

Otter Tail County

Local Water Management Plan



***August 31, 2009 –
August 31, 2019***

(Amended 2014)



Prepared by Bayerl Water Resources, with mapping by
Otter Tail County GIS Department and BWSR and technical
assistance from the LWMP task force

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY	I-1
A. Background	I-1
B. Plan Purpose	I-1
C. Description of Priority Concerns	I-2
D. Consistency with Other Plans	I-2
E. Recommendations to Other Plans and Official Controls	I-3
II. PRIORITY CONCERNS	II-1
A. Priority Concerns Identification	I-1
1. Surface Water Issues	II-6
a) Water Quality	II-6
Surface Water Assessment and Management Planning	II-6
LiDAR	II-6
Impaired Waters / TMDL	II-7
Data Collection and Lake Association Support	II-10
Wetlands and Wildlife Habitat	II-14
Agriculture	II-18
Minnesota Ag Water Quality Certification Program	II-24
Soil Health Initiative	II-24
Drainage Water Management	II-24
Central Minnesota On-Farm Nitrogen Management Program	II-25
Lakescaping	II-25
Emergent Aquatic Vegetation Mapping	II-26
b) Regulatory Issues	II-27
Shoreland Regulations	II-27
Otter Tail County Buffer Initiative	II-27
Platting	II-28
Long-Range Planning	II-30
Sensitive Areas	II-33
Stormwater Regulations	II-35
Agriculture Rules	II-39
Aquatic Invasive Species	II-39
c) Surface Water Quantity	II-40
OHWL	II-40
2. Groundwater Issues	II-42
a) Groundwater Quality	II-42
Nitrates and Arsenic	II-42
Source Water Protection / Wellhead Protection	II-45
Weather Station Network	II-47
Irrigation Scheduler Program	II-48
Irrigation Education and Outreach	II-48
Irrigation Water Management	II-48
DNR Observation Well Monitoring	II-48
Private Well Monitoring	II-48
Sub-Surface Sewage Treatment Systems	II-49
b) Quantity Issues	II-52
Precipitation	II-52
Geology and Soils	II-54
B. Goals, Objectives and Actions addressing Priority Concerns	II-57

Surface Water Priority Issues	II-58
Water Quality Goal.....	II-58
Regulatory Issues Goal	II-68
Groundwater Priority Issues.....	II-72
Groundwater Quality Goal	II-72
Groundwater Quantity Goal.....	II-76
III. IMPLEMENTATION SCHEDULE.....	III-1
Priority Issue: Surface Water Quality	III-1
Priority Issue: Regulatory Issues	III-6
Priority Issue: Groundwater Quality	III-7
Priority Issue: Groundwater Quantity.....	III-9
IV. ON-GOING PROGRAMS	IV-1
APPENDIX	A-D
Priority Concerns Scoping Document	A-1 – A-17
References.....	B-1
Additional Plans.....	C-1
Revision Documents.....	D-1

LISTING OF MAPS AND TABLES INCLUDED IN PLAN

FIGURE	TITLE	SECTION-PAGE
ONE	BASE MAP WITH WATERSHED BOUNDARIES.....	II-2
TWO	2008 LAND USE	II-4
THREE	IMPAIRED WATERS MAP.....	II-8
FOUR	CARLSON’S TROPHIC STATE INDEX	II-11
FIVE	NATIONAL WETLANDS INVENTORY MAP.....	II-15
SIX	DRAINED WETLANDS INVENTORY MAP	II-16
SEVEN	PUBLIC LANDS SURVEY MAP	II-20
EIGHT	2008 CROPLAND DATA MAP	II-22
NINE	AQUATIC VEGETATION MAP OF DEAD LAKE	II-26
TEN	SHORELAND BUFFER MAP	II-29
ELEVEN	TSI / PROPERTY VALUE COMPARISON MAP	II-31
TWELVE-FIFTEEN	PROPERTY DEVELOPMENT STUDY.....	II-32 – II-33
SIXTEEN	BLUFFS MAP	II-34
SEVENTEEN	TOPOGRAPHY MAP.....	II-36
	Infested Waters.....	II-40
EIGHTEEN	OHWL	II-41
NINETEEN	NITRATE-NITROGEN PROBABILITY MAP.....	II-42
TWENTY	GROUNDWATER SENSITIVITY MAP	II-44
TWENTY-ONE	ARSENIC PROBABILITY MAP	II-45
TWENTY-TWO	WELLHEAD PROTECTION AREAS	II-46
TWENTY-THREE	SOURCEWATER PROTECTION AREA – FERGUS FALLS.....	II-47
	Otter Tail County Aquifer Vulnerability.....	II-49
TWENTY-FOUR	SEPTIC SYSTEM ABATEMENT MAP.....	II-50
TWENTY-FIVE	SEPTIC SUITABILITY MAP.....	II-51
TWENTY-SIX	PRECIPITATION ISOLINES MAP - MINNESOTA.....	II-52
TWENTY-SEVEN	GLACIATIONS MAP	II-54
TWENTY-EIGHT	DISTRIBUTION OF WATERSHED AREA.....	II-55

TABLE

A	LAND USE COMPARISON	II-5
B	STREAM IMPAIRMENTS	II-7
C	LAKE IMPAIRMENTS	II-9
D	TSI AVERAGES 1996-2008	II-12 – II-13
E	WETLANDS BY WATERSHED	II-14
F	PRESERVATION ACTIVITY	II-17
G	RUSLE REVISED UNIVERSAL SOIL LOSS EQUATION	II-18
H	OTTER TAIL COUNTY CROP HISTORY.....	II-19
I	CROP INVENTORY.....	II-23
J	PLATS	II-28
K	WATER APPROPRIATION PERMITS.....	II-53
L	SOIL ASSOCIATIONS	II-56

I. Executive Summary

The priority concerns of the residents of Otter Tail County have been well documented through a survey process and two public meetings conducted for that purpose. Each of these concerns will be addressed at length in this plan, with emphasis on surface and groundwater resources. These two resources were identified by survey as the most threatened. The Priority Concerns Scoping Document can be found, in its entirety, in the Appendix of this plan.

A. Background

Otter Tail County is located in west-central Minnesota amid the sandy glacial outwash plain with gently rolling hills. Along the northwestern and southeastern edges lie steeper hills and bluffs. The majority of the county's 1,048 lakes are formed in the sandy areas. The Pelican and Otter Tail Rivers flow to the west in the Red River Watershed, then north to Hudson Bay. The Leaf River starts north of Henning and flows to the Red Eye River and out the eastern edge to the Upper Mississippi River, while the Pomme de Terre and Chippewa Rivers headwater in the southwest corner and flow to the Minnesota River. Both the Upper Mississippi and the Minnesota Rivers end up in the Gulf of Mexico. The continental divide runs along the major basin boundaries. The City of Fergus Falls is the county seat. The population in Otter Tail County between 1990 and 2000 has increased by 12.7%. The number of households has risen 16.2%, from 19,510 in 1990 to 22,671 in 2000. A greater than 40% increase in population is predicted throughout the county. Development is occurring mainly around the lakes and greater than 50% growth is predicted in Perham, Pelican Rapids, Otter Tail and New York Mills.

Agriculture, in the form of cultivated land is the dominant land use within the county. In the past twenty years, cultivated land has decreased and grasslands have doubled. The county acreage includes 12% water and 4.7% wetlands classification.

Otter Tail County's Local Water Management Plan (LWMP) is implemented by the Soil and Water Conservation Districts. Due to the size of the county, it is split into the East and West Otter Tail SWCD. Currently, the administration of the LWMP is the responsibility of East Otter Tail Office Manager, with support from the West Otter Tail District Manager. The original LWMP was formally adopted on October 10, 1990. The responsible government unit for implementation of the original plan was the Land and Resource Management Department. Two plan revisions have been implemented since then. This third revision will be implemented by August 31, 2009.

B. Plan Purpose

The purpose of this LWMP is to identify existing and potential problems and opportunities for protection, management and development of water resources and related land resources in Otter Tail County. Pursuant to the requirements of Minn. Stat. 103B.311subd., the five requirements of this plan are as follows:

1. The plan must cover the entire county.
2. The plan must address problems in the context of watershed units and groundwater systems.
3. The plan must be based upon principals of sound hydrologic management of water, effective environmental protection, and efficient management.
4. The plan must be consistent with local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or ground water system.

-
5. The plan will be effective for a ten year period until August 31, 2019; with the Goals, Objectives & Action Items amended by August 31, 2014.

Changing development patterns and economic growth will eventually create more pressure on natural resources and impact agricultural, water resources and recreational needs of Otter Tail County residents.

C. Description of Priority Concerns

Following a series of two public participation meetings in Otter Tail County, priority concerns were established. These meetings were facilitated with both a survey of perceived threatened resources and problems within the county and an active participation process to address these problems. From this process, Development Pressure was identified as the over-reaching issue for Otter Tail County. Based on this premise, the following priority concerns were identified:

1. Surface Water Quality Issues
 - a. Water Quality Issues
 - i. Targeting the restoration and protection of surface water by using tools like lake assessments, MPCA WRAPS, and other assessment tools to prioritize water quality projects.
 - ii. Continuing to support shoreline specialist position.
 - iii. Support and implement watershed based assessments and plans developed.
 - iv. Support surface water quality monitoring efforts.
Drainage water management
 - b. Regulatory Issues
 - i. Lake re-classification, Alternative shoreland rules, Agricultural rules, Support state-wide process, Agriculture advisory task force
 - ii. Otter Tail County Shoreland Buffer Initiative
 - iii. Sanitation Code
2. Groundwater Issues:
 - a. Quality Issues:
 - i. Elevated nitrate concentration in drinking water, public and private.
 - ii. Educational efforts for ag producers (Programs and workshops)
 - iii. Irrigation management, tools for irrigators and weather data
 - iv. Nutrient management
 - v. Reductions in CRP acres
 - vi. Septics
 - vii. Ag BMPS
 - b. Quantity Issues:
 - i. Pumping to other watersheds, Ethanol plants, Increased demand for irrigation water
 - ii. Impacts of increased tile drainage.

These issues will be the focus in the establishment of goals, objectives and strategies for implementation.

D. Consistency of plan with other pertinent local, state, and regional plans

Numerous plans were considered in the completion of this document. Major basin plans

include the Minnesota Red River Basin Water Quality Plan, Upper Mississippi Basin Plan and the Minnesota River Basin Plan. Watershed District Plans include the Buffalo-Red and Bois de Sioux. Watershed joint-powers and associations with plans include the Otter Tail River, the Pomme de Terre River, and the Chippewa River Watersheds. Wellhead protection plans from the cities of Perham and Parkers Prairie were reviewed for appropriate strategies; as well as plans from the Pelican Group of Lakes Improvement District, Long Range Planning Task Force report and recommendations, “Building Local Partnerships for Managing Water Resources in Otter Tail County”, and US Fish and Wildlife Service Comprehensive Conservation Plan and Environmental Assessment. These plans were reviewed for compatibility and collaboration. Otter Tail County Local Water Management Plan update has utilized appropriate action items to support these plans, and is consistent with the data and goals presented therein. All relevant plans developed between 2014-2019 may be integrated into the Water Plan.

E. Recommendations to Other Plans and Official Controls

The Otter Tail County Local Water Management task force supports the statewide revision of the Shoreland Regulations. It was the feeling of the general public, supported by the task force, that the existing regulations do not adequately preserve the sensitive shorelines that are still undeveloped.

II. Priority Concerns

A. IDENTIFICATION OF PRIORITY CONCERNS

The priority concerns of the residents of Otter Tail County have been well documented through a survey process and two public meetings conducted for that purpose. Each of these concerns will be addressed at length in this chapter, with emphasis on surface and groundwater resources. These two resources were identified by survey as the most threatened. The Priority Concerns Scoping Document can be found, in its entirety, in the Appendix of this plan.

Otter Tail County is comprised of three major basins, which affects surface water flow. As shown in [Figure One](#), the majority of the county lies within the Red River Basin. The edge of this basin is the continental divide. Land within this basin flows, essentially, to the south and west within Otter Tail County, then north to Hudson Bay. There are five watersheds within this basin that cross the county borders. The largest of these is the Otter Tail River watershed. This is the area containing the majority of lakes and development within the county. The others have minimal area within the county boundary and are the Buffalo, Red, Boise De Sioux, and Mustinka. Of these watersheds, the Buffalo-Red, Bois de Sioux, and the uppermost portion of the Cormorant Lakes are governed by a watershed district. Both quality and quantity of water is regulated by these districts and long-range plans have been completed to provide for this.

The Mississippi River Basin covers the whole eastern border of the county. About 25% of the water in Otter Tail County flows through the Long Prairie, Redeye and Crow Wing watersheds into the Mississippi basin, then south to the Gulf of Mexico. This basin is less densely populated and is comprised of numerous wetlands.

The south central land within Otter Tail County drains to the Minnesota River and is a part of the basin of that name. Two watersheds, the Pomme De Terre and the Chippewa River, originate here. This area represents about 15% of the county and the water flows south, eventually entering the Mississippi River also.

Minor watersheds (lakesheds) lie within each major watershed. These watersheds, or drainage areas, flow to the lowest spot within the boundary, then out to another lakeshed. This area is usually a lake or waterway. Preservation of our water resources is a function of land use throughout the county.

Basin plans are available for the following watersheds and will be considered for common goals and action items:

- Minnesota Red River Basin Water Quality Plan (adopted 1999)
 - o Boise De Sioux Watershed Plan Update (adopted 2003)
 - o Otter Tail River Watershed Basin Plan (adopted 2003)
 - o Buffalo–Red River Watershed District Watershed Management Plan (update in process)
- Upper Mississippi River Basin (adopted 2003)
- Minnesota River Basin (adopted 2001)
 - o Pomme De Terre River Watershed Implementation Plan (adopted 2002)

Figure One

Otter Tail County Watershed Base Map

Explanation of Features

Major Watersheds

-  Red River
-  Crow Wing River
-  Chippewa River
-  Bois De Sioux River
-  Buffalo River
-  Mustinka River
-  Long Prairie River
-  Pomme De Terre River
-  Redeye River
-  Otter Tail River

Major River Basins

-  Minnesota River Basin
-  Mississippi River Basin
-  Red River Basin
-  Minor Watersheds
-  Lakes
-  Township Boundary
-  Cities
-  Interstate
-  MN Highways
-  US Highways
-  Undefined Stream
-  River or Creek

© COPYRIGHT OTTER TAIL COUNTY 2003
THIS MAP WAS COMPILED FROM
MULTIPLE DATA SOURCES AND IS
INTENDED FOR REFERENCE USE ONLY.
OTTER TAIL COUNTY DOES NOT ASSUME
LIABILITY FOR ERRORS, INACCURACIES
OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

Groundwater flows in a similar manner, but underground where it cannot be seen. Direction of flow of groundwater and surface water are not always related. Groundwater can flow across the “continental divide” because the flow beneath the surface is not influenced by land forms on the surface. Groundwater sources, aquifer sizes and movement have been “mapped” by the Minnesota Department of Natural Resources (DNR) through the completion of a Regional Hydrogeologic Assessment in 2002.

Regional Hydrogeologic Assessment maps are available on the DNR website at:
www.dnr.state.mn.us/waters/groundwater_section/mapping/status.html.

The following sections will address the five priority concerns in Otter Tail County. All maps and tables will show watershed boundaries, and assessments will take into consideration the drainage within the areas of concern.

ASSESSMENT OF PRIORITY CONCERNS - DEVELOPMENT PRESSURES

Development pressures are the overreaching issues in Otter Tail County. It was the consensus of the task force that all issues of concern in the County are linked to development pressures and the need for tools to manage them.

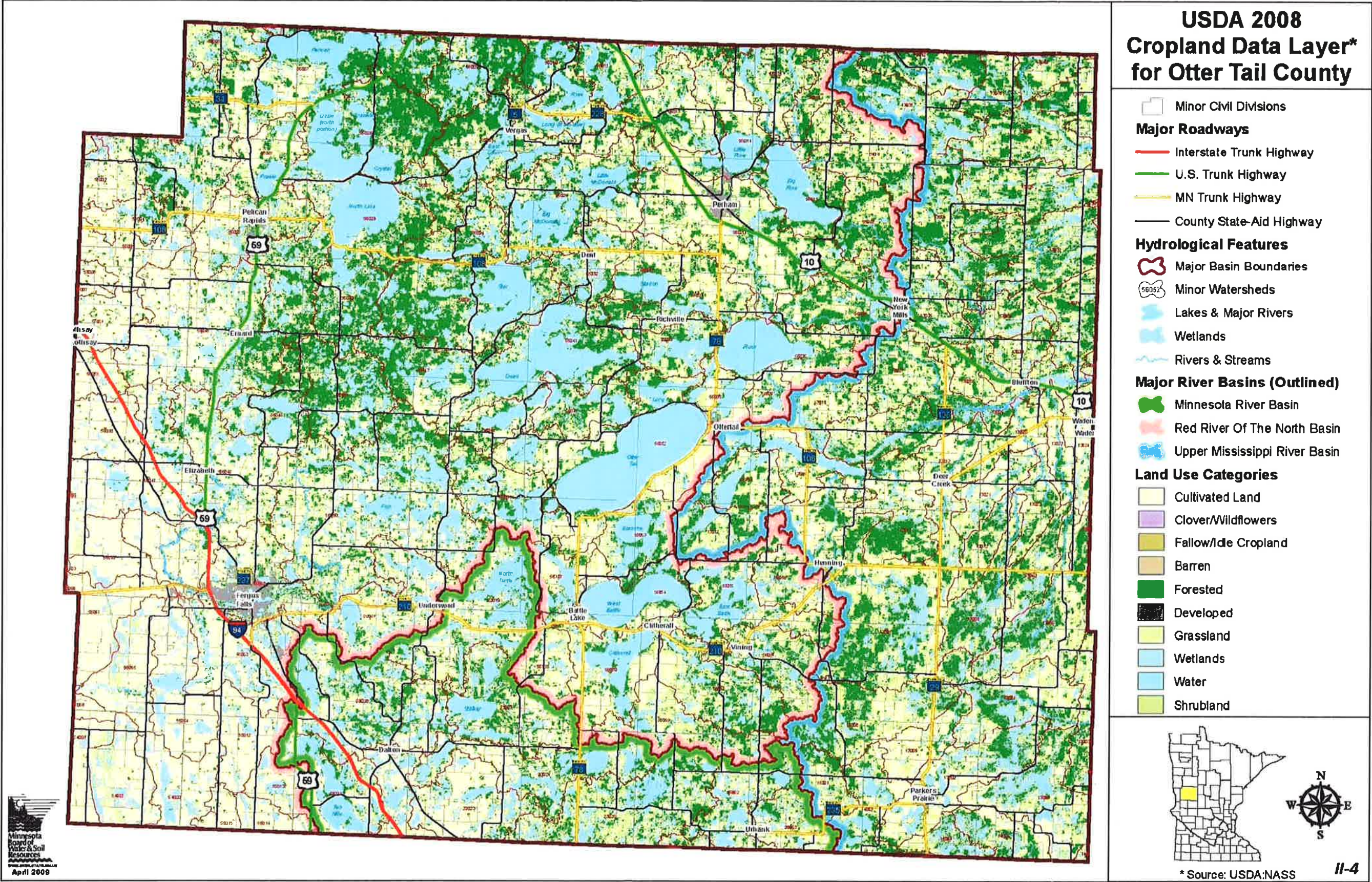
During the public input process, development and the pressures on the lakes created by development were the number one concern of residents of Otter Tail County. Comments included concerns regarding urban development in rural areas; large dwellings on small, non-conforming lakeshore lots; loss of both terrestrial and aquatic wildlife habitat; effects of development in sensitive areas; and the need to regulate development county-wide.

The **population** in Otter Tail County between 1990 and 2000 has increased by 12.7%. The number of households has risen 16.2%, from 19,510 in 1990 to 22,671 in 2000. Development is occurring mainly around the 1,048 lakes that exist in the county.

Census information is available at the Minnesota State Census Bureau’s website at: <http://server.admin.state.mn.us/resource.html?id=7376>

Population trends derived by the Minnesota State Census Bureau give the predicted growth out to 2030. According to the website, the adjusted 2000 population of Otter Tail County is 55,762. The predicted growth by 2030 is a greater than 40% increase in population throughout the county. Greater than 50% growth is predicted in Perham, Pelican Rapids, Otter Tail and New York Mills cities – along with the partial bordering cities of Wadena and Rothsay. Three cities are predicted to have negative growth: Vining, Urbank, and Erhard. Nine townships surrounding these three cities and outside the lakes area are also predicted to have negative growth. The 23 townships with expectations of more than 50% increase in population are located in the lakes area, a prediction of the future use of this resource within the County. The lakes provide resources to both residents and seasonal people. Of the greater than 60,000 parcels in Otter Tail County, 24% are seasonal, non-homestead. These property owners provide 22% of the gross property taxes. Based on the USDA 2008 Cropland Data Layer for Otter Tail County, shown in **Figure Two**, cultivated land, deciduous forest, water and grassland are the major land uses in Otter Tail County. There is some variation by watershed.

Figure Two



Land use in Otter Tail County was mapped and assessed in 1989 and again in 2008. Comparisons of the two assessments show the changes that have occurred in this almost 20-year span. When broken down by major basin, cultivation remains the main land use throughout the basins. Cultivated land, as noted in [Table A](#), comprised over 40 percent of the land area in all basins in the 1989 land use survey. Since then, there have been changes in land use. In the 2008 survey, cultivated crops have diminished from between 20 and 42 percent in the three basins. This is partially due to land use changes, and partially due to better mapping technology. The Red River Basin comprises approximately 63 percent of the area of the county. The Minnesota and Mississippi River Basins make up 11 and 26 percent, respectively.

Land Use by Major Basin									Table A			
	Red River				Minnesota River				Mississippi River			
Basin	1989 Land Use		2008 Crop Data		1989 Land Use		2008 Crop Data		1989 Land Use		2008 Crop Data	
Land Use	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total
Evergreen	3,795	0.4	5,245	0.6	0	0.0	420	0.3	10,233	2.7	2,114	0.6
Cultivated	429,127	47.9	228,974	25.6	65,242	41.9	33,625	22.7	175,042	46.7	61,485	16.1
Deciduous	157,255	17.5	196,280	21.9	27,353	17.6	29,202	19.7	78,540	20.9	112,119	29.4
Developed	20,305	3	60,605	6.8	2,150	1.0	10,178	6.9	5,517	1	19,939	5.2
Barren Land	1063	0.1	124	0.0	222	0.1	11	0.0	229	0.1	42	0.0
Grassland	78,195	8.7	205,957	23.0	16,798	10.8	40,353	27.3	44,231	11.8	137,447	36.1
Grassland-Shrub-Tree	9,606	1.1	631	0.1	1,311	0.8	250	0.2	15,798	4.2	1,953	0.5
Mixed Forest	0	0	391	0.0	0	0.0	35	0.0	3	0	511	0.1
Transitional Agricultural	19,867	2.2			6,633	4.3			12,591	3.4		
Clover / Wildflowers			20	0.0			1	0.0			46	0.0
Fallow/Idle Cropland			85	0.0			2	0.0			12	0.0
Unclassified	3,212	0.4			4,512	2.9			2,695	0.7		
Water	137,022	15.3	136,208	15.2	23,493	15.1	23,085	15.6	8,647	2.3	8,692	2.3
Wetlands	36,907	4.1	60,285	6.7	8,035	5.2	10,947	7.4	21,446	5.3	36,669	9.6
Total	896,354	100	894,806	100	155,749	100	148,108	100	374,972	100	381,030	100

2008 USDA NASS Crop Data Layer

An increase in developed land is noted from 1989. This correlates with census data and has a relationship with population growth. The majority of this development has taken place in the Red River Basin, where most of the lakes in the county and The Otter Tail River exist.

There is a slight increase in wetland acreage – some due to the available restoration programs and CRP and some due to better mapping capability. The largest increase in land use is in the grassland category. Grassland doubled in the Red and Minnesota River basins and more than tripled in the Mississippi River Basin. Programs that place marginal land into reserve for wildlife habitat and erosion control have been promoted strongly in the county. It is important to continue to protect these marginal lands.

1. **Surface Water Issues**

The surface water issues being faced include general water quality and regulatory issues.

a) **Water Quality**

Lake Water Quality Assessment Program, or LAP studies, is conducted by the MPCA to assess the overall condition of a lake. The MPCA works closely with lake associations, collecting lake data, watershed and historic information. Fourteen lakes have completed this program in Otter Tail County. These lakes include: Big Pine, Clitherall, Dead, East Battle, Stuart, Six, Long (at Vergas), Marion, Pelican, Rush, and Wall. Wall was completed in 1987, and re-analyzed in 1996 for trends. Education involving LAP studies should be presented to lake associations with encouragement to apply to the program. Lake Lida and Star were completed in 2000 and Lake Seven in 2006.

Further information on LAP's completed is available at:
<http://www.pca.state.mn.us/water/lakereport.html>

Otter Tail County rivers and streams are important for recreation, transportation, and as a source of clean water for many plants and animals...including humans! Testing on the Otter Tail and Red River in Otter Tail County has been conducted by Minnesota State University, Moorhead. Parameters tested include: Temperature, pH, Turbidity, Total Solids, Total Nitrates, Dissolved Oxygen, and Biological Oxygen Demand. This data has been compiled since 1992. Trends in this data should be charted and analyzed.

Data can be found at:
<http://www.mnstate.edu/regsci/water/index/html>

Surface Water Assessment and Management Planning is an important tool for individual lake associations and LID's to take a look at the needs of property owners vs. needs of the lake. Taking an in-depth look at the immediate watershed of the lake, noting potential contaminant sources, and devising a systematic plan to alter land use to benefit the water resource for protection or water restoration purposes is one of the actions of this process. The other is involving the landowners in the process. Providing guidance is an important part of Otter Tail County's Local Water Management Plan. Mapping for Lake Management Plans is provided by the Otter Tail County GIS Department. Light Detecting and Ranging, or LiDAR is a remote sensing technology that uses laser scanning to collect height or elevation data. This mapping is to be completed in 2009 and will provide accurate contour data for these assessments. Known lake associations with completed management plans include Little McDonald, Kerbs and Paul Lake Improvement District, Lida Lake Property Owners Association, Star Lake, Big Pine Lake, Marion Lake and Dead Lake Association. The LWMP utilizes input from management plans when planning implementation strategies.

LiDAR or Light Detection and Ranging will continue to be utilized to prioritize and target high priority projects. Several LiDAR tools are currently available including the International Water Institute's Water Quality Decision Support Application (WQDSA), Stream Power Index rankings in the South Branch of the Buffalo-Red River Watershed District, and NRCS LiDAR tools which allow all staff to develop LiDAR and Stream Power Index maps. These resources will be used to target and prioritize the best possible projects.

Impaired Waters / Total Maximum Daily Load (TMDL)

The MPCA has determined that an impaired water body is one that does not meet water quality monitoring standards and designated uses because of pollutants, pollution or unknown causes. When a water body is determined to be impaired, it is placed on 303(d) impaired waters list. This list is updated by the MPCA every two years as required by the Clean Water Act. It is based on water quality information in the STORET database, subject to a public comment period and submitted to the EPA for approval. Water bodies included in this list will result in a TMDL study and implementation plan. The location of the impaired waters in Otter Tail County is shown in [Figure Three](#).

There are four phases in the process of addressing impaired waters:

1. Water quality monitoring and assessment which involves the data collection necessary to determine if a water is impaired and if a TMDL is necessary;
2. TMDL study development which distributes the pollutant load contributions to the different sources involved (point and non-point) within the Watershed;
3. TMDL implementation plan involves the development of strategies and identifies management practices that need to be implemented to assure water quality goals are met; and
4. Effectiveness monitoring and adaptive management. Once the implementation phase has begun, the MPCA monitors the water quality for improvements.

Within Otter Tail County there are four river reaches that are impaired, as shown in [Table B](#). The impairments include low dissolved oxygen, turbidity, mercury in fish tissue and fish bio assessments. TMDL plans have been completed and approved by the MPCA for the mercury in fish tissue in the Pomme de Terre River. The turbidity in the Lower Otter Tail River at the outlet of Judicial Ditch #2 is on target for completion in 2009. The formation of a stakeholder group will include Otter Tail County even though the impairment is at the county line. JD-2 is located in the county and is a likely contributor to the turbidity in that reach of the River. The target start for the fish bio assessments on that reach is set to begin in 2010 with a 2013 completion date. The last reach with a known impairment is the Otter Tail River between Rice and Mud Lakes with an identified low dissolved oxygen stressor and the assessment is scheduled for 2010 for completion in 2013.

Stream Impairments listed for Otter Tail County										Table B
River	Reach	Year Listed	River ID#	Affected use	Pollutant or stressor	TMDL Target start	TMDL Target completion	Category	Approved TMDL EPA ID#	Year TMDL Plan Approved
Otter Tail River	JD 2 to Breckenridge Lake	02	09020103-504	Aquatic life	Fish Bioassessments	2010	2013	5A		
Otter Tail River	JD 2 to Breckenridge Lake	04	09020103-504	Aquatic life	Turbidity	2005	2009	5A		
Otter Tail River	Rice Lake to Mud Lake	98	09020103-532	Aquatic life	Dissolved Oxygen	2010	2013	5C		
Pomme de Terre River	Tenmile Lake to Pelican Cr		07020002-505	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Pomme de Terre River	Stalker Lake to Tenmile Lake		07020002-514	Aquatic consumption	Mercury in fish tissue			4A	32414	2008

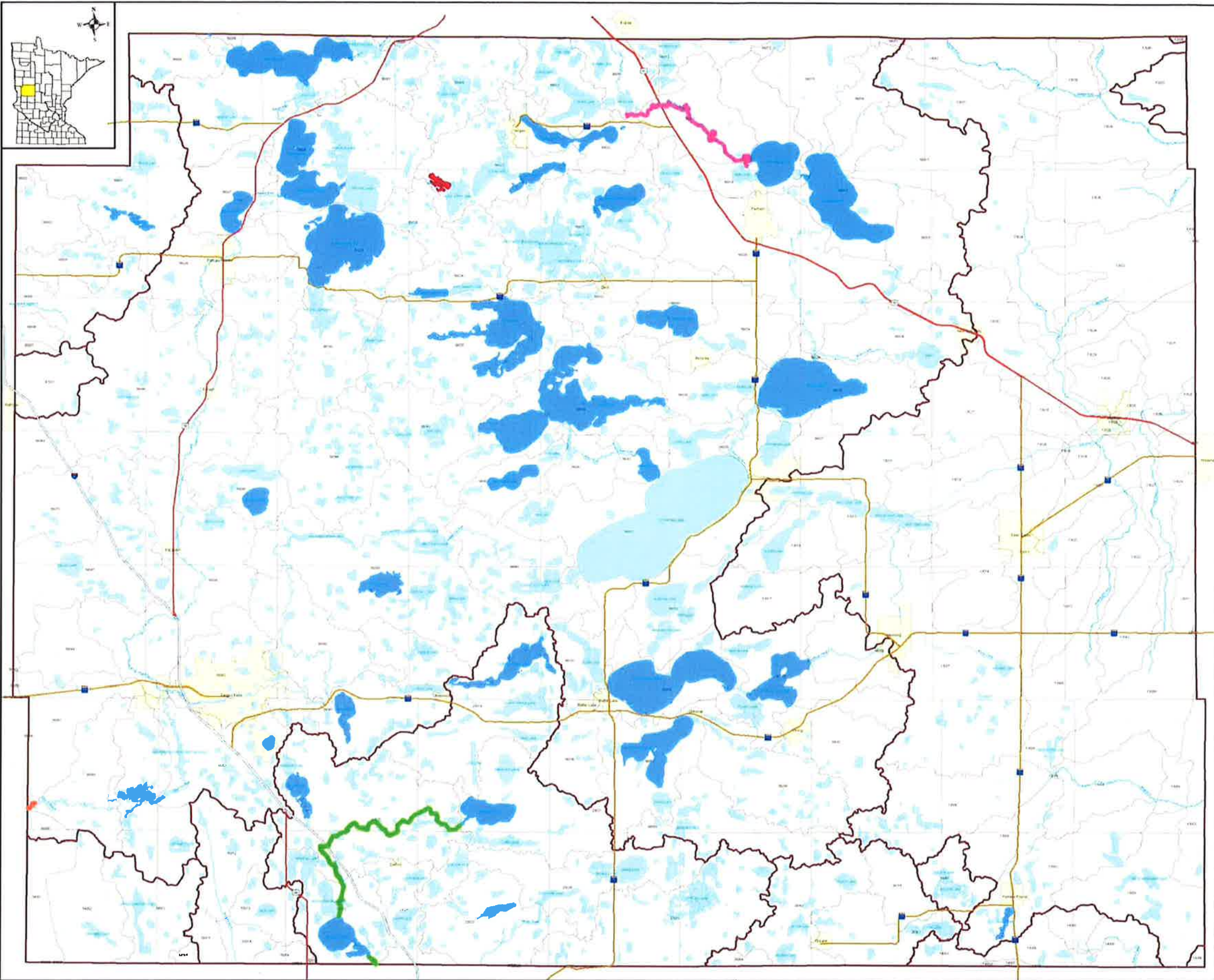


Figure Three
Otter Tail County
 Impaired Lakes and Rivers

- Legend**
- Stream Impairments**
- Mercury
 - Dissolved Oxygen
 - Turbidity/Fish Blo
- Lake Impairments**
- Mercury
 - Nutrient/Eutrophication
- Interstate
- MN Highways
- US Highways
- Minor Watersheds
- Major Watersheds
- Lakes
- Undefined Stream
- River or Creek
- Cities
- Townships

OTTER TAIL COUNTY, MINN. DATA SOURCE: MN DNR, 2008. THIS MAP IS A GENERALIZATION OF THE DATA AND DOES NOT REPRESENT THE ACTUAL DATA. THE DATA IS FOR INFORMATIONAL PURPOSES ONLY. THE DATA IS NOT TO BE USED FOR ANY OTHER PURPOSES. THE DATA IS NOT TO BE USED FOR ANY OTHER PURPOSES. THE DATA IS NOT TO BE USED FOR ANY OTHER PURPOSES.

All the listed impaired lakes shown in [Table C](#) have the identified pollutant of mercury. TMDL plans have been approved on all but three of these lakes. The State has completed a TMDL for all mercury impairments and will have the lead role in implementation. Local Governments will have minimal input.

Lake Impairments listed for Otter Tail County Lakes									Table C
Lake Name	Year Listed	Lake ID#	Affected use	Pollutant or stressor	TMDL Target start	TMDL Target completion	Category	Approved TMDL EPA ID#	Year TMDL Plan Approved
Big Pine		56-0130-00	Aquatic consumption	Mercury in fish tissue			4A		2008
East Battle	02	56-0138-00	Aquatic consumption	Mercury in fish tissue	2002	2015	5C		
Rush		56-0141-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Little Pine		56-0142-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Clitherall		56-0238-00	Aquatic consumption	Mercury in fish tissue			4A		2008
West Battle		56-0239-00	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Marion		56-0243-00	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Walker		56-0310-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Little McDonald		56-0328-00	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Dead		56-0383-00	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Star		56-0385-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Long		56-0388-00	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Pickereel		56-0475-00	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
West Spirit	08	56-0502-00	Aquatic recreation	Nutrient/Eutrophication Biological Indicators	2012	2015	5C		
West Silent	08	56-0519-00	Aquatic consumption	Mercury in fish tissue	2008	2022	5C		
Wall		56-0658-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Fish	06	56-0684-00	Aquatic consumption	Mercury in fish tissue	2006	2021	5C		
North Lida		56-0747-01	Aquatic consumption	Mercury in fish tissue			4A		2008
Lizzie (North)		56-0760-01	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Lizzie (South)		56-0760-02	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
Pelican		56-0786-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Pebble		56-0829-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Jewett		56-0877-00	Aquatic consumption	Mercury in fish tissue			4A		2008
Prairie		56-0915-00	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
West Olaf		56-0950-01	Aquatic consumption	Mercury in fish tissue			4A	32414	2008
East Olaf		56-0950-02	Aquatic consumption	Mercury in fish tissue			4A	32414	2008

The MPCA is planning to address the remainder as listed in the table. One lake, West Spirit, has been identified as impaired for Nutrient/Eutrophication and Biological Indicators. The TMDL on this lake will be addressed starting in 2012 with a completion date of 2015. The Otter Tail County LWMP and SWCD will be participants in this process as identified by the MPCA.

More information and completed plans are available on the MPCA website at: <http://www.pca.state.mn.us/water/tmdl/index.html>

Data Collection and Lake Association support

The Otter Tail County Coalition of Lakes Association (COLA) is an active organization that provides education to lakeshore property owners and the public in general on issues involving water quality. They provide valuable important input to the LWMP task force and comment on developments in sensitive areas. The COLA is instrumental in the development and maintenance of the **monitoring program** for the area lakes. Of the 1,049 designated lakes in Otter Tail County, 75 are monitored on a monthly basis from May through September and the data is published annually by the Otter Tail County Coalition of Lakes Associations. This data is also submitted to the MPCA data base called STORET, where state-wide lake data is maintained.

To view all lake data either gathered by or submitted to the state, access the DNR's website at: <http://www.dnr.state.mn.us/lakefind/index.html>

The program was set up in 1996 and of the lakes monitored, thirty-two have been monitoring continuously for the past eleven to thirteen years and twenty-one for six to ten years. There have been fifteen new lakes added to the monitoring program within the past five years. The Otter Tail COLA has been working with RMB Labs on data storage. Through the website at www.rmbel.info individual lakes associations are able to copy graphs, charts and lake monitoring data for distribution to the public. The lakes involved in Otter Tail COLA's collection are monitored for Total Phosphorus, Chlorophyll-a, and clarity (secchi). The data received is used to calculate Carlson's Trophic State Index (TSI). This index, as described in **Figure Four**, uses this data to determine the quality of the lakes. A correlation between the sampled parameters exists, such as:

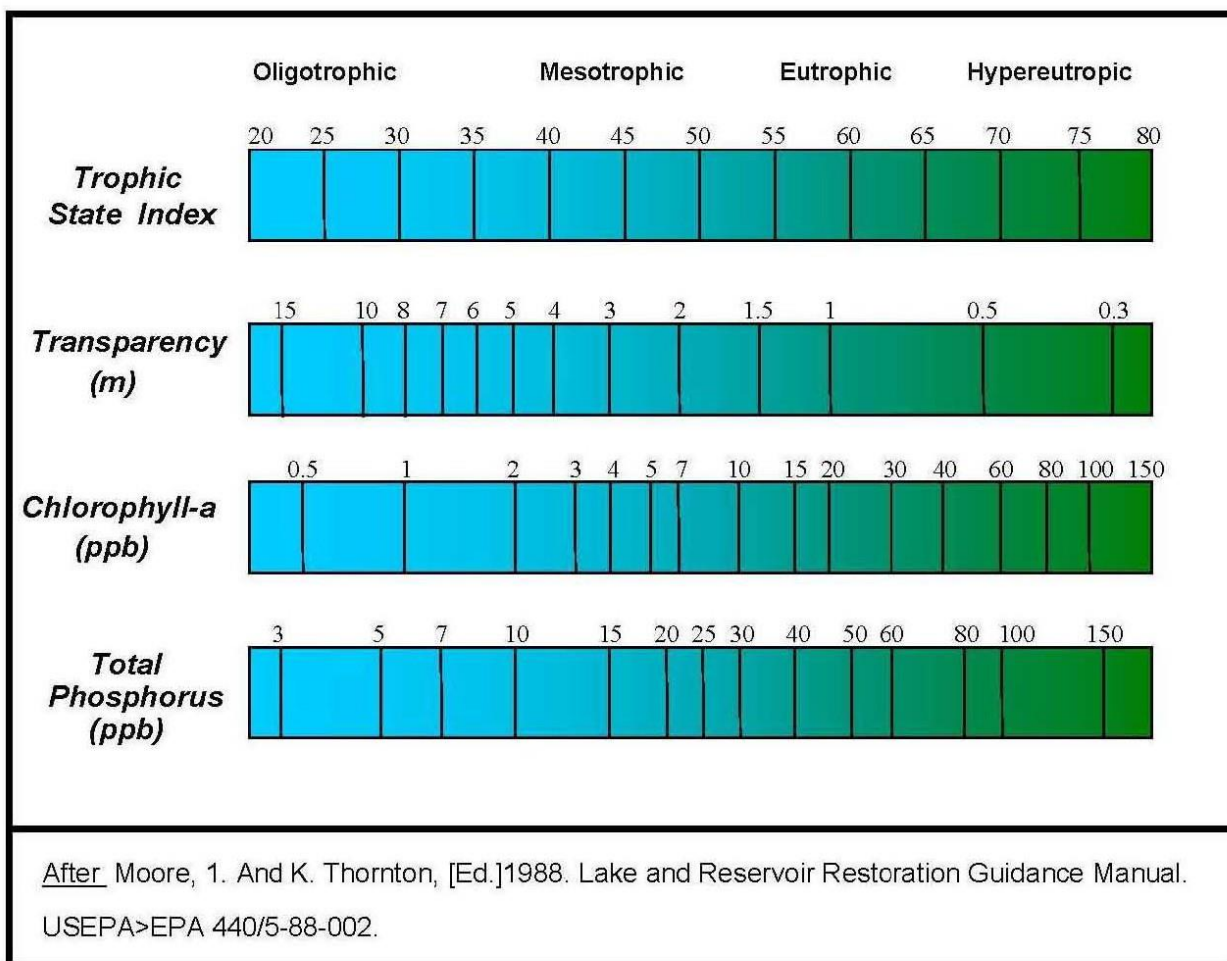
"Increased phosphorus = increased chlorophyll = decreased secchi disk depth".

Based on this correlation, **Table D** shows the TSI averages from 1996 to the present. The index is based on an overall average of all collected data. Most Otter Tail County Lakes monitored fall into the mesotrophic classification. These lakes are clear for most of the year, with some possible low oxygen below the thermocline in the summer. More lakes need to be brought into this monitoring program to increase the knowledge base and make better decisions on land use throughout the county. Education programs should focus on training new monitors and teaching best management practices on unmonitored lakes while tracking long-term water quality trends.

Carlson's Trophic State Index

Figure Four

- TSI < 30** Classic Oligotrophy: Clear water, oxygen throughout the year in the hypolimnion, salmonid fisheries in deep lakes.
- TSI 30 - 40** Deeper lakes still exhibit classical oligotrophy, but some shallower lakes will become anoxic in the hypolimnion during the summer.
- TSI 40 - 50** Water moderately clear, but increasing probability of anoxia in hypolimnion during summer.
- TSI 50 - 60** Lower boundary of classical eutrophy: Decreased transparency, anoxic hypolimnia during the summer, macrophyte problems evident, warm-water fisheries only.
- TSI 60 - 70** Dominance of blue-green algae, algal scums probable, extensive macrophyte problems.
- TSI 70 - 80** Heavy algal blooms possible throughout the summer, dense macrophyte beds, but extent limited by light penetration. Often would be classified as hypereutrophic.
- TSI > 80** Algal scums, summer fish kills, few macrophytes, dominance of rough fish.



<i>Trophic State Index (TSI) on Otter Tail County monitored lakes</i>			<i>Table D</i>
MN Lake ID	Lake Name	Mean TSI	Dates Monitored
56-0241-00	Annie Battle	38	1998-2000
56-0770-00	Bass 56-0770	43	2003-2008
56-1149-00	Berger	53	2005-2008
56-0386-01	Big McDonald	39	1996-2008
56-0386-03	Big McDonald #2	41	1996-1998, 2004-2008
56-0786-00	Big Pelican	43	1996-2008
56-0130-00	Big Pine	53	1997-2008
56-0240-00	Blanche	43	1996-2003, 2005-2008
56-0079-00	Block	60	2008
56-0212-00	Boedigheimer	45	2002-2008
56-0209-00	Buchanan	47	2001-2006
56-0559-00	Clear	51	2008
56-0238-00	Clitherall	41	1996-2008
56-0293-00	Crane	44	1996-1998
56-0749-00	Crystal	43	2002
56-0383-00	Dead (includes 4 sites)	48	1996-2008
56-0298-00	Deer	44	2004-2008
56-0245-00	Devils	42	2002-2008
56-0253-00	Eagle	37	1996-2008
56-0138-00	East Battle (both bays)	42	1996-2008
56-0116-02	East Leaf	53	1996-1998, 2001-2008
56-0378-00	East Lost	46	2000-2003
56-0517-00	East Silent	37	1996-2008
56-0501-00	East Spirit	41	1999-2007
56-0306-00	Elbow	37	1998-2008
56-0768-00	Fish	41	2003-2008
56-0759-00	Franklin	47	2004-2008
56-0368-00	Graham	50	2002-2003
56-1627-00	Hoffman	49	2002-2008
56-0877-00	Jewett	45	1996-2008
56-1636-00	Kerbs	35	2002-2008
56-0532-01	Leek (Trowbridge) East Bay	46	2007-2008
56-0532-02	Leek (Trowbridge) West Bay	43	1996-2008
56-0328-00	Little McDonald	36	2004-2008
56-0761-00	Little Pelican	47	2003-2008
56-0142-00	Little Pine	51	1996-2008
56-0760-01	Lizzie	44	2002-2008

MN Lake ID	Lake Name	Mean TSI	Dates Monitored
56-0388-02	Long 56-0388	47	1996-2008
56-0390-00	Long 56-0390	47	2005-2007
56-0784-00	Long 56-0784	46	2002-2008
56-0523-00	Loon	41	1999-2008
56-0243-00	Marion	43	1998-2008
56-0116-01	Middle Leaf	45	1996-2008
56-0747-01	North Lida	44	1998-2008
56-0379-00	North Turtle	56	2008
56-0950-01	Olaf, West	50	2005-2006
56-0242-00	Otter Tail (includes 3 sites)	45	1997-2008
56-0335-00	Paul	36	2001-2008
56-0829-00	Pebble	45	2008
56-0475-00	Pickerel	41	1996-2008
56-0915-00	Prairie	45	2003-2008
56-0360-00	Rose	44	2008
56-0214-00	Round 56-0214	52	2004-2008
56-0297-00	Round 56-0297	46	1996-2008
56-0141-00	Rush	52	1996-2008
56-0358-00	Seven (Scalp)	36	2002-2008
56-0302-04	Silver 56-0302	46	1996-1998, 2008
56-0369-00	Six	36	1996, 1998, 2002, 2004, 2007
56-0747-02	South Lida	51	1998-2008
56-0377-00	South Turtle	39	2008
56-0437-00	Stalker (includes 2 sites)	45	1998-2008
56-0385-00	Star	44	1996-2008
56-0191-01	Stuart	42	1996-2008
56-0781-00	Swan	46	2002, 2005-2008
56-0387-00	Sybil	39	1996-2008
56-0931-00	Tamarac	48	2002-2008
56-0613-00	Ten Mile	49	1996-2008
56-0310-00	Walker	52	2000-2008
56-0658-00	Wall	48	1996-2007
56-0239-00	West Battle	41	1997-2008
56-0114-00	West Leaf	46	1996-2008
56-0386-02	West McDonald	38	1996-2008
56-0519-00	West Silent	37	1997-2008
56-0502-00	West Spirit	61	2000-2007
56-0355-00	Wimer	46	2002-2006

Data supplied by RMB Labs

A secchi monitoring program, called the **Citizens Lake Monitoring Program (CLMP)** also exists through the MPCA. Sixty two lakes are presently involved in the program. More volunteers are needed to add to the lakes data base. The SWCDs and the COLA actively recruit new volunteer monitors.

Information on the CLMP is available at:

<http://www.pca.state.mn.us/water/volunteer-monitoring.html>

Wetlands/Wildlife Habitat

Habitat destruction is occurring in Otter Tail County. The land less desirable for agricultural use, such as wooded or wet areas, is being sold for dwelling sites and recreational land use. This breaking up of land destroys habitat for numerous types of wildlife and waterfowl.

Filling of wetlands for farming or development depletes the areas of the county for groundwater recharge, flood and sediment control. These areas are important for holding water during times of heavy rains and runoff. They also provide habitat for waterfowl, frogs, turtles and other wetland animals. According to the National Wetland Inventory, as shown in **Figure Five**, there are about 66,387 acres of wetland in Otter Tail County. Breakdown by watershed

Wetlands by Watershed		Table E
Watershed	Total Acres	Wetland acres
Crow Wing River	4,641.8	214.7
Red Eye River	352,370.7	20,229.5
Long Prairie River	17,605.5	1,002.3
Pomme De Terre River	128,821.3	6,513.9
Chippewa River	25,744.6	1,520.6
Bois De Sioux River	24,233.5	590.5
Mustinka River	18,454.2	531.1
Otter Tail River	807,009.1	34,406.5
Red River of the North	6,243.2	82.1
Buffalo River	38,849.7	1,295.6
Total	1,423,973.6	66,386.8

is shown in **Table E**. The Otter Tail River watershed has the largest area of wetland. It also makes up the largest area of the county. The Red Eye River Watershed is located on the eastern quarter of the county and is made up of many long, narrow wet areas.

Due to documented development pressures within the designated shoreland areas, priority is given to preserving the wetlands within 1000 feet of a lake or 300 feet of a river.

In order to effectively restore the highest priority wetlands, Otter Tail County joined with the BWSR, DU, USFWS, NRCS, DNR, PF and other groups/agencies to map the areas of drained wetlands in the western third of the county. This is the area chosen due to the geology and the location on the edges of the north central hardwood forest area. This map is shown in **Figure Six** and depicts the extent of drained wetlands. Restoration of wetlands that have been drained provides the best opportunity of producing a wetland that functions as habitat, filtration and storage.



Figure Five
Otter Tail County
 National Wetlands Inventory

Explanation of Features

NWI

Circular 39 Classification

- Bogs
- Deep Marshes
- Municipal/Industrial
- Riverine System
- Seasonally Flooded Basin/Flat
- Shallow Marsh
- Open Water
- Shrub Swamp
- Wet Meadow
- Wooded Swamp

Major River Basins

- Minnesota River Basin
- Mississippi River Basin
- Red River Basin

Major Watersheds

Minor Watersheds

Township Boundary

Cities

Interstate

MN Highways

US Highways

Undefined

River or Creek

© COPYRIGHT OTTER TAIL COUNTY 2003
 THIS MAP WAS COMPILED FROM
 MULTIPLE DATA SOURCES AND IS
 INTENDED FOR REFERENCE USE ONLY.
 OTTER TAIL COUNTY DOES NOT ASSUME
 LIABILITY FOR ERRORS, INACCURACIES
 OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

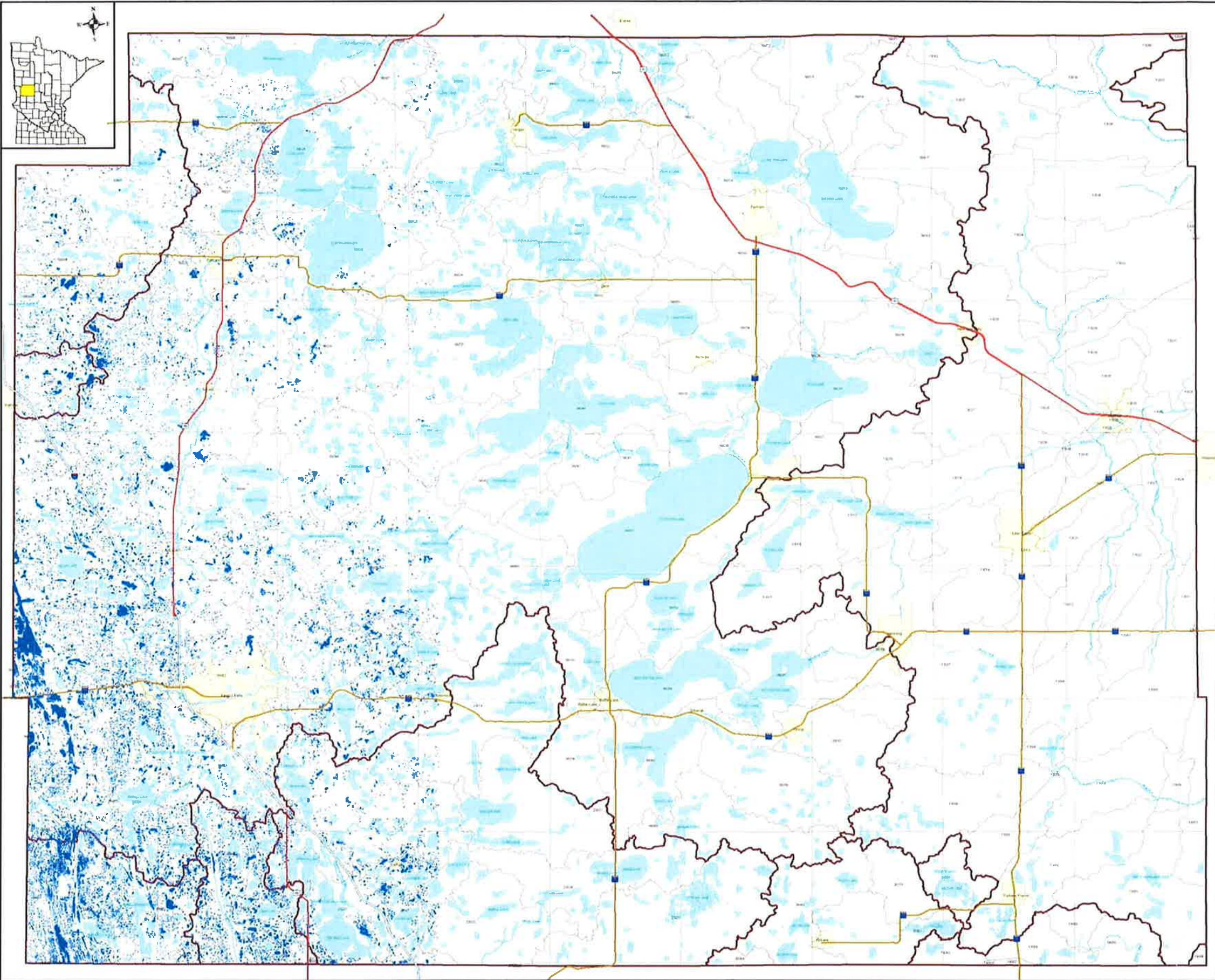


Figure Six
Otter Tail County

Restorable Wetlands
(Data available for western Otter Tail County only)

- Legend**
- Restorable Wetlands
 - Interstate
 - MN Highways
 - US Highways
 - Minor Watersheds
 - Major Watersheds
 - Lakes
 - Undefined Stream
 - River or Creek
 - Cities
 - Townships

© COPYRIGHT 2011 BY THE STATE OF MINNESOTA
THIS MAP AND DATA WERE
PREPARED BY THE MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
AND ARE FOR INFORMATIONAL USE ONLY.
OTHER MAPS AND DATA WERE
USED IN THE PREPARATION OF THIS
MAP. FOR MORE INFORMATION,
CONTACT THE MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
AT 651.224.2600.

In addition to open space preserved for wildlife habitat, the county also utilizes several programs available to set land aside by means of easement or acquisition. Preservation activity in Otter Tail County is shown in [Table F](#). While there is a net gain in several programs, the acreage lost in CRP is a testament to the pressures on farmers to grow more crops. It is important to add supplemental incentives to the existing programs to protect these areas.

A summary of the available protection programs in Otter Tail County include:

CRP (Conservation Reserve Program)

The CRP program is a federal program administrated through the Farm Service Agency (FSA) office. The landowner receives an annual payment and cost-share assistance for enrolling environmentally sensitive cropland for a period of 10 to 15 years. These acres are planted to a conserving cover consisting of a variety of grasses and/or trees.

<i>Set-aside acres in Otter Tail County</i>			<i>Table F</i>
	2003	2009	Gain/Loss
CRP	69,052.2	55,181.4	-13,870.8
CCRP	14,056.5	16,821.1	2,764.6
CREP	708.5	741.7	33.2
RIM	850.4	1,047.9	197.5
RIM WRP	95.4	95.4	0.0
WRP	1,049.6	894.5	-155.1
DNR Parks	13,095.7	13,095.7	0.0
DMR WMA	11,681.0	13,201.8	1,520.8
USFWS	33,679.7	36,598.9	2,919.2
Total	144,269.0	137,678.4	-6,590.6

CCRP (Continuous Conservation Reserve program)

The CCRP program is a federal program administrated through the Farm Service Agency (FSA) office. The landowner receives an annual payment and cost-share assistance for enrolling high-priority conservation practices on eligible land for a period of 10 to 15 years. These acres are planted to either a mixture of grasses or trees. Wetlands can be restored through the program.

RIM (Reinvest in Minnesota)

The RIM program is a state program administrated through the Soil & Water Conservation District (SWCD) office. The landowner receives a one-time payment and cost-share for enrolling lands in a 30 year or perpetual easement. These acres can be seeded to conserving cover consisting of either/or native grasses and forbs, trees and shrubs. Wetlands can be restored through the program.

CREP (Conservation Reserve Enhancement Program)

This was a combination of the federal CRP program and the state RIM program. The landowner receives 15 CRP annual payments, a one-time RIM payment, and cost-share for enrolling in a 50 year or perpetual easement. These acres are planted to native grasses and forbs, or trees and shrubs. Wetlands can be restored through the program.

WRP (Wetland Reserve Program)

The WRP program is a federal program administrated through the Natural Resources Conservation Service (NRCS) office. The landowner receives a one-time payment and cost-share assistance for restoring wetlands and enrolling the wetlands and adjacent upland in a 10 year, 30 year, or perpetual easement. These upland acres are planted to native grasses and forbs, and the wetlands are restored.

GRP (Grassland Reserve Program)

The GRP program is a federal program that helps landowners restore and protect grasslands, including rangelands and pasturelands, while maintaining the areas as grazing lands. The FSA and NRCS administer the GRP program. The landowner receives annual payments for enrolling these lands for a limited or perpetual amount of time.

The Public Lands map shown in [Figure Seven](#) contains the Waterfowl Production Areas, County Parks and Recreation, Forestry, Trails and Waterways and existing Wildlife Management Areas. As you can see by the map, there are no corridors of natural habitat for wildlife. The areas are patchy and spread apart.

The United States Fish and Wildlife Service (USFWS); a federal agency dedicated to preservation and restoration of fish, wildlife and plant habitats; has recently developed a *Comprehensive Conservation Plan and Environmental Assessment* for the Fergus Falls Wetland Management District. This district includes all of Otter Tail County.

Minnesota Prairie Conservation Plan

The Prairie Conservation Plan focuses efforts on grassland and wetland and demonstrates unprecedented cooperation between federal agencies, state agencies, and the states most active conservation organizations. The plan identifies core conservation areas and creates a vision of a connected landscape from Canada to Iowa. The strategies of the prairie plan include protection, restoration and enhancement through available state and federal programs.

Agriculture – pasture / hay conversions to cropland (RUSLE)

RUSLE, or the Revised Universal Soil Loss Equation, has been developed by the USDA to determine erosion potential of various soils and land use practices. Soil loss as related to ground cover is as follows in [Table G](#):

Soil Loss Estimation		Table G
Land use		Approximate Soil Loss (tons per acre)
Pasture/CRP/Vegetative Cover		1
Hay Rotation		5
Crop Rotation - Corn/Beans/Small Grains with conservation tillage		7-8
Crop Rotation - Corn/Beans/Small Grains w/o conservation tillage		15-20

The crop history for Otter Tail County, as shown in [Table H](#), shows corn as the dominant acreage planted. While there is not enough data to come to any significant conclusions based on available data, it is important to record these histories in order to determine trends in the future.

<i>Crop History</i> <i>Table H</i>				
Year/Crop	All Wheat	Soybeans	All Corn	All Hay
2004	61,200	135,500	152,400	110,600
2005	66,400	117,900	132,000	108,700
2006		133,000	135,800	110,400
2007	60,300	111,500	167,500	89,200

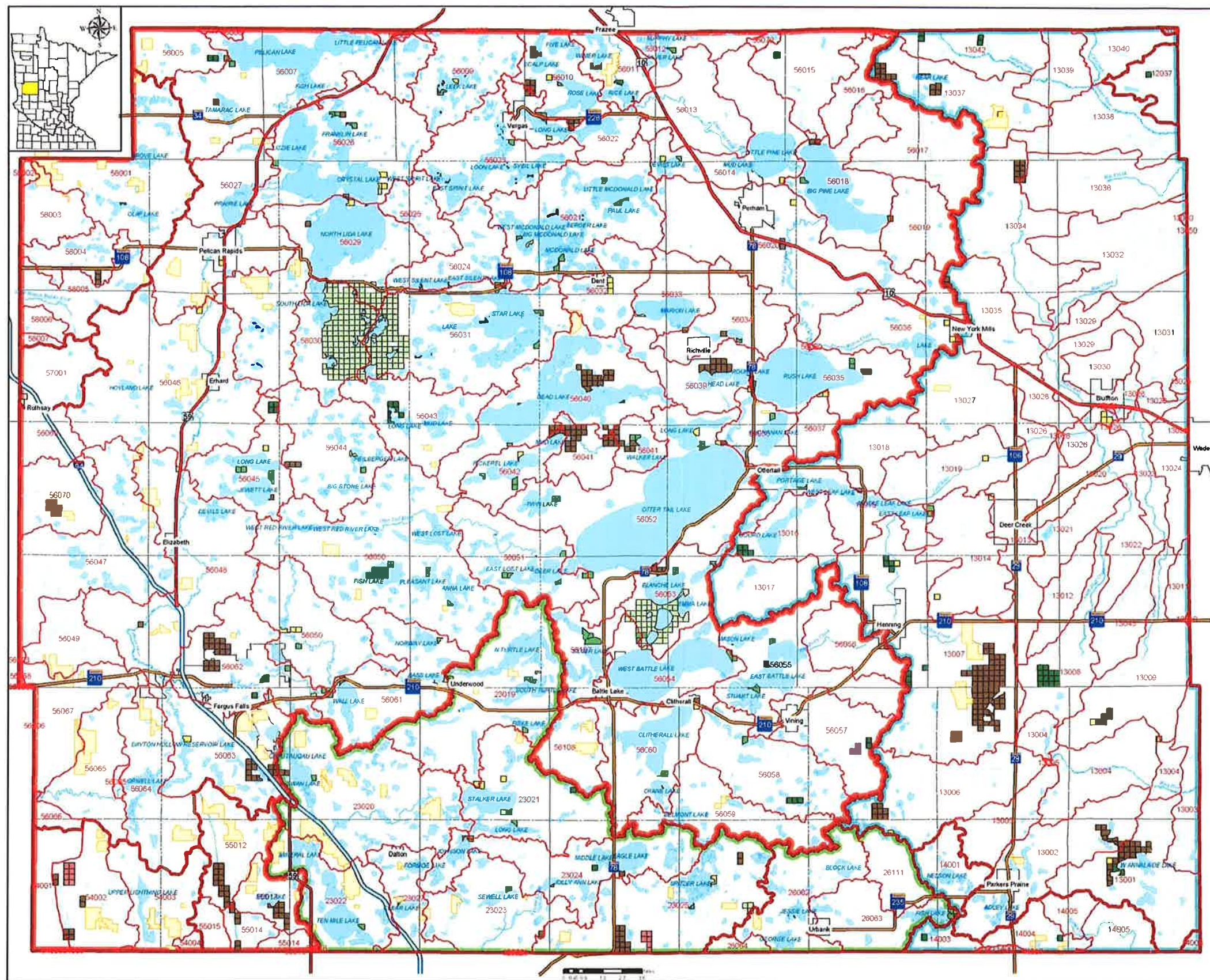


Figure Seven
Otter Tail County
 Public Land Locations*

Explanation of Features

- Waterfowl Production Area
- DNR PUBLIC LANDS**
- County Area
- Scientific & Natural Area
- Forestry Division
- General
- Parks & Recreation
- Trails & Waterways
- Wildlife Management Area
- Major River Basins**
- Minnesota River
- Mississippi River
- Red River
- Major Watersheds
- Minor Watersheds
- Lakes
- Township Boundary
- Cities
- Interstate
- MN Highways
- US Highways
- Undefined Stream
- River or Creek

The DNR Public Lands are presented as 40 Acre Tracts and may not accurately represent actual property boundaries

© COPYRIGHT OTTER TAIL COUNTY 2003
 THIS MAP WAS COMPILED FROM
 MULTIPLE DATA SOURCES AND IS
 INTENDED FOR REFERENCE USE ONLY.
 OTTER TAIL COUNTY DOES NOT ASSUME
 LIABILITY FOR ERRORS, INACCURACIES
 OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

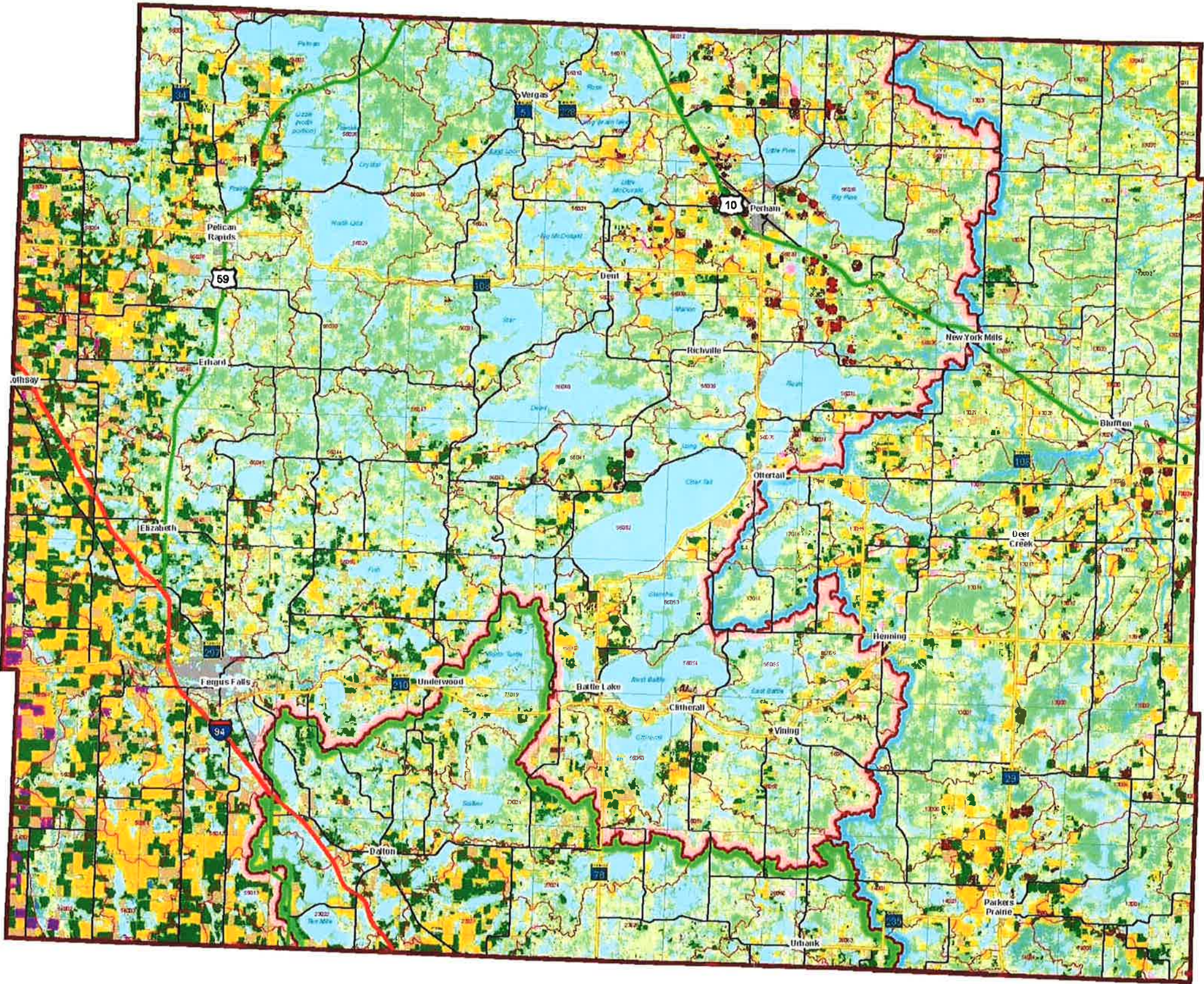
As shown in [Figure Eight](#) and [Table I](#) the land use can be broken down by each specific crop planted. Soybeans are the largest crop in the Red and Minnesota River Basins, with corn a close second and spring wheat third. In the Mississippi Basin, corn is number one and soybeans and pasture grass follow. When looking at the soil loss potential on soybeans, it is important to follow good management crop practices in the field.

Otter Tail County has currently 55,181 acres enrolled in CRP. These lands are protected from wind and water erosion with the cover of vegetation. Areas enrolled are the highly erodible soils located throughout Otter Tail County.

A survey was completed in 2002 by the West Otter Tail SWCD involving 115 lakes with public accesses. This survey involved counting the livestock pasturing on lakeshore. Of the lakes surveyed, 32 (or 27%) had livestock >10 animal units pastured on the shoreline. Less than 10 animal units were pastured on 43 (or 37%) of these lakes. Pasturing on the shoreline of a lake, according to the table above, creates minimal disturbance to the soils and erosion. Direct fecal coliform contamination can occur when animals stand in the water, but if fenced from direct contact, pasturing is likely a more beneficial use, with a well maintained pasture, than development in regards to non-point contamination. A 50-foot buffer from agriculture practices around waters of the state is required by the state shoreland ordinance. Education and incentives are available through SWCD / NRCS programs, with enforcement when necessary.

Figure Eight

USDA 2008
Cropland Data Layer*
for Otter Tail County



Minor Civil Divisions

Major Roadways

- Interstate Trunk Highway
- U.S. Trunk Highway
- MN Trunk Highway
- County State-Aid Highway

Hydrological Features

- Major Basin Boundaries
- Minor Watersheds
- Lakes & Major Rivers
- Wetlands
- Rivers & Streams

Major River Basins (Outlined)

- Minnesota River Basin
- Red River Of The North Basin
- Upper Mississippi River Basin

Land Use Categories

Alfalfa	NLCD - Mixed Forest
Apples	NLCD - Open Water
Barley	NLCD - Pasture/Hay
Canola	NLCD - Shrubland
Christmas Trees	NLCD - Woody Wetlands
Clover/Wildflowers	Oats
Corn	Other Crops
Dry Beans	Other Small Grains
Durum Wheat	Pasture/Grass
Fallow/Idle Cropland	Peas
Flaxseed	Potatoes
Grapes	Rape Seed
Herbs	Rye
Millet	Seed/Sod Grass
Misc. Veggies. & Fruits	Sorghum
NLCD - Barren	Soybeans
NLCD - Deciduous Forest	Spring Wheat
NLCD - Developed/High Intensity	Sugarbeets
NLCD - Developed/Low Intensity	Sunflowers
NLCD - Developed/Medium Intensity	Sweet Corn
NLCD - Developed/Open Space	Wetlands
NLCD - Evergreen Forest	Winter Wheat
NLCD - Grassland Herbaceous	Woodland
NLCD - Herbaceous Wetlands	



Crops in Otter Tail County by Major Watershed Basin

Table I

2008 Land Use (CDL Classes)	Major Basin					
	Red River		Minnesota River		Mississippi River	
		% of		% of		% of
	Acres	Total	Acres	Total	Acres	Total
Alfalfa	7,917.4	0.88%	1,219.7	0.82%	4,199.3	1.10%
Barley	105.4	0.01%	4.6	0.00%	20.1	0.01%
Canola	15.5	0.00%	0.0	0.00%	6.2	0.00%
Christmas Trees	7.7	0.00%	1.5	0.00%	22.5	0.01%
Clover/Wildflowers	20.1	0.00%	0.8	0.00%	45.7	0.01%
Corn	80,190.5	8.96%	10,112.7	6.83%	27,444.7	7.20%
Dry Beans	2,544.8	0.28%	38.7	0.03%	214.7	0.06%
Fallow/Idle Cropland	85.2	0.01%	2.3	0.00%	12.4	0.00%
Flaxseed	0.8	0.00%	0.0	0.00%	0.0	0.00%
Herbs	2.3	0.00%	2.3	0.00%	0.8	0.00%
NLCD - Barren	124.0	0.01%	10.8	0.01%	41.8	0.01%
NLCD - Deciduous Forest	196,280.1	21.93%	29,202.2	19.72%	112,118.9	29.43%
NLCD - Developed/High Intensity	351.8	0.04%	5.4	0.00%	31.8	0.01%
NLCD - Developed/Low Intensity	4,751.0	0.53%	454.9	0.31%	586.6	0.15%
NLCD - Developed/Medium Intensity	1,163.9	0.13%	30.2	0.02%	71.3	0.02%
NLCD - Developed/Open Space	54,383.3	6.08%	9,687.3	6.54%	19,249.1	5.05%
NLCD - Evergreen Forest	5,244.7	0.59%	420.0	0.28%	2,114.0	0.55%
NLCD - Grassland Herbaceous	13,454.2	1.50%	3,334.5	2.25%	5,329.1	1.40%
NLCD - Herbaceous Wetlands	59,046.8	6.60%	10,749.7	7.26%	35,899.1	9.42%
NLCD - Mixed Forest	24.8	0.00%	9.3	0.01%	4.6	0.00%
NLCD - Open Water	136,208.1	15.22%	23,084.9	15.59%	8,692.3	2.28%
NLCD - Pasture/Hay	161,046.7	18.00%	33,262.0	22.46%	112,928.7	29.64%
NLCD - Scrubland	630.8	0.07%	249.5	0.17%	1,952.8	0.51%
NLCD - Woody Wetlands	1,099.6	0.12%	148.8	0.10%	709.8	0.19%
Oats	631.6	0.07%	72.1	0.05%	603.7	0.16%
Other Crops	242.6	0.03%	19.4	0.01%	17.8	0.00%
Pasture/Grass	31,456.4	3.52%	3,756.8	2.54%	19,189.4	5.04%
Potatoes	2,228.7	0.25%	0.8	0.00%	1727.3	0.45%
Rye	28.7	0.00%	0.0	0.00%	27.1	0.01%
Seed/Sod Grass	13.9	0.00%	0.8	0.00%	0.0	0.00%
Sorghum	13.9	0.00%	0.0	0.00%	11.6	0.00%
Soybeans	89,889.5	10.05%	15,974.3	10.79%	19,879.1	5.22%
Spring Wheat	40,609.0	4.54%	6,076.9	4.10%	6,975.9	1.83%
Sugar beets	2,685.9	0.30%	0.0	0.00%	7.7	0.00%
Sunflowers	1,681.6	0.19%	42.6	0.03%	170.5	0.04%
Sweet Corn	0.8	0.00%	0.0	0.00%	0.8	0.00%
Wetlands	138.7	0.02%	48.0	0.03%	60.4	0.02%
Winter Wheat	163.5	0.02%	58.1	0.04%	56.6	0.01%
Woodland	366.5	0.04%	25.6	0.02%	506.0	0.13%
Total	894,851.0	100%	148,107.8	100%	381,029.4	100%

* USDA:NASS Crop Data Layer Clipped to Major Basin Areas.

April 2009



Minnesota Ag Water Quality Certification Program (MAWQCP)

The Minnesota Ag Water Quality Certification Program (MAWQCP) is a voluntary program designed to accelerate adoption of on-farm conservation practices that protect Minnesota's lakes and rivers. Producers who implement and maintain approved farm management practices will be certified and in turn assured that their operation meets the state's water quality goals and standards for a period of 10 years. Through the MAWQCP, producers will receive regulatory certainty and priority for technical assistance and funding to implement practices that protect water quality. Certainty is an assurance that producers who voluntarily implement conservation practices consistent with state's water quality goals will be officially recognized for their efforts and will not be subject to new water quality regulations during the 10 year period of certification.

Certainty is a commitment provided by the Minnesota Department of Agriculture (MDA), the Minnesota Board of Water and Soil Resources (BWSR), Minnesota Department of Natural Resources (DNR), and the Minnesota Pollution Control Agency (MPCA). The program is currently a pilot program to further refine details and gather feedback from local producers and conservation professionals. The pilots will last for three years and a statewide program is planned following the pilots. One of the four pilot areas is the Whiskey Creek Watershed within the Buffalo-Red River Watershed District jurisdiction. The pilot is a partnership between the Buffalo-Red River Watershed District, Wilkin County Soil and Water Conservation District and the West Otter Tail Soil and Water Conservation District.

Soil Health Initiative

Soil Health is the capacity of a soil to function. How well is your soil functioning to infiltrate water and cycle nutrients to feed growing plants? Tillage, fertilizer, livestock, pesticides and other management tools can be used to improve soil health, or they can significantly damage soil health if not applied correctly. Managing for soil health can be accomplished by disturbing the soil as little as possible, growing as many different species of plants as practical, keeping living plants in the soil as often as possible and keeping the soil covered all the time. Many soils have a water infiltration problem that causes a water runoff problem. If soil health is improved, the structure of the soil results in greater water infiltration, less runoff, less or no erosion, and reduced incidence of flooding and sedimentation. The four basic principles of soil health are as follows: Keep soil covered as much as possible, disturb the soil as little as possible, keep plants growing throughout the year to feed the soil, and diversify as much as possible using crop rotation and cover crops.

Drainage Water Management

Subsurface tile drainage is an essential water management practice on many highly productive fields in Otter Tail County. However, nitrates carried in drainage water can lead to local water quality problems; therefore strategies are needed to reduce the nitrate loads while maintaining adequate drainage for crop production. Drainage Water Management is the practice of using a water control structure in a main, sub main, or lateral drain to vary the depth of the drainage outlet. The purpose of drainage water management is to reduce nutrient, pathogen and /or pesticide loading from drainage systems into downstream receiving waters, improve productivity, health and vigor of plants, reduce oxidation of organic matter in soils, reduce wind erosion or particulate

matter emissions, and provide season wildlife habitat.

Central MN On-Farm Nitrogen Management Program

Working through a MDA joint powers agreement the EOTSWCD has been working with producers in the five county areas to conduct guided basal stalk testing in corn acres. The basal stalk nitrate test evaluates the adequacy of the nitrogen fertilizer program for the current growing season. Utilizing field management data from the grower, high resolution imagery, and GPS technology four sample points are selected. Three sample points are chosen to reflect field uniformity and overall plant health while one sample point is chosen by the appearance of nitrogen stress. Ten stalk samples are collected at each point after the crop has reached full maturity and no longer moves nitrogen into the grain. The samples are sent to a certified lab which analyzes nitrate levels in the corn stalk. The results give an indication of nitrogen sufficiency for that growing year. Excessive nitrate amounts indicate a potential for reduced fertilizer rates which decrease the risk of leaching and lowering overall input costs for the producer.

The On-Farm Program also aims to further the understanding of nitrogen management by working with corn growers to conduct replicated strip trials. These trials provide a side by side yield comparison of two or more different management practices within a field. Management practices may focus on rate, timing, or form of nitrogen fertilizer. The results of these trials have led producers to make farm level management changes that are not only more profitable for the grower, but also provide environmental benefits and water resource protection.

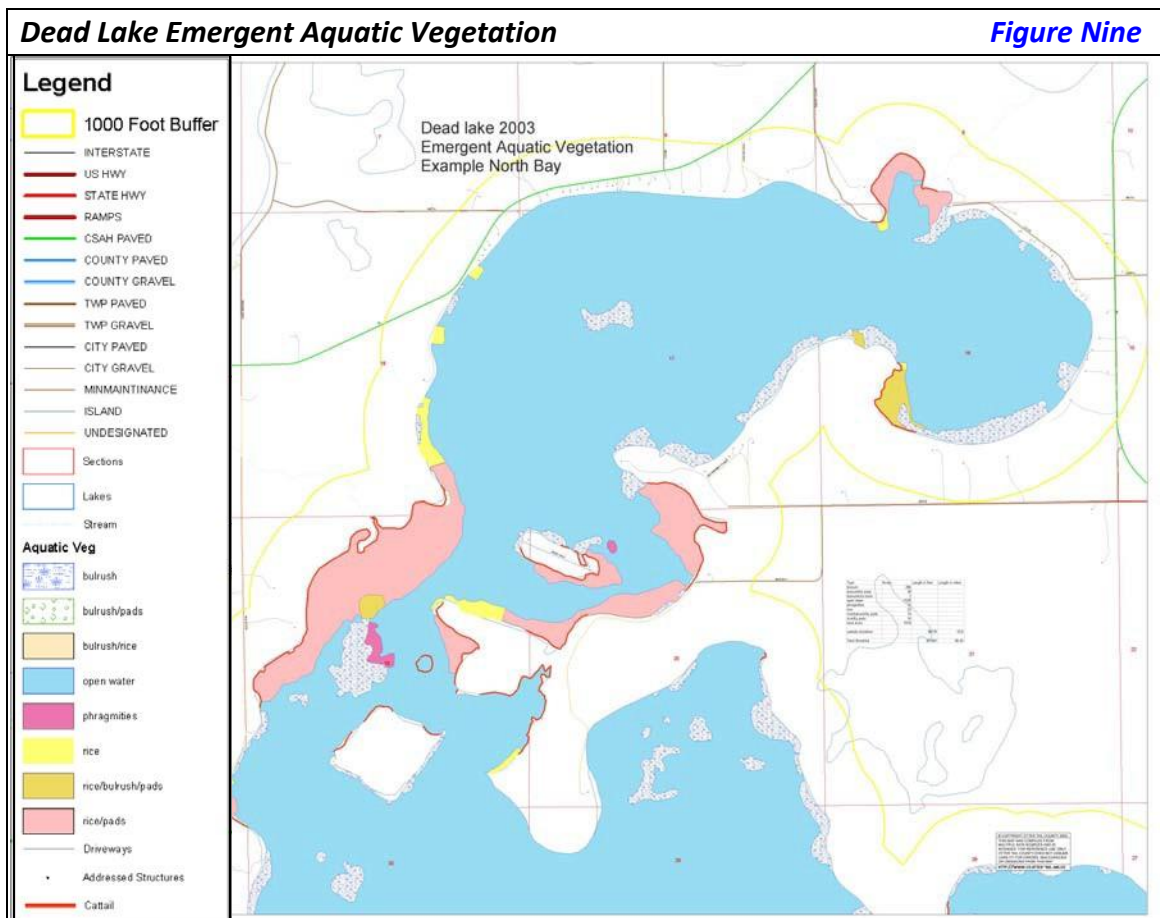
Lakescaping

Lakescaping is the practice of restoring shoreline areas using methods that help improve and protect water quality and wildlife habitat. Creating buffer zones of native vegetation such as trees, shrubs, wildflowers, grasses, sedges, and aquatic plants will help to restore the ecological function of the shoreline, filter out pollutants and runoff that degrade water quality, and protect it from erosion. Otter Tail SWCD Shoreline Specialists with the help of the Clean Water Fund, DNR Shoreline Habitat Grant, and the Minnesota Conservation Corps Young Adult crew, have been working with lakeshore property owners to install native buffers and rain gardens along their shoreline. In 2013 twenty lakeshore projects were completed on ten different lakes across the county. Otter Tail SWCD Lakeshore specialist and Assistant Lakeshore Specialist have visited with many other lakeshore owners across the county and provided technical assistance wherever needed. Otter Tail SWCD Shoreline Specialists work to provide education to lakeshore owners on how they can exercise best management practices (BMPs) on their shorelines.

Emergent Aquatic Vegetation Mapping

Habitat degradation can occur during development around shorelines. The removal of vegetation diminishes habitat for biota that live in the near shore area. This vegetation also prevents sediment from entering the surface water. Sediment contains phosphorus. One pound of phosphorus can cause the growth of 500 pounds of aquatic vegetation and algae. Sediment also degrades fish habitat and is especially damaging to spawning areas. By filling in the cracks in the small rock, or cobble, fish eggs become smothered by sit or lie on top and are eaten by other fish.

During the summer of 2002 Otter Tail County established a program to map emergent aquatic vegetation in an effort to preserve some of the habitat that still exists. One hundred three lakes were targeted and, of them, fifty-two have been completed. Vegetation mapped includes Bulrush, Cattail, Phragmites, Wild Rice, and Lily Pads. These files are on inventory with the Otter Tail County GIS Department. It is important to explore new funding for completion and continuation of this program. A sample map is shown in [Figure Nine](#).



b) Regulatory Issues

The discussion during public input centered on the existing regulations within the shoreland area. The need for an overall long-range plan, coupled with new shoreland rules and better enforcement of the existing shoreland regulations was a high priority among the attendees. Lake re-classification for preservation of sensitive areas, support of the new alternative shoreland rules, and agricultural rules within the shoreland area were brought forward as actions. A comprehensive plan will need to be completed to better address these issues on a county-wide basis.

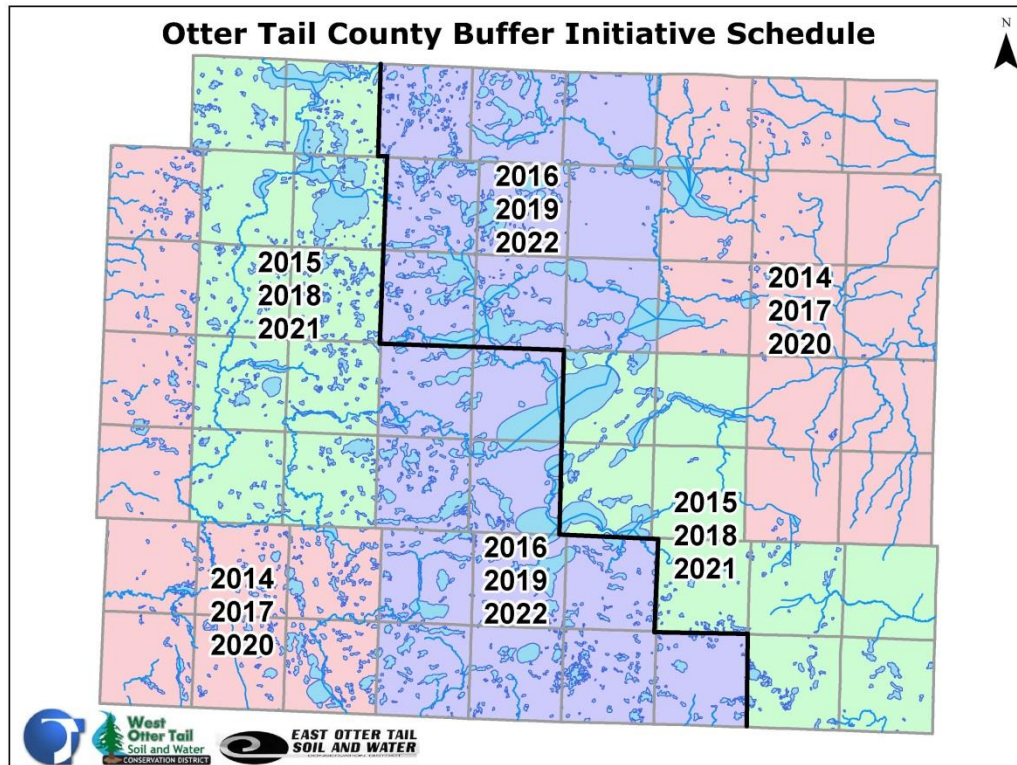
Shoreland Regulations

Local governments (counties, cities, towns) are responsible for the implementation, administration and enforcement of shoreland management standards through their planning and zoning controls. These controls affect shoreland property owners and the use and development of shoreland areas. The Department of Natural Resources is currently in the rulemaking process to revise the shoreland management standards. The shoreland rules were last revised in 1989. The goal is to have workable standards that reflect key resource values and science and are adaptable to a variety of local issues and needs.

Lakes in Otter Tail County make up about 12 percent of the total land area, or 169,162 acres. Wetlands comprise 66,388 acres or 4.7 percent. Development within the 1000 feet of lakes, and 300 feet of rivers, as shown in [Figure Ten](#), is regulated by the Shoreland Management Ordinance of Otter Tail County. Land use is regulated within this area with regards to preservation of the water resources. Annual building site permits throughout the county for the past five years have ranged from 590 in 2008 to a high of 906 in 2004 – all occurring within this shoreland area. There has been a steady decline in permits over the past six years.

Otter Tail County Buffer Initiative

The purpose of the Otter Tail County Buffer Initiative is to assist landowners and the county to move in the direction of 100% compliance with the state and county shoreland rules as noted on page 17 in the Shoreland Management Ordinance of Otter Tail County, Minnesota revised August 1, 2013. This initiative is a systematic approach to prioritize and target those properties adjacent to the 1,048 lakes and 1,174 miles of rivers, who are currently not in compliance with the 50ft buffer requirements. This is a nine year, three phase initiative in which SWCD has identified six target areas within the county. Two target areas will be implemented each year. Phase one will include an informational mailing, map and fact sheet about the initiative, the shoreland management ordinance, and available programs to assist. Phase two will consist of a second letter informing landowners they are out of compliance and fact sheet, Phase three will be the final letter and will require a deadline to establish the required buffer voluntarily. A database of all required buffers will be maintained and updated on a regular basis in order to measure the success of the program and landowner participation in programs.



Platting, or splitting land into lots, has occurred mainly within the 1000 feet surrounding the lakes of the county. While the increase in plats in 2001 and 2004 would indicate growth, [Table J](#) shows an overall decrease in development platting over the past ten years. Development is occurring on previously platted land and metes and bounds tracts.

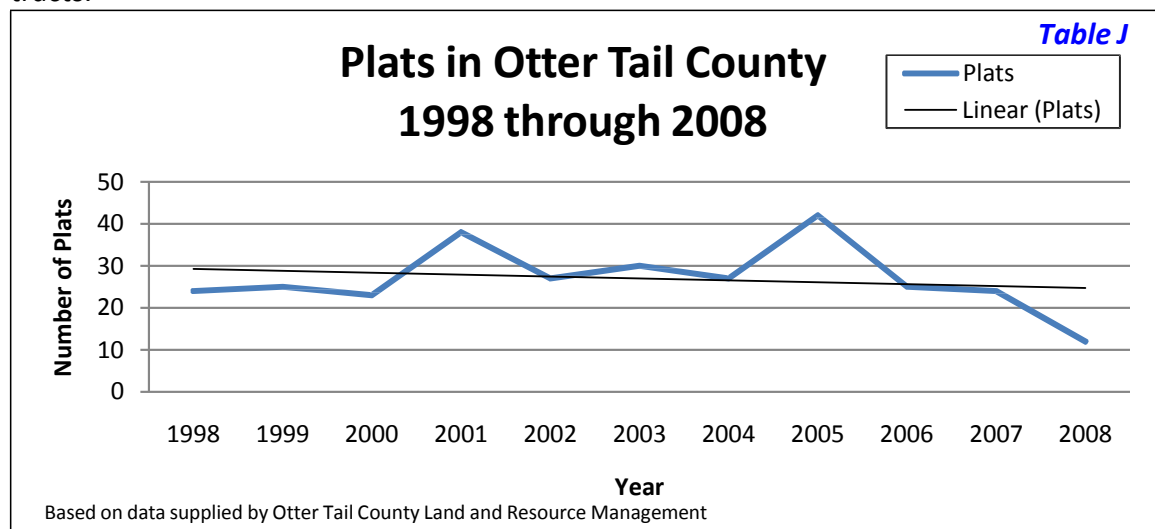
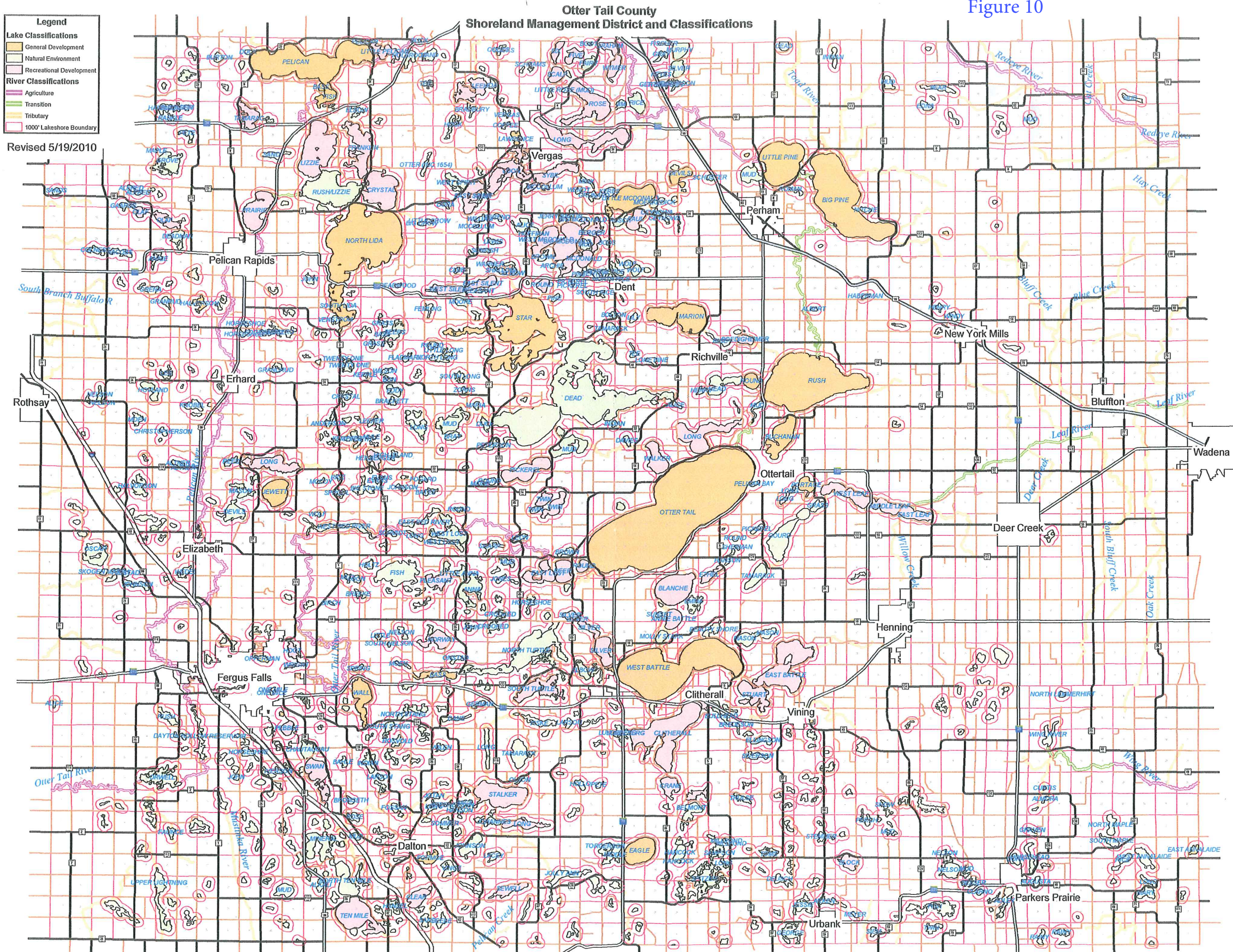


Figure 10



The area within 1000 feet of a lake and/or 300 feet of a river, or the shoreland area, makes up 17.5% of the area of Otter Tail County minus the area of the lakes themselves. The desire to be near this resource is causing high density development in the most sensitive areas of the county. Unfortunately, the very resource that attracts development can be destroyed by it. In [Figure Eleven](#), the drainage area, or lakeshed, of each lake system is mapped. Overlaid on this map is the trophic state of each of these lakes. The darker the color of the lake, the higher the nutrient content (or poor water quality) of the lake. In correlation, the darker the lakeshed, the higher the property value. Note the higher property value assessments occur on the lightest colored (cleanest) lakes. Continued development in this manner will cause degraded water quality and, subsequently, lower property values.

Long Range Planning

Otter Tail County Commissioners appointed a special task force in March of 2000 to examine Long Range Planning. Recommendations from this task force were presented to the County Board in July of 2003. This document is on file with the Land and Resource Management Office in Otter Tail County. Recommendations to the county board included development of county-wide zoning and zoning ordinance(s). To accomplish this task, a County Comprehensive Plan must be developed.

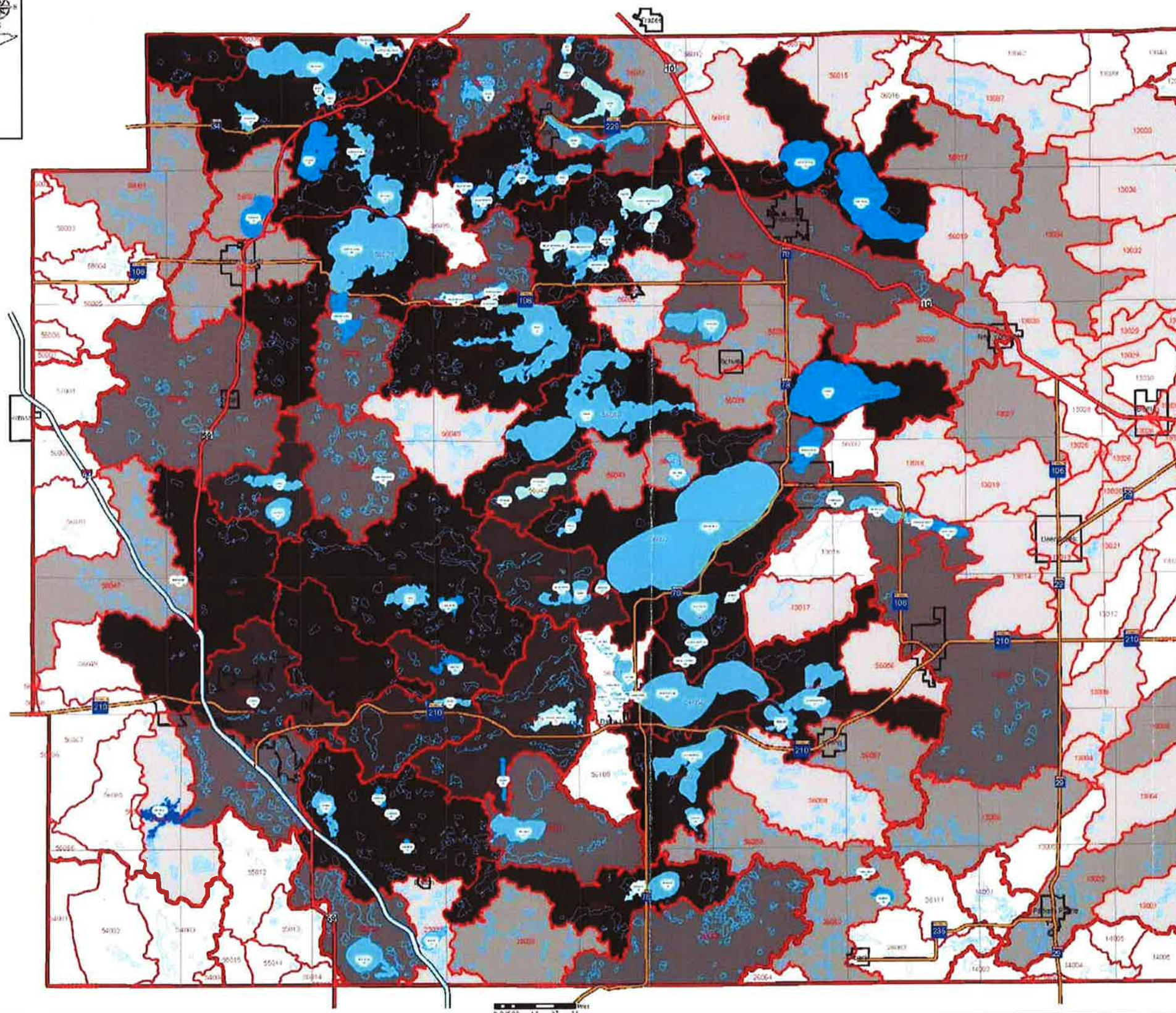


Figure Eleven
Otter Tail County
 Property Values By Watershed*

Explanation of Features

Property Values

- Under \$10 Million
- \$10-\$20 Million
- \$20-\$40 Million
- \$40-\$80 Million
- \$80-\$100 Million
- Over \$100 Million

Trophic State Index Values

- No Data
- Under 30 Oligotrophic
- 30-50 Mesotrophic
- 45-65 Eutrophic
- Over 65 Hypereutrophic

- Major Watersheds
- Minor Watersheds
- Lakes
- Township Boundary
- Interstate
- MN Highways
- US Highways
- Cities

*The values shown represent only those properties with addressed, habitable structures

© COPYRIGHT OTTER TAIL COUNTY 2009
 THIS MAP WAS COMPILED FROM MULTIPLE DATA SOURCES AND IS INTENDED FOR REFERENCE USE ONLY. OTTER TAIL COUNTY DOES NOT ASSUME LIABILITY FOR ERRORS, INACCURACIES OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

Topographic alterations require a Conditional Use Permit for projects over 350 cubic yards or projects that have unique sensitivity issues. In the past five years, these permits have decreased from 69 in 2004 to 26 in 2008. Shoreland alterations, or grade and fill permits, in Otter Tail County have averaged around 318 per year for the past five years. While a single alteration may be considered small, the cumulative effects of all alterations can be detrimental to a lake. The following **Figures Twelve through Fifteen** reflect a study, conducted by the Wisconsin Department of Natural Resources, shows the effects of development.

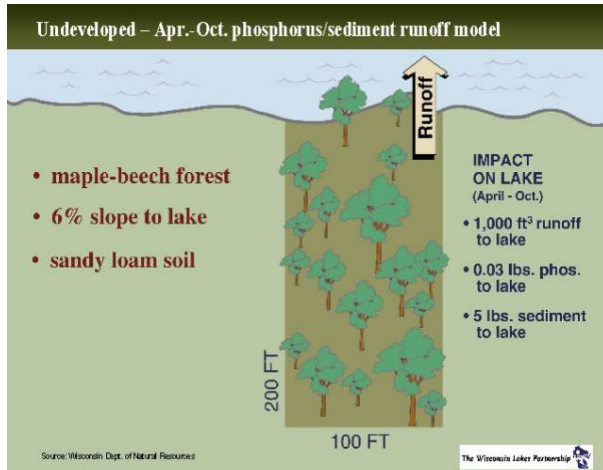


Figure Twelve- The first is a lot with its vegetation intact. Note the amount of phosphorus that enters

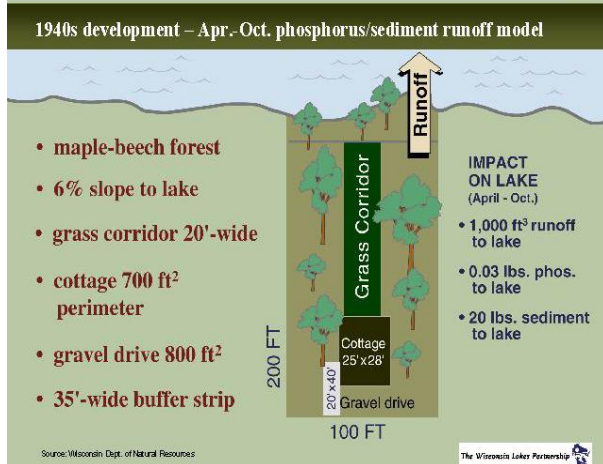


Figure Thirteen- Here is the same lot with a 1940s type cabin and a 20-foot wide grassy path to the lake. There is a 35-foot buffer of vegetation and much of the lot is still wooded. The grass corridor is a typical lawn turf. The model is based on vegetation after it has recovered from

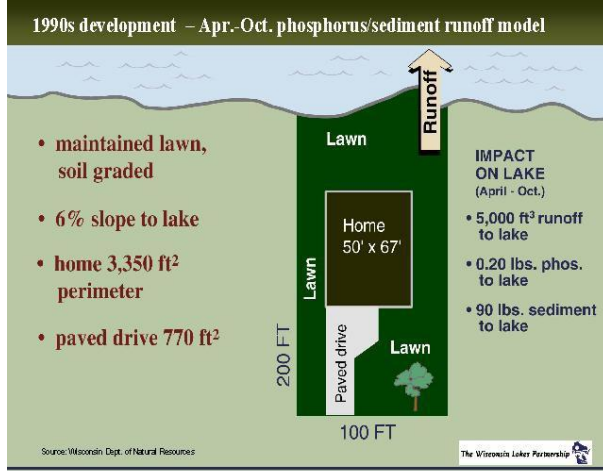
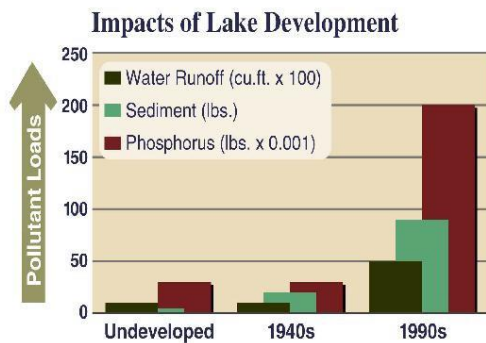


Figure Fourteen - Here is the same lot with a 1990s type house, 50X67 feet: the 35-foot buffer of vegetation is gone, there is more impervious area and most of the trees are gone. Again the lawn is a typical grass turf. Note the amount of phosphorous that washes off the land and into the lake. Again, the model is based on vegetation after it has recovered from construction.



Source: Wisconsin Dept. of Natural Resources

The Wisconsin Lakes Partnership

Figure Fifteen - Change in runoff, compared to undeveloped lot:

- 1940s
 - runoff, no change
 - sediments, 4X increase
 - phosphorus, no change
- 1990s
 - runoff, 5X increase
 - sediments, 18X increase
 - phosphorus, 7X increase

Data has been completed by the Wisconsin Department of Natural Resources

This image summarizes the runoff of water, sediments and phosphorus at the three levels of development. When landowners remove the natural vegetation to build a home and establish a lawn, the amount of phosphorus and sediments that can be carried into the lake by rains greatly increases.

These results do not include runoff of pollutants during the construction period. Using sediment barriers during construction can assist in limiting the movement of sediments into the lake.

With many lakes in Otter Tail County reaching full development, cumulative effects will become more obvious and more difficult to correct. Alterations typically increase the amount of phosphorus and sediment entering the lake. This increase degrades water quality and clarity.

Sensitive Areas

Areas sensitive to development pressures in Otter Tail County have unique features that contribute to groundwater or surface water pollution. Features contributing to sensitivity include high water table (low ground elevation); sandy, porous soils; tight, clay soils; steep slopes / bluffs; and shallow, mucky shoreland areas.

A bluff, or hill higher than 25 feet and steeper than 30% slope, is unstable when vegetation is removed or development occurs too close to the edge. A 30-foot setback from the top of the bluff is required in Otter Tail County within the shoreland area. In addition to this, vegetation removal is regulated to protect the integrity of the bank. Undue pressure from a dwelling can cause instability on the bottom, or toe, of the bluff. This causes failure or slumping of the bank. There are several areas in the county that contain bluffs, as noted in [Figure Sixteen](#). These areas require special consideration of setbacks, lot sizes, and vegetation removal during the development process.

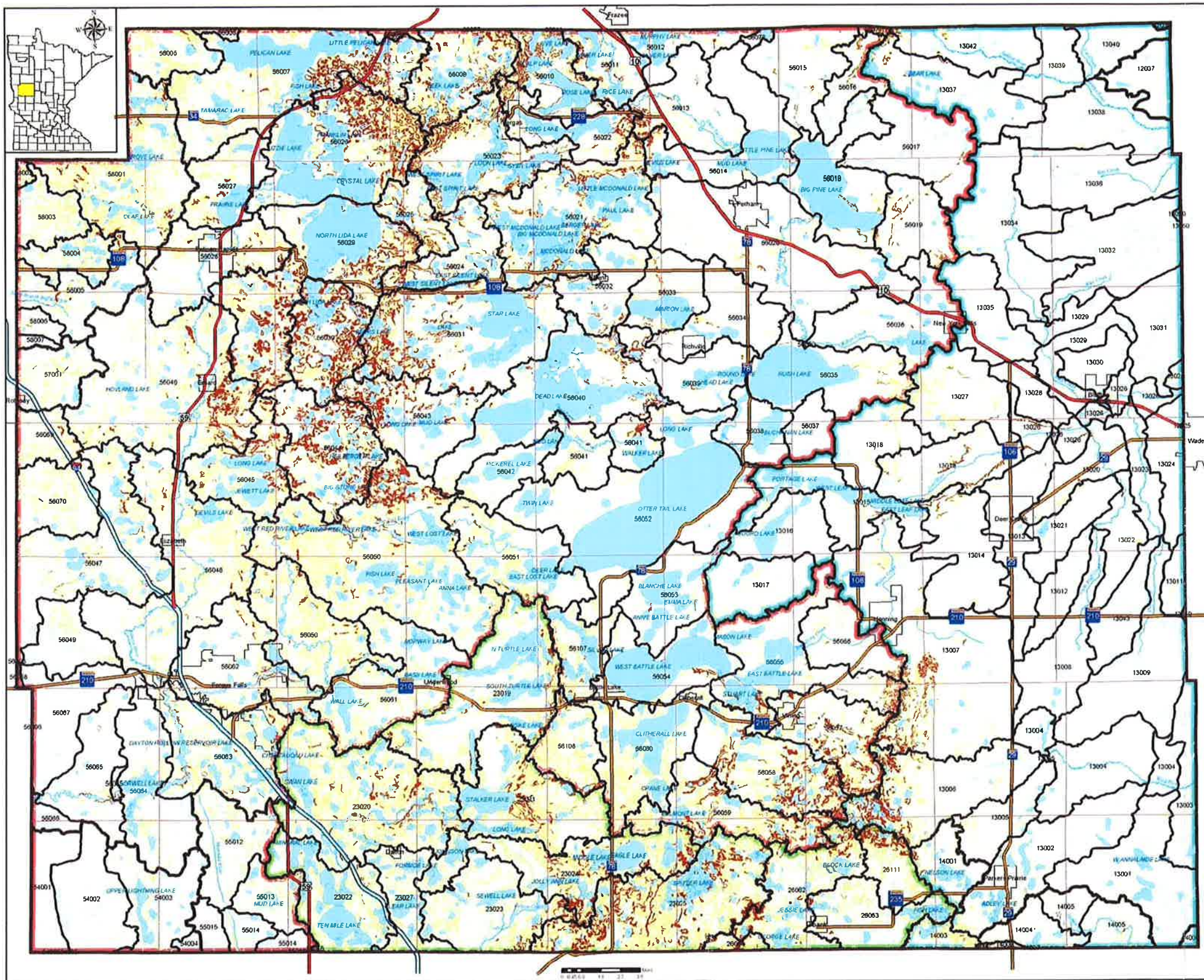


Figure Sixteen
Otter Tail County
 Bluff Locations And Steep Slopes
 As Described By The
 1994 SSURGO Soil Survey

Explanation of Features

Bluffs

Slope Values

Steep Slopes (12% - 29%)

Bluffs (30% or Greater)

Major River Basins

Minnesota River Basin

Mississippi River Basin

Red River Basin

Major Watersheds

Minor Watersheds

Lakes

Township Boundary

Cities

Interstate

MN Highways

US Highways

Undefined

River or Creek

Bluffs for this project are defined as follows.

A topographic feature such as a hill, cliff, or embankment with the grade of the slope from the toe to a point 25 ft or more above the ordinary high water level which averages 30% or greater.

© COPYRIGHT OTTER TAIL COUNTY 2003
 THIS MAP WAS COMPILED FROM
 MULTIPLE DATA SOURCES AND IS
 INTENDED FOR REFERENCE USE ONLY.
 OTTER TAIL COUNTY DOES NOT ASSUME
 LIABILITY FOR ERRORS, INACCURACIES
 OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

Stormwater Regulations

The identified issues of contaminated runoff, declining water clarity, fertilizer over-application, high water levels and erosion are included in this stormwater management assessment. This section addresses the movement of water over land and its effects on the quality of the waters within Otter Tail County.

Topography and Erosion

Movement of water is caused by rainfall and snow melt and is one of the leading contributors to water pollution. Topography, or land features, has an effect on erosion potential. According to [Figure Seventeen](#), there is an 800+ foot difference in elevation throughout the county. From the river valley in the western quarter to Inspiration Peak, the highest elevation in Otter Tail County, a variety of slopes exist. The continental divide that separates north-flowing waters from south-flowing waters lies in an irregular line from near Butler to New York Mills, then south to just west of Dalton. North-flowing waters drain via the Red River into the Hudson Bay, and south-flowing waters drain via the Crow Wing and Minnesota Rivers into the Mississippi River. The higher the degree of variation in slope, the higher the potential for erosion during over-land movement of water.

Soil loss occurs mainly during the construction process. Once a site is stabilized with vegetative cover, loss is minimized. It is important to protect our resources during this process. Local governments must consider proper stormwater management in all reviews, approvals and permit issuance under shoreland management controls adopted under Minnesota Rules 6120.2500 to 6120-3900. Stormwater management is regulated in Otter Tail County's Shoreland Management Ordinance, revised in 2008, to help eliminate sediment deposition in area lakes and rivers. Basic standards include:

- Impervious surface coverage of lots must not exceed 25% of the lot area.
- When constructed facilities are used for stormwater management, they must be designed and installed consistent with the field office technical guide of the local Soil and Water Conservation Districts.
- New constructed stormwater outfalls to public waters must provide for filtering or settling of suspended solids and skimming of surface debris before discharge.
- Surface area of a lot physically separated (i.e. public, private road right-of-way or easement) from itself or another cannot be included for purposes of the impervious surface calculation.
- Unless otherwise provided by the property owner, a minimum 12-foot wide driveway, from the nearest road right-of-way to the proposed structure(s), must be included in the impervious surface calculation.
- Surface area covered by permeable pavers must be included in the impervious surface calculation.

These provisions help to prevent contamination due to runoff within 1000 feet of a lake or 300 feet of a river.

Complete rules can be found on the Otter Tail County website at:
<http://www.co.otter-tail.mn.us/land/shorelandmanagement.php>

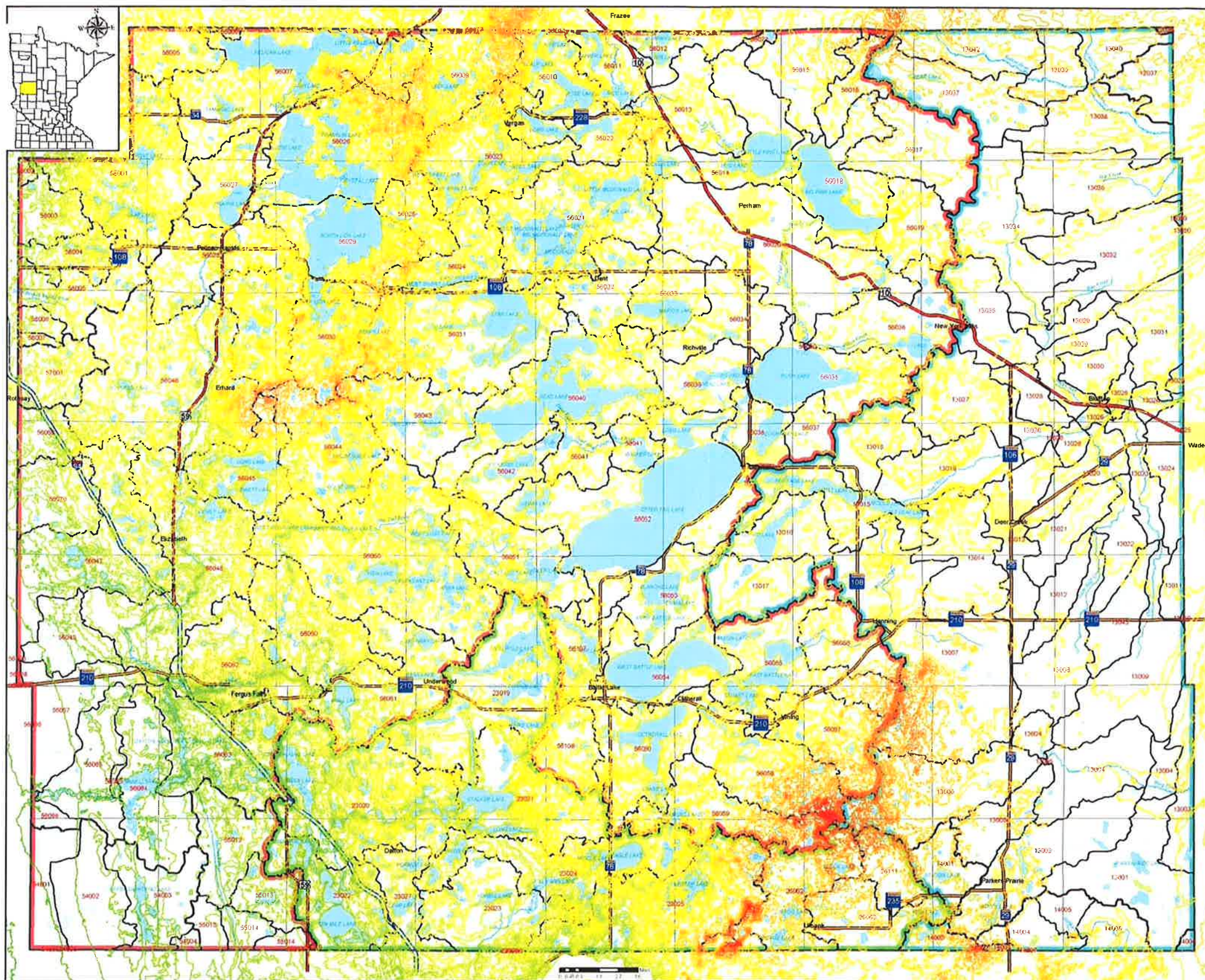


Figure Seventeen
Otter Tail County
 30 Meter Contour Intervals

Explanation of Features

- 974
- 1004
- 1034
- 1064
- 1094
- 1124
- 1154
- 1184
- 1214
- 1244
- 1274
- 1304
- 1334
- 1364
- 1394
- 1424
- 1454
- 1484
- 1514
- 1544
- 1574
- 1604
- 1634
- 1664
- 1694
- 1724
- 1754
- 1784

Major River Basins

- Minnesota River Basin
- Mississippi River Basin
- Red River Basin
- Major Watersheds
- Minor Watersheds
- Lakes
- Township Boundary
- Cities
- Interstate
- MN Highways
- US Highways
- Undefined Stream
- River or Creek

© COPYRIGHT OTTER TAIL COUNTY 2003
 THIS MAP WAS COMPILED FROM
 MULTIPLE DATA SOURCES AND IS
 INTENDED FOR REFERENCE USE ONLY.
 OTTER TAIL COUNTY DOES NOT ASSUME
 LIABILITY FOR ERRORS, INACCURACIES
 OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

Drainage

Minnesota drainage law (Minn. Stat., chapter 103E), established in 1887 and amended on a regular basis since, has allowed Otter Tail County Commissioners to regulate drainage within their borders. Delegation has been given to the Land and Resource Management Department. Map drawings of the original ditch system are available. Otter Tail County has 63 ditch systems, comprising approximately 274 miles of drainage.

This law was originally established to allow for productive agricultural use of low, wet areas. Today, the drainage law and cleanout rules provided within, can conflict with the need to protect area lakes and wetlands. The 2007 Legislative Session provided changes to 103E.021 which provides the ability of the ditch authority to require permanent buffer strips of perennial vegetation or side inlet controls to improve water quality without full re-determination of benefits. By determining the damages to the landowner for land removed from production, these water quality improvement measures can be enacted in a relatively inexpensive manner. Other federal and state laws have been passed that may cause conflict in the implementation of the original law. Some of these include:

“Swampbuster” Rules

The wetland conservation provisions of the 1985, 1990 and 1996 Farm Bills require agricultural producers to protect wetlands on the farms they own or operate in order to be eligible for USDA farm program benefits.

The Clean Water Act, section 404

Individuals cannot undertake activities involving filling, even on privately owned lands, if that land comes under the broad definition of “wetlands” without an Army Corps of Engineers permit

Minnesota Environmental Policy Act (MEPA)

This state law was passed in 1973 to promote efforts to prevent or eliminate damage to the environment. This program may require the drainage authority to prepare an environmental assessment worksheet (EAW) or environmental impact statement (EIS). An EAW or EIS may be required by the Environmental Quality Board (EQB) through a petition by interested landowners.

1991 Wetlands Conservation Act (WCA)

This “no-net-loss” legislation states that any drained or filled wetlands must be replaced with created wetlands or restored wetlands of equal or greater size and quality (Minn. Stat. 103G.222 subd.1). For wetlands regulated by the WCA and not covered by the DNR, the drainage authority must obtain approval of a wetland replacement plan, exemption, or no-loss determination from the appropriate local government unit. Otter Tail County’s SWCDs have been designated as the clearinghouse for wetland information. Otter Tail County Land and Resource Management has regulatory authority for WCA for unincorporated areas in Otter Tail County.

More information regarding regulatory authority is available on the following website: <http://www.bwsr.state.mn.us/directories/WCA.pdf>

DNR Permit Requirements

The DNR administers the state's public water permit program, under Minn. Stat. ch.103G. Any person proposing to change the course, current, or cross-section of a public water, including draining or partially draining a lake or wetland, must obtain a permit from the DNR.

DNR protected waters map can be accessed on the following website:
http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps_nw.html

State and local agencies must work closely to determine maximum use for agricultural practices while still protecting the environment.

NPDES permitting

The Storm-water Program for construction activity is designed to reduce the amount of sediment and pollution entering surface and ground water both during and after construction projects. Storm-water discharges associated with construction activities are regulated through the use of National Pollutant Discharge Elimination System (NPDES) permits. NPDES permits are issued by the MPCA. Through this permit, the owner is required to develop a storm-water pollution prevention plan that incorporates specific best management practices (BMPs) applicable to their site.

Construction activities that disturb one acre or more of land require a permit. These activities may include road building, landscaping clearing, grading, excavation, and construction of homes, office buildings, industrial parks, landfills and airports. Both owners and operators are responsible for submitting the permit application. The permit is required of developers, builders, landscapers, architects, design engineers, surveyors, city/county highway departments, the Minnesota Department of Transportation and more.

The MPCA is in process of implementing a Storm Water Program for urbanized areas with a population greater than 10,000. This program is designed to reduce the amount of sediment and pollution that enters surface and ground water from storm sewer systems to the maximum extent practicable. Storm water discharges associated are regulated through the use of National Pollutant Discharge Elimination System (NPDES) permits. Through this permit, the owner or operator is required to develop a storm water pollution prevention program that incorporates BMPs applicable to their community.

More information is available on the MPCA website at:
<http://www.pca.state.mn.us/water/stormwater/stormwater-c.html#links>

An urban area may also be required to develop a Storm Water Program if it is located on sensitive waters or if it impacts waters. While some cities on the list currently have populations less than 10,000, the MPCA anticipates their populations will exceed 10,000 by the next census. Additionally, designation criteria can also be based on potential significant water quality impacts of storm water discharges to impacted waters. The City of Fergus Falls is preliminarily on this list to manage stormwater discharge.

Agricultural Rules

Agriculture plays an important role in maintaining open space and preservation of large tracts of land containing trees and wetlands, in addition to providing food resources. According to *Minnesota Agricultural Statistics 2008*, compiled by the Minnesota Department of Agriculture, Otter Tail County ranked in the top ten leading agricultural counties in the following areas:

- **2007 Crop Production** – first in Oats, second in All Hay; third in Dry Edible Beans, seventh in Sunflowers, and tenth in Barley.
- **2006 Cash Farm Receipts** – ninth in Livestock
- **As of 01/01/08** – second in Cattle and Calves, Beef Cows; and fourth in Milk Cows and Milk Production, and eighth in Breeding Sheep and Lambs.

The following agricultural use standards are found in the Otter Tail County Shoreland Regulations:

1. The Shoreland Impact Zone for parcels with permitted agricultural land uses is equal to a line parallel to and 50-feet from the Ordinary High Water Level (OHWL).
2. General cultivation farming, grazing, nurseries, horticulture, truck farming, sod farming and wild crop harvesting are permitted uses if the shore and bluff impact zones are maintained in permanent vegetation or operated under an approved conservation plan (Resource Management Systems) consistent with the field office technical guides of the local Soil and Water Conservation District or the United States Natural Resources Conservation Service.
3. Animal feedlots must not be located in the shoreland of rivers or in bluff impact zones and must meet a minimum setback of 300-feet from the OHWL of all public water basins.
4. Application of fertilizer, herbicides, pesticides, animal wastes or other chemicals within shorelands must be done in such a way as to minimize impact on the shore or bluff impact zones or public water by the use of earth or vegetation.

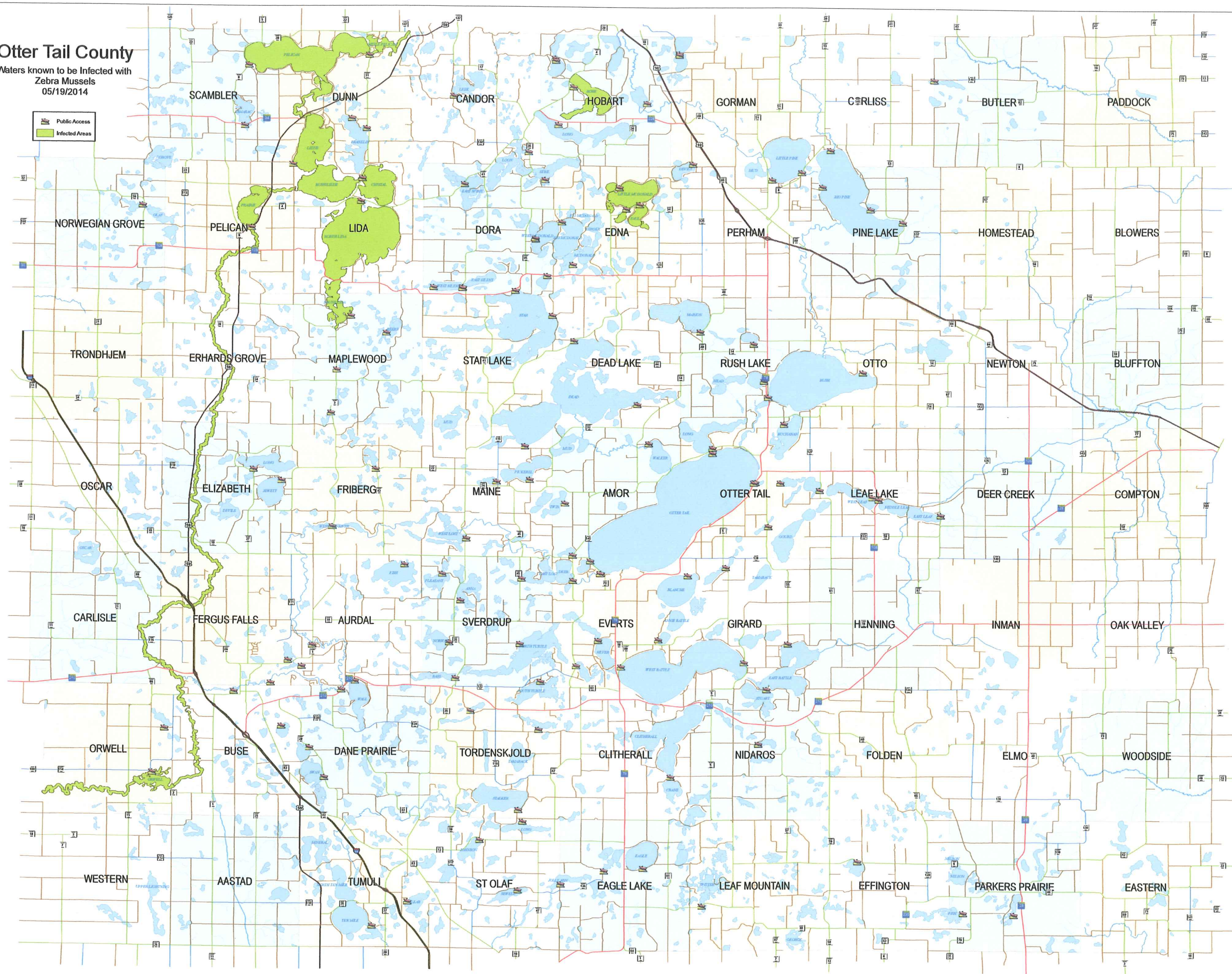
It is the consensus of the LWMP task force that the regulations help to protect the resource. The Otter Tail County Land and Resource Management Office is encouraged to enforce the existing regulations.

Aquatic Invasive Species

Aquatic invasive species are nonnative animals and plants that do not naturally occur in our waters and cause ecological and economic harm. Once introduced into an ecosystem where they have few natural predators, they can do irreparable damage to lakes, streams, and wetlands and their native inhabitants. Because of Otter Tail County's abundance of lakes Aquatic invasive species can greatly impact the health of the county's water resources. Otter Tail County has formed an Aquatic Invasive Species committee to make recommendations to the county board on AIS issues.

Otter Tail County

Waters known to be Infected with
Zebra Mussels
05/19/2014



c) Surface Water Quantity

Minnesota Statutes, Section 103G.005, subdivision 14 defines “ordinary high water level” (OHWL) as:

- An elevation delineating the HIGHEST water level, *Figure Eighteen*, that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial; for watercourses, the OHWL is the elevation of the top of the bank of the channel; and
- for reservoirs and flowages, the OHWL is the operating elevation of the normal summer pool.

The OHWL has been established on many but not all lakes in Otter Tail County. The established OHWL for lakes in Otter Tail County have been compiled by the Otter Tail COLA and are included in the appendix. Alterations in aquatic vegetation, addition or removal of sediment, or any “work” completed below the OHWL of lakes requires a permit from the MN DNR.

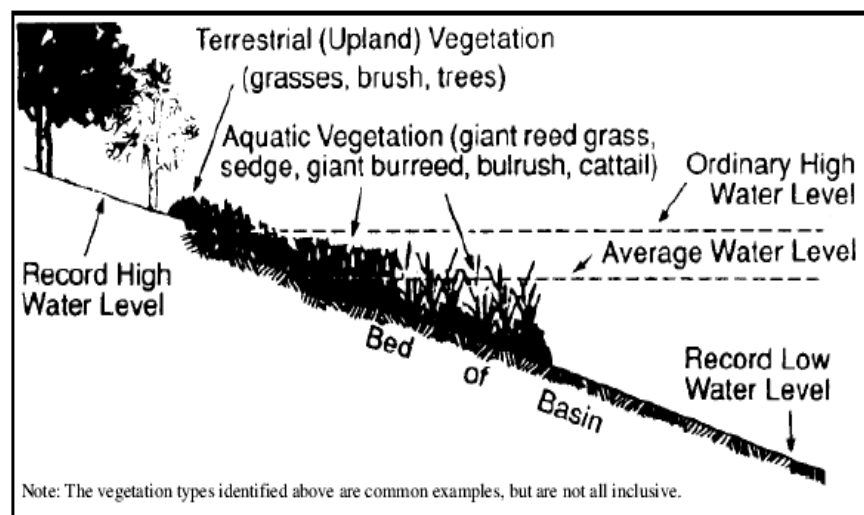
Lake Level Minnesota is a citizen volunteer program set up by the DNR. Citizens monitor lake levels and send the information to the DNR area hydrologist. More volunteers are needed in this area.

This data is compiled and accessible for individual lakes through the lake finder website, <http://www.dnr.state.mn.us/lakefind/html>

Several high water issues have occurred within the county. Impacts of high water on public roads and structures can cause hardship to the general public. When a lake has no or limited outlet for the water, it can rise up on the banks and cause erosion of sediment into the lake. In many cases, it works to lower the level to the OHW – as long as no impact is felt by downstream landowners. No DNR permit is required for this type of change. Occasionally, the water level needs to be dropped below the OHW; such as Hovland Lake 56-1014. MN Rules 6115.0221, subp.2 states this can be done under certain conditions.

Ordinary High Water Levels (OHWL)

Figure Eighteen



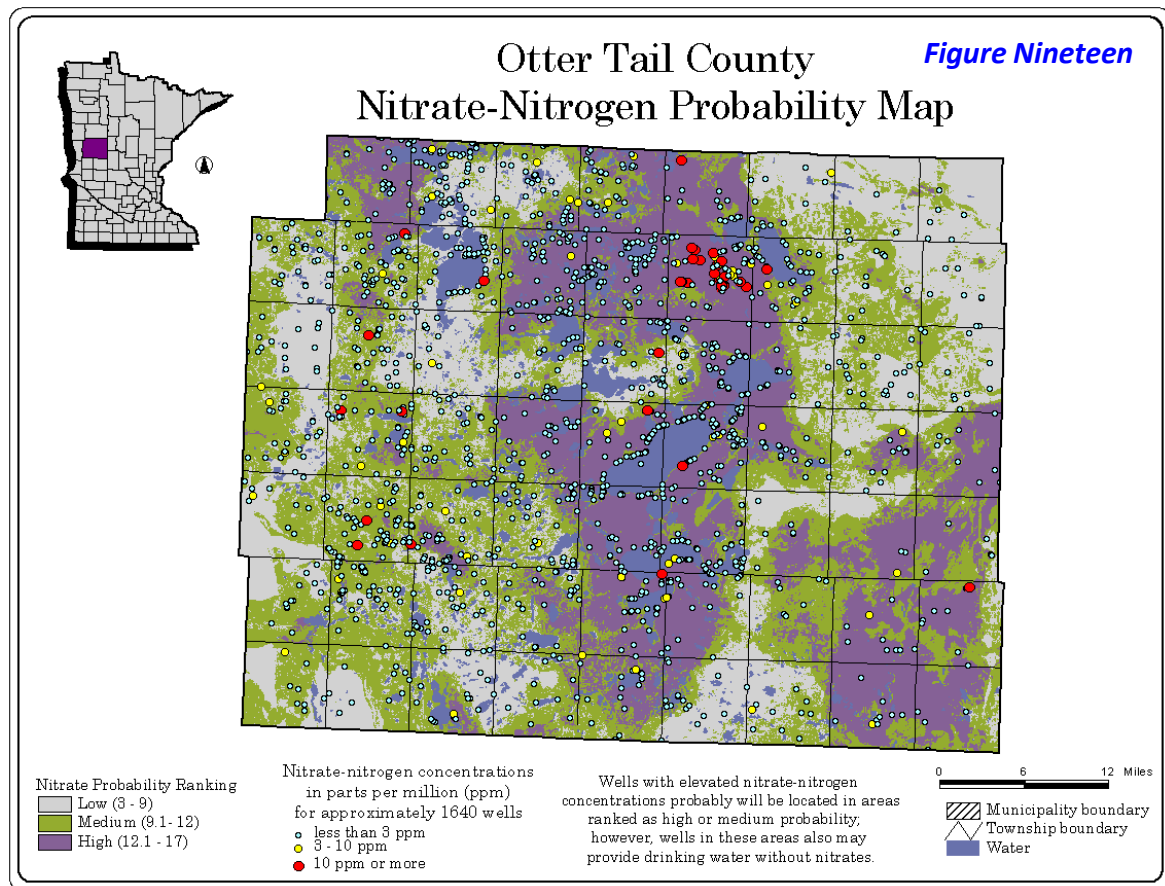
2. Groundwater Issues:

a) Groundwater Quality

One of the Priority Concerns of the residents of Otter Tail County is groundwater contamination. This concern was discussed at length at the public meetings and issues relevant to groundwater included concerns regarding abandoned wells, failing septic systems, agriculture contamination, potential for well contamination, education, effects of land use, hazardous waste dumping, and the natural / artificial contamination from arsenic. In this section precipitation, soils, groundwater (hydrogeology and wells), and surface water will be discussed regarding their interrelationship with each other and their ability to protect from vs. contributions to groundwater contamination.

Nitrates, Arsenic

Utilizing well data from approximately 1600 well locations, land use, landforms, soils, and depth to water table aquifer, the Minnesota Department of Health (MDH) developed a Nitrate-Nitrogen Probability map for Otter Tail County. This map clearly marks the areas within Otter Tail County that are susceptible to contamination from nitrates and other water soluble contaminants. As seen in [Figure Nineteen](#), these areas coincide with the above mentioned soils and hydrogeology information. The complete study is available in the appendix.



Within the high Nitrate-Nitrogen probability area, agriculture is the predominant land use. Irrigation in Otter Tail County has increased since the early '90s. Irrigation within the Otter Tail River Watershed occurs on more than twice the acreage than the rest of the county. In these sensitive areas, the potential for movement of pesticides, herbicides and fertilizers into the groundwater is high. Irrigation helps facilitate this movement.

Through the Sand Plains Cooperative Agreement between the Minnesota Department of Agriculture (MDA), the Otter Tail SWCDs, and Otter Tail County in 1998, a 20-year monitoring plan has been established to identify contaminants in the ground water within the outwash sand plain. The goal of this joint ground water monitoring cooperative is to “provide information on impacts of the routine use of agricultural chemicals on the region’s ground water so that agricultural chemicals may be managed to prevent degradation of the region’s ground water resources.” This will provide important information based on real data obtained within Otter Tail County.

Programs have been established throughout Otter Tail County to monitor well water for Nitrates. The presence of Nitrates in groundwater can be a valuable indicator of environments that are susceptible to contamination. The MDA has been funding testing to communities and lake associations at no cost since 1995. In conjunction with Wellhead Protection, the City of Perham has established a voluntary well monitoring network, monitoring 100 wells within the Wellhead Protection Area every six months for Nitrates.

A Regional Hydrogeologic Assessment was completed in western Otter Tail County in 2000 and completed for the rest of the county in 2002. This study considered the near-surface groundwater, generally between 20 and 50 feet deep. Consideration for sensitivity to pollution was based on texture of soils and depth to water table. Potential for groundwater contamination based on the soil infiltration rates is shown in *Figure Twenty*.

Regional Hydrogeologic Assessment maps are available on the DNR website at: http://www.dnr.state.mn.us/waters/groundwater_section/mapping/status.html

High potential for groundwater contamination exists along a beach ridge that runs in a linear north-south direction along the west side of Big and Little Pine Lakes, through Rush Lake and down along the east side of Otter Tail Lake – changing from high to moderate/high south from there to the county border. Another high sensitivity area runs from the northwest corner of the county and then down along highway 59. Around the north central lakes the sensitivity is moderate/high, as well as the area around Parkers Prairie.

The majority of the rest of the county is in the moderate sensitivity range. Within the county there are few areas where surface actions do not adversely affect groundwater.

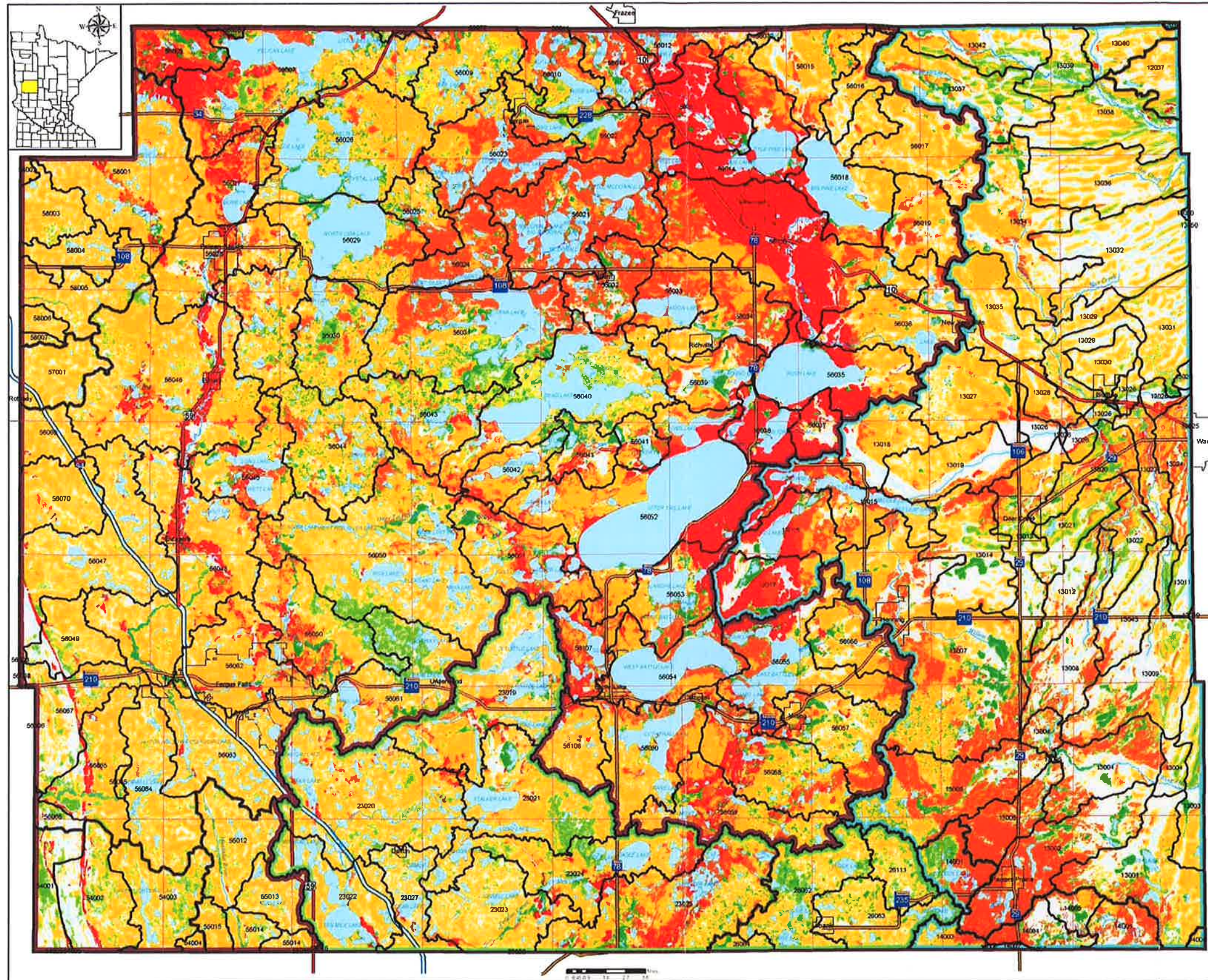


Figure Twenty
Otter Tail County
 Groundwater Contamination Potential
 Based on Soil Infiltration Rates
 As Described In The
 1994 SSURGO Soil Survey*

Explanation of Features

Soil Infiltration Rates

Drained Areas or Ponded Water

- Very low
- low
- Moderate - low
- Moderate
- Moderate - High
- High

Major River Basins

- Minnesota River
- Mississippi River
- Red River

Major Watersheds

Minor Watersheds

Lakes

Township Boundary

Cities

Interstate

MN Highways

US Highways

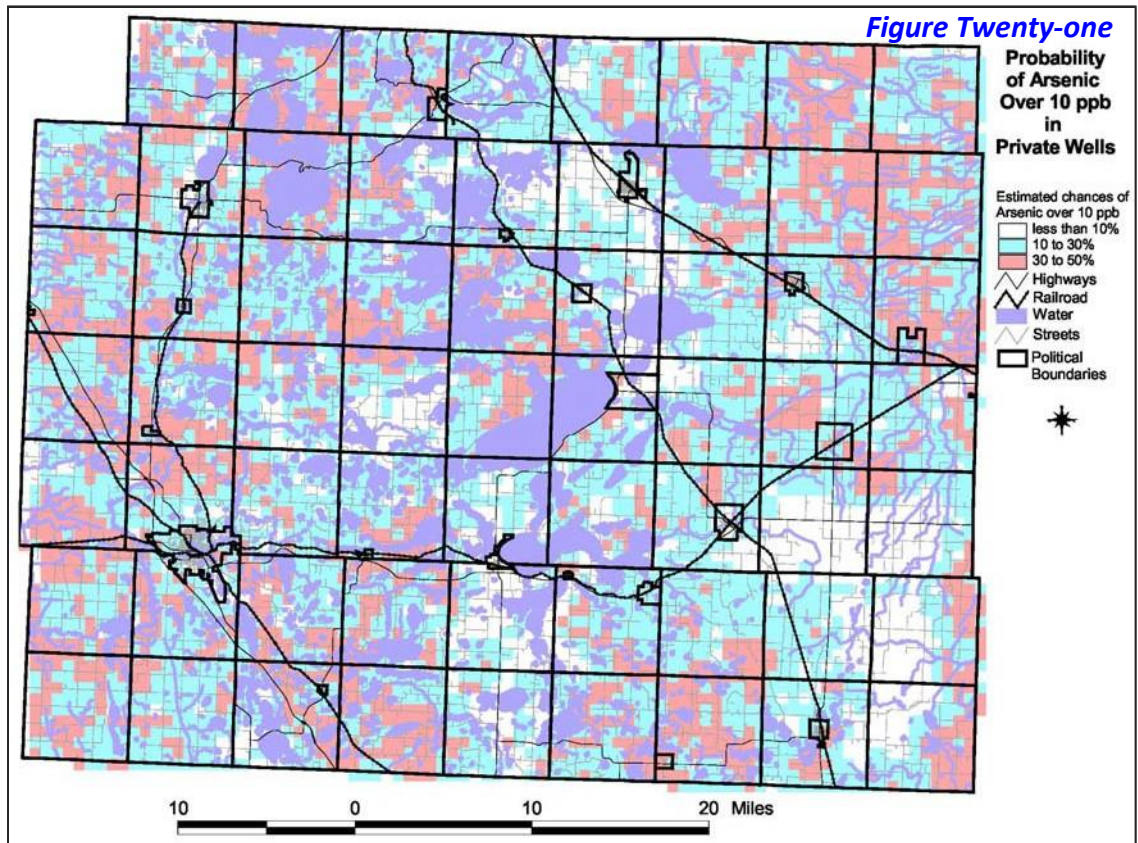
Undefined

River or Creek

*Groundwater contamination potentials shown on this map are based off of Soil Permeability and Infiltration Rates ONLY. This data does not take into account such factors as Hydraulic Conductivity, Soil Chemistry, or other constraints. No data for these factors was available when this map was created.

© COPYRIGHT OTTER TAIL COUNTY 2003
 THIS MAP WAS COMPILED FROM MULTIPLE DATA SOURCES AND IS INTENDED FOR REFERENCE USE ONLY. OTTER TAIL COUNTY DOES NOT ASSUME LIABILITY FOR ERRORS, INACCURACIES OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

Arsenic in drinking water wells is an existing issue to Otter Tail County. Glacial deposition of certain shale materials and thick clay layers from the Des Moines Lobe have contributed to naturally caused arsenic levels occurring over state drinking water standards of ten parts per billion. As shown in *Figure Twenty-one*, multiple areas within the county have higher than safe limit levels of Arsenic.



Landowners with wells containing arsenic at or beyond the health concern level of 10 ppb could be provided with information and / or assistance in determining if another aquifer exists nearby with a sand lens and no arsenic.

There may be other localized areas where arsenic occurs due to land use activities, such as the City of Perham. These areas will be dealt with on a case-by-case basis, determining the extent and location of the source.

Sourcewater Protection / Wellhead Protection

A Source Water Assessment is a document produced by MDH staff intended to provide basic information to public water suppliers and the general public regarding: 1) where their drinking water comes from, and 2) the degree to which it may be impacted by potential sources of contamination.

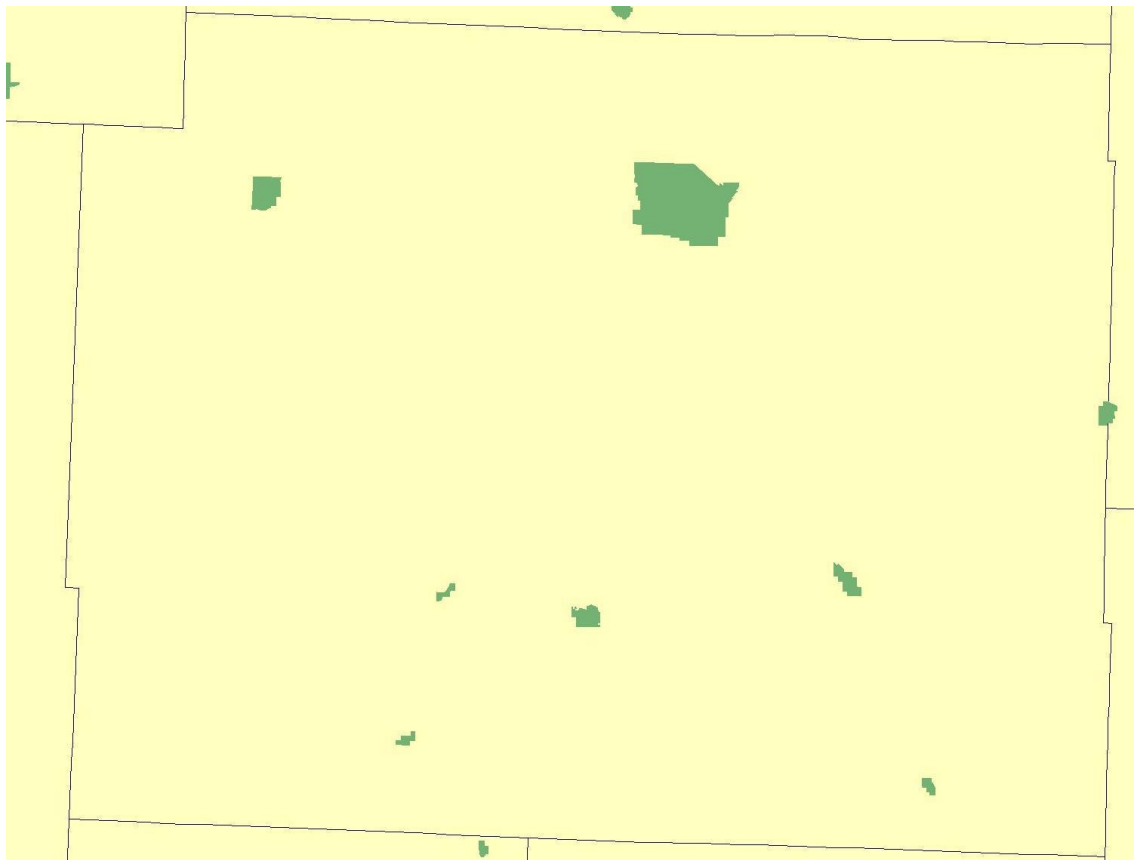
A complete listing of source water assessments for Otter Tail County is available at:

<http://www.health.state.mn.us/divs/eh/water/swp/swa/index.htm>

Wellhead protection is a method developed by the MDH to prevent well contamination by effectively managing potential contaminant sources in all or a portion of a well's recharge area. This area, as shown in *Figure Twenty-two*, is known as the wellhead protection area. Sourcewater protection uses this concept when water is used from a surficial source, instead of a well. This could include a lake, river or reservoir.

The MDH is systematically requiring a wellhead protection plan in all public water supply sources in Minnesota. In Otter Tail County, the Cities of Parkers Prairie and Perham have completed and approved wellhead protection plans. Wellhead protection areas have been designated for Otter Tail Nursing Home, Underwood, Pelican Rapids, Dalton, and Battle Lake. Nutrient management, public education and inventory of SSTs and underground tanks are high priorities within these plans.

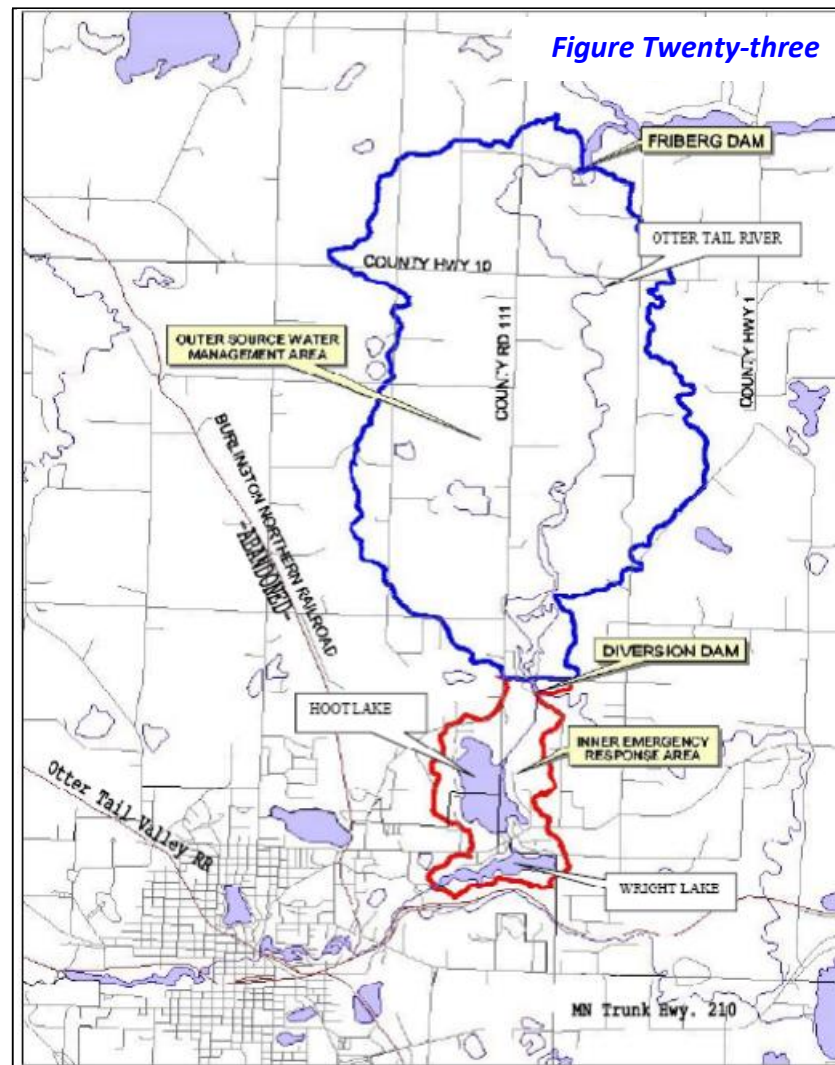
Figure Twenty-two



There are 303 public water suppliers in Otter Tail County that will need to address their drinking water protection by development of a plan. Different communities are in varying stages of plan development. The MDH and Minnesota Rural Water Association assist these suppliers in development and implementation of protective strategies. It is important to work closely with suppliers during development and these areas become a priority for management practices.

Surface water protection is being studied on a voluntary basis. The City of Fergus Falls has developed a non-mandatory surface water protection plan since they receive a

major portion of their water supply from the Wright Lake, a flowage area of the Otter Tail River. Their outer response area, as shown in [Figure Twenty-three](#), is relatively large and encompasses the drainage area of the Otter Tail River up to Friberg Dam. The inner response area is the immediate drainage area of Hoot and Wright lakes and this area is the most critical to protect from contaminants.



Weather Station Network

East Otter Tail SWCD currently maintains four weather stations across the county. They are located at the Perham airport, Wadena airport, Ottertail County Sheriff's Outpost, and on a private parcel in Parkers Prairie. These weather stations collect information that is vital to agricultural production such as temperature, humidity, solar radiation, precipitation, and potential ET (evapotranspiration). This information is downloaded daily by our irrigation specialist and uploaded to an irrigation checkbook program to determine crop specific water needs. This information is updated daily on the East Otter Tail SWCD website and available to the public. EOT is currently working with MDA and neighboring SWCDs to install four additional weather stations in the spring of 2014. EOT is currently seeking additional funding sources to streamline our weather network and make it available in "near real time" as well as offering the service on a mobile application for smartphones and tablets.

The ISP is designed to give farmers a second opinion of soil moisture status of a given field which assists in the decision of if and when to irrigate. Program participants are required to track all irrigation and rain events using a provided rain gauge and all precipitation is then reported to our irrigation specialist once a week. The irrigation specialist then combines all precipitation data with ET information that was gathered from the weather station network. The resulting output provides a report of the estimated soil moisture level. The irrigation specialist then visits each field weekly to verify the accuracy of the report by conducting an in-field soil moisture assessment. This information is used to prevent crop yield loss due to under irrigation or fertilizer leaching events from over irrigation.

Irrigation Education and Outreach

Since 2011 EOTSWCD has been working through a joint powers agreement with the MN Department of Agricultural to promote Best Management Practices for irrigation water management. East Otter Tail has hosted 8 irrigation workshops in 5 different counties in central Minnesota. These workshops have hosted over 267 producers who manage tens of thousands of irrigated acres. Workshop participants are provided with presentations from agency staff and industry representatives that highlight changes and innovations that maximize water management efficiency. Attendees are also given hands on opportunities to learn proper soil moisture assessment of different soil types and other ways of monitoring crop available water supplies.

Irrigation Water Management

Through a successful clean water grant application EOTSWCD has been able to provide cost share to county producers in order to convert high pressure irrigation systems to low pressure. Low pressure systems utilize significantly less energy to move the same amount of water. Installation of low pressure nozzles also results in larger droplet size which decreases the amount of water that is lost to evaporation and drift. EOTSWCD has used the clean water grant to help fund 11 different conversions, covering over 1300 acres.

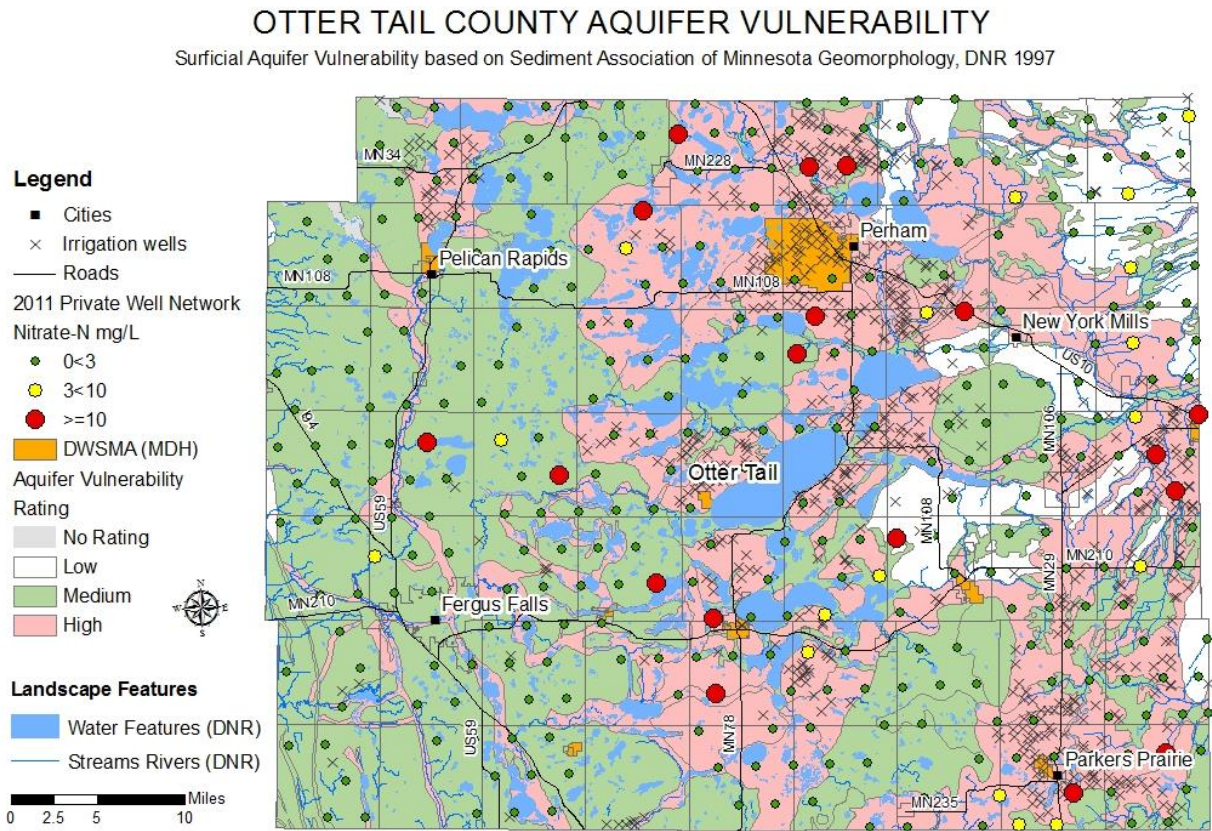
DNR Observation Well Monitoring

The SWCDs are contracted by the MN DNR to record monthly measurements in a network of observation wells across the county. Measurement of the static water levels help the state get a snapshot of aquifer health and recharge, model long term trends, determine the impact of pumping on aquifers, and resolve well interference conflicts.

Private Well Monitoring

Using Clean Water Funds, Minnesota Department of Agriculture (MDA) began the Central Sands Private Well Monitoring Network in the spring of 2011. Concerns about high nitrate concentrations in private drinking water wells is what led to the development of the Central Sands Private Well Network. The MDA has been monitoring nitrate concentrations in observation wells since 1986 through the pesticide groundwater monitoring program. Sixty-two percent of the MDA observation well data shows that nitrate levels in the most vulnerable portion of the aquifer, near the edge of fields, exceeds the drinking water limit in the Central Sands counties. The Central Sands counties include: Becker, Benton, Cass, Crow Wing, Douglas, Hubbard, Kandiyohi, Morrison, Otter Tail, Pope, Sherburne, Stearns, and Wadena. Wadena SWCD is the lead local project coordinator. In the first year a total of

1555 private drinking water wells were sampled for nitrate concentrations and over 2500 wells in the past three years. The project is broken up into two phases, phase 1 of the project determined current nitrate concentrations in private wells throughout the Central Sands region of Minnesota. The data collected in Phase 1 will be used to determine areas of concern, and to develop a long term trend monitoring network as part of Phase 2.

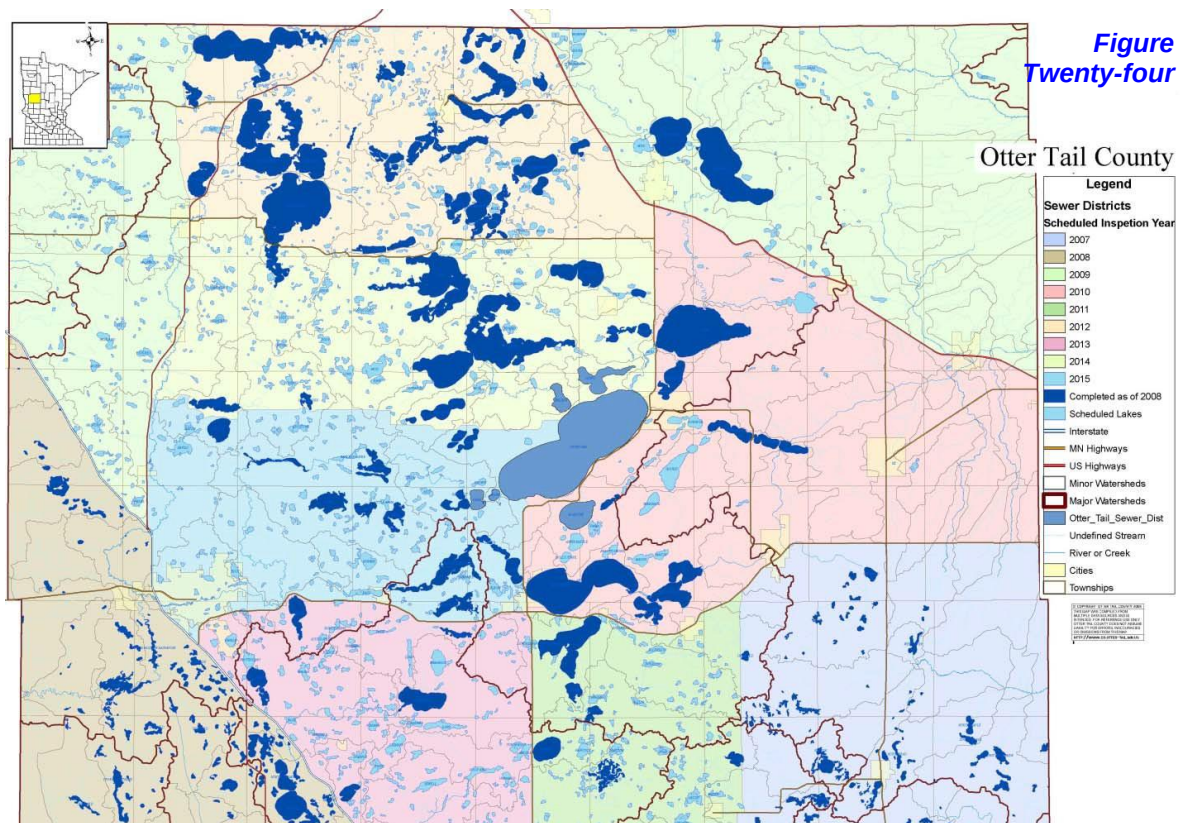


Prepared by the Minnesota Department of Agriculture November 2014



Sub-Surface Sewage Treatment Systems

SSTS, or sub-surface sewage treatment systems, is the term used by state and local units of government for septic systems. Regulations regarding SSTS are mandated by the State of Minnesota. Otter Tail County has adopted and administers Minnesota Rules Parts 7080.0010 to 7080.315, 7080.0700, and 7080.0910 with variations documented in the *Sanitation Code of Otter Tail County*. This rule regulates the SSTS throughout the State of Minnesota. Within the shoreland area, which is 1000 feet from a lake or 300 feet from a river or stream, the county has a sewage system abatement program. Utilizing this program, area lakeshore properties are inspected either at the request of lakes associations or priority areas, as shown in [Figure Twenty-four](#), determined by Land and Resource Management. This program is dependent upon funding availability.



In 1981 a Sewer District was formed including all the land lying within 1000 feet of Lakes Blanche, Otter Tail, Deer, Round, Walker and the southern 2/3 of Long. This district consists of a combination of SSTS and cluster systems, maintained by the district manager. Properties are assessed based on the type of system and maintenance required. Systematic inspections are carried out to determine if tanks are sealed and sewage is moving through the soil. These types of organizations help ensure compliant septic systems and should be encouraged.

Septic System Conditions

Septic system conditions for the county were derived based on the SURGGO soils for Otter Tail County. These conditions were determined mainly by utilizing permeability of the soil and depth to water table. Slope and susceptibility to flooding is also considered. As shown in [Figure Twenty-five](#), most of the county is in the severe category. This does not necessarily mean no septic systems will provide treatment within these areas, but it does mean special attention needs to be paid when assessing the soils and designing the treatment system. Mounds, or above ground sewage treatment systems, may be needed in this area. All new sewage treatment systems installed in Otter Tail County must meet SSTS MN State 7080 rules, in addition to the *Sanitation Code of Otter Tail County*.

The sandy soils and high water table, particularly around Otter Tail Lake are one example of an area where special attention must be paid to the SSTS. The potential for both lake and groundwater contamination are very high in this area.

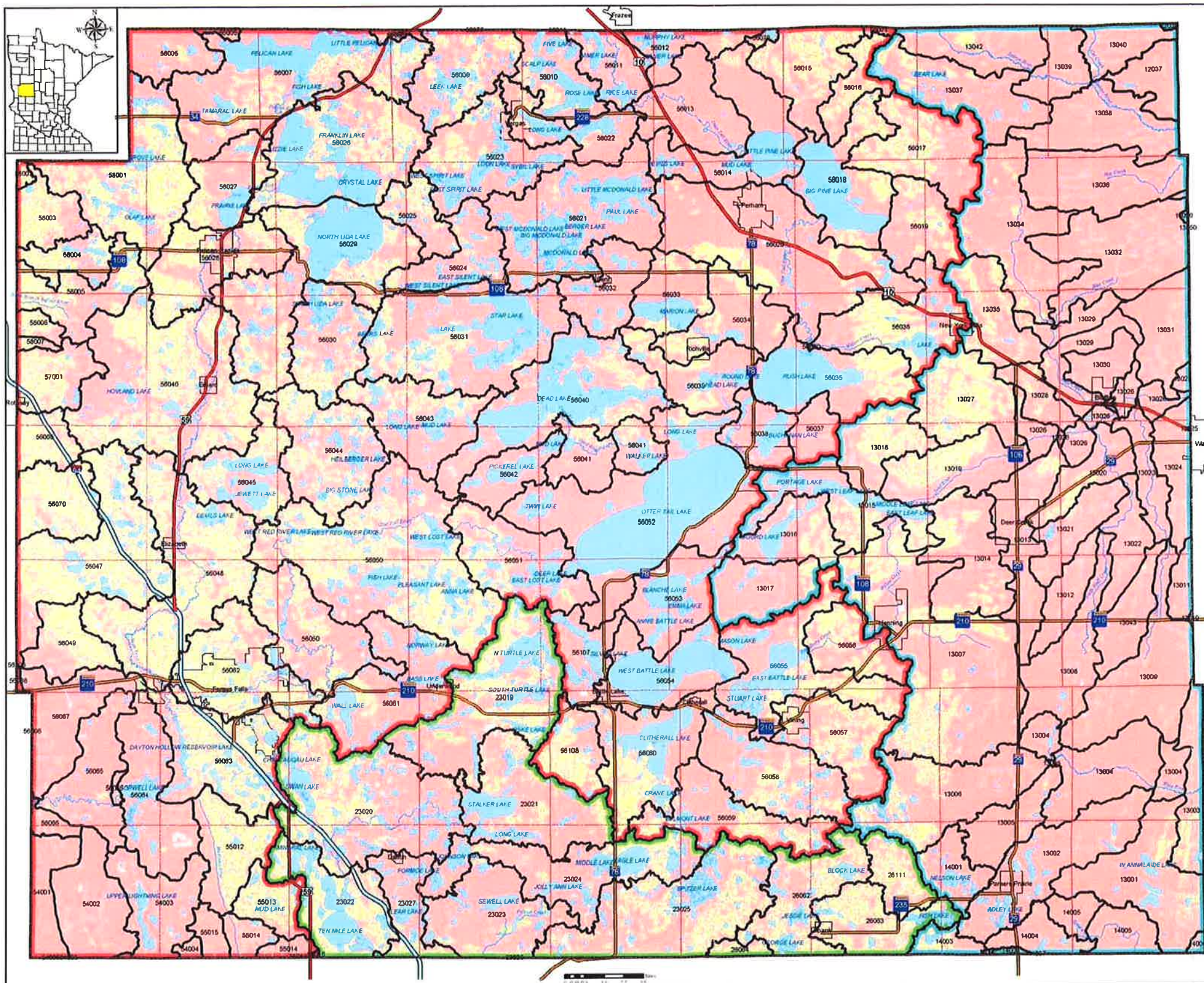


Figure Twenty-five
Otter Tail County
 Septic System Conditions
 As Described By The
 1994 SSURGO Soil Survey*

Explanation of Features

Septic System Conditions

- Low
- Moderate
- Severe

Major River Basins

- Minnesota River Basin
- Mississippi River Basin
- Red River Basin

Basin

- Major Watersheds
- Minor Watersheds
- Lakes
- Township Boundary
- Cities
- Interstate
- MN Highways
- US Highways
- Undefined Stream
- River or Creek

*The septic system conditions represented are based on suitability measurements for ALL types of systems. Conditions on a system-by-system basis are not suitable for display at this scale

© COPYRIGHT OTTER TAIL COUNTY 2003
 THIS MAP WAS COMPILED FROM MULTIPLE DATA SOURCES AND IS INTENDED FOR REFERENCE USE ONLY. OTTER TAIL COUNTY DOES NOT ASSUME LIABILITY FOR ERRORS, INACCURACIES OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

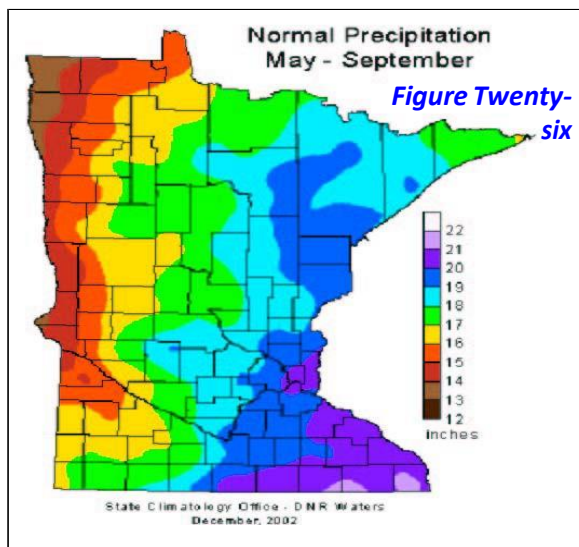
b) Quantity Issues

Irrigation in Otter Tail County has increased since the early '90s. See [Table K](#) for DNR Water Appropriation Permits by watershed and use. Since the 2001 plan, water appropriation permits have increased by 17,401 million gallons per year (MGY) and the actual reported use has increased by 8,455 MGY. This amount is without taking into account the new ethanol plant that went into use in 2008. Irrigation has increased by 31,487 acres since the last update and occurs on more than twice the acreage within the Otter Tail River Watershed than the rest of the county. Monitoring these trends will help identify potential water-saving strategies.

Precipitation

The total annual precipitation averages 26.3 inches per year. Of this, 17.6 inches, or about 67 percent, usually falls in May through September. The growing season for most crops falls within this period. Weather isolines for the state of Minnesota can be seen in [Figure Twenty-six](#) and depicts the rainfall patterns across the state. The Otter tail County Soil and Water Conservation District (SWCD) and the National Weather Service (NWS) both monitor precipitation throughout Otter Tail County.

Precipitation information is available at the State Climatology website at: <http://www.climate.umn.edu/>



Aquifer Preservation - Water Sharing / Increased Demand

With the start of ethanol plants and an increased in irrigation in the past five years, aquifer preservation may become an issue. Using management practices to decrease the demand for irrigation is encouraged. The SWCDs work with agriculture producers to maximize the irrigation benefit in order to minimize the amount needed. The ethanol plant within the Otter Tail River Watershed is permitted to use up to 415 million gallons of groundwater per year at a volume of 790 gallons per minute. In 2007, the first year, the plant used 198 million gallons of

groundwater, less than half of the permitted amount.

Exploration of the Pelican River Sands Aquifer and the Otter Tail Outwash Aquifer as feasible sources to help meet the water supply needs of the Red River Valley in North Dakota has been conducted by the United States Department of the Interior, Bureau of Reclamation. An Environmental Impact Statement (EIS) was completed to determine the long-term needs of the Red River Valley and these two aquifers were cited as options – proposing to drill an estimated 129 wells, removing the water from the aquifer and transporting it to North Dakota. Drought conditions were not included in the studies to determine the effects of drawing water of this magnitude from the aquifers. The county board of commissioners expressed concern about the long-term effects on lake levels and existing pockets of nitrates and arsenic in the groundwater system.

Water Appropriations Permits

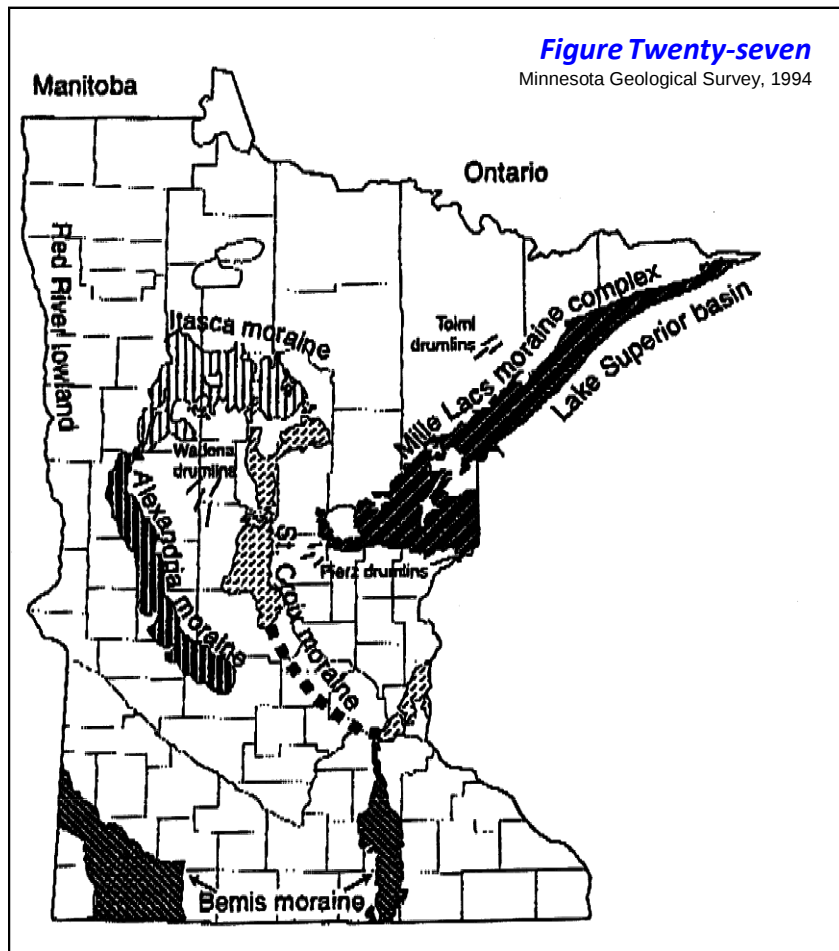
Table K

Watershed	Use	Resource Ground/ Surface	Number of Permits	Irrigated Acres	Gallons per Minute	Million Gallons per Year	Reported 1992	Use 1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Redeye River	Municipal	6G	6		2960	259.0	35.1	34.1	49.6	52	58.7	63.6	54.8	50.2	47.2	45.1	43	43.9	39.4	39	41.8	41.1	
	Major Crop Irrigation	13S, 289G	302	35861	155177	13,117.1	1982.3	417.8	2153.9	1889.8	3129.9	2131.3	2519.7	1845.1	2724.4	3100.8	3130.7	4153	3175.7	3138.5	5079.3	5995.1	
	Subtotal		308	35861	158137	13,376.1	2017.4	451.9	2203.5	1941.8	3188.6	2194.9	2574.5	1895.3	2771.6	3145.9	3173.7	4196.9	3215.1	3177.5	5121.1	6036.2	
	% of total		30	34	25	11.0	14	2	8	8	12	8	7	6	7	8							
Long Prairie River	Major Crop Irrigation	21G	21	2666	10720	1,083.0	159.3	21.6	105.6	54.5	251.6	212.4	205	156.7	237.9	274.8	0	0	0	0	0	24.2	
	Sand and Gravel Washing	1G	1		800	85.0					190	54.7	86.2	81.7	0.1	0	48.8	49.2	49.6	17.3	20	21.4	
	Subtotal		22	2666	11520	1,168.0	159.3	21.6	105.6	54.5	441.6	267.1	291.2	238.4	238	274.8	48.8	49.2	49.6	17.3	20	45.6	
	% of total		2	3	2	1.0	1	0	0	0	2	1	1	1	1	1	0	0	0	0	0	0	
Pomme de Terre River	Municipal	2G	2		290	40.0	15.5	15.9	17.3	18	18.3	17.1	19	18.3	17.7	16.6	17	17	14	13	11	10	
	Sand and Gravel Washing	2G	2		1300	112.0				34	74.4	37.2			0	29.8	0	0	0	25	0	0	
	Basin (lake) level	3S	3		9775	1,638.5											0	0	0	0	1487	328.7	
	Livestock Watering	1S, 3G	4		520	32.0										2.2	2.1	0.4	3.5	4.2	4.5	5.3	
	Golf Course	1S, 2G	3	180	1027	42.7	1.2	0.6	0.4	1.7	3.5	3.5	5.5	2.4	3.8	2.9	1.4	4.4	0	0.3	0.4	0.5	
	Major Crop Irrigation	8S, 16G	24	2724	10550	789.6	90.3	19.6	52.2	97.5	120.5	53.8	124.7	86	64.5	113.9	57.6	178.3	115.7	116.9	227.9	231.4	
	Subtotal		38	2904	23462	2,654.8	107	36.1	69.9	151.2	216.7	111.6	149.2	106.7	86	165.4	78.1	200.1	133.2	159.4	1730.8	575.9	
	% of total		4	3	4	2.2	1	0	0	1	1	0	0	0	0	0							
Chippewa River	Livestock Watering	G	1		100	2.0								0.1	1	1.4	1.3	0	0	0	0	0	
	Subtotal		1		100	2.0								0.1	1	1.4	1.3	0	0	0	0	0	
	% of total		0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Boise de Sioux River	Major Crop Irrigation	2-S, 1-G	3	510	2000	97.7											0	0	0	0	0	0	
	Subtotal		3	510	2000	97.7											0	0	0	0	0	0	
	% of total		0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Otter Tail River	Municipal	43G	43		75615	10,322.2	1358.3	1256.1	1449.4	1394.6	1437.9	1512.5	1515.1	1432.8	1487.3	1371.8	1335.2	1291	1315.5	1372.4	1351.9	1381.7	
	Petroleum-Chemical processing, Ethanol	2G	2		1580	830.0												0	0	0	0	0	
	Aquaculture	1S	1		100	32.5												0	0	0	0	0	
	Commercial/Institutional	6G	6		300	49.4	2.7	3.1	3.6	3.7	5.3	5.6	5.5	3.3	3.1	3.4	2.3	2.1	2.2	2	2	1.3	
	Steam Power Cooling - once through	2S	2			65,746.0	6434.2	14517	16864.6	14006.1	13696.6	18268.7	23640.5	22964.8	25676.6	26192.5	25251.1	23627.6	19866.2	29424	23994.8	27696.6	
	Steam Power Cooling - wet tower	2G	2		1025	888.0	0.18	0.16	0.14	0.35	1.01	0.102	0.18	0.88	0.45	1.006	0.2	6	0.8	0.1	14	0.1	
	Once-through Heating or A/C	5G	5		580	136.0	34.9	30.4	36	33.3	32	36.6	36.8	22.5	2.6	4.2	5.4	4.3	2.5	4.2	10.6	11.3	
	Heat Pumps	2G	2		1070	494.0											0	0.4	0	0	0	0	
	Ag Processing (food and livestock)	1S, 4G	5		4000	1,826.0	312.6	304	335.1	466.4	526.6	532.3	494	511	503.5	454.3	325.8	15.3	302.7	373.9	419.4	385.9	
	Water Level Maintenance (temporary)	N/A	1		800	32.5										0							
	Basin (lake) level	6S	6		7150	465.3	17.7	0.4	0	92.1	31.1	33.2	29.2	166.2	82.9	130.9	56.3	20.2	123	58.7	359.5	96.4	
	Pollution Containment	6G	6		503	180.0		1.4	2.6	2	2.5	1.3			0	0	23.1	46.9	40.9	44.6	0	36.8	
	Livestock Watering	1S, 3G	4		345	21.1									9.6	9.8	5.7	6.3	4.9	6.4	6.9	6.4	
	Golf Course	5S, 18G	23	1334	12920	624.9	49.1	53.8	78.3	77.1	93.8	94.2	116.5	119.7	127.8	141.7	142.1	165.5	159.7	141.5	163.2	169.2	
	Landscaping/Athletic Fields	2S, 1G	3	22	800	13.7	2.5	1.5	1.7	1.8	2.1	1.3	2.6	2.5	2.6	3.5	4.6	6.9	23.8	25.7	11.7	8.2	
	Nursery	3G	3	187	40	63.1	16.6	17.6	19	7.2	7.3	9.7	6.6	8	8	36.6	28.4	17.1	13.5	6	12.8	6.3	
	Orchard	1G	1	5	800	0.8											0	0	0.2	0.2	0.3	0	
	Major Crop Irrigation	55S, 469G	524	61156	325420	22,505.7	4406.2	1735.4	4990.3	7444.8	7066.4	5365.6	7021.5	6120.8	6042	7691.3	7790.7	9568.1	7104.6	7294.4	10366.4	11649.7	
	Subtotal		639	62704	433048	104,231.2	12634.98	17920.86	23780.74	23529.45	22902.61	25861.1	32868.48	31352.48	33946.45	36041.01	34970.9	34777.7	28960.5	38754.1	36713.5	41449.9	
	% of total		63	60	69	85.7	85	97	91	92	86	91	92	93	91	91	91	89	89	92	84	86	
Red River of the North	Municipal	2G	2		700	44.8	13.7	1.1							13.8	14.4	14	15.1	15.2	15.1	14.6	16.5	
	Subtotal		1			22.4	13.7	1.1							13.8	14.4	14	15.1	15.2	15.1	14.6	16.5	
	% of total		0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Crow Wing River	Major Crop Irrigation	G	2	265	1200	111.6											0	0	0	7	8	13	25
	Subtotal																0	0	0	7	8	13	25
	% of total																0	0	0	0	0	0	0
Buffalo River	Major Crop Irrigation	1-S, 1-G	2		3375	450.0									50.2	51	0	0	0	0	0	0	
	Subtotal		2	195		40.5									50.2	51	0	0	0	0	0	0	
	% of total		0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total		1014	104840	628267	121,592.7	14932	18432	26160	25677	26750	28435	35883	33593	37107	39694	38287	39239	32381	42131	43613	48149	

The Otter Tail County Commissioners passed a resolution on April 11, 2006 in opposition of the use of these aquifers in the Red River Valley Water Supply Project and questioning the adequacy of the EIS in its exploration of drought conditions. A second resolution dated April 15, 2008 has requested the State prohibit the allocation and/or sale of water outside the state of Minnesota.

Geology and Soils

The underlying bedrock of Otter Tail County is covered by 200 to more than 400 feet of glacial deposits, left during the Wisconsin Glaciation period, about 75,000 years ago. Throughout the Ice Age, ice lobes advanced across the state several different times from several different directions. The Wadena lobe was active in the early to middle Wisconsin Age. Deposits from this lobe are gray in color and contain Paleozoic limestone from the Winnipeg lowland in southern Manitoba. The Alexandria moraine as depicted in [Figure Twenty-seven](#) may mark the passing of this glacier. This moraine has contributed to the many lakes and rolling hills in this part of the county. As shown in [Figure Twenty-eight](#), with explanation in [Table L](#), the type of glacial deposition, or soil, is varied throughout the county.



Complete Geologic History and Geomorphology is available on the Otter Tail County GIS website at: <http://www.co.otter-tail.mn.us/gis/soilsurvey7geologic.asp>

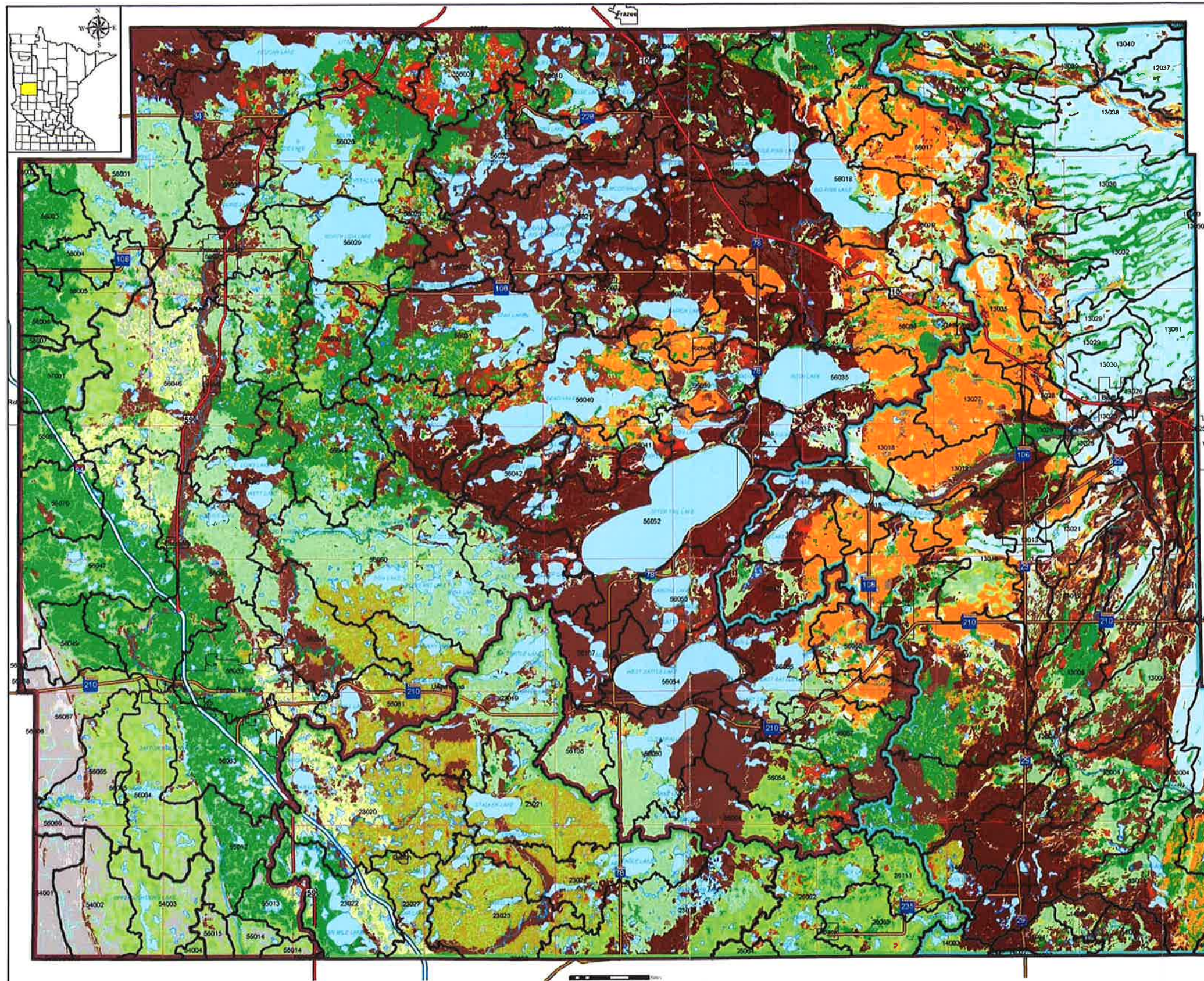


Figure Twenty-eight
Otter Tail County
 General Soil Type Associations
 Based On Soils As Described In
 The 1994 SSURGO Soil Survey*

Explanation of Features

General Soil Associations

- Blowers-Paddock-Cathro
- Chapett-Sisseton-Friberg
- Sisseton-Hemidal-Quam
- Formdale-Aazdahl-Parnell
- Barnes-Langhei-Lakepark
- Snellman-Naytahwaush-Lida
- Forman-Buse-Peever
- Kandota-Knute-Brandsvold
- Waukon-Cathro-Gonvick
- Nidaros-Seelyeville-Pinelake
- Hubbard-Duelm-Nidaros
- Dorset-Corliss-Nidaros
- Arvilla-Sverdrup-Sandberg
- Lida-Two Inlets-Nidaros
- Hamerly-Rockwell-Mustinka
- Rockwell-Wolverton-Foldahl
- Open Water

Major River Basins

- Minnesota River
- Mississippi River
- Red River

Major Watersheds

Minor Watersheds

Lakes

Township Boundary

Cities

Interstate

MN Highways

US Highways

Undefined

River or Creek

*Soil Types as shown are based on the data available from the SSURGO survey and were reclassified as close as possible to the associations listed in the NRCS General Soil Survey. Because of differences in available data and methods, the representation does not match the map represented in the NRCS survey.

© COPYRIGHT OTTER TAIL COUNTY 2003
 THIS MAP WAS COMPILED FROM
 MULTIPLE DATA SOURCES AND IS
 INTENDED FOR REFERENCE USE ONLY.
 OTTER TAIL COUNTY DOES NOT ASSUME
 LIABILITY FOR ERRORS, INACCURACIES
 OR OMISSIONS FROM THIS MAP.
[HTTP://WWW.CO.OTTER-TAIL.MN.US](http://www.co.otter-tail.mn.us)

Otter Tail County Full Soil Survey is available at: <http://websoilsurvey.nrcs.usda.gov>

General Soil Type Associations Based on Soils as Described in the 1994 SSURGO Soil Survey

Table L

Association Name	Slope	Drainage	Texture	Infiltration	Septic Suitability
1 BLOWERS-PADDOCK-CATHRO	Level to Sloping (0 to 20%)	Poorly to Well Drained	Formed Dominantly in Loamy Glacial Till and Organic Material Under Dominantly Forested Vegetation	Percs Slowly / Wetness / Poor Filter	Severe
2 CHAPETT-SISSETON-FRIBERG	Level to Very Steep (0 to 30%)	Very Poorly to Excessively Well Drained	Formed Dominantly in Loamy Glacial Till and Organic Material Under Dominantly Prairie Vegetation	Percs Slowly / Wetness / Poor Filter	Moderate / Severe
3 SISSETON-HEIMDAL-QUAM	Level to Very Steep (0 to 30%)	Moderately Well to Well Drained	Formed Dominantly in Loamy Glacial Till and Organic Material Under Dominantly Prairie Vegetation	Wetness / Poor Filter / Slope	Moderate / Severe
4 FORMDALE-AASDAHL-PARNELL	Level to Very Steep (0 to 35%)	Mostly Well Drained / some Very Poorly	Formed Dominantly in Loamy Glacial Till and Organic Material Under Dominantly Prairie Vegetation	Percs Slowly / Wetness / Slope	Moderate / Severe
5 BARNES-LANGHEI-LAKEPARK	Level to Sloping (0 to 20%)	Very Poorly to Well Drained	Formed Dominantly in Loamy Glacial Till and Organic Material Under Dominantly Prairie Vegetation	Percs Slowly / Wetness / Ponding / Slope	Moderate / Severe
6 SNELLMAN-NAYTAHWAUSH-LIDA	Level to Very Steep (0 to 45%)	Mostly Well Drained / some Very Poorly	Formed Dominantly in Loamy Glacial Till and Sandy Glacial Outwash Under Dominantly Forested Vegetation	Percs Slowly / Wetness / Poor Filter	Mostly Severe / some Moderate
7 FORMAN-BUSE-PEEVER	Nearly Level to Sloping (1 to 20%)	Moderately Well to Well Drained	Formed Dominantly in Loamy Glacial Till and Organic Material Under Mixed Prairie and Forested Conditions	Percs Slowly / Wetness	Severe
8 KANDOTA-KNUTE-BRANDSVOLD	Level to Sloping (0 to 20%)	Poorly to Somewhat Excessively Well Drained	Formed Dominantly in Loamy Glacial Till and Organic Material Under Mixed Prairie and Forested Conditions	Wetness / Poor Filter / Percs Slowly	Mostly Severe / some Moderate
9 WAUKON-CATHRO-GONVICK	Nearly Level to Very Steep (1 to 30%)	Moderately Well to Well Drained	Formed Dominantly in Loamy Glacial Till and Organic Material Under Mixed Prairie and Forested Conditions	Percs Slowly / Wetness	Severe
10 NIDAROS-SEELYEVILLE-PINE LAKE	Level	Somewhat Poorly to Poorly Drained	Formed Dominantly in Organic Material and Sandy Glacial Outwash Under Mixed Forested and Prairie Vegetation	Poor Filter / Wetness	Severe
11 HUBBARD-DUELM-NIDAROS	Level to Gently Sloping (0 to 12%)	Somewhat Excessively to Excessively Well Drained	Formed Dominantly in Sandy Glacial Outwash and Organic Material Under Dominantly Prairie Vegetation	Poor Filter	Severe
12 DORSETT-CORLISS-NIDAROS	Level to Very Steep (0 to 35%)	Moderately Well to Excessively Well Drained	Formed Dominantly in Sandy Glacial Outwash and Organic Material Under Dominantly Prairie Vegetation	Poor Filter / Slope	Severe
13 ARVILLA-SVERDRUP-SANDBERG	Level to Very Steep (0 to 30%)	Somewhat Excessively to Very Poorly Drained	Formed Dominantly in Sandy Glacial Outwash and Organic Material Under Dominantly Prairie Vegetation	Poor Filter	Mostly Severe / one Moderate
14 LIDA-TWO INLETS-NIDAROS	Level to Gently Sloping (0 to 12%)	Well Drained	Formed Dominantly in Sandy Glacial Outwash and Organic Material Under Dominantly Forested Vegetation	Poor Filter	Severe
15 HAMERLY-ROCKWELL-MUSTINKA	Mostly Level with limited Very Steep (0 - 30%)	Very Poorly to Moderately Well Drained	Formed Dominantly in Loamy Glacial Till and Sandy, Loamy and Silty Glaciolacustrine Sediments Under Dominantly Prairie Vegetation	Wetness / Percs Slowly	Mostly Severe / one Moderate
16 ROCKWELL-WOLVERTON-FOLDAHL	Level	Very Poorly to Moderately Well Drained	Formed Dominantly in Loamy Glacial Till and Sandy, Loamy and Silty Glaciolacustrine Sediments Under Dominantly Prairie Vegetation	Poor Filter / Ponding / Wetness	Severe

B. Goals, Objectives and Actions addressing Priority Concerns

The Otter Tail County Local Water Management Task Force has hosted four public input meetings to find out citizen concerns. These meetings resulted in the Priority Concerns Scoping Document, and the development of the following priority issues:

DEVELOPMENT PRESSURES

- **Surface Water Issues**
 - Surface Water Quality
 - Regulatory Issues
- **Groundwater Issues**
 - Groundwater Quality
 - Groundwater Quantity

The development of the **goals** and **objectives** within this chapter defines broad directions that county residents who participated in the public forum of the Local Water Management planning process wish to pursue to protect their resources. **Action** items describe specific measures that the county will implement, with assistance from appropriate state and federal agencies, to achieve the goals and objectives. Goals may have one or more objectives.



The goals, objectives and action items listed provide the guidance for day-to-day operations of Otter Tail County Soil and Water Conservation Districts, Land and Resource Management, Local Water Management Task Force and State and Local Government Units. This document will provide assistance in annual budgeting and in grant writing decisions.

CHAPTER DEFINITIONS: Abbreviations used throughout this chapter are defined as follows:

BMP	= Best Management Practices	LWMP	= Local Water Management Plan
BWSR	= Board of Water and Soil Resources	MDA	= Minnesota Department of Agriculture
COLA	= Otter Tail County Coalition of Lake Associations	MDH	= Minnesota Department of Health
CRP	= Conservation Reserve Program	MW	= Minnesota Waters
DNR	= Minnesota Department of Natural Resources	MPCA	= Minnesota Pollution Control Agency
DU	= Ducks Unlimited	NRCS	= Natural Resource Conservation Service
EOTSWCD	= East Otter Tail Soil and Water Conservation District	RIM	= Reinvest in Minnesota
EQIP	= Environmental Quality Incentives Program	PF	= Pheasants Forever
FFA	= Future Farmers of America	SS	= Shoreland Specialist
GIS	= Otter Tail County Geographic Information Systems Department	SSTS	= Sub-surface Sewage Treatment System
LA	= Lake Associations	SWCD	= Soil and Water Conservation District
LID	= Lake Improvement District	USFWS	= United States Fish and Wildlife Service
LRM	= Otter Tail County Land and Resource Management Department	WOTSWCD	= West Otter Tail Soil and Water Conservation District
		WHIP	= Wildlife Habitat Incentive Program
		WLI	= Working Lands Initiative
		WRP	= Wetland Reserve Program

OTTER TAIL COUNTY OVERALL PRIORITY: DEVELOPMENT PRESSURES

Surface Water Priority Issues:

Water Quality Goal: *Otter Tail County will maintain or improve the quality of the surface waters within their boundaries.*

Water Quality Objectives:

1. Target and Prioritize: *Target and prioritize surface water quality issues using tools and resources such as individual lake assessments, MPCA WRAPS, IWI- Water Quality Decisions Support Application (WQDSA), Lidar, and Stream Power Index to develop measurable goals and outcomes.*

Action

- a) *Participate in the development of TMDLs as determined by the 303(d) listing of impaired waters (Otter Tail River from Rice Lake to Mud Lake for dissolved oxygen and West Spirit Lake for Total Phosphorus). Provide BMP information to the Chippewa and Pomme de Terre watershed projects for implementation practices on impairments downstream of Otter Tail County. The Otter Tail County Board, SWCD and/or LWMP will attend meetings and provide input in the writing of TMDLs.*

Timeline: 10 years

Agency (Who): MPCA, DNR, LWMP, SWCDs, Otter Tail County, Chippewa and Pomme de Terre Watershed Projects

Cost: Agency and staff time

- b) *Develop and implement a method to determine the existence of additional impaired waters.*

Timeline: 2010, then on-going

Agency (Who): SWCDs, BWSR, SS, COLA and MPCA

Cost: \$2,500 per year plus staff time

- c) *Work with the MPCA on the development of a TMDL for Nutrient/Eutrophication and Biological Indicators (Total Phosphorus) for West Spirit Lake.*

Timeline: 2010

Agency (Who): SWCDs, SS, DNR, BWSR and MPCA

Cost: Staff time

- d) *Review monitoring assessments by Chippewa and Pomme de Terre watershed organizations to determine effectiveness of BMPs.*

Timeline: 2 years

Agency (Who): LRM, COLA, and DNR

Cost: Staff time

- e) *Pursue Surface Water Assessment grants and investigate the feasibility of high school students completing surface water monitoring.*

Timeline: 2010, on-going

Agency (Who): MPCA, COLA, SWCDs, SS, High School Teachers

Cost: \$6,000 to \$8,000 start-up per site. Target 4 to 6 sites. \$24,000 to \$42,000

- f) **MPCA Watershed restoration and protection Strategies (WRAPS):** *Protection Strategies – Assist with monitoring efforts, development of implementation plans and implementation activities in the following watersheds: Buffalo-Red River, Pomme de Terre, Bois de Sioux, Chippewa, Ottertail, Mustinka, Red Eye, Crow Wing, and Long Prairie*

Timeline: On-going

Agency (Who): MPCA, DNR, SWCDs,
Land and Resource Management, COLA,
Concerned Citizens and consultants

Cost: \$45,000

- g) **Water Quality Monitoring:** *Monitoring efforts including but not limited to MPCA's watershed monitoring program, COLA's lake monitoring program and volunteer citizen stream monitoring program.*

Timeline: On-going

Agency (Who): MPCA, COLA, SWCDs,
Concerned Citizens

Cost: Lake Monitoring Volunteers time

- h) **Lake Assessment:** *Utilize Lake Assessments to prioritize target BMPs at the lakeshed level and measure the success of implemented practices over a longer timeframe.*

Timeline: On-going

Agency (Who): COLA, SWCDs,
Concerned Citizens, RMB Labs, Lake
Associations

Cost: Lake Monitoring Volunteers time

2. Lake Association Support: *Support lake associations and the Otter Tail County COLA to protect and preserve the lakes and lakeshed environment. Continue with the advancements of the Lake Assessments to develop lake trends and possible concerns.*

Action

- a) *Continue to support Shoreland Specialist position at EOTSWCD to provide the lake associations with an advocate and advisory contact.*

Timeline: On-going

Agency (Who): SWCDs, BWSR, Otter Tail County Board, LWMP

Cost: \$465,382 (avg. \$46,538 per year)

- b) *Continue annual workshops through the Otter Tail COLA, teaching lakeshore property owners lakescaping BMPs.*

Timeline: 10 years

Agency (Who): SS, BWSR, COLA

Cost: \$250 per year plus staff and volunteer time

- c) *Provide mailings to smaller lakes in Otter Tail County to promote pro-active development and land use within their lakesheds. Notify lake associations of training available through MN Waters.*

Timeline: 2009 then re-assess

Agency (Who): LRM, COLA, BWSR, SS

Cost: \$500 per year printing and mailing costs

- d) *Work with Otter Tail COLA and MPCA to add 5-10 lakes per year to their monitoring program. Ensure all data is entered into MPCA STORET system. Fund monitoring on smaller lakes as available.*

Timeline: 10 years

Agency (Who): COLA, BWSR, SS, MPCA, LA

Cost: Up to \$2,000 per year

- e) *Continue connection with stakeholders such as BWSR, MDA, MDH, MPCA, DNR, LIDs, and Watershed Districts; completing studies in Otter Tail County and list available data sources on Otter Tail County's website.*

Timeline: On-going

Agency (Who): GIS and DNR

Cost: Staff time

- f) *Set-up and participate in existing environmental education programs for youth such as the envirothon, conservation days, lake management curriculum, ag-in-the-classroom, conservation camps for kids (pheasants forever), prairie wetlands center programs, FFA, 4-H.*

Timeline: On-going

Agency (Who): LWMP task force, PF, area high schools, and extension

Cost: Staff and volunteer time

- g) *Pursue funding sources for display media to be made available to area restaurants encouraging Best Management Practices for city, lakes, agriculture and residential property. Identify need for phosphorus free fertilizer and present facts to property owners.*

Timeline: Every two years

Agency (Who): COLA, BWSR, SS, LWMP

Cost: Up to \$400 every 2 years

- h) *Work with Otter Tail County Lake Associations to complete and implement Lake Assessments and Lake Management Plans. Completed Lake Assessments help to determine areas of the lake to focus on and help to incorporate beneficial projects into the Lake Management Plan.*

Timeline: On-going

Agency (Who): SS, LWMP, MPCA, DNR, BWSR, GIS, SWCD, LRM

Cost: Staff time

- i) *Update information brochure listing agencies and organizations responsible for*

available information with person, phone number, and web page.

Timeline: 2014

Agency (Who): COLA and LWMP task force

Cost: Volunteer time plus \$200 printing costs

- j) Support the completion of aquatic vegetation mapping on priority lakes in Otter Tail County (52 lakes completed to date). Re-assess for changes after completion.*

Timeline: On-going

Agency (Who): DNR, LRM, SS, GIS

Cost: \$15,000 per year

- k) Maintain Local Water Management Update on county web site.*

Timeline: 2009

Agency (Who): GIS, LRM

Cost: Staff time

- l) Hold annual water plan meeting with presentation of accomplishments and work plan for upcoming year.*

Timeline: Annually

Agency (Who): EOTSWCD

Cost: Staff time

- m) Continue to conduct Lake Assessments on lakes in Otter Tail County to gain and assess valuable data about the lake and target areas of concern, lake trends, and possible lake projects. Twenty one lakes in Otter Tail County have completed Lake Assessments and thirty-eighty lakes are currently working to complete their Lake Assessment*

Timeline: ongoing

Agency (Who): EOTSWCD, WOTSWCD,

COLA, RMB Labs, Lake Associations

Cost: Staff time

3. Stormwater/Drainage Management: *Offer education and incentive programs aimed at mitigating the effects of overland runoff on the surface waters of Otter Tail County, utilizing available regulations if necessary.*

Action

- a) Coordinate with the Bois de Sioux Watershed District to increase water storage through water retention structures and non-structures, and other temporary and permanent structures in the Mustinka and Bois de Sioux watershed.*

Timeline: On-going

Agency (Who): WOTSWCD

Cost: Staff time

- b) Coordinate with the Buffalo-Red River Watershed District to increase water storage through water retention structures and other temporary and permanent structures within the watershed.*

Timeline: On-going
Agency (Who): WOTSWCD
Cost: Staff time

- c) *Support DNR and local government efforts in establishing and/or maintaining lake levels at appropriate elevations, creating outlets and discharge conditions with regard to water quality and quantity issues pursuant to MN Rules 6115.0221.*

Timeline: On-going
Agency (Who): DNR, Lake Associations, LIDs, COLA, LRM, LWMP
Cost: Staff time

- d) *Provide incentive funding for high priority buffer strips where appropriate along water courses and basins.*

Timeline: On-going
Agency (Who): SWCD, BWSR, NRCS, DNR, PF
Cost: Up to \$25,000 per year

- e) *Enforce existing lakeshore buffer regulations on new developments. Provide buffer incentives for existing lakeshore owners through DNR Shoreland Initiative Grant.*

Timeline: On-going
Agency (Who): LRM, DNR and WOTSWCD
Cost: Staff time and up to \$20,000

- f) *Enforce existing required buffer area between rivers / streams / lakes and Ag fields and existing requirement for vegetation on steep slopes and bluffs.*

Timeline: On-going
Agency (Who): LRM and DNR
Cost: Staff time

- g) *Reward existing BMPs through the Conservation Security Program in eligible watersheds as funding allows.*

Timeline: On-going
Agency (Who): SWCD, NRCS, BWSR
Cost: Staff time

- h) *Pursue funding for perpetual easements on developments around sensitive areas.*

Timeline: On-going
Agency (Who): SWCD, BWSR, NRCS
Cost: Staff time

- i) *Support 20 no-till farming practices / year through cost-share incentives such as EQIP.*

Timeline: On-going
Agency (Who): NRCS
Cost: Staff time

- j) *Map the county ditch system and scan old documents into digital data.*

Timeline: 5 years
Agency (Who): LRM, GIS, BWSR
Cost: \$20,000 for scanning

- k) *Support adoption of an annual assessment maintenance fund for each county ditch.*

Timeline: 2009

Agency (Who): LWMP, COLA, GIS, County Auditor, LRM
Cost: Staff time

l) Design and install rain gardens in urban area, lake properties, and second tier development

Timeline: 2014-2019

Agency (Who): SWCD, Local NGU Partners

Cost: \$200,000

4. Wetlands/Wildlife Habitat: *Identify and protect wetland and wildlife habitat areas located within Otter Tail County.*

Action

a) Enhance existing and new wetland restoration and buffers programs such as CRP, WHIP, WLI, RIMWRP and USFWS. Promote wetlands within the shoreland and groundwater recharge areas.

Timeline: On-going

Agency (Who): WOTSWCD, NRCS, BWSR

Cost: \$50,000 per year

b) Restore 1000 - 2000 acres of wetland and wildlife habitat annually.

Timeline: On-going

Agency (Who): East and West Otter Tail SWCD

Cost: Staff time

c) Participate in the Local Technical Teams for the Minnesota Prairie Conservation Plan

Timeline: On-going

Agency (Who): West Otter Tail SWCD, USFWS, MNDNR, NRCS, Duck Unlimited, Pheasants Forever, BWSR

Cost: Staff time

d) Prioritize and target wetland and grassland restorations in the core, corridor and complexes identified in Otter Tail County.

Timeline: On-going

Agency (Who): West Otter Tail SWCD, USFWS, MNDNR, NRCS, Duck Unlimited, Pheasants Forever, BWSR

Cost: Staff time

e) Enroll approximately 200 – 300 acres of perpetual easements annually

Timeline: On-going

Agency (Who): West Otter Tail SWCD, East Otter Tail SWCD, NRCS, Duck Unlimited, Pheasants Forever, BWSR

Cost: \$30,000

f) Inspect a percentage of Conservation Easements annually

Timeline: On-going
Agency (Who): West Otter Tail SWCD, East Otter Tail SWCD, NRCS, Duck Unlimited, Pheasants Forever, BWSR
Cost: \$7,000

- g) *Promote and educate landowners about pollinator plantings throughout Otter Tail County*

Timeline: On-going
Agency (Who): West Otter Tail SWCD, East Otter Tail SWCD, NRCS, Pheasants Forever, BWSR
Cost: Staff Time

5. Minnesota Ag Water Quality Certification Program: *Educate and certify producers within the MAWQCP Target Areas*

Action

- a) *Educate landowners and producers on the value of MAWQCP*

Timeline: 2014 – 2016 (Pilot years)
Agency (Who): WOTSWCD, Wilkin County SWCD, NRCS, Buffalo-Red River Watershed District
Cost: \$24,000 per year

- b) *Assist producers with the certification process and implementation of conservation programs, if needed for certification*

Timeline: 2014 – 2016 (Pilot years)
Agency (Who): WOTSWCD, Wilkin County SWCD, NRCS, Buffalo-Red River Watershed District
Cost: \$ 24,000 per year

6. Soil Health Initiative: *Educate and inform ag producers about the value and benefit of soil health.*

Action

- a) *Educate landowners and producers about the importance of soil health and the benefits to their farm operation.*

Timeline: Ongoing
Agency (Who): EOT SWCD, WOT SWCD, NRCS
Cost: Staff Time

- b) *Develop local soil health test plots for experimental and educational purposes.*

Timeline: ongoing
Agency (Who): WOT SWCD, EOT SWCD, NRCS
Cost: Staff time

7. Drainage Water Management: *Promote drainage water management where applicable within Otter Tail County.*

Action

- a) *Educate and inform landowners and producers about the importance of drainage water management.*

Timeline: 2014 – 2016 (Pilot years) On-going

Agency (Who): WOTSWCD, Wilkin County, EOT SWCD, NRCS, Buffalo-Red River Watershed District

Cost: Staff Time

8. LiDAR: Utilize the best available watershed modelling resources to prioritize, target and measure project and practice success

Action

- a) *Prioritize and target projects and practices using the best available watershed modelling resources to project and obtain measurable outcomes.*

Timeline: 2014-2019 On-going

Agency (Who): WOTSWCD, EOT SWCD, NRCS,

Cost: Staff Time

9. Central MN On-Farm Nitrogen Management Program- Conduct basal stalk nitrate testing and replicated strip trials to promote BMP implementation for nutrient stewardship.

Action

- a) *Work with producers in a five county area to conduct guided basal stalk testing in corn acres.*

Timeline: 2014-2019

Agency (Who): MDA, EOTSWCD, other SWCDs

Cost: \$20,000 per year

- b) *Use the results collected to educate farmers on the environmental benefits, water resource protection, and how the program helps lead producers to make farm level management changes that are more profitable to the grower.*

Timeline: 2014-2019

Agency (Who): MDA, EOTSWCD, other SWCDs

Cost: \$2,000 per year

10. Lakescaping- landscaping shoreline areas using methods that help improve and protect water quality and wildlife habitat

Action

- a) *Install buffer zones and rain gardens of native vegetation along lakeshores.*

Timeline: 2014-2019

Agency (Who): SWCDs

Cost: \$ 45,000 per year

- b) *Educate lakeshore owners on best management practices to enhance public knowledge.*

Timeline: 2014-2019

Agency (Who): SWCDs, COLA, Lake Associations

Cost: \$10,000 per year

11. Irrigation: *Promote BMP for irrigators county-wide by offering beneficial data and programs.*

Action

- a) *Collect information vital to agricultural production by monitoring our four weather stations, installing additional weather stations, and uploading information to an irrigation checkbook program.*

Timeline: On-going

Agency (Who): MDA, EOTSWCD,
DNR

Cost: \$50,000

- b) *Promote the irrigation scheduler program (ISP) to give farmers a second opinion on the soil moisture status of a given field.*

Timeline: On-going

Agency (Who): MDA, EOTSWCD,
WOT SWCD, DNR

Cost: \$5,000

- c) *Educate farmers on BMP for irrigation management by hosting irrigation workshops throughout Otter Tail County and surrounding counties.*

Timeline: On-going

Agency (Who): MDA, EOTSWCD,
WOT SWCD, DNR

Cost: \$15,000

- d) *Work to convert high pressure irrigation systems to low pressure through a clean water grant application that allows EOTSWCD to provide cost share to county producers.*

Timeline: On-going

Agency (Who): EOTSWCD, WOT
SWCD, DNR

Cost: \$15,000

12. State Cost Share – *Address high priority wind, water, and water quality issues within the county by providing financial assistance to landowners.*

Action

- a) *Assist landowners addressing high priority wind, water and water quality issues within the county*

Timeline: On-going

Agency (Who): SWCD

Cost: \$74,000

13. Agriculture – Address and target water quality, and erosion issues on agricultural land.

Action

- a) *Identify and contact landowners with inactive Ag Waste pits about sealing pits*

Timeline: On-going

Agency (Who): SWCDS

Cost: Staff time

- b) *Assist landowners with nutrient and pest management activities*

Timeline: On-going

Agency (Who): SWCDs

Cost: Staff time

14. Erosion – Target and prioritize high priority erosion sites and provide technical and financial assistance to landowners to address erosion problems

Action

- a) *Target and prioritize high priority erosion sites using the best available resources.*

Timeline: Ongoing

Agency (Who): EOT and WOT SWCD

Cost: Staff Time

- b) *Pursue funding to assist with erosion control practices within all watersheds of Otter Tail County.*

Timeline: Ongoing

Agency (Who): EOT and WOT SWCD, watershed districts and association, lake associations

Cost: Staff Time

- c) *Design and install high priority erosion control practices.*

Timeline: Ongoing

Agency (Who): SWCDs, Joint Powers

Cost: \$50,000

- d) *All measurable outcomes will be recorded in BWSR Elink.*

Timeline: Ongoing

Agency (Who): SWCDs, BWSR

Cost: Staff Time

Regulatory Issues Goal: Develop regulations, education and incentives to ensure orderly development with minimal impacts to sensitive areas to preserve Otter Tail County's natural resources.

Regulatory Issues Objectives:

1. Otter Tail County Buffer Initiative: Assist landowners and the county to move in the direction of 100% compliance with state and direction of 100% compliance with state and county shoreland rules.

Action

- a) *Identify areas of concern and create a database of potential non-compliant parcels. Maintain and continually update database.*

Timeline: 2014 - 2022

Agency (Who): EOT SWCD, WOT SWCD, Otter Tail County Land and Resource

Cost: \$90,000 per year

- b) *Phase 1 – Mail a letter, factsheet, and map to landowners with potential non-compliant parcels informing them of the state and county ordinance and programs to assist.*

Timeline: 2014 - 2016

Agency (Who): EOT SWCD, WOT SWCD, Otter Tail County Land and Resource

Cost: \$90,000 per year

- c) *Phase 2 – Landowners who did not respond or install a buffer will receive a second letter informing them that they are out of compliance and a 50ft buffer is required along all county lakes, rivers and streams.*

Timeline: 2017 - 2019

Agency (Who): EOT SWCD, WOT SWCD, Otter Tail County Land and Resource

Cost: \$90,000 per year

- d) *Phase 3 – Landowners who did not respond or install a buffer will receive a third letter informing them that they are out of compliance and a 50ft buffer is required along all county lakes, rivers and streams. There will be a deadline to voluntarily install the required buffer.*

Timeline: 2020 - 2022

Agency (Who): EOT SWCD, WOT SWCD, Otter Tail County Land and resource

Cost: \$90,000 per year

2. Sensitive areas: Develop a model to identify areas sensitive to intensive development throughout Otter Tail County.

Action

- a) *Explore available sensitivity models being utilized by other counties and work with LRM, Eagle Lake Township and Dead Lake to determine feasibility of use as a lake*

districting pilot project, for potential use in county-wide land use planning.

Timeline: 2009 - 2013

Agency (Who): LRM, GIS, Eagle Lake Township, Dead Lake Association, BWSR

Cost: Staff time / GIS / \$50,000

- b)** *Develop Lake Districting county-wide to protect sensitive areas from degradation due to overdevelopment.*

Timeline: 2009 and on-going

Agency (Who): LRM, DNR, Lake Associations

Cost: \$10,000

- c)** *Request DNR re-classification of 203 lakes in Otter Tail County. Adopt and implement re-classification of lakes 150 acres or less in size from General or Recreational Development to Natural Environment Shoreline.*

Timeline: 2009

Agency (Who): LRM, DNR

Cost: Staff time

- d)** *Participate in and support state-wide process of shoreland rulemaking and support adoption of new rules when approved by the State.*

Timeline: 2009-2010

Agency (Who): LRM, COLA, and DNR

Cost: Staff time

- e)** *Educate the decision makers of Otter Tail County by pursuing funding to bring training to the decision makers locally.*

Timeline: 2009-2010

Agency (Who): LRM, COLA, SWCDs, County Board, Planning Advisory Commission, Board of Adjustment

Cost: \$3,000 to \$5,000

3. Agriculture: *Support the Agriculture Advisory Task Force and their recommendations to the Otter Tail County Board regarding regulation of agriculture practices.*

Action

- a)** *Actively participate as a member of the Ag Advisory Task Force. Support the recommendation of the need for a long-range county comprehensive plan and investigate the obstacles preventing it from happening.*

Timeline: 2010-2012

Agency (Who): LRM, COLA, SWCD

Cost: Staff time

- b)** *Support county delegation for feedlots by informing the County Board of the program, and the feasibility of one designated feedlot officer and technical support staff to complete inventory through MPCA feedlot program, and administer the program.*

Timeline: 2009-2012

Agency (Who): SWCD, BWSR, LWMP, Ag Advisory Task Force

Cost: \$120,000

- c) *Support the adoption of the agriculture rules included in the new State Shoreland Rules.*

Timeline: 2010-2011

Agency (Who): LRM, DNR, Otter Tail County Board, SWCD

Cost: Staff time

4. Sub-surface Sewage Treatment: *Promote county-wide Sub-surface Sewage Treatment System compliance through systematic inspection, education and regulation.*

Action

- a) *Continue systematic Sub-surface Sewage Treatment System (SSTS) inspection around the shorelines of Otter Tail County Lakes. Target lakes identified in Section II:*

Timeline: On-going

Agency (Who): LRM and LWMP task force

Cost: \$15,000 - \$20,000 annually

- b) *Support the county adoption of the new SSTS rules in 2010, requiring system certification every three years.*

Timeline: 2010 - 2011

Agency (Who): LWMP task force and LRM

Cost: Staff / volunteer time

- c) *Utilize Extension products to develop maintenance fact sheet to be issued with 800-plus compliance letters on SSTS.*

Timeline: Annually

Agency (Who): LRM and Extension

Cost: \$500 per year

- d) *Facilitate land-owners meetings to encourage cluster systems with maintenance agreements in sensitive areas, moving the disposal site away from inadequate soils.*

Timeline: On-going

Agency (Who): LRM

Cost: Staff time

- e) *Continue low interest loan program for failing septic systems. Prioritize sensitive areas such as high water table, wellhead protection area, excessively sandy or heavy soils.*

Timeline: On-going

Agency (Who): East and West Otter Tail SWCD

Cost: Staff time

5. Aquatic Invasive Species: *Promote the importance of controlling aquatic invasive species.*

Action

- a) *Educate the public about the significant impact aquatic invasive species can have on the water resources of Otter Tail County.*

Timeline: On-going

Agency (Who): Otter Tail County Land and Resource, SWCDs, DNR, COLA, Lake Associations, AIS Taskforce

Cost: Staff time

- b) *Continue to support the Otter Tail County Aquatic Invasive Species Taskforce*

Timeline: On-going

Agency (Who): Otter Tail County Land and Resource, SWCDs, DNR, COLA, Lake Associations, AIS Taskforce

Cost: Staff time

Groundwater Priority Issues:

Groundwater Quality Goal: *Otter Tail County will protect the existing groundwater quality for drinking water purposes.*

Groundwater Quality Objectives:

- 1. Sourcewater Protection:** *Otter Tail County will participate in the preservation of the quality of the drinking water supply resources.*

Action

- a) *Participate on wellhead/source water protection teams during the development and implementation of Wellhead Protection Plans.*

Timeline: On-going

Agency (Who): SWCD, MDH, LRM

Cost: Staff time

- b) *Identify Wellhead Protection Areas on a County GIS map layer.*

Timeline: 2009, update annually

Agency (Who): GIS Department

Cost: Staff time

- c) *Conduct four Nitrate testing clinics (Otter Tail, New York Mills, Fergus Falls, and Perham) per year through MDA and cooperative efforts with lake associations and communities.*

Timeline: On-going

Agency (Who): EOTSWCD and MDA

Cost: Staff time with equipment provided by MDA

- d) *As part of the Nitrate testing clinics, distribute handouts to inform landowners of potential causes of contamination from arsenic, whether artificial or natural and available testing for groundwater.*

Timeline: On-going

Agency (Who): EOTSWCD

Cost: Staff time

- e) *Encourage the DNR to work with the local unit of government to incorporate conservation practices with irrigation permits within sensitive groundwater areas.*

Timeline: On-going

Agency (Who): SWCD

Cost: Staff time

- f) *Coordinate groundwater monitoring results throughout the county and request MDH presentation of information every two years to the LWMP task force and county board per the sand plain agreement with MDH.*

Timeline: On-going

Agency (Who): EOTSWCD, MDA and MDH

Cost: Staff time

- g) *Cost-share up to 75% toward sealing of abandoned wells. Prioritize wellhead*

protection, groundwater recharge, and other sensitive areas for funding.

Timeline: On-going

Agency (Who): SWCD, BWSR, MDH

Cost: \$2,000 - \$3,000 per year

- h) Continue low interest loan program for failing SSTs. Prioritize sensitive areas such as high water table, wellhead protection area, excessively sandy or heavy soils.*

Timeline: On-going

Agency (Who): SWCD, BWSR

Cost: Staff time

- i) Promote education of the general public on chemical/fertilizer use and BMPs through EOTSWCD, WOTSWCD and Extension newsletters, and articles in the local newspapers.*

Timeline: Annually

Agency (Who): WOTSWCD and Extension

Cost: Staff time

- j) Develop and implement 20 Nutrient Management Plans annually to prevent over-application of livestock and commercial fertilizer.*

Timeline: On-going

Agency (Who): NRCS

Cost: Staff time

2. DNR Observation Well Monitoring-*Measuring static water levels in a network of observation wells across the county.*

Action

- a) Assist the DNR to monitor observation wells to provide information on aquifer health and recharge, and model long term trends.*

Timeline: 2014-2019

Agency (Who): SWCDs, DNR

Cost: 10,000 annually

- b) Determine the impact of pumping on aquifers and resolve well interference conflicts.*

Timeline: 2014-2019

Agency (Who): SWCDs, DNR

Cost: Staff Time

3. Private Well Monitoring Network-*Continue to support private well monitoring efforts to determine quality of drinking water.*

Action

- a) Determine current nitrate-n concentrations in private wells.*

Timeline: 2011-2019

Agency (Who): MDA, Wadena

SWCD, SWCDs

Cost: Staff Time

- b) *Determine nitrate-n trends.*

Timeline: 2014-2019

Agency (Who): MDA, Wadena

SWCD, SWCDs

Cost: Staff Time

4. Irrigation: *Promote BMP for irrigators county-wide by offering beneficial data and programs.*

Action-

- a) *Collect information vital to agricultural production by monitoring our four weather stations, installing additional weather stations, and uploading information to an irrigation checkbook program.*

Timeline: On-going

Agency (Who): MDA, EOTSWCD,

DNR

Cost: \$50,000

- b) *Promote the irrigation scheduler program (ISP) to give farmers a second opinion on the soil moisture status of a given field.*

Timeline: On-going

Agency (Who): MDA, EOTSWCD,

DNR

Cost: \$5,000

- c) *Educate farmers on BMP for irrigation management by hosting irrigation workshops throughout Otter Tail County and surrounding counties.*

Timeline: On-going

Agency (Who): MDA, EOTSWCD,

DNR

Cost: \$15,000

- d) *Work to convert high pressure irrigation systems to low pressure through a clean water grant application that allows EOTSWCD to provide cost share to county producers.*

Timeline: On-going

Agency (Who): EOTSWCD, DNR

Cost: \$150,000

5. State Cost Share - Address high priority wind, water, and water quality issues within the county by providing financial assistance to landowners.

Action

- c) Assist landowners addressing high priority wind, water and water quality issues within the county

Timeline: On-going

Agency (Who): SWCD

Cost: \$74,000

6. Agriculture – Address and target water quality, and erosion issues on agricultural land.

Action

- d) Identify and contact landowners with inactive Ag Waste pits about sealing pits

Timeline: On-going

Agency (Who): SWCDS

Cost: Staff time

- e) Assist landowners with nutrient and pest management activities

Timeline: On-going

Agency (Who): SWCDs

Cost: Staff time

Groundwater Quantity Goal: Otter Tail County will work to maintain the existing adequate volumes of groundwater for the use of the constituents.

Groundwater Quality Objectives:

1. Preservation of Aquifer volume: *Preserve the adequacy of the groundwater volume through education, incentive and regulation.*

- a) *Address the Otter Tail County Commissioners and the East and West Otter Tail SWCD Boards resolutions to prevent movement of groundwater from within the boundaries of the county to other major watersheds.*

Timeline: On-going

Agency (Who): SWCD

Cost: Staff time

- b) *Investigate and comment on future proposed ethanol plants for volume of surface and/or groundwater needed and the capacity of the aquifer or surface water system.*

Timeline: On-going Agency

(Who): DNR, SWCD **Cost:**

Staff time

- c) *Work with irrigators within the county on utilizing BMPs to reduce the irrigation needs.*

Timeline: On-going

Agency (Who): SWCD and MDA

Cost: Staff time

- d) *Develop a program to educate the public and support the sustainability of the aquifer resources in Otter Tail County.*

Timeline: On-going Agency

(Who): SWCD, DNR **Cost:**

Staff time

Surface Water Priority Issues					
Water Quality Goal: Otter Tail County will maintain or improve the quality of the surface waters within their boundaries.					
Objective 1: Target and Prioritize: Target and prioritize surface water quality issues using tools and resources such as individual lake assessments, MPCA WRAPS, IWI- Water Quality Decisions Support Application (WQDSA), Lidar, and Stream Power Index to develop measurable goals and outcomes.					
	Action	Priority Subwatershed	Proposed Time Frame	Coordinating Agencies *Lead Agency	Estimated Cost
a)	Participate in the development of TMDLs as determined by the 303(d) listing of impaired waters (Otter Tail River from Rice Lake to Mud Lake for dissolved oxygen and West Spirit Lake for Total Phosphorus). Provide BMP information to the Chippewa and Pomme de Terre watershed projects for implementation practices on impairments downstream of Otter Tail County. The Otter Tail County Board, SWCD and/or LWMP will attend meetings and provide input in the writing of TMDLs.	Otter Tail River, Chippewa River, Pomme de Terre River	2009 - 2019	*MPCA, DNR, LWMP, SWCDs, Otter Tail County, Chippewa and Pomme de Terre Watershed Projects	Agency and Staff time
b)	Develop and implement a method to determine the existence of additional impaired waters.	All	2010 - 2019	*SWCDs, BWSR, SS, COLA, MPCA	\$25,000
c)	Work with the MPCA on the development of a TMDL for Nutrient/Eutrophication and Biological Indicators (Total Phosphorus) for West Spirit Lake.	Otter Tail River	2010	*MPCA, SWCDs, SS, BWSR	Staff time
d)	Review monitoring assessments by Chippewa and Pomme de Terre watershed organizations to determine effectiveness of BMPs.	Chippewa and Pomme de Terre River	2010 - 2012	*LRM, COLA, DNR	Staff time
e)	Pursue Surface Water Assessment grants and investigate the feasibility of high school students completing surface water monitoring.	Otter Tail River	2010 - 2019	*SWCDs, MPCA, COLA, SS, HS teachers	\$42,000
f)	MPCA Watershed restoration and protection Strategies (WRAPS): Protection Strategies – Assist with monitoring efforts, development of implementation plans and implementation activities in the following watersheds: Buffalo-Red River, Pomme de Terre, Bois de Sioux, Chippewa, Ottertail, Mustinka, Red Eye, Crow Wing, and Long Prairie	Ongoing	2014-2019	MPCA, DNR, SWCDs, Land and Resource Management, COLA, Concerned Citizens	\$450,000
g)	Water Quality Monitoring: Monitoring efforts including but not limited to MPCA's watershed monitoring program, COLA's lake monitoring program and volunteer citizen stream monitoring program.	Ongoing	2014-2019	MPCA, SWCDs, COLA	Volunteer Time
h)	Utilize Lake Assessments to prioritize target BMPs at the lakeshed level and measure the success of implemented practices over a longer timeframe.	Ongoing	2014 - 2019	COLA, SWCDs, Lake Associations	Staff and Volunteer time
Objective 2: Lake Association Support: Support lake associations and the Otter Tail County COLA to protect and preserve the lakes and lakeshed environment. Continue with the advancements of the Lake Assessments to develop lake trends and possible concerns.					
a)	Continue to support Shoreland Specialist position at EOTSWCD to provide the lake associations with an advocate and advisory contact.	All	2009 - 2019	SWCD, BWSR, LWMP, Otter Tail County Board	\$465,382
b)	Continue annual workshops through the Otter Tail COLA, teaching lakeshore property owners lakescaping BMPs.	All	2009 - 2019	*COLA, SS, BWSR	\$2,500

	Action	Priority Subwatershed	Proposed Time Frame	Coordinating Agencies *Lead Agency	Estimated Cost
c)	Provide mailings to smaller lakes in Otter Tail County to promote pro-active development and land use within their lakesheds. Notify lake associations of training available through MN Waters.	All	2009 - 2019	*COLA, LRM, BWSR, SS	\$5,000
d)	Work with Otter Tail COLA and MPCA to add 5-10 lakes per year to their monitoring program. Ensure all data is entered into MPCA STORET system. Fund monitoring on smaller lakes as available.	All	2009 - 2019	*SS, COLA, LA, BWSR, MPCA	\$20,000
e)	Continue connection with stakeholders such as BWSR, MDA, MDH, MPCA, DNR, LIDs, and Watershed Districts; completing studies in Otter Tail County and list available data sources on Otter Tail County's website.	All	2009 - 2019	*GIS, DNR	Staff time
f)	Set-up and participate in existing environmental education programs for youth such as the envirothon, conservation days, lake management curriculum, ag-in-the-classroom, conservation camps for kids (pheasants forever), prairie wetlands center programs, FFA, 4-H.	All	2009 - 2019	*LWMP task force, area high schools, extension, PF	Staff and Volunteer time
g)	Pursue funding sources for display media to be made available to area restaurants encouraging Best Management Practices for city, lakes, agriculture and residential property. Identify need for phosphorus free fertilizer and present facts to property owners.	All	2009 - 2019 even years	*COLA, BWSR, SS, LWMP	\$2,000
h)	Work with Otter Tail County Lake Associations to complete and implement Lake Assessments and Lake Management Plans. Completed Lake Assessments help to	All	2009 - 2019	*SS, LWMP, MPCA, DNR, BWSR, GIS, SWCD, LRM	Staff time
i)	Update information brochure listing agencies and organizations responsible for available information with person, phone number, and web page.	All	2014	*COLA, LWMP task force	\$200
j)	Support the completion of aquatic vegetation mapping on priority lakes in Otter Tail County (52 lakes completed to date). Re-assess for changes after completion.	All	2009 - 2019	*LRM, DNR, SS, GIS	\$150,000
k)	Maintain Local Water Management Update on county web site.	All	2009 - 2019	*GIS, LRM	Staff time
l)	Hold annual water plan meeting with presentation of accomplishments and work plan for upcoming year.	All	2009 - 2019	*EOTSWCD	staff time
m)	Continue to conduct Lake Assessments on lakes in Otter Tail County to gain and assess valuable data about the lake and target areas of concern, lake trends, and possible lake projects. Twenty one lakes in Otter Tail County have completed Lake Assessments and thirty-eight lakes are currently working to complete their Lake Assessment	All	2014 - 2019		Staff Time
Objective 3: Stormwater / Drainage Management: Offer education and incentive programs aimed at mitigating the effects of overland runoff on the surface waters of Otter Tail County, utilizing available regulations if necessary.					
a)	Coordinate with the Bois de Sioux Watershed District to increase water storage through water retention structures and non-structures, and other temporary and permanent structures in the Mustinka and Bois de Sioux watershed.	Bois de Sioux, Mustinka	2009 - 2019	*WOTSWCD	Staff time

b)	Coordinate with the Buffalo-Red River Watershed District to increase water storage through water retention structures and other temporary and permanent structures within the watershed.	Buffalo-Red	2009 - 2019	*WOTSWCD	Staff time
c)	Support DNR and local government efforts in establishing and/or maintaining lake levels at appropriate elevations, creating outlets and discharge conditions with regard to water quality and quantity issues pursuant to MN Rules 6115.0221.	All	2009 - 2019	*DNR, LA, LIDs, COLA, LRM, LWMP	Staff time
d)	Provide incentive funding for high priority buffer strips where appropriate along water courses and basins.	All	2009 - 2019	*SWCD, BWSR, NRCS, DNR, PF	\$250,000
e)	Enforce existing lakeshore buffer regulations on new developments. Provide buffer incentives for existing lakeshore owners through DNR Shoreland Initiative Grant.	All	2009 - 2019	*LRM, DNR, WOTSWCD	\$20,000
f)	Enforce existing required buffer area between rivers / streams / lakes and Ag fields and existing requirement for vegetation on steep slopes and bluffs.	All	2009 - 2019	*LRM, DNR	Staff time
g)	Reward existing BMPs through the Conservation Security Program in eligible watersheds as funding allows.	All	2009 - 2019	*SWCD, NRCS, BWSR	Staff time
h)	Pursue funding for perpetual easements on developments around sensitive areas.	All	2009 - 2019	*SWCD, NRCS, BWSR	Staff time
Objective 4: Wetlands / Wildlife Habitat: Identify and protect wetland and wildlife habitat areas located within Otter Tail County.					
a)	Enhance existing and new wetland restoration and buffers programs such as CRP, WHIP, WLI, RIMWR and USFWS. Promote wetlands within the shoreland and groundwater recharge areas.	All	2009 - 2019	*WOTSWCD, NRCS, BWSR	\$500,000
b)	Restore 1000 - 2000 acres of wetland and wildlife habitat annually.	All	2009 - 2019	*East and West Otter Tail SWCD	Staff time
c)	Participate in the Local Technical Teams for the Minnesota Prairie Conservation Plan	Pomme de Terre, Otter Tail, Bois de Sioux	2014 - 2019	WOT SWCD, MNDNR, USFWS	Staff Time
d)	Prioritize and target wetland and grassland restorations in the core, corridor, and complexes identified in Otter Tail County	Pomme de Terre, Otter Tail, Bois de Sioux	2014 - 2019	WOT SWCD, MNDNR, USFWS	Staff Time
e)	Enroll approximately 200 – 300 acres of perpetual easement annually	All	2014 - 2019	WOT SWCD, EOT SWCD, NRCS, DU, PF, BWSR	\$30,000
f)	Inspect a percentage of conservation easements annually	All	2014 - 2019	WOT SWCD, EOT SWCD, NRCS, DU, PF, BWSR	\$7,000

g)	Promote and educate landowners about pollinator plantings throughout Otter Tail County	All	2014 – 2019	WOT and EOT SWCD, NRCS, Pheasants Forever, BWSR	Staff Time
Objective 5: Minnesota Ag Water Quality Certification Program: Educate and certify producers within the MAWQCP Target Area.					
a)	Educate landowners and producers on the value of the MAWQCP	Buffalo – Red River Watershed	2014 - 2017	WOTSWCD, NRCS, BWSR	Staff Time
b)	Restore 1000 - 2000 acres of wetland and wildlife habitat annually.	Buffalo – Red River Watershed	2014 - 2017	WOTSWCD, NRCS, BWSR	Staff time
Objective 6: Soil Health Initiative: Educate and inform ag producers about the value and benefits of soil health.					
a)	Educate landowners and producers about the importance of soil health and the benefits to their farm operation.	All	2014–2019	WOTSWCD, EOT SWCD NRCS, BWSR	Staff Time
b)	Develop local soil health test plots for experimental and educational purposes	All	2014 - 2019	WOTSWCD, EOT SWCD NRCS, BWSR	Staff time
Objective 7: Drainage Water Management: Promote drainage water management where applicable within Otter Tail County.					
a)	Educate and inform landowners and producers about the importance of drainage water management	All	2014–2019	WOTSWCD, EOT SWCD NRCS, BWSR	Staff Time
Objective 8: LiDAR: Utilize the best available resources to prioritize, target and measure project and practice location and success.					
a)	Prioritize and target high profile projects and practices using the best available resources	All	2014-2019	WOTSWCD, EOTSWCD, NRCS, BWSR	Staff Time
Objective 9: Central MN On-Farm Nitrogen Management Program- Conduct basal stalk nitrate testing and replicated strip trials to promote BMP implementation for nutrient stewardship.					
a)	Work with producers in a five county area to conduct guided basal stalk testing in corn acres.	All	2014-2019	MDA, EOTSWCD, SWCDs	20,000 per year
b)	Use the results collected to educate farmers on the environmental benefits, water resource protection, and how the program helps lead producers to make farm level management changes that are more profitable to the grower.	All	2014-2019	MDA, EOTSWCD, SWCDs	2,000 per year

Objective 10: Lakescaping- landscaping shoreline areas using methods that help improve and protect water quality and wildlife habitat					
a)	Install buffer zones and rain gardens of native vegetation along lakeshores.	All	2014-2019	SWCDs	45,000 per year
b)	Educate lakeshore owners on best management practices to enhance public knowledge	All	2014-2019	SWCDs, COLA, Lake Associations	10,000 per year
Objective 11: Irrigation: Promote BMP for irrigators county-wide by offering beneficial data and programs.					
a)	Collect information vital to agricultural production by monitoring our four weather stations, installing additional weather stations, and uploading information to an irrigation checkbook program.	All	On Going	MDA, EOT SWCD, DNR	\$50,000
b)	Promote the irrigation scheduler program (ISP) to give farmers a second opinion on the soil moisture status of a given field.	All	On Going	MDA, EOT SWCD, WOT SWCD, DNR	\$5,000
c)	Educate farmers on BMP for irrigation management by hosting irrigation workshops throughout Otter Tail County and surrounding counties.	All	On Going	MDA, EOT SWCD, WOT SWCD, DNR	\$15,000
d)	Work to convert high pressure irrigation systems to low pressure through a clean water grant application that allows EOTSWCD to provide cost share to county producers.	All	On Going	MDA, EOT SWCD, WOT SWCD, DNR	\$150,000
Objective 12: State Cost Share: Address high priority wind, water, and water quality issues within the county by providing financial assistance to landowners					
a)	Assist landowners addressing high priority wind, water and water quality issues within the county.	All	On going	WOT SWCD, EOT SWCD	\$74,000
Objective 13: Agriculture: Address and target water quality and erosion issues on agricultural land.					
a)	Identify and contact landowners with inactive Ag Waste Pits about sealing pits	All	On going	WOT and EOT SWCD	Staff Time
b)	Assist landowners with nutrient and pest management activities	All	On going	WOT and EOT SWCD	Staff time
Objective 14: Erosion: Target and prioritize high priority erosion sites and provide technical and financial assistance to landowners to address erosion problems					
a)	Target and prioritize high priority erosion sites using the best available resources	All	On going	EOT and WOT SWCD	Staff time
b)	Pursue funding to assist with erosion control practices within all watersheds of Otter Tail County	All	On going	EOT and WOT SWCD	Staff Time

c)	Design and install high priority erosion control practices	All	On going	EOT and WOT SWCD, Joint Powers	\$50,000
d)	All measurable outcomes will be recorded in BWSRs Elink	All	On going	EOT and WOT SWCD	Staff Time
Regulatory Issues Goals: Develop regulations, education and incentives to ensure orderly development with minimal impacts to sensitive areas to preserve Otter Tail County's natural resources.					
Objective 1: Sensitive Areas: Develop a model to identify areas sensitive to intensive development throughout Otter Tail County.					
a)	<i>Explore available sensitivity models being utilized by other counties and work with LRM, Eagle Lake Township and Dead Lake to determine feasibility of use as a lake districting pilot project, for potential use in county-wide land use planning.</i>	Otter Tail River	2009 - 2013	*LRM, GIS, Eagle Lake Township, Dead Lake Association, BWSR	\$50,000
b)	<i>Develop Lake Districting county-wide to protect sensitive areas from degradation due to overdevelopment.</i>	All	2009 - 2019	*LRM, DNR, LA	\$10,000
c)	<i>Request DNR re-classification of 203 lakes in Otter Tail County. Adopt and implement re-classification of lakes 150 acres or less in size from General or Recreational Development to Natural Environment Shoreline.</i>	All	2009	*LRM, DNR	Staff time
d)	<i>Participate in and support state-wide process of shoreland rulemaking and support adoption of new rules when approved by the State.</i>	All	2009 - 2010	*LRM, COLA, DNR	Staff time
e)	<i>Educate the decision makers of Otter Tail County by pursuing funding to bring training to the decision makers locally.</i>	All	2009 - 2010	*LRM, COLA, SWCDs, County Board, Planning Advisory Commission, Boars of Adjustment	\$5,000
Objective 2: Agriculture: Support the Agriculture Advisory Task Force and their recommendations to the Otter Tail County Board regarding regulation of agricultural practices.					
a)	<i>Actively participate as a member of the Ag Advisory Task Force. Support the recommendation of the need for a long-range county comprehensive plan and investigate the obstacles preventing it from happening.</i>	All	2010 - 2012	*LRM, COLA, SWCDs	staff time
b)	<i>Support county delegation for feedlots by informing the County Board of the program, and the feasibility of one designated feedlot officer and technical support staff to complete inventory through MPCA feedlot program, and administer the program.</i>	All	2009 - 2012	*SWCD, BWSR, MPCA, LWMP, Ag, Advisory Task Force	\$120,000
c)	<i>Support the adoption of the agriculture rules included in the new State Shoreland Rules.</i>	All	2010 - 2011	*LRM, DNR, SWCD, Otter Tail County Board	staff time
Objective 3: Subsurface Sewage Treatment: Promote county-wide Sub-Surface Sewage Treatment System compliance through systematic inspection, education and regulation.					

a)	<i>Continue systematic Sub-surface Sewage Treatment System (SSTS) inspection around the shorelines of Otter Tail County Lakes. Target lakes identified in Section II:</i>	All	2009 - 2019	*LRM, LWMP Task Force	\$200,000
b)	<i>Support the county adoption of the new SSTS rules in 2010, requiring system certification every three years.</i>	All	2010 - 2011	*LRM, LWMP Task Force	Staff time
c)	<i>Utilize Extension products to develop maintenance fact sheet to be issued with 800-plus compliance letters on SSTS.</i>	All	2009 - 2019	*LRM, Extension	\$5,000
d)	<i>Facilitate land-owners meetings to encourage cluster systems with maintenance agreements in sensitive areas, moving the disposal site away from inadequate soils.</i>	All	2009 - 2019	*LRM	Staff time
e)	<i>Continue low interest loan program for failing septic systems. Prioritize sensitive areas such as high water table, wellhead protection area, excessively sandy or heavy soils.</i>	All	2009 - 2019	*East and West Otter Tail SWCD	Staff time

Objective 4: Otter Tail County Buffer Initiative: Assist landowners and the county to move in the direction of 100% compliance with the state and county shoreland ordinance.

a)	<i>Identify areas of concern and create a database of potential non-compliance parcels. Maintain and continually update database</i>	All	2014 - 2022	EOT SWCD, WOT SWCD, County Land and Resource	\$90,000
b)	<i>Phase 1 – Mail a letter, factsheet, and map to landowners with potential non-compliant parcels informing them of the state and county ordinance and programs available to assist</i>	All	2014 - 2016	EOT SWCD, WOT SWCD, County Land and Resource	\$90,000
c)	<i>Phase 2 – Landowners who did not respond or install a buffer will receive a second letter informing them that they are out of compliance and a 50ft buffer is required along all county lakes, rivers, and streams.</i>	All	2017 - 2019	EOT SWCD, WOT SWCD, County Land and Resource	\$90,000
d)	<i>Phase 3 – Landowners who did not respond or install a buffer will receive a third letter informing them that they are out of compliance and a 50ft buffer is required along all county lakes, rivers and streams. There will be a deadline to voluntarily install the required buffer.</i>	All	2020–2022	EOT SWCD, WOT SWCD, County Land and Resource	\$90,000

Objective 5: Aquatic Invasive Species: Promote the importance of controlling aquatic invasive species.

a)	<i>Educate the public about the significant impact aquatic invasive species can have on the water resources of Otter Tail County</i>	All	2014-2019	County Land and Resource, AIS Taskforce	Staff Time
b)	<i>Continue to support the Otter Tail County Aquatic Invasive Species Taskforce</i>	All	2014-2019	County Land and Resource, SWCDs, DNR, COLA, Lake Association, AIS Taskforce	Staff Time

Groundwater Priority Issues:

Groundwater Quality Goal: Otter Tail County will protect the existing groundwater quality for drinking water purposes.					
Objective 1: Sourcewater Protection: Otter Tail County will participate in the preservation of the quality of the drinking water supply resources.					
a)	Participate on wellhead/source water protection teams during the development and implementation of Wellhead Protection Plans.	All	2009 - 2019	*SWCD, MDH, LRM	Staff time
b)	Identify Wellhead Protection Areas on a County GIS map layer.	All	2009 - 2019	*GIS	Staff time
c)	Conduct four Nitrate testing clinics (Otter Tail, New York Mills, Fergus Falls, and Perham) per year through MDA and cooperative efforts with lake associations and communities.	Otter Tail River All	2009 - 2019	*EOTSWCD, MDA	Staff time
d)	As part of the Nitrate testing clinics, distribute handouts to inform landowners of potential causes of contamination from arsenic, whether artificial or natural and available testing for groundwater.	All	2009 - 2019	*EOTSWCD, MDA	Staff time
e)	Encourage the DNR to work with the local unit of government to incorporate conservation practices with irrigation permits within sensitive groundwater areas.	All	2009 - 2019	*SWCD	Staff time
f)	Coordinate groundwater monitoring results throughout the county and request MDH presentation of information every two years to the LWMP task force and county board per the sand plain agreement with MDH.	Otter Tail River All	2009 - 2019	*EOTSWCD, MDA, MDH	Staff time
g)	Cost-share up to 75% toward sealing of abandoned wells. Prioritize wellhead protection, groundwater recharge, and other sensitive areas for funding.	All	2009 - 2019	*SWCD, BWSR, MDH	\$30,000
h)	Continue low interest loan program for failing SSTs. Prioritize sensitive areas such as high water table, wellhead protection area, excessively sandy or heavy soils.	All	2009 - 2019	*SWCD, BWSR	Staff time
i)	Promote education of the general public on chemical/fertilizer use and BMPs through EOTSWCD, WOTSWCD and Extension newsletters, and articles in the local	All	2009 - 2019	*WOTSWCD, Extension	Staff time
j)	Develop and implement 20 Nutrient Management Plans annually to prevent over-application of livestock and commercial fertilizer.	All	2009 - 2019	*NRCS	Staff time
Objective 2: DNR Observation Well Monitoring- Measuring static water levels in a network of observation wells across the county.					
a)	Assist the DNR to monitor observation wells to provide information on aquifer health and recharge, and model long term trends.	All	2014-2019	SWCDs, DNR	10,000 annually
b)	Determine the impact of pumping on aquifers and resolve well interference conflicts.	All	2014-2019	SWCDs, DNR	Staff Time
Objective 3: Private Well Monitoring Network- Continue to support private well monitoring efforts to determine quality of drinking water.					
a)	Determine current nitrate-n concentrations in private wells.	All	2011-2019	MDA, Wadena SWCD, SWCDs	Staff Time
b)	Determine nitrate-n trends.	All	2014-2019	MDA, Wadena SWCD, SWCDs	Staff Time

Objective 4: Irrigation: Promote BMP for irrigators county-wide by offering beneficial data and programs.

a)	Collect information vital to agricultural production by monitoring our four weather stations, installing additional weather stations, and uploading information to an irrigation checkbook program.	All	2014-2019	MDA, EOT SWCD, DNR	\$50,000
b)	Promote the irrigation scheduler program (ISP) to give farmers a second opinion on the soil moisture status of a given field.	All	2014-2019	MDA, EOT SWCD, WOT SWCD, DNR	\$5,000
c)	Educate farmers on BMP for irrigation management by hosting irrigation workshops throughout Otter Tail County and surrounding counties.	All	2014-2019	MDA, EOT SWCD, WOT SWCD, DNR	\$15,000
d)	Work to convert high pressure irrigation systems to low pressure through a clean water grant application that allows EOTSWCD to provide cost share to county producers.	All	2014-2019	MDA, EOT SWCD, WOT SWCD, DNR	\$150,000

Objective 12: State Cost Share: Address high priority wind, water, and water quality issues within the county by providing financial assistance to landowners

a)	Assist landowners addressing high priority wind, water and water quality issues within the county.	All	On going	WOT SWCD, EOT SWCD	\$74,000
----	--	-----	----------	--------------------	----------

Objective 13: Agriculture: Address and target water quality and erosion issues on agricultural land.

a)	Identify and contact landowners with inactive Ag Waste Pits about sealing pits	All	On going	WOT and EOT SWCD	Staff Time
b)	Assist landowners with nutrient and pest management activities	All	On going	WOT and EOT SWCD	Staff time

Groundwater Quantity Goal: Otter Tail County will work to maintain the existing adequate volumes of groundwater for the use of the constituents.					
Objective 1: Preservation of Aquifer Volume: Preserve the adequacy of the groundwater volume through education, incentive and regulation.					
a)	Address the Otter Tail County Commissioners and the East and West Otter Tail SWCD Boards resolutions to prevent movement of groundwater from within the boundaries of the county to other major watersheds.	All	2009 - 2019	*SWCD	Staff time
b)	Investigate and comment on future proposed ethanol plants for volume of surface and/or groundwater needed and the capacity of the aquifer or surface water system.	All	2009 - 2019	*DNR, SWCD	Staff time
c)	Work with irrigators within the county on utilizing BMPs to reduce the irrigation needs.	Otter Tail River All	2009 - 2019	*SWCD, MDA	Staff time
d)	Develop a program to educate the public and support the sustainability of the aquifer resources in Otter Tail County.	All	2009 - 2019	*SWCD, DNR	Staff time

Otter Tail County Local Water Management Plan Implementation Schedule

On-Going Activities

Programs	Cooperators	Match	Funding	Grant Source	Watershed
Shoreland Management	OTC L&RM	\$ 20,219.00	\$ 20,219.00	BWSR NRBG	All
WCA	OTC L&RM	\$ 33,047.00	\$ 33,047.00	BWSR NRBG	All
WCA	EOT SWCD	\$ 20,000.00	\$ 21,450.00	BWSR NRBG	All
WCA	WOT SWCD	\$ 15,000.00	\$ 17,400.00	BWSR NRBG	All
EQIP	EOT NRCS	\$ 200,000.00	\$ 800,000.00	USDA	All
EQIP	WOT NRCS	\$ 108,000.00	\$ 432,000.00	USDA	All
WHIP	EOT NRCS	\$ 25,000.00	\$ 100,000.00	USDA	All
WHIP	WOT NRCS	\$ 4,500.00	\$ 18,000.00	USDA	All
ISTS	OTC L&RM	\$ 10,000.00	\$ 10,000.00	BWSR NRBG	All
State Cost Share Program	EOT SWCD	\$ 7,200.00	\$ 28,809.00	BWSR Cost Share	All
State Cost Share Program	WOT SWCD	\$ 7,200.00	\$ 28,809.00	BWSR Cost Share	All
Local Water Management Plan	SWCDs & OTC L&RM	\$ 19,585.00	\$ 12,934.00	BWSR NRBG	All
Ag BMP Loan	EOT SWCD	\$ 2,000.00	\$ 87,000.00	MN Dept. of Ag	All
Total Annual Projected Cost		\$471,751.00	\$1,609,668.00		

Appendix

A – Priority Concerns Scoping Document

B – References and Websites

C – Additional Plans

D – Amendment Documents

Appendix A

Priority Concerns Scoping Document

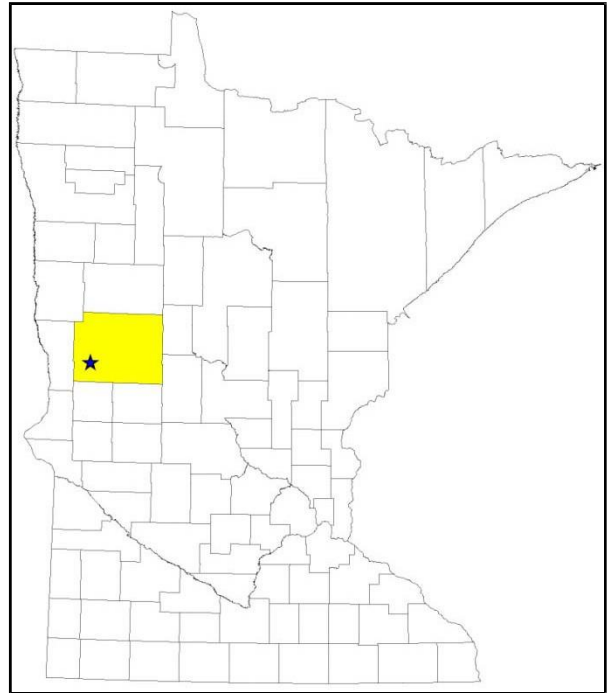
Otter Tail County Local Water Management Plan

Priority Concerns Scoping Document

INTRODUCTION:

Figure One

Otter Tail County is located in west central Minnesota. Fergus Falls, the county seat, is located along Interstate-94 (I-94) 50 miles northwest of Alexandria, 60 miles southeast of Moorhead and 95 miles west of Brainerd. Douglas and Grant County border it on the south, Becker on the north, Wilkin on the west, Clay on the northwest corner and Wadena and Todd on the east. Otter Tail County has a total area of 2,232 square miles (1,427,075 acres). According to the Otter Tail County website, “There are 1048 lakes in Otter Tail County. That is more than any other single county in the entire United States of America”, and for this reason, along with the scenic landscape; new development is in high demand. **Figure One** shows the location of Fergus Falls, the county seat and the geographic location of the County in Minnesota.



Otter Tail County is the “top of the watershed” for three major drainage basins. The Pelican and Otter Tail Rivers flow to the west in the Red River Watershed, then north to Hudson Bay. The Leaf River starts north of Henning and flows to the Red Eye River and out the eastern edge to the Upper Mississippi River, while the Pomme de Terre and Chippewa Rivers headwater in the southwest corner and flow to the Minnesota River. Both the Upper Mississippi and the Minnesota Rivers end up in the Gulf of Mexico. The continental divide runs along the major basin boundaries. Protecting down-stream resources is the responsibility of the county.

Otter Tail County Demographics:

- **Population Trends** – Population trends derived by the Minnesota State Census Bureau’s website at: <http://server.admin.state.mn.us/resource.html?Id=7376> gives the predicted growth out to 2030. According to the website, the adjusted 2000 population of Otter Tail County is 55,762. The predicted growth by 2030 is a greater than 40% increase in population throughout the county. Greater than 50% growth is predicted in Perham, Pelican Rapids, Otter Tail and New York Mills cities – along with the partial bordering cities of Wadena and Rothsay. Three cities are predicted to have negative growth: Vining, Urbank, and Erhard. Nine townships surrounding these three cities and outside the lakes area are also predicted to have negative growth. The 23 townships with expectations of more than 50% increase in population are located in the lakes area, a prediction of the future use of this resource in the County. The lakes provide resources to both residents and seasonal people. Of the greater than 60,000 parcels in Otter Tail County, 24% are seasonal, non-homestead and these property owners provide 22% of the gross property taxes.

Figure Two

- **Land Use** - Land use in Otter Tail County (OTC) from 1989, as shown in the last water plan update indicated over 60% of the land in Otter Tail County is designated agriculture use (cultivated, pasture, and open). Land use information is shown in **Figure Two**. Current information will be available in the CLWMP update. The majority of development has occurred around the Cities of Fergus Falls, Perham and Pelican Rapids and around the numerous area lakes.

Otter Tail County Land Use Percent	
Woodland	19
Water	12
Cultivated Land	47
Wetlands	5
Pasture	14
Residential / Commercial	2
Total	100

Local Water Management Plan Information:

- **Responsibility** – The East Otter Tail Soil and Water Conservation District (EOTSWCD) has been charged with implementation of the Local Water Management Plan (LWMP), with support from the West Otter Tail Soil and Water Conservation District (WOTSWCD). Advisory to the LWMP is the Task Force (**Appendix item A** – LWMP Task Force). This group meets twice a year or as needed to discuss budget and implementation strategies.
- **Original Water Plan** – The original water plan was adopted in October of 1990. Updates to the Plan were completed in 1997 and 2004.
- **Expiration Date** – Otter Tail County's current LWMP expires June 30, 2009.

PRIORITY CONCERNS IDENTIFICATION:

The OTC Local Water Management planning process of addressing priorities has included the following actions:

Public and Internal Forums Held to Gather Input:

- **October 9, 2007:** Resolution to update the LWMP was signed by the OTC Board of Commissioners.
- **October 9, 2007:** Letter and survey sent to surrounding counties and SWCDs, cities, townships, local interest groups, watershed groups and state agencies located within OTC; requesting a copy of existing plans and issues or concerns that should be addressed in the plan update (**Appendix item B** – mailing list).
- **January, 2008:** Survey and notification of public visioning session were distributed to countywide newspapers, radio stations and on SWCD website. A copy of the survey can be reviewed in **Appendix item C** – Survey - Summary of Results.
- **January 28th and February 5th, 2008:** Public participation meetings/visioning sessions were conducted.
 - One public meeting was conducted in Fergus Falls on the January 28th from 7-9 p.m.
 - One public meeting was conducted in Ottertail on February 5th from 7-9 p.m.
 - A facilitation process was used at these meetings to determine priorities and desired outcomes. A total of 23 people attended these sessions, including representation from township boards, County land use staff, SWCD board supervisors, Agriculture producers, OTC COLA, and agency representation from the NRCS, USFWS, DNR, MPCA and BWSR. Several lake association members were also present. A summary of the input from these meetings is provided in **Appendix item D** – Public Information Sessions Input.

- **March 17, 2008:** A meeting of the Task Force with a presentation of the findings from the combined survey and the visioning session was given to interested state and local government agencies. Discussion of agency priority concerns was accepted at the meeting. Attendees included:
 - Darren Newville, EOT SWCD
 - Dennis Mosher, OTC Commissioner
 - Leon Johnson, WOT FSA
 - Terry Lejcher, DNR, Fergus Falls
 - Gary Cruft, EOT SWCD Board
 - Pete Waller, BWSR
 - Brad Mergens, WOT SWCD
 - John Matteson, OTC COLA
 - Jeff Lepp, NRCS, Fergus Falls
 - Richard B. Vigor, WOT SWCD
 - Jack Frederick, MPCA
 - Marilyn Bayerl, Bayerl Water Resources

PRIORITY CONCERN SELECTION

Respondents to the survey felt equally that groundwater and lakes are the most threatened resource in Otter Tail County. Streams, rivers and wetlands followed. Local government and state agency input are documented more thoroughly in **Appendix Item E** - Local Government Units and State Agencies – Summary of Concerns.

Through the survey and public meeting facilitation process, the respondents were asked what they considered the top four problems faced in Otter Tail County. Based on responses to the survey, through the facilitated public meetings and input from the task force, the top priority concern is development pressure, with the accompanying issues as follows:

Development Pressures:

<i>Surface Water Issues:</i>	Water Quality issues	- Total Maximum Daily Load allocations, shallow and smaller lakes, sensitive bays, shoreland specialist to work with lakeshore properties
	Regulatory issues	- lake re-classification, alternative shoreland rules, agricultural rules, support state-wide process, agriculture advisory task force
<i>Groundwater Issues:</i>	Quality issues	- fertilizer application, reductions in CRP acres
	Quantity issues	- pumping to other watersheds, ethanol plants, increased demand for irrigation

The LWMP Task Force will continue to meet to assist in the development of objectives and strategies to address each of these priority concerns over the next ten years.

PRIORITY CONCERNS NOT ADDRESSED BY THE PLAN:

Some water management issues will not be addressed in the updated plan. As with the previous LWMP, development pressures and land use / zoning issues were a concern of both citizens and other respondents. Other concerns will be re-prioritized as the need arises or as part of the next LWMP update.

Implementation of the Priority Concerns in the Otter Tail County Local Water Management Plan is dependent on several variables. The county needs to continue making water planning a priority, the state must fund LWMP at its previous level, and the water management coordinator must pursue other grants and work with adjoining counties on watershed based Total Maximum Daily Load allocation grants that are available through the state funding for impaired waters.

Supporting Documents:

LWMP Task Force Members

Mailing List

Survey – Summary of Results Appendix item

Public Information Sessions Input

Local Government Units and State Agencies – Summary of Concerns

Otter Tail County Local Water Management Plan
Members of the Task Force

Bruce Becker, Natural Resources Conservation Service (NRCS)

Pete Waller, Board of Water and Soil Resources (BWSR)

Jack Frederick, Minnesota Pollution Control Agency (MPCA)

Bill Kalar, OTC Land and Resources (OTC LR)

Darren Newville, EOT SWCD

David Hauser, OTC Attorney

Kevin Brennan, United States Fish and Wildlife Services (US FWS)

Carolyn Herron, OTC Coalition of Lakes Associations (COLA)

Karen Terry, University of Minnesota Extension

Leon Johnson, Farm Services Agency

Dennis Mosher, OTC Commissioner

Terry Lejcher, Minnesota Department of Natural Resources (DNR)

Jeff Lepp, NRCS

Richard Vigor, WOT SWCD

John Matteson, OTC COLA

Gary Cruff, EOT SWCD

Dave Johnson, Farmers Union

Bruce Brenden, Farm Bureau

Les Estes, OTC Planning Commission

Brad Mergens, WOT SWCD

Vic Petterson

Lenny Holmer

David Holt

Otter Tail County Local Water Management Plan Mailing List

ORGANIZATION	FIRST	LAST
SCAMBLER TOWNSHIP	WAYNE	JOHNSON
DUNN TOWNSHIP	WAYNE D	OLSON
HOBART TOWNSHIP	TERRY	HOCKERT
GORMAN TOWNSHIP	ELDRED	ELLENBERG
CANDOR TOWNSHIP	HENRY	MOLTZAN JR
CORLISS TOWNSHIP	DAVID	FIELDER
BUTLER TOWNSHIP	JOHN	PEETERS
BLOWERS TOWNSHIP	RAYMOND	PUTIKKA
HOMESTEAD TOWNSHIP	DUWAYNE	ROBERTS
PINE LAKE TOWNSHIP	EDWARD	ROBERTS
PERHAM TOWNSHIP	KELVIN	RUDOLPH
EDNA TOWNSHIP	LOUIE	SAZAMA
DORA TOWNSHIP	NORBERT	BENKE
LIDA TOWNSHIP	CARL	JOHNSON
PELICAN TOWNSHIP	THOMAS	LANGSETH
NORWEGIAN GROVE TOWNSHIP	EARNEST	HOVLAND
TRONDHJEM TOWNSHIP	CHARLES	HAUGEN
ERHADS GROVE TOWNSHIP	LEE	BACKSTROM
MAPLEWOOD TOWNSHIP	CRAIG	RIPLEY
STAR LAKE TOWNSHIP	WILLIAM	FIELD
DEAD LAKE TOWNSHIP	JOHN	KIMPLE
RUSH LAKE TOWNSHIP	ANDREW	KLINNERT
OTTO TOWNSHIP	TROY	SALO
NEWTON TOWNSHIP	CHRISTOPHER	ROBERTS
BLUFFTON TOWNSHIP	DEAN	ENDRES
COMPTON TOWNSHIP	LARRY	RICHTER
DEER CREEK TOWNSHIP	NORMAN	JAHNKE
LEAF LAKE TOWNSHIP	JAMES	KEDKITALO
OTTER TAIL TOWNSHIP	DONALD	DREGAR
AMOR TOWNSHIP	CHARLES	ERICKSON
MAINE TOWNSHIP	GERALD	KUSNIEREK
FRIBERG TOWNSHIP	GORDON	HANNEMAN
ELIZABETH TOWNSHIP	EDWIN	CARLSON
OSCAR TOWNSHIP	DAVID	EMERY
CARLISLE TOWNSHIP	CHARLES	PIEKARSKI
FERGUS FALLS TOWNSHIP	HOWARD	GOESE
AURDAL TOWNSHIP	NORMAN	PIERCE JR.
SVERDRUP TOWNSHIP	DANIEL	STENOIEN
EVERTS TOWNSHIP	MARLYN	KRUSCHKE
GIRARD TOWNSHIP	JAMES	TRITES
HENNING TOWNSHIP	ALAN	HAUGDAHL
INMAN TOWNSHIP	KEVIN	ANDERSON
OAK VALLEY TOWNSHIP	ALVIN	FINN
WOODSIDE TOWNSHIP	JOHN	DITTBERNER
ELMO TOWNSHIP	DUANE	HANSON

OTC LWMP Mailing list		Appendix B
ORGANIZATION	FIRST	LAST
FOLDEN TOWNSHIP	GREGG	MALLORY
NIDAROS TOWNSHIP	RICHARD	TROSDAHL
CLITHERALL TOWNSHIP	DONALD	DAVENPORT
TORDENSKJOLD TOWNSHIP	JOHN	SCHAUFF
DANE PRAIRIE TOWNSHIP	PETER	LINDQUIST
BUSE TOWNSHIP	SCHAN	SORKNESS
ORWELL TOWNSHIP	DANIEL	ROEHL
WESTERN TOWNSHIP	ARLYN RICKY	HENSCH
AASTAD TOWNSHIP	GARY	LIEN
TUMULI TOWNSHIP	DON	VIGER
ST. OLAF TOWNSHIP	PAUL	MOE
EAGLE LAKE TOWNSHIP	DAVID	BRAND
LEAF MOUNTAIN TOWNSHIP	AURTHOR	DORN
EFFINGTON TOWNSHIP	ROGER	RUCKHEIM
PARKERS PRAIRIE TOWNSHIP	EUGENE	PAYNE
EASTERN TOWNSHIP	ROBERT	LEHMANN
PADDOCK TOWNSHIP	CHARLES	BELDO
CITY OF FERGUS FALLS	RUSSEL	ANDERSON
CITY OF DALTON	JULIE	HENDERSON
CITY OF UNDERWOOD	BERTHOLD	KINZLER
CITY OF BATTLE LAKE	LES	ESTES
CITY OF CLITHERALL	HEATH	WEST
CITY OF URBANK	VERNON	KLIMEK
CITY OF VINING	DONALD	SELVAAG
CITY OF PARKERS PRAIRIE	LARRY	LAHMAN
CITY OF HENNING	JIM	HERMANSON
CITY OF DEER CREEK	GERALD	PORTER
CITY OF WADENA	WAYNE	WOLDEN
CITY OF BLUFFTON	DALE	PORTER
CITY OF OTTERTAIL	RAYMOND	MOUNTS
CITY OF NEW YORK MILLS	LARRY	HODGSON
CITY OF RICHVILLE	TERRY	LEE
CITY OF PERHAM	KEVIN	KIEL
CITY OF DENT	PERRY	COLEMAN
CITY OF VERGAS	DEAN	HAARSTICK
CITY OF PELICAN RAPIDS	WAYNE	RUNNINGEN
CITY OF ROTHSAY	PAUL	FOSSE
CITY OF ERHARD	RICHARD	BRATLIEN
CITY OF ELIZABETH	HOWARD	EUNAU
BECKER COUNTY PLANNING AND ZONING	BRIAN	BERG
WILKEN COUNTY	BRUCE	POPPEL
WADENA COUNTY	DEANNA	SKOV
TODD COUNTY ELRM	ANDREW	DAHLGREN
DOUGLAS COUNTY BOARD OF COMMISSONERS	WILLIAM	SCHALOW
GRANT COUNTY BOARD OF COMMISSIONERS	JIM	STANDISH
CLAY COUNTY BOARD OF COMMISSIONERS	VIJAY	SETHI
BECKER SWCD	BRAD	GRANT
WILKEN SWCD	DON	BAJUMPAA
WADENA SWCD	MALINDA	DEXTER

OTC LWMP Mailing list		
ORGANIZATION	FIRST	LAST
TODD SWCD	SANDY	ROHR
DOUGLAS SWCD	JERRY	HAGGENMILLER
GRANT SWCD	JOE	MONTONYE
CLAY SWCD	KEVIN	KASSENBOG
BUFFALO RED RIVER WATERSHED DISTRICT		
BOISE DE SIOUX WATERSHED DISTRICT		
PELICAN RIVER WATERSHED DISTRICT		
POMME DE TERRE WATERSHED	MATT	SOLSMASS
CHIPPEWA RIVER WATERSHED PROJECT	KYLENE	OLSON
OTTERTAIL COUNTY COLA	BOB	DEUTCHMAN
OTTER TAIL DU		
MWA WINDY LAKE CHAPTER	DOUG	HARTHUN
PELICAN RIVER PF	PATTY	FRADET
OTTERTAIL PF	MATT	KING
MINNESOTA DEPARTMENT OF AG	BECKY	BALK
MN ENVIRONMENTAL QUALITY BOARD	JOHN	WELLS
MN DEPT OF HEALTH	ART	PERSONS
MN DNR	MIKE	CARROLL
MN MPCA - WATERSHED SECTION	DAVID L.	JOHNSON
MN BWSR	RON	SHELITO
OTTER TAIL COUNTY SOLID WASTE		
OTTER TAIL COUNTY COORDINATORS OFFICE	LARRY	KROHN
OTTER TAIL COUNTY PUBLIC HEALTH		
WADENA COUNTY BOARD OF COMMISSIONERS		
WILKEN COUNTY BOARD OF COMMISSIONERS		
TODD COUNTY BOARD OF COMMISSIONERS		
BECKER COUNTY BOARD OF COMMISSIONERS		
NRCS	BRUCE	BECKER
BWSR	PETE	WALLER
	VIC	PETTERSON
	DAVID	HOLT
	LENNY	HOLMER
MPCA	JACK	FREDRICK
OTC LAND AND RESOURCES	BILL	KALAR
EOT SWCD	DARREN	NEWVILLE
OTC ATTORNEY	DAVID	HAUSER
US F&WS	KEVIN	BRENNAN
OTTERTAIL COLA	CAROL	HERRON
U OF M EXTENSION	KAREN	TERRY
FSA	LEON	JOHNSON
OTTERTAIL COUNTY COMMISSIONER	DENNS	MOSHER
MINNESOTA DNR	TERRY	LETJCHER
NRCS	JEFF	LEPP
WOT SWCD	RICHARD	VIGOR
OTTER TAIL COLA	JOHN	MATTESON
EOT SWCD	GARY	CRUFF
FARMERS UNION	DAVE	JOHNSON

OTC LWMP Mailing list		
ORGANIZATION	FIRST	LAST
FARM BUREAU	BRUCE	BRENDEN
OTC PLANNING COMMISSION	LES	ESTES
WOT SWCD	BRAD	MERGENS
Alice Lake Assoc.		
Berger Lake Assoc		
Big McDonald Lake Assoc.		
Big Pine Lake Assoc	Sylvia	Soeth
Blanch Lake Assoc.		
Bodeigheimer Lake Assoc.		
Buchanan Lake Assoc.		
Clitherall Lake Assoc.		
Crane Lake Assoc.	Dale	Nelson
Crystall Lake Assoc.	Bob	Engelstad
Dead Lake Assoc.		
Deer Lake Assoc.		
Devils Lake Assoc.		
Eagle Lake Lakeshore Assoc		
East Battle Lake Assoc.		
East Lost Lake Assoc		
Elbow Lake Assoc.		
Franklin Lake Assoc.		
Graham Lake Assoc.		
Hoffman Lake Assoc		
Jewett Lake Assoc.		
Lake Lida Property Owners Assoc		
Lake Seven (Scalp) Lake Assoc.		
Lake Six Assoc.		
Leaf Lake Area Assoc.		
Little McDonald Group of Lakes L.I.D.		
Little Pine Lake Assoc.		
Lizzie Lake Assoc.		
Long Lake Assoc		
Long Lake Assoc		
Long Lake Assoc	Ronald	Hardyman
Loon Lake Assoc.		
Marion Lake Assoc.		
McDonald Lake Assoc.		
Olaf Lake Assoc.	Joe	Maske
Otter Tail Property Owners Assoc.		
Paul Lake Assoc.	Patty	Nelson
Pelican Group of Lakes L.I.D.		
Pickerel Lake Assoc.		
PKLM Lake Improvement District	Fred	Bauck
Prairie Lake Assoc		
Round Lake Assoc.	Dr. Gerald	Kavanaugh

OTC LWMP Mailing list		
ORGANIZATION	FIRST	LAST
Rush Lake Assoc.		
Silent Lakes Assoc	Dennis	Johnson
Silver Lake Assoc.		
Spirit Lake Assoc		
St Olaf Long Lake Assoc.		
Stalker Lake Assoc.		
Star Lake Assoc.		
Stuart Lake Assoc.		
Swan Lake Assoc		
Sybil Lake Assoc.		
Tamarac Lake Assoc.		
Ten Mile Lake Assoc.		
Trowbride-Leek Lake Assoc.		
Walker Lake Assoc.		
Wall Lake Assoc.		
West Battle Lake Lakeshore Assoc.		
West McDonald Lake Assoc.		
Wymer Lake Assoc.	Marvin	Anderson

Survey Results

Which Watershed is your home/land located in?

Major Basin: Red River of the North Basin:

Otter Tail River	14
Red River of the North	3
Buffalo River	1
Bois de Sioux River	0
Mustinka River	0

Major Basin: Minnesota River Basin:

Pomme de Terre River	4
Chippewa River	1

Major Basin: Upper Mississippi River Basin:

Redeye River	3
Long Prairie River	1

What are the top four problems in Otter Tail County?

Development Pressures / Impacts on sensitive areas and/or Ag preservation lands	17
Groundwater Contamination	13
Failing Septic Systems	9
Declining Water Clarity	9
Erosion	9
Stormwater / Drainage Management	9
Lack of Environmental Education	8
Contaminated Runoff	8
Over-application of Fertilizers	7
Natural Habitat Destruction	5
Lack of Regulations	5
Other: Feedlots / Manure Management	1
Other: Potential Loss of CRP Acres	1
Other: Invasive Species	1
Other: Too Much Government Regulations	1

Which resource is the most threatened? (Average of rankings from 1-5, with 1 being the most threatened)

Groundwater	1.7
Lakes	1.8
Streams / Rivers	2.9
Wetlands	3.0
Other: Grassland	
Other: Soil contamination from agriculture	

Additional Comments / Suggestions:

“Irrigation with pesticides and fertilizers has a negative impact on ground water, especially when combined with high water tables and sandy soil.”

“Manure should not be applied in the winter and should be injected or tilled upon application.”

“Massive people pressure”

“The last few winters with low snow cover we spread manure all winter if we get heavy snow on the spring we are guaranteed a heavy phosphorus runoff in to our lakes and streams.”

“Development of habitat corridors in western Otter Tail County between the Pelican River and priority landscapes for grassland and wetlands in Clay, Wilkin and SW Otter Tail Counties.”

“Leaf Lake Township will bring a land use zoning question to its residents in March 2008. It may include water usage and or contamination.”

Request for “consideration of a ditch between Berger Lake and the 3 lakes that are sometimes affected by high water, Kerbs, Little Mac and Paul Lake...”

Otter Tail County Local Water Management Plan Public Information Sessions Input

January 27, 2008 at Fergus Falls: Present: Kevin Brennan, Bruce Brenden, Richard B. Vigor, Bill Kalar, Jack Frederick, Mike Nelson, Jeff Lepp, Dan Johnson, Jennifer Smestad, Brad Mergens and Marilyn Bayerl.

Development Pressure / Impacts on Sensitive Areas and/or Agriculture Preservation Lands:

- DNR should re-classify lakes in Otter Tail County.
- Multi-class levels on lakes, such as bays more sensitive than main lake.
- Surface water regulations should be placed on sensitive lakes.
- Set a deadline for county-wide zoning.
- Continue Ag Advisory group and Shoreland Ordinance group. County board should support the findings of these groups.

Declining Water Clarity:

- Set up River Watch Program for Otter Tail County to monitor more rivers.
- Support a lake monitoring position to increase the number of lakes in the county with baseline monitoring.
- Set up a program for invasive species training and education.
- Add protective measures for shallow, marsh-like lakes.
- Work with the MPCA on the impaired waters of the county to create TMDLs.
- Check existing monitoring through OTC COLA monitoring program for trends in water quality (specifically declines).
- Update the water clarity vs. property value map for new plan to see changes.
- Include impaired waters map in plan.

Nutrient and Sediment Runoff (this group chose to combine the headings of Erosion, Over Application of Fertilizer, and Contaminated Runoff into the above category):

- See declining water clarity above.

Stormwater Drainage / Management:

- Address on both rural cities and agricultural areas.

February 5, 2008 at Ottertail: Present: Sandy and Gary Cruft, Steven Inwards, Pete Waller, Eric Peters, Dave Hanson, Ray Morunts, Lee Sherman, Dale Rustes, Bruce Spanswick, Don Lohring, Jim Swanson, Darren Newville, Bill Kalar, Marilyn Bayerl.

Failing Septic Systems:

- On lakes, people are polluting themselves.
- Public health issues.
- Negative impact on our lakes and rivers.
- We need better programs of systems inspections.
- Education.
- More sewer management districts like around Otter Tail Lake.
- Need constant management.

Development Pressure / Impacts on Sensitive Areas and/or Agriculture Preservation Lands:

- Otter Tail County is developing without doing research on the impact.
- Need full impact consideration with development.
- Seeing re-development of existing sub-standard lots.
- Too many failing septic systems.
- Need county-wide zoning.

Declining Water Clarity:

- Our lakes are over-developed.
- The lakes are a resource.
- Failing septic systems cause this.

Stormwater:

- Need Best Management Practices – shoreland specialist should work with the people on this.
- Need to address irrigation and chemigation over small pot holes in fields – we are allowing them to be contaminated.
- Too much contaminated runoff from over-application of fertilizers and pesticides.
- Runoff during development.
- Runoff –road salt, need to support new technology.
- Address airplane drift of fungicides, insecticides, herbicides.
- CRP land coming out is an issue for runoff.

Groundwater Contamination:

- Groundwater is our greatest resource.
- We need to regulate fertilizer application.
- It is both a quantity and quality issue.
- Need to support Wellhead Protection programs and groundwater recharge areas.

Otter Tail County Local Water Management Plan Government Units and State Agencies – Summary of Concerns

US Fish and Wildlife Service

Priority Concern 1: Wetland Loss

Priority Concern 2: Development around larger wetlands / smaller lakes.

Board of Water and Soil Resources

Priority Concern 1: Lake Water Quality

Priority Concern 2: Ground Water Quality

Priority Concern 3: Natural Habitat

Minnesota Pollution Control Agency – Detroit Lakes

Priority Concern 1: The establishment of county-wide zoning

Priority Concern 2: Establishment of Ottetail River Watershed District

Priority Concern 3: Lake and River water quality

Minnesota Pollution Control Agency – St. Paul

Priority Concern 1: Impaired Waters – TMDL

Priority Concern 2: Environmental Data Access System

Priority Concern 3: Adoption of a Comprehensive County Wide Land Use Planning and Zoning Ordinance.

Priority Concern 4: Increased Surface Water Monitoring within the County.

Minnesota Department of Health

Priority Concern 1: Protect ground water-based drinking water sources within Otter Tail County and a surface water intake for the City of Fergus Falls through source water protection.

Priority Concern 2: Sealing unused, unsealed wells.

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

Minnesota Department of Natural Resources

Priority Concern 1: Development Pressures/impacts on sensitive areas

Priority Concern 2: Contaminated runoffs and failing septic systems

Priority Concern 3: Natural habitat destruction

Chippewa River Watershed Project

Priority Concern 1: Reducing priority pollutants

Priority Concern 2: Water/Drainage Management

Priority Concern 3: Flooding

Priority Concern 4: Education and Outreach

Priority Concern 5: Storm Water Management

Buffalo – Red River Watershed District

Priority Concern 1: Flood Damage Reduction

Priority Concern 2: Water Quality

Priority Concern 3: Erosion and Sediment Control

Otter Tail County Public Health

Priority Concern 1: Contamination of Groundwater

Todd County Soil and Water Conservation District

Priority Concern 1: Protect and preserve groundwater quality and quantity

Priority Concern 2: Protect and preserve surface water quantity and quality

Priority Concern 3: Promote and encourage land uses that lessen the impacts on water resources in the county.

East Otter Tail Soil and Water Conservation District

Priority Concern 1: Water quality improvement

Priority Concern 2: Protection of our groundwater from pollution

Priority Concern 3: Livestock Manure management

West Otter Tail Soil and Water Conservation District (1)

Priority Concern 1: Development Pressure on sensitive areas

Priority Concern 2: Natural habitat destruction

Priority Concern 3: Erosion

West Otter Tail Soil and Water Conservation District (2)

Priority Concern 1: Development pressure

Priority Concern 2: Water Clarity

Priority Concern 3: Erosion

Otter Tail County Coalition of Lake Associations

Priority Concern 1: Clean Water

Priority Concern 2: Zoning

Priority Concern 3: Aquatic Invasive Species

Swan Lake Association

Priority Concern 1: Failing Septic System

Sybil Lake Association

Priority Concern 1: Water quality improvement

Priority Concern 2: Protection of ground water

Priority Concern 3: Livestock manure management

Elbow Lake Shore Line Property Owners

Priority Concern 1: Overcrowding – over development

Franklin Lake Association

Priority Concern 1: Update Septic Systems

Priority Concern 2: Water Clarity

Priority Concern 3: Education

Boedigheimer Lake Association

Priority Concern 1: Groundwater

Priority Concern 2: Lakes

Priority Concern 3: Streams and Rivers

City of New York Mills

Priority Concern 1: Development Pressures

Priority Concern 2: Groundwater Contamination

Priority Concern 3: Erosion / Runoff and Wind blown

Everts Township

Priority Concern 1: Contaminated Runoff / Stormwater Management

Priority Concern 2: Development Pressure

Priority Concern 3: Education

Amor Township

Priority Concern 1: Excess fertilizer and pesticide used around lakes

Priority Concern 2: Sewage system update

Priority Concern 3: Buffer zones

Perham Township

Priority Concern 1: Stabilize Irrigation Water

Corliss Township

Priority Concern 1: Over fertilizing on lawns and golf courses

Oscar Township (1)

Priority Concern 1: Development Pressure

Priority Concern 2 Erosion

Oscar Township (2)

Priority Concern 1: Lakes – Over development

Priority Concern 2: Wetland loss

Dora Township

Priority Concern 1: Ground Water

Priority Concern 2: High influx of new people



Appendix B

References and Websites

References

Lake Assessments: www.eotswcd.org

Limnology 2nd Ed. Saunders College Publishing. Wetzel, R.G. 1983. 753pp.

Minnesota Red River Basin Water Quality Plan, Minnesota Pollution Control Agency, St. Paul, MN. 1999.

Upper Mississippi River Basin Water Quality Plan Headwaters to the Rum River at Anoka. Minnesota Pollution Control Agency, St. Paul, MN 2004.

Citizen Lake Monitoring Program: <http://www.pca.state.mn.us/water/volunteer-monitoring.html>.

Geologic History and Geomorphology: <http://www.co.otter-tail.mn.us/gis/soilsurvey7geologic.asp>

Lake Water Quality Assessment Reports (LAP): <http://www.pca.state.mn.us/water/lakereport.html>.

Lake Water Quality, OHWL and Fisheries Data: <http://www.dnr.state.mn.us/lakefind/index.html>.

Minnesota River Basin Information: <http://www.pca.state.mn.us/water/basins/mnrriver/index.html>

Minnesota State Census Bureau: <http://server.admin.state.mn.us/resource/html?Id=7376>

Otter Tail County Nitrate-Nitrogen Probability Map, Minnesota Department of Health, St. Paul, MN., <http://www.health.state.mn.us/divs/eh/water/swp/nitratemaps.html>.

Precipitation information: <http://www.climate.umn.edu>

Regional Hydrogeologic Assessment Maps:
http://www.dnr.state.mn.us/waters/groundwater_section/mapping/status/html.

Shoreland Regulations: <http://www.co.otter-tail.mn.us/land/shorlandmanagement.php>.

Soils Survey: <http://websoilsurvey.nrcs.usda.gov>

Sourcewater / Wellhead Protection: <http://www.health.state.mn.us/divs/eh/water/swp/swa/index.htm>

Stormwater Management: <http://www.pca.state.mn.us/water/stormwater/stormwater-c.html#links>

Stream Testing Program Data, Minnesota State University, Moorhead:
<http://www.mnstate.edu/regsci/water/index/html>.

Total Maximum Daily Load Studies: <http://www.pca.state.mn.us/water/tmdl/index.html>

United States Department of Agriculture, National Agricultural Statistics Service,
<http://www.nass.usda.gov/CensusofAiculture>

Wetlands Conservation Act: <http://www.bwsr.state.mn.us/directories/WCA.pdf>

Appendix C

Additional Plans

Additional Plans

Douglas County Comprehensive Water Plan -

http://www.co.douglas.mn.us/Uploads/Public/Documents/LRM/PDFs/FinalWaterPlan_020909.pdf
http://www.douglasswcd.com/faq/FinalPlan_020909.pdf

Becker County Local Water Management Plan –

http://www.co.becker.mn.us/dept/soil_water/PDFs/LWMP.pdf

Becker County Local Water Management Plan Implementation Scheduled –

http://www.co.becker.mn.us/dept/soil_water/PDFs/WaterPlanImplementationSchedule.pdf

Becker County Local Water Management Plan Summary of Accomplishments

http://www.co.becker.mn.us/dept/soil_water/PDFs/WaterPlanAccomplishments.pdf

Pelican River Watershed District Revised Management Plan –

<http://www.prwd.org/files/PRWD%20-%20RMP.pdf>

Buffalo-Red River Watershed District –

<http://www.brrwd.org/revised-watershed-management-plan-update/>

Pomme de Terre River Major Watershed Restoration and Protection Strategies – PDF available on request

Todd County 2030 Comprehensive Plan –

<http://www.co.todd.mn.us/sites/default/files/users/ToddCounty2030ComprehensivePlan.pdf>

Todd County Comprehensive Local Water Management Plan –

http://www.co.todd.mn.us/sites/default/files/soil_water/Publications/Misc/2010%20Water%20Plan.pdf

Wilkin County Water Plan – hard copy available on request

Otter Tail County Shoreland Management Ordinance –

<http://www.co.otter-tail.mn.us/land/shoreland/default.php>

Otter Tail County Shoreland Guide to Lake Stewardship –

<http://www.co.otter-tail.mn.us/land/shoreland/shorelandguide.php>

Minnesota Prairie Conservation Plan –

<http://www.dnr.state.mn.us/prairieplan/index.html>

Appendix D

Amendment Documents

Amendment Feedback from LGUs

Minnesota Department of Agriculture

The Minnesota Department of Agriculture (MDA) has developed the Water Plan website below to discuss and illustrate MDA priority concerns and recommended courses of action for local county water plans. So, instead of a lengthy letter of recommendations and priority concerns, please go to the website for MDAs information and guidance. Please also share this email with other relevant Ottertail County staff and partners. Once you and other partners have a chance to review the website, please let me know what your thoughts are on the website. Your feedback will be helpful and is useful as the MDA further refines its recommendations and priority concerns in the future.

MDA Water Plan Assistance Website:

<https://www.mda.state.mn.us/protecting/waterprotection/waterplanning.aspx>

A map is forthcoming (PDF and JPEG) of Ottertail County that relates to the Groundwater/Surface Water priority concern and the map intent is discussed at that section of the MDA water plan website above. Also, one other item of interest that is not highlighted in the weblink above is the issue of water conservation in all sectors of the local economy. There is discussion about irrigation management at the weblink but the MDA recommends additional consideration given towards other non-agricultural areas that can reduce/conservate water usage.

Drainage Comments - Above and Beyond Recommendations at the MDA Water Planning Website:

A. Regarding drainage, the MDA recommends that Ottertail County consider developing a comprehensive drainage management plan to guide public drainage activities within the County. An example is the Martin County plan that was just released February 2014 and here is the weblink to that plan:

<http://www.co.martin.mn.us/index.php/government/ditch-administration>

B. As you know, the management of public drainage systems is complex and involves consideration of how public open ditches, tiles and culverts interact or are affected by private systems – both subsurface tile and open ditches with private culverts. Therefore, the MDA recommends that Ottertail County create a permanent drainage management or advisory team to further discuss important drainage issues before policy decisions are made by the Ottertail County Commissioners.

C. The MDA recommends that Ottertail County conduct a system-wide culvert inventory if one is not available or complete. This will provide much needed information about the location, capacity and condition of culverts that are part of the public drainage system. Once conducted, Ottertail County may want to consider how culvert sizing can be utilized to address localized flooding conditions. The MDA is referring Ottertail County to a technical paper that was

developed by the Technical and Scientific Advisory Committee of the Red River Watershed Management Board titled, "Culvert Sizing for Flood Damage Reduction" and the report can be found at the following website:

<http://www.rrwmb.org/files/FDRW/TP15.pdf>

D. The MDA recommends developing an inventory (if one does not exist) of open tile inlets that are immediately adjacent to public ditches. An inventory will provide information about where inlets could be converted into blind inlets, rock inlets or some other type of inlet to reduce sediments and to slow water flow. The inventory could also provide information about where side inlet controls would be beneficial. Your SWCD may already have knowledge of areas that are in need of open tile inlet conversion or side inlet controls.

The MDA realizes that Ottertail County is not completing an entire re-write at this time and that not all comments can or may be incorporated into the updated plan. The MDA also realizes that staff and financial resources may not always be available to implement all recommendations. On another note, you may want to update the 2008 Cropland Data Layer Map in the current plan (Figure 8). Thank you and please contact me with any comments or questions.

BWSR

Please consider this the BWSR input to the Otter Tail County LWP Amendment.

Prioritize, Target & Measurable Outcomes (PTM)

See the attached PDF image entitled 'March 2014 BWSR CWF Outcomes'. This is a single slide from a BWSR presentation given at a recent Minnesota House Environment, Natural Resources, and Ag Finance Committee "Outcomes" hearing. It's pie chart illustrates the weighted Selection Criteria used for the FY14 CWF Projects & Practices funds. 80% of the criteria is related to Targeting, Measurable Results & Plan Connection. I share this as a means to emphasize the importance of PTM and its relationship to the local plan.

As the Amendment is developed keep PTM as the framework the document is crafted under. Otter Tail County is blessed with abundant water resources, >1,000 lakes and 1,174 miles of river. A means of PTM should be either documented in the Amendment or included as an Objective with a specific action item. Examples to potentially utilize are:

- ☐ The International Water Institute's Water Quality Decision Support Application (WQDSA). Link: <http://www.rrbdin.org/wqdsa-welcome> Could be reviewed as a potential means to Prioritize and Target the where, what, when, by whom and measure the outcomes.
- ☐ As stated in the Crow Wing County Plan, "Because of this sheer quantity, sorting these resources and prioritizing implementation strategies as well as funding are some of the biggest water planning challenges." The plan should either have or develop a "decision-tree" means that assesses all the watersheds (minors, majors to be determined) in the County to determine which watersheds are already on good condition, which could use

more protection and which would likely need restoration strategies. Crow Wing County's LWP has a section entitled "Implementation: Watershed Classification & Prioritization". Link: <http://crowwing.us/DocumentCenter/View/4695>

BWSR staff are very willing to meet with LGU staff to discuss further as prudent with the Amendment timeframe and whether its developed to be put into the Amendment or an Objective/Action to be developed as part of the Amendment Implementation.

WRAPS are another such tool, as best you can for each of the WRAPS going on (or planned to occur during the next 5 year period) please be involved in crafting the Implementation Plans with PTM as the framework. Please remember that within MN, LGUs are the primary 'doers' of the on the ground implementation, what's really happening out there on the ground and what's 'sound' implementation actions to either protect or improve the water quality within Otter Tail County. For Implementation Plans of TMDLs and WRAPS reflect what's within your 'wheel-house'?

Review the Clean Water Fund applications that have been submitted but not approved for funding. What projects from those applications are still priorities that the county LGUs want to target their efforts to achieve measurable outcomes. How can the LWP Amendment be drafted to Prioritize, Target those projects and have measurable results?

Consider reviewing the Pope LWP (<http://www.co.pope.mn.us/pdf/2013-2023%20Pope%20County%20Water%20Plan.pdf>) for examples of measurable action items. Please avoid like the plague words such as "reduce", "educate", "promote" etc, generalities that are not measurable.

The lake screening reports are no-brainers to be included in the Amendment as priorities. Going from >1,000 lakes to ~ 60 could be defined as priorities. The water quality trends for each lake further help target action items.

The County's Buffer initiative definitely has to be included. Maybe the "Implementation plan 4.0 Draft" file will help the creative thought process and you could modify it to put some PTM "meat" into the County's Buffer initiative?

What's the anticipated efforts of the County with its legal drainage systems? Consider reviewing the FY14 Soil Erosion & Drainage Law Compliance Program RFP, attached. Are any of those Subprogram 2 - Drainage Ditch Inventory & Inspection activities or Subprogram 3 – Redetermination of Benefits and Drainage Ditch Buffer Strips activities of interest for the resource management of the County's 103E systems? Again this should be crafted with PTM as the framework.

There's a significant groundwater sensitivity area within the County. How can that be further prioritized? What's to be or where's the target area? Measurable actions items (convert "fill in

the blank with a number” irrigation systems to low pressure, or continue “fill in the blank with a number” of irrigators in the irrigation scheduler program and increase the participation in the irrigation scheduler by “fill in the blank with a number”).

Continued implementation of on-going programs (SSTS, Shoreland, WCA) should be woven into the amendment. Again Pope’s LWMP is a good example for this.

Thanks for the opportunity to be part of the resource management in Otter Tail County and the work you've achieved in the 1st five years of the LWMP.

Douglas Soil & Water Conservation District

You can find a copy of the Douglas County LWMP at either of http://www.co.douglas.mn.us/Uploads/Public/Documents/LRM/PDFs/FinalWaterPlan_020909.pdf
http://www.douglasswcd.com/faq/FinalPlan_020909.pdf

My comments are to attach the Lake Assessments as an Appendix and ensure you account for all the innovative stuff you are already implementing.

Becker County SWCD

Good bad, expiring or whatever, here’s what I’ve got for you.

http://www.co.becker.mn.us/dept/soil_water/PDFs/LWMP.pdf

[http://www.co.becker.mn.us/dept/soil_water/PDFs/Water Plan Implementation Schedule.pdf](http://www.co.becker.mn.us/dept/soil_water/PDFs/Water_Plan_Implementation_Schedule.pdf)

[http://www.co.becker.mn.us/dept/soil_water/PDFs/Water Plan Accomplishments.pdf](http://www.co.becker.mn.us/dept/soil_water/PDFs/Water_Plan_Accomplishments.pdf)

Pelican River Watershed District

From your February 21, 2014 letter, it appears there will be no major changes to the overall water management concerns, only to the introductory sections and plan implementation schedule (2015 – 2019 – 5 years).

Currently the District is updating its 10 year plan (2015- 2024). We are kicking off the public process within the next month and staff has started to work on a proposed outline for the update.

What is your timeline for completing the Ottetail update? I was on [the www.eotswcd.org](http://www.eotswcd.org) & www.wotswcd.org websites and I am having trouble locating the water management plans. Can you email me the direct links?

Here is our current plan website link: <http://www.prwd.org/files/PRWD%20-%20RMP.pdf>

Our website is undergoing a major revamp and will be on-line in mid-April. We are keeping our current website up (barebones at this time). Here is a link to our current plan however, the link will change shortly.

I am out of town the rest of the week for legislative work in St. Paul, but I may send further comments after reading your plans. Thank you for the opportunity to comment and participate in your plan development.

Buffalo-Red River Watershed District

In response to your letter dated 02/21/14 regarding the above, the Revised Watershed Management Plan (RWMP) for the Buffalo-Red River Watershed District (BRRWD) can be found at our website at www.brrwd.org, just look under Resources. As you know, parts of Scrambler, Pelican, Norwegian Grove, and Trondhjem Township have been a part of the BRRWD since 1976, when the District was enlarged. On 04/25/12, the Minnesota Board of Water and Soil Resources (BWSR) added an additional area to the BRRWD in Wilkin and Otter Tail Counties. The additional Townships include: Oscar, Carlisle, Orwell, Western, and Fergus Falls. By separate e-mail, I'll forward the maps, delineating the new eastern boundary. At the time, BWSR gave us two years to include the new area in our RWMP. Well, that didn't happen, and we intend to start the planning process for this new area, in the next month or so. That timing may tie in quite nicely, with your update. We'll continue to keep you posted in that regard.

The other thing we are considering is BWSR's One Watershed, One Plan (1W1P). The nomination deadline is 04/21/14. Wilkin County has already expressed interest in participating in the 1W1P. So, will keep you posted in that regard, also.

Pomme de Terre

I have attached the Pomme de Terre Major Watershed Plan. This plan was written to target priority management sites within the watershed. The pages that pertain to Otter Tail County: Pages 7-10 deal with the Upper Pomme de Terre sub-watershed and pages 11-13 deal with the Pelican Creek sub-watershed. The priority areas listed in this management plan are categorized by buffers, wetlands, severe erosion sites, shoreline stabilization, SSTS enforcement, and Ag BMP Activities.

If you have any questions please don't hesitate to contact me. My contact information listed below.

Todd County SWCD

Here is Todd County's current Comprehensive Plan:

<http://www.co.todd.mn.us/sites/default/files/users/ToddCounty2030ComprehensivePlan.pdf>

Here is the Todd County Local Water Plan (this plan will begin being update in June of this year):
http://www.co.todd.mn.us/sites/default/files/soil_water/Publications/Misc/2010%20Water%20Plan.pdf

Wilkin County Environmental Officer

In regards to your letter dated 2/21/2014

Wilkin County is in the process of moving towards a 1w1p and has been granted an extension from BWSR on our 5 year update until 2018 which will correspond with plan updates from both the Buffalo Red and Bois de Sioux watershed districts

MN DNR

RE: Otter Tail Local Water Management Plan Priority Concerns
and Update Department of Natural Resources (DNR)
Comments

Mr. Newville,

Thank you for the opportunity to review the Otter Tail Local Water Management Plan (the Plan). We have completed our review of the Plan and offer the following comments.

Section I. Executive Summary

Item A. Background

Recent changes in landuse and cover types should be updated in this section (section currently indicates that in the past 20 years cultivated land has decreased and grassland have increased). In providing the update, indicate changes in irrigated cropland, agricultural pattern tiling, and changes in grassland coverage as all of these changes are potentially significant. Table A. should also be updated. In doing so, we recommend retaining columns for 2008 to show coverage variability over time.

Consider mentioning concerns over Aquatic Invasive Species (AIS) in the executive summary and including objectives specific to AIS later in the document.

Item D. Consistency of plan with other pertinent local, state, and regional plans:

Recommend that the following document be included in this section:

- The [Lower Otter Tail River TMDL Implementation Plan dated February 14, 2007](#) – This plan includes watershed areas from Orwell Dam in Otter Tail County downstream to the confluence with the Bois De Sioux River.
- The *Mustinka River TMDL Implementation Plan* dated November 2010 – This plan identifies implementation strategies for the Mustinka River Watershed in Otter Tail County.
- Groundwater Strategic Plan - The Department of Natural Resources has recently developed a Groundwater Strategic Plan <http://files.dnr.state.mn.us/waters/gwmp/gwsp-draftplan.pdf> that could be used to support water plan objectives.
- It should be mentioned in the Plan that Watershed Restoration and Protection Strategies (WRAPS) are being developed for the Redeye, Mustinka and Rabbit

River Watersheds as impairments have been identified in these watersheds. The Stream Monitoring and Assessment Reports have been completed for the Mustinka, Bois De Sioux (includes the Rabbit River) and the Redeye River. The Plan should list any new impairments identified and provide links to these reports as they become available on the Minnesota Pollution

Control Agency's website. Contact the DNR area hydrologist Julie Aadland at 218-739-7576 ext. 243 for current information on these WRAPS.

- [Minnesota Prairie Conservation Plan](#) – This plan identifies conservation approaches (e.g. protection of remnant prairie, grassland, and wetland habitats) for the states prairie region that when implemented can result in water quality improvements.

Section II B Goals, Objectives and Actions addressing Priority Concerns

Surface Water Priority Issues

Item 1. TMDL Allocations - Recommend including language that supports work on WRAPs in the County. This discussion should include the Mustinka, Rabbit and Redeye River.

Item 2. Lake Association Support - In the interests of being more inclusive, we recommend adding Lake Improvement District support.

Item 3. Stormwater/Drainage Management - Recommend including an action item to support the retention of existing wetlands on the landscape.

Potential Additional items

Streams Connectivity – Recommend including an item which shows support for all efforts that promote increased connectivity. Loss of stream connectivity will be identified through the TMDL stressor identification process as the cause of stream biological impairments at some locations. Having better connectivity in streams is beneficial to fish populations, water quality, riparian habitats, etc. Identifying the need for assessing and correcting connectivity issues in the Plan will both prioritize the need for increased connectivity as well as increase recognition of connectivity projects. Projects with broader recognition are more likely to received grant funds and overall support.

AIS Concerns – Since the discovery of zebra mussels in Pelican Lake in 2009 inclusion of action items specific to AIS as priority concerns would seem appropriate.

Groundwater Priority Issues

Item 1. Preservation of Aquifer Volume – Recommended inclusion of a priority item demonstrating support for DNRs Groundwater Strategic Plan.

Appendix A

Consider new survey efforts as part of future Plans. It is likely that the Survey Results listing the top four problems in Otter Tail County (page 11 in Appendix C) would be different. The current 2008 list has invasive species ranked at the bottom. Since the discovery of zebra mussels in Pelican Lake in 2009, an updated survey could have different results. Additionally, Lake Associations list concerns over aquatic invasive species as priory concerns.

General Comments

Otter Tail County is unique in that several ecological provinces and subsection intersect the county boundaries. In order to better place future discussions about specific fish, wildlife and natural resources in a landscape context, DNR recommends that the future updated plan describe the ecological setting/landscape of the County down to the Sub-section level (e.g., Red River Prairie, Hardwood Hill, Minnesota River Prairie, and Pine Moraines and Outwash Plain) using the Ecological Classification System (ECS). An overview of each subsection should then be provided.

The ECS was developed by the MDNR and the U.S. Forest Service and enables resource managers to consider ecological patterns for areas as large as North America or as small as a single timber stand and identify areas with similar management opportunities or constraints relative to that scale. A complete description of the ECS along with links to subsection overviews is available at:

<http://www.dnr.state.mn.us/ecs/index.html>

Key Habitats and SGCN

Consider inclusion of maps and descriptions of both key habitats and species of greatest conservation (SGCN) occurring within the planning area.

Key Habitats

Minnesota's SWAP identifies specific key habitats to be conserved and enhanced in each of Minnesota's 25 ecological subsections (see <http://www.dnr.state.mn.us/ecs/index.html>). It also describes the key habitats relative to the ecological subsection, focusing on the important components of the habitats, both in terms of habitat quality and features important to SGCN.

SGCN

Species in greatest conservation need (SGCN) are defined as native animals whose populations are rare, declining, or vulnerable to decline and are below levels desirable to ensure their long-term health and stability. Every state recently completed a "state wildlife action plan (SWAP)" which identifies conservation needs for species of concern, including threatened and endangered wildlife and other important wildlife species. Minnesota's SWAP titled, "Tomorrow's Habitat for the Wild and Rare" is a strategic plan focused on managing Minnesota's populations of "species in greatest conservation need." In Minnesota, 292 species meet the definition of species in greatest conservation need (SGCN). These species includes mammals, birds, reptiles, amphibians, fishes, insects, and mollusks, and represents about one-quarter of the nearly 1,200 animal species in Minnesota that were assessed for this project.

Thank you for the opportunity to comment on priority concerns as part of the Otter Tail Local Water Management Plan update proceeds. DNR will continue to bring forward these important issues through participation in Plan advisory committees.

Sincerely,



Nathan Kestner
NW Regional Environmental Assessment Ecologist Division of
Ecological and Water Resources

ORGANIZATION	FIRST	LAST
AASTAD TOWNSHIP	GARY	LIEN
AMOR TOWNSHIP	BRENDA	HILDERBRAND
AURDAL TOWNSHIP	SANDRA	KVERN
BLOWERS TOWNSHIP	EDITH	HUTTUNEEN
BLUFFTON TOWNSHIP	BECKIE	VORDERBRUGGEN
BUSE TOWNSHIP	JOYCE	SCHMIDT
BUTLER TOWNSHIP	BONNIE	HINTZMAN
CANDOR TOWNSHIP	SHARON	SAUER
CARLISLE TOWNSHIP	CHARLES	PIEKARSKI
CLITHERALL TOWNSHIP	JANET	EITZEN
COMPTON TOWNSHIP	LARRY	RICHTER
CORLISS TOWNSHIP	TREVA	MAYFIELD
DANE PRAIRIE TOWNSHIP	BONNIE	MARK
DEAD LAKE TOWNSHIP	CHERYL	HARRIS
DEER CREEK TOWNSHIP	KATHY	TECHAM
DORA TOWNSHIP	GREGORY	MEYER
DUNN TOWNSHIP	FAYE	ENGKJER
EAGLE LAKE TOWNSHIP	MARY	CULLEN
EASTERN TOWNSHIP	ROBERT	LAHMANN
EDNA TOWNSHIP	CAROL	NELSON
EFFINGTON TOWNSHIP	ROGER	RUCKHEIM
ELIZABETH TOWNSHIP	EDWIN	CARLSON
ELMO TOWNSHIP	DUANE	HANSON
ERHADS GROVE TOWNSHIP	LEE	BACKSTROM
EVERTS TOWNSHIP	MARLYN	KRUSCHKE
FERGUS FALLS TOWNSHIP	ELAINE	SCHOENING
FOLDEN TOWNSHIP	JENNIFER	HOWARD
FRIBERG TOWNSHIP	DUANE	MAVIS
GIRARD TOWNSHIP	JAMES	TRITES
GORMAN TOWNSHIP	TERRY	JELLISON
HENNING TOWNSHIP	ALAN	HAUGDAHL
HOBART TOWNSHIP	TERRY	HOCKERT
HOMESTEAD TOWNSHIP	DUWAYNE	ROBERTS
INMAN TOWNSHIP	KEVIN	ANDERSON
LEAF LAKE TOWNSHIP	JAMES	KEDKITALO
LEAF MOUNTAIN TOWNSHIP	AURTHOR	DORN
LIDA TOWNSHIP	DENISE	BOE
MAINE TOWNSHIP	JOANNE	SEEGER
MAPLEWOOD TOWNSHIP	CRAIG	RIPLEY
NEWTON TOWNSHIP	CHRISTOPHER	ROBERTS
NIDAROS TOWNSHIP	RICHARD	TROSDAHL
NORWEGIAN GROVE TOWNSHIP	EARNEST	HOVLAND
OAK VALLEY TOWNSHIP	KAREN	MCBRADY
ORWELL TOWNSHIP	DANIEL	ROEHL
OSCAR TOWNSHIP	DAVID	EMERY

OTTER TAIL TOWNSHIP	DENNIS	MARTIN
OTTO TOWNSHIP	TROY	SALO
PADDOCK TOWNSHIP	WAYNE	ISAACSON
PARKERS PRAIRIE TOWNSHIP	BRUCE	JAHNKE
PELICAN TOWNSHIP	THOMAS	LANGSETH
PERHAM TOWNSHIP	KELVIN	RUDOLPH
PINE LAKE TOWNSHIP	EDWARD	ROBERTS
RUSH LAKE TOWNSHIP	ANDREW	KLINNERT
SCAMBLER TOWNSHIP	ALDIE	KELSVEN
ST. OLAF TOWNSHIP	LINDA	KLIMEK
STAR LAKE TOWNSHIP	KATHLIEN	TORKILDSON
SVERDRUP TOWNSHIP	DANIEL	STENOIEN
TORDENSKJOLD TOWNSHIP	JOHN	SCHAUFF
TRONDHJEM TOWNSHIP	CHARLES	HAUGEN
TUMULI TOWNSHIP	HERBERT	SORBEL
WESTERN TOWNSHIP	LORI	MITTELSTADT
WOODSIDE TOWNSHIP	CAROL	BOEHLAND
ORGANIZATION	FIRST	LAST
CITY OF BATTLE LAKE	CHUCK	REEVE
CITY OF BLUFFTON	DALE	PORTER
CITY OF CLITHERALL	MARY	MURPHY
CITY OF DALTON	JULIE	HENDERSON
CITY OF DEER CREEK	JULIE	BRUNKO
CITY OF DENT	PERRY	COLEMAN
CITY OF ELIZABETH	TOM	WEDLL
CITY OF ERHARD	NEIL	HUNTER
CITY OF FERGUS FALLS	HAL	LELAND
CITY OF HENNING	JIM	HERMANSON
CITY OF NEW YORK MILLS	JULIE	GERBER
CITY OF OTTERTAIL	MIKE	WINDEY
CITY OF PARKERS PRAIRIE	SANDRA	FROEMMING
CITY OF PELICAN RAPIDS	BEN	WOESSNER
CITY OF PERHAM	TIMOTHY	MEEHL
CITY OF RICHVILLE	TERRY	LEE
CITY OF ROTHSAY	CHRIS	BUCKINGHAM
CITY OF UNDERWOOD	PAUL	HOFF
CITY OF URBANK	VERNON	KLIMEK
CITY OF VERGAS	DEAN	HAARSTICK
CITY OF VINING	JAMES	WALLEVAND
CITY OF WADENA	WAYNE	WOLDEN
ORGANIZATION	FIRST	LAST
BECKER COUNTY PLANNING AND ZONING	PATRICIA	SWENSON
WILKEN COUNTY	BRUCE	POPPEL
WADENA COUNTY	DEANA	MALONE
TODD COUNTY ELRM	TIM	STIEBER
DOUGLAS COUNTY BOARD OF COMMISSONERS		
GRANT COUNTY BOARD OF COMMISSIONERS		

CLAY COUNTY BOARD OF COMMISSIONERS		
BECKER SWCD	PETER	MEAD
WILKEN SWCD	DON	BAJUMPAA
WADENA SWCD	DARREN	NEWVILLE
TODD SWCD	SANDY	KATTERHAGEN
DOUGLAS SWCD	JERRY	HAGGENMILLER
GRANT SWCD	JOE	MONTONYE
CLAY SWCD	KEVIN	KASSENBOG
PELICAN RIVER WATERSHED DISTRICT		
CHIPPEWA RIVER WATERSHED PROJECT	JOE	HAUGER
U.S. F.&W.S.		
OTTERTAIL COUNTY COLA		
OTTERTAIL DU		
MWA WINDY LAKE CHAPTER	ROD	MARSH
PELICAN RIVER PF		
OTTERTAIL PF	AARON	LARSEN
MINNESOTA DEPARTMENT OF AG	BECKY	BALK
MN ENVIRONMENTAL QUALITY BOARD	WILL	SEUFFERT
MN DEPT OF HEALTH		
MN DNR	GREG	NELSON
MN MPCA - WATERSHED SECTION	DAVID L.	JOHNSON
MN BWSR	RON	SHELITO
OTTERTAIL COUNTY SOLID WASTE	MIKE	HANAN
OTTERTAIL COUNTY COORDINATORS OFFICE		
OTTERTAIL COUNTY PUBLIC HEALTH	MARY	THORSON
WADENA COUNTY BOARD OF COMMISSIONERS		
WILKEN COUNTY BOARD OF COMMISSIONERS		
TODD COUNTY BOARD OF COMMISSIONERS		
BECKER COUNTY BOARD OF COMMISSIONERS		
MN MPCA- DETROIT LAKES	JIM	COURNEYA
BUFFALO RED RIVER WATERSHED DISTRICT	BRUCE	ALBRIGHT
BOISE DE SIOUX WATERSHED DISTRICT	JON	ROESCHLEIN
POMME DE TERRE WATERSHED	JARED	HOUSE
OTTERTAIL DU	SCOTT	ANDERSON
MWA WINDY LAKE CHAPTER	ROD	MARSH
PELICAN RIVER PF	PATTY	JOHNSON
OTTERTAIL PF	AARON	LARSEN
FERGUS FALLS FISH AND GAME CLUB	MICK	SIEMS
LAKE COUNTRY SPORTSMEN'S CLUB	GARY	HARRINGTON
MINNESOTA WATERFOWL ASSOCIATION - PRAIRIE WETLANDS		
NATIONAL WILD TURKEY FEDERATION - LEAF VALLEY TOMS	BRENT	OST
NATIONAL WILD TURKEY FEDERATION - OTTER TAIL LAKES	JOHN	CARLSON
OTTERTAIL ROD AND GUN CLUB	JOHN	CARLSON
PERHAM SPORTSMEN'S CLUB	CRAIG	SWANSON
MINNESOTA DEER HUNTERS ASSOCIATION - EAST OTTER TAIL	CHAD	VANWATERMULEN

MINNESOTA DEER HUNTERS ASSOCIATION - FERGUS FALLS	MIKE	ROBERTSON
COOTS UNLIMITED	JIM	RYLANDER
ORGANIZATION	FIRST	LAST
NRCS	BRUCE	BECKER
BWSR	PETE	WALLER
	VIC	PETTERSON
	DAVID	HOLT
	LENNY	HOLMER
MPCA	JACK	FREDRICK
OTC LAND AND RESOURCES	BILL	KALAR
EOT SWCD	DARREN	NEWVILLE
OTC ATTORNEY	DAVID	HAUSER
OTTERTAIL COLA	CAROL	HERRON
U OF M EXTENSION	KAREN	TERRY
FSA	LEON	JOHNSON
OTTERTAIL COUNTY COMMISSIONER	DENNIS	MOSHER
MINNESOTA DNR	TERRY	LETJCHER
NRCS	PENNY	DOTY
WOT SWCD	RICHARD	VIGOR
OTTER TAIL COLA	JOHN	MATTESON
EOT SWCD	GARY	CRUFF
FARMERS UNION	DAVE	JOHNSON
FARM BUREAU	BRUCE	BRENDEN
OTC PLANNING COMMISSION	LES	ESTES
WOT SWCD	BRAD	MERGENS

Notice of Amendment

To Whom It May Concern:

The Otter Tail County Board of Commissioners adopted a resolution on January 21st, 2014 requiring the amendment and update of the Otter Tail Local Water Management Plan, as authorized under Minnesota Statutes, Chapter 103B.301, and the Comprehensive Local Water Management Act. . Only the following plan components will be amended: Preface, Executive Summary, and the Implementation Schedule. The overall Otter Tail County Local Water Management Plan remains in effect through August 31, 2019.

The plan will be focused on priority water management concerns. Otter Tail County invites all recipients of this notice to submit water management issues they feel the plan should focus on.

Also, please submit a link or electronic version of any water and related land management plans to the name below so that they can be reviewed to ensure consistency with the County Local Water Management Plan.

Please submit the requested information by March 21st, 2014 or direct inquiries to:

Darren Newville
801 Jenny Ave SW Suite 2
Perham, MN 56573
218-346-4260 ext. 3
Darren.newville@mn.nacdn.net

If you are no longer your agency/organizations representative for the local water management plan, please pass along to the appropriate staff and inform us of that change.

The Otter Tail County Local Water Management Plan can be found on the SWCDs' websites at www.eotswcd.org and www.wotswcd.org. Hard copies are available on a limited basis by contacting Darren Newville at 218-346-4260 ext. 3 or Brad Mergens at 218-739-1308 ext. 114.

Thank you for your continued interest in soil and water conservation.

Sincerely,

Darren Newville
EOT SWCD District Manager

Brad Mergens
WOT SWCD District Manager

Press Release for Public Input Meetings

For Immediate Release

Contact: Brad Mergens – 218-739-1308
Darren Newville – 218-346-4260

Public Input Meeting to be Held on County Local Water Management Plan

Otter Tail County is seeking input from its residents on Priority Concerns for the update of the County's Local Water Management Plan. The purpose of the Local Water Management Plan is to evaluate the quality of our surface and ground water resources and identify the existing and potential hazards to these resources. Once these priority concerns are identified the plan will be amended to address the current problems and to prevent future problems.

The current Local Water Management Plan priority issues include Surface Water Quality and Quantity, Regulatory Issues, and Ground Water Quality and Quantity.

The Local Water Management Plan Committee is currently asking for public input on what the updated plan should focus on for the next five years. Along with requesting input on water management concerns we would also like to get input on what action items are needed to be taken to solve those concerns. Two Informational meetings will be held at the following locations:

April 23, 2014 6pm – 8pm

Otter Tail Power Community Rooms

215 S Cascade St

Fergus Falls, MN 56537

April 24, 2013 6pm – 8pm

Perham City Hall Chambers

125 2nd Ave NE

Perham, MN 56573

If you have any questions about the LWMP please feel free to call the East Otter Tail SWCD office at (218)346-

4260 or West Otter Tail SWCD at (218)739-1308

PUBLIC NOTICE

Special Meeting

Of the

Otter Tail County Commissioners

Water Management Advisory Taskforce

on the adoption of the amended

Otter Tail County Local Water Management Plan

May 13, 2014 at 10:00 A.M.

Otter Tail County Government Service Center
Commissioners Room
520 Fir Ave W.
Fergus Falls, MN 56537

[4/30/14]

by: _____

Brad Mergens, West Otter Tail SWCD District Manager

LWP Advisory Meeting Attendance
April 10th, 2014 9 am
Otter Tail Government Service Center

Bill Kalar – Otter Tail County Land and Resource
Darren Newville – EOT SWCD
Brad Mergens – WOT SWCD
Dave Johnson – WOT Farmers Union
Denny Renolds – EOT SWCD Supervisor
Richard Viger – WOT SWCD Supervisor
John Matteson – COLA
Tara Mercil – MPCA
Roger Heitike – COLA
John Lindquist – OTC Commissioner
Bruce Brenden – WOT Farm Bureau
Julie Aadland – MN DNR Eco Waters
Aaron Larsen – WOT SWCD

Comments

Lakescaping – don't want to overlook streams. Can we add streamscaping also for Otter Tail River and other river properties. – Julie Aadland, DNR

General discussion included aquatic invasive species, irrigation permits, drainage water management, and the Otter Tail County Buffer Initiative.

Miscellaneous typos were identified.

Water Plan Public Input Meetings

Fergus Falls
April 23rd, 6 pm
Otter Tail Power Community Room

Attendees

Jeff Stabnow – Clitherall Lake
Eric Babolian – OTC Land and Resources
David Ford – Sewell Lake
Brad Mergens – WOT SWCD
Aaron Larsen – WOT SWCD

Comments

Discussed lakeshore owner / farmer relationships.

Discussed the Otter Tail County Buffer Initiative, Lake Associations and Aquatic Invasive Species.

Perham
April 24th, 6 pm
Chamber of Commerce

Attendees

Darren Newville – EOT SWCD
Katelyn Haarstick – EOT SWCD
Kyle Westergard – OTC Land and Resource

Comments – NA

Water Plan Advisory Meeting 2/13/14

1. Pete Waller
 - o Talked about the 5 year implementation plan update and Water Plan amendment process. Emphasized the need to Prioritize; Target, and Measure.
 - o Told us what to expect during the amendment process
2. Brad Mergens and Darren Newville (WOT and EOT SWCD)
 - o Talked about what East and West Otter Tail SWCDS have been doing, updated everyone on current activities along with any new activities that have been happening.
3. Land and Resource Activities- Bill
 - o Gave an update on their septic system project
 - o Talked about the Aquatic Invasive Species Task Force that has been assigned to their office.
4. DNR-Julie
 - o DNR has a groundwater hydrologist in their office now.
 - o Discussed Little McDonald Lake and what they can do to lower ground water.
5. Fish and Wildlife Service
 - o Asked the questions about the amount of tiling and ditching that is being done in OTC.
How is it affecting water resources?

**MINUTES OF THE
OTTER TAIL COUNTY BOARD OF COMMISSIONERS
Government Services Center, Commissioners' Room
515 W. Fir Avenue, Fergus Falls, MN May 13, 2014
9:30 a.m.**

Call to Order

The Otter Tail County Board of Commissioners convened at 9:30 a.m. Tuesday, May 13, 2014 at the Government Services Center in Fergus Falls, MN, with Commissioners Wayne Johnson, Chairman; Roger Froemming, Vice-Chairman; John Lindquist, Lee Rogness, and Doug Huebsch present.

Approval of Agenda

Chairman Johnson called for approval of the May 13, 2014 agenda. Motion by Rogness, second by Froemming, and unanimously carried to approve the Board of Commissioners agenda of May 13, 2014 with the following additions:

- Library Funding Discussion
- Sheriff's Department Retirement Presentation
- Additional Auditor Agenda Items

Public Hearing for Amendments to the Comprehensive Local Water Management Plan

At 10:00 a.m., Chairman Johnson opened the Public Hearing to receive comment on proposed Amendments to the Otter Tail County Local Water Management Plan (LWMP). Representatives from West and East Soil and Water Conservation Districts (SWCD) and Bill Kalar, Land & Resource Director; presented the proposed amendments in summary format and provided the complete Water Plan. The Water Plan is a 10-year plan with a requirement to update the plan every 5 years. Two informational meetings were held (one in Fergus Falls and one in Perham) to provide education and accept public comment. Discussion took place regarding the proposed changes, the estimated cost for various projects, the grant funding process, and how the Water Plan assists with grant funding and prioritizing projects. Motion by Lindquist, second by Froemming, and unanimously carried to approve the proposed Amendments to the Otter Tail County Local Water Management Plan with a suggested addition for pollinators under the Wildlife Section. The updated Water Plan will be sent to the MN Board of Water and Soil Resources (BWSR) for their Committee's review and comment with final approval of the Amendments expected September 2014.

Recess & Reconvene

At 10:20 a.m., Chairman Johnson closed the Public Hearing and recessed the meeting of the Otter Tail County Board of Commissioners for a short break. The Board of Commissioners meeting was reconvened at 10:28 a.m.