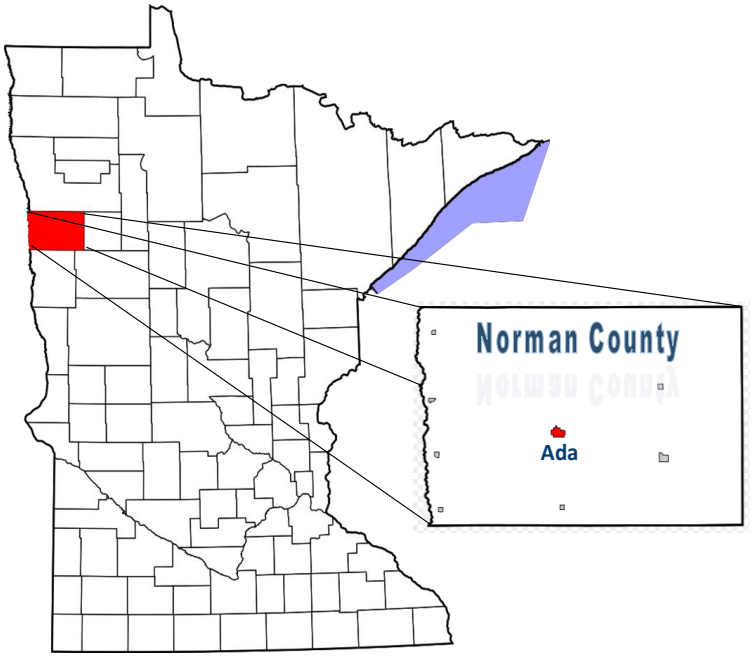
2017-2026

Norman County Local Water Management Plan



Prepared by the

NORMAN COUNTY SOIL & WATER CONSERVATION DISTRICT

and the

LOCAL WATER MANAGEMENT PLAN ADVISORY COMMITTEE

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

Introduction

Purpose of the Plan

The purpose of this plan is to address the following priority concerns by protecting water resources through the promotion of Best Management Practices (BMPs) throughout the county and watershed. The plan will focus on four priority concerns. (not in order of importance)

Priority 1, puts emphasis on proper control of water movement, drainage, and retention.

Priority 2, will focus on reducing unwanted wind and water erosion and the associated sedimentation that occurs within Norman County.

Priority 3, will focus on improving surface and ground water quality at the watershed level.

Priority 4, concentrates on the appropriate use of natural resources by coordinating and implementing government programs.

The overall cost to address these priority concerns would be about $1,156,000.

History of Norman County

Norman County was established February 17, 1881. Residents of the county claim the name was chosen because of the great number of Norwegian immigrants that settled there. Norsk, or Norman refers to a native person in Norway. The immigrants first settled on the Marsh River near Halstad in the west and near Twin Valley in the east.

Geology/Geography

Norman County is in the Red River Valley of Minnesota, one of the great farming regions of the world. The Red River Valley is relatively flat and heavily cultivated. This ecoregion has few lakes, and the surface water drains north through the Red River into Lake Winnipeg in Canada and eventually reaches the Hudson Bay. Norman County is bordered by Mahnomen County on the east, Polk County on the north, North Dakota on the west, Clay County on the south, and Becker County on the southeast. Major geological features include the Red River, which makes the west border of the county, and the Wild Rice River, which flows all the way through the county from the eastern border to the west, emptying into the Red River. Norman County contains one of the highest elevations in northwestern Minnesota. Frenchman's Bluff, located in Flom Township, sits at 1,340 feet above sea level.

Norman County includes four general eco-regions; Glacial Moraine, Glacial Lake-Till Plains, Beach Complex and Glacial-Lake Plain. The Glacial Moraine is an area of hills and depressions that has local relief up to 150 feet and is present in the very northeast part of Norman County. The Glacial Lake-washed Till Plain is a flat to gently rolling area that has local relief up to 15 feet and is in the very eastern part of Norman County. The Beach Ridge complex runs north/south in the eastern

third of the county. Approximately, the western two-thirds of Norman County is Glacial-Lake Plain. This area is extremely flat, sloping only a few inches to a few feet per mile. (U.S. Geological Survey, "Southern Red River Valley Regional Hydrogeological Assessment").

Norman County is part of the Red River Basin. The Wild Rice River and its tributaries flow through the county from the east to the west and drain into the Red River which flows north until it empties into Lake Winnipeg. Lake Winnipeg is currently facing a critical point to water quality health. The lake is showing advanced stages of eutrophication, which is caused by excess nutrients (nitrogen and phosphorus) entering the lake. The water that flows through Norman County affects what happens to other water bodies downstream. It is important to protect these water resources.

There are 24 Townships in the county, with a total area of 877 square miles (561,592 acres). Dry land comprises 873 square miles and 3.9 square miles are water. There are 8 cities and 4 unincorporated communities. The 2010 census showed a population of 6,852. The County seat is Ada. The eight cities in Norman County include: Shelly, Halstad, Hendrum, Perley, Ada, Borup, Gary, and Twin Valley. The 4 unincorporated communities include; Faith, Lockhart, Hadler, and Syre.

Table 1: Historic Populations (US Census Bureau)

Census	Population	% increase/ decrease
1890	10,618	
1900	15,045	41.7%
1910	13,446	-10.6%
1920	14,880	10.7%
1930	14,061	-5.5%
1940	14,746	4.9%
1950	12,909	-12.5%
1960	11,253	-12.8%
1970	10,008	-11.1%
1980	9,379	-6.3%
1990	7,975	-15.0%
2000	7,442	-6.7%
2010	6,852	-7.9%

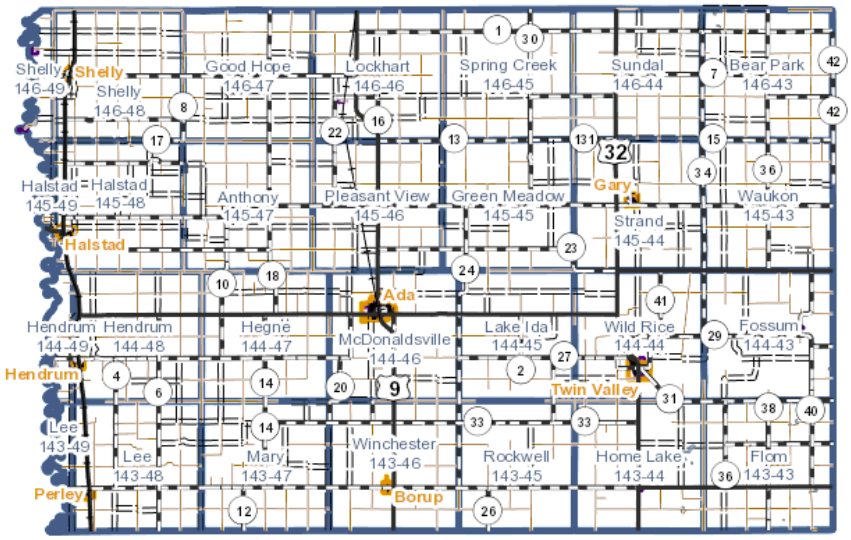
Table 2: 2010 census by city (US Census Bureau)

City	Population
Ada	1,707
Twin Valley	821
Halstad	597
Hendrum	307
Gary	214
Shelly	191
Borup	110
Perley	92
TOTAL	**4,039**

Table 3: Estimated 2015 Populations for Norman County, Minnesota (Minnesota State Demographic Center)

City/Township	Population
Ada City	1702
Anthony Township	47
Bear Park Township	117
Borup City	104
Flom Township	261
Fossum Township	175
Gary City	222
Good Hope Township	46
Green Meadow Township	70
Halstad City	598
Halstad Township	96
Hegne Township	57
Hendrum City	281
Hendrum Township	100
Home Lake Township	177
Lake Ida Township	171
Lee Township	114
Lockhart Township	70
McDonaldsville Township	164
Mary Township	83
Perley City	117
Pleasant View Township	112
Rockwell Township	78
Shelly City	223
Shelly Township	96
Spring Creek Township	78
Strand Township	95
Sundal Township	115
Twin Valley City	771
Waukon Township	85
Wild Rice Township	238
Winchester Township	62

Figure 1: Township Map of Norman County



Dominant Land Use of Norman County and Projected Trends

Norman County lies within the Red River Valley of the North. The soils left by glacial Lake Agassiz are very productive. The primary land use of Norman County is agricultural based at approximately 87%. In 2010, there were 692 farms, with 465,225 acres being cropland. The main crops are soybeans, corn, wheat and sugar beets. The percentages of land use are not expected to change in the next 10 years. Norman County has a large area identified as prime farmland by the USDA NRCS. Norman County has five Scientific and Natural Areas, one of which is partially in Polk County, totaling 2,479 acres. There are 14 Wildlife Management Areas totaling 5,260 acres.

Figure 2: Norman County Land Use Statistics

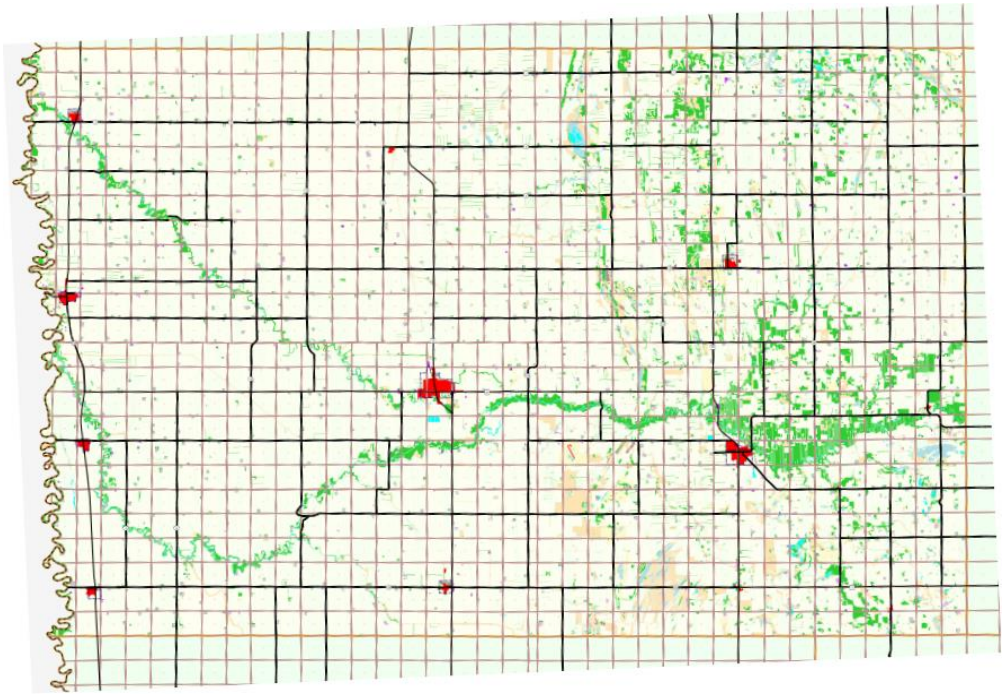
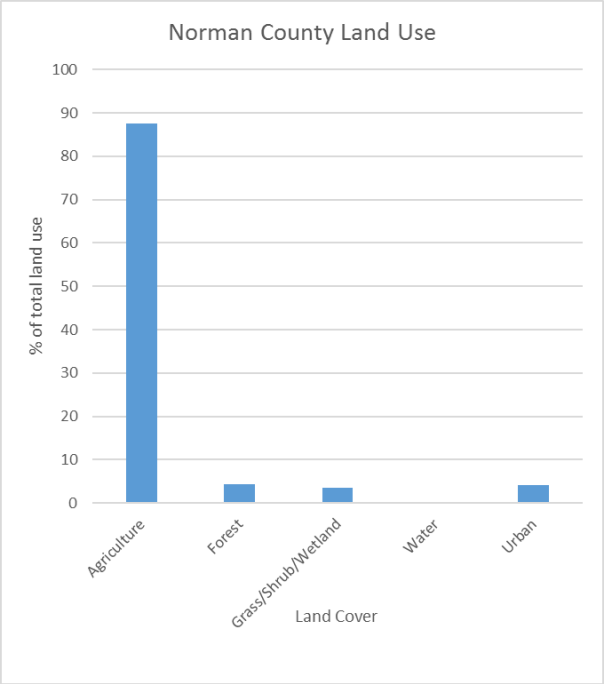


Figure 3: Norman County Land Use Cover



One Watershed, One Plan

Because water is continually moving, it is a resource that tends to be difficult to manage based on linear political boundaries. Municipal and county lines, based on the rectangular grid of original government surveys, are not often well suited for the management of water resources. Water resources should be managed on a watershed level, because water does not stay inside of one single county. Water will flow where gravity takes it, across many political boundaries.

Under legislative mandate, revisions to county water plans must be written within a watershed context. Minnesota has a long history of water management by local government. One Watershed, One Plan is rooted in this history and in work initiated by the Local Government Water Roundtable (Association of Minnesota Counties, Minnesota Association of Watershed Districts, and Minnesota Association of Soil and Water Conservation Districts) in 2011, which recommended that the local governments charged with water management responsibility should organize and develop focused implementation plans on a watershed scale. The recommendation was followed by legislation that permits BWSR to adopt methods to allow comprehensive plans, local water management plans, or watershed management plans to serve as substitutes for one another; or to be replaced with one Comprehensive Watershed Management Plan. This legislation is referred to as One Watershed, One Plan. Further Legislation was passed in 2015, defining purposes and outlining additional structure.

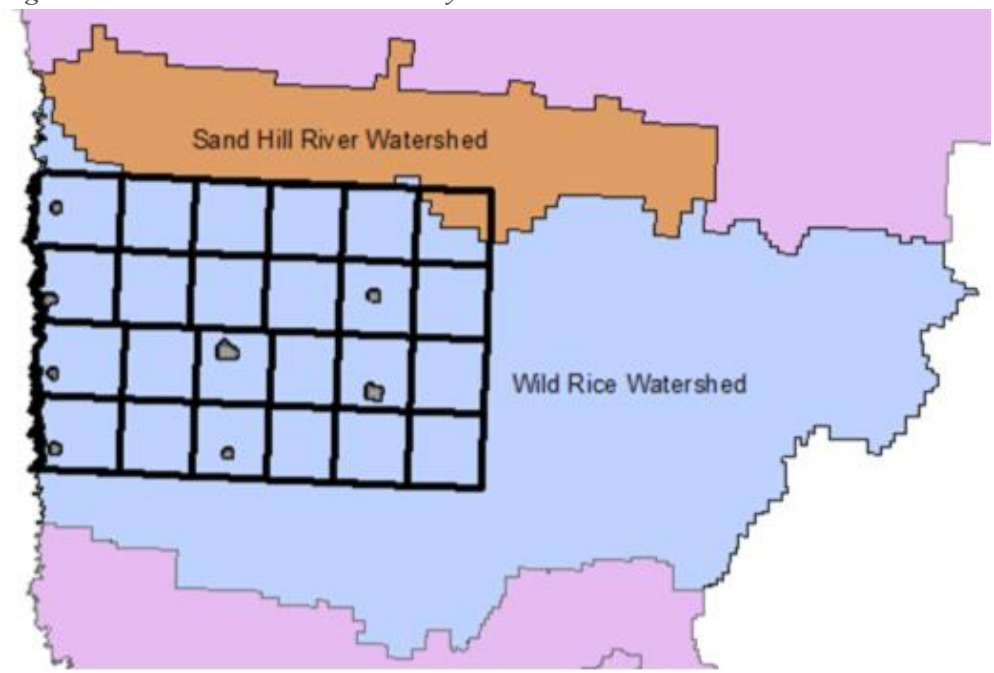
There are currently five pilot areas in the state developing their plan, none of which is in Norman County. The purpose of this requirement is to ensure that counties look beyond the jurisdictional boundaries when making assessments and goals for water quality issues. By doing this, the county will be able to identify trend, problems, and opportunities that are specific to a watershed, rather than assuming the problem or issue is confined to political boundaries.

Major Watersheds of Norman County

A watershed is the area within the geographic boundaries of land that drain into a surface water feature such as a stream, river, or lake and contributes to the recharge of groundwater. The Watershed Act was established to better address water-related issues and concerns occurring within the state at the watershed level. Watershed Districts are special purpose units of local government that have been created to help prevent and solve water resource problems on a watershed basis. The boundaries of a watershed district generally follow the hydrologic or topographical limits of an area or region. Most often, watersheds are named for the major surface water resource within the watershed.

Norman County contains three major watersheds, the Wild Rice Watershed, Marsh River and the Sandhill River Watershed.

Figure 4: Watersheds in Norman County



Wild Rice Watershed

The Wild Rice Watershed, encompassing an area of approximately 2,085 square miles, includes the drainage basin of the Wild Rice River and its South Branch, which is a direct tributary to the Red River of the North in northwestern Minnesota. This watershed makes up 93% of the county and is made up of the Agassiz Lake Plain and Glacial Moraine areas that are used mainly for agricultural production.

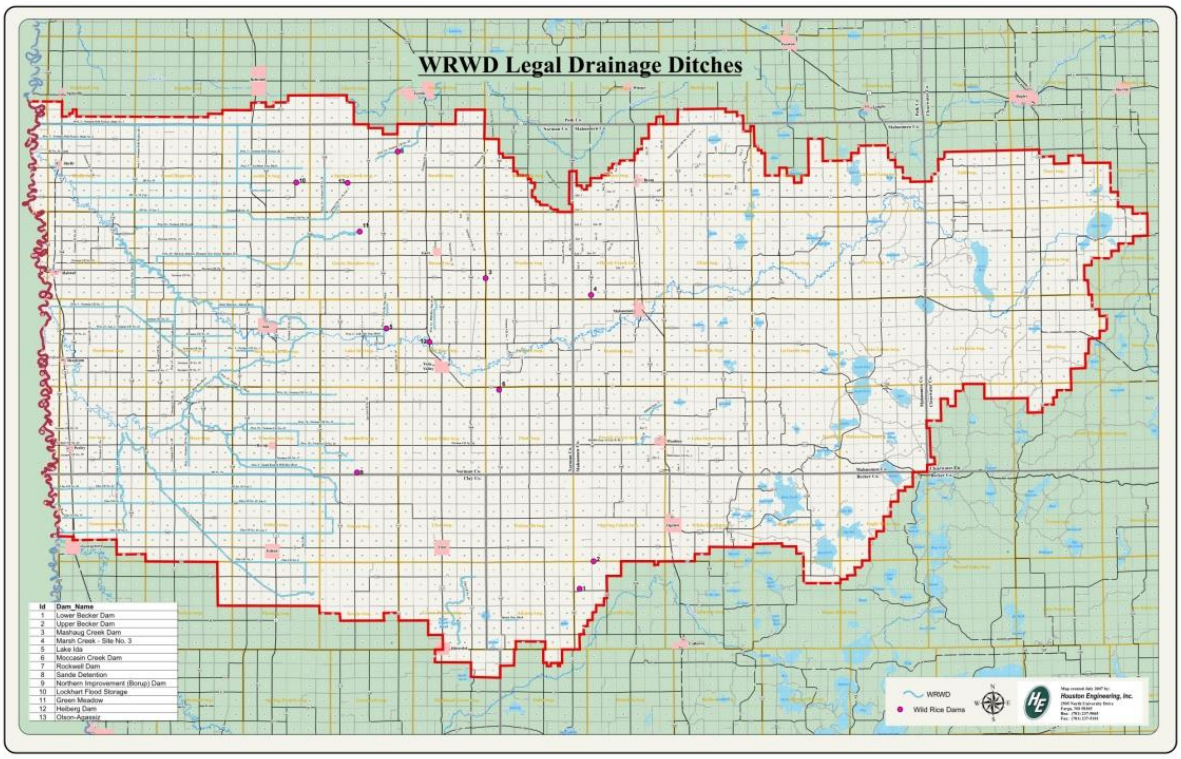
The Wild Rice River is in Northwest Minnesota. The river begins on the Upper Rice Lake in Clearwater County and ends on the western side of Norman County flowing into the Red River. The Wild Rice River on the western side of the county experiences flooding while the eastern side of the county has severe channel erosion. The District also includes the watershed of the Marsh River and other small contiguous areas directly tributary to the Red River of the North.

The District office is in Ada and serves 15,000 residents. The original mission of the District focused on reducing flood damage. The mission has been updated to include a focus on water quality and natural resource management. The District exists to manage water flow in the drainage area of the Wild Rice River. They provide services to farmers, ranchers, and citizens with water control. Their main duties include:

1. Issuing permits for water related drainage
2. Maintaining Watershed Drainage Ditches
3. Maintaining Watershed Projects
4. Preventing erosion into surface waters
5. Protecting fish and wildlife habitat
6. Protecting groundwater and surface water systems
7. Improving water quality
8. Establishing governmental policies to manage water resources
9. Providing recreational opportunities

Other major municipalities within the District include Hendrum, Halstad, Shelly, Twin Valley, Ulen, Hitterdal, Mahnomen, Felton, Borup, Gary, Perley, Waubun, Bejou, Ogema, and Naytahwash. The District comprises portions of Norman, Mahnomen, Clay, Clearwater, Becker, and Polk Counties in Minnesota.

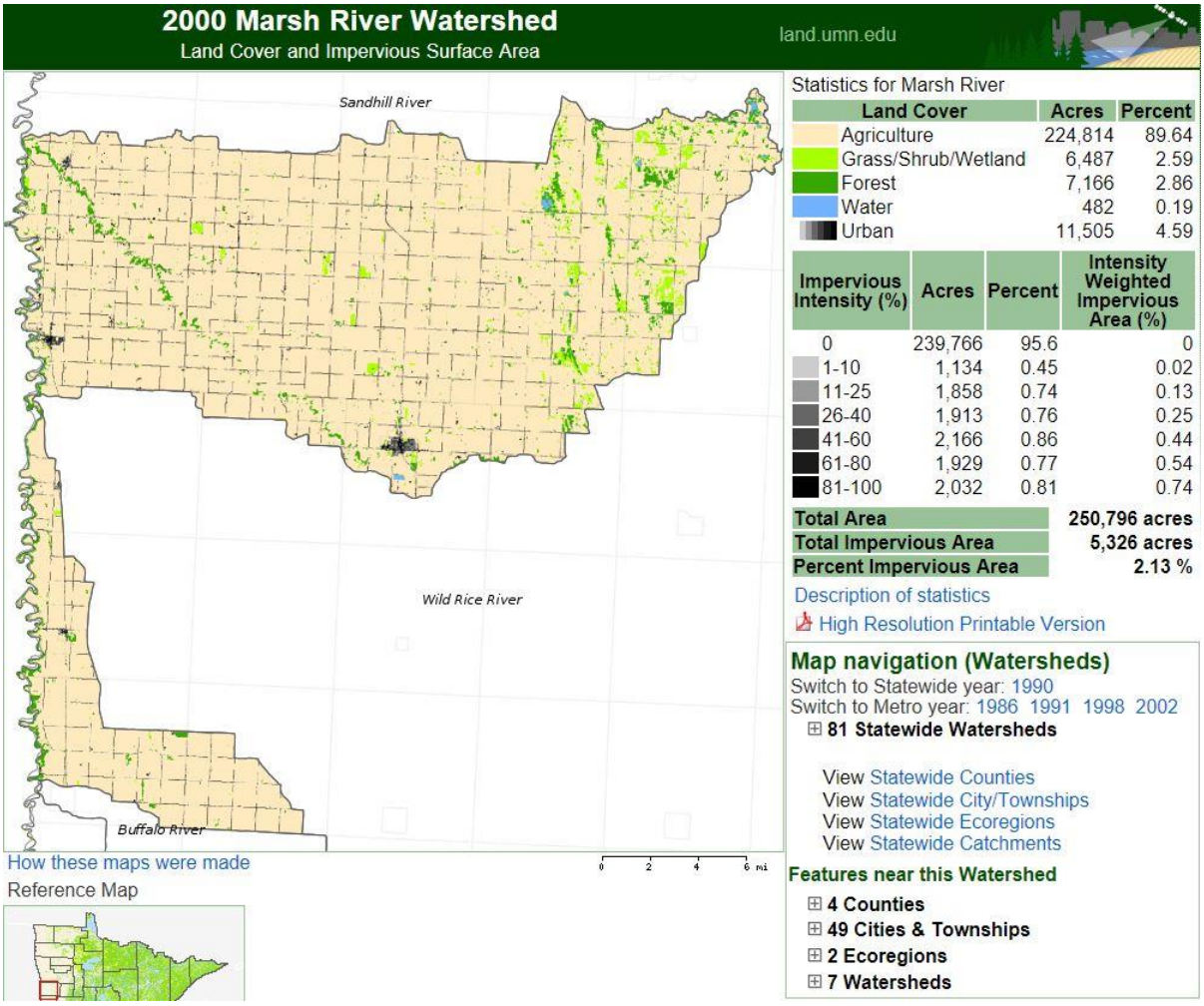
Figure 5: WRWD Legal Drainage Ditches



Marsh River Watershed

The Marsh River, located in Minnesota, is a 49.9-mile-long (80.3 km)[1] tributary of the Red River of the North. It rises less than 600 feet (180 m) from the Wild Rice River, east of the city of Ada, and flows generally northwest, entering the Red River 2 miles (3 km) northwest of Shelly. The Marsh River flows entirely within Norman County.

Figure 6: Marsh River Watershed



Sand Hill River Watershed

The Sand Hill River Watershed, located in northwest Minnesota, comprises over 486 square miles and includes portions of Polk, Norman, and Mahnomen counties. Land use within the watershed is predominantly agricultural. The Sand Hill River Watershed is in the Red River of the North Basin.

The seat of the Sand Hill River Watershed District is in Fertile, MN. The duties and responsibilities of the old Sand Hill River Drainage and Conservancy Board were given to the new District on May 28, 1975 in accordance with the Minnesota Watershed Act.

The District's south boundaries were hydrologically determined and established at a hearing at the Fertile Community Center on June 26, 1984. The north boundaries were established from the old Sand Hill Drainage & Conservancy District. The District encompasses 475 square miles, almost wholly in the south part of Polk County, with a small part in Mahnomen and Norman County. The area includes the entire drainage basin of the Sand Hill River.

The average width of the basin is 8 miles and it is approximately 55 miles long. The Sand Hill River originates in Sand Hill Lake, located about four miles south of the City of Fosston and outlets two miles west of Climax into the Red River of the North. Elevation at the eastern end of the watershed is nearly 1,350 feet above sea level and an elevation of 850 feet at the western end.

The Sand Hill River Watershed is found in the upper northern part of Norman County. Only 12 to 14 square miles of this watershed is found in Norman County. Land is primarily used for agricultural production in the Agassiz Lake Plain area and is extensively drained. The main resource concerns in the watershed are wind and water erosion, nutrient management, wetland management, surface water quality, flood damage reduction and wildlife habitat. Many of the resource concerns relate directly to flooding and increased sediment and pollutant loadings to surface waters.

Figure 7: Sand Hill River Watershed District Boundaries

Water Plan Process

Responsible Local Unit of Government

Many individuals, agencies and LGUs play a part in the creation of the county's water plan. Preparation of the Norman County Local Water Management Plan (LWMP) required the review of existing planning documents from other local, state and regional agencies, along with the Local Water Management Plan Advisory Committee. Plans reviewed for input in the water plan were; Wild Rice Watershed Water Management Plan, Lower Wild Rice River TMDL Plan, Sand Hill River Watershed District Water Management Plan, Red River Basin Natural Resources Framework Plan and the Norman County SWCD Comprehensive Plan.

The Norman County LWMP is coordinated and administered by the Norman County Soil and Water Conservation District (SWCD) with assistance from the Local Water Management (LWM) Advisory Committee. The Norman County SWCD works with area watershed districts, local, state, and federal agencies, private citizen groups, organizations, state associations, township boards, and municipalities.

The Norman County SWCD also works closely with the Norman County Environmental Services and the Norman County Highway Department on programs such as Shoreland Ordinances, the Subsurface Sewage Treatment System (SSTS) Program, and the Wetland Conservation Act (WCA).

Updates and Adoption

The Norman County Water Plan was adopted in 1990. Updates to the plan occurred in 1997, 2002, 2006, 2012, 2016 and 2017.

Expiration of Current Plan

The previous plan expired on December 31, 2016. After this plan is approved, it will expire in 2026 with an update in 2021.

Purpose of the Local Water Management Plan

The purpose of the LWMP is the protection of water resources in the county from point and non-point sources of pollution. Coordination of these protection efforts between the various local, state, and federal agencies and organizations will help reduce duplication and eliminates gaps in implementation strategies aimed at a common goal of water protection.

The water plan meets the requirements set forth in M.S. 103B.311subd.4 as follows;

1. The water plan covers the entire county.
2. The water plan addresses problems in the context of watershed units and ground water systems.
3. The water plan is based upon principles of sound hydrologic management of water, effective environmental protection and efficient management.
4. The water plan is consistent with local water management plans prepared by counties and watershed districts wholly or partially within a single watershed unit or ground water system.
5. The water plan duration is for ten years with review and amendment to the plan as necessary in five years.

Priority Concerns Addressed by the Plan

The purpose of this plan is to address the following priority concerns by protecting water resources through the promotion of Best Management Practices (BMPs) throughout the county and watershed. The plan will focus on four priority concerns. (not in order of importance)

Priority 1, puts emphasis on proper control of water movement, drainage, and retention.

Priority 2, will focus on reducing unwanted wind and water erosion and the associated sedimentation that occurs within Norman County.

Priority 3, will focus on improving surface and ground water quality at the watershed level.

Priority 4, concentrates on the appropriate use of natural resources by coordinating and implementing government programs.

Consistency of the Plan

The Norman County Local Water Management Plan is consistent with other state, county, regional, and local plans.

Ongoing Activities & Services

- Comprehensive Local Water Plan Administration
- Erosion Control & Water Management Program
- Conservation Technical Assistance
- Clean Water Fund competitive grant implementation
- Wetland Conservation Act Administration
- Reinvest in Minnesota (RIM)
- Conservation Tree Sale Program
- Tree Planter Service
- Tree Maintenance Program
- Rainfall Monitoring Network
- DNR Observation Well Monitoring
- Envirothon
- Northwest Water Festival
- Educational materials students and adults
- Norman County Fair Booth
- River Watch Program
- Cooperative Weed Management
- Shoreland Management
- Sub-Surface Sewage Treatment System Programs
- Sub-Surface Sewage Treatment System Low-Income Grants
- Feedlot Program Administration
- Buffer Program Technical Assistance
- Project Team Meetings with local agencies
- Water Erosion Projects
- GIS Technology
- Flood Storage Dam Maintenance
- Mn Agricultural Water Quality Certification Program (MAWQCP) Technical Assistance
- AIS Administrator
- Watershed Restoration and Protection Strategy (WRAPS)
- Assist with Wellhead Protection Plans
- Discovery Farms Water Monitoring
- Soil Loss Ordinance Management
- Flood Damage Reduction Workgroup

ASSESSMENT OF PRIORITY CONCERNS

The Priority concerns were chosen based on significant resource concerns expressed by residents, advisory committee members, and agency input.

PC 1 - Control Water Movement

Priority Concern 1 will focus on water movement throughout the watersheds.
The Wild Rice River is in Northwest Minnesota. The river begins on Upper Rice Lake in Clearwater County and ends on the western side of Norman County, flowing into the Red River. The Wild Rice River on the western side of the county experiences flooding while the eastern side of the county has severe channel erosion. Norman County has experienced major flood damages in recent years from spring runoff events as well as summer rain events. These disasters resulted in many rural landowners and municipalities experiencing severe economic hardships. Extreme natural resource damages have occurred in the past years. In response to these disasters, large amounts of local, state and federal dollars have been provided to Norman County to repair damages to public infrastructure and homes. Insufficient assistance was provided to the rural landowners for damages to agricultural land. In response, LGUs, local landowner groups, and state and federal agencies have focused their efforts on developing strategies to reduce flood damages, with their target on agriculture land.

The direct impacts from improper water movement include; loss of wildlife and habitat, loss of economic development, increased flood fighting costs, increased flood repair costs, increased erosion and sedimentation, and contamination of water quality.

The indirect impacts from improper water movement include; agencies and landowners disagreeing on proper control measures and people and businesses leaving the area because of the stress of flooding. Everyone in the county is touched by the problems associated with improper water movement.

There are ways to control the flow of water across the watershed. Water retention projects slow the flow of water and allow natural filtration. Control of culvert size, placement, and quantity prevent unwanted movement of water. Improper culvert size can have negative effects. A culvert that is too small and restricts water flow can cause flooding on the upstream side and create barriers for migrating fish. A culvert that is too big can cause flooding on the downstream side.

Goals

1. Work with 50 landowners and agencies to locate, fund and install projects within identified priority areas identified by the Flood Damage Reduction Workgroup.

2. Work with 30 landowners and agencies to maintain existing water control projects.

3. Assist in the improvement of 10 existing public and private water control projects and continue to upgrade them as technology advances.

4. Contribute to the advancement of technology.
    a) Work with the county to keep the parcel mapping updated.
    b) Collaborate with NRCS to acquire digital soil maps of Norman County.
    c) Team up with local agencies to acquire survey grade GPS equipment.
    d) Train the staff to use digital survey equipment.

PC 2 - Reduce Soil Movement

Priority 2 will focus on wind and water erosion and the associated sedimentation that occurs within Norman County.

Wind erosion is a serious environmental problem. It occurs mostly on flat, bare areas with dry, sandy soil. Much of Norman County meets this description, especially in the spring months when the previous year's crop has been harvested and the new crop is not yet established.

Wind erosion has always been a problem across Norman County. A portion of the center of the county is sandy eroded soil types. The United States Department of Agriculture (USDA) has identified Highly Erodible Soils based on production loss. The soils in the western half and eastern edge of the county are made up of loams and clays that require less protection but are still at risk to wind erosion.

Water erosion is a problem in the eastern half of the county, where slopes are steepest and soils are prone to washing away. In the eastern half of the county, the slopes are steep enough for the water to carry a heavy sediment load. Sedimentation occurs in the western half of the county, where the general slope has dropped to less than one foot per mile.

State programs are used extensively in Norman County to reduce soil erosion and sedimentation, and increase water quality and wildlife habitat. Wind and water erosion of cropland leads to sedimentation in streams. This has adversely impacted the flow capacity and aquatic environmental health of the Wild Rice River and its tributaries, particularly in the reaches below the beach ridge. Decreased flow capacities encourage frequent flooding during common rain events (5 to10-year frequency rain events). This sedimentation has also adversely impacted the aquatic ecosystem that the rivers and streams historically have supported (local testimonial comes from stream and bank erosion). The USGS study shows that a substantial amount of sedimentation comes from agricultural land. This sedimentation can also reduce the life expectancy/maintenance schedule of existing and future flood control and natural resource enhancement projects.

There are direct impacts of sedimentation to cropland; loss of applied crop inputs, destruction of crops from sandblasting, helicoptering and washing away of young plants, and increased flooding. An indirect impact is the loss of soil productivity.

The direct impact to wildlife land is the loss of habitat. The indirect impact is underutilization of wildlife land. Everyone in the county is affected to some extent by loss of soils and the associated sedimentation. The residents of Norman County pay increased taxes, which go for flood fighting costs, increased cost of flood repairs, and flood prevention plans. FEMA's payments have increased to the county and the Farm Bill disaster payments have increased to farmers for their losses.

Goals

1. Reduce Wind Erosion by 400,000 tons per year. Wind erosion has been a long-term problem across all Norman County.
   a) Work with interested parties to identify priority project areas that will reduce wind erosion.
   b) Update the general priority Wind Erosion Map for Norman County.
   c) Work with individuals, local, state, and federal agencies to establish priority projects that will reduce wind erosion.
   d) Develop projects, from tree plantings to changes in farming practices, based on new priority wind erosion maps.
   e) Implement conservation tillage BMPs to increase cover crops and reduce top soil losses.
   f) Promote, coordinate, and implement erosion control methods and structures such as buffer strips in sensitive areas.

2. Reduce Water Erosion by 40,000 tons per year. Water erosion is a problem in the eastern half of the county, where slopes are steep and soils are prone to erosion.
   a) Work with interested parties to identify priority project areas that will reduce water erosion.
   b) Promote erosion control BMPs such as buffer strips, grass waterways, cover crops, and sediment basins to inform landowners of the options available.
   c) Update the general priority Water Erosion Map for Norman County.
   d) Work with the Wild Rice Watershed to meet the requirements for the Lower Wild Rice River Total Maximum Daily Load.

3. Work with 40 individuals, local, state and federal agencies to establish priority projects that will reduce water erosion.
   a) Develop projects, from herbaceous to structural, based on new priority water erosion maps.
   b) Promote the MDA's Minnesota Agricultural Water Quality Certification Program (MAWQCP) and encourage landowners to become certified.
   c) Advertise Agriculture Best Management Loan Programs and provide technical assistance to landowners interested in projects that reduce water pollution.
   d) Provide technical assistance to landowners who must implement the Buffer Initiative.

4. Reduce sedimentation by 80,000 tons per year. The soils in the western half of the county are so fertile that they can lose many tons of soil per year and remain very productive. Sedimentation occurs in the western half of the county; the slopes are steep enough for the water to carry a heavy sediment load.
   a) Work with interested parties to identify priority project areas that will reduce sedimentation.
   b) Update the sedimentation map for Norman County.

5. Work with 60 individuals, local, state and federal agencies to establish priority projects that will reduce sedimentation.
   a) Develop projects, from herbaceous to structural or even changes in farming practices, based on the new sedimentation map.

6. Implement Federal and State Programs that reduce erosion and sedimentation.
    a) Work with individuals, local, state and federal agencies to implement state programs that reduce erosion and sedimentation.
    b) Implement programs that reduce erosion and sedimentation such as: Cost share, CRP, Total Maximum Daily Load (TMDLs), Shoreland and Erosion Control.
    c) Partner with the Natural Resource Conservation Service (NRCS) to promote and provide financial and technical assistance to interested parties in the following programs that focus on erosion control:
        1. Environmental Quality Incentives Program (EQIP)- encourage signups to producers, especially those with sensitive lands.
        2. Conservation Stewardship Program (CSP)- Promote and provide technical and financial assistance to participants to install additional erosion control measures.
    d) Use Minnesota Board of Water and Soil Resources (BWSR) grants to provide funding and cost share to landowners who install conservation practices on their land.
    e) Promote easements such as Reinvest in Minnesota (RIM) to establish native vegetation, especially on highly erodible land.
    f) Use funds provided by the Minnesota Pollution Control Agency (MPCA) to monitor the water quality in watersheds.

7. Work with 200 landowners to comply with the new Buffer Initiative.
    a) Send out letters to 685 landowners explaining the buffer program, help identify the areas where buffers will be required and assist them with conservation planning.
    b) SWCDs will implement the buffer requirement, including planning, technical assistance to landowners, approval of alternative practices, and tracking and reporting progress.

8. Work with 100 landowners to comply with the Soil Loss Ordinance.
    a) Conduct field visits to investigate excessive erosion or sedimentation.
    b) Prepare conservation plans with assistance by the landowner to implement soil conservation practices to prevent excessive soil loss or reduce the soil loss to a practicable extent.

PC 3 – Maintain or Improve Water Quality

Priority 3 will focus on surface and ground water quality within the watersheds.

The recharge of aquifers can take thousands of years. The age of the water in Norman County aquifers is predicted to be 100,000 years old on the east, and 300,000 years old on the west. In the past, well water testing has identified very hard water across the county with some shallow wells that have had nitrate levels above the recommended levels for human consumption. Surface water contaminating an aquifer often takes place through a conduit such as an abandoned well. Most residents of the county use wells as their drinking water source.

There are locations in Norman County the PCA has identified as impaired for turbidity. The River Watch Program will continue to sample surface water. The PCA will continue to test surface water quality under WRAPS (Watershed Restoration and Protection Strategy). The DNR is currently performing "Steam Channel Stability Assessments" to a few priority sites under the same WRAPS grant. Norman County SWCD assists both the PCA and the DNR with these sites in the Wild Rice Watershed.

Contaminated groundwater directly degrades drinking water, which increases health risks in homes and businesses. An indirect impact of contaminated groundwater; the cost of water may increase, as it must be treated for the contaminates, and concerns of contamination will rise.

Direct impacts of contaminated surface water are; a decline in recreational opportunities, loss of sensitive vegetation, macroinvertebrates, fish, birds, and other wildlife, and ecosystem imbalance.

Since a large percent of Minnesota is prime farm land, many of the state's inhabitants now face the problem of having elevated levels of nitrogen in their drinking water. The conversion of native prairie into cropland has reduced natural filtering of ground water native landscapes provide. Nitrogen is not the only contaminant; various toxic substances are found in herbicides and pesticides. Persons with compromised immune systems using sand point wells or wells with damaged castings could be at risk for health complications. Wells near contamination zones pose health risks, the owners of these wells must install better filtration systems to improve their water quality. The costs associated with these problems could be severe.

Groundwater quality is lessened by contamination through failing wells, abandoned wells, and surface contamination entering aquifers from the ground sensitive areas. Nitrate problems have been identified in sand point wells and failing deep water wells, where casings are cracked.

Water hardness increases from east to west as the age of the water increases from 100,000 years on the east side to 300,000 years on the west side of the county. Norman County has a very large supply of water, but with aquifer recharge of 100,000 to 300,000 years, that water is very limited. Wellhead protection and management plans need to be developed. Household hazardous waste needs to continue to be removed from streams and disposed of properly. Surface water quality has been affected by natural and manmade events within the county. Soil erosion causes turbidity, which is a visible problem within the Wild Rice River and its tributaries.

Another focus of Priority Concern 3 is to control the introduction and spread of Aquatic Invasive Species (AIS). The Red River, which makes up the western border of Norman County, has been listed as invested with zebra mussels. The DNR has listed an unnamed wetland in section 2 of Flom township invested with faucet snail. The SWCD works to educate the public on AIS and what they can do to stop them from spreading to new water bodies. The SWCD has placed signs at every public access in the county advising boaters to clean all visible aquatic plants and animals from their watercraft and trailers, drain all water-related equipment, and dispose of all unwanted bait in the trash. The SWCD participates in the Water Festival every year, where 4th graders are taught about water resources, AIS being one of the topics. More educational opportunities for the public are under development. AIS informational materials are left at businesses around the county to spread awareness.

Goals

1. Coordinate testing of well water and work with the Department of Ag and MN Department of Health to test for nitrates. Well testing kits are available from the Extension office in Ada. Healthy Home Grants from the Department of Housing and Urban Development are available to help pay for well testing through Norman-Mahnomen Public Health.

2. Promote and coordinate the State Cost Share Program for sealing abandoned wells, EQIP Program and the Clean Water Legacy Grant. Promote Ag BMP programs for new septic systems.

3. Work with the Zoning Administration to protect aquifer recharge in sensitive areas by restricting activities that will adversely affect water quality.

4. Support local cities to establish a Wellhead Protection Management Plan and review the Water Supply Plan for the city of Ada. Currently, no cities in the county acknowledge a Wellhead Protection Management Plan.
   a) Work with DNR to establish a Wellhead Protection Program in all cities in the county.
   b) Work with DNR to develop a Water Supply Plan for communities that serve over 1000 people.

5. Collaborate with other agencies to sponsor a household hazardous waste pickup and recycling program. Flushing of toxic materials can contaminate drinking water.

6. Subsidize landowners on installation of projects that improve impaired waters, sedimentation is evident within the Wild Rice River and its tributaries.

7. Administer the state feedlot program.
   a) Conduct site inspections and assist landowners with registration and compliance when requested.
   b) Provide current and new feedlot owners with information about Norman County and the Minnesota Pollution Control Agency feedlot registration, permitting regulations, permits, and rule requirements.
   c) Provide informational, technical, and financial assistance for producers.
   d) Present educational opportunities to producers in forms such as newsletters, newspaper articles, radio, trade shows, and workshops.
   e) Assist feedlot operators with developing a manure management plan.

8. Assist the Environmental Service Officer with oversight of the county's Shoreland Management Program to protect and enhance water quality.
   a) Issue permits and inspect registered feedlots in shoreland for compliance.
   b) Provide landowners in the shoreland with Norman County's requirements.
   c) Help update the Shoreland Ordinance which includes subdivision and county wide permitting.

9. Support the Environmental Service Officer with the Subsurface Sewage Treatment System Program.
   a) Conduct on-site investigations and assist with permitting when requested.
   b) Inventory properties along the Wild Rice River for compliance.
   c) Educate property owners regarding compliance of their existing systems.

10. Work with federal, state and local agencies to improve the "Impaired Waters" in the county to meet water quality standards.
    a) Support and participate in current and forthcoming efforts of impaired waters study by providing input, and financial and technical assistance when possible.
    b) Support and participate in current and future impaired waters TMDL programs.
    c) Continue to pursue grants and loans for landowners and the county that will support the county's surface water protection and improvement efforts.

Table 4: 2014 Norman County Impaired Waters List

Assessment Unit	ID	Impaired Use	Impairment Cause	Impairment Status
Wild Rice River-S Br to Red R	09020-108-501	Aquatic Life	Turbidity	TMDL Approved
Wild Rice River-Marsh Cr to South BR	09090-108-503	Aquatic Life	Turbidity	

Work with the Wild Rice Watershed and the Sand Hill River Watershed to improve water drainage and retention. The watersheds require a permit from anybody who requests to change the flow of water in any way. Every permit application has a field review before it is considered for approval. The permit must be approved by the board of managers. This helps control and monitor the flow of water across the watershed. Some of the ways landowners can change the flow and retention of water include drain tile, culverts, and control structures.

11. Work with 25 landowners to develop a chemical and nutrient management plan.
    a) Work with land operators to reduce over application of nutrients.
    b) Work with land operators to reduce pesticide drift.

12. Work with certified crop advisors and agriculture groups to inform them of the goals of the water plan.

13. Incorporate Drainage Water Management (DWM) BMPs in ditch system projects.
    a) Encourage BMPs in critical areas to reduce ditch system maintenance costs.

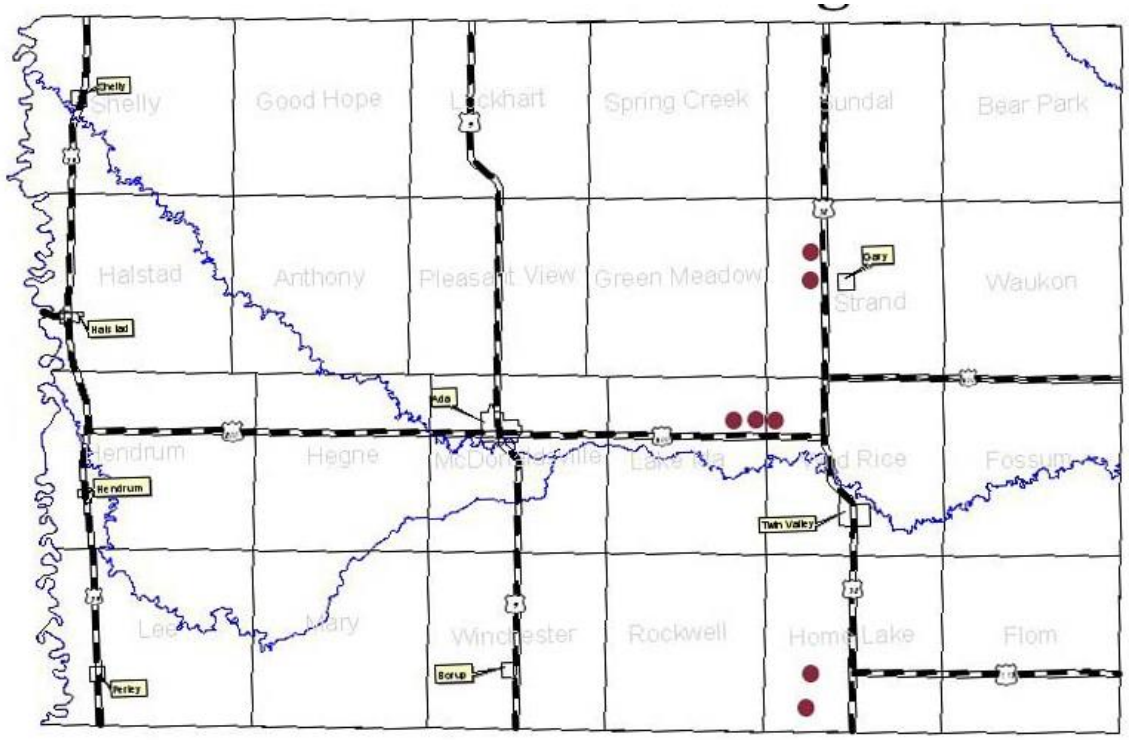
14. Work with 200 landowners to comply with the new Buffer Initiative.
    a) Send out letters to 685 landowners explaining the buffer program, help identify the areas where buffers will be required and assist them with conservation planning.
    b) SWCDs will implement the buffer requirement, including planning, technical assistance to landowners, approval of alternative practices, and tracking and reporting progress.

15. Work with 100 landowners to comply with the Soil Loss Ordinance.
    a) Conduct field visits to investigate excessive erosion or sedimentation.
    b) Help landowners create conservation plans with soil conservation practices to prevent excessive soil loss.

16. Put significant importance on successful programs that contribute to improving surface water quality in the county.
    a) Support agencies and landowners to implement the Rainfall Monitoring Program, Surface Water Assessment Grant, Observation Well Data Collection, the River Watch Program, and additional programs related to surface water quality.

17. Continue to monitor the seven DNR Observation Wells.

Figure 7: DNR Observation Wells



DNR Well #	Well Name	Location
54002	Rudy Braseth	T143 R44 S32
54003	Natco Inc.	T144 R45 S12
54004	Richard Ista	T145 R44 S17
54005	Natco Inc.	T144 R44 S7
54006	Syre Wildlife	T143 R44 S29
54007	Ada Rod & Gun	T144 R45 S12
54008	Gary Pines	T144 R44 S8

18. Educate adults and kids on the Aquatic Invasive Species and how to keep them from entering our streams and rivers.
    a) Publish ads in the newspaper and radio promoting the Clean-Drain-Dry campaign.
    b) Educate kids through class presentations and our annual Water Festival for fourth graders.

Source Water Protection

The MN Department of Health (MDH) has completed a source water assessment for all the public water systems in the state, as required by the 1996 amendments to the Federal Safe Drinking Water Act. The following cities have had a MDH source water assessment and MN DNR appropriation water permit. Well depth (in feet), well status, aquifer(s) used, and sensitivity of the source(s) of drinking water are listed in the following tables.

Table 5: City of Shelly

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00258177	Well #4(S)	256	Primary	Glacial Deposits	Low	See (1)	No
00520973	Well #5	251	Primary	Glacial Deposits	Low	See (2)	N

Table 6: City of Halstad

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00241983	Well #2	297	Primary	Bedrock	High	See (1)	No
00241984	Well #3	293	Primary	Bedrock	High	See (1)	No

Table 7: City of Hendrum

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00147208	Well #2	298	Primary	Glacial Deposits	Low	See (2)	No
00778186	Well #3	319	Primary		Low	See (2)	No

Table 8: City of Perley

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00240075	Well #3	230	Primary	Glacial Deposits	Low	See (2)	No

Table 9: City of Ada

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00239751	Well #2	255	Primary	Glacial Deposits	Low	See (1)	No
00220498	Well #3	262	Primary	Glacial Deposits	Low	See (2)	No
00239752	Well #4	260	Primary	Glacial Deposits	Low	See (2)	No

Table 10: City of Borup

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00235774	Well #1	144	Primary	Glacial Deposits	Low	See (2)	No

Table 11: City of Gary

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00163369	Well #3	267	Primary	Glacial Deposits	Low	See (2)	No

Table 12: City of Twin Valley

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00220496	Well #4	246	Primary	Glacial Deposits	Low	See (2)	No
00429355	Well #5	243	Primary	Glacial	Low	See (2)	No

PC 4 - Appropriate Use of Natural Resources

Priority Concern 4 will focus on the appropriate use of natural resources within Norman County, using Best Management Practices (BMPs).

There have been disagreements between landowners and agencies over the appropriate use of natural resources. "Conservation" means the careful utilization of a natural resource to prevent depletion. Sometimes what is best for the farmer is not best for the land. This is where BMPs come in to play, SWCDs and other agencies exist to help the private land operators find a BMP that works for them without being too hard on the land.

Sensitive or unique areas need extra protection. The beach ridge area of Norman County is an irreplaceable natural resource area of not only the state, but also the nation. This area supports rare and endangered plants and animal communities and a valuable geological phenomenon; calcareous fens. This area is rich in gravel and is being mined aggressively throughout the Red River Valley. Mining threatens the fens and associated plant communities. Land use restrictions should be placed in these sensitive and valuable communities.

Improper land use directly leads to erosion and sedimentation, increased flooding, damage to rare and endangered species, and loss of soil productivity. The indirect impacts are; loss of federal farm programs, incorrect placement of homes and businesses, destruction of wetlands, and contamination from nonconforming sewage facilities.

Wetlands are an important part of Norman County's native habitats. They provide habitat for many of the county's fish and wildlife. They improve water quality, flood damage reduction, and ground water recharge. Many wetlands in Norman County have been converted to agriculture.

The SWCD plans to work with the DNR and other state and federal agencies, LGU's, and non-government organizations on a Wetland Restoration Strategy to restore priority wetlands that will provide lasting functional benefits.

Goals

1. Promote conservation practices & educate the residents of Norman County about the importance of proper land use.
    a) Work with the SWCD, Wild Rice Watershed District, Norman County Highway Department, NRCS, Department of Ag, and others to promote the buffer program and BMPs.

2. Implement the State Wetland Conservation Act (WCA).
    a) Act as the LGU for the county.
    b) Work with landowners, federal, state, and local agencies to enforce the WCA program.
    c) Provide informational and technical assistance to landowners inquiring about requirements and limitations of work in or near a wetland.
    d) Conduct field investigations and make wetland determinations.
    e) Assist with the wetland replacement plans; banking and restored.

3. Implement the Reinvest in Minnesota Program (RIM).
    a) Work with landowners, federal, state, and local agencies to implement easements for the RIM program.
    b) Provide informational and technical assistance to landowners about the program.
    c) Conduct annual inspections of RIM easements.

4. Advertise for the MN Agricultural Water Quality Certification Program (MAWQCP).
    a) Work with 20 landowners, federal, state, and local agencies to implement this program and help landowners become certified.
    b) Provide technical assistance and MAWQCP information to interested landowners.

5. Work with landowners to control and eradicate invasive species.
    a) Apply for Cooperative Weed Management grants when available.

FUNDING OPPORTUNITIES

Funding opportunities come from a variety of sources; federal, state, and local agencies and organizations.

Soil and Water Conservation Districts are funded through a variety of sources. Many of their program administration dollars and funding for landowner projects are state dollars allocated by the legislature and passed through BWSR. General operating funds are obtained from BWSR, County, fees for services, and grants or partnership agreements with the federal government or other conservation organizations.

Yearly Implementation Schedule

Implementation Schedule
Priority 1 - Control Water Movement

Goals	Agencies	Cost	Funding Source	Watershed	Timeline
1	SWCD, WD, NRCS, DNR, BWSR	$100,000	SWCD, NRCS, BWSR, WD	All	Ongoing
2	SWCD, WD, DNR	$10,000	SWCD, BWSR, WD	Wild Rice	Ongoing
3	SWCD, WD, NRCS, DNR, BWSR	$500,000	SWCD, NRCS, BWSR, WD	All	Ongoing
4	SWCD, NRCS, County, BWSR	$25,000	SWCD, County, BWSR	All	Ongoing

Implementation Schedule
Priority 2 - Reduce Soil Movement

Goals	Agencies	Cost	Funding Source	Watershed	Timeline
1	SWCD, NRCS, Dept of Ag	NA	Staff Time	All	Ongoing
2	SWCD, NRCS, Dept of Ag, WD	NA	Staff Time	All	Ongoing
3	SWCD, NRCS, Dept of Ag, WD, BWSR	NA	Staff Time	All	Ongoing
4	SWCD, NRCS, WD	NA	Staff Time	All	Ongoing
5	SWCD, NRCS, BWSR	NA	Staff Time	All	Ongoing
6	SWCD, NRCS, Dept of Ag, WD, MPCA	$100,000	SWCD, NRCS, BWSR, MPCA	All	Ongoing
7	SWCD, NRCS, DNR, WD, County, BWSR	$200,000	SWCD, NRCS, BWSR	All	Ongoing
8	SWCD, BWSR, NRCS	NA	Staff Time	All	Ongoing

Implementation Schedule
Priority 3 - Maintain or Improve Water Quality

Goals	Agencies	Cost	Funding Source	Watershed	Timeline
1	SWCD, Dept of Ag, Dept of Health, Norman-Mahnomen Public Health	2,500	Dept of Ag, Dept of Health, SWCD	All	Ongoing
2	SWCD, NRCS, BWSR, Dept of Health, Dept of Ag	$3,000	SWCD, BWSR. Dept of Ag, Dept of Health	All	Ongoing
3	SWCD, County	NA	County Staff Time	All	Ongoing
4	SWCD, County, Cities, Dept of Health	$5,000	Dept of Health	All	Ongoing
5	SWCD, County, MN PCA	$7,500	Mn PCA, County, SWCD	All	Ongoing
6	SWCD, WD, BWSR	$50,000	SWCD, WD, State	All	Ongoing
7	SWCD, County, MPCA	$20,000	SWCD, County, State	All	Ongoing
8	SWCD, County	$3,000	County, State	All	Ongoing
9	SWCD, County	$20,000	County, State	All	Ongoing
10	SWCD, WD, MPCA	NA	Staff Time	All	Ongoing
11	SWCD, WD's, MN DNR	NA	Staff Time	All	Ongoing
12	SWCD, NRCS	NA	Staff Time	All	Ongoing
13	SWCD, NRCS, WD, County, BWSR	$35,000	SWCD, BWSR	All	2016-2019
14	SWCD, NRCS, BWSR	NA	Staff Time	All	Ongoing
15	SWCD, State	$2,000	State	All	Ongoing
16	SWCD, DNR	$2,000	State, DNR	All	Ongoing

Implementation Schedule
Priority 4 - Appropriate Use of Natural Resources

Goals	Agencies	Cost	Funding Source	Watershed	Timeline
1	SWCD, NRCS, WD, County	$35,000	SWCD, BWSR	All	2016-2019
2	SWCD, County	$30,000	SWCD, County, BWSR	All	Ongoing
3	SWCD, NRCS	$3,000	SWCD, BWSR	All	Ongoing
4	SWCD, Dept of Ag	$3,000	Dept of Ag	All	Ongoing

ACRONYMS

AIS- Aquatic Invasive Species

BMPs- Best Management Practices

ACEP- Agricultural Conservation Easement Program

BWSR- Board of Water and Soil Resources

CRP- Conservation Reserve Program

CSP- Conservation Stewardship Program

DNR- Department of Natural Resources

DWM- Drainage Water Management

EQIP- Environmental Quality Incentives Program

FDR- Flood Damage Reduction

GPS- Global Positioning System

LGU- Local Government Unit

LWM- Local Water Management

MAWQCP- Minnesota Agricultural Water Quality Certification Program

MDA- Minnesota Department of Agriculture

MPCA- Minnesota Pollution Control Agency

NRE- Natural Resource Enhancement

RCPP- Regional Conservation Partnership Program

RIM- Reinvest in Minnesota

SWCD- Soil and Water Conservation District

TMDL- Total Maximum Daily Load

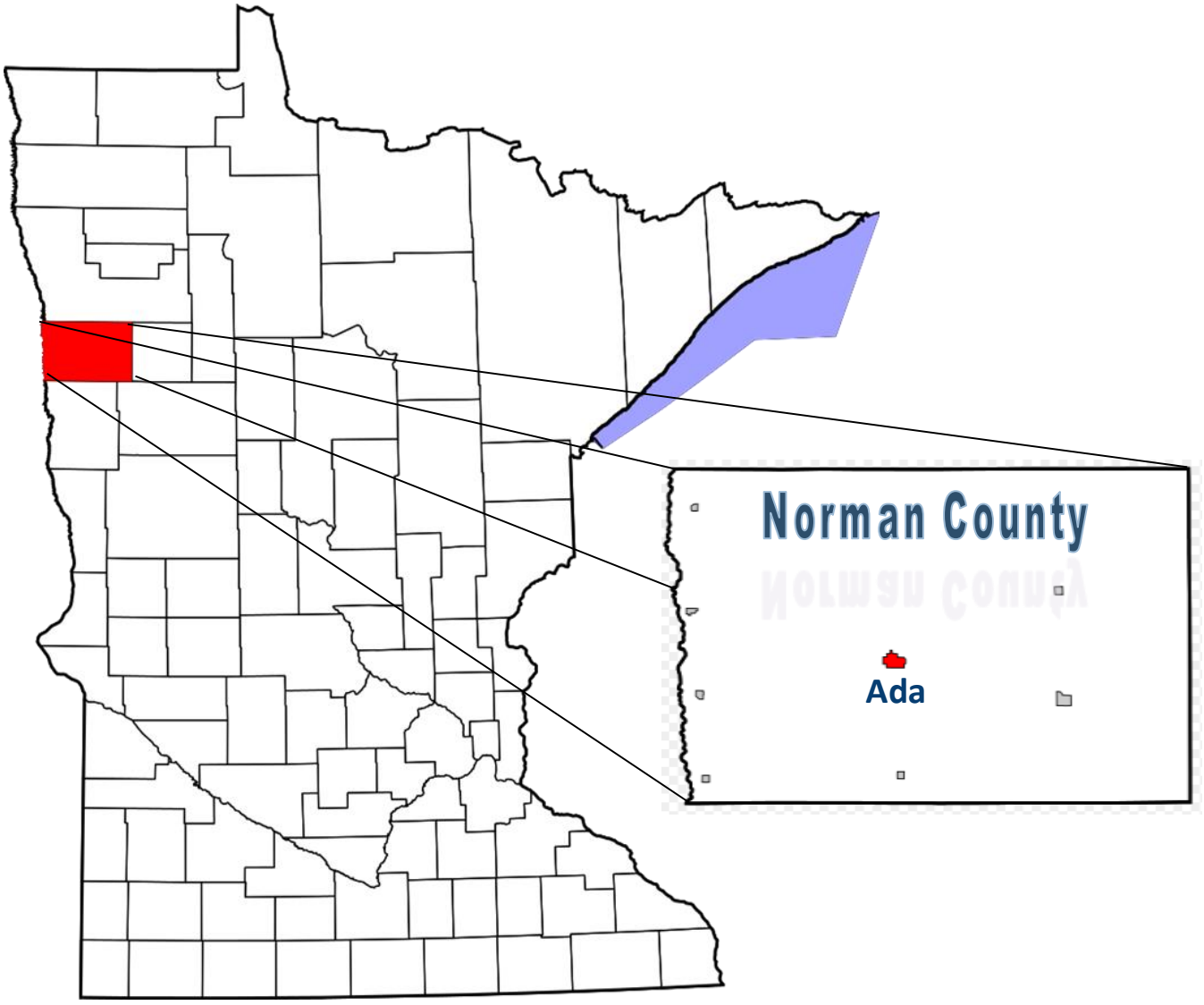
USDA- United States Department of Agriculture

WASCOB-Water and Sediment Control Basin

WRAPS- Watershed Restoration and Protection Strategy

WRP- Wetland Reserve Program

Norman County's Priority Concerns Scoping Document



The Priority Concerns Scoping Document of the Norman County Comprehensive Local Water Management Plan was developed in accordance with the changes to the Comprehensive Local Water Management Act; Statutes 103B.304 – 103B.355. The scoping document lists the priority concerns the Norman County Water Management Advisory Committee has chosen, along with a detailed account of how the concerns were identified and selected.

The updates to the Priority Concerns Scoping Document was done by the

Norman County Soil & Water Conservation District

A. INTRODUCTION

1. County Primer

Norman County is in northwestern Minnesota, with an area of 887 square miles (561,592 acres). There are 8 cities and 4 unincorporated communities. The 2010 census showed a population of 6,852. The County seat is Ada. The eight cities in Norman County include: Shelly, Halstad, Hendrum, Perley, Ada, Borup, Gary, and Twin Valley. The 4 unincorporated communities include; Faith, Lockhart, Hadler, and Syre.

Historic Populations (US Census Bureau)

Census	Population	% increase/ decrease
1890	10,618	
1900	15,045	41.7%
1910	13,446	-10.6%
1920	14,880	10.7%
1930	14,061	-5.5%
1940	14,746	4.9%
1950	12,909	-12.5%
1960	11,253	-12.8%
1970	10,008	-11.1%
1980	9,379	-6.3%
1990	7,975	-15.0%
2000	7,442	-6.7%
2010	6,852	-7.9%

2010 census by city (US Census Bureau)

City	Population
Ada	1,707
Twin Valley	821
Halstad	597
Hendrum	307
Gary	214
Shelly	191
Borup	110
Perley	92
TOTAL	**4,039**

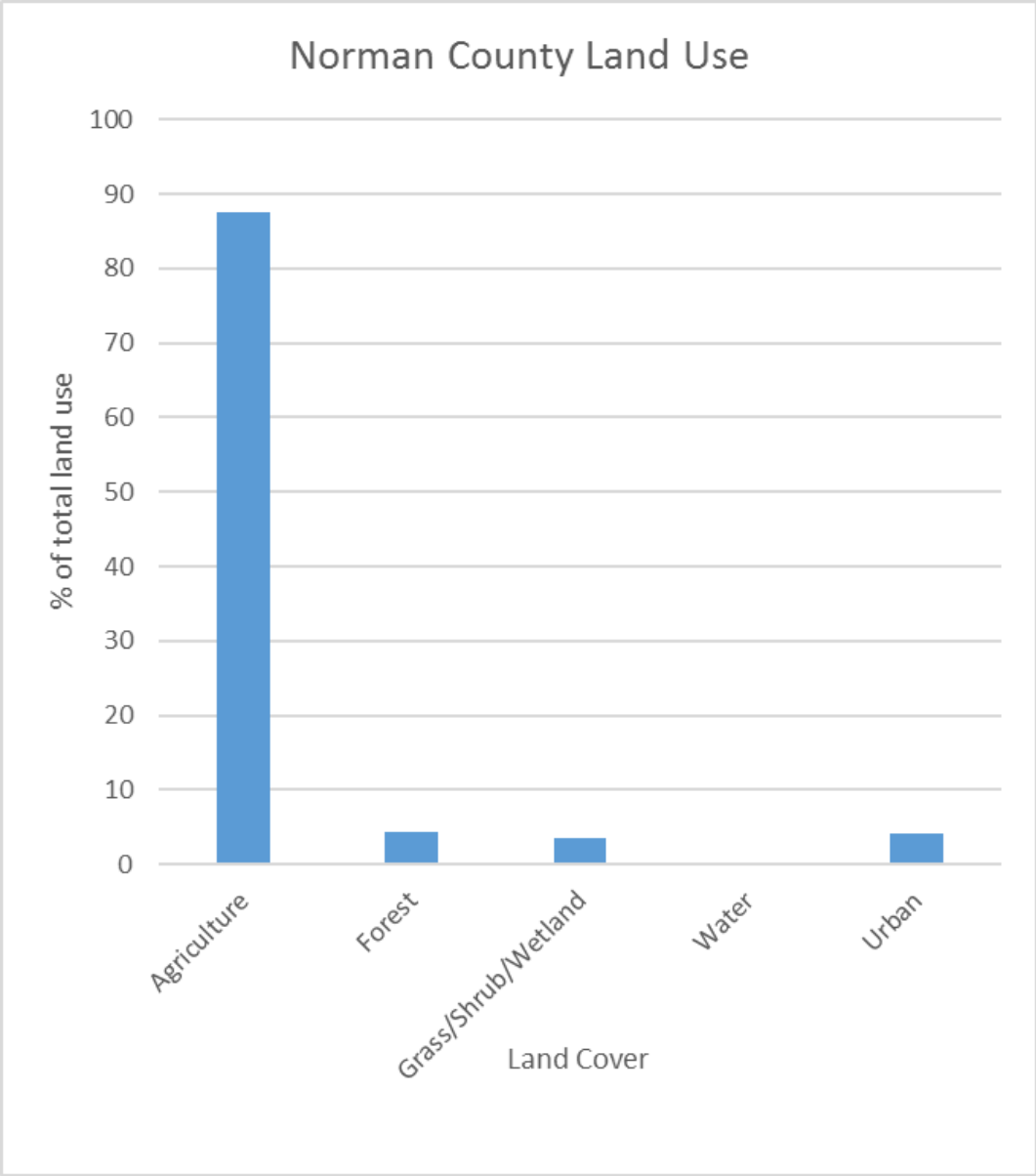
Estimated 2015 Populations for Norman County, Minnesota (Minnesota State Demographic Center)

City/Township	Population
Ada City	1702
Anthony Township	47
Bear Park Township	117
Borup City	104
Flom Township	261
Fossum Township	175
Gary City	222
Good Hope Township	46
Green Meadow Township	70
Halstad City	598
Halstad Township	96
Hegne Township	57
Hendrum City	281
Hendrum Township	100
Home Lake Township	177
Lake Ida Township	171
Lee Township	114
Lockhart Township	70
McDonaldsville Township	164
Mary Township	83
Perley City	117
Pleasant View Township	112
Rockwell Township	78
Shelly City	223
Shelly Township	96
Spring Creek Township	78
Strand Township	95
Sundal Township	115
Twin Valley City	771
Waukon Township	85
Wild Rice Township	238
Winchester Township	62

There are 24 Townships in Norman County; Shelly, Good Hope, Lockhart, Spring Creek, Sundal, Bear Park, Halstad, Anthony, Pleasant View, Green Meadow, Strand, Waukon, Hendrum, Hegne, McDonaldsville, Lake Ida, Wild Rice, Fossum, Lee, Mary, Winchester, Rockwell, Home Lake, and Flom. **(Attachment 1: Township Map of Norman County)**

A. Dominant Land Use of Norman County and Projected Trends

Norman County lies within the Red River Valley of the North. The soils left by glacial Lake Agassiz are very productive. The primary land use of Norman County is agricultural based at approximately 87%. In 2010, there were 692 farms, with 465,225 acres being cropland. The main crops are soybeans, corn, wheat and sugar beets. The percentages of land use are not expected to change in the next 10 years. Norman County has five Scientific and Natural Areas, one of which is partially in Polk County, totaling 2,479 acres. There are 14 Wildlife Management Areas totaling 5,260 acres. **(Attachment 2: Norman County Landuse Cover)**



2. Plan Information

a. Identify the LGU responsible for the local water management plan/program

The Norman County Local Water Management Plan (LWP), (previously known as the Norman County Comprehensive Local Water Plan) was first developed and approved by the Minnesota Board of Water and Soil Resources in 1990. It was developed as a five-year plan and was updated in 1997 (the 1990 – 1995 Plan was granted a two-year extension). The 1997–2002 Plan was granted a two-year extension, to match up with the Wild Rice Watershed planning process.

The Norman County Soil and Water Conservation District is responsible for the writing, development, and implementation of the Local Water Management Plan in coordination with the Local Water Management (LWM) Advisory Committee, area watershed districts, local, state, and federal agencies, private citizen groups, organizations, state associations, township boards, and municipalities.

b. Local water management plan adoption dates and the number of times it has been updated.

The Norman County Water Plan was adopted in 1990. Updates to the plan have been in 1997, 2002, 2006, 2012 and 2016.

c. Expiration date of the current plan

The current plan expires on December 31, 2016. After the plan is approved this year, it will expire in 2026 with an update in 2021.

B. Priority Concerns Addressed By The Plan

not listed by importance order

The following priority concerns were identified through prior public meetings and agency input.

1. Priority 1 puts emphasis on proper control of water movement, drainage, and retention
2. Priority 2 will focus on reducing unwanted wind and water erosion and the associated sedimentation that occurs within Norman County.
3. Priority 3 will focus on improving surface and groundwater quality at the watershed level.
4. Priority 4 concentrates on the appropriate use of natural resources by coordinating and implementing government programs.

Priority Concern 1- Control Water Movement Across Watersheds.

The fourth priority concern will focus on water movement throughout the watersheds. The water cycle has remained the same since the beginning of time. Water stored in wetlands, lakes, rivers, streams, or underground sources are all linked together throughout a watershed. Rain that falls from the sky can flow into a surface water body or filtrate through the soil into the groundwater. Eventually, water flowing over the surface or through the ground makes its way into rivers and lakes, or is absorbed by plants and trees where it evaporates or transpires to begin the cycle again, therefore it is important to control the movement of water across the watershed. A healthy watershed provides safe drinking water, conserves water, promotes streamflow, supports sustainable streams, rivers, lakes, groundwater sources, enables healthy soils for crops, manages flood and drought impacts, maintains healthy ecosystems, and contributes to tourism and recreation. There are many factors that affect the flow of water across a watershed; steepness of the slope, type of rock or soil, amount of vegetation, shape of the streambed, style of biological diversity, and obstructions. Water that falls in the form of precipitation will either soak into the soil or flow across the surface as runoff until it finds a stream, river, lake, or wetland. Runoff is excess water that is not absorbed by the surrounding area. If not properly controlled, runoff can pick up contaminants before reaching a waterbody.

There are many ways to control the movement of water across a watershed:

1. Streambank stability which stabilizes a streambank from eroding and adding sediment to the watercourse.
2. Wetland restoration which reestablishes or repairs the hydrology, plants, and soils of a former degraded wetland.
3. Vegetation
    a. Certain plants soak more water out of the ground, thus requiring more water to soak into the ground and leaving less as runoff.
    b. We cannot control the soil type, so certain types are more prone to creating runoff. Vegetation can help certain soil types absorb more water.
4. Culvert restrictions limit the sizes of new culverts or exiting culverts to manage water flow.
5. Water retention measures that aim to safeguard and enhance the water storage potential of landscape, soil, and aquifers, by restoring ecosystems, natural features and characteristics of water courses and using natural processes.
6. Conservation tillage, Ag BMP's
    a. Soil that is tilled too hard will lose its soil structure.
    b. Soil left bare without cover crop or residue is vulnerable to soil erosion, and rainwater cannot infiltrate bare soil as easily as soil with cover.
7. Shoreland Management, which regulates all land within 1,000 feet of a lake and 300 feet of a river and its designated floodplain.

Priority Concern 2- Reduce Unwanted Soil Movement

The priority concern will focus on wind and water erosion and the associated sedimentation that occurs within Norman County. This Priority Concern could benefit by the expanded use of local, state and federal programs including; CRP, EQIP, CSP, ACEP, WRP, RCPP, MAWQCP, RIM, State Cost Share and other programs. We will be monitoring surface water within local priority areas.

Wind Erosion

Wind erosion has been a long-term problem across all Norman County. The United States Department of Agriculture (USDA) has identified Highly Erodible Soils based on production loss. The soils in the western half of the county are so productive that they can lose many tons per year and remain very productive. The soils in the eastern half of the county are lighter soils and are prone to wind erosion. Wind erosion can be slowed or corrected by:

1. Field windbreaks
2. Cross-wind strip-cropping
3. Conservation tillage
4. Cover crops

(Attachment 3: Norman County Wind Erosion Priority Areas)

Water Erosion

Water erosion is a problem in the eastern half of the county where slopes are steep and soils are prone to erosion. Altering of the streambank will accelerate erosion. A stream will seek to reestablish a stable size and pattern, making streambank erosion a natural process. Damaging or removing streamside vegetation can cause a dramatic increase in bank erosion. A degrading stream bed results in higher and often unstable, eroding banks. When land use changes occur in a watershed, such as clearing land for agriculture or development, runoff increases. With this increase in runoff, the stream channel will adjust to accommodate the additional flow, increasing streambank erosion. Addressing the problem of streambank erosion requires an understanding of both stream dynamics and the management of streamside vegetation. A protected streambank not only stops accelerated erosion, but also provides shade, cover, and food for a variety of wildlife. There are ways streambank erosion can be hindered:

1. Rock rip-rap
2. Planting of vegetation along banks
3. Placement of native, natural materials (rocks, logs) to deflect flow away from sensitive areas
4. Buffers along shoreline to slow runoff

(Attachment 4: Norman County Water Erosion Priority Areas)

Water Erosion and Sedimentation

When runoff flows across bare soil or impervious surfaces, it picks up soil, waste, salt, pesticides, fertilizers, and other pollutants. This water will eventually drain directly into a

water source. This polluted runoff can be harmful to plants, fish, wildlife, and seriously degrades the quality of the water. Sedimentation occurs in the western half of the county where the general slope has dropped to less than one foot per mile. In the eastern half of the county the slopes are steep enough for the water to carry a heavy sediment load. Sediment is harmful in the following ways:

1. Fills up watercourses which will increase the potential for flooding
2. Murky water prevents natural vegetation from growing in the water
3. Sediment can disrupt the natural food chain
4. Sediment increases the cost of treating drinking water
5. Sediment can directly harm fish and other aquatic life
6. Nutrients transported by sediment can activate extreme algae growth
7. Sediment deposits can alter the flow of water, which can cause further erosion

There are different ways to slow sedimentation:

1. Water control structures
2. Cover crops
3. Buffers along water sources
4. Minimize disturbance at construction sites
5. Creation of sediment traps or ditches
6. Stabilizing sensitive soils
7. Protect slopes with perennial vegetation
8. Storm inlet protection

Priority Concern 3 - Maintain or Improve Water Quality

Water is one of the most precious resources in Norman County. It maintains crops and other vegetation, offers recreational opportunities, provides habitat and nourishment to wildlife, and provides aesthetic beauty. Groundwater provides the county with much of its drinking water. Surface water and groundwater are closely connected. Groundwater provides discharge to streams and rivers. Surface water provides recharge to groundwater. The second priority will focus on surface and groundwater quality within the watersheds. This priority concern would benefit from monitoring current wells for possible contamination, locating and sealing abandoned wells, monitoring landuse within the area of groundwater sensitivity and developing wellhead protection and management plans. Surface water quality could be improved by use of local, state and federal programs including; CSP, ACEP, RCPP, MAWQCP, RIM, EQIP, WRP, State Cost Share and other programs. Monitoring of surface water within local priority areas, and removal of contamination near surface water can improve water quality. The MPCA has identified 18 streams and rivers in Minnesota that are impaired for turbidity. These streams must have a TMDL developed for it. A TMDL is the maximum amount of a pollutant a body of water can receive without violating water quality standards. **(Attachment 5: Public Water Index) (Attachment 6: TMDL Impaired Waters)**

Groundwater quality

There are no identified groundwater contamination zones within Norman County. Nitrate problems have been identified in sand point wells and failing deep water wells within the county. Water hardness increases from east to west as the age of the water increases from 100,000 years on the east to 300,000 years on the west side of the county. The county has a very large supply of water but with aquifer recharge of 100,000 to 300,000 years that water is very limited. Wellhead protection and management plans need to be developed. Household hazardous waste needs to continue to be removed from waste streams and disposed of properly. Field irrigation is becoming more common in Norman County. While Minnesota has less irrigated cropland than drier states to its west, irrigation is not uncommon in areas of the state with sandy soils or lower total rainfall. Generally, average annual precipitation decreases from east to west across Minnesota, making irrigation more common in the western part of the state. Irrigation water management is becoming important. An objective of irrigation management is to prevent irrigation-induced soil and water quality problems such as salinity, soil erosion or leaching of nutrients or pesticides into groundwater. Crop managers must understand the potential for these problems to occur and address them as needed.

Groundwater quality within Norman County could be affected by 3 main events:

1. Contamination by failing wells. To correct this, we will help the landowners to find funding for drilling a new well,

2. Contamination by abandoned wells. There is state and federal funding available to help seal abandoned wells in the county,

3. Surface contamination entering groundwater from sources such as over applied fertilizer. We will encourage Ag BMP's to reduce misuse of agricultural chemicals.

Surface Water quality

Minnesota is abundant with surface water. The land of 10,000 lakes has 11,842 lakes over 10 acres, over 104,000 miles of streams and rivers, and about 9.3 million acres of wetlands. The task of protecting these resources is shared among numerous government organizations at the local, state, and federal level. There are also many non-government organizations and citizens who get involved. Each organization plays a critical role such as; monitoring and assessing water quality, developing strategies for restoration and protection projects, regulating activities, issuing permits, and compliance inspections. There are many ways that surface water may become impaired, a few ways include:

1. Agricultural runoff
2. Improper wastewater disposal, sewage failure
3. Impervious surfaces near open water, urban development
4. Bank erosion
5. Industrial waste
6. Animal waste

There are ways to prevent surface water degradation on sites in equilibrium, and ways to improve surface water quality of sites with impairments:

1. Buffers or filter strips to filter out impurities before the water reaches a stream, lake, river, wetland, etcetera
2. Proper application and setback limits of agricultural chemicals and fertilizers using Ag BMP's
3. Streambank erosion control structures in priority areas
4. Proper disposal of industrial waste, regulations and restrictions in sensitive areas
5. Proper disposal of waste and setback limits for feedlot operations
6. Upkeep and updating of sewage systems, especially those in or near sensitive areas
7. Construction of water retention projects to control the flow of water into a water body or system and allow time for natural filtration

Priority Concern 4 - Appropriate Use of Natural Resources

The third priority concern focuses on the appropriate use of natural resources within the county using Ag BMP's. Correct land use opinions vary greatly, depending on the opinions of landowners, local, state or federal agencies or private organizations. The harmonization of the meaning of correct, and a suitable compensation for an alternative use of natural resources will warrant whether many projects are completed in the county.

The Flood Damage Reduction (FDR) workgroup has identified priority areas for both FDR and Natural Resource Enhancement (NRE) activities within Norman County.

1. Priority NRE areas have been identified for wetland restoration and creation within the beach ridge area of eastern Norman County. This area is unique and comprises rare vegetation.
2. Priority NRE areas have been identified for water storage. In these areas, the main emphasis is on control of the water transported to the river system to reduce flooding.
3. Priority NRE areas have been identified for prairie restoration and establishment along the Wild Rice River and its tributaries.
4. Priority NRE areas would benefit from the use of local, state and federal programs including; Buffers, CSP, ACEP, RCPP, MAWQCP, RIM, EQIP, WRP, State Cost Share and other programs.

C. PRIORITY CONCERN IDENTIFICATION PROCESS

1. Public and Internal Forums Held to Gather Input Regarding Priority Concerns

- March 27, 2002- a Norman County Comprehensive Local Water Plan Task Force meeting was held to discuss the goals and their corresponding objectives and the time line of the Norman County LWP revision.

- April 2002- the Norman County Board adopted a resolution to revise the Norman County Comprehensive Local Water Plan. (Norman County Local Water Management Plan)

- May 2002- Notice of Decision to revise the Norman County Comprehensive Local Water Plan was sent to:
  - County Boards of contiguous counties
  - Watershed District Boards with boundaries within Norman County
  - All LGU's wholly or partially within Norman County
  - Minnesota Board of Water and Soil Resources – Bill Best, Board Conservationist
  - Municipalities within Norman County
  - Townships within Norman County
  - Norman County Comprehensive Local Water Plan Task Force members

- May 2002- Norman County made a request for Local Plans and Official Controls to all cities, townships, and watershed districts with boundaries of Norman County in conjunction with the Notice of Decision.

- September 3, 2002- a request on behalf of Norman County was made to the Minnesota Board of Water and Soil Resources for an extension to the Norman County Comprehensive Local Water Plan.

- October 23, 2002- the Minnesota Board of Water and Soil Resources approved Norman County's request for an extension of the Norman County Comprehensive Local Water Management Plan.

- May 5, 2004- a public informational meeting was held to gather information on local water plan priorities.

- May 5, 2004- the Norman County Local Water Management Plan Task Force met to discuss priority concerns for Norman County.

- May/June 2004- published water plan survey in the Ada Index and the Twin Valley Times.

- June 2004- ran radio ads to request residents to fill out and return surveys published in the local newspapers.

- June 21, 2004- requested priority concerns from local, state and federal agencies and organizations.

- June 1, 2006- update of the Norman County Local Water Plan.
- July 1, 2012- update of the Norman County Local Water Plan.
- December 29, 2015- resolution approved to update the Norman County Local Water Plan
- February 3, 2016- requested priority concerns from local, state and federal agencies and organizations.
- July 27, 2016- Local Water Management Plan Advisory Committee met to discuss the 2016 water plan and scoping document update and additions or changes to the Priority Concerns Scoping Document
- August 8, 2016- Local Water Management Plan Advisory Committee met to discuss the Public Meeting.
- August 8, 2016- Public Meeting for the Priority Concerns Scoping Document.
- August 12, 2016- Priority Concerns Scoping Document sent to BWSR for review and 30-day comment period.
- October 12, 2016- Priority Concerns Scoping Document approved by BWSR

C. PRIORITY CONCERNS NOT ADDRESSED BY PLAN

There are some concerns that are unable to be adequately addressed through the Local Water Management Plan. Some issues and concerns should not be addressed through this plan, but through other entities' plans and programs such as watershed districts, county planning and zoning, cities, and others.

D. ACRONYMS

Ag BMP- Agricultural Best Management Practices

ACEP- Agricultural Conservation Easement Program

CRP- Conservation Reserve Program

CSP- Conservation Stewardship Program

EQIP- Environmental Quality Incentives Program

FDR- Flood Damage Reduction

LGU- Local Government Unit

LWM- Local Water Management

LWMP- Local Water Management Plan

MAWQCP- Minnesota Agricultural Water Quality Certification Program

MPCA- Minnesota Pollution Control Agency

NRE- Natural Resource Enhancement

RCPP- Regional Conservation Partnership Program

RIM- Reinvest in Minnesota

SWCD- Soil and Water Conservation District

TMDL- Total Maximum Daily Load

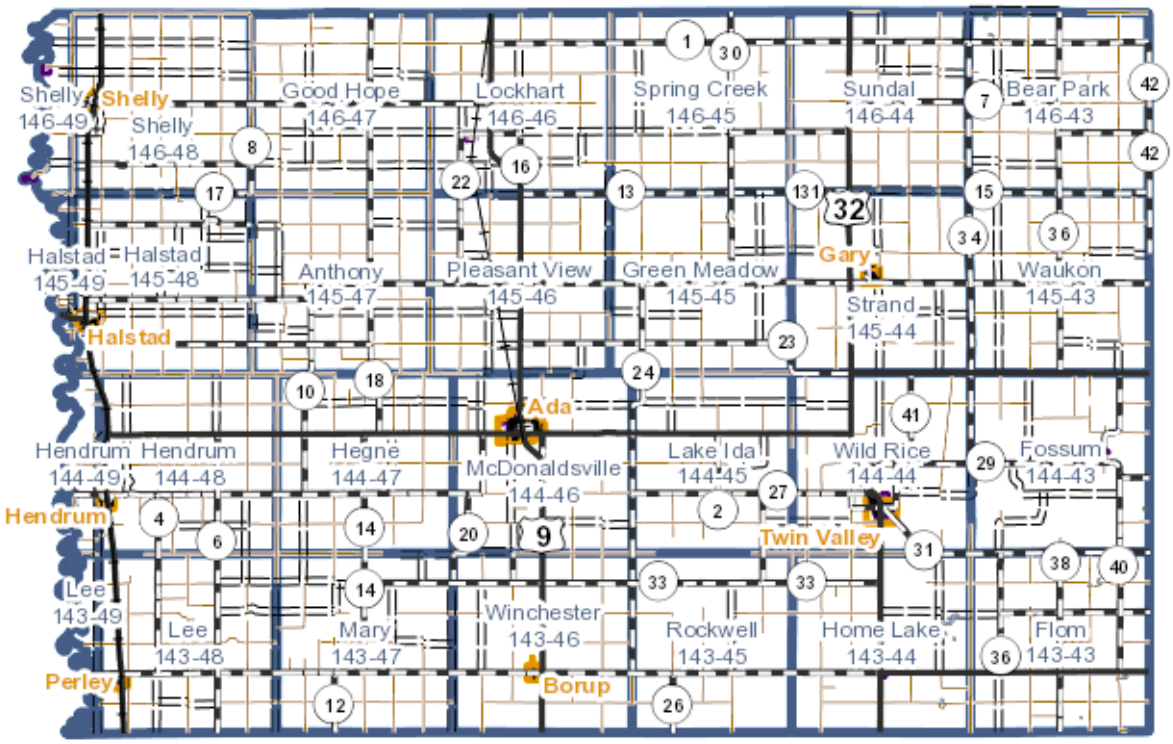
USDA- United States Department of Agriculture

WRP- Wetland Reserve Program

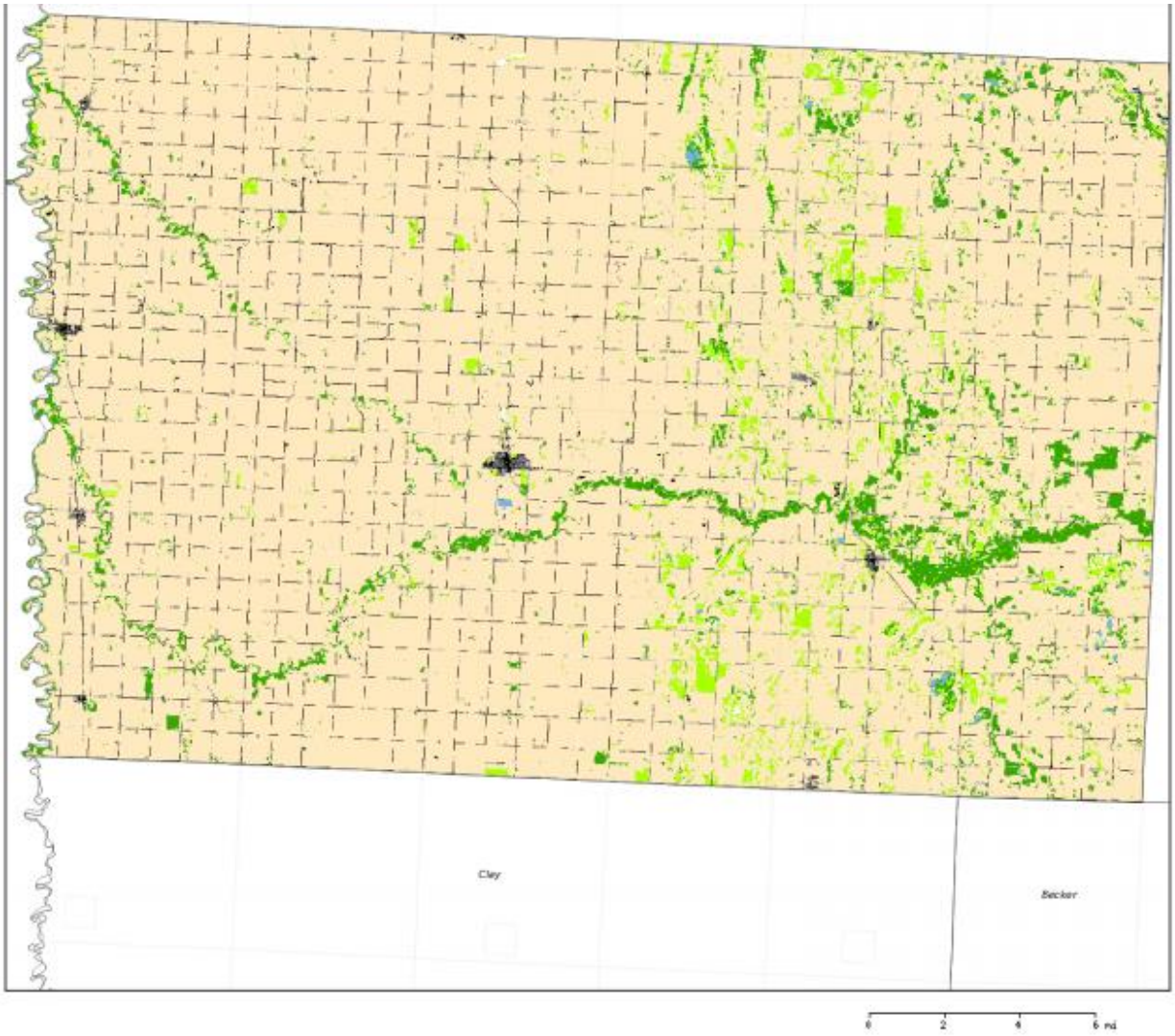
E. ATTACHMENTS

1. Township Map of Norman County
2. Norman County Landuse Cover
3. Norman County Wind Erosion Priority Areas
4. Norman County Water Erosion Priority Areas
5. Public Water Index
6. TMDL Impaired Waters
7. Watershed boundaries in relation to Norman County

Attachment 1: **Township Map of Norman County** (Norman County Website)



Attachment 2: **2000 Norman County Land Cover and Impervious Surface Area** (University of Minnesota)

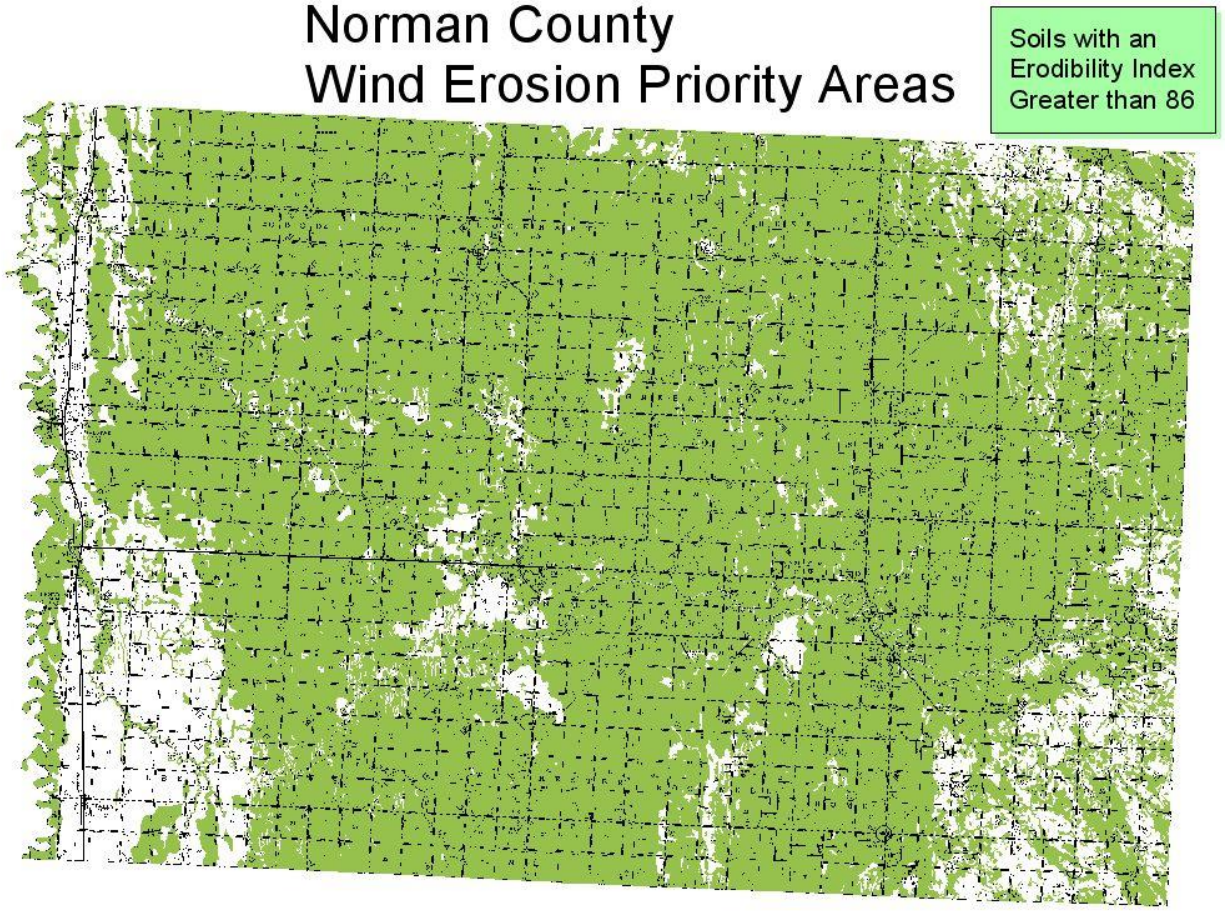


Land Cover	Acres	Percent
Agriculture	491,913	87.59
Forest	24,659	4.39
Grass/Shrub/Wetland	20,235	3.6
Water	836	0.15
Urban	23,647	4.21

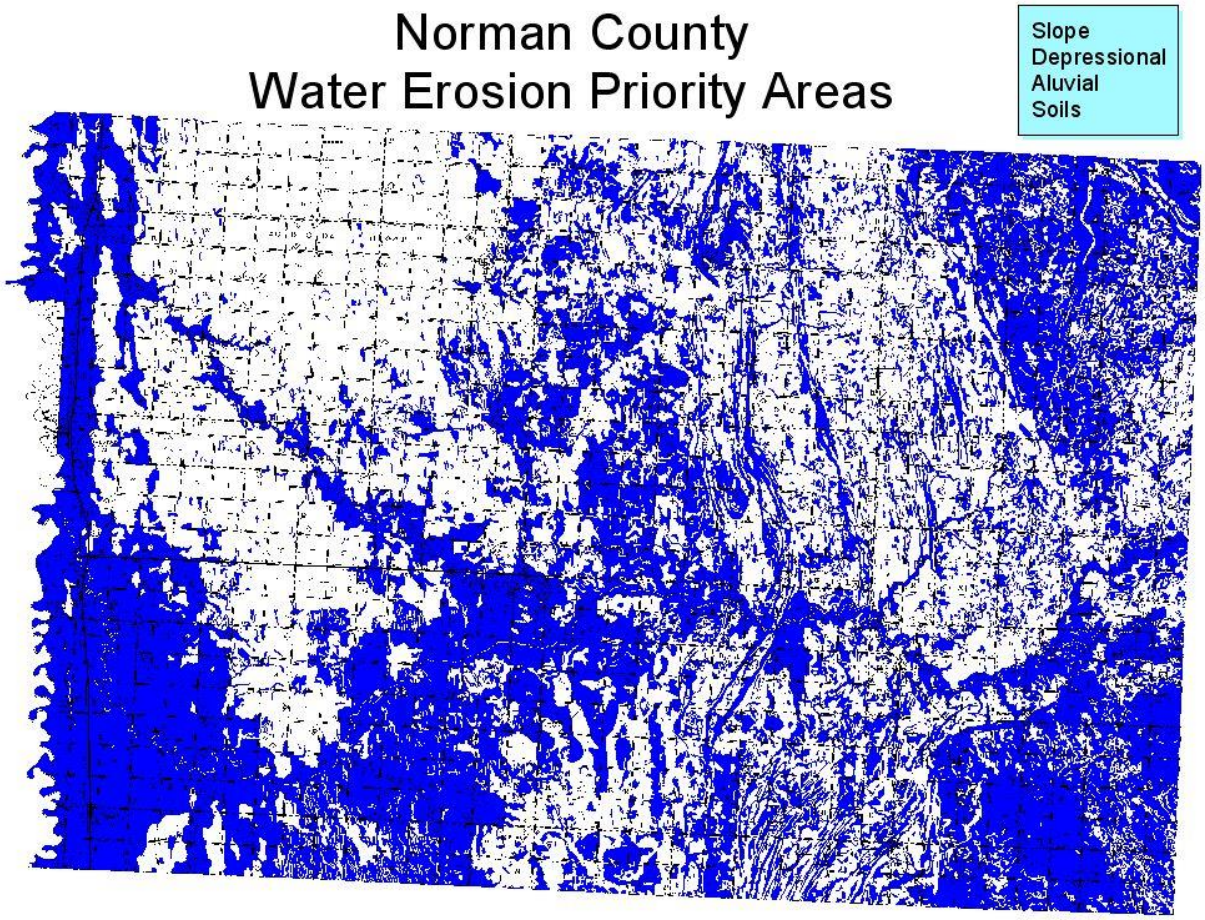
Impervious Intensity (%)	Acres	Percent	Weighted Impervious Area (%)
0	539,036	95.98	0
1-10	2,426	0.43	0.02
11-25	3,917	0.7	0.13
26-40	3,919	0.7	0.22
41-60	4,305	0.77	0.39
61-80	3,820	0.68	0.48
81-100	4,184	0.75	0.68

Total Area:	561,592	Acres
Total Impervious area:	10,802	Acres
Percent Impervious Area:	1.9	%

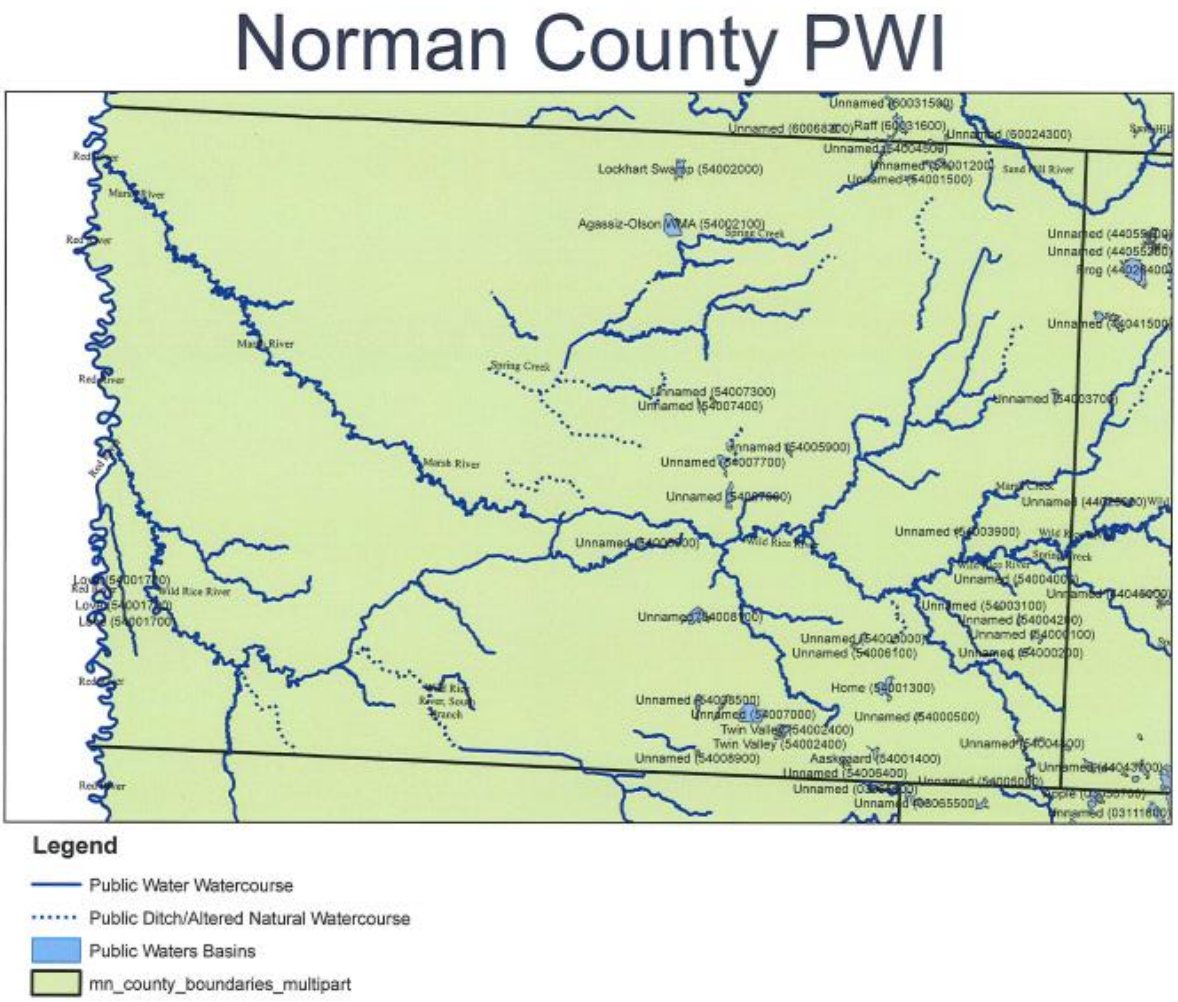
Attachment 3**: Norman County Wind Erosion Priority Areas**



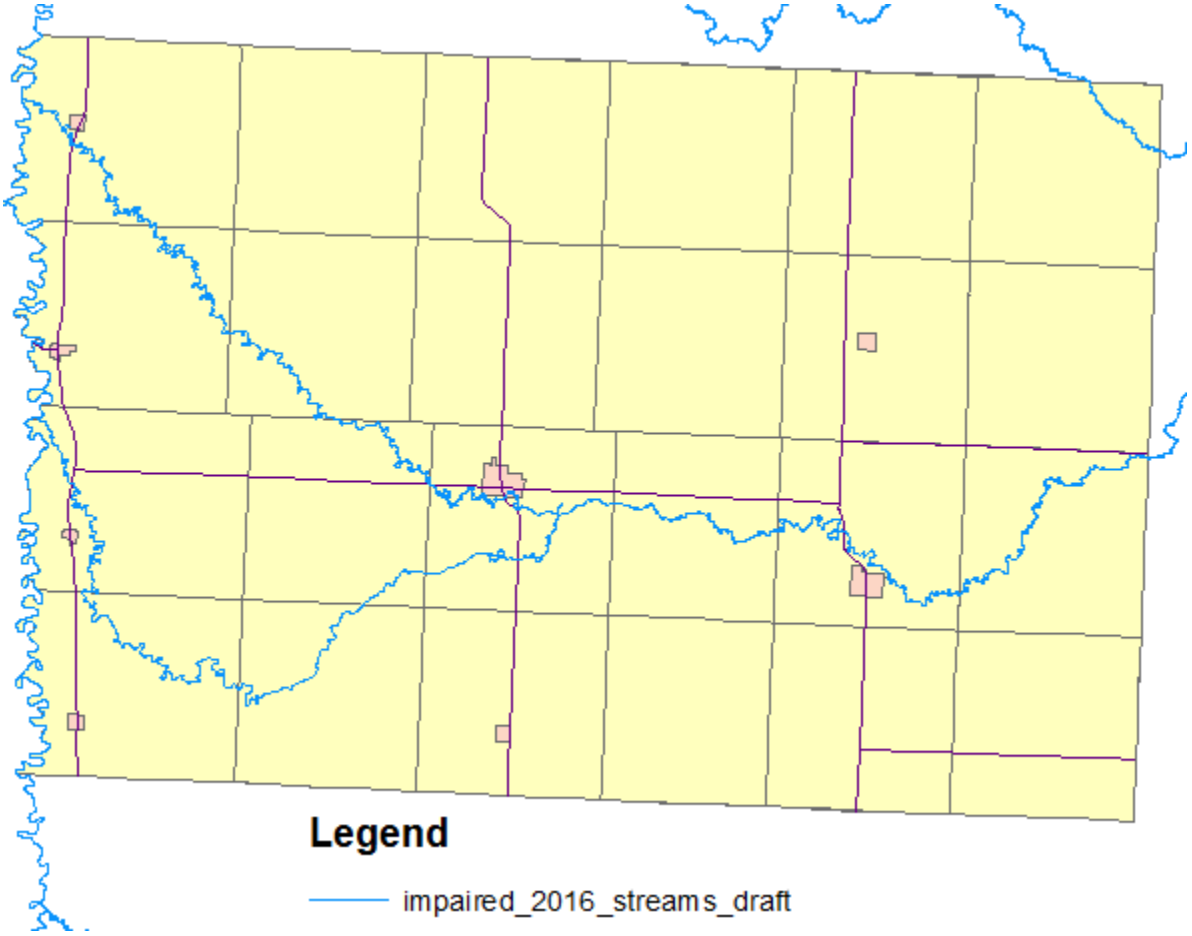
Attachment 4: **Norman County Wind Erosion Priority Areas**



Attachment 5: **Norman County Public Water Index**



Attachment 6: **TMDL Impaired Waters** (MPCA)



Attachment 7: **Watershed Boundaries in relation to Norman County**