10-Year Land And Water Resource Management Plan

December 2015

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Credits for Plan Development

Citizens Advisory Committee

Dennis Kroll	LCC Chairperson/Agricultural Producer
Ann Hogan	Town of Riverview/Lake Association
John Peterson	Agricultural Producer
Wayne Czypinski	Trout Unlimited
Randy Heise	Ag Ventures Co-op/Nutrient Management
Michael Sievert	Agricultural Producer
Brian Reith	NWTC Farm Business Instructor
Steve Fleming	Oconto County Lakes and Waterways
Greg Blaser	Agricultural Producer

Land Conservation Committee

Lowell (Buzz) Kamke	Darrel Pagel
Dennis Kroll, Elected Chairperson	Charles (Bill) Grady
Mary Lemmen	Dick Gillis, FSA Rep

Technical Advisory Committee

Ken Dolata	County Conservationist (LCD)
Chad Trudell	Conservation Technician (LCD)
Brady Stodola	Conservation Technician (LCD)
Jeff Maroszek	District Conservationist (NRCS)
Erin Hansen	Water Resource Mngmt. Specialist (WDNR)
Dale Mohr	Community Development Agent (UWEX)

Plan Summary

In 2002 the ***Department of Natural Resources (DNR)*** passed NR 151 setting new performance standards for farms to prevent runoff and protect water quality. ***Department of Agriculture, Trade and Consumer Protection (DATCP)*** then passed rules in ATCP 50 that identifies the conservation practices that farmers must follow to meet DNR Standards.

Counties have a choice to participate in the effort to carry out the state performance standards and the four prohibitions. The local ***Land Conservation Committees (LCC)*** and staff are the designated county agents to carry this out. County LCCs may apply for implementation grants to assist in the effort to help county landowners meet the new standards.

What follows is a brief summary of the chapters contained within this document. This summary is meant as a way to familiarize you with the plan and its contents without getting into too much detail and robbing the substance from the plan itself.

Chapter 1 details the reason for developing Ten-year Land and Water Resource plans and outlines the requirements to be included for adoption by the state. The state prohibitions and standards make up a large part of the plan and are detailed here also. The Oconto County Animal Waste Ordinance has incorporated the prohibitions for enforcement on a local level. This chapter also introduces Oconto Countyôs setting, history and natural resources. ***Environmental Protection Agency (EPA)*** 303d waters are listed along with general stream and lake data which has been collected from the DNR. The numerous Outstanding and Exceptional Resource Waters are chronicled. Each watershed located within the county is summarized, followed by a brief discussion on surface water quality and concerns unique to the area. The discussion continues on water resources, shifting to groundwater resources and wetlands. The last part of the chapter includes land use figures along with population and development trends.

Chapter 2 discusses how the plan initially came to be, through public participation and various committees as listed in the preceding credits. Questions had been raised and concerns had been heard about a wide range of pertinent topics. Our previous Land and Water Resource Plans were the foundation for this plan. Because the feeling that the foundation was solid, this plan became more of a redirection than a recreation. Goals have been broadened and more thought has been put into specific objectives and strategies. This chapter then goes on to highlight the goals and objectives. The new broadened goals were categorized toward two of the main economic aspects of Oconto County: agricultural and recreational resources. Specific objectives and strategies allowing us to reach the goals are detailed as well. Information and education is the driving factor for much of this plan. Implementation by the Land Conservation Division or other partner agencies through ordinance or cost sharing, ultimately leads to the success of this plan through measureable results.

Chapter 3 deals with implementation of the state performance standards and prohibitions. The objective of improving soil health through reducing soil erosion will be implemented using a DNR model called ***Erosion Vulnerability Assessment for Agricultural Lands (EVAAL)*** to locate susceptible areas throughout the county, and follow-up with field checks to verify issues. The use of this tool can be referenced within goal 1, objective 1. Changes in crop rotation, tillage practices or timing of tillage can easily be implemented to reduce soil erosion without much economic hardship. The objective of controlling animal waste runoff encompasses the four prohibitions, and is implemented by the permit process through our animal waste ordinance or by priority farm designation. Initially, priority was set in ***Water Quality Management Areas (WQMAs)*** and while we continue to work with that list, a new list of priority farms outside WQMAs must be established. The chapter concludes with the compliance and enforcement procedures of the previously discussed standards and prohibitions. In the past we have encountered situations where our animal waste ordinance enforcement procedures have not progressed the way they had been envisioned. Referencing our ordinance allows us to clarify such situations and allows for a more streamlined and efficient enforcement process.

Chapter 4 details, in table format, our 5-year work plan for each goal. The objectives are laid out, along with activities, which will allow us to reach those objectives. Partners needed, estimated staff time necessary, agencies involved, cost in staff dollars, evaluation and monitoring parameters, and the specific benchmarks we will strive to achieve are included in this chapter. Staff and funding availability can, at times, dictate priority which is evident in some of the activities and their benchmarks. This part of the plan is the working document, which allows us to adapt to changing situations within our county over the next ten years. Many challenges can alter the work plan, from staff fluctuation, cost share funding availability, or changes in the public resource concerns. After 5 years, a regularly scheduled update to this work plan will be forthcoming.

Chapter 5 discusses the information and education strategies for the goals and objectives. Public input into this section resulted in some very interesting and promising strategies to try and reach the people concerned and influenced by the goals stated in this plan. Education is a key aspect of the planning process; therefore this is a very important part of our plan. Most strategies for information and education are a given part of some of the activities, whereas some activities are solely stated as being forms of education.

Chapter 6 cites our partners and collaborators for the implementation of this plan. It takes many agencies and organizations, both public and private working in cooperation, to fully reach the goals established herein. Also included here are possible funding sources available to help implement this plan. Federal, state, county, and other local on governmental sources may be available. From these sources, we have gained information included in the development of this plan and intend to continue collaboration during implementation.

Chapter 1

Introduction

Land and Water Resource Management Plan Background

The need for local leadership in natural resources management is an important concept endorsed by both Federal and State government, including the ***United States Department of Agriculture's (USDA)*** 2002 Farm Bill, ***Natural Resources Conservation Service's (NRCS)*** Conservation Programs Manual, the EPAôs Water Action Plan, 1997 Wisconsin Act 27, and Comprehensive Planning. Elected officials and policy makers have reaffirmed that local leadership and grassroots decision-making that involves a diverse team of interested groups and individuals, are the keys to successfully managing and protecting our natural resources. Following this principle, Wisconsinôs 72 County ***Land Conservation Committees (LCC)*** continue to lead their communities in determining local conservation needs and priorities.

Locally led conservation is based on the principle that local leaders are best suited to identify and resolve local natural resource problems. It challenges local, state, and federal agency representatives and urban and rural neighbors to work together and take responsibility for addressing resource needs. Locally led conservation creates new opportunities, but also poses significant challenges to County committees to take a more active role as conservation leaders in their communities.

Plan Requirements

The 1997 Wisconsin Act 27 includes provisions for County Committees to develop County ***Land and Water Resource Management (LWRM) plans***. County LWRM plans cover a ten-year period and are envisioned to be a local action or implementation plan with emphasis on program integration. This local planning process is not to be thought of as another ñprogramò among the many others from the state and federal level. Rather, it is a process by which counties and their public stakeholders can assess their resource conditions and needs, decide how best to meet water quality goals, implement state performance standards and other local conservation objectives, and measure progress towards meeting these goals. The planning process will provide a more efficient and effective means to address resource issues, meet state standards, and more effectively leverage local, state, and federal resources.

Every citizen benefits from the protection and sustainable use of our natural resources. As standing committees to County Boards, County Committees are the primary local delivery system of natural resource programs. County Committees and Departments are the publicôs vital link with local landowners to promote the implementation of conservation practices and achieve greater environmental stewardship of the land.

Performance Standards and Prohibitions

Performance standards and prohibitions are a vital component of County LWRM plans. Through 1997 Wisconsin Act 27, the Legislature amended the statutes to allow County LCCs to develop and adopt standards and specifications for management practices to control erosion sedimentation and ***nonpoint source water pollution (NPS)***.

The statutes also require DNR and DATCP to develop performance standards for agriculture and non-agriculture nonpoint pollution sources. In October 2002, after long deliberation and many public hearings, new state runoff rules took effect. DNR rule NR 151 sets performance standards for runoff and to protect water quality.

The Manure Management Prohibitions summarized from NR 151 Subchapter II* are:

- No direct runoff from feedlots or stored manure into ***waters of the state***
- No unlimited livestock access to waters of the state where high concentrations of animals prevent the maintenance of adequate or self-sustaining sod cover
- No overflow of manure storage structures
- No manure stacking in unconfined piles within a WQMA

Performance Standards listed summarized from NR 151 Subchapter II* are:

- Sheet, Rill, and Wind Erosion ï all land where crops or feed are grown, including pastures, shall be managed to achieve a soil erosion rate equal to, or less than , the ñtolerableò (T) rate established for that soil.
- Tillage setback ï no tillage operations may be conducted within five feet of the top of the channel of surface waters.
- Phosphorus index ï croplands, pastures, and winter grazing areas shall average a phosphorus index of six or less over the accounting period and may not exceed a phosphorus index of 12 in any individual year within the accounting period.
- Manure Storage Facilities ï all new, substantially altered or abandoned manure storage facilities must be constructed, maintained or abandoned in accordance with accepted standards to minimize the risk of structural failure and minimize leakage in order to comply with groundwater standards.
- Process wastewater handling ï no significant discharge of process wastewater to waters of the state.
- Clean Water Diversions ï runoff must be diverted away from contacting feedlots, manure storage areas and barnyards located in a water quality management area.
- Nutrient Management ï manure, commercial fertilizer and other nutrients shall be applied in conformance with a nutrient management plan.

*Reference NR 151 Subchapter II for complete and detailed standards and prohibitions.

The DATCP rule ATCP 50 identifies the following conservation practices available to maintain compliance with the DNR standards. Specifically, the DATCP rule sets the requirements that ***nutrient management plans (NMP)*** must meet to comply with State law.

Practice or Activity	ATCP 50 Cost Share Rate	Funding Source
Manure Storage System	70%	Bonding Revenue
Manure Storage Abandonment	70%	Bonding Revenue
Access Road or Cattle Crossing	70%	Bonding Revenue
Cattle Mound	70%	Bonding Revenue
Critical Area Stabilization	70%	Bonding Revenue
Diversion	70%	Bonding Revenue
Field Windbreak	70%	Bonding Revenue
Filter Strip	70%	Bonding Revenue
Grade Stabilization Structure	70%	Bonding Revenue
Heavy Use Area Protection	70%	Bonding Revenue
Intensive Grazing Management	70%	SEG Funding
Livestock Fencing	70%	Bonding Revenue
Livestock Watering Facility	70%	Bonding Revenue
Milking Center Waste Control System	70%	Bonding Revenue
Nutrient Management for up to 3 years	Flat rate	SEG Funding
Pesticide Management for up to 3 years	Flat rate	SEG Funding
Relocating or Abandoning animal feeding operations	70%	Bonding Revenue
Roof	70%	Bonding Revenue
Roof Runoff System	70%	Bonding Revenue
Sediment Basin	70%	Bonding Revenue
Streambank and Shoreline Protection	70%	Bonding Revenue
Subsurface Drain	70%	Bonding Revenue
Terrace	70%	Bonding Revenue
Underground Outlet	70%	Bonding Revenue
Waste Transfer System	70%	Bonding Revenue
Water and Sediment Control Basin	70%	Bonding Revenue
Waterway System	70%	Bonding Revenue
Well Abandonment	70%	Bonding Revenue
Wetland Restoration	70%	Bonding Revenue
Conservation Tillage	70%	SEG Funding
Contour Farming	70%	SEG Funding
Strip-cropping	70%	SEG Funding

How these performance standards and prohibitions are to be implemented and enforced, and how violations and appeals are to be handled, will be detailed in subsequent portions of this plan.

Performance Standards and Prohibitions Incorporated into County Ordinances

Manure management prohibitions have been incorporated into the Oconto County Animal Waste Management ordinance enacted in March 2001 (Section 18.100 through and including 18.115) and was updated in 2008 to include the performance standards that were current at that time. This ordinance regulates permitting of new and expanding animal waste storage facilities and feedlots, removal of abandoned feed piles, nutrient management planning and proper closure of vacated waste storage facilities. The ordinance is administered by the ***Land Conservation Division (LCD)***, but enforced by the ***Zoning Department***. The Zoning Department enacted an ordinance in February 2003 to regulate animal numbers according to ***animal units (AU)*** (Section 14.429). This ordinance limits AU to one per acre on parcels ranging from 2 to 35 acres. Properties larger than 35 acres are not limited as to total number of AU. Nutrient management planning is required to comply with AU numbers.

Oconto County History

The following are descriptions of the physical, population and economic characteristics of Oconto County. The *Oconto County Volume II: County Resources 20-Year Comprehensive Plan* is the primary resource document for this section of the plan. In many instances detailed maps, tables and charts are referenced for further reading.

The Old Copper Culture people are early inhabitants of Wisconsin in an area that is the ancestral home of the Menominee. The name ñOld Copper Cultureò is derived from the fact that these people made a variety of bracelets, spear points, fishing hooks, knives, and other ornaments and tools out of copper. They worked the copper by alternating hot and cold hammering, called annealing. They are among the earliest known metal smiths in the world, and the first in North America. Copper tooling in various fashions has been known around the world for 10,000 years, but this is the first instance of its use in this country. The copper was mined in the Lake Superior region during the warmer months and transported south to a tooling or village site.

The Copper People lived in the Middle Archaic period. Carbon 14 tests conducted at the University of Chicago in 1953 placed these people here as far back as 7,510 years ago, between 5,500 and 5,600 BC, which predates the ancient Egyptian pyramids. During this period, sustenance was gained by hunting, fishing, and collecting wild foods. Pottery making, mound building and agriculture of the later Woodland period were unknown to the copper industry people in Oconto. They buried their dead here using the natural elevation of the land during a high water period.

The Menominee People (meaning rice eaters) were the first recorded nation to control Oconto County land. They were a people whose main diet centered on the fish and wild rice of the area. The Menominee had a large settlement to the north in what is now Marinette. The city derives its name from a famous Indian woman who developed a large trading post where that city now stands. The two primary forms of transportation for the Menominee people were by canoe or by foot.

The first Europeans to write about being in the area of Oconto County were the French who worked for Canadian Samuel de Champlain. Men were sent from the colony of New France (Canada), founded in 1608, to learn the languages and customs of the Native Americans and form economic, political and military ties with them. Other Frenchmen to make their presence known in the Oconto County area were Father Allouez and his contemporary, Father Andre. Both these Catholic priests spent many years and endured enormous hardship in an effort to comfort, heal, educate, and sometimes convert members of the local tribes.

France, by 1671, had claimed the Great Lakes area for its own. The region including Oconto County was later claimed by Massachusetts, Connecticut, New York and Virginia immediately after the American Revolution of 1776. Ohio won the distinction of claiming the area in 1785, then Indiana, Illinois and finally Michigan, each took a turn. The first saw mill in what became Oconto County was built at Pensaukee in 1827 on land leased from the Menominee Indians for $15 a year and enough board lumber to make caskets. By the early

1830's, George Furwick was the first to purchase land from the government in what is now the City of Oconto. In 1848, Wisconsin achieved statehood, being the last in the Great Lakes Territory to do so. The first elections were held in what is now Oconto on November 4, 1851 to form the boundaries and name this new county separating from Brown County. Oconto City became the county seat at this time. The name "Oconto" was taken from an early Native American settlement named "Oak-a-toe". With the act of Congress that created Oconto County in 1851 from the northern part of Brown County, the white cities and villages officially came into existence, and the Indian villages they replaced vanished forever.

By 1850, the U.S. Census listed the county as having a population of 415 described as "wilderness dwellers". The first steam powered circular saw was brought into production by Samuel B. Gilkey in 1853, and the first steamboats began moving along the Oconto River the following spring. Also in 1854, Henry Tourtilotte and his Indian wife and four children came to the Gillett area being the first to build a split level log cabin on what is now First and Main Streets. He was soon followed by Henry Clark and his Indian wife and their three children.

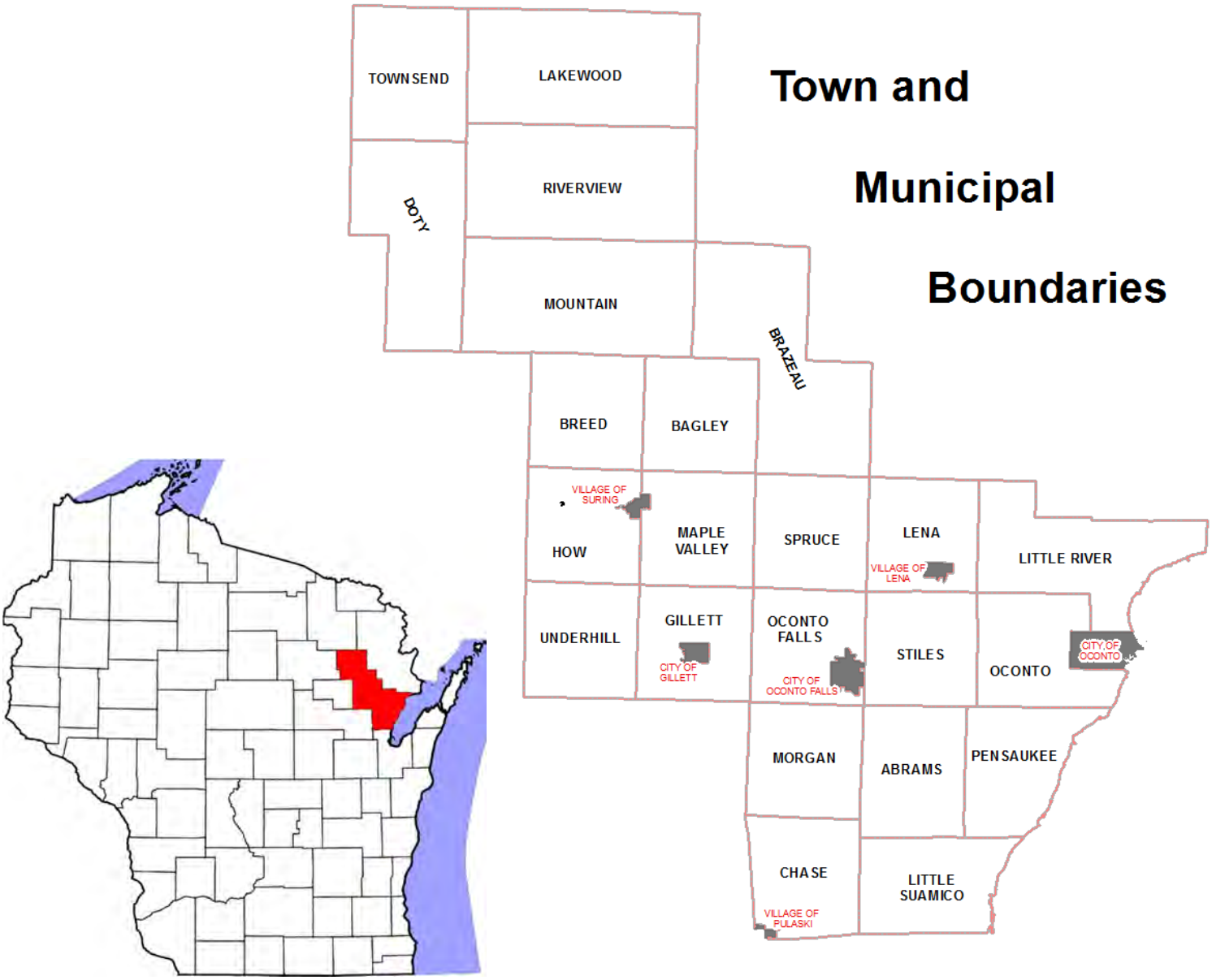
In 1855, the first road between the cities of Green Bay and Menominee began construction, northward. On March 11 of 1869 Oconto was chartered as a city by an Act of Legislature. Lumbering gave way to homestead farming, and in particular, dairying, in the latter half of the 1800's. Oconto County was an important reason why Wisconsin rose to the stature of "Dairy Capitol of the World". Tracks for the train line between Green Bay and Menominee were being laid in 1871, but faced a major setback when the huge "Peshtigo Fire" burned nearly every foot of track along the route. The first Christian Science Church was built in 1886. In 1879, the final boundaries were set for present day Oconto County with the inclusion of Town of How from Shawano County.

Source: Adapted from Rita Neustifter,1998; and The Copper Culture People Oconto Historical Society, 2010.

Geography and Geology

Locational Context

Oconto County, encompassing an area of approximately 1,016 square miles, or 650,266 acres, is located in Northeast Wisconsin. Oconto County, as of the 2010 Census, had 37,660 residents. The county has a total of 28 municipalities comprised of 23 towns and five incorporated communities: City of Oconto (4,513 residents); City of Oconto Falls (2,891 residents); City of Gillett (1,386 residents); Village of Lena (564 residents); and the Village of Suring (544 residents). Oconto County is bordered by Marinette and Forest counties to the North, Menominee and Shawano Counties to the West, Brown County to the South, and the Bay of Green Bay of Lake Michigan to the east. The maps below provide locational context of Oconto County in Wisconsin and the townships and municipalities within.



Climate

The climate in and around Oconto County is typical of Northern Wisconsin. It is classified as continental climate with harsh cold winters, heavy snowfall, and warm humid summers. The average annual rainfall is approximately thirty-one inches with the maximum occurring during June and July, and the minimum during January and February. The growing season averages approximately 150 days. The weather conditions are favorable for many outdoor recreational activities including the intense watercraft and snowmobiles, and non-motorized activities such as equestrian trails/hiking trails, ball fields and parks.

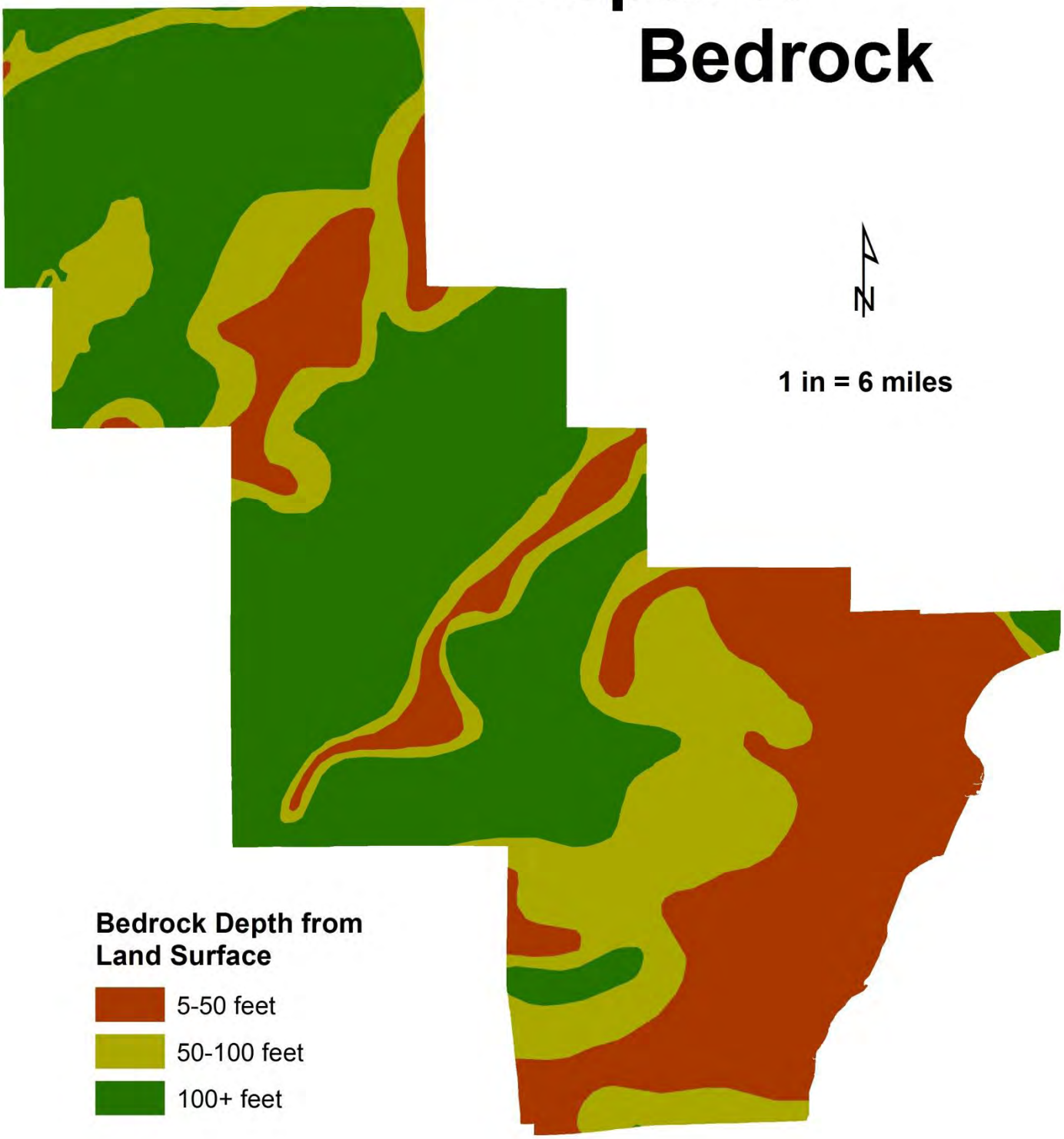
Geology

Quaternary (glacial/surface) and bedrock geology characterize the terrestrial appearance and function of the county. Glacial geology refers primarily to the effects continental glaciations have had on the land over thousands of years, and to a lesser extent, the surface effects of more recent erosion and deposition activities. Bedrock geology refers to the much older, solid rock layers that lie beneath glacial sediments.

The bedrock underlying Oconto County is made up of seven distinct types from three geologic eras. As a result, the county can be split into three distinct regions based on the age of the bedrock. Bedrock in the Northern Highland Region, which lies in the northwestern portion of the county, is made up primarily of granite and mixtures of igneous and metamorphic rocks that are Precambrian (600 million years ago based upon science) in their origin. To the southeast of the Precambrian formation is the Central Plain Region. This region is characterized by the Cambrian (between 570 and 500 million years ago based upon science) group which consists of a variety of sandstones. As the bedrock continues southeast, the formations found are of the Ordovician Era (between 488 and 443 million years ago based upon science). This region is known as the Eastern Ridges and Lowlands. These formations include the Prairie du Chien group consisting of dolomite, the Saint Peter sandstone and the Platteville-Galena group consisting of dolomite and limestone. In addition to these distinct regions, along the northern border of Oconto County is a narrow formation of quartzite, slate and iron. Bedrock has not presented any significant development problems in the past. However, bedrock may impact development when found near the surface. Bedrock near the surface may hinder excavation, therefore considerably increasing the cost of construction of recreational facilities. In addition, conventional on-site septic systems cannot function properly where bedrock is near the surface.

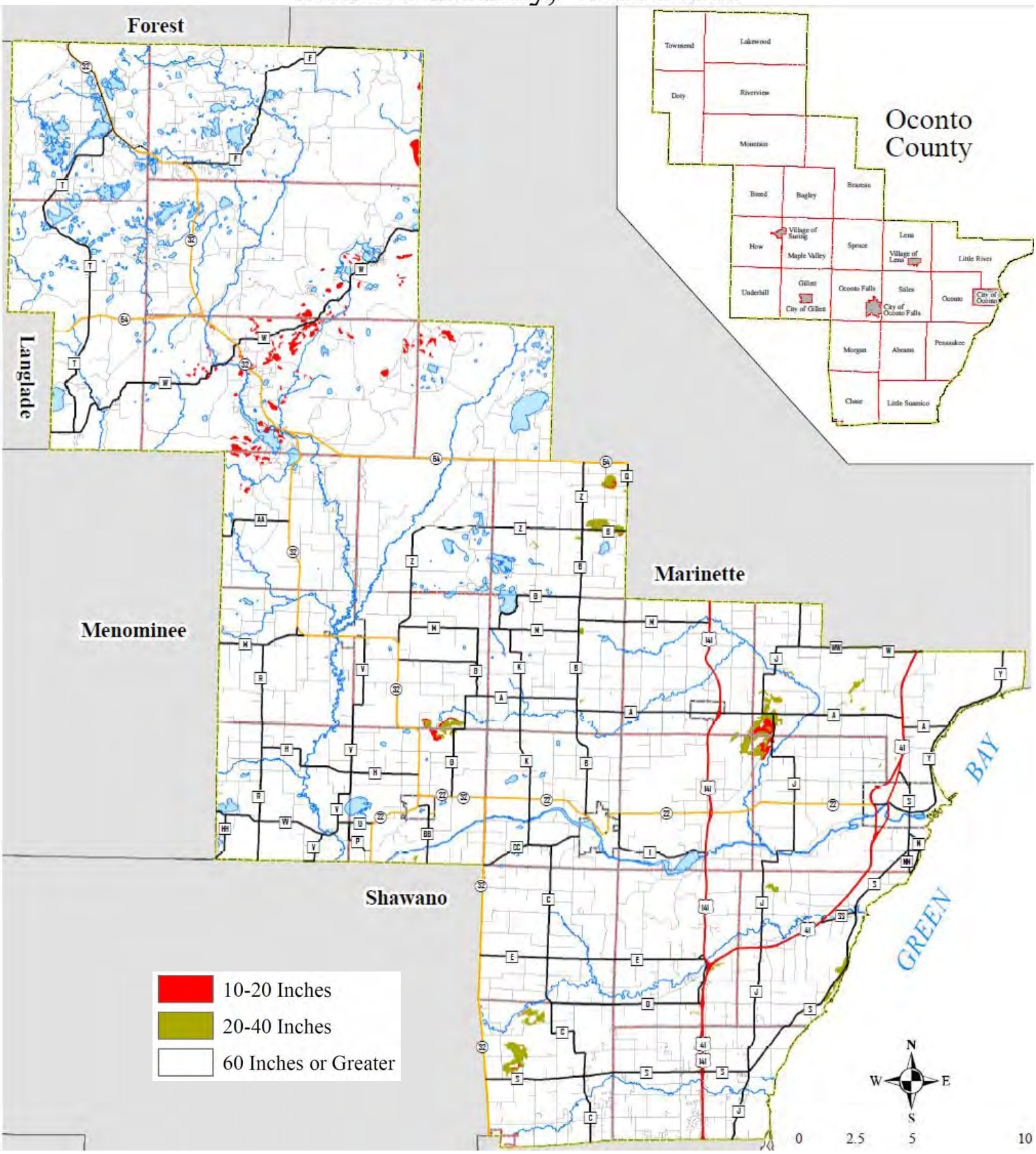
During the glacial period, Oconto County was completely covered by a sheet of ice known as the Green Bay Lobe of the Labrador Ice Sheet. This sheet of ice was responsible for shaping the surface features that can be seen today throughout the County. The glacial drift in Oconto County consists primarily of clayey till. Glaciofluvial sediments in the form of an outwash plain comprised of lake silt and clay are located in areas adjacent to major water features and through the central portion of the county. The soils may be less than five feet thick in some areas and up to 200 feet in depth above the bedrock. A general map of bedrock depth throughout the county and a map of specific bedrock depth areas of concern within the county are shown as follows.

Oconto County Depth to Bedrock



Depth to Bedrock

Oconto County, Wisconsin



Topography

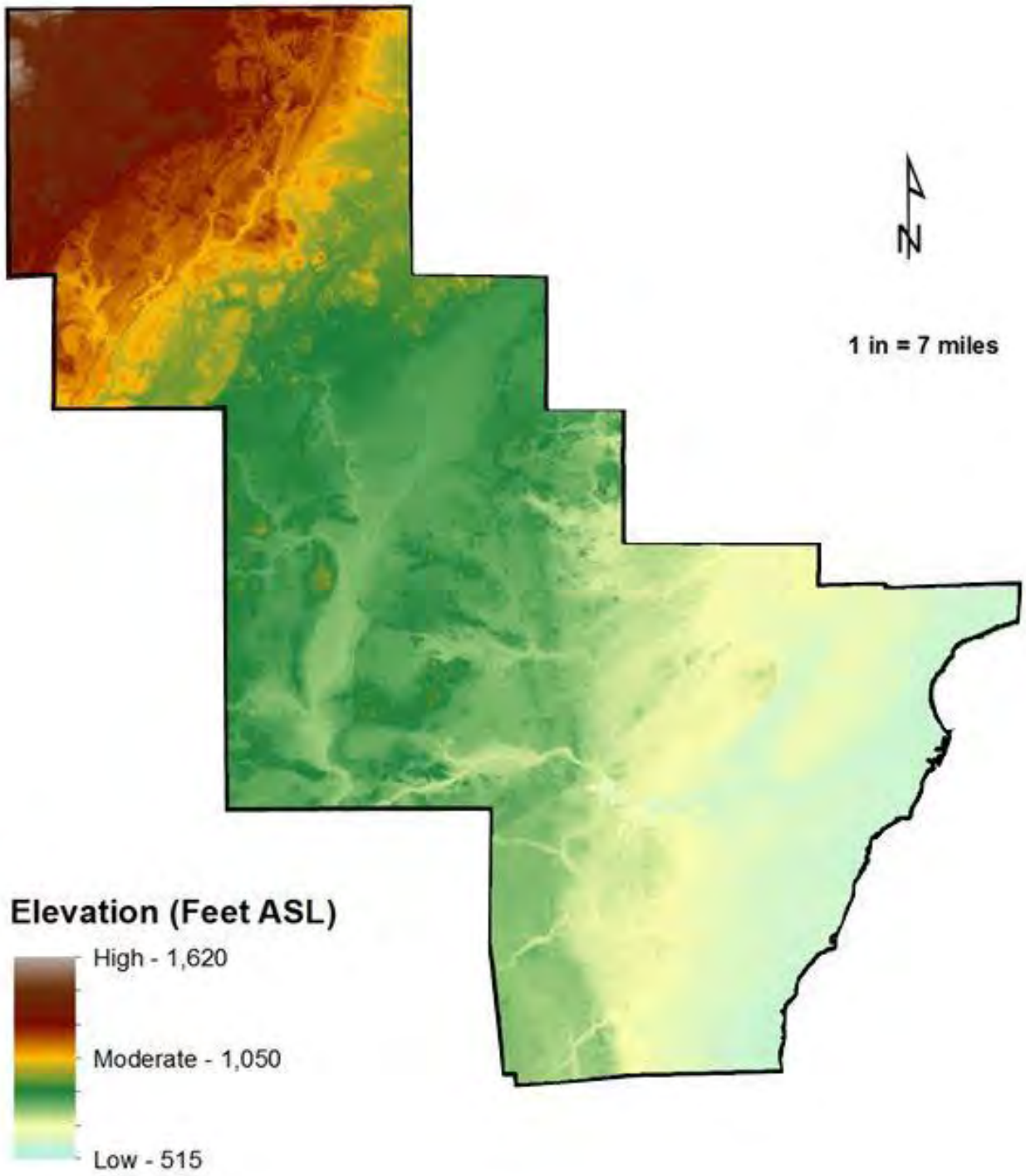
Glacial events occurring in Wisconsin, along with the type of underlying bedrock, have split Oconto County into three distinct regions.

The northern highlands region of Oconto County, which includes Mountain, Doty, Lakewood, Riverview, Townsend and parts of Brazeau, was once a mountainous area. Centuries of erosion and smothering have removed the mountains, leaving behind a number of outcrops which can be seen in the Town of Mountain and the Town of Riverview near Crooked Lake. Some of the highest elevations in the state can be observed in this region as well. Thunder Mountain, located near the Oconto County-Marinette County border, rises 1,375 feet above sea level. McCaslin Mountain, located near the junction of Forest, Marinette and Oconto Counties, has been measured at 1,620 feet above sea level.

The central plain region of Oconto County includes Gillett, Maple Valley, Spruce, Underhill and portions of Brazeau. This area is covered by a hilly, undulating end moraine. A series of low ridges can also be found in the northeastern part of the central region. This region averages between 700 and 900 feet.

In southeast Oconto County the end moraine of the Central Plain Region eventually merges with the eastern ridges and lowlands region of the county with a broad, undulating ground moraine that slopes to the east. The entire ground moraine encompasses a number of depressions and basins and is scattered with lake and outwash plains. As can be seen in the following map, this region is very low in elevation compared to the rest of the county being as low as 515 feet above sea level.

Oconto County
Topography Model



Landcover

As depicted in the following land use map, about 253,000 acres, equal to 39%, of land in the county was comprised of forest as of the most recent survey in 2007. The primary timber types are aspen, softwoods, swamp hardwoods, and northern hardwoods. Publicly owned land makes up approximately half of the forested areas in Oconto County. Most of the forested land, the Chequamegon-Nicolet National Forest in particular, is situated in the northern third of the county. State, county, and privately owned forests also exist in this northern portion, as well as in the southern portion.

Next most abundant landcover is cropland at 219,000 acres and 34% of all land in the county. Agriculture is found mainly in the middle and southern portions of the county. Wetland follows cropland in acreage of cover at 138,000 and 21% of all cover. Although this landcover type is seen in large pockets in some areas of the county, it can generally be described as dispersed throughout. Another map following is that showing the dispersal of cultivated cropland throughout the county in 2014 according to NRCS.

Other landcover types such as developed land (including roads), shrubland, grasslands, and open water, cover the rest of the county. Specific acreage and percentage for these remaining types can be seen in the table on the following landcover map.

In addition to the above landcover types, another distinction in land type is availability for public use. The final map under this heading shows the distribution of the large amounts of available public land partitioned into federal, state, and county ownership.

Shoreland

Oconto County contains approximately 25 miles of Lake Michigan and Green Bay shoreline. Shorelands are viewed as valuable environmental resources both in rural and urbanized areas. Even though development within shoreland areas is generally permitted, specific design techniques must be taken into consideration.

Wetland

Because of their importance, there are strict regulations regarding wetlands. Oconto County contains approximately 140,000 acres of wetlands. Prominent wetlands in the county include Christie Lake, Morgan Marsh, Jamison Marsh, Lena Swamp, Wolf Marsh, Brazeau Swamp, Peshtigo Brook Wetlands, County Line Swamp, West Shore Rivers Wetlands, Wesco Creek Swamp, and others adjoining the many lakes and streams of the county.

Oconto County has a number of extensive wetland complexes, with the majority being located within 25 miles of the Green Bay shoreline. Wetlands located within close proximity to the coast provide rich habitat for plants and animals and greatly influence the larger ecosystem processes of the Great Lakes Ecosystem. As transition zones between land and water, coastal wetlands are often rich in species diversity and provide critical habitat for migratory and nesting birds, spawning fish, and rare plants. The WDNR has identified

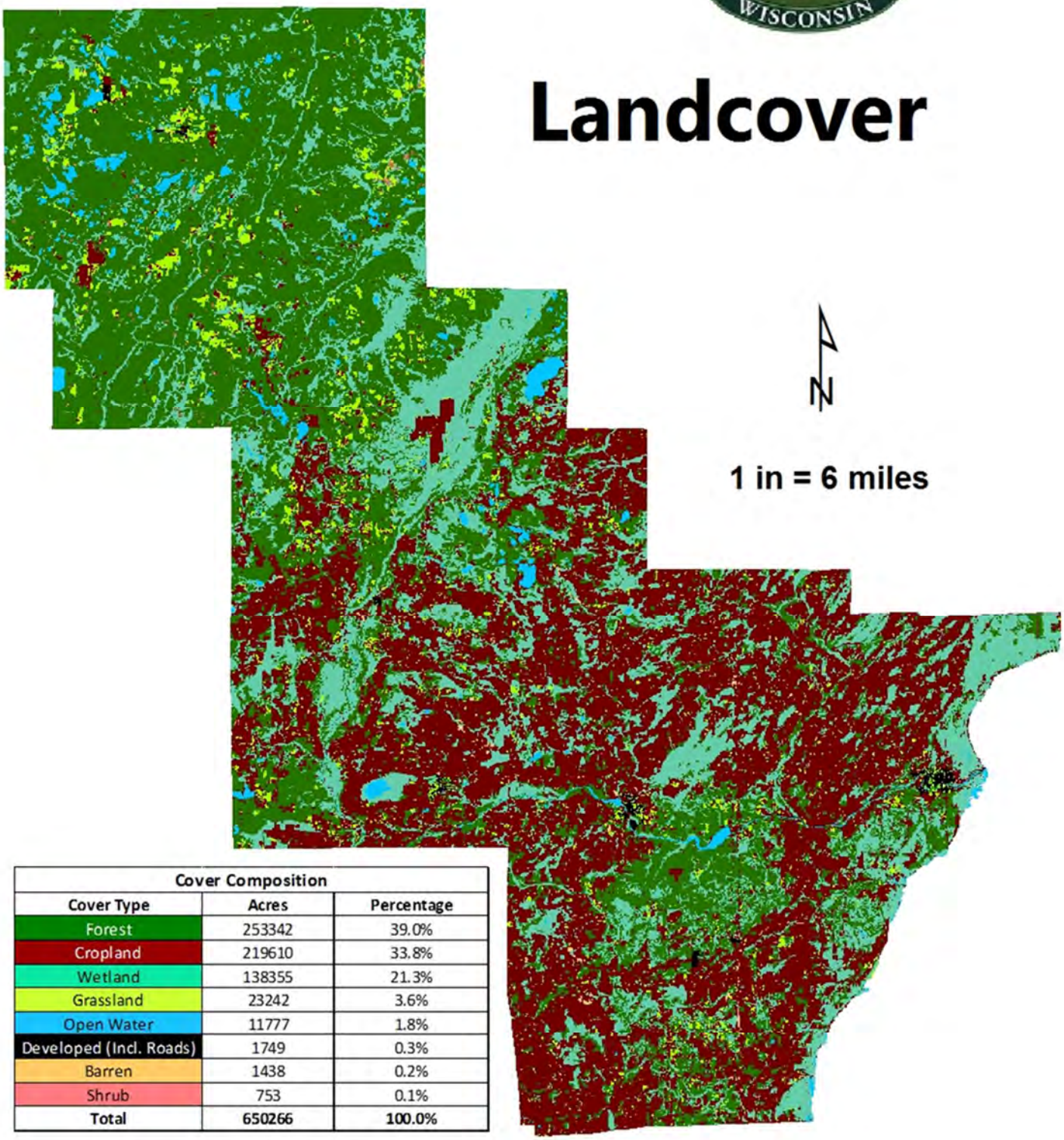
ecologically Significant Coastal Wetlands along Lake Michigan as a way to guide future planning efforts. The Oconto Marsh, County Line Swamp, Pensaukee River Wetland Complex, Charles Pond, and Mud Creek Wetland are all designated Significant Coastal Wetlands.

Woodlands

Woodlands maintain watershed cover, provide shade, serve as a windbreak, and help reduce soil erosion. Upland woodlands and lowland woodlands (i.e., woodlands within wetlands) comprise a total of approximately 253,000 acres. A large portion of Oconto County is covered by forests. In addition to the privately held forests, the Nicolet National Forest consists of 138,000 acres located in the northern third of the county, while the Oconto County Forest comprises another 43,345 acres located in the northern and southern portions of the county.

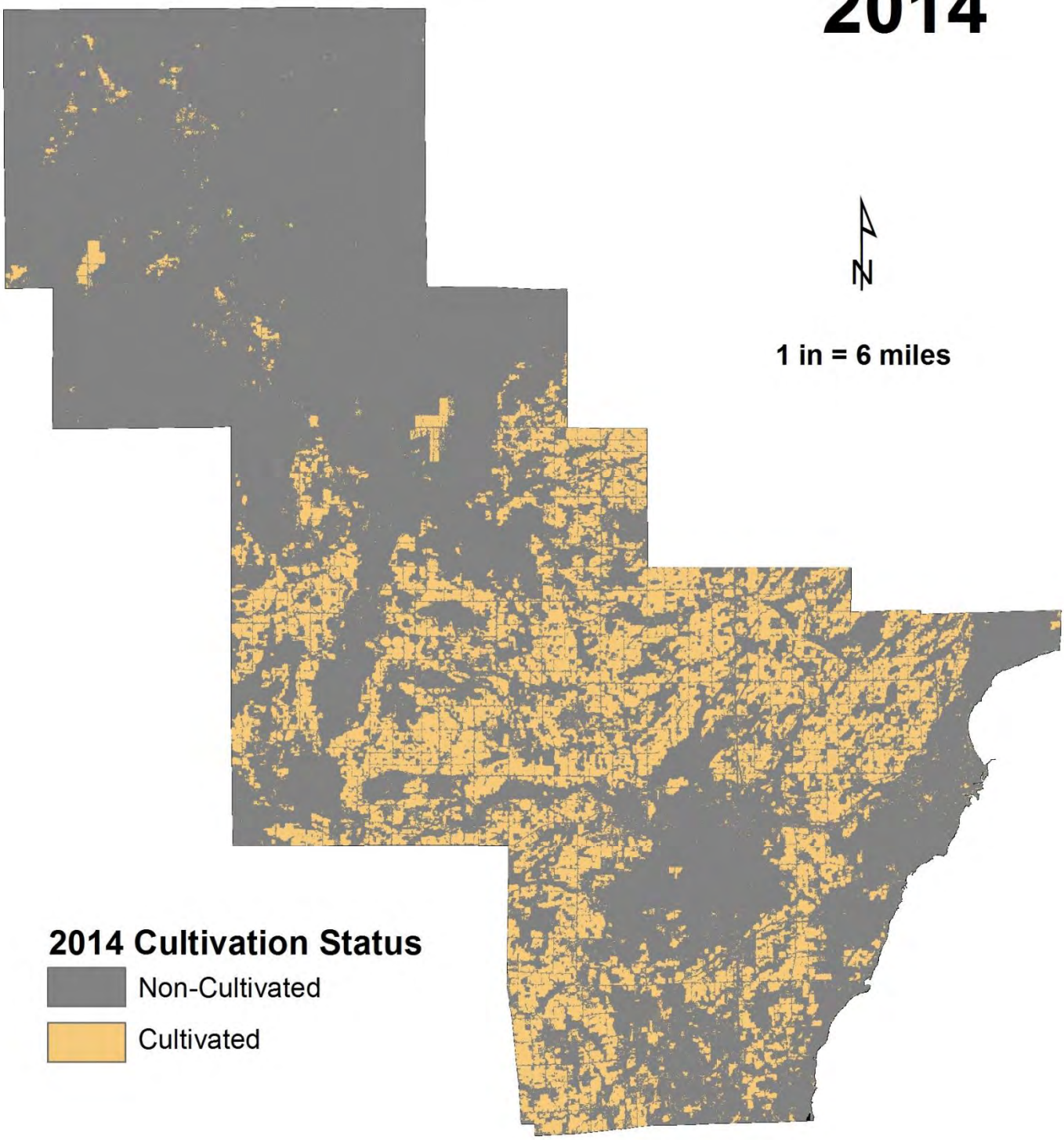
Oconto County

Landcover

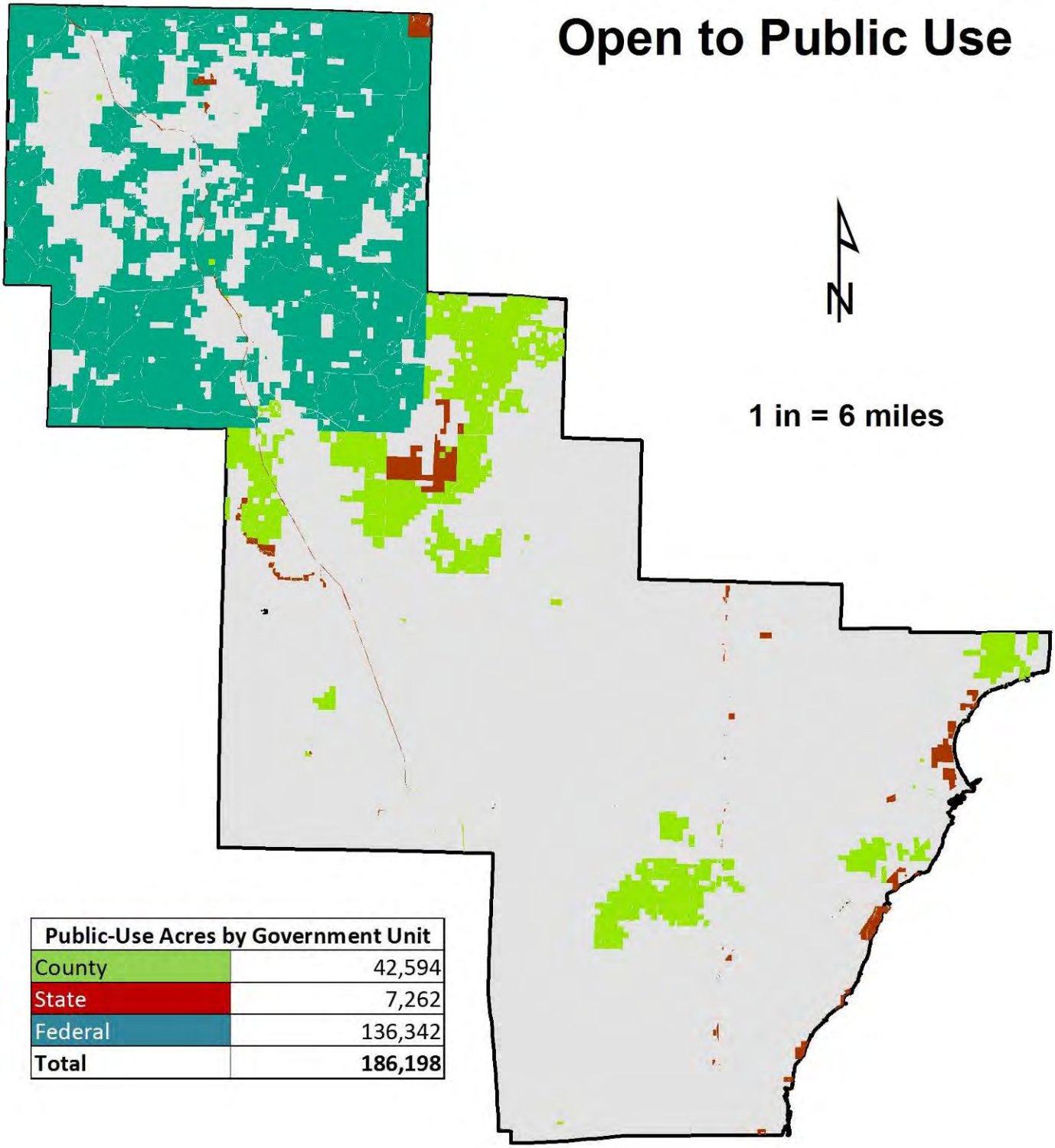


Cover Composition		
Cover Type	Acres	Percentage
Forest	253342	39.0%
Cropland	219610	33.8%
Wetland	138355	21.3%
Grassland	23242	3.6%
Open Water	11777	1.8%
Developed (Incl. Roads)	1749	0.3%
Barren	1438	0.2%
Shrub	753	0.1%
Total	**650266**	**100.0%**

Oconto County
Cultivated Lands
2014



Oconto County
Goverment-Owned Land
Open to Public Use



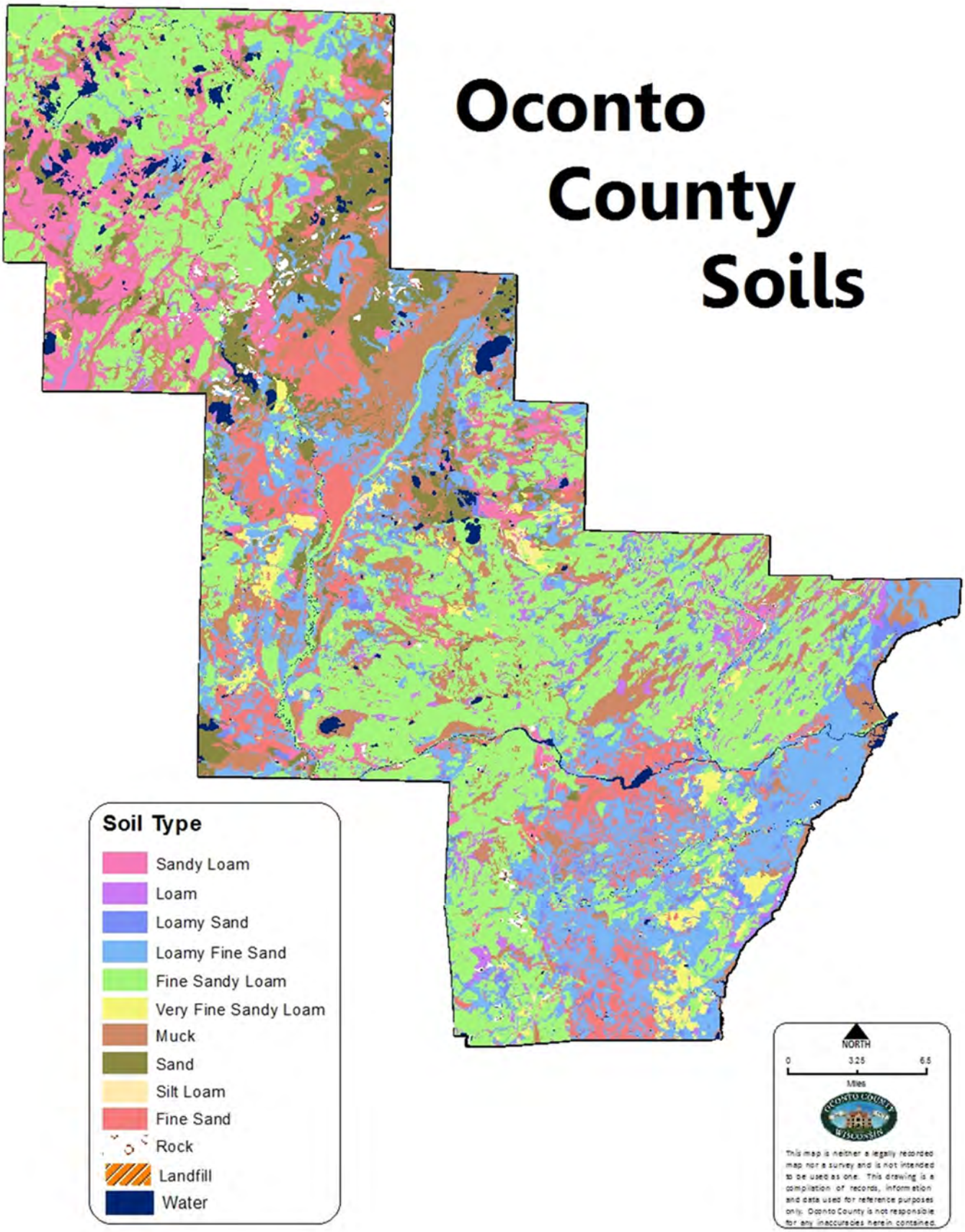
Public-Use Acres by Government Unit	
County	42,594
State	7,262
Federal	136,342
Total	**186,198**

Soils

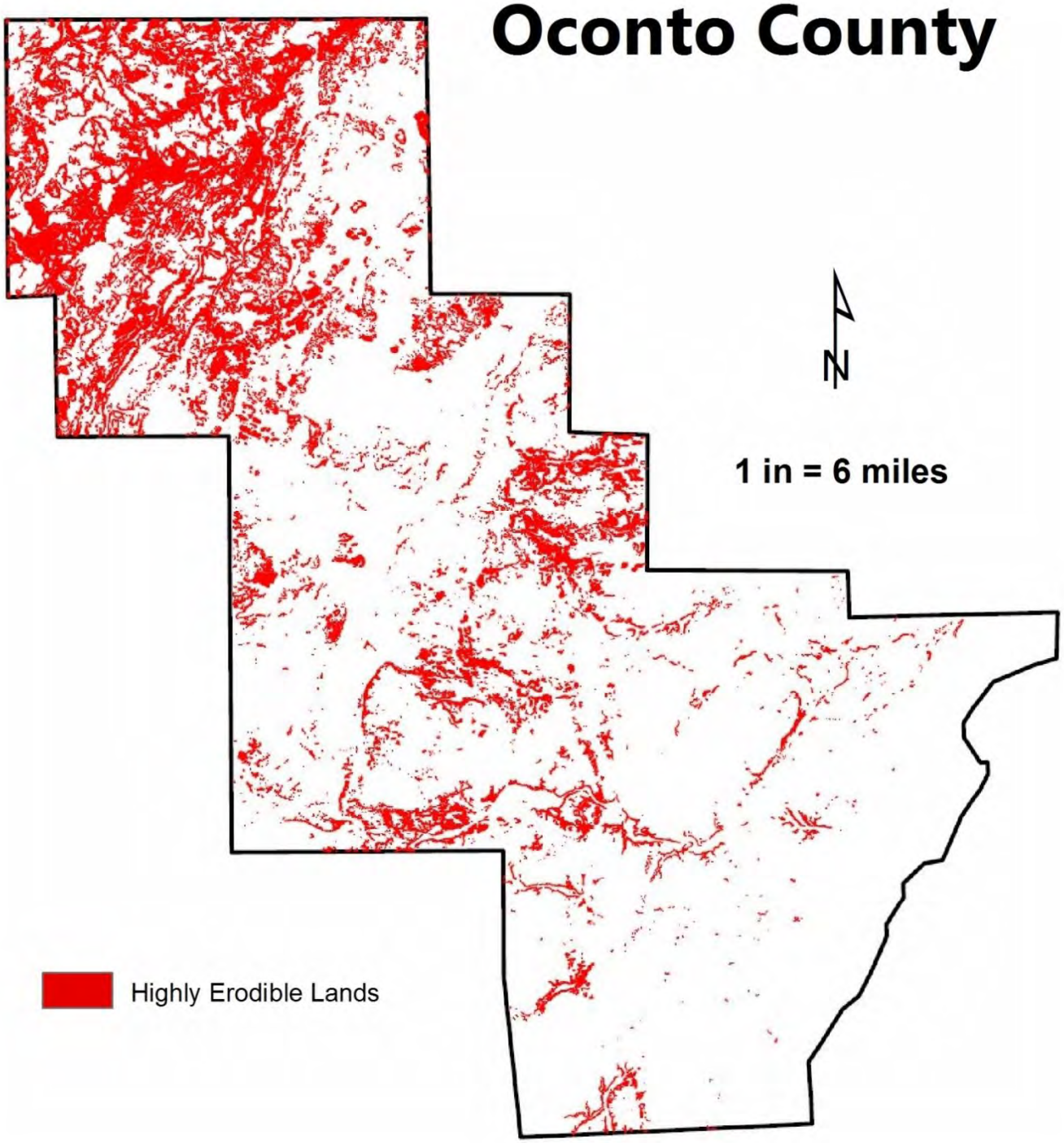
The Northern Highlands Region is generally comprised of Menahga-Rousseau, Padus-Pena, and Lennan-Keweenaw soils that are well drained, nearly level to very steep, and can range from sandy loams to loamy sands. Onaway-Solona-Seelyeville soils comprise the majority of the soils in the Central Plains Region. These soils are nearly level to very steep, well drained to somewhat poorly drained or very poorly drained, generally range from fine sandy loams to mucks. Solona-Onaway-Iosco is the predominate soil of the Eastern Ridges and Lowlands of eastern Oconto County. These soils are nearly level to gently sloping, well drained to somewhat poorly drained, loamy and sandy soils on uplands. A map of the county soils can be seen on page 25.

Soil Erosion

Soil erosion is a concern not only because of reduced productivity on the land, but also because of the introduction of eroded soil into the surface water bodies. Sediment reaching rivers or lakes may need to be dredged, and more importantly, the sediment reduces aquatic habitat. Nutrients and pesticides attached to the soil particles have an adverse effect on water quality. Loamy and sandy soils located along steeper slopes are identified as having soil erosion problems. These soil types are predominantly found in the central part of the county in the towns of Breed, Brazeau, and Oconto Falls. Soil erosion from sources other than cropland is generally a concern relating to construction sites. In Oconto County, this is mainly a concern closely tied to development on the shores of lakes, rivers, and streams throughout the county. Following the soils map is an additional map that shows the locations of the countyôs highly erodible lands according to NRCS. The determination of these locations is based on soil type characteristics and slope factors.


Oconto County Soils
Soil Type
Sandy Loam
Loam
Loamy Sand
Loamy Fine Sand
Fine Sandy Loam
Very Fine Sandy Loam
Muck
Sand
Silt Loam
Fine Sand
Rock
Landfill
Water
NORTH
0
3.25
6.5
Miles
This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. Oconto County is not responsible for any inaccuracies herein contained.

NRCS Determined Highly Erodible Lands in Oconto County



Natural Resources

Surface Water

Approximately 2 percent of the county is covered by surface waters. The surface waters in Oconto County primarily flow southeast to the bay of Green Bay. The major river systems within the county consist of the Little Suamico, Oconto, Little and Pensaukee Rivers. Oconto County has many lakes and streams that provide an abundant supply of surface water. Oconto County has 210 named lakes and 165 unnamed lakes totaling 12,650 surface acres. Additionally, the county contains 1,073 miles of streams which cover 12,814 surface acres. Of the following tables, the first two statistically summarize the surface waters in the county and the next two more specifically list the major surface water features in Oconto County. These include lakes and ponds greater than 100 surface acres and the major rivers and their tributaries. The surface waters of the county also provide quality habitat for waterfowl and wildlife in addition to recreational opportunities. Over 300 miles are considered Class One trout streams, meaning natural reproduction alone is sufficient to retain populations. An additional 150 miles are Class Two or Three meaning stocking is needed for populations to sustain. The location and distribution of these waters can be seen on the map on page 29.

Stream Data for Oconto County

Average Width (Feet)	Number of Streams	Total Length (Miles)
<10	142	198
10 - 19	21	90
20 - 39	23	161
40+	5	108
Total	**191**	**557**

Lake Data for Oconto County

Lake Size (Acres)	Number of Lakes	Total Size (Acres)
<10	228	761
10 - 29	74	1,331
30 - 49	29	1,097
50 - 99	17	1,152
≥100	27	8,309
Total	**375**	**12,650**

Source: Wisconsin Department of Natural Resources

Oconto County Lakes and Ponds Greater than 100 Surface Acres

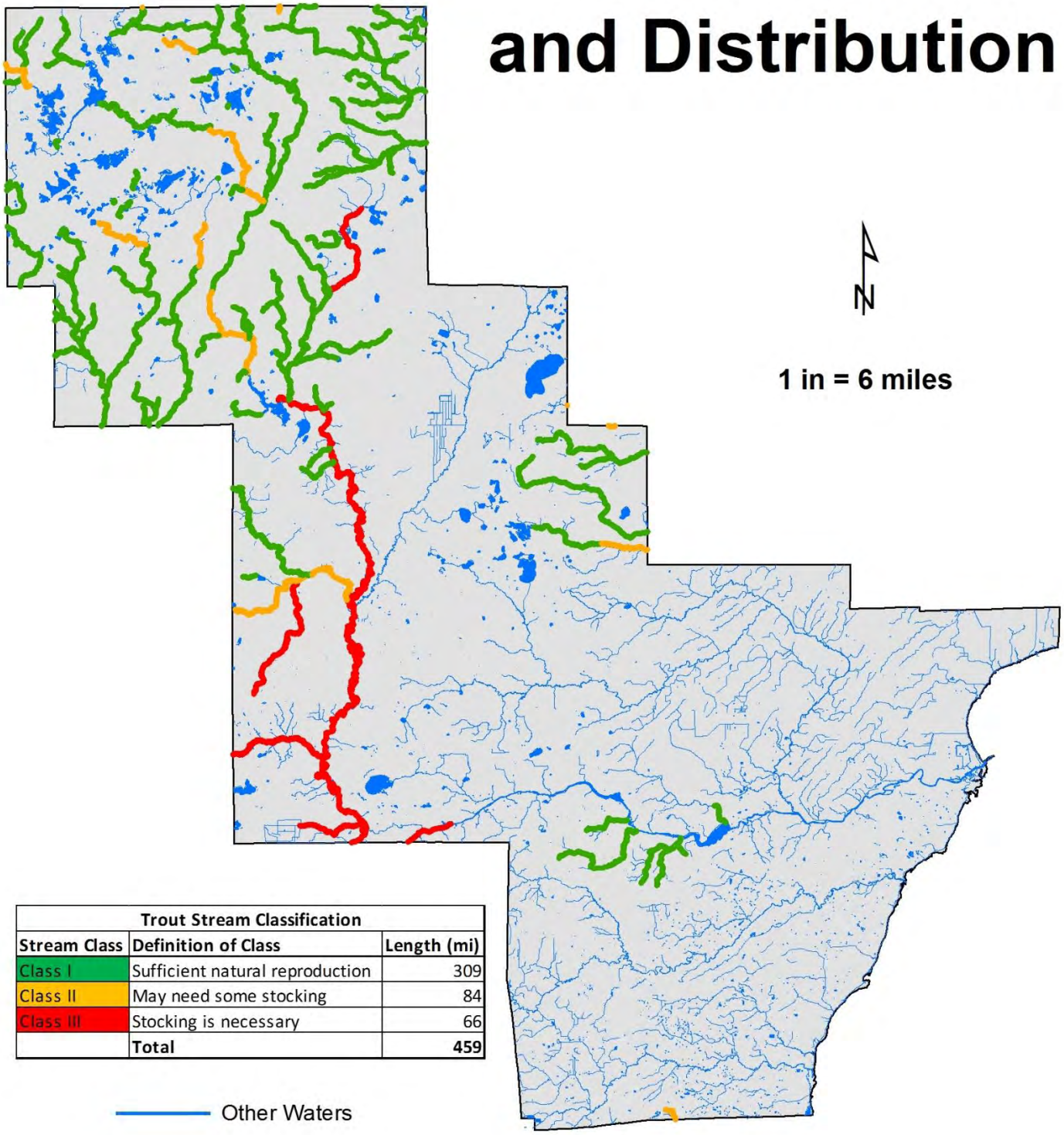
Name	Location
Anderson Lake	T30N, R17E, Section 3
Archibald Lake	T32N, R15E, Section 2
Bass Lake	T32N, R15E, Section 4
Berry Lake	T28N, R17E, Section 19
Boot Lake	T32N, R15E, Section 9
Boulder Lake	T31N, R15E, Section 21
Caldron Falls Reservoir	T33N R18E Section 10
Christie Lake	T28N, R18E, Section 19
Chute Pond	T31N, R16E, Section 36
Crooked Lake	T32N, R17E, Section 22
Horn Lake	T33N, R15E, Section 21
Kelly Lake	T29N, R19E, Section 6
Lake John	T33N, R16E, Section 16
Leigh Flowage	T30N, R19E, Section 30
Machickanee Flowage	T28N, R20E, Section 34
Maiden Lake	T32N, R16E, Section 7
Mary Lake	T32N R14E Section 1
Montana Lake	T30N R20E Section 30
Oconto Falls Pond	T28N, R19E, Section 26
Paya Lake	T32N, R16E, Section 10
Pickerel Lake	T33N, R15E, Section 11
Reservoir Pond and Explosion Lake	T33N, R15E, Section 28
Townsend Flowage	T33N, R15E, Section 22
Waubee Lake	T33N, R16E, Section 13
Waupee Flowage	T32N R17E Section 21
Wheeler Lake	T33N, R16E, Section 22
White Potato Lake	T31N, R18E, Section 23

Oconto County Major Rivers

Name	Location
First South Branch Oconto River	T31N, R16E, Section 31
Kelly Brook	T29N, R20E, Section 12
Little River	T28N, R21E, Section 30
Little Suamico River	T26N, R21E, Section 29
North Branch Little River	T28N, R21E, Section 30
North Branch Oconto River	T29N, R17E, Section 12
Oconto River	T29N, R22E, Section 16
Pensaukee River	T27N, R21E, Section 12
Peshtigo Brook	T29N, R17E, Section 12
South Branch Oconto River	T29N, R17E, Section 12

Source: Wisconsin Conservation Department, Wisconsin DNR

Oconto County Trout Stream Classification and Distribution



Trout Stream Classification		
Stream Class	**Definition of Class**	**Length (mi)**
Class I	Sufficient natural reproduction	309
Class II	May need some stocking	84
Class III	Stocking is necessary	66
	Total	**459**

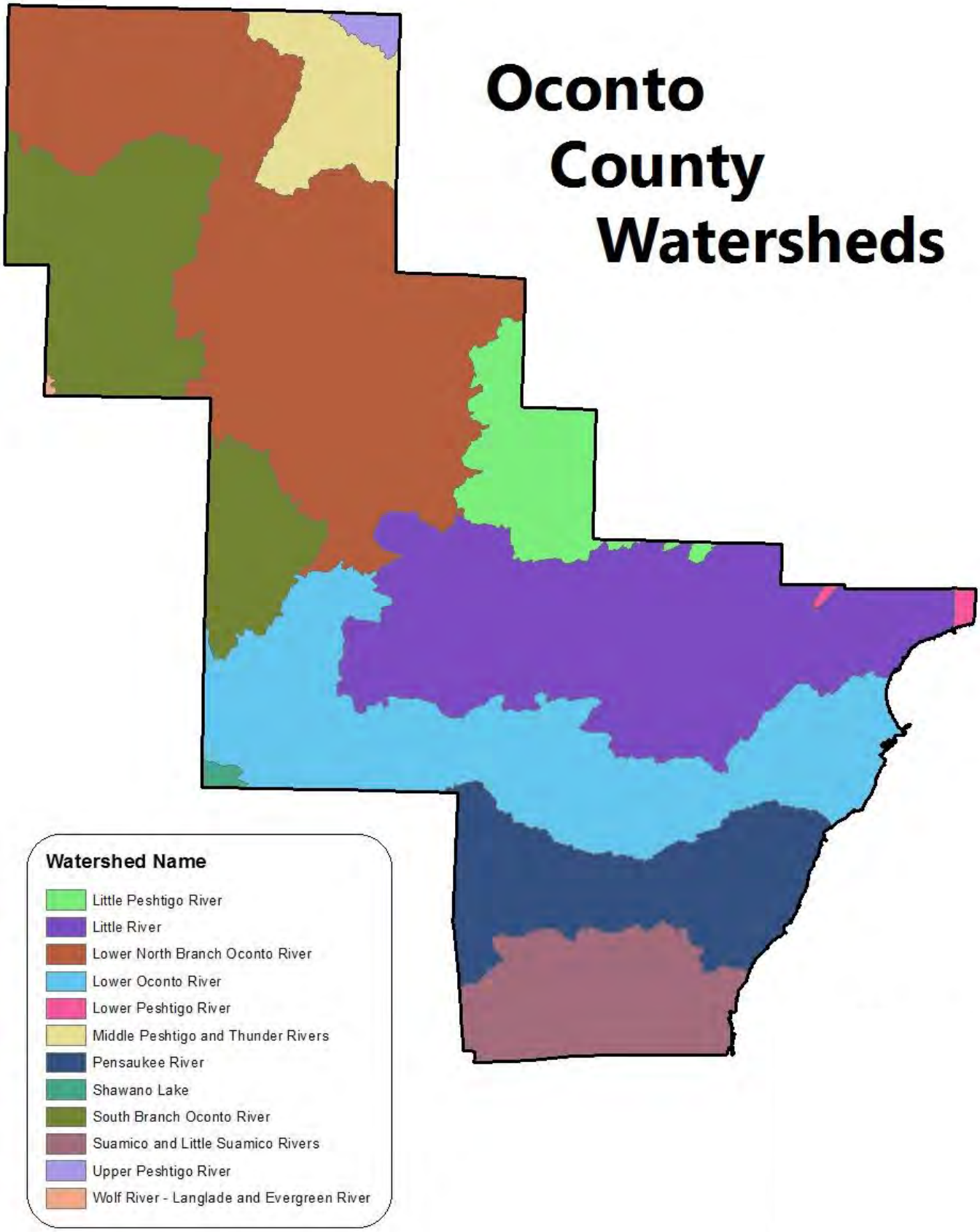
Watersheds

Oconto County consists of twelve watersheds, ten of which are part of the larger Lake Michigan Basin. All of these ten watersheds drain indirectly into Lake Michigan through the bay of Green Bay via one of the countyôs major rivers. Of those, there are six ómajorô watersheds in which most of the land area resides in the Oconto County boundary, two that are moderately contained within the county, and four of which have minute portions within the county. Following is a map of all the watersheds in the county, and maps showing respective major water resources and landmarks of each watershed excluding the four of which there are minute portions within the county. In addition, the aforementioned six major watersheds include detailed descriptions.

The extent of watershed evaluation from the Wisconsin DNR within Oconto County is minimal, but does exist. The studies and data available are present day observations and impart no indications of load reduction targets.

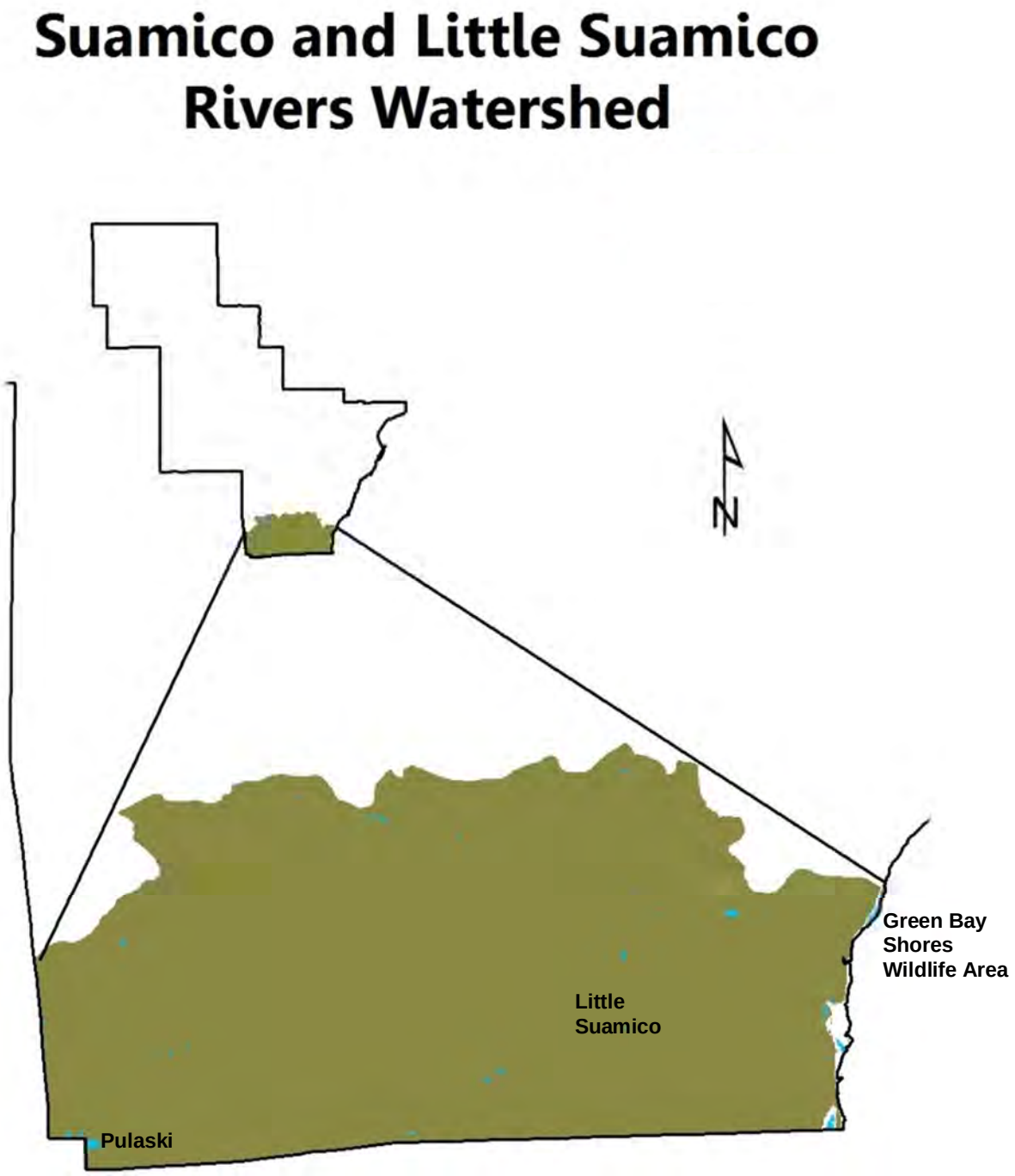
There were assessments from 2012 and 2013 of the Lower Oconto River Watershed by Andrew Hudak, a Water Quality Biologist with the DNR. These studies entailed water temperature monitoring, electroshock fish surveys, habitat surveys, and macroinvertebrate sampling in the Oconto River and select tributaries. Habitat quantity tended to be fair to good in all sampling locations. Fish surveys were ñconsistent with expectations,ò according to Hudak. In addition, macroinvertebrate survey results were variable throughout from poor to excellent. No contaminant data were available in this study; however, Hudak did find some signs of possible pollutant indicators that could spur future studies for specific pollutants at some sampling locations.

In addition, there was a DNR study of the Little Suamico River watershed with compiled data from 2005 to 2014. This study was even less thorough than the Lower Oconto, and most results were deemed as having been drawn from insufficient data.


Oconto County Watersheds
Watershed Name
Little Peshtigo River
Little River
Lower North Branch Oconto River
Lower Oconto River
Lower Peshtigo River
Middle Peshtigo and Thunder Rivers
Pensaukee River
Shawano Lake
South Branch Oconto River
Suamico and Little Suamico Rivers
Upper Peshtigo River
Wolf River - Langlade and Evergreen River

Suamico and Little Suamico River Watershed (GB01)

The Suamico and Little Suamico Rivers originate in eastern Shawano County and flow easterly to Green Bay. Near Green Bay and inland for several miles, wetlands are especially prominent and are valuable spawning habitat for Green Bay sport fish species. The primary land use in the watershed is agricultural with residential homes expanding out from the City of Green Bay. Nonpoint source pollution impacts the water quality in this watershed. In 2014 the Little Suamico River was designated by EPA on the 303(d) list with total phosphorus named as the major pollutant. Pulaski is the largest community in this watershed and their wastewater is piped to the City of Green Bay.



Pensaukee River Watershed (GB02)

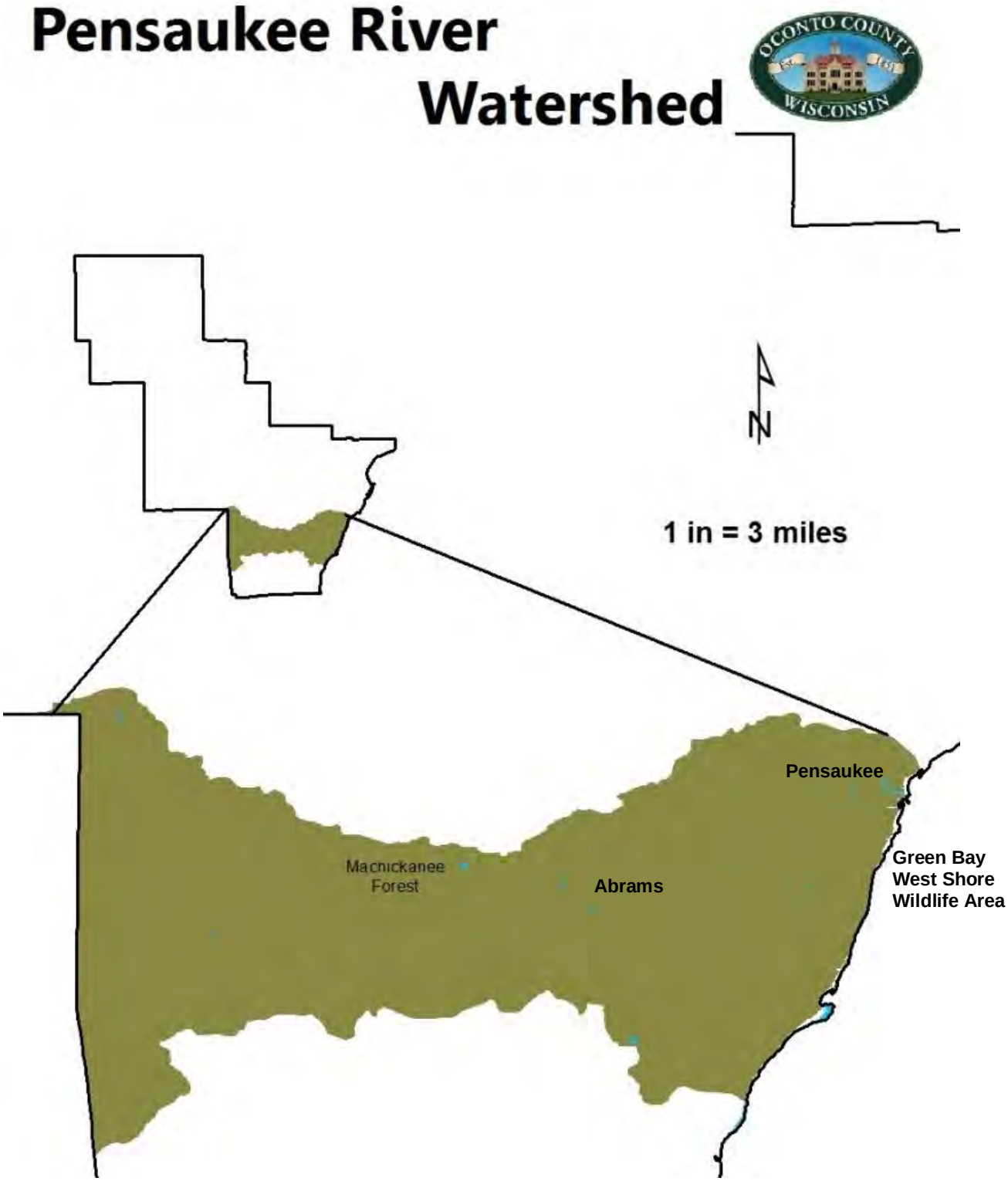
The Pensaukee River Watershed originates in eastern Shawano County and flows east through Oconto to Green Bay. The watershed has been involved in the ***nonpoint source pollution abatement program*** to deal with NPS problems. The overall water resource goals sought through this priority watershed are as follows:

- Protect, enhance and restore water quality of the streams of the subwatershed in order to improve the water quality of all the subwatersheds and ultimately Green Bay
- Protect, enhance and restore wetlands of the subwatersheds, especially focusing on the near shore areas of Green Bay in order to enhance fish spawning habitat, as well as within the headwater areas of the Pensaukee River for enhancing base flow
- Protect and enhance the groundwater resource from NPS especially through sinkholes or other internally drained areas

(Taken from *Nonpoint Source Control Plan for the Pensaukee River Priority Watershed Project* pp. 17)

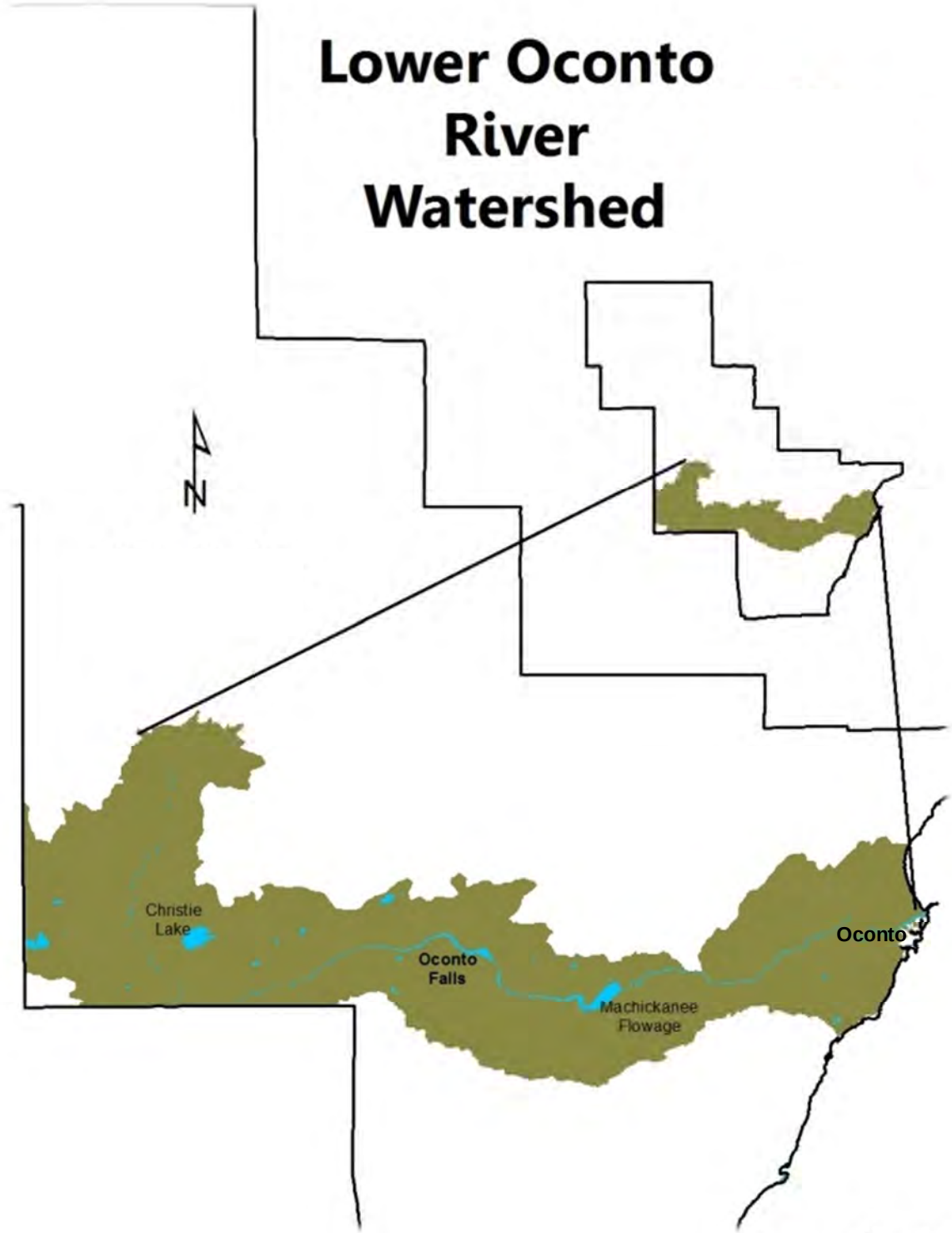
Individual subwatershed discussions, existing water quality conditions, NPS and goals and objectives can be found in the above referenced plan (DNR PUB-WT-484). The Pensaukee River Watershed plan is a 9 Key Element approved plan that will expire in 2018. In 2014 the Pensuakee River was designated by EPA on the 303(d) list with total phosphorus named as the major pollutant. This watershed is also valuable spawning habitat for some Green Bay sport fish species. The primary land use in the watershed is agricultural.

Pensaukee River Watershed



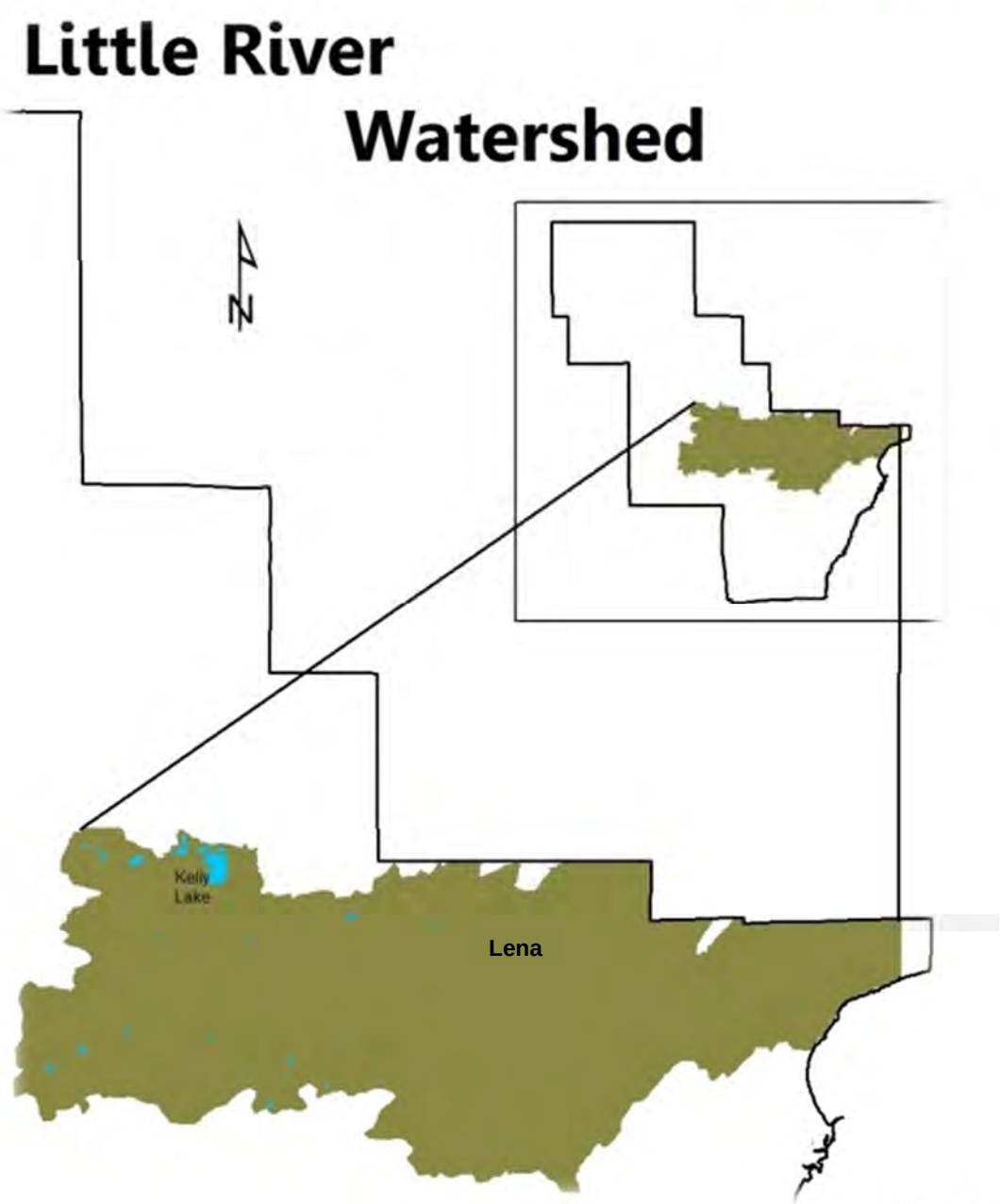
Lower Oconto River Watershed (GB03)

The Lower Oconto River Watershed is located in central Oconto County, with small portions extending into northern Shawano and eastern Menominee counties, and drains into Green Bay. Three hydroelectric power dams operate on the Oconto River in this watershed. There is agricultural activity along this stretch of the Oconto River. There are two sections of the lower Oconto River on the 303(d) list with the major pollutant being mercury. Oconto Falls and Oconto are the largest communities in this watershed.



Little River (GB04)

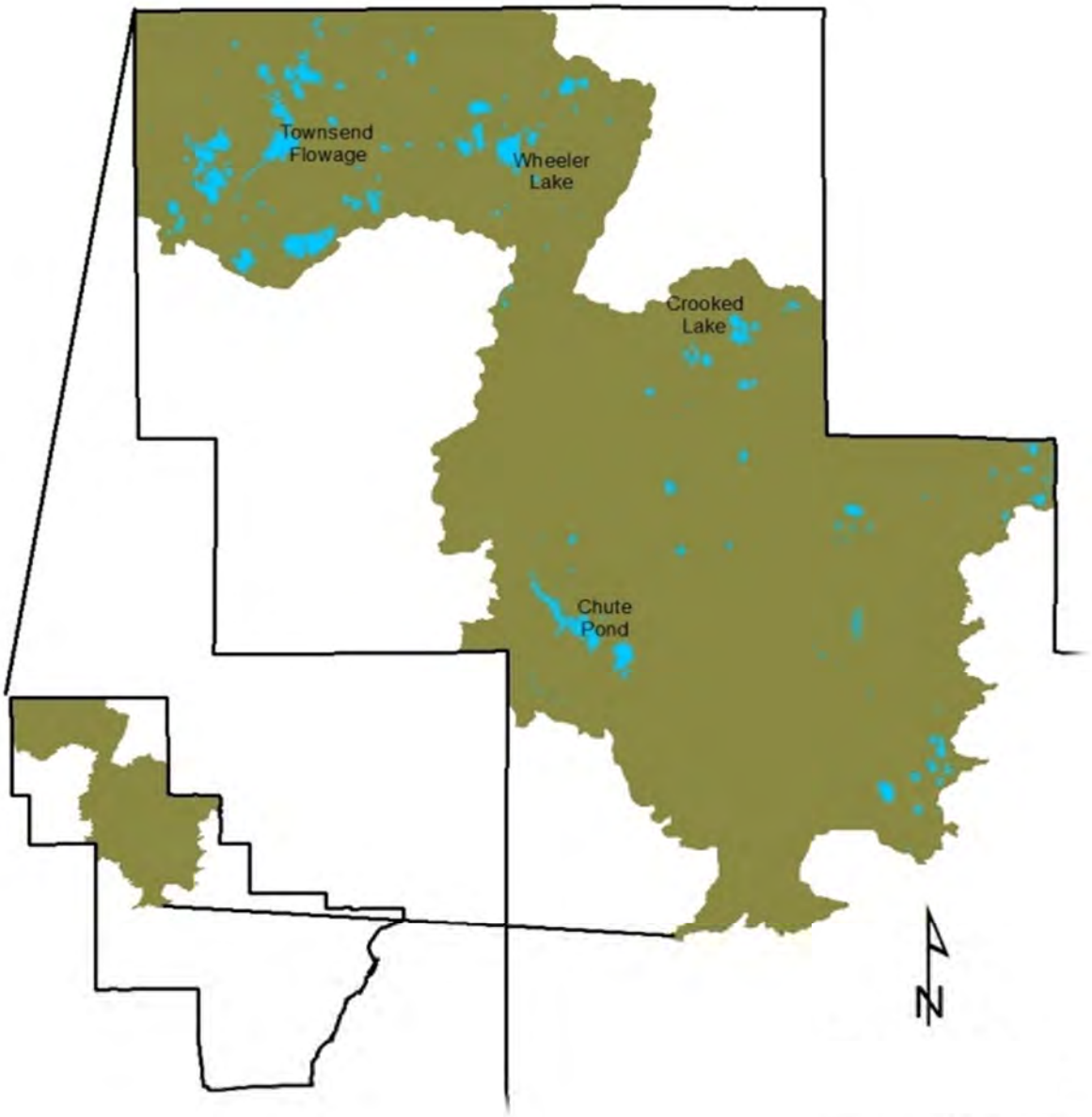
The Little River Watershed is located mostly in Oconto County with a small area in Marinette County. The Little River is a major tributary to the Oconto River. Agricultural activities comprise the principle land use. As a consequence, the watershed had been designated as a priority watershed project area during the late 1980's and early 90's due to NPS pollution. The plan, published in 1986 (DNR PUB WR-226-86), sought to reduce NPS from upland erosion, streambank erosion, barnyard runoff and manure spreading runoff. In 2014 the Little River was designated by EPA on the 303(d) list with total phosphorus named as the major pollutant (the complete plan titled *A Nonpoint Source Control Plan for the Little River Priority Watershed Project* can be referenced with the numbers above). The project period has expired with NPS problems still existing in the watershed. Lena is the largest community in this watershed.



Lower North Branch Oconto River (GB05)

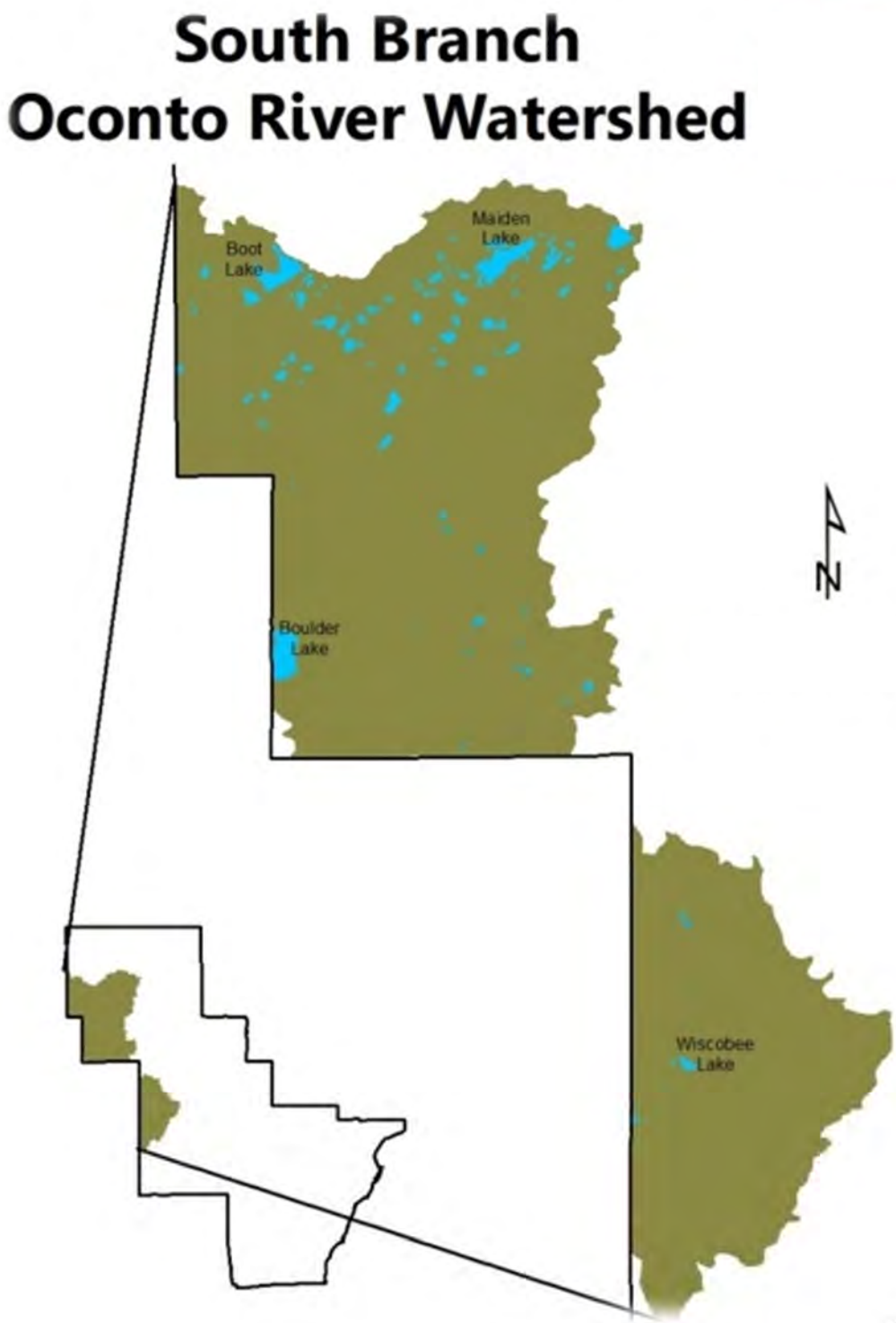
The Lower North Branch Oconto River Watershed lies in central Oconto County and small portions extend into Marinette and Menominee Counties, along with overlapping into the Headwaters Basin (Forest and Langlade Counties). There are a number of inland lakes scattered throughout the basin and wetlands are abundant in the southeastern portion of the watershed. A large portion of the watershed is forested with some areas of agricultural lands found in the lower reaches of Peshtigo Brook.

Lower North Branch Oconto River Watershed



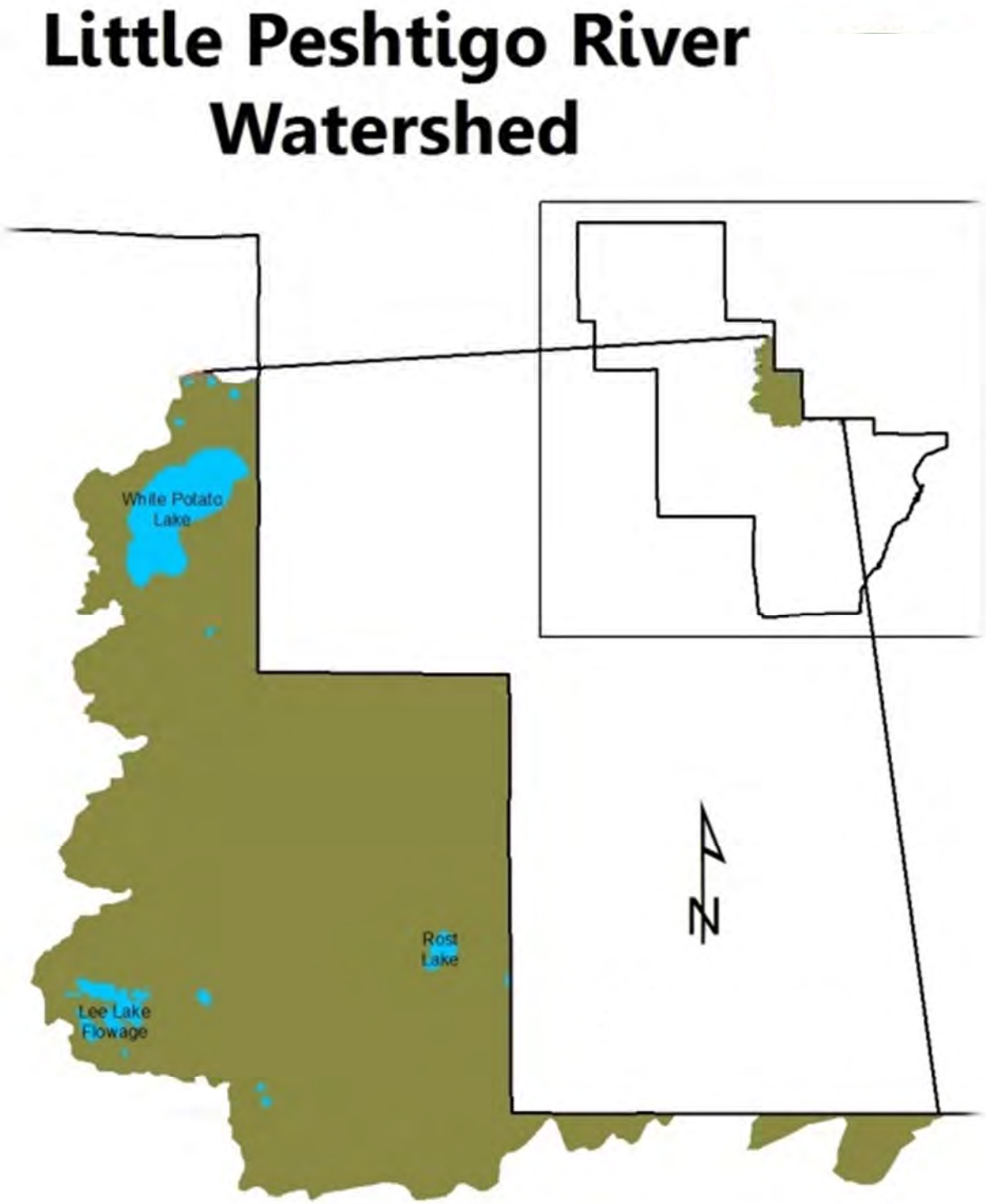
South Branch Oconto River (GB06)

The South Branch Oconto River Watershed is situated in west-central Oconto County, extending in Menominee County and a small portion of Langlade County (Headwaters Basin). The majority of streams in this watershed are trout waters as can be referenced in the preceding Trout Stream Classification map in the surface water section. Most of the inland lakes are located in the northern half, and more scattered wetland areas are found in the southern half of the watershed.

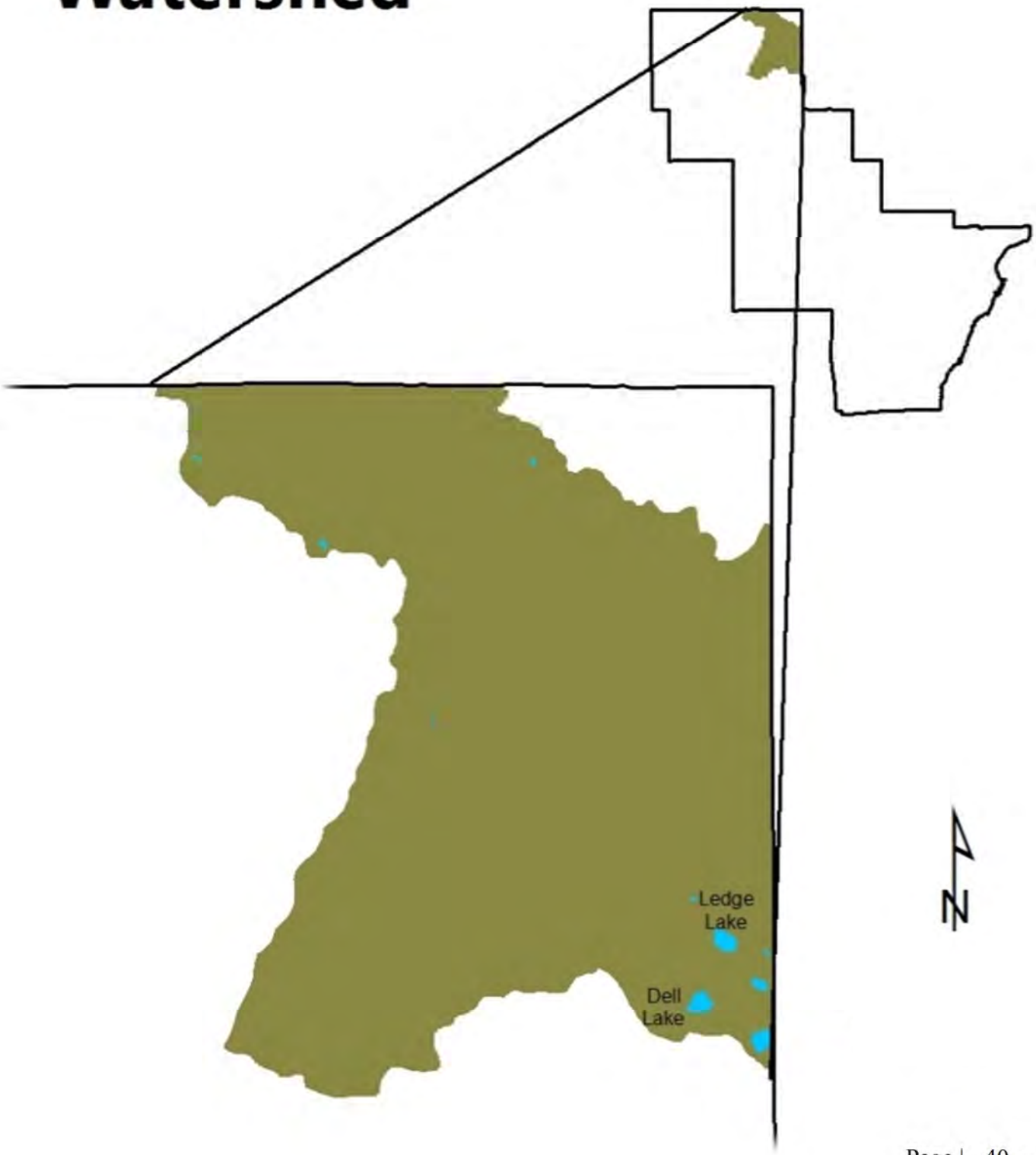


Little Peshtigo River and Middle Peshtigo and Thunder Rivers Watersheds

The Little Peshtigo River and the Thunder River head waters start in Oconto County with the majority of the watershed in Marinette County. The Thunder River is comprised of mainly forest, while the Little Peshtigo watershed has a mix of agriculture and forest.



Middle Peshtigo and Thunder Rivers Watershed



Surface Water Quality

Of the 12 watersheds within the county, five lie primarily within the boundaries of the Nicolet National Forest. As a result, these watersheds have lower potential for water quality problems due to a lack of agriculture and development related pressures. The remaining watersheds: the southern portions of the South Branch Oconto, Lower Oconto, Little River, Little Peshtigo, Lower Peshtigo, Little Suamico and Pensaukee all have a higher potential for contamination. This is a result of increased development and agriculture.

The Little River, Little Suamico and the Pensaukee River Watersheds have been designated on the EPA 303d list with total phosphorus identified as the major pollutant. If staff and funding is available, Oconto County intends to develop 9 Key Element plans for these watersheds in the future.

Nonpoint water pollution issues that have been identified as concerns in the county are:

- Cropland Soil Erosion - most prevalent in the middle and southern townships
- Construction Site Soil Erosion - most critical along shorelines
- Streambank Erosion - occurs along streams in agricultural areas
- Animal Waste Management - particularly among medium-sized and expanding dairies
- Stormwater Runoff - rural subdivisions in the northern and southern part of the county
- Pesticide and Fertilizer Runoff - agriculture and residential
- Improper Well Abandonment - isolated throughout the county
- Recreational Use Pressure - northern lakes area, county and federal forest.

The lower two-thirds of the county from roughly HWY 64 south is the concentrated agricultural and budding urban sprawl from Brown County. The northern one third of the county from roughly HWY 64 north is forested land with small agricultural impacts. The size of the county, and somewhat marked change in resource concerns from south to north, requires two different avenues of response in combating surface water impacts.

Impaired Waters (EPA-303d list)

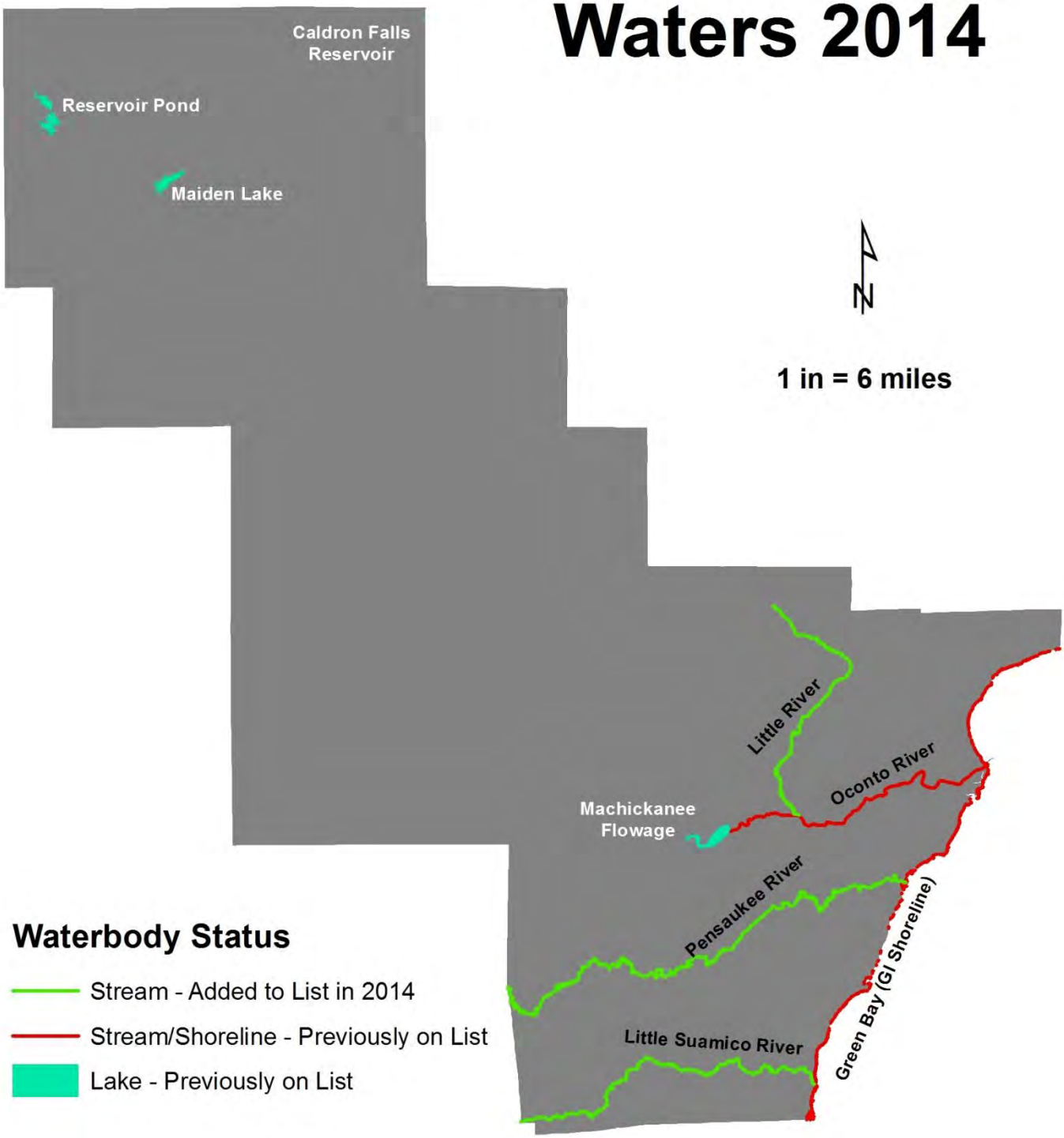
Under the requirements of the Environmental Protection Agency, a listing of waters under the Clean Water Act (s.303d) must occur every two years. This list, which identifies waters not meeting water quality standards, has been characterized as an impaired waters list. Oconto County waters on the ***303d impaired waters*** may be listed as a result of airborne or waterborne contamination. Mercury contamination, or PCBs, account for the main reasons for ***Fish Consumption Advisory (FCA)*** and are on Maiden Lake, Lower Oconto River, Machickanee Flowage, Reservoir Pond and Caldron Falls. The Little Suamico River, Little River and Pensaukee River are all listed for total phosphorus. These waters first appeared on the 2014 EPA approved 303d list which is shown on page 42 in table format and page 43 in map format.

Oconto County 303d Waters

Waterbody Name	County	Water Type	Total Miles/ Acres	DNR Category	Date Listed	Source Category	Pollutant	Impairment Indicator	TMDL Priority
Caldron Falls	Oconto / Marinette	Impoundment	1018 Acres	5B	4/1/1998	ATM.DEP.	Mercury	Contaminated Fish Tissue	Medium
Little River	Oconto	River	60.63 Miles	5P	4/1/2014	PS/NPS	Total Phosphorus	Impairment Unknown	Low
Little Suamico River	Oconto	River	23.78 Miles	5A	4/1/2014	PS/NPS	Total Phosphorus	Degraded Biological Community	Low
Machickanee Flowage	Oconto	Impoundment	435 Acres	5B	4/1/1998	ATM.DEP.	Mercury	Contaminated Fish Tissue	Medium
Maiden Lake	Oconto	Lake	269 Acres	5B	4/1/1998	ATM.DEP.	Mercury	Contaminated Fish Tissue	Medium
Oconto River	Oconto	River	14.16 Miles	5A	4/1/1998	Contam. Sediment	Mercury	Contaminated Fish Tissue	Low
Pensaukee River	Oconto	River	60.4 Miles	5P	4/1/2014	PS/NPS	Total Phosphorus	Impairment Unknown	Low
Reservoir Pond	Oconto	Impoundment	409 Acres	5B	4/1/1998	ATM.DEP.	Mercury	Contaminated Fish Tissue	Medium

Abbreviations: ATM.DEP – Atmospheric Deposition, PS – Point Source, NPS – Nonpoint Source

Oconto County 303D Impaired Waters 2014



Outstanding and Exceptional Resource Waters

Wisconsinôs ñOutstanding and Exceptional Resource Water Programò was designated by the state to maintain water quality in Wisconsinôs cleanest waters. Within Oconto County there are nine named bodies of water that are classified as Outstanding Resource Waters and an additional 35 that are classified as Exceptional Resource Waters. A complete list of these waters is shown below. Not shown on the list are those surface waters that are not formally named, however, they are included on the map. Oconto County contains 68 unnamed creek segments that fall into that category and are also classified as Exceptional Resource Waters.

The majority of the following list of surface waters, cited from the Wisconsin DNR, tends to be in the forested northern region of Oconto County, with the exception of the South Branch Oconto River which flows through the northern part of the agricultural region of the county. Zoning regulations will be the primary tool to protect these waters from overdevelopment. The South Branch Oconto River with the limited agricultural influence will be protected by the state runoff standards and the Oconto County Animal Waste Management Ordinance.

Waterbodies designated as Outstanding Resource Waters (ORW)

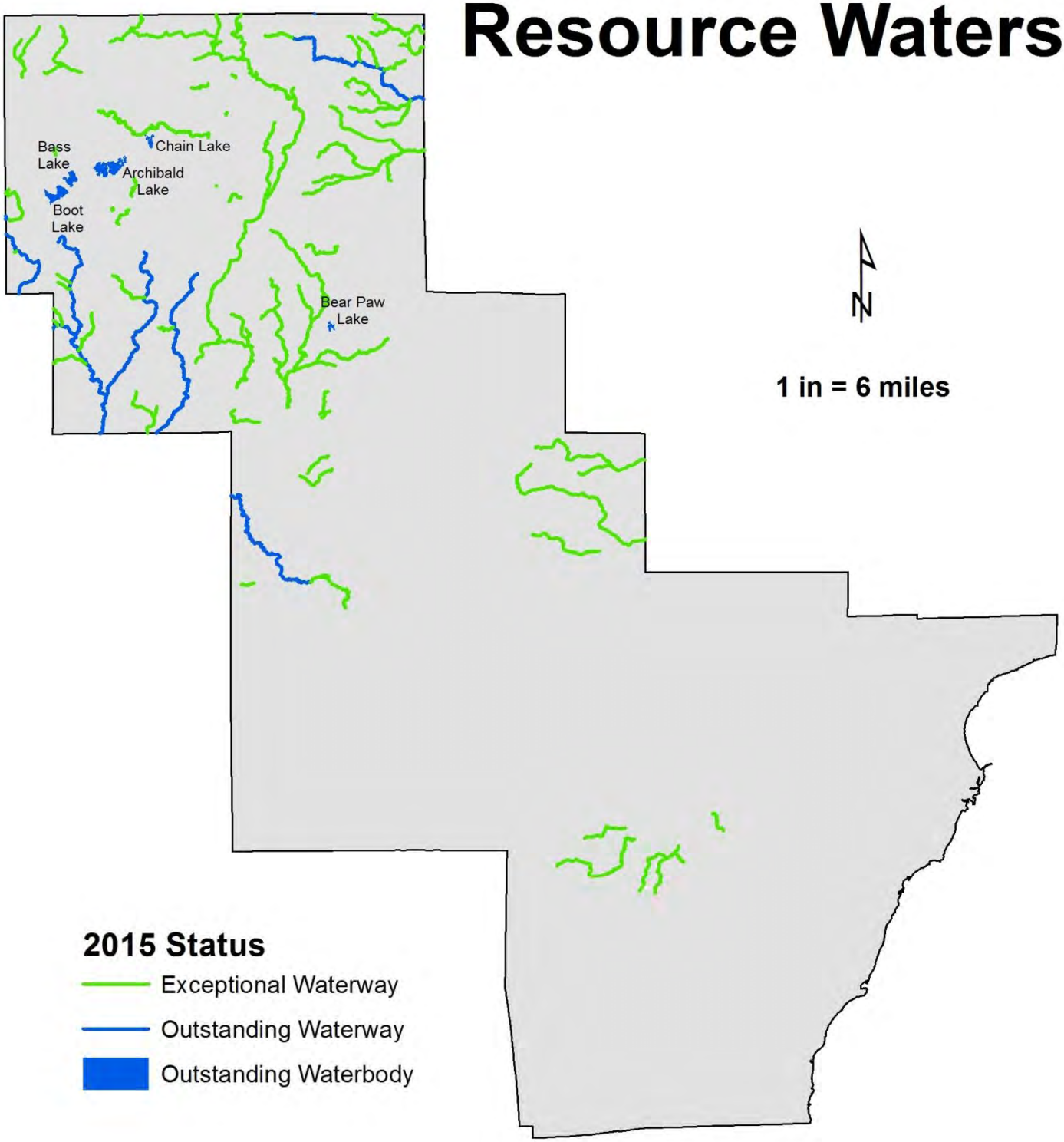
Name	Portion
Archibald Lake	All
Bass Lake (T32N R15E S9)	All
Bear Paw Lake	All
Boot Lake	All
Chain Lake	All
First S Branch Oconto River	Below Hwy 32
Hills Pond Creek	All
S Branch Oconto River	Above Menominee Reservation to Hwy 32
Second S Branch Oconto River	Below junction with Deadman Creek

Waterbodies designated as Exceptional Resource Waters (ERW)

Name	Portion
Archibald Creek	All
Baldwin Creek	All
Battle Creek	All
Bonita Creek	All
Brehmer Creek	All
Coopman Creek	All
Dump Creek	All
E Fork Thunder Creek	All
Fenske Creek	Below S8 T33N R16E
Forbes Creek	All
Hay Creek	All
Hines Creek	All
Jones Creek	All
Knowles Creek	All
Little Waupee Creek	All
McCaslin Brook	Above Hwy F to Townsend Flowage
McCauley Creek	All
McDonald Creek	All
McPherson Creek	All
Messenger Creek	Above Hwy B
Mosquito Creek	All
Mountain Creek	All
N Branch Oconto River	Above Hwy 32
N Branch Oconto River	Hwy 32 to Chute Pond
N Fork Thunder River	All
Pat Creek	All
S Branch Beaver Creek	All
S Branch Oconto River	Hwy 32 to mouth
S Fork Thunder River	All
Shadow Creek	All
Snowfalls Creek	All
Splinter Creek	Below S28 T28N R20E
W Thunder Creek	All
Waupee Creek	McCauley Creek to old Hwy 64
Wiscobee Creek	Above Wiscobee Lake

A good depiction of the aforementioned distribution of these waters favoring the northern portion of the county can be seen in the map on page 46.

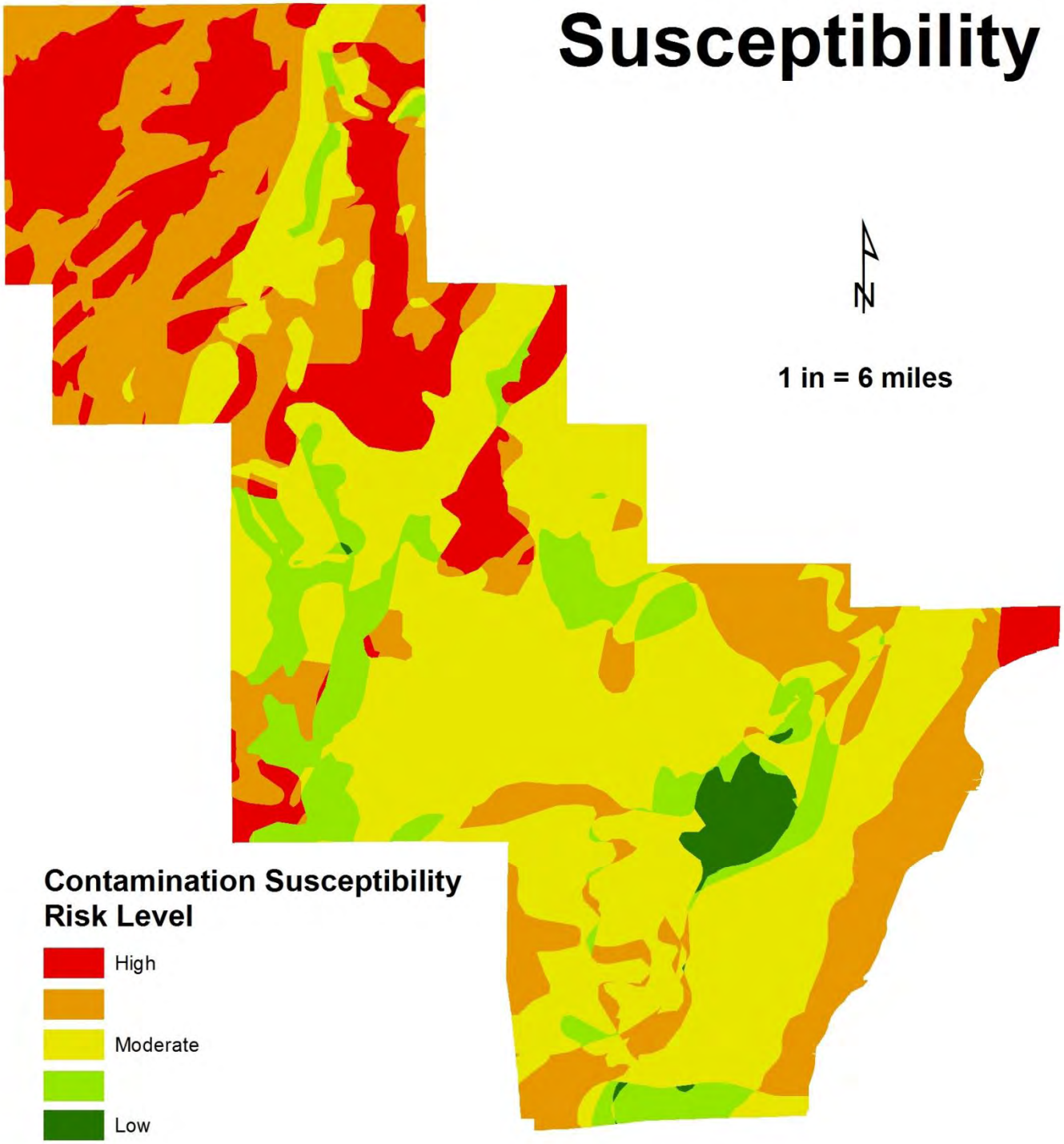
Oconto County Outstanding and Exceptional Resource Waters



Groundwater

In the southern half of the county, groundwater resides in the sedimentary rocks of the Cambrian and Ordovician. These sedimentary rocks thicken in a southeasterly direction. Wells near Lena and Oconto Falls are approximately 450 feet deep and may yield up to 500 gallons per minute. Shallow wells in the area draw water from overlying glacial drift, which yields lower volumes of water. The northwestern half of the county is underlain by crystalline rock. Water availability is hard to predict and must come from glacial drift aquifers situated above the bedrock. Yields from these glacial deposits can be expected to be approximately 200-500 gallons per minute. The overall quality of groundwater in Oconto County is generally very good. According to the DNR, there are some northern areas that could be susceptible to groundwater contamination due to shallow soils over bedrock or sandy soils as seen in the following map. Past testing has resulted in minimal occurrences being reported of wells exceeding standards for nitrates. No discernible patterns of contamination linked to nitrates have been documented. The map shows groundwater contamination susceptibility within the county based on DNR data.

Oconto County Groundwater Contamination Susceptibility



Wildlife and their Habitat

Wildlife habitat can be defined as areas that provide the arrangement of food, water, cover and space required to meet the biological needs of an animal. Different wildlife species have different requirements and these requirements vary over the course of a year. Also, different plants provide fruit and food in different seasons. Maintaining a variety of habitats generally benefits a much desired diverse wildlife. Woodlands, wetlands, floodplains and the water features within the county provide habitat for many species of wildlife. White-tailed deer, raccoon, opossum, turkey, grouse, pheasant, gray/red/fox squirrel, black bear, wolf, coyote, fox, muskrat, snowshoe and cottontail rabbit, mink, otter and chipmunks are some of the more well-known species found in Oconto County. The inland surface waters and those of the bay of Green Bay provide habitat for fish such as walleye, bass, catfish, pan fish, sturgeon, trout, sucker, musky, northern, carp, as well as migratory fowl that frequent the area.

Rare, Threatened, and Endangered Species

Oconto County has over 133 rare animal species occurring within the county, including three federally listed species. Oconto County also has 33 state endangered or threatened species and one species of special concern. The following table lists all of the endangered and threatened species.

Species Classification	Common Name	State Listing	Federal Listing
Bird	**Bald Eagle**	Special Concern	Threatened
Bird	**Common Tern**	Endangered	
Bird	**Forster's Tern**	Endangered	
Bird	**Loggerhead Shrike**	Endangered	
Bird	**Piping Plover**	Endangered	Endangered
Bird	**Red-necked Grebe**	Endangered	
Bird	**Red-Shouldered Hawk**	Threatened	
Bird	**Yellow Rail**	Threatened	
Butterfly	**Karner Blue Butterfly**	Endangered	Endangered
Butterfly	**Northern Blue Butterfly**	Endangered	
Butterfly	**Swamp Metalmark**	Endangered	
Fish	**Greater Redhorse**	Threatened	
Fish	**Longear Sunfish**	Threatened	
Fish	**Redfin Shiner**	Threatened	
Herptile	**Eastern Massasauga Rattlesnake**	Endangered	Future Candidate
Herptile	**Western Ribbon Snake**	Endangered	
Invertebrate	**Pygmy Snaketail**	Threatened	
Invertebrate	**Slippershell Mussel**	Threatened	
Mammal	**Timber Wolf**	Threatened	Threatened
Plant	**Bog Bluegrass**	Threatened	
Plant	**Braun's Holly-Fern**	Threatened	
Plant	**Dwarf Huckleberry**	Endangered	
Plant	**Dwarf Milkweed**	Threatened	
Plant	**Fairy Slipper**	Threatened	
Plant	**Hert-Leaved Foam-Flower**	Endangered	
Plant	**Little Goblin Moonwort**	Endangered	
Plant	**Marsh Valerian**	Threatened	
Plant	**Pale Green Orchid**	Threatened	
Plant	**Ram's-Head Lady's-Slipper**	Threatened	
Plant	**Round-Leaved Orchid**	Threatened	
Plant	**Seaside Crowfoot**	Threatened	
Turtle	**Blanding's Turtle**	Threatened	
Turtle	**Wood Turtle**	Threatened	

Source: Wisconsin Department of Natural Resources, 2006.

Significant Natural Areas

A number of sites located within the county may be considered significant natural features. These areas may be designated as WDNR State Natural Areas, State Wildlife and Fishery Areas, Significant Coastal Wetlands, Land Legacy Places; or be included in the ñNatural Areas Inventory,ò conducted by the Scientific Areas Preservation Council of the WDNR. Definitions of these designations are in *Volume II: 20 Year Comprehensive Land Use Plan 2014*. Below is a table summarizing these designations within their respective Natural Areas.

Natural Areas Inventory

The ñNatural Areas Inventoryò (NAI) was conducted in 1976 and updated in 1980 under the direction of the Scientific Areas Preservation Council (SAPC) of the WDNR to identify natural areas along Wisconsinôs Lake Michigan and Lake Superior coasts. The SAPC defined the NAI sites as ñtract[s] of land or water so little modified by manôs activity or sufficiently recovered that they contain intact native plant and animal communities believed to be representative of the pre-settlement landscapeò. The SAPC identified NAI sites independently of the State Natural Areas program; as a result, some sites fall under both programs.

Significant Natural Area	Designation				
	State Natural Area	State Wildlife and Fishery Area	Significant Coastal Wetland	Land Legacy Place	Natural Area Inventory
Barney Creek	X				
Battle Creek Hemlocks	X				
Bonita Country	X				
Brazeau Swamp				X	
Camp Five Lake	X				
Cathedral Pines	X				
Charles Pond	X		X		
Charles Pond Unit - Green Bay West Shores		X			X
Chequamegon-Nicolet National Forests				X	
Copper Culture Cemetery					X
County Line Swamp			X		X
Diamond Roof	X				
Forbes Springs	X				
Glocke Lake	X				
Hagar Mountain	X				

LaFave Swamp	**X**				
Mud Creek Wetland			**X**		
Nelligan Lake	**X**				
North Branch Bottoms	**X**				
Oconto County Forest					**X**
Oconto Marsh			**X**	**X**	
Oconto Marsh Unit - Green Bay West Shores		**X**			**X**
Oconto River				**X**	
Oconto River (South-Branch) Fishery Area		**X**			
Pecor Point Unit - Green Bay West Shores		**X**			**X**
Pensaukee Lacustrine Forest					**X**
Pensaukee River Wetland Complex			**X**		
Pensuakee Unit - Green Bay West Shores		**X**			**X**
Peshtigo Brook Wildlife Area		**X**			
Peshtigo Harbor Unit - Green Bay West Shores		**X**			**X**
Priest Rock	**X**				
Rush Point Unit - Green Bay West Shores		**X**			**X**
Snow Falls Creek	**X**				
South Branch Beech Grove	**X**				
Suamico, Little Suamico and Pensaukee Rivers				**X**	
Sunrise Lake	**X**				
Tar Dam Pines	**X**				
Thunder Mountain	**X**				
Thunder River Swamp	**X**				
Tibbett Suamico Unit - Green Bay West Shores		**X**			**X**
Waupee Lake Swamp	**X**				
West Shore Green Bay Wetlands				**X**	

Source: Wisconsin Department of Natural Resources, 2006.

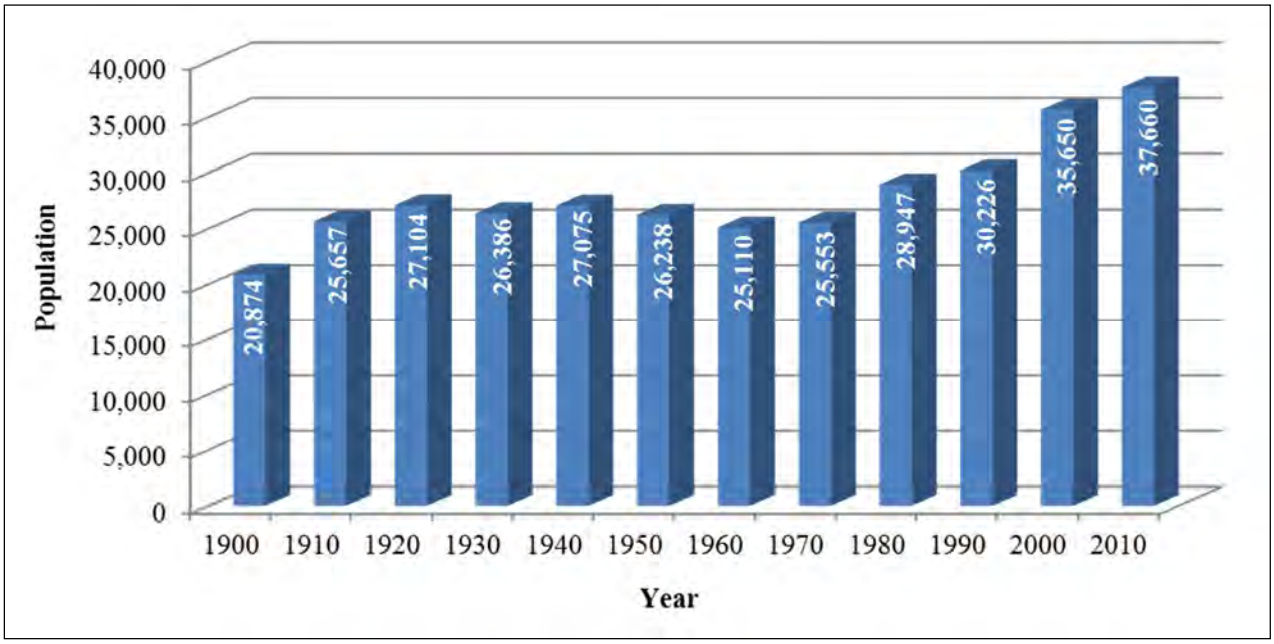
Demographics

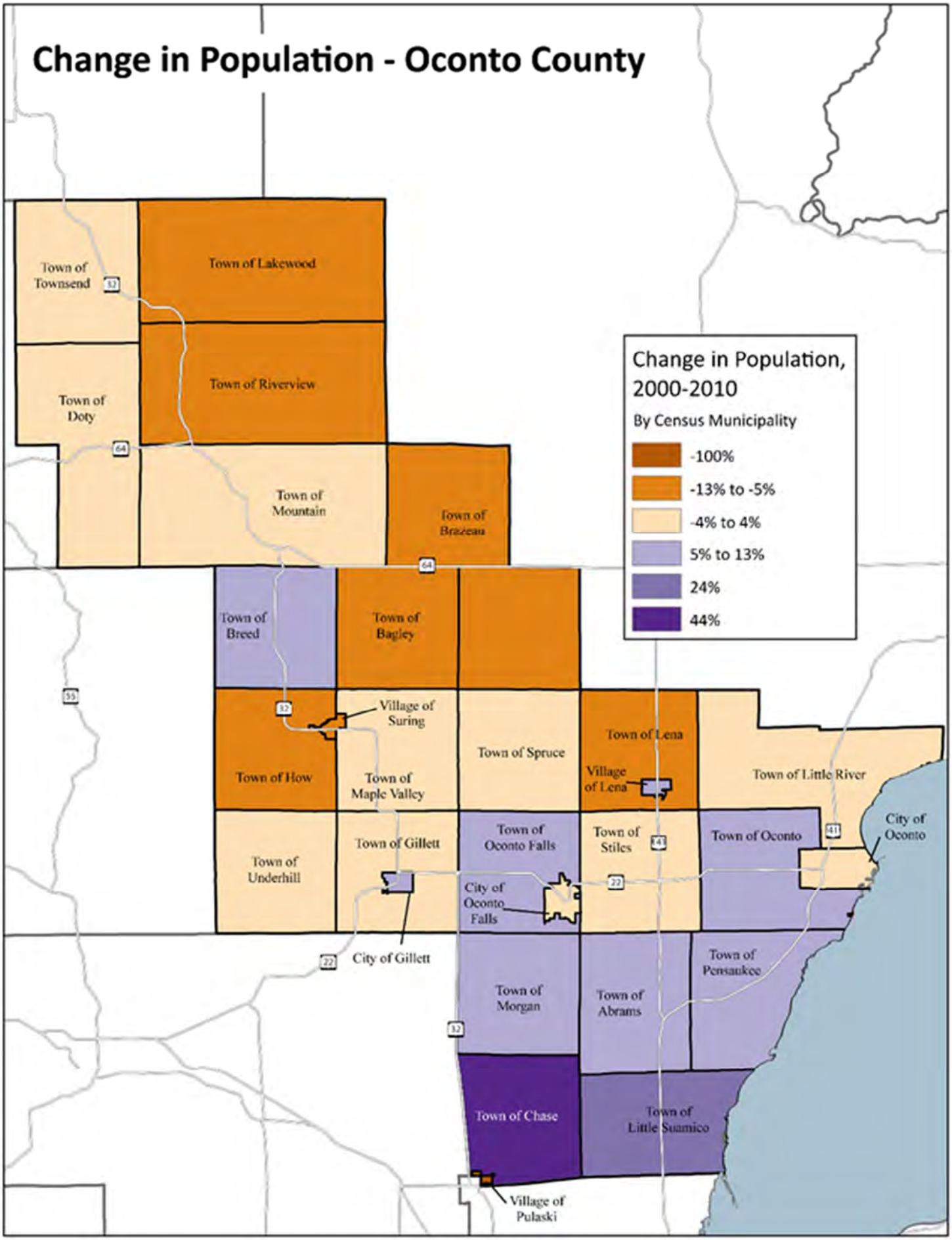
Oconto County's highest population level of 39,567 in 2010 reflected a 90 percent or 18,693 person increase since 1900. The largest periods of population expansion in the county occurred between 1900 and 1910 and between 1990 and 2000 with increases of 23 and 18 percent, respectively. In contrast, the county experienced sizable losses in population leading up to the 1930, 1950, and 1960 U.S. Census counts when the local farming industry was struggling, and more people elected to relocate to metropolitan areas like the City of Green Bay to live and work. The fastest growth rates are mostly in the towns. Together they accounted for 90 percent of the population gain over the decade. Little Suamico town is now the largest municipality in the county.

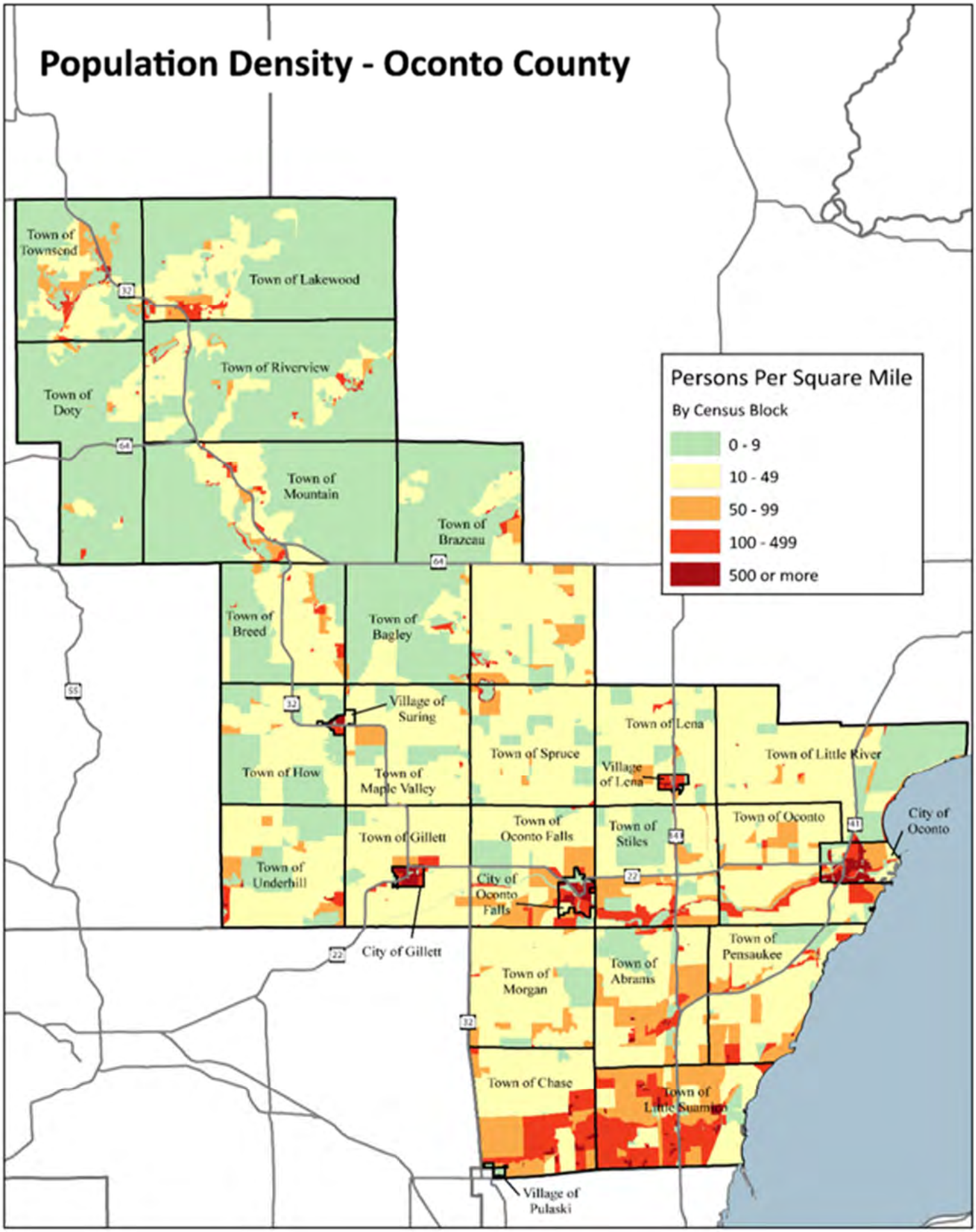
According to Wisconsin Department of Administration, Oconto County is projected to have a population peak of 45,430 in 2035. This represents an increase 20.6 percent from the 2010 Census count of 37,660. WDOA projections show potential population declines for many of the northern counties in the state including Oconto County. For Oconto County, WDOA projects that the Oconto County population will begin to decline after 2035. The main reason for this projected population decrease for many of these northern counties is due to the higher percentages of older residents being affected by natural decrease as time progresses.

In addition, as of 2010 the county had an estimated 17,001 additional people in the county considered seasonal residents. A large majority of those individuals maintain seasonal homes in the northern part of the county. By 2020 it is estimated that there will be an additional 1,451 person increase in the seasonal population from the 2015 figure. Graphical representation of the historical population numbers can be seen in the following table and maps.

Oconto County Population 1900-2010




Change in Population - Oconto County
Town of Townsend
Town of Lakewood
Town of Riverview
Town of Doty
Town of Mountain
Town of Brazeau
Town of Breed
Town of Bagley
Village of Suring
Town of How
Town of Maple Valley
Town of Spruce
Town of Lena
Village of Lena
Town of Little River
City of Oconto
Town of Underhill
Town of Gillett
City of Gillett
Town of Oconto Falls
City of Oconto Falls
Town of Stiles
Town of Oconto
Town of Morgan
Town of Abrams
Town of Pensaukee
Town of Chase
Town of Little Suamico
Village of Pulaski
Change in Population, 2000-2010
By Census Municipality
-100%
-13% to -5%
-4% to 4%
5% to 13%
24%
44%


Population Density - Oconto County
Town of Townsend
Town of Lakewood
Town of Riverview
Town of Doty
Town of Mountain
Town of Brazeau
Town of Breed
Town of Bagley
Village of Suring
Town of How
Town of Maple Valley
Town of Spruce
Town of Lena
Village of Lena
Town of Little River
Town of Oconto
City of Oconto
Town of Gillett
Town of Oconto Falls
Town of Stiles
Town of Underhill
City of Oconto Falls
City of Gillett
Town of Pensaukee
Town of Morgan
Town of Abrams
Town of Chase
Town of Little Suamico
Village of Pulaski
Persons Per Square Mile
By Census Block
0 - 9
10 - 49
50 - 99
100 - 499
500 or more

Economy

Oconto is a rural community with agriculture as the predominant land use. The recent agriculture study shows that there are more cows than people within the county. Agriculture is an important economic element in Oconto County. It includes hundreds of family-owned farms as well as agriculture related businesses and industries that provide equipment, services and other products farmers need to process, market and deliver food to consumers. The production, sales and processing of Oconto Countyôs farm products generate employment, economic activity, income and tax revenue. In 2012, Oconto County ranked ninth in the state and in the top 100 nationally for Christmas tree and woody shrub production. Oconto County also ranked twenty-second in the state and in the top one hundred nationally for dairy production.

The following table shows employment by major industry group for Oconto County as of 2008. The countyôs labor force increased by an estimated 1,754 workers, or 9.5 percent, from 2000 to 2012. The number of unemployed Oconto County residents has fluctuated from 682 or 3.5 percent in 2000 compared to 1,479 or 7.4 percent in 2013. In 2000, 29 percent of employed county residents worked in manufacturing followed by educational, health and social services at 15 percent. The remaining 56 percent of the employed population was evenly distributed among the other 11 industries. These percentages are similar to those of the state. Manufacturing remains the economic engine for the county and is strongly supported by the educational, health and social services industry.

Employed Persons by Industry Group, Oconto County and State of Wisconsin

Industry	Oconto County		Wisconsin	
	Number	Percent	Number	Percent
Agricultural, forestry, fishing and hunting, and mining	1,112	6.3	75,418	2.8
Construction	1,346	7.6	161,625	5.9
Manufacturing	5,126	29.0	606,845	22.2
Wholesale trade	463	2.6	87,979	3.2
Retail trade	1,517	8.6	317,881	11.6
Transportation and wharehousing, and utilities	1,263	7.1	123,657	4.5
Information	210	1.2	60,142	2.2
Finance, insurance, real estate, and rental and leasing	733	4.1	168,060	6.1
Professional, scientific, administrative, and waste management	730	4.1	179,503	6.6
Educational, health, and social services	2,723	15.4	548,111	20.0
Arts, entertainment, recreation, accomadation, and food service	1,286	7.3	198,528	7.3
Other services (except public administration)	640	3.6	111,028	4.1
Public administration	531	3.0	96,148	3.5
Total	17,680	100.0	2,734,925	100.0

Source: U.S. Bureau of the Census, 2000 Census.

Chapter 2

The Planning Process, Public Participation and Identification of Concerns

Participants in Plan Development

The development of this plan was led by the Oconto County LCD who gathered input and assistance from the Land Conservation Committee and a ***citizens advisory committee (CAC)*** representing a variety of locals and interests. In addition, a ***technical advisory committee (TAC)*** was formed for professional input to accompany the CACs decision making.

The CAC was comprised of seven members, half of which were new to the plan development process. Members brought with them a wide range of views from agriculture, business, riparian property ownership, education, local government, lake associations, realty and outdoor recreation. A list of CAC members is located on the credits page of this plan. Our appreciation must go out to the dedicated members who attended numerous meetings while energizing the contents of this plan.

The Technical Advisory Team, also listed in the credits, was made up of individuals representing the Land Conservation Division, Oconto County UW-Extension, DNR and NRCS.

Planning for the Plan

The initial phase included orienting the technical team as to the elements, procedures and timeline of the planning process; as well as the overall purposes, key stakeholders and roles of state agencies in the plan approval process.

A review of the 2008 LWRM plan, its goals and the success of reaching those goals was the first step in developing a direction with which to go with the new plan. Discussions on past soil and water resource conservation plans, county-wide land use, population changes, agricultural trends, conservation programs and recreational uses spurred early formations of possible goals to include in the new plan.

Goals and Objectives

Resource Concern Identification and Goal Development

The quality of Oconto Countyôs land and water resources is determined by a complex, interrelated set of factors including how ecosystems function, human activity, natural changes, land use, economic realities and programming resources. The challenge is to develop an effective, yet reasonably simple plan to protect our natural resources while respecting those complexities and forging strategies that will win the support of the general public, as well as the technical/professional communities involved in implementation. Goals, objectives and activities were developed to ensure:

- Relation to the resource concerns expressed by the public through the CAC process and the public hearings
- Adherence to the prohibitions and standards required in the plan by enabling legislation, DATCP, DNR and other laws and statutes governing natural resource protection
- There was aim at lofty, yet achievable, results
- Goals and objectives were fashioned with regards to the LCD mission statement:

  ñTo serve landowners of Oconto County to manage, protect, and improve land and water resources through cooperation with Federal, State, and private agencies, and secure funding to provide technical and monetary assistance to achieve sound environmental practices to permanently benefit our land and water resources.ò

The process used to develop the goals and objectives was educational in nature, consisting of analysis and arriving at a consensus. First, a list of resource concerns was identified by the CAC through the review of past plans and new suggestions. These concerns were then prioritized by the CAC participants. A final consensus came at the-second to last CAC meeting that there would be two broad goals that encompass the two major resources in our county: productive and protective agriculture, and diverse recreational opportunities. From there, focus would be in the direction of developing more specific objectives with special activities geared towards achieving them over the course of this ten-year plan.

Each objective represents priorities, reasonable yet far-reaching, upon which county-wide efforts should be focused. The public identification of these resource concerns and subsequent analysis of the public input by the CAC and the TAC led to the development of the goals and objectives. Attaining the goals will be the result of continuous effort by an array of departments, agencies, professionals, concerned citizens and civic organizations. Concerns discussed were based on current issues, with most objectives outlined in the work-plan being implemented over a ten-year span, from 2016 through 2025, with possible revisions after the first five years.

The specific timeline and developments from meetings and discussions can be seen as follows:

March 4th, 2015: An initial CAC meeting was held at the Oconto Falls Library. This meeting involved a member-led discussion, facilitated by TAC member Dale Mohr where the CAC decided to begin by reviewing the 2008 version of the plan. The CAC followed by establishing a vision of ñHaving the Cleanest Waters in Wisconsinò as a target to keep them all enthused and focused during the planning process. They decided that several topics should be continued on into the upcoming version of the ten-year plan including animal waste, nutrient management, soil erosion control, and groundwater quality. In addition, the CAC continued on in small groups to brainstorm a list of new concerns of which a simplified list can be seen below:

- Removal of excessive debris (vegetation) in all Oconto County waterways
- Water quality degradation due to lack of enforcement on septic inspections/violations
- ñGrandfatheringò ï of old household septic systems from current regulations and farm systems
- Road run-off
- Adding integrity to the Nutrient Management Plans
- Need to have consistency of existing policies and programs
- Nutrient value and manure education
- Tile drainage and outlet management
- Need to develop funding for valuable programs
- Invasive species management

March 12th, 2015: The TAC then met to put the CAC generated ideas into an organized, plan-oriented format.

March 24th, 2015: The TAC met once more to get presentations and materials in place to bring to the next CAC meeting. It was decided to make a suggestion to focus on more specific objectives in this plan, rather than have many goals with broad objectives.

April 8th, 2015: The second CAC meeting was held at the Oconto Falls Library and several handouts were given to the attendees to summarize what came from the previous meeting. A presentation of the materials was given through PowerPoint by Ken Dolata of the TAC. Following the presentation about the countyôs inventory and previous discussions, the CAC decided to hold true with a limited number of all-encompassing goals and spend more efforts on developing specific objectives. The consensus settled on two goals which will be expanded on throughout the plan.

June 5th, 2015: the TAC met again to begin developing ideas to bring to the next CAC meeting. These included expansion on some of the objectives that were brought forth by CAC members at the second meeting, and also formulation of corresponding activities. The LCD set a directive to complete a draft by the end of June to send to the state for review. Now, great progress had taken place within the first two weeks of June.

June 18th, 2015: the TAC met again to collectively look over the progress that had been made up to that date. At this meeting, additional activities were discussed to correspond with objectives set by the CAC.

August 11th, 2015: the TAC held a meeting to discuss any additional activities that could be added and corrections to be made after receiving a review of the first draft by Lisa Tumble of DATCP.

September 23rd, 2015: A final CAC meeting was held at the Gillett Public Library in order to present with the members the final draft of the plan before submitting it for review by the general public and finally the Land and Water Conservation Board. The plan was reviewed together, each member having a copy in hand, and open for comment or questioning by the CAC members. After a presentation by Ken Dolata, all in attendance were satisfied with the plan contents.

October 7th, 2015: An open hearing was held for public comment on the Ten-Year Land and Water Resource Management Plan. The plan was reviewed and discussed with all in attendance. No changes were requested.

December 1st, 2015: The plan is presented to the Land and Water Conservation Board for approval.

January 2015: The plan is presented at the Oconto County Board meeting.

The final developed goals and objectives are listed under the following heading and expanded on throughout the plan.

Goals and Objectives

Goal 1: Sustainably manage agricultural practices while controlling impacts to natural resources.

Objectives:

1. Increase soil health by reducing erosion
2. Control animal waste and agricultural runoff
3. Meet nutrient management requirements
4. Protect groundwater quality and quantity
5. Maintain prime farmland

Goal 2: Protect and enhance land and water resources to preserve and restore quality, ecological functions, and recreational and aesthetic value.

Objectives:

1. Prevent, control and possibly eliminate invasive species
2. Protect and enhance lake and stream water quality
3. Improve wildlife and waterway habitat
4. Protect and restore wetlands
5. Strengthen the capacity of Lakes and Waterways groups
6. Provide quality recreational opportunities

The work plan and its tables, further in the plan, will detail the many activities that will be pursued in order to accomplish each objective and ultimately each of the two encompassing goals.

Chapter 3

Implementing State Performance Standards and Prohibitions

The goals and objectives detailed in Chapter four are the heart of this plan and will drive resource management in Oconto County for the life of this plan. Implementing the state performance standards and prohibitions through these goals and objectives then becomes the engine that drives this plan forward. The goals deal with these standards and prohibitions and detail how they are intended to be carried out through this plan.

State Standards and Prohibitions Encompassed in Plan Goals

NR 151.02 states ñAll land where crops or feed are grown shall be cropped to achieve a soil erosion rate equal to, or less than, the ñtolerableò (T) rate established for that soilò. The following strategy will be employed to meet this directive.

Transect Survey

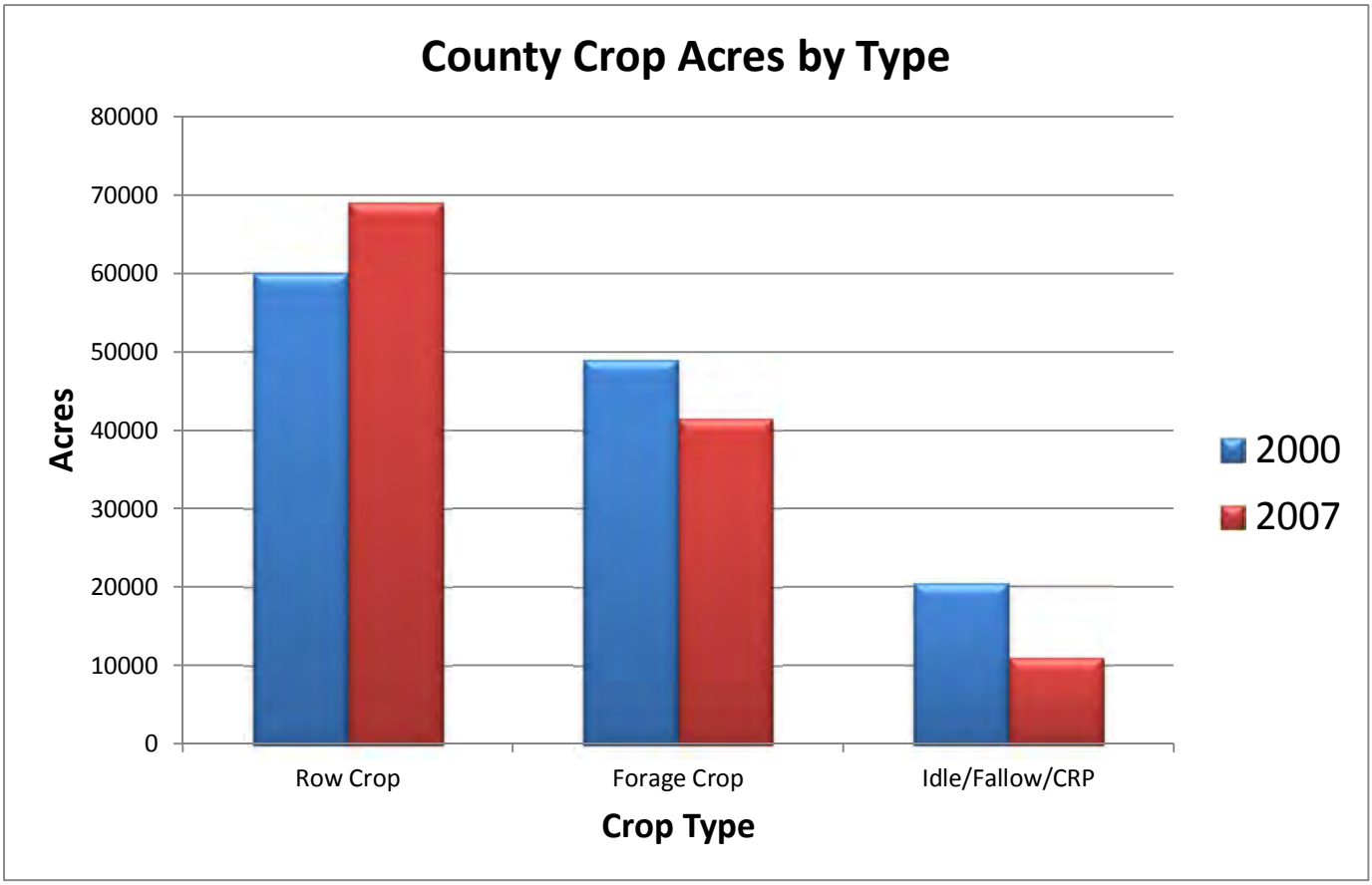
In 1998 Oconto County first participated in the Wisconsin County Transect Survey administered by DATCP. The survey route was mapped out and had been an annual project since. The survey entailed making regular interval stops along the predetermined route and recording pertinent agricultural information on both sides of the road where crop fields are present. Past and present crop, slope, residue cover, soils and other factors required to generate USLE results were obtained.

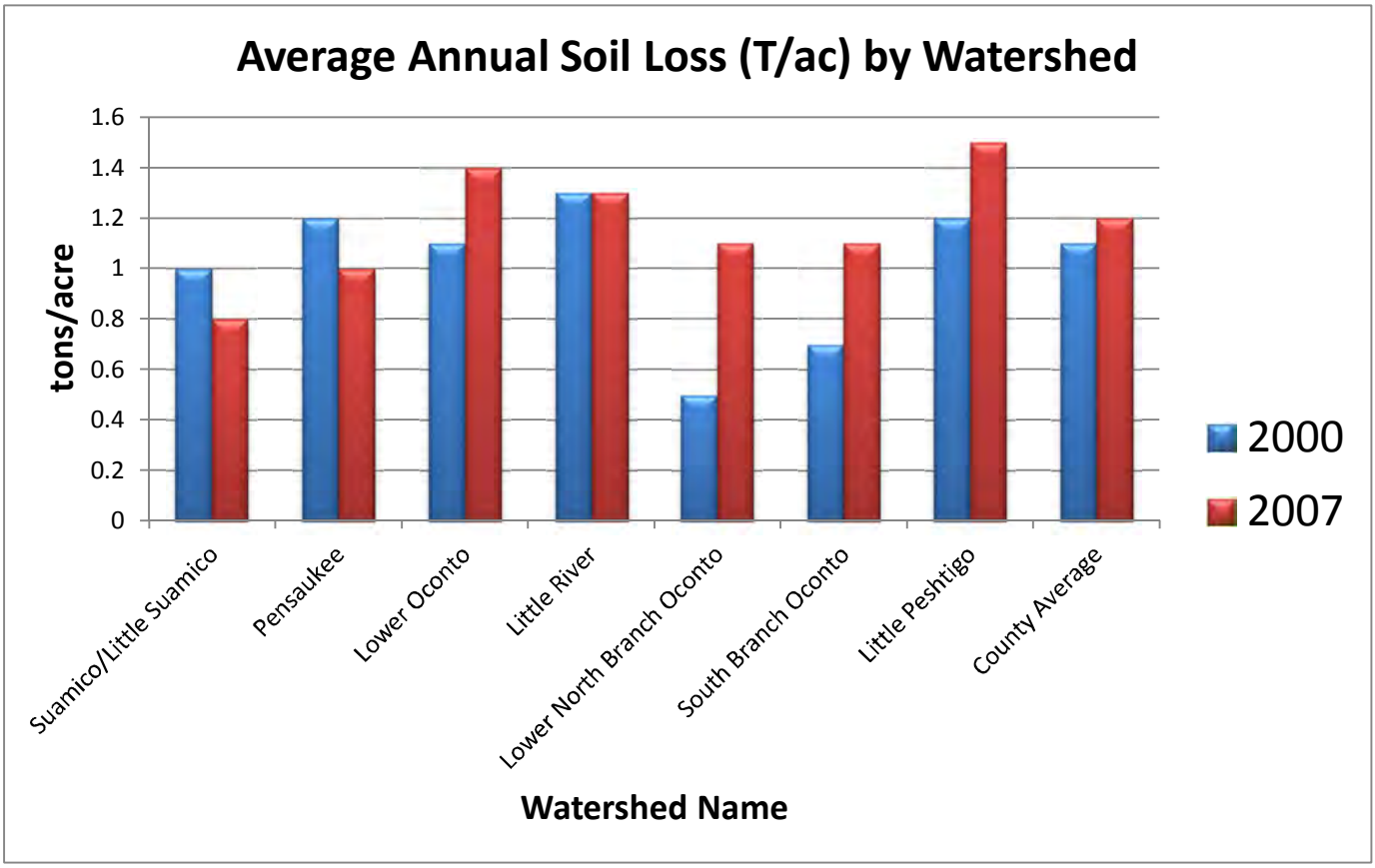
In spring 2008, new Windows® based transect survey software (***WinTransect***) was released. This new application had incorporated a simplified version of RUSLE II. This new transect survey software allowed for greater accuracy and tracking capabilities. Erosion rates through the WinTransect would still be run through the more comprehensive RUSLE II program to confirm results.

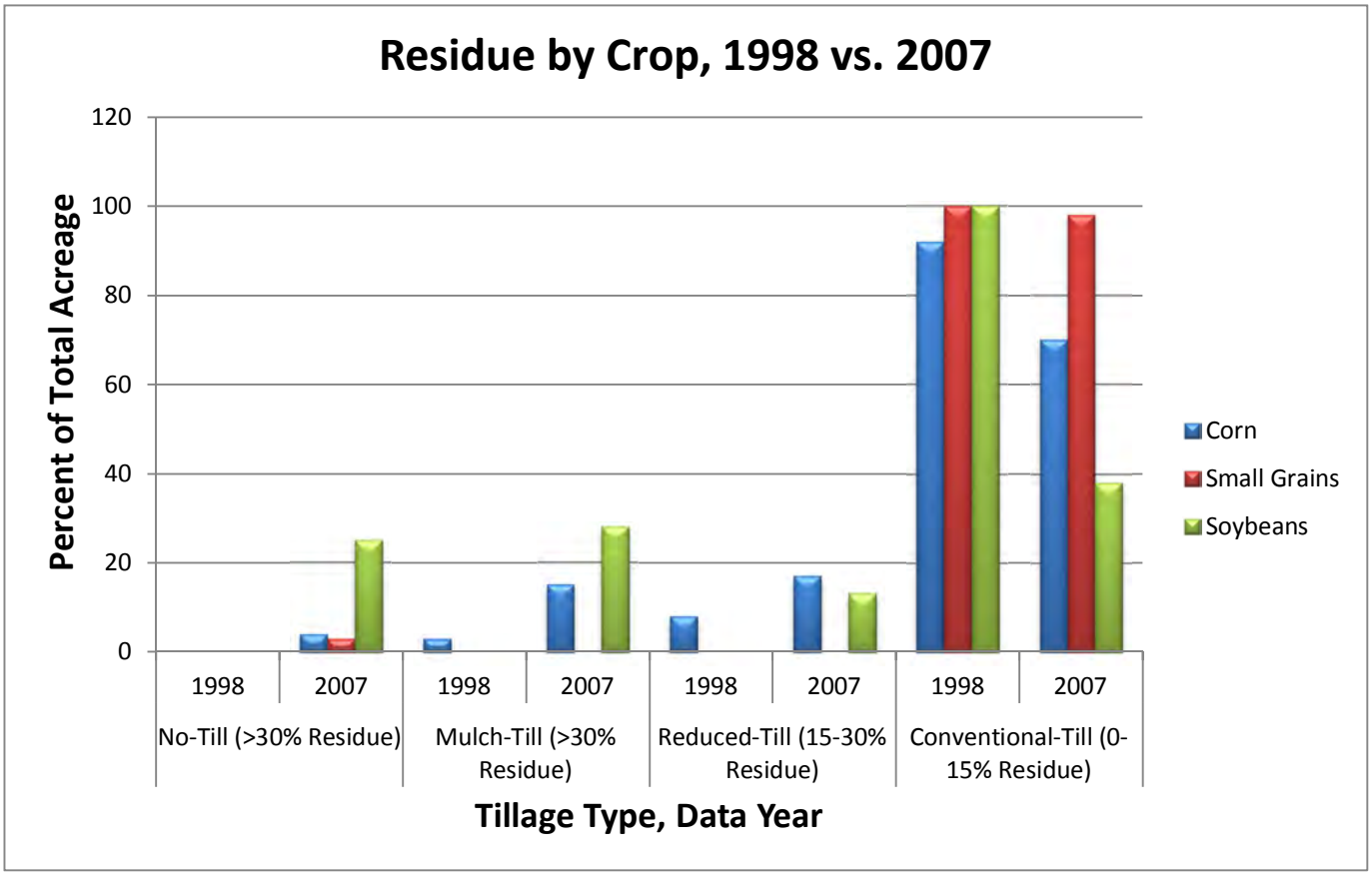
Unfortunately, soon after the new release, the county experienced issues with the software. After some troubleshooting, trial and error, the software was no longer considered practical by the administrator until issues could be resolved. The included data in this section is from our latest possible functional use of the software and surveys in 2007. As can be seen in our first goal, we are setting out to use a brand new DNR model called EVAAL. This is a very intricate ***Geographic Information Systems (GIS)*** based model that incorporates crop rotation, soil type, management practices, slopes and rainfall into its processes. With this, we will be able to identify the focus areas within the county as it pertains to reducing erosion.

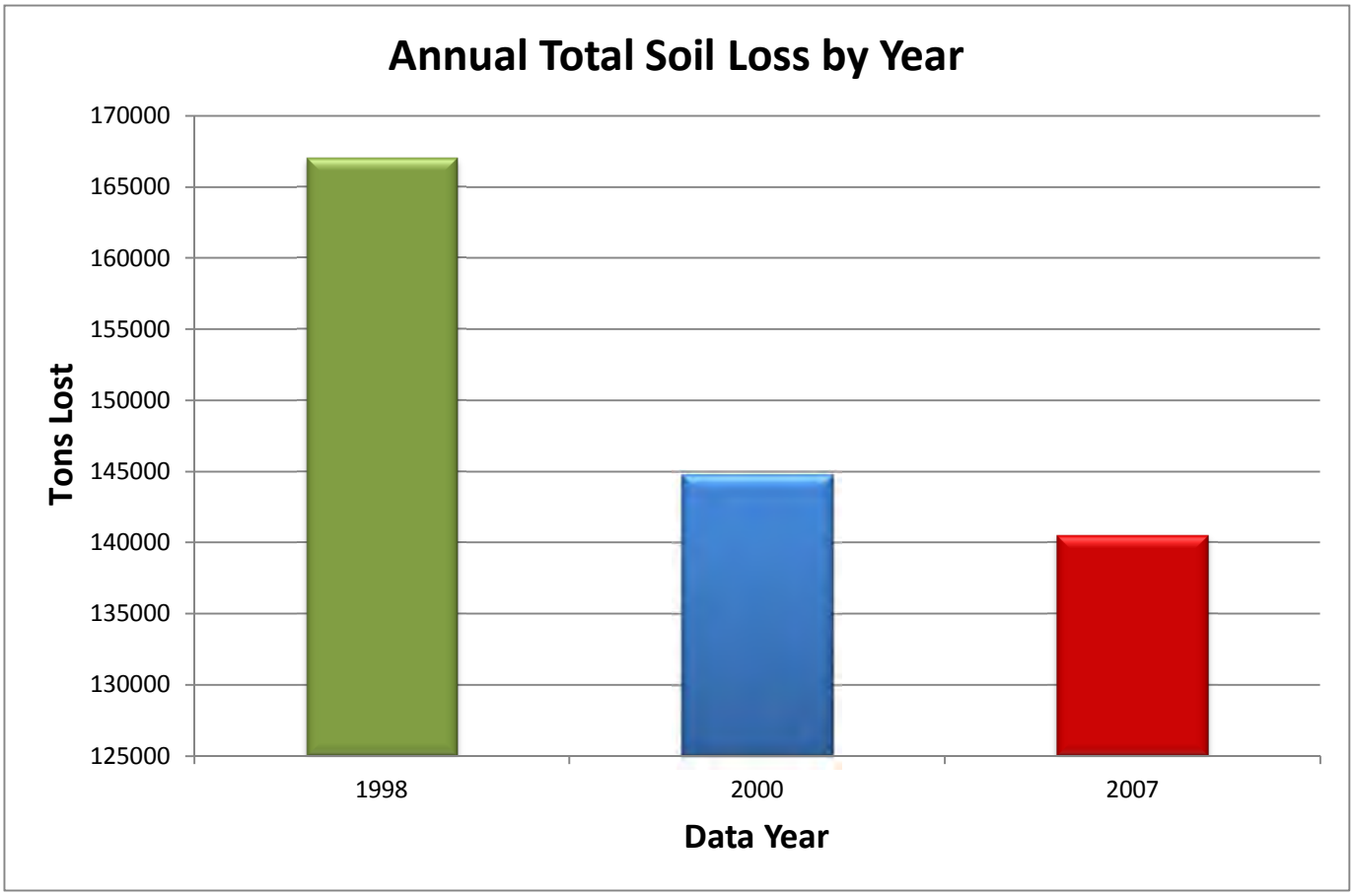
Historical Transect Data

The following graphs show that with the increase in row cropping, there has been a slight increase in erosion rates in some watersheds. But, overall the county erosion rate has still continued to decrease. This is likely due to the increase in use of residue management and fall cover crops.


County Crop Acres by Type
80000
70000
60000
50000
40000
30000
20000
10000
0
Acres
Row Crop
Forage Crop
Idle/Fallow/CRP
Crop Type
2000
2007


Average Annual Soil Loss (T/ac) by Watershed
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
tons/acre
Suamico/Little Suamico
Pensaukee
Lower Oconto
Little River
Lower North Branch Oconto
South Branch Oconto
Little Peshtigo
County Average
Watershed Name
2000
2007


Residue by Crop, 1998 vs. 2007
Percent of Total Acreage
120
100
80
60
40
20
0
1998
2007
1998
2007
1998
2007
1998
2007
No-Till (>30% Residue)
Mulch-Till (>30% Residue)
Reduced-Till (15-30% Residue)
Conventional-Till (0-15% Residue)
Tillage Type, Data Year
Corn
Small Grains
Soybeans


Annual Total Soil Loss by Year
Tons Lost
170000
165000
160000
155000
150000
145000
140000
135000
130000
125000
1998
2000
2007
Data Year

Erosion Reduction

Once erosion areas are identified and verified, they can be addressed in a number of ways. Voluntary adoption of rotational changes (e.g. reduction in row crop years), residue management and cover crop ***best management practices (BMPs)*** and grassed waterways for ***ephemeral erosion*** is the initial option. Cost sharing can be offered for the BMPs and the grassed waterways. The second option is to require a practice be installed where cost sharing must be made available. Compliance and enforcement with required erosion standards will follow guidelines set in NR 151.09. We will provide these identified areas with data and analyses through the following methods:

- Identify priority farms with potentially high erosion rates determined with EVAAL
- Verify erosion rates with RUSLE II and inventory by tract and expand search to surrounding tracts with same soils, slopes and operators to locate more possible priority sites
- Offer solutions to achieve desired soil erosion reduction

Manure Management

In addition to the previous guidelines, NR 151.08 titled *Manure Management Prohibitions* requires that all livestock producers comply with the following addressing soil contamination issues rather than erosion:

- No overflow of manure storage facilities
- No unconfined manure piles in a WQMA
- No direct runoff from a feedlot or manure storage into waters of the state
- No unlimited access by livestock to waters of the state where high animal concentrations prevent the maintenance of adequate sod or self-sustaining vegetative cover

Oconto County Animal Waste Management Ordinance

In 2008 the county saw a revised ordinance go into effect to regulate any construction, reconstruction, enlargement, abandonment or substantial altering of any feedlot or manure storage facility. A permit must be secured to proceed with any of the above, and the county must review and approve site plans before such a permit is issued. Any permitted projects must meet NRCS technical standards for construction. The Oconto County Animal Waste Management Ordinance updated in 2008 contains all state prohibitions and standards except Tillage, Phosphorus Index and Process Waste Water. It is projected to update the ordinance to include all prohibitions and standards in the near future.

Water Quality Management Areas

Permitting livestock operations through the ordinance is voluntary, and while permitting will continue, there is a need to inventory existing farms to see if they meet state runoff standards. This inventory has identified livestock operations within the surface water quality management

areas of lakes and streams throughout the county. Future inventory is necessary to identify remaining operations outside WQMAs. These areas can be measured using technology provided by the Oconto County GIS. Orthophotos in an Arcview based system can be consulted to locate and identify livestock operations that fall outside WQMAs. From there, on-site investigations must be done to determine compliance. Cross referencing with past and existing priority watershed projects must be done to determine if some operations have already or are in the process of reaching compliance. The ***Barnyard Runoff model (BARNY)*** will be used to rate feedlots and concentrated animal yards to determine phosphorus runoff amounts. These livestock operations will be rated on a high, medium or low rating with respect to phosphorus runoff. Priority areas will be delineated by watersheds that contain the most livestock operations with feedlot phosphorus runoff exceeding 20 pounds or a high rating. High priority watersheds will be offered cost sharing first on a volunteer basis.

Public Complaints

The last option for inventorying livestock operations will be by public notification of an operation that is possibly in violation of one or more of the state prohibitions. These operations will need to be investigated on-site and compliance procedures and enforcement follows NR 151.095. This will be discussed in the next chapter.

NR 151 Implementation Recap

- Permit livestock operations through Oconto County Animal Waste Management Ordinance that requires design and construction specifications meet NRCS standards before a permit is issued. These are on a voluntary basis.
- Priority farms will be located using the Oconto County GIS system ï farms that fall within WQMAs will be targeted for compliance first, followed by those located outside.
- Public cooperation in alerting the LCD to problem farms will be the final way to seek compliance.

Voluntary Implementation

As reflected in Goal 1 Objective 2, it is a priority that we assist all voluntary walk-in clients to encourage continual implementation of the relevant conservation practices. A 100% assistance rate will keep clients aware of the ways we can help them out financially and technically.

Compliance and Enforcement of Standards and Prohibitions

Complete, detailed processes of the sections below are described in NR 151.09 and NR 151.095.

Compliance or Noncompliance Notification Process

The following is a generalized description of the compliance notification process Oconto County will follow which mirrors the more detailed process contained in NR 151.

After the various inventories are completed with each goal to identify compliance or noncompliance, the notification procedure will be as follows:

Compliance Notification Process

- Written notification shall be made to landowner or operator indicating determination of compliance
- Notice shall be sent certified mail, return receipt requested, or via personal delivery
- Notice shall include:
    - performance standard(s) or prohibition(s) complied or not complied with
    - cropland or livestock facility status of existing or new operation
    - determination which best management practices or other corrective measures are needed to comply with performance standard(s) or prohibition(s) and whether or not they are eligible for cost sharing
- If cost sharing is available for eligible costs:
    - there shall be a written offer of cost sharing
    - offer to provide or coordinate the provision of technical assistance
    - a compliance period to meet the performance standard(s) or prohibition(s)
    - an explanation of possible consequences if the landowner or operator fails to comply with the provisions of the notice, including enforcement or loss of cost sharing or both
    - an explanation of state or local appeals procedures
- If no eligible costs are involved:
    - a compliance period to meet the performance standard(s) or prohibition(s)
    - an explanation of consequences if the landowner or operator fails to comply with the provisions of the notice
    - an explanation of state or local appeals procedures
- If landowner or operator is determined to be in compliance with the performance standard(s) or prohibition(s), compliance must be maintained by the existing landowner or operator and heirs or subsequent owners

Compliance Tracking

- Compliance is currently tracked by landowners according to corresponding operators in a Microsoft Excel spreadsheet
- In the future, with available staff expertise, time and funds, we would like to employ a geospatial tracking system

Enforcement Process

NR 151.09 (7) and NR 151.095 (8) detail enforcement of cropland standards and livestock standards respectively.

- If no action is taken by the landowner/operator to come into compliance after a noncompliance notification has been issued, the county will request a notice of violation letter be sent by the DNR
- DNR then may take enforcement actions pursuant to s. 281.98 Stats. or other appropriate actions

Enforcement Under Animal Waste Management Ordinance

Any person who violates, neglects, or refuses to comply with or resists enforcement of any provision of the ordinance shall be subject to a forfeiture of not less than $501 per violation. An unlawful violation includes failure to comply with any standard of the ordinance or with any condition or qualification attached to the permit. Each day that a violation exists shall be a separate offense. Failure to obtain a proper permit is considered a violation. Oconto County Land Conservation Division shall refer all enforcement to the Oconto County Corporation Council and the Zoning Division enforcement technician for initiation of the enforcement action.

Appeals Process

LCD determinations can be appealed in regard to compliance status with state standards. If the LCD findings are verified, the appeal would proceed to the LCC for review and decision. If matter remains unresolved, a notice of violation from the DNR would be recommended by the LCC and enforcement could proceed as described above.

Appeals Process Under Animal Waste Management Ordinance

Under authority of Chapter 68 Wisconsin Statutes, the Oconto County Land Conservation Sub-committee, created under Sections 59.878 Wisconsin Statutes and by the Oconto County Board of Supervisors, acting as an appeal authority under Section 68.09 (2) Wisconsin Statutes is authorized to hear and decide all appeals where it is alleged that there is error in any order, requirement, decision or determination by the county Land Conservation Division in administering the ordinance. The rules, procedures, duties and powers of Land Conservation Sub-committee and Chapter 68 Wisconsin Statutes, shall apply to this ordinance. Appeals may be taken by any person having a substantial interest which is adversely affected by this order, requirement, decision or determination made by the county Land Conservation Division.

Chapter 4

Information and Education Strategy

Education efforts go hand-in-hand with the other action steps set out in this plan. Education is important to the long term success of this plan for two reasons:

1) Education is a cost-effective strategy. Many effective educational strategies can be based on cooperation among government agencies, involvement by community organizations, volunteerism, and using all media outlets to relay information and positively affect behavior. These resources have some costs associated with them that must be met, but costs are minimal and a large investment is not normally necessary; and

2) Public understanding of the issues, problems and solutions is absolutely vital for other strategies to succeed. Regulations, public projects and cost-sharing programs cannot succeed on their own if individuals and the general public do not appreciate the importance of our natural resource base, what the threats to it are and what efforts can make a difference to protect those resources. Protecting groundwater, lakes, rivers and streams requires broad public understanding, support and cooperation.

Educational efforts for each goal & plan objectives are described below and highlighted with target audiences, messages and potential resources and partners.

Goal 1: Sustainably manage agricultural practices while controlling impacts to natural resources.

Objectives

1.) Increase soil health by reducing erosion.

Educational Objectives:

- Increase farmer awareness about the impacts of soil erosion and state erosion standards.
- Educate farmers about reducing erosion with residue management and conservative crop rotations.

Target Audiences:

- Farmers ï identify by sub-watersheds and down to parcels
- Rural landowners ï identify by sub-watersheds and down to parcels

Messages:

- High erodibility of some county soil types
- Nutrients are transported with soils
- Loss of agricultural productivity as topsoil is eroded
- Uncomplicated and cost efficient options are available to reduce soil erosion problems

Activities:

- Print newspaper releases detailing problems and need for soil erosion reduction
- Work one-on-one with farmers to adapt soil conservation practices to their specific situations
- Publications about cost-sharing opportunities for volunteers to adopt practices
- Write conservation plans that when followed will reduce erosion potential

Resources:

- UWEX and NRCS publications
- RUSLE II
- Kansas State University Extension Residue Sheets
- Transect Survey
- Erosion Vulnerability Assessment for Agricultural Lands (EVAAL)

2.) Control animal waste and agricultural runoff.

Educational Objectives:

- Continue to educate farmers and landowners of Oconto County about the Animal Waste Management ordinance and the state standards and prohibitions contained.
- Educate farmers/landowners within WQMAs as to the need for heightened protection from animal waste runoff in these zones.
- Encourage manure spreading on approved areas at approved times.
- Encourage development of emergency spill response plans.
- Educate absentee landowners about state and county agricultural regulations.

Target Audiences:

- Farmers/landowners - building new or expanding existing animal waste storages or animal feedlots
- Farmers/landowners - within WQMAs first then remaining farmers/landowners
- Town officials

Messages:

- Permits may be needed for any and all animal waste storage and animal feedlot work
- Design services can be provided
- Cost-sharing may be available
- Manure spreading must be located and timed properly to avoid environmental impacts
- Emergency spill response plans can minimize environmental impacts of accidental manure spills and facility or equipment failure
- Absentee landowners must be made aware of state and local agricultural regulations without jeopardizing the landowner/operator relationship

Activities:

- Print a series of news releases detailing NR 151 performance standards and prohibitions along with compliance requirements
- Require permits for projects determined necessary through Animal Waste Management ordinance parameters
- Continue to cooperate with operations within WQMAs
- Identify all animal operations outside WQMAs
- Hold informational meetings on high hazard area spreading
- Hold informational meetings, send newsletters and mailings on emergency spill response plan development
- Send newsletters and mailings to absentee landowners detailing state and local regulations

Resources:

- Oconto County Zoning Enforcement Technician
- NRCS Construction Standards and Specifications
- Oconto County GIS
- LCD, UWEX & NRCS
- WDATCP
- WDNR

3.) Meet nutrient management requirements.

Educational Objectives:

- Continue to educate farmers/landowners about the benefits of nutrient management planning
- Educate nonagricultural property owners about the impacts of over application of nutrients.

Target Audiences:

- Farmers/landowners- those who apply organic nutrients or fertilizers for the purpose of greater crop production
- Nonagricultural property owners ï application to lawns and gardens

Messages:

- Nutrient management planning can and does: reduce total fertilizer use, reduce over-applications, reduce cost of commercial fertilizer by reducing volume needed
- Reduction in over-applications of manure/fertilizer, limits nutrient runoff and ultimately curbs potential explosion in aquatic vegetation growth
- Future fertilizer purchases may be determined by nutrient balance shown on land
- Phosphorous free fertilizer should be used in areas that can easily runoff to surface water

Activities:

- Print news release encouraging nutrient management planning and cost share options
- Require nutrient management plans as companion practices with manure storage facilities in Animal Waste Management ordinance permit operations
- Cost share planning that is both voluntary and required in impaired watersheds
- Offer EQIP & SWRM funding for cost-sharing
- Target new cost sharing opportunities as they may become available
- Develop a residential nutrient planning model
- Speak at city/town and lake association/district meetings to detail nutrient runoff
- Speak at events, fairs and radio to detail nutrient and pesticide over application

Resources:

- NRCS and UWEX publications
- NRCS Standard 590- Nutrient Management
- Private Agricultural Agents and Agronomists
- WDATCP
- LCD

4.) Protect groundwater quality and quantity.

Educational Objectives:

- Educate public on the importance of clean groundwater and wellhead protection
- Educate public on the importance and need of proper well abandonment

Target Audiences:

- General Public
- Well drillers

Messages:

- Wellhead protection areas promote clean water infiltration for well recharge
- Proper well abandonment reduces the direct conduits from the ground surface to the aquifers, which are paths for contaminants

Activities:

- Plan, identify and develop groundwater protection areas
- Provide cost share funding for well abandonment
- Identify and publish high bedrock and other high hazard area maps

Resources:

- UWEX specialists, publications and website
- WDNR specialists, publications and website

5.) Maintain prime farmland.

Educational Objectives:

- Inform property owners as to why there is a need to protect the prime farmland in Oconto County
- Promote and inform property owners of the countyôs Farmland Preservation Program

Target Audiences:

- Property owners

Messages:

- There is a need to make landowners aware of the value of farmland within the county. Agriculture amounts to approximately one-third of the countyôs economy. Development is an ongoing reality that is consuming farmland in the southern half of the county. Along with the need to keep farmland from being developed, this same land also has to be farmed to be sustainable while protecting water quality

Activities:

- Incorporate Farmland Preservation information into Planning and Zoning informational publications, website and other media outlets

Resources:

- LCD
- NRCS
- Planning and Zoning
- UWEX

<u>Goal 2:</u> Protect and enhance land and water resources to preserve and restore quality, ecological function, and recreational and aesthetic value.

<u>Objectives:</u>

1.) Prevent, control, and possibly eliminate invasive species.

Educational Objectives:

- Introduce best management practices to lake associations, districts and individuals, i.e. CBCW (Clean Boats Clean Water).
- Educate landowners and tourists about the need for invasive species recognition, control and elimination.
- Educate the general public of the impacts of invasive species.
- Make the public aware of the Timberland Invasive Species Partnership and the resources available.

Target Audiences:

- General Public
- Landowners
- Lake groups
- Realtors

Messages:

- Terrestrial and aquatic invasive species infestations can have dramatic ecological and economic impacts.
- Invasive species displace and degrade naturally occurring species and ecosystems. Therefore, sensitive areas should be identified and protected.
- Users of the public land and water are unknowingly one of the main transporters of invasive species. With education can help slow the spread and transportation of invasive species.
- Volunteer groups such as CBCW can make a difference.

Activities:

- Work with property owners and groups to promote best management practices.
- Work with individuals to design and install demonstration projects.
- Educated individuals, property owners, government agencies on the importance to have invasive species coordinator for the county.
- Place articles in newspaper or other media outlets to help educate the public.

Resources

- WDNR specialist, publications and website
- UWEX publications and website
- LCD
- TIP

2.) Protect and enhance lake and stream water quality.

Educational Objectives:

- Educate riparian owners of the benefits of restoring and maintaining natural shorelines.
- Educate on the benefits of using best management practices such as buffers, rain gardens and diversions to reduce contaminated runoff that could contain soil, fertilizers, pesticides, herbicides, salt, petroleum products, etc.
- Encourage the use of phosphorus free fertilizers.
- Educate water body users on the effects excessive runoff can have on the ecosystem.

Target Audiences:

- General Public
- Riparian property owners
- Lake Associations and Districts
- Realtors

Messages:

- Runoff can deposit unwanted materials such as pesticides, herbicides and soil into water bodies.
- Phosphorus can cause algae blooms, excessive weed growth and even hypoxic areas which may degrade the recreational value of lake or stream, and have negative ecological effects on the system.
- Show riparian owners that they can install best management practices on the shoreline without restricting their view or usage of the water body.
- Inform riparian owners that the LCD will help design, fund and install best management practices on their shorelines.

Activities:

- Design, fund and install best management practices on shoreline properties.
- Send out newsletters or information material stating the importance of the use of phosphorus free fertilizer, installation of best management practices, etc.
- Give informational presentations at lake association/district meetings and other events.
- Look to set up tours or visits to established projects to demonstrate and illustrate on-the-ground successful practices and projects.

Resources:

- WDNR specialist, publications and websites
- UWEX publications, newsletters and website
- LCD staff, publications and website
- TIP
- NRCS

3.) Improve wildlife and waterway habitat.

Educational Objectives:

- Educate the public about the benefits of improving habitat for wildlife and fish; such as the benefits of woody habitat in lakes and streams, how buffers along shoreline improve habitat for birds, mammals and amphibians while also providing shade helping lower water temperatures and reducing the amount of sediment reaching the water body.
- Educate the public about striving to maintain or restore stream flows and natural ecologic functions and biotic conditions.

Target Audiences:

- General Public
- Property owners
- Realtors

Messages:

- Natural shorelines offer wildlife value and reduce human impacts associated with development.
- Shoreline buffers increase aesthetics while reducing storm water runoff impacts.
- Shoreline restoration can be an inexpensive way to stop shoreline erosion, restore fish spawning habitat, attract wildlife and improve aesthetics.
- Altered stream morphology can dramatically change the biotic makeup of the stream, i.e. cold water trout stream to warm water bass stream.

Activities:

- Work with property owners, groups and organizations to educate and demonstrate best management practices that will allow use of shoreline while still providing wildlife and fish habitat.
- Provide information through local media outlets on informational materials.

Resources:

- WDNR specialist, publications and website
- UWEX publications and website
- LCD
- USFWS
- NRCS

4.) Protect and restore wetlands.

Educational Objectives:

- Educate the public on the benefits of restoring and maintaining the countyôs wetlands.
- Inform the public of available programs to fund wetland restoration and enhancement projects.

Target Audiences:

- General Public
- Property owners
- Developers
- Realtors

Messages:

- Inform people that wetlands are specialized ecosystems that assist in absorbing runoff which reduces flooding, settling out nutrients and contaminations, while providing wildlife habitat and important fish spawning habitat.
- The west shore of Green Bay contains 50 percent of the remaining wetlands on Lake Michigan with the majority within Oconto County. These wetlands are vital to many fish species, amphibians and reptiles, and are a major bird breeding ground and migration route rest area.

Activities:

- Notify the public of the programs available through newsletters, publications, websites and other media outlets.
- Conduct demonstration projects for the public.
- Incorporate wetland information at public events and county fair.

Resources:

- WDNR publications and websites
- UWEX publications and websites
- NRCS publications
- LCD
- USFWS

5.) Strengthen capacity of Lakes and Waterways groups.

Educational Objectives:

- To establish a comprehensive working relationship with local associations, districts and other groups to create a network of people and organizations to develop programs that use volunteers such as lake monitoring, early detection of invasive species monitoring, Clean Boats Clean Water, etc.

Target Audiences:

- General Public
- Lake Associations and Districts
- Local Sportsman Clubs
- Other local organizations

Messages:

- With decreases in budgets and staff at all levels of government over the last several years, there is a need to organize local work groups to work with government units to accomplish tasks such as monitoring, plan writing, applying for grants and special projects.

Activities:

- Establish a citizenôs advisory committee comprised of representatives from various organizations and government representatives to devise a plan to accomplish needed activities to protect and improve the water resources of Oconto County.

Resources:

- UWEX
- LCD
- WDNR
- NRCS

6.) Provide quality recreational opportunities.

Educational Objectives:

- To make the public aware that Oconto County has 136,000 acres of federal land with the majority being part of the Chequamegon-Nicolet National Forest, 42,600 acres of county land and 7,300 acres of state land. While making the public aware of the vast amount of public land available, we need to educate them on the proper use of the forest as not to cause damage to the forest through erosion, transportation of invasive species, etc.
- Increase recreational opportunities for the general public on Oconto County public forest, lakes and streams such as an increase in handicap access to public property and lakes.

Target Audiences:

- General Public

Messages:

- Make the public aware of the valuable resources available to them within the county while also educating them on how to be responsible with these resources.

Activities:

- Incorporate informational items into existing brochures, news releases, websites and other media outlets.

Resources:

- Oconto County Forest and Parks
- UWEX
- NRCS
- US Forest Service
- WDNR

Chapter 5

Work Plan with Evaluation and Monitoring and Targeted Benchmarks

The following tables illustrate a five-year work plan. Our goals and objectives will likely take more than five years to be implemented; this is indicated by the year range in the target benchmarks column. Each year, progress toward reaching plan goals will be evaluated and priorities will be graded and possibly reestablished.

As noted in the tables, estimated cost totals are on a yearly basis.

As noted in tables, lead agency for each activity is listed first.

Priority activities are in **bold.**

Goal 1: Sustainably manage agricultural practices while controlling impacts to natural resources.

Objective	Activities	Agencies (lead listed first)	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmarks (Short term/Long term)
1. Increase soil health by reducing erosion.	**a. Implement Erosion Vulnerability Assessment for Agricultural Land using GIS**	**LCD, DNR**	**500/yr**	**$15,500/yr**	**N/A**	**Number of watersheds modeled.**	**One watershed every two years/All necessary watersheds by 2026.**
	b. Educate the public on soil health.	NRCS,LCD, UWEX	40/yr	$1,240/yr	N/A	Number of events and/or publications.	One-Two per year**
	c. Promote BMPs that reduce erosion.	**LCD, NRCS**	**40/yr**	**$1,240/yr**	**20,000/yr**	**Number of BMPs installed.**	**Two contracts per year/10 contracts by the end of 2021.**
	d. Inventory and correct areas of gully erosion.	LCD	200/yr	$6,200/yr	5,000/yr	Linear feet of gully repaired.	200 linear feet per year/1,000 linear feet by 2021.
		Totals	**780/yr**	**$24,180/yr**	**$25,000/yr**		

Objective	Activities	Agencies (lead listed first)	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmarks (Short term/Long term)
2. Control animal waste and agricultural runoff.	a. Gather existing information on the link between farm practices and nutrient transport.	LCD, NRCS	20/yr	$620/yr	N/A	Number of referenced materials.	Compile sufficient information to produce a public document by 2021/Keep information updated.
	b. Enforce animal waste ordinance.	**LCD**	**220/yr**	**$6,820/yr**	**N/A**	**Number of permits issued.**	**10-20 per year/Long term as needed.**
	c. Address priority farms.	**LCD**	**1,040/yr**	**$32,240/yr**	**$500,000/yr**	**Number of farms brought into NR 151 compliance.**	**Two farms per year.****
	d. Field research on the link between farm practices and nutrient transport.	NRCS, LCD,UWEX, DATCP, DNR	240/yr	$7,440/yr	To be Determined*	Number of sites tested.	Two sites per year.**
	e. Develop 9 key-element plans for impaired waters.	LCD,NRCS	500/yr	$15,500/yr	N/A	Number of plans approved.	One plan per 10 year period.**
	f. Work with DNR on Notice of Discharge, Notice of Intent, and Confined Animal Feeding Operations.	**LCD, NRCS, DNR, UWEX**	**500/yr**	**$15,500/yr**	**Depedent on # of instances.***	**Number of complaints addressed.**	**As needed.**
	g. Promote nutrient management practices.	**NRCS, LCD, UWEX**	**50/yr**	**$1,550/yr**	**$14,000/yr**	**Number of acres enrolled.**	**500 acres per year.**
	h. Complete county wide farm inventory.	**LCD**	**1,600/yr**	**$49,600/yr**	**N/A**	**Number of farms inventoried.**	**Complete 20 farms per year/Complete entire county by 2036.**
	i. Assist walk-in clients.	**LCD, NRCS**	**1,500/yr**	**$46,500/yr**	**Depedent on # of clients.***	**Percentage assisted; as needed.**	**Assist 100% of clients continually.**
		Yearly Totals	**5,670/yr**	**$175,770/yr**	**$514,000/yr**		

Objective	Activities	Agencies (lead listed first)	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmarks (Short term/Long term)
3. Meet nutrient management requirements.	a. Educate the public about nutrien value.	UWEX, LCD, NRCS	20/yr	$620/yr	N/A	Number of events and/or publications.	One-Two per year**
	b. Increase field visits.	LCD, NRCS	240/yr	$7,440/yr	N/A	Number of field visits.	Two visits per year/20% per year**
	c. Perform greater reviews of plans and maps (spot checks).	**NRCS, LCD**	**30/yr**	**$930/yr**	**N/A**	**Amount of attention to detail.**	**Implement a more sufficiently detailed checklist each year**
	d. Keep agronomists up to date on local NRCS 590 submittal requirements.	NRCS,LCD	20/yr	$620/yr	N/A	Number of meetings.	One meeting per year.
		Yearly Totals	**310/yr**	**$9,610/yr**	**N/A**		

Objective	Activities	Agencies (lead listed first)	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmarks (Short term/Long term)
4. Protect groundwater quality and quantity.	**a. Cost-share eligible well abandonments.**	**LCD**	**40/yr**	**$1,240/yr**	**$2,500/yr**	**Number of wells abandoned.**	**Five wells per year/25 wells by 2021**
	b. Educate the public on groundwater quality and quantity.	UWEX, LCD	20/yr	$620/yr	N/A	Number of events and/or publications.	One-Two per year**
		Yearly Totals	**60/yr**	**$1,860/yr**	**$2,500/yr**		

Objective	Activities	Agencies (lead listed first)	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmarks (Short term/Long term)
5. Maintain prime farmland.	a. Educate and inform farmers on farmland preservation program.	LCD,UWEX	20/yr	$620/yr	N/A	Number of events and/or publications.	One-Two per year**
	b. Encourage Agricultural Enterprise Areas in Prime farmland areas.	LCD, UWEX	20/yr	$620/yr	N/A	Number of contacts made.	10 contacts made per year.
	c. Maintain FPP compliance with current contracts through field visits.	**LCD**	**10/yr**	**$310/yr**	**N/A**	**Number of field visits.**	**Minimum of 25% contract farms visited per year.**
		Yearly Totals	**50/yr**	**$1,550/yr**	**N/A**		

Total Yearly Hours, Costs, and Funding Needed to Accomplish Goal 1		
Staffing Hours	**Staffing Dollars**	**Cost-Share Dollars***
6,870 per year	$212,970 per year	$541,500 per year

*** Dependent of number of clients, variation of assistance, and/or occurrences in order to determine estimates of cost-sharing needed. It is important to note that this could increase cost-share dollars by significant amounts due to the Oconto County LCD bench mark to assist 100% of walk-in clients.**

**** Dependent on staff and funding levels.**

Monitoring plan progress allows evaluation of effectiveness concerning reaching goals established in the plan. The next section further details objectives, key benchmarks reached, agencies involved, timelines and supportive narrative. These details may be used by partners to prepare other work plans for implementation of this plan and to evaluate the impacts of collaboration with other agencies. Evaluation, monitoring and ultimately reaching projected benchmarks is closely tied to the ability to maintain staff and funding at sufficient levels throughout the entirety of this plan.

Monitoring and Evaluation for GOAL #1 by objective:

1) Increase soil health by reducing erosion

Inventorying county watersheds using the DNR EVAAL model will allow a systematic, targeted approach to address target areas for soil erosion. Once problem areas are identified, it will require yearly educational events or publications to get the word out which will hopefully lead to installed BMPs and rehabilitated gully erosion sites. Success will be dependent on consistent funding for BMP installation.

2) Control animal waste and agricultural runoff

By continuing to enforce the Animal Waste Management Ordinance, voluntary standards and prohibitions compliance will be achieved. Completion of the county-wide farm inventory on GIS based tracking will allow more efficient identification and tracking of compliance achieved versus farms where work needs to be done. We will strive to achieve complete inventory within 20 years, which comes out to approximately 20 per year. The pace will be re-evaluated at the end of the five-year work plan. Yearly enforcement of NR151 to address at least one operation is a reasonable goal on top of the walk-in and voluntary compliance at this time. As more operations come into compliance through expansion and voluntary permit issuance, then a more aggressive enforcement schedule may be necessary. This enforcement may likely be necessary through involvement with the DNR and their cost share options. As a county we would like to explore the link between agricultural practices and nutrient transport, and would like to gather as much existing information to pass along to farmers as possible. On-farm, field edge trials would be the ultimate goal of this activity. The final activity of this objective is to begin to formulate 9 Key Element plans for our impaired waters. These plans consist of detailed watershed information collection and comprehensive specific goals for each watershed which take significant time to generate. This leads to the expanded time frame for completion. Success of many activities falling under this objective are completely dependent on staff and funding levels remaining constant or increasing through the 10-year plan period.

3) Meet nutrient management requirements

There is a real need to educate the public about the value of farm nutrients as they are hauled past neighboring houses on the way to be spread on a field. Oconto County intends to stress the value through yearly educational events and/or publications. Recent local nutrient management planning issues are leading us to increase plan review detail, map verification and finally increased field inspections. Our partners at NRCS are instrumental in conducting these plan reviews. Between NRCS and county programs there are currently 78 farmers that have adopted nutrient management plans covering 79,000 of the 219,000 total cropland acres in the county. Remaining farmers if not willing to voluntarily signup for nutrient management, they must be offered 70 percent cost share to assure compliance. This will require adequate funding throughout the span of this plan.

4) Protect water quality and quantity

Quality drinking water is becoming a more limited resource as it is being pumped at a greater quantity by expanding suburban areas and growing high capacity use by many types of business. Improper land spreading of nutrients, herbicides and pesticides can affect the quality of drinking water when near conduits to ground water. Oconto County intends to try to educate the general public of these issues through yearly events and/or publications. Well abandonments continue to be the best option to limit surface to groundwater contamination issues in the county and 5-10 abandonments per year will continue to close-off these direct conduits for contaminants. Abandonments have been funded with a county cost share program which will need to be maintained to continue to close these wells.

5) Maintain prime farmland

Farmland preservation has a limited presence in the county and we will continue to try and educate farmers of the benefit of the program through yearly event and/or publications. Their best avenue for adoption of the program is through AEAs. We will attempt to contact farmers to gauge interest on a yearly basis. Finally, the few existing contracts will be monitored through field visits of 25 percent of participants per year.

Goal 2: Protect and enhance land and water resources to preserve and restore quality, ecological function and recreational and aesthetic value.

Objective	Activites	Agencies (lead listed first)	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark (Short term/Long term)
1. Prevent, control, and possibly eliminate invasive species.	a. Pursue funding for invasive species oriented programs.	LCD, DATCP	150/yr	$4,650/yr	N/A	Number of programs initiated or continued.	One new program developed by 2021.
	b. Pursue funding for additional invasive species staff.	**LCD, DATCP**	**2,080/yr**	**$64,000/yr**	**N/A**	**Number of new staff hired.**	**Minimum of one.**
	c. Educate the public on invasive species control and management.	LCD, UWEX,TIP	40/yr	$1,240/yr	N/A	Number of events held and/or information distributed.	One event or information source per year/Five events by 2021.
	d. Inventory new populations and control existing stands.	LCD, TIP, DNR	1,000/yr	$31,000/yr	$20,000/yr	Acres of coverage.	10% decrease in acres of coverage within the next 5 years.
	e. Implement county invasives Strategic Action Plan.	**LCD, UWEX, DNR**	**1,000/yr**	**$31,000/yr**	**N/A**	**Portion of plan implemented.**	**As much as possible, dependent on funding.**
	f. Collaborate with TIP to monitor populations.	**LCD, TIP, USFWS**	**200/yr**	**$6,200/yr**	**N/A**	**Projects worked on.**	**Five projects by 2021/Ten by 2026**
	g. Continue to update Oconto County website information pertaining to invasive species.	LCD	20/yr	$620/yr	N/A	Website information status.	Continually keep current with new developments.
	h. Continue Oconto County early detection monitoring program.	LCD	40/yr	$1,240/yr	N/A	Number of lakes monitored.	Five eligible lakes per year/Continous cycle through all eligible lakes
	i. Establish a county-wide Clean Boats, Clean Waters team.	LCD,OCLAWA, UWEX, TIP	800/yr	$9,600/yr	$6,000/yr	Number of teams.	One team by 2021/Two or more teams by 2026
	j. Obtain portable boat wash units for use throughout Oconto County.	LCD, OCLAWA, TIP	120/yr	$3,720/yr	$5,000/yr	Number of units obtained.	One unit in use by 2021/as available
	k. Promote an increase in Clean Boats, Clean Waters monitoring hours.	LCD, OCLAWA, TIP	40/yr	$1,240/yr	$1,240/yr	Number of hours worked.	Five percent increase by 2026.
		Yearly Totals	**5,490/yr**	**$154,510/yr**	**$32,240/yr**		

Objective	Activites	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark (Short term/Long term)
2. Protect and enhance lake and stream water quality.	a. Install shoreline buffers.	LCD	500/yr	$15,500/yr	$8,000/yr	Linear feet of buffer installed.	60 feet of lakeshore and 200 feet of streambank per year
	b. Promote county cost-share fund use for shoreline restoration.	**LCD, DATCP**	**120/yr**	**$3,720/yr**	**N/A**	**Personal contacts made/press releases.**	**Five contacts and one press release per year.**
	c. Design and implement shoreline restoration plans.	**LCD, TU, DU**	**80/yr**	**$2,480/yr**	**$3,000/yr**	**Feet of shoreline restored.**	**Minimum of 60 linear feet per year.**
	d. Educate the public on benefits of natura land features.	LCD, UWEX	20/yr	$620/yr	N/A	Number of events held and/or information distributed.	One event or information source per year/Five events by 2021.
	e. Promote and encourage completion of plans and surveys such as comprehensive acquatic management plans and point intercept surveys.	LCD, UWEX, OCLAWA, DNR, TIP	40/yr	$1,240/yr	N/A	Amount of assistance provided.	Provide one waterbody with assistance every 2 years/Assist with 5 waterbodies by 2026
		Yearly Totals	**760/yr**	**$23,560/yr**	**$11,000/yr**		

Objective	Activites	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark (Short term/Long term)
3. Improve wildlife and waterway habitat.	**a. Restore stream morphology.**	**LCD, NRCS, TU, DU**	**200/yr**	**$6,200/yr**	**$2,000/yr**	**Percentage of stream length that is restored to natural conditions.**	**Restore 100 linear feet by 2021.**
	b. Encourage lakes to participate in the Citizen Lake Monitoring Network to assure quality wildlife waters.	LCD, Lakes and Waterway groups	40/yr	$1,240/yr	N/A	Number of lakes with designated lake monitor(s).	Increase the number of participating lakes by 10% by 2019.
	c. Promote the removal of livestock grazing from woodlots.	NRCS, LCD	20/yr	$620/yr	N/A	Number of contacts made.	Two contacts per year.
	d. Minimize the removal of natural tree-fall from lake shores.	LCD, Lakes and Waterway groups, Sportsmen's Clubs	240/yr	$7,440/yr	N/A	Trees per mile.	Record an increase in tree-lined shore over the next 5 years/Continued increase
		Yearly Totals	**500/yr**	**$15,500/yr**	**$2,000/yr**		

Objective	Activites	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark (Short term/Long term)
4. Protect and restore wetlands.	**a. Restore degraded wetlands.**	**LCD, NRCS**	**280/yr**	**$8,680/yr**	**$30,000/yr**	**Acreage of wetlands restored to native conditions.**	**Restore 3 acres per year/Restore 15 acres by 2021**
	b. Educate landowners on the benefits of wetlands.	LCD, UWEX	20/yr	$620/yr	N/A	Number of events held and/or information distributed.	One event or information source per year/Five events by 2021.
		Yearly Totals	**300/yr**	**$9,300/yr**	**$30,000/yr**		

Objective	Activites	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark (Short term/Long term)
5. Strengthen the capacity of Lakes and Waterways groups.	a. Assist Oconto County Lakes and Waterways Association in the development of a Lake and Stream Management Plan.	LCD, OCLAWA	240/yr	$7,440/yr	N/A	Chapters/sections of plan completed.	Have 50 percent of the plan completed by the end of 2019/Complete plan by 2024.
	b. Partner with volunteer groups and DNR to monitor lake levels.	**LCD, DNR**	**80/yr**	**$2,480/yr**	**N/A**	**Number of participants.**	**Monitor 5 lakes per year/All eligible lakes at equal rate**
		Yearly Totals	**320/yr**	**$9,920/yr**	**N/A**		

Objective	Activites	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark (Short term/Long term)
6. Provide quality recreational opportunities.	a. Work with local organizations and government units to make public lands and waters handicap accessible.	LCD, DNR, Sportsmen's Clubs	120/yr	$3,720/yr	$1,000/yr	Number of access points created and properties made accessible.	One access point per five year period/2 access points by 2026.
	b. Create awareness of the value of Oconto County recreational resources.	LCD, UWEX	40/yr	$1,240/yr	N/A	Number of events/publications.	One per year/five by 2021
		Yearly Totals	**160/yr**	**$4,960/yr**	**$1,000/yr**		

Total Yearly Hours, Costs, and Funding Needed to Accomplish Goal 2		
Staffing Hours	**Staffing Dollars**	**Cost-Share Dollars**
7,530 per year	$233,430 per year	$76,240 per year

Monitoring and evaluation for Goal #2 by objective:

1) Prevent, control and possibly eliminate invasive species

With the loss of the AIS coordinator it is imperative to secure funding to continue the work on invasive species that was started, and look to increase programs and influence throughout the county. Regardless of securing another staff person to take on the work started, there needs to be a continued educational effort to increase public knowledge of control and management through events and information distributed. There is a network of contacts in place that should allow five events in the first five years of this plan. Inventory of new species and control of existing stands will be done in conjunction with the county strategic action plan, most likely with help from ***Timberland Invasives Partnership (TIP).*** Website updates might be tied to the link to TIP increasing the effectiveness of the county website. The county has made a commitment to early detection monitoring of specified lakes for invasives (five lakes per year with retesting of lakes once all have been cycled through for the initial survey). The success of this objective is entirely dependent on increased invasive species funding for staff and projects.

2) Protect and enhance lake and stream water quality

Installation of shoreline buffers continues to be the most cost effective and easiest way to influence lake and stream water quality with 60 linear feet installed per year. Diversion of upslope water from reaching the lake or stream is another easily incorporated BMP as part of a larger restoration plan. The plans need to be designed and implemented by the county with cost share funding of one plan per two-year period. Finally, education about the sources of runoff and subsequent remedies is a cost effective way to address the issue. Yearly events and information distributed, likely at lake association meetings, will allow meeting the goal of five events in five years.

3) Improve wildlife and waterway habitat

Changing stream morphology has become an issue as waters widen and slow which warms them up and changes the biotic ecosystem. With the help of Trout Unlimited, we intend to try and return streams to their more natural state by restoring 200 linear feet of stream per year. Lakes are also rapidly changing and another activity would be to encourage lakes to find volunteer citizen monitors to detect these changes in early stages. With a 10 percent increase in monitors by 2018, negative effects could be mitigated in many instances. A simple cost effective way to improve water way habitat is to leave fallen beneficial woody debris in place measured by percent of shoreline with fallen trees. Some wildlife habitats in land are severely impacted by woodlot and wetland grazing. The county will attempt to monitor this issue.

4) Protect and restore wetlands

Protection of wetlands greatly impacts the runoff associated with increasingly stronger rainfall events. The county will attempt to increase wetland acreage through the limited effect we might have on reclamations, easements or other methods to secure protection of 10 acres in 10 years. Restoration of degraded or converted wetlands is likely to be more of a focus which restoration of 3 acres per year as a benchmark. Landowner education is needed to reveal the value of wetlands as something other than ñwaste landò by hosting yearly events or making publications available. Maintaining funding is essential to wetland restoration projects.

5) Strengthen the capacity of lakes and waterways groups

As a county, we would like to assist the Oconto County Lakes and Waterways Association in writing their comprehensive lake and stream management plan by 2024. There is a preliminary plan to assist DNR and lake groups with lake level monitoring, five lakes per year until finished, then continuous monitoring.

6) Provide a quality recreational opportunity

Working with local organizations and governmental units to open public lands to handicapped individuals could greatly increase recreational opportunities by increasing access points, two by 2024. The need to create a general awareness of the value of the expanse of recreational resources of the county needs to be conveyed as many ways as possible to interested users.

Chapter 6

Partners and Collaborators for Plan Implementation

Many agencies and organizations are involved in protecting land and water resources in Oconto County. Each agency has its own particular mission and leadership, but has a common goal to preserve and protect the environment for future generations. Cooperation is imperative to guarantee successful plan implementation. Many of the agencies below are included in our work plan and will be relied upon for technical support, funding, cooperation and guidance.

Partner Agencies

The agencies listed below are entrusted with protecting and managing our natural resources. All agencies and private groups will be invited to participate in annual reviews and subsequent revisions of this plan.

Oconto County Land Conservation Committee
Natural Resource Conservation Service
Farm Service Agency
University of Wisconsin-Extension
Department of Agriculture, Trade and Consumer Protection
Department of Natural Resources
Oconto County Zoning Committee
Oconto County Land and Water Resource Committee
U. S. Fish and Wildlife Service

Private Voluntary Organizations

Oconto County Lakes and Waterways Association (County-wide group)
Individual Lake Associations and Districts (21)
Trout Unlimited
Oconto County Sportsmenôs Club
Land and Water Resource Management Plan Citizenôs Advisory Committee

Funding Plan Implementation

The Oconto County Land and Water Resource Plan is a document that can be utilized by all partners in natural resources. A combination of private, local, state and federal sources of funding will be sought to implement the priorities of the plan. As funding opportunities surface, the plan goals and objectives will be referenced to develop project applications. A partial list of potential funding sources is outlined below.

Local Government Sources

Oconto County Land and Water Resource Budget (Land Conservation, Zoning, Forest & Parks)
Oconto County Cost Share Program

County Cost Share Program

$20,000.00 per year was allocated by the Oconto County Board of Supervisors for first use in the 2002 calendar year. The program cost shares agricultural and shoreline restoration projects. The funding is capped at $2,500.00 maximum per project.

Other Local Funding Sources

Individual Contributions
Volunteer Hours
County Lake Associations
Trout Unlimited
Oconto County Sportsmenôs Alliance
Ducks Unlimited
Whitetails Unlimited

State Government Sources

Department of Natural Resources
Department of Agriculture, Trade and Consumer Protection
Land and Water Plan Implementation Funds (Soil & Water Resource Management Grants)
Targeted Resource Management Grants
Stewardship Funds
Lake Planning Grants
Lake Protection Grants

Federal Government Sources

U. S. Department of Agriculture- Farm Service Agency
- ***Conservation Reserve Program (CRP)***
- ***Grassland Reserve Program (GRP)***

Natural Resource Conservation Service
- Environmental Quality Incentives Program (EQIP)
- ***Wildlife Habitat Incentives Program (WHIP)***
- ***Wetland Reserve Program (WRP)***
- ***Conservation Stewardship Program (CSP)***

Glossary

Key terms, Acronyms, and Initials

303(d) Waters: This list identifies waters which are not meeting water quality standards, including both water quality criteria for specific substances or the designated uses. It is used as the basis for development of Total Maximum Daily Loads (TMDLs) under the provisions of section 303(d) (1) (C) of the Clean Water Act, U.S. Environmental Protection Agency (EPA) EPA requires that the DNR update its list every two years. Also called List of Impaired Waters.

Aquatic Invasive Species (AIS): Water dwelling, non-native or introduced species which negatively impact the natural aquatic ecosystem.

Animal Unit (AU): Single animal types or combination of animal types, which are fed, confined, maintained or stabled in an animal feeding operation. 1000 pounds of livestock live weight is equivalent to one AU.

ATCP 50: The chapter of Wisconsinôs Administrative Code that implements the Land and Water Resource Management Program as described in Chapter 92 of the State Statutes. It identifies those conservation practices that may be used to meet performance standards.

Barnyard Runoff Model (BARNY): Excel spreadsheet which computes phosphorus runoff from barnyards in pounds of phosphorous.

Best Management Practices (BMPs): The most effective practice or combination of practices for reducing nonpoint source pollution to acceptable levels.

Conservation Plan: A record of decisions and intentions made by land users regarding the conservation of the soil, water and related natural resources of a particular unit of land.

Conservation Reserve Program (CRP): A provision of the federal Farm Bill that takes eligible cropland out of production and puts it into grass or tree cover for 10-15 years.

Department of Agriculture, Trade and Consumer Protection (DATCP): The state agency responsible for establishing statewide soil and water conservation policies and administering the stateôs soil and water conservation programs. The DATCP administers state cost-sharing funds for a variety of LCC operations, including support for staff, materials and conservation practices.

Department of Natural Resources (DNR): The state agency responsible for managing state owned lands and protecting public waters. DNR also administers programs to regulate, guide and assist LCCs, LCDs and individual land users in managing land, water, fish and wildlife. The DNR administers state cost-sharing funds for priority watershed project, Targeted Runoff Management (TRM) grants, and Urban Nonpoint Source Construction and Planning grants.

Environmental Protection Agency (EPA): The agency of the federal government responsible for carrying out the nationôs pollution control laws. It provides technical and financial assistance to reduce and control air, water and land pollution.

Environmental Quality Incentives Program (EQIP): Federal program to provide technical and cost-sharing assistance to landowners for conservation practices that provide water quality protection.

Ephemeral erosion: Channeled, concentrated erosion that results in gullies.

Erosion Vulnerability Assessment for Agricultural Lands (EVAAL): a GIS-based tool that uses readily-available topographic, soils, and land use information to assess vulnerability of agricultural lands to erosion and nutrient export.

Farm Service Agency (FSA): USDA agency that administers agricultural assistance programs including price supports, production controls and conservation cost-sharing.

Fish Consumption Advisory (FCA): Food and Drug Administration imposed limit or restriction on fish consumption based on elevated toxicity levels- generally mercury or PCBs.

Geographic Information System (GIS): A computerized system of maps and layers of data about land including soils, land cover, topography, field boundaries, roads and streams. Such geographically based data layers improve the ability to analyze complex data for decision making.

Grassland Reserve Program (GRP): Voluntary program that helps landowners and operators restore and protect grassland, including rangeland, and pastureland and certain other lands, while maintaining the areas as grazing lands.

Impaired Waters List: Same as the 303(d) list.

Land and Water Resource Management Plan (LWRM): A locally developed and implemented multi-year strategic plan with an emphasis on partnerships and program integration. The plan includes a resource assessment, identifies the applicable performance standards and related control of pollution from nonpoint sources, identifies a multiyear description of planned activities, establishes a progress tracking system, and describes an approach for coordinating information and implementation programs with other local, state and federal agencies, communities and organization (ATCP 50.12).

Land Conservation Committee (LCC): The portion of county government empowered, by Chapter 92 of the Wisconsin Statutes, to conserve and protect the countyôs soil, water and related natural resources.

Land Conservation Division (LCD): The department of county government responsible for administering the conservation programs and policies of the Land Conservation Committee.

Natural Resources Conservation Service (NRCS): Part of USDA, NRCS provides soil survey, conservation planning and technical assistance to local land users.

Nonpoint Source Pollution (NPS): Pollution from many small or diffuse urban and rural sources. Livestock waste finding its way into a stream and causing water pollution is an example of a nonpoint source pollution.

NR 151: DNRôs administrative code that establishes runoff pollution performance standards for non-agricultural facilities and transportation facilities and performance standards and prohibitions for agricultural facilities and practices designed to meet water quality standards.

Nutrient Management Plan: The Nutrient Management Plan means any of the following:
(a) A plan required under s. ATCP 50.04 (3) or 50.62 (5) (f).
(b) A farm nutrient plan prepared or approved, for a landowner, by a qualified nutrient management planner.

Oconto County Lakes and Waterways Association (OCLAWA): An organization with the mission to promote the conservation and preservation of all lakes, rivers, streams, and reservoirs in Oconto County, the shorelines surrounding them, and the ecologically sound and environmentally safe development on or near these waters

ORW/ERW: DNR classifies streams as Outstanding Resource Waters (ORW) and Exceptional Resource Waters (ERW) as listed in NR 102.10 and NR102.11. ORW waters have excellent water quality and high-quality fisheries and do not receive wastewater discharges. ERW waters have excellent water quality and valued fisheries but may already receive wastewater discharges

RUSLE II: Revised universal soil loss equation- equates various factors to determine erosion rates on cropland.

Soil and Water Resource Management Program (SWRM): DATCP program that provides counties with funds to hire and support Land Conservation Department staff and to assist land users in implementing DATCP conservation programs (ATCP 50).

Soil Loss Tolerance (T): Erosion rate in tons per acre per year at which a soil could maintain productivity.

Soil Survey: NRCS conducts the National Cooperative Soil Survey and publishes soil survey reports. Soils data is designed to evaluate the potential of the soil and management needed for maximum food and fiber production.

Timberland Invasives Partnership (TIP): a partnership between Federal, Tribal, State and local government organizations that symbolizes their commitment to work together across jurisdictional boundaries to eliminate invasive species.

Terrestrial Invasive Species (TIS): Land dwelling, non-native or introduced species which negatively impact the terrestrial ecosystem.

United States Department of Agriculture (USDA): Branch of federal government with responsibilities in the areas of food production, inspection and storage. Agencies with resource conservation programs and responsibilities, such as FSA, NRCS, Forest Service and others are agencies of the USDA.

University of Wisconsin-Extension (UWEX): The outreach of the University of Wisconsin system responsible for formal and informal educational programs throughout the state.

Waters of the State: Those portions of Lake Michigan and Lake Superior within the boundaries of Wisconsin, all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, water courses, drainage systems and other surface water or groundwater, natural or artificial, public or private within the state or under its jurisdiction, except those waters which are entirely confined and retained completely upon the property of a person.

Water Quality Management Area (WQMA): Areas within 300 feet of any stream found on U.S. Geological Survey Quad maps and within 1000 feet of a lake ordinary high water mark.

Watershed: The geographic area from which a particular river, stream or water body receives its water supply.

Wetlands Reserve Program (WRP): A provision of the federal Farm Bill that compensates landowners for voluntarily restoring and protecting wetlands on their property.

Wildlife Habitat Incentives Program (WHIP): Federal program to help improve wildlife habitat on private lands.

Zoning Department: Department of county involved in setting ordinances and issuing permits for buildings, setbacks, private sewage systems, excavations and other development related activities.