

Septage disposal is another issue with SSTs. When septic systems are pumped, the most economical way to dispose of the waste consists of spreading it onto agricultural lands, where it has the potential to reach surface or groundwater. As development encroaches on these areas, there will be less space for septage disposal and an increased demand for public utilities. One option is setting aside land to be used as sites for septage composting and natural degradation. By composting this waste, many of the nutrients, pathogens and chemicals can be retained due to an increased cation exchange capacity and organismal metabolism. Composting septic waste before using it as fertilizer increases the availability of nutrients to crops versus spreading the waste fresh from the tank.

#### **Site Suitability**

Soil types and water table levels play a large role in a SSTs susceptibility to producing or preventing surface or groundwater pollution. Soils with good drainage potential can prevent waste water from rising to the surface, while soils with too little pore space don't allow for adequate leaching. As for water table levels, areas with high water tables have a greater chance of contamination from drain field leachate, whereas deeper water tables receive water that has been more thoroughly filtered and treated by soils. While sandy soils allow for leaching, their limited cation exchange capacity reduces their capacity to retain minerals that can absorb nutrients before reaching groundwater. Within the Inventory and Assessment of Natural Resources in Crow Wing County, maps showing groundwater

contamination susceptibility and soil suitability serve as a good resource for determining SSTS suitability. From a water quality standpoint, areas near bodies of water and those poorly suited for SSTS systems should receive the initial focus in achieving compliance and consideration of SSTS alternatives. Data compiled by the U.S. Geological Survey and the ongoing NRCS soil survey will be valuable resources in determining site suitability for SSTSs.

### **Inspections and Compliance**

The Crow Wing County Sanitary Sewer District is in its beginning stages of development and is currently starting to do SSTS inspections in the townships within the District. The newly formed District feels that properly functioning SSTSs are currently the best way to deal with wastewater. The District will be working to create an inventory of existing septic systems within its area by inspecting pre 1996 SSTSs without current certificates of compliance. Presently the District covers Unorganized territory and the townships of Mission, Center, Pelican, Lake Edwards, and Ideal, and the City of Crosslake. The formation of this pilot project will be a major means of addressing this priority concern.

### **Assistance and Alternatives**

Federal and State programs provide little funding to assist individual home owners and small communities in addressing their wastewater needs. With this in mind, there is a need for innovative ways to make compliant and alternative sewer treatment feasible for people of all socio-economic statuses. Possible solutions include shared wastewater treatment systems, composting systems, municipal utilities, and low interest loans or grants.

### **Education and Awareness**

Education plays a large role in achieving SSTS compliance. Knowledge of SSTS placement, design, maintenance, and use is crucial for raising compliance rates within Crow Wing County. While spreading SSTS knowledge is important, it is equally important to provide insight into their potential threats to both ground and surface water.

## **Priority Concern 5: Minimize the adverse effects of development on water quality countywide**

Marginal lands are lands that are less favorable for development and have important limitations. These lands are sensitive and are at a greater risk for degradation if developed. Marginal lands may include wetlands, vegetation buffers, steep slopes, and shallow lakes with emergent vegetative fringes.

The population of Crow Wing County is increasing, as is the demand for lakeshore property. Larger lakeshore parcels are being divided into smaller parcels to allow more people to buy lakeshore property. There is a risk of increased pollution and degradation in areas that are overdeveloped. One of the main factors in the current and predicted population increase in this area is the desire to live on or near water. Much of the prime lakeshore in the County has already been developed. After the more suitable lands and lakeshore are taken, there is more pressure to develop the land around the small environmental lakes, streams, wetlands, and areas with steep slopes. The smaller lakes are less developed, but they are more sensitive to pollution due to a smaller buffer capacity. Overbuilt shoreline areas can degrade the quality of an entire water body. Surface water is a very important resource to Crow Wing County, and that resource becomes compromised with the side effects of development. There are 202 lakes in the County that are classified as natural environment lakes. The rest are classified as general or recreational development, and about 69 lakes that do not have a classification standard.

### **Land Cover**

It is estimated that 2 percent of the land in the County is already developed. Not only is lakeshore property in danger of being over developed, but the amount of suitable land in the whole County is limited since 14 percent of the County is covered by wetlands, 14 percent is covered by lakes and streams, and another 20 percent is public land.

### **Planning and Zoning**

Development has many negative impacts on our natural resources. When development occurs on marginal lands, these negative impacts are greatly increased. Local government units (LGUs) set standards for lands bordering lakes, streams, and rivers. Local standards must meet or exceed state shoreland standards, and can be tailored to the specific type of land needs. Examples of such standards include requiring the development on shorelines to have a minimum lot size and water frontage, setbacks for buildings and SSTs. This provides an opportunity for LGUs to determine areas that are sensitive to increased development of shorelines and marginal lands and apply specialized ordinances to protect such areas.

When development occurs in sensitive areas it is important to design a more compatible type of development to protect the resources. Cluster-style developments and subdivisions designed to promote conservation of open spaces help to achieve this goal. These are called conservation design. A centralized communal style septic system is easier to achieve with cluster-style developments. Shared wastewater systems are also well suited for areas with soils unsuitable for the pressures of a development where every dwelling has its own SSTs.

### **Function of Marginal Lands**

Wetlands, forests and shoreland vegetation buffers function to keep surface and groundwater clean by trapping sediments and nutrients from entering our water. Wetlands also help to reduce flooding by storing water. Wetlands and vegetation are not only important for water quality, they also provide critical habitat for birds and wildlife. Areas with steep slopes are very susceptible to erosion. There are both onsite and offsite effects of erosion. Onsite erosion may result in the loss of top soil, and vegetation and may reduce property and/or aesthetic value. Negative offsite effects include soil erosion that carries sediments and nutrients into surface waters, which can cause degradation to the water quality and increased water temperatures.

Degradation of our water resources has already occurred as a result of the loss of marginal land. If this loss continues, the degradation will continue. State and local rules were put in place to protect these resources, but these rules must be enforced in order to be effective.

### **Priority Concern 6: Coordinate the development and implementation of educational programs on water quality protection**

Education is a very important part of protecting natural resources. If people do not understand the value and function of resources, they will not understand the need to protect them. Education can increase the awareness of actions and the impact they create (good or bad). There is not enough staff in the County to fully protect our resources, so it is important for the public to be aware of what they can do to help.

The cause and effect of peoples' actions are not often recognized. For example, some landowners do not understand the connection between impervious surfaces and a decline in the water quality on a lake. It is difficult to promote the use of pervious surfaces when the benefits are unknown to many people. Not only is it important to educate people on what the concern is and why there is a concern, but it is also important to provide people with the skills they need to apply what they have learned.

All of the preceding priority concerns listed in this Water Plan have their best chances of being addressed through educating the citizens of Crow Wing County on why these concerns exist. The more people know about why rules and regulations exist and what they protect, the more public cooperation will exist. Everyday more and more people are developing a concern for water resources, but not everyone knows the cause of their concerns or what they can do to contribute to prevention or mitigation of water quality degradation. The initial effort in educating people on protecting water quality will ultimately lead to this knowledge and be passed down to future generations.

Currently, public receptivity to learning more about water conservation is good. Conservation ideologies are becoming mainstream at such an increasing rate that advertisements for consumer goods are even using environmental education in place of a sales pitch. The general public is ever increasingly opening up to new ways to be “green” as well as searching out such ideas. Not everyone is altruistic in their reasoning for wanting to protect water quality. Some of the more common reasons fueling peoples’ desires to protect water quality include recreational activities such as fishing, swimming and boating. Other reasons include aesthetics values, drinking water and protecting property values. With the existence of these and many other motivators to protect water quality comes an increased demand for educational opportunities.

According to The Minnesota Report Card on Environmental Literacy, fewer than half of adults surveyed understand that the leading cause of stream and river pollution is surface water runoff. This survey also showed that Minnesotans are more concerned about water pollution than any other environmental threat. Studies such as these are an excellent resource for determining the direction and curriculum for future programs and activities aimed at educating citizens of Crow Wing County on protecting their surface and groundwater. With Minnesotans’ concern, interest, and sense of responsibility for our water resources, the future and support for educational programs and opportunities is very promising.

# Implementation Plan

## Goal: Protect surface water and groundwater quality in Crow Wing County

<b>Priority Concern 1: Establish and maintain an organized countywide surface water quality monitoring program</b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1	Gather all existing surface water data available and organize it into a database maintained and updated annually by the County.	SWCD, MPCA	2008-2013	\$2,000/year
2	Identify minimal data needed to fully assess surface water quality.	SWCD	2008	\$500
3	Identify gaps in existing water quality data, including: 1) incomplete assessment and 2) unassessed or unmonitored lakes in Crow Wing County over 100 acres.	SWCD, MPCA	2008-2013	\$2,000/year
4	Obtain missing data by working with lake associations, property owners, volunteers, student groups, etc.	SWCD, MPCA	2008-2013	\$1,000/year
5	Implement a schedule to update water quality data on fully assessed lakes.	SWCD, MPCA	2008-2009	\$1,000
6	Monitor trends in the trophic status of county lakes and assist when significant degradation trends are noted.	SWCD, MPCA, Lake Assoc.	2008-2013	\$2,000/year
7	Based on water quality data, identify priority lakes that need protection strategies.	MPCA, SWCD	2008-2013	\$2,500
8	Submit all data to the MPCA Storet Database and also encourage lake associations to do so.	SWCD, Lake Assoc., 30 Lakes, Laboratories	2008-2013	\$2,000/year
9	Complete the Enhanced Portion of the CLWP.	SWCD	2009	\$25,000
<b>Priority Concern 2: Address Stormwater Runoff to Minimize Impacts to Water</b>				
<b>Action</b>		<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1	Educate riparian and non-riparian property owners on stormwater issues and support best management practices (BMPS) to prevent/correct stormwater runoff and erosion. (e.g. raingardens, shoreland revegetation, vegetative swales, etc.)	SWCD, County, MPCA	2008-2013	\$3,000/year
2	Encourage LGUs to require stormwater	County, MPCA,	2008-2013	\$3,000

	management plans for all riparian development and redevelopment before issuing permits.	LGU, SWCD		
3	Encourage LGUs to require shoreland mitigation for all variances on riparian properties.	County, SWCD, LGU	2008-2013	\$1,500
4	Encourage LGUs to ensure that Phase II Stormwater permits have been obtained, where applicable, before issuing local building permits.	County, MPCA, SWCD, LGU	2008-2013	\$2,000/year
5	Encourage LGUs to monitor and ensure compliance with the best management practices or other requirements of stormwater management plans and pursue appropriate enforcement measures for violations of the permit.	County, MPCA, SWCD, LGU	2008-2013	\$2,000/year
6	Encourage and support innovative stormwater management techniques.	County, MPCA, SWCD, LGU	2008-2013	\$1,000/year
7	Provide education for contractors, developers, realtors, the business community, and local officials on stormwater management.	County, MPCA, SWCD, LGU	2008-2013	\$500/year

**Priority Concern 3: Protect Ground Water Quality**

Action		Lead/Supporting Agency	Timeframe	Cost
1	Utilize the completed County Geologic Atlas in regulatory planning, ordinance development, and land use decision-making.	County, SWCD, 30 Lakes	2008-2013	\$3,000/year
2	Work with community and non-community public water suppliers in the development and implementation of wellhead protection strategies.	SWCD, County, MDA, LGU	2008-2013	\$3,000/year
3	Encourage LGUs to consider wellhead protection areas when making land use decisions.	SWCD, County, LGU	2008-2013	\$1,000/year
4	Ensure all unused wells are located and sealed; identify and provide financial incentives to encourage private land owner well sealing.	MDH, SWCD, County, LGU	2008-2013	\$2,000/year
5	Offer private well testing for nitrate and arsenic contamination.	SWCD, MDA	2008-2013	\$500/year

**Priority Concern 4: Address Wastewater needs throughout the County**

Action		Lead/Supporting Agency	Timeframe	Cost
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1	Ensure all Subsurface Sewage Treatment Systems (SSTS) have certificates of compliance as required by Minnesota Statute 7080 and system upgrades are completed when noncompliance is identified.	County, Lake Assoc. or local groups	2008-2013	\$5,000/year
2	Ensure that LGUs maintain current records of SSTS compliance that are tied to real estate parcel records.	County	2008-2013	\$2,000/year
3	Support low-interest loans for upgrading non-conforming SSTS.	Region V, County, SWCD	2008-2013	\$1,000/year
4	Educate property owners on SSTS compliance requirements and promote education on proper system maintenance and operation.	SWCD, U of M Extension, County, MPCA	2008-2013	\$3,000/year
5	Assist small communities (e.g. small towns, rural developments, cluster developments, subdivisions, etc) in identifying wastewater treatment options and identify land for application of septage.	County, SWCD, Region V	2008-2013	\$2,000/year
<b>Priority Concern 5: Minimize the adverse effects of development on water quality countywide</b>				
	<b>Action</b>	<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1	Identify sensitive shorelands countywide using DNR criteria.	County, SWCD, DNR	2008-2013	\$5,000
2	Develop new regulatory tools to protect water quality, including the establishment of special protection zones for sensitive shorelands and wetland setbacks.	SWCD, County	2008-2013	\$5,000
3	Ensure consistent application and enforcement of Crow Wing County land use regulations.	County, SWCD	2008-2013	\$2,000/year
4	Establish a county/state agency shoreland technical evaluation panel (STEP) to advise the Planning Commission and Board of Adjustment on land use decisions that have water quality impacts.	SWCD, County	2010	\$1,000/year
5	Develop surface water quality protection strategies for lakes in Crow Wing County.	SWCD, MPCA	2009	\$1,000/year
6	Implement surface water quality protection strategies.	SWCD, MPCA	2009-2013	\$1,000/year

7	Encourage the use of land conservation options (e.g. conservation easements, protection of undeveloped shoreland, land acquisition, etc.).	SWCD, County	2008-2013	\$2,000/year
8	Enforce the Wetland Conservation Act.	County, SWCD, DNR	2008-2013	\$5,000/year
9	Encourage and support forest management plans that protect the integrity of private, public, and corporate forest land.	SWCD	2008-2013	\$500/year
10	Support public/private partnerships with lake associations and other groups to protect water quality.	SWCD, MPCA, County, Lake Assoc. or local groups	2008-2013	\$3,000/year

**Priority Concern 6:** Coordinate the development and implementation of educational programs on water quality protection

	<b>Action</b>	<b>Lead/Supporting Agency</b>	<b>Timeframe</b>	<b>Cost</b>
1	Support youth education on water quality protection.	SWCD, 30 Lakes, County, DNR, Lake Assoc. or local groups	2008-2013	\$500/year
2	Develop and/or distribute materials on shoreland best management practices.	SWCD, 30 Lakes, County, DNR, Lake Assoc. or local groups	2008-2009	\$15,000
3	Utilize the mass media to educate the public on water quality protection.	SWCD	2008-2013	\$1,000/year
4	Support workshops for targeted audiences on water quality protection strategies.	SWCD, MPCA, DNR	2008-2013	\$1,500/year

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## Ongoing Activities

**Wetland Conservation Act-** The Wetland Conservation Act (WCA) is administered on behalf of Crow Wing County outside of shoreland areas and in all of the municipalities except the cities of Brainerd and Pequot Lakes by the Crow Wing SWCD. The SWCD provides wetland technical assistance to the zoning authorities that administer the WCA.

**Construction Stormwater Program Phase II-** The Crow Wing SWCD was selected as one of ten pilot local governments in the state to help the Minnesota Pollution Control Agency (MPCA) with inspections and educating the public for the Construction Stormwater Program (CSP) Phase II. This partnership started in December 2004. The Crow Wing SWCD assists the MPCA by inspecting all of the projects that have received or are required to obtain CSW permit coverage. Various educational events are provided to contractors and developers to help them comply with the permit conditions. The SWCD also assists the MPCA with enforcement activities. As of June 1, 2008, there were 361 open permits in Crow Wing County with between 200 and 250 of them being active. A total of 413 inspections were completed by Crow Wing SWCD staff in 2007.

**Healthy Lakes and Rivers Partnership-** The SWCD continues to work with the Initiative Foundation and their Healthy Lakes and Rivers Partnership Program. In 2007, 6 County lake associations completed lake management plans and graduated from the program.

**Army Compatible Use Buffer Program-** The viability of military training facilities is compromised by increased development around their borders. This is certainly true for Camp Ripley. Camp Ripley is partnering with BWSR, DNR, The Nature Conservancy, Trust for Public Land, Morrison SWCD, Cass County SWCD, and the Crow Wing SWCD to obtain the development rights from willing landowners within three miles of Camp Ripley's borders. The landowners may sell their property to the DNR, The Nature Conservancy, or the Trust for Public. If they wish to retain their property, they may sell the development rights under an easement to BWSR. The respective SWCDs work with the landowners within their counties on behalf of BWSR. The Crow Wing SWCD has signed two landowners in Crow Wing County to Army Compatible Use Buffer (ACUB) applications. A total of 450 acres would be enrolled if these applications are finalized. The Cass County SWCD also asked the Crow Wing SWCD to work with two landowners in Cass County. These landowners have submitted applications that would restrict development on 524.6 acres. It is hoped that these applications will be completed in 2008.

**Soil Survey Update-** 2007 was the first year that a complete soil survey party completed work in Crow Wing County. Approximately 10% of the documentation was completed, 73,000 acres was mapped, 37,500 acres were digitized, and 5% of the NASIS was completed. This meets the goal that NRCS established.

**Cost-Share-** The State Cost-Share Program is a program that provides grants to Soil and Water Conservation Districts. With these grants, SWCD's provide technical and financial assistance to local landowners/occupiers to help with the cost of conservation practices. This program may provide up to 75% of the total cost of a conservation practice. The Board of Water and Soil Resources has 12 conservation practices that are eligible for this program. The local SWCD's select and assist with projects that are identified as having high priority water quality and erosion problems.

**Rain Gauge Readings-** Through the Minnesota Climatology Office the SWCD works with 15 volunteers throughout Crow Wing County recording precipitation amounts from April through October.

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# Supporting Programs

## Clean Water Legacy Act and Crow County Water Planning

On June 2, 2006 Governor Pawlenty signed the Clean Water Legacy Act (CWLA). It is a very powerful tool for protecting and restoring the lakes, streams, and rivers that are such a valuable resource for Minnesota and Crow Wing County. The CWLA requires states to adopt water quality standards to protect the nation's waters. This law will provide Minnesota with the opportunity to implement the Clean Water Act by focusing on protection and remediation of lakes, rivers and streams. The CWLA was developed to deal with water pollution in Minnesota's lakes but it also has a strong emphasis on protection, which is an important priority for Crow Wing County. Coordinating Crow Wing County water planning with CWLA objectives will increase opportunities for funding activities aimed at protecting surface waters. As the lead agency, the Minnesota Pollution Control Agency will be in charge of forming the Clean Water Council of citizens and government officials to distribute funding. Funding will be distributed to local units of government for implementation of protection and restoration activities.

Crow Wing County is fortunate to be faced with protecting surface waters versus restoring them. Throughout the state, a total of \$24.95 million dollars will be divided between protection and restoration, with protection receiving \$4.13 million and the remaining \$20.83 million going to restoration related activities. Protection is far less costly than restoration, which reflects why more funding has been allocated towards restoration activities.

To further break down the allocation of funding:

- 1) \$2.14 million will go towards monitoring and assessment of surface waters to determine any impairment-causing pollutants listed under 303(d) of the Clean Water Act.
- 2) The remaining \$1.99 million of protection funds will be for protecting waters from nonpoint-source pollution by protecting watersheds within forested regions of the state. Crow Wing County will benefit from this allocation since it lies within the northern lakes and forest eco-region. This is going to be a main priority for Crow Wing County, with the projected increase in population and development.
- 3) The restoration funding will be used for TMDLs, point-source and nonpoint-source restorations. \$3.17 million will go towards implementing Total Maximum Daily Loads, which are used for assessing and restoring impaired waters.
- 4) Point-source restoration and prevention is receiving \$8.41 million for new and improved wastewater treatment facilities and stormwater systems.
- 5) The final and largest amount of funding, \$9.24 million, will go towards the remediation of non point- source pollution within the watersheds of impaired waters with approved TMDLs prior to 2007.

Funding proportions 1, 2, and 4 should prove to be the most likely sources for funding Water Plan related objectives and activities within Crow Wing County. There is also language under subdivision "purposes" of the CWLA account section stating that funds shall be used to support public agencies providing financial assistance for upgrading and replacing individual septic systems. In order to be eligible for receiving funding allocated by the Clean Water Legacy Act, priority concerns, objectives and actions in the 2007 CLWP should match those adopted by the state of Minnesota.

## Healthy Lakes and Rivers Partnerships Program

In 1999, The Initiative Foundation in collaboration with the Crow Wing Lakes and Rivers Alliance, developed a program called the Healthy Lakes and Rivers Partnerships (HLRP). HLRP was

developed to empower local shoreline associations to improve the quality of their lakes and rivers. The HLRP program has assisted shoreline associations by helping them:

- Enhance the leadership skills of association members.
- Provide a forum for shoreline property owners to plan for the future of their watershed.
- Obtain opportunities to network, work cooperatively, learn from one other, and advocate for healthy waters in central Minnesota.
- Create visions, missions, goals, and management plans for their watershed using a template developed by the Healthy Lakes Program and modeled after the State Interagency Lakes Coordinating Committee guide.
- Establish indicators to measure the success of their association's efforts.
- Receive training, technical assistance and support for citizen-based planning and project implementation.

Crow Wing County has had 27 lakes participate in the program. Participants attend two training sessions to learn how to develop a locally shared vision and plan, how to set measurable goals, and how to report on their progress and outcomes. Some common outcomes of the program are:

- Wastewater treatment practices or needs
- Establishment of low interest septic upgrade funds
- Evaluation of alternative community wastewater treatment options
- Fisheries habitat improvements
- Demonstrations on lakeshore landscaping to enhance water quality
- Active involvement in the management of invasive aquatic plants
- Ongoing involvement in local planning and zoning review processes

Below is a list of lakes that have participated in the HLRP program for Crow Wing County.

#### **Crow Wing County**

- Clark Lake, Nisswa, '01
- Crow Wing Lake, Fort Ripley, '99
- Emily Lake, Emily, '04
- Horseshoe Lake, Merrifield, '04
- Hubert Lake, Nisswa, '99 and '05
- Lake Edward, Mission Township, '01
- Little Hubert Lake, Nisswa, '99
- Lower South Long Lake, Brainerd, '99
- Mission Lake, Merrifield, '04
- Mud/Island Lakes, Emily, '01
- Nokasippi Watershed Group, Fort Ripley, '06
- Pelican Lake, Breezy Point, '06
- Perch Lake, Baxter, '05
- Placid Lake, Deerwood, '01
- Platte Lake, Hillman, '01
- Portage Crooked Lake, Deerwood, '99 and '05
- Red Sand Lake, Brainerd, '04
- Rogers Lake, Emily, '01
- Round Lake, Brainerd, '01
- Serpent Lake, Crosby/Deerwood, '99
- Sebie Lake, Fort Ripley, '05
- Shirt Lake, Deerwood, '05
- Sibley Lake, Pequot Lakes, '99
- Upper South Long Lake, Brainerd, '01
- Whipple Lake, Baxter, '99
- White Sand Lake, Baxter, '05

For more information on this program contact the Initiative Foundation at [www.ifound.org](http://www.ifound.org).

Source:[www.ifound.org/environmental\\_train.php](http://www.ifound.org/environmental_train.php).

## **Thirty Lakes Watershed District**

The Crow Wing Soil and Water Conservation District works in cooperation with the Thirty Lakes Watershed District on various projects.

### **Background**

Thirty Lakes Watershed District was established by Order of the Minnesota Water Resources Board on May 18, 1971 in response to two nominating petitions.

The District is located in west central Crow Wing County and covers close to 70 square miles, approximately 60 percent of which is covered by surface water. The District's major watersheds include: Clark, Edward, Gladstone, Horseshoe, Hubert, North Long and Pelican Lakes. The townships of Lake Edward, Center, Pelican and Mission and the cities of Breezy Point and Nisswa lie wholly or partially within the District. Recreation and tourism are the most important industries within the District. The beautiful lakes in the area attract visitors and encourage the construction of seasonal and permanent residences. The population of the District has increased substantially during the past 20 years. From 1980 to 2000 the population has increased 28 percent; however, these U.S. Census totals do not include seasonal residents.

The District recognizes that runoff volume will increase as development in the Watershed District continues. Therefore, the District has adopted a 100-year rain event requirement for all stormwater runoff plans. The District has also concentrated efforts on wastewater management in response to the growth of the District. The District will continue to work with Crow Wing County to manage wastewater in the District and in the Unorganized Area of Crow Wing County.

### **Primary Goal**

The District's primary goal is the protection of the surface and subsurface water within the District's boundaries.

### **Primary Purpose**

The purpose of the Thirty Lakes Watershed District is to conserve natural resources through land use planning, flood control and other conservation projects to protect public health, safety and welfare.

Thirty Lakes Watershed District was formed to preserve lake ecology, prevent or minimize adverse impacts to the District's water resources, and to conserve and make wise use of the District's water resources.

### **Thirty Lakes Watershed District Projects**

Thirty Lakes Watershed District was formed to preserve lake ecology, prevent or minimize adverse impacts to the District's water resources and to conserve and make wise use of the District's water resources. The District works on various projects that reflect the District's commitment to protecting surface and subsurface waters within the District's boundaries. The District also works on Cooperative projects to meet its goal of working with other governmental bodies and residents to solve problems and protect the District's water resources. Water quality and quantity data, mapping data, lake management plans, and sewer projects are some examples of the District's projects. Thirty Lakes currently monitors 52 lakes. Included in those lakes are Lake Edward, North Long Lake, Pelican and Lake Hubert.

Source: *Thirty Lakes Watershed District*. [www.30lakes.org](http://www.30lakes.org)

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## Enhancing Crow Wing County's Comprehensive Local Water Plan

In November 2007, the Minnesota Board of Water and Soil Resources invited selected counties in Minnesota to apply for funding through the Clean Water Legacy Act. The purpose of this funding is to help the state develop protection strategies that will protect the surface water quality of Minnesota's lakes. The counties that were invited are in the process of updating their Comprehensive Local Water Plans. The funding is to help update the water plans and include a Clean Water Legacy enhanced portion in the plan.

Crow Wing County's 416 lakes cover nearly 14 percent of its surface area with water. To protect Crow Wing County's lakes, it is necessary to gain a more thorough understanding of the surrounding influences which both directly and indirectly affect water quality. In order to determine the water quality of these lakes and develop action plans for their preservation, a systematic approach should be used. One way to do this is by breaking Crow Wing County's lakes into different classes based on their size. Of the 14 percent of Crow Wing County land covered in water, over 35 percent of that water is made up of the lakes that are greater than 1000 acres. When including the intra county lakes, these large lakes make up over 50 percent of the County's land covered in water. Despite the fact that lakes over 1000 acres make up half of the County's surface water, they make up only 7 percent of the total number of lakes in the county. These lakes greater than 1000 acre provide an ideal place to start an assessment of surface water because it is a manageable number and they constitute a large portion of County's surface water. These large lakes are some of the most popular lakes in the County for the tourism industry, recreation, and lake home real estate. This popularity puts an increased amount of stress on water quality, native species, and fish and wildlife habitats. To determine the best way to protect these lakes, it is important to gather and assess past and present water quality data and compare that information with the surrounding land use and current management strategies. There is a great amount of information for these lakes, but this information has not been gathered together in a common database.

Aitkin, Cass and Crow Wing counties were invited to apply for this funding and will work together on this project to develop projects/strategies that can be used on other lakes throughout the state and to gain support for future legislative funding to help protect the water before it becomes impaired.

The enhanced portion of the Water Plan Update will include Lake Watershed Assessments on the lakes within the three county area that are larger than 1,000 acres in size; some of these lakes cross county borders.

The project will be administered by Aitkin, Cass and Crow Wing Soil and Water Conservation Districts and the Minnesota Board of Water and Soil Resources. Others that will assist in the project include: lake associations, the Minnesota Pollution Control Agency, the Minnesota Department of Natural Resources, and the Water Plan Advisory Committees from each county.

The Lake Watershed Assessments will include:

1. Surface Water Quality Assessments
2. Watershed/Land Cover Assessments
3. Demographics
4. Recommendations for each lake

**Pilot Lakes Chosen**

The following are lakes over 1,000 acres chose for these assessments. The lakes to be assessed in Crow Wing County are:

Borden 18-0020  
Cross 18-0312  
Edward 18-0305  
Gull 11-0305  
Hubert 18-0375  
North Long 18-0372  
Pelican 18-0308  
Platte 18-0088  
Roosevelt 11-0043  
Round 18-0373  
Serpent 18-0090  
South Long 18-136  
Trout 18-0315  
Whitefish 18-0310  
Bay 18-0034

This project is expected to be complete by June 2009 and will be added to the 2008 CLMP as an amendment.

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# Glossary

## U.S. Government Agencies

ACOE	Army Corps. Of Engineers
EPA	Environmental Protection Agency
NRCS	Natural Resource Conservation Service
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

## State of Minnesota Agencies

BWSR	Board of Water and Soil Resources
DNR	Department of Natural Resources
LCMR	Legislative Commission on Minnesota Resources
LMIC	Land Management Information Center
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MGS	Minnesota Geological Survey
MPCA	Minnesota Pollution Control Agency
MN DOT	Minnesota Department of Transportation

## Local Agencies

30 Lakes	Thirty Lakes Watershed District
GKWMLL	Garrison Kathio West Mille Lacs Lake Sanitary Sewer District
IRRRB	Iron Range Resources & Rehabilitation Board
LARA	Lakes and Rivers Alliance
MHB	Mississippi Headwaters Board

MLA	Minnesota Lakes Association
PRWPF	Pine River Watershed Protection Foundation
SWCD	Soil and Water Conservation District
WPAC	Water Plan Advisory Committee

## Others

BMP	Best Management Practices
CHS	County Health Services
CLMP	Citizen Lakes Monitoring Program
CLWP	Comprehensive Local Water Plan
CSAH	County-State Aid Highway
CRP	Conservation Reserve Program
CWA	Clean Water Act
FIS	Flood Insurance Studies
GPS	Global Positioning System
Ground Water	Water that is underground in aquifers
LAP	Lake Assessment Program
LGU	Local Government Unit
LUST	Leaking Underground Storage Tank
LWT	Land and Water Treatment - Water plan Subcommittee
MDC	Monitoring and Data Collection – Water plan Subcommittee
MG/Y	Million Gallons Per Year
NASIS	National Soil Information System
Non-Point Source	Contamination of a regional or aerial extent resulting from largely undefined sources
NPDES	National Pollutant Discharge Elimination System
OHW	Ordinary High Water Mark
Point-Sources	A source of contamination that is localized and releases potential pollutants from a single definable location

PUD	Planned Unit Development
PWI	Protected Waters Inventory
ORV	Off-Road Vehicle
SCORP	State Comprehensive Outdoor Recreation Plan
STORET	Short for STOrage and RETrieval. The EPA's computerized environmental data system that is used by many agencies, universities, private citizens, and others
SSTS	Subsurface Sewage Treatment System
Surface Water	Water in lakes, rivers, ponds, creeks, etc.
TMDL	Total Maximum Daily Load
TH	Trunk Highway
UST	Underground Storage Tank
Watersheds	An area from which all water drains to a common outlet
Wetland	Area where the soils, vegetation, and hydrology meet the characteristics of a wetland
WCA	Wetland Conservation Act
WHP	Wellhead Protection

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# Appendix

## Priority Concerns Scoping Document

For the Crow Wing County  
Comprehensive Local Water Plan



Crow Wing Soil and Water Conservation District

7118 Clearwater Road  
Baxter, MN 56425

The Crow Wing County Comprehensive Local Water Plan (CLWP) is a comprehensive analysis of water and related land resources coupled with a recommended series of action strategies designed to achieve maximum water resource use and achieve management goals. The plan has been developed under the legislative authority and mandate of the Comprehensive Local Water Management Act (Minnesota Statutes, Chapter 110B) and its associated State Rule (MCAR, Chapter 9300).

The first water plan (1990) was authorized by resolution of the Crow Wing County Board of Commissioners. A Water Management Plan Task Force comprised of 12 county residents was appointed to provide citizen input, help analyze data and assist in plan preparation. The County, together with the Task Force, sponsored a public hearing to gain input relative to management and preservation of the County's water resources. The original water plan was adopted in 1990.

In 1997, the CLWP was updated. This update built upon the framework of the original plan and added three areas of assessment - wellhead protection, wetland prioritization, and storm water management - and created new goals and objectives. Numerous implementation efforts have taken place in the past several years.

The original Water Plan Advisory Board (WPAB) was made up of five members who were appointed by each of the County Commissioners. In 1998, the WPAB was expanded to a 16-member board representing the following sectors of the community: Municipalities, Business, Area Planning and Zoning, ISTS Field, Agricultural, Resorts, Township Supervisors, Public Education, Lakeshore Owners, Forestry, Well Drillers, Lakes and Rivers Coalition, Planning Commission/Board of Adjustment, SWCD Board of Supervisors, an Interested Citizen from the Northern Part of the County and an Interested Citizen from the Southern Part of the County.

The process to update the CLWP in preparation for the third five-year interval began in the summer of 2001 and was adopted December 17, 2002. The 2002 CLWP aimed at promoting better planning and management of our shared natural resources by working in conjunction with neighboring communities and internally with planning county-wide.

The 2007 update began in March 2006. Below is the process that was followed in selecting the priority concerns for the 2007 update. These priority concerns were identified for Crow Wing County after receiving input from various agencies, the Water Plan Advisory Committee (WPAC), and the public.

### **Timeline of Actions**

The Priority Concerns of Crow Wing County were identified through the following process:

March 28, 2006 the Crow Wing County Board of Commissioners signed a resolution to update the Comprehensive Local Water Plan.

May 10, 2006 a survey regarding priority water management concerns was mailed out to the twenty-seven townships and eighteen cities in Crow Wing County. The parties were given 35 days to respond. 23 surveys were returned to our office.

July 19, 2006 a meeting with Dan Steward (BWSR) was held to discuss the update.

August 15, 2006 a written notice was sent to all interested parties informing them of intent to update and requested any water and related land resources plans and official controls. The notice further requested that the party identify any conflict, problem, or opportunity they would like examined in the process. The parties were given 45 days to respond. Notice was sent to all twenty seven townships, eighteen cities, one watershed organization, SWCD's of the 4 surrounding counties, and representatives of the MDA, DNR, EQB, BWSR, MPCA, MDH, and Crow Wing County Planning & Zoning.

October 25, 2006 a special meeting held with the WPAC to discuss the priority concerns.

January 11 and February 8, 2007 Water Plan survey published in the Echo Newspaper  
January 7 and February 4, 2007 Water Plan survey published in the Brainerd Dispatch  
January 10 and February 7, 2007 Water Plan survey published in the Crosby-Ironton Courier

January-February 2007 the Water Plan survey was posted on Crow Wing County's website

The survey was printed in the Crow Wing SWCD's newsletter and sent out in January.

Surveys were due back February 28, 2007. 109 public input surveys were received.

March 5, 2007 WPAC meeting discussed survey and selected priority concerns.

March 19, 2007 met with Dan Steward (BWSR) to discuss the update.

April 4, 2007 WPAC Special meeting to discuss priority concerns actions and assessment.

### **Outcomes**

Written responses were received from the following agencies and surveys were received from the public:

#### **MN Dept. of Agriculture**

**Priority Concern 1:** Manure Management and Individual Sewage Treatment Systems (ISTS)

- Seek additional funding sources to help assist landowners in upgrading ISTS in the County. Continue education and outreach efforts on manure management in the County and involve livestock producers in TMDL and watershed projects, and provide technical and financial assistance for producers to assist them in adopting practices to reduce the impacts from manure runoff.

**Priority Concern 2:** Open lot feedlot runoff

- It is important that Crow Wing County work with livestock producers that have signed up with the Open Lot Agreement by providing technical assistance and information on financial assistance.

#### **MN Dept. of Health**

**Priority Concern 1:** Protect ground water-based drinking water sources within Crow Wing County

- Acknowledgement and support of public water supply wellhead protection areas within the county. *Currently the cities of Brainerd and Pequot Lakes have approved wellhead protection plans and the City of Baxter will initiate planning efforts in the near future.* Work with community and non-community public water suppliers in development and implementation of wellhead protection activities. Consider wellhead protection areas when making land use decisions. When requested by a public water supplier, provide aid in efforts to locate wells for ground water modeling efforts undertaken in wellhead protection.

**Priority Concern 2:** Sealing unused, unsealed wells

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

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

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

#### **Board of Soil and Water Resources**

**Priority Concern 1:** Protection of Water Quality During and After Land Development in Riparian Areas.

- County leadership on lake water quality protection issues. Consistent application and enforcement of Crow Wing County shoreland rules. Continue work to develop new and voluntary and regulatory tools to protect water quality. Continue strong administration of the Wetland Conservation Act. Shoreland revegetation, develop strong working relationships between the county and lake associations through the water plan, track impervious by lake watershed, map portions of lakes that need special protection, work with the North Central Lakes project to establish a county/agency lakes technical team, protect sensitive sites with conservation easements.

**Priority Concern 2:** Erosion and Sediment Control on Developing Areas throughout Crow Wing County.

- Vigilant inspection of sites where disturbance is occurring. Continue to participate in the MPCA pilot stormwater permitting project, continue to trail realtor, developers, contractors, and local officials to the need for stormwater management.

**Priority Concern 3:** Forest Land Conversion and Water Quality Impacts.

- A comprehensive forest land protection plan. The water plan could set the stage for such a plan. Work with agencies and non-profits to protect forestland. Provide private landowners with technical information to encourage retention of forestland.

### **MPCA**

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

- Identify the priority of the County places on addressing impaired waters, and how the county plans to participate in the development of TMDL pollutant allocations or implementation of TMDLs for impaired waters. Include maps of impaired waters. Address the commitment of the County to submit any data it collects to MPCA for use in identifying impaired waters and data entry into the U.S. Environmental Protection Agency's STORET data base. Provide plans for monitoring as yet unmonitored waters for a more comprehensive assessment of waters in the County. Describe actions and timing the County intends to take to reduce the pollutants causing the impairments.

**Priority Concern 2:** Feedlots

- Targeted compliance and continued education and training for producers. Technical assistance might include runoff diversions, buffer strips, re-design of appropriate water access. Education and assistance in enrolling landowners in cost shared programs is also an important tool. Developing a stronger collaborative relationship between MPCA staff, NRCS staff and county offices would also be a beneficial next step in improving feedlot management in the County.

**Priority Concern 3:** Sensitive/High Quality Water Bodies Needing Protection

- County should consider a supporting role to further citizen management efforts, develop a prioritization or ranking scheme to identify high need or at risk areas and identify its role in supporting citizen efforts.

### **Minnesota Department of Natural Resources**

Priority Concerns for the Northeast Region of Minnesota

- Water Quality: Non Point Source Pollution, Fisheries Deterioration, Inadequate Construction Site Erosion and Sedimentation Controls, Inadequate Storm Water Management, Septic System Non-Compliance Failures, Under Designed and Inadequate Municipal Sewage Treatment Facilities
- Mining Impacts
- Stream Stability
- Wetlands
- Roads: Management, Access to Remote Parcels
- Water Surface Use
- Loss of Water Retaining Functions on the Landscape
- Water Crossings
- Loss of Terrestrial and Aquatic Habitat in Near Shore Areas
- Cattle Grazing in Riparian/Stream Areas
- Proliferation of Damaging Exotic Species
- Public Ditches

- Inadequate or Non-Existing Public Water Access to Lakes and Rivers

**Thirty Lakes Watershed District**

Asked that the Water Plan include management of a 100 year rain event, which is approximately 5.5 inches of rain in a 24 hour period. Crow Wing County is rich in water resources, and therefore we feel that the entire County be considered a High Priority area for storm water management.

**Timothy Township**

Priority Concern 1: Education is needed

Priority Concern 2: The threat of alien species in our environment and waters.

- Enforcement is needed. Ensuring that boats don't transport weeds from lake to lake-limit population density.

Priority Concern 3: In our township it is the abuse caused by off-road vehicles.

- Ban travel on sensitive areas and stop the trespassing on wetlands.

**Gail Lake Township**

Priority Concern 1: Sewer Systems

Priority Concern 2: Development

Priority Concern 3: Shoreline

**Review of Plans**

Plans were collected and reviewed from the following:

Priority Concerns Scoping documents from Douglas County and Mille Lacs County.

Rules of Thirty Lakes Watershed District

**Survey**

A survey regarding priority water management concerns was mailed out to the twenty-seven townships and eighteen cities in Crow Wing County. The parties were given 35 days to respond. 23 surveys were returned to our office. The townships and cities were asked to rate each issue on a scale of one to five with 5 being the highest priority. The results are listed below with the votes reflecting how many people selected each issue as the highest priority.

Rank	Issue	Votes
1	Protect Wetlands	15
2	Establish a means of getting non-complying ISTS (septic systems) in compliance.	14
3	Reduce or stop the development of marginal land.	12
4	Address current and future shoreland ordinance violations.	11
5	Identify and reduce pollution from point and non-point sources	11
6	Minimize erosion/sedimentation	8
7	Gather information regarding ground water quality/quantity and utilize the information in planning	8
8	Establish an organized county wide water quality monitoring program	7
9	Coordinate the development of educational programs to inform citizens and youth on surface water issues.	7
10	Address and minimize the effects of stormwater runoff.	5
11	Assist small communities in addressing wastewater needs beyond ISTSs.	4

To gather public input, the surveys were also published in the Brainerd Dispatch, Echo and Courier. The survey was posted on the Crow Wing County Website and mailed out in the Crow Wing Soil and Water Conservation Winter Newsletter. The public was asked to return the surveys by February 28, 2007. 109 surveys were returned. The public was asked to rate each issue on a scale of one to five with 5 being the highest priority. The results are listed below and the votes reflect how many people selected each issue as the highest priority.

Rank	Issue	Votes
1	Address current and future shoreland ordinance violations.	69
2	Protect Wetlands	68
3	Reduce or stop the development of marginal land.	61
4	Establish a means of getting non-complying ISTS (septic systems) in compliance.	58
5	Identify and reduce pollution from point and non-point sources	57
6	Establish an organized county wide water quality monitoring program	46
7	Minimize erosion/sedimentation	40
8	Gather information regarding ground water quality/quantity and utilize the information in planning	37
9	Coordinate the development of educational programs to inform citizens and youth on surface water issues.	35
10	Address and minimize the effects of stormwater runoff.	31
11	Assist small communities in addressing wastewater needs beyond ISTSs.	18

Below are the results of the Water Plan Advisory Committee survey.

Rank	Issue	Votes
1	Establish an organized county-wide water quality monitoring program.	8
2	Address current and future shoreland ordinance violations.	8
3	Reduce or stop the development of marginal land.	8
4	Protect wetlands.	6
5	Coordinate the development of educational programs to inform citizens and youth on surface water issues.	5
6	Gather information regarding ground water quality/quantity and utilize the information in planning to protect ground water resources.	4
7	Identify and reduce pollution from point and non-point sources.	3
8	Address and minimize the effects of stormwater runoff.	2
9	Establish a means of getting non-complying ISTS (septic systems) in compliance.	2
10	Address and minimize the effects of stormwater runoff.	2
11	Assist small communities in addressing wastewater needs beyond ISTSs.	2

**Priority Concerns Selected**

The priority concerns for Crow Wing County were selected after the evaluation of the surveys, review of the comments received by local and state agencies, and discussion by the Water Plan Advisory Committee. Below is the list of priority concerns that were selected.

1. Protect Surface Water Quality
2. Address and Minimize Stormwater Runoff
3. Protect Ground Water Quality/Quantity
4. Address wastewater needs throughout the county
5. Protect Marginal Land and address Shoreland Ordinance Violations
6. Promote Environmental Education

**These priority concerns were selected for Crow Wing County based on the following:**

Surface water is one of Crow Wing counties most valuable resources. 14% of the county is covered by wetlands and another 14% is covered by lakes, streams and rivers. This great abundance of surface water is what brings an increase in population and economic success to Crow Wing County. An

increase in population means an increase in development. As population, use and development on the counties surface waters increase, this irreplaceable resource becomes more vulnerable to degradation.

As development is occurring at a high rate in Crow Wing County, there has been an increase in construction and an increase in impervious surfaces. The Environmental Protection Agency has determined the combination of construction and urban runoff to be the leading cause of impairments to surface waters. Currently Crow Wing County has approximately 300 sites permitted under the Minnesota Pollution Control Agency National Pollution Discharge Elimination System Construction Stormwater Program.

Many of Crow Wing County's citizens rely on ground water for drinking water, so it is important to make sure that there are safe and sustainable drinking water supplies. It is estimated that there are 60,000 septic systems in Crow Wing County. Non-complying ISTSs can pose a potential problem for human health and the environment. Inspections have shown that up to 20% of septic systems near lakeshore are non-compliant with county regulations (CWC 2004 Comprehensive Plan). It is not uncommon for untreated groundwater in many portions of the county to exceed the Safe Drinking Water Act standard for arsenic of 10ug/L (2002 Water Plan). In 1998 the MPCA conducted a study of the effects of septic systems on the groundwater quality in Baxter. pH and concentrations of nitrate, dissolved organic carbon, and total organic carbon were greater in unsewered areas than in sewerred areas (MPCA).

Much of the prime lake shore in the county has already been developed and is also the most costly to obtain, shifting development to land considered marginal. Defining marginal lands is difficult due to differing ideas and economic factors attributing to a persons use of land. Land is considered marginal when it is on the edge of being useful for human needs such as development and agriculture. Most often these lands are poorly drained, steep, or contain poor soils. Marginal lands are sensitive and are at a greater risk for degradation. When undisturbed, marginal lands function to help keep surface and ground water clean by trapping sediments and nutrients. State and local rules were put in place to protect these resources, but these rules must be enforced in order for them to be effective.

With the high amount of surface water in the county it is important to monitor the quality of water. By monitoring water quality and interpreting the data, we can have the information necessary to protect the high quality resources we have and manage any water quality problems that may be identified. When followed over time, water quality data can reveal trends in water quality that can be compared to events or lake usage during the same time frame to isolate specific sources of impairment. With increasing development, it is important to evaluate the quality of the lakes to insure that quality is not diminished as a result of such activities. The main value in gathering this information will be its role in making actual decisions for taking actions in making the conservation and restoration of Crow wing County lakes actually happen.

Education is a very important part in protecting natural resources. If people do not understand the value and function of natural resources, they will not understand the need to protect them. There is not enough staff in the county to fully protect our resources, so it is important for the public to be aware of what they can do to help. A means of educating youth and the public needs to be developed to get them involved in conservation and restoration.

### **Priority Concerns Not Addressed**

In order to develop water related priority concerns relevant to the current state of Crow Wing County's water resources and the views of the people who depend on them, a survey was distributed to the public, local government units, and various agencies. The survey asked participants to rate a list of 11 water related issues in terms of their priority as well as list what they feel are the top four water resource related problems in Crow Wing County. Of the 11 issues surveyed for, 9 priority concerns were chosen after careful consideration of survey results. In order to have a set of priority concerns that is both achievable and thorough, the 9 priority concerns were condensed into 6.

The two issues that were not specifically listed as priority concerns were: Protect Wetlands and Identify and Reduce Pollution from Point and Non-Point sources. These issues were not selected as priority based on a number of reasons. The main reasons being that they are addressed through current legislation and other agencies, as well as the six selected priority concerns.

Protecting wetlands was not selected as a priority since it is a very broad issue and one of the tactics for addressing the priority concerns selected was to ensure that they are directed towards specific issues. Wetlands are already being protected under the Wetland Conservation Act and the issues that are being addressed under the selected priority concerns will directly and indirectly help protect wetlands. Wetland protection will also be addressed under the priority concern for addressing the development of marginal land because wetlands often fall under this category. Reducing the development of marginal land will ultimately protect wetlands where the Wetland Conservation Act does not.

Reducing pollution from point and non-point sources was not selected as a priority concern for similar reasons of being too broad and being addressed through other agencies and selected priority concerns. One element in reducing non-point pollution will be accomplished through the priority concern aimed at addressing and minimizing stormwater runoff. Erosion and sedimentation is a large component of non-point source pollution. Addressing the development of marginal lands will also prevent non-point source pollution by reducing the development of steep slopes which causes erosion and retaining wetlands which serve as natural water filtration systems. Independent sewage treatment systems were selected as a priority concern due to their potential to produce point source pollution. ISTSs are wide spread throughout Crow Wing County and often located in close proximity to lakes. This could pose a major threat to our lakes and rivers if not functioning properly. Many of the other sources of point source pollution are common to industry and regulated by agencies such as the MPCA.

The priority concern dealing with providing education to citizens and youth on surface water issues has the potential to encompass wetland issues and point and non-point source pollutants as well as any other issues related to water quality.

**Water Plan Advisory Committee:**

Bob Becker(Chair)-SWCD Board of Supervisors  
Paula West(Vice Chair)-Interested Citizen at Large (northern)  
Barbara Brandt-Lakeshore Property Owners at Large  
Ann Beaver-Crow Wing LARA  
Tom Phelps-Municipal Interest-Brainerd Power and Light  
Bob Kuschel-Public Education  
Sue Jordan-Planning Commission/Board of Adjustment  
Dennis Slayton-Area Planning & Zoning-Administrator  
Sy Berezni –Well Drillers  
Paul Thiede-Crow Wing County Board of Commissioners Liaison

**Technical Advisors:**

Keith Pohl (Crow Wing SWCD)  
Carrie Maurer-Ackerman (Crow Wing SWCD)  
Dan Steward (BWSR)