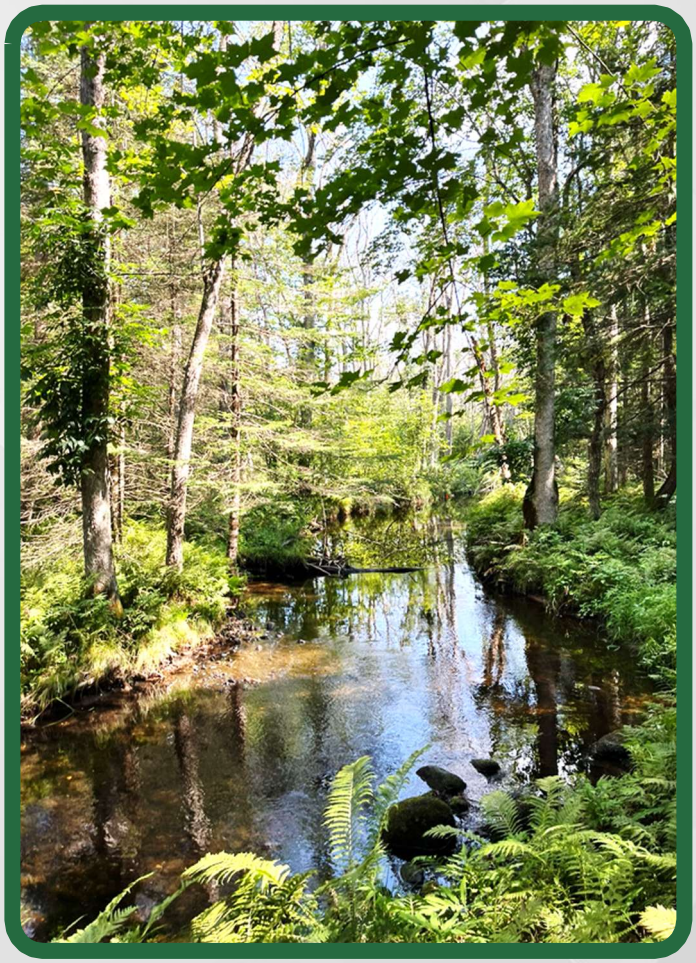
OCONTO COUNTY

LAND & WATER RESOURCE MANAGEMENT PLAN



2026-2035

Cover Design by Emily Schwartz
Oconto County LWCD

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CREDITS FOR PLAN DEVELOPMENT

Citizens Advisory Committee

Tim Cole	*LWRC Chairperson*
Mike Rasmussen	*Oconto County Lakes and Waterways*
Carolyn Alsteen	*Agricultural Producer*
Wayne Czypinski	*Trout Unlimited*
Bobbi Holl	*Agronomist / CCA*
Michael Sievert	*Agricultural Producer*
Floyd Schmidt	*Chute Pond Lake District*
Jim Mahoney	*Agricultural Producer*

Land & Water Resource Committee

Tim Cole – Chairperson	Wayne Kaczrowski
Pat Scanlan	Mike Beyer
Keith Schneider	

Technical Advisory Committee

Ken Dolata	*County Conservationist (LWCD)*
Chad Trudell	*Conservation Technician (LWCD)*
Brady Stodola	*Conservation Technician (LWCD)*
Emily Schwartz	*Conservation Planner (LWCD)*
Jeff Maroszek	*District Conservationist (NRCS)*
Erin Hanson	*Water Resource Management 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 and prohibitions for farms to prevent runoff and protect water quality. ***The Department of Agriculture, Trade and Consumer Protection (DATCP)*** then passed rules in ***ATCP 50*** that identified the conservation practices as part of the ***Soil and Water Resource Management (SWRM)*** grant program 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 prohibitions. The local ***Land Conservation Committees (LWRC)*** and staff are the designated county agents to carry this out. County LWRCs may apply for implementation grants to assist in the effort to help landowners meet the new standards. Since 2002, both NR 151 and ACTP 50 have been further revised (in 2012 and 2016) to include new or updated agricultural standards and prohibitions as well as practices to meet the standards.

What follows is a brief summary of the chapters contained within this document.

Chapter 1: Details the reason for developing County ***Land and Water Resource Management plans (LWRMP)*** 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 County's 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 (ORW/ERW)*** along with Healthy Resource Waters are chronicled. Each major ***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 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. Previous Land and Water Resource Management Plans were the foundation for this plan. Furthermore, this chapter highlights the goals and objectives. The two goals were categorized toward the main economic aspects of Oconto County in regards to Land and Water Resources: agricultural and recreational use. Specific objectives and strategies leading to attainment of the goals are detailed as well. Information and education is the driving factor for much of this plan. Implementation by the ***Land & Water Conservation Department (LWCD)*** or other partner agencies through ordinance or cost sharing ultimately leads to the success of this plan.

Chapter 3: Discusses the implementation of the state performance standards and prohibitions. The DNR tool called ***Erosion Vulnerability Assessment for Agricultural Lands (EVAAL)*** was used to locate erosion susceptible croplands throughout the county as part of the last plan update. If additional resources are needed in the future, the results from the use of this tool could be considered as a reference to help achieve current and future goals. 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 state prohibitions and is implemented by the permit process through the county's animal waste ordinance or by priority farm designation. Initially, priority was set in ***Water Quality Management Areas (WQMAs)*** and while work continues 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 standards and prohibitions discussed in Chapter 1.

Situations have arisen in the past where the animal waste ordinance enforcement procedures have not progressed the way they had been envisioned. Referencing the ordinance allows clarification of such situations and allows for a more streamlined and efficient enforcement process.

Chapter 4: Details, in table format, the 5-year work plan for each goal. The objectives are laid out, along with activities, which will allow for the accomplishment of those objectives. Partners needed, estimated staff time necessary, agencies involved, cost in staff dollars, evaluation and monitoring parameters, and the specific benchmarks that were set out to be achieved 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 for adaptation to changing situations within Oconto 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 the 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 the 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 non-governmental sources may be available. From these sources, information has been obtained and has been included in the development of this plan and the intention is to continue collaboration during implementation.

CHAPTER 1: BACKGROUND AND RESOURCE ASSESSMENT

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)*** Most Recent Farm Bill, ***Natural Resources Conservation Service's (NRCS)*** Conservation Programs Manual, the EPA's 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 natural resources. Following this principle, Wisconsin's 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 "program" 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 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 public's vital link with local landowners to promote the implementation of conservation practices and achieve greater environmental stewardship of the land.

<u>Performance Standards and Prohibitions</u>

The NR151 Agricultural 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 LWRCs 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. Since then, the NR 151 standards were updated in 2012 to include new or revised soil erosion and phosphorus reduction standards. As a whole, DNR rule NR 151 sets performance standards for runoff and to protect water quality. The ATCP 50 rule developed by DATCP and described below, defines the practices and cost sharing requirements that can be used in order to help operations meet NR 151 standards.

Performance Standards listed summarized from NR 151 Subchapter II are:

- NR 151.02: Sheet, Rill, and Wind Erosion – 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 "tolerable" (T) rate established for that soil.
- NR 151.03: Tillage setback – no tillage operations may be conducted within five feet of the top of the channel of surface waters.
- NR 151.04: Phosphorus index – 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.
- NR 151.05: Manure Storage Facilities – 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.
- NR 151.055: Process wastewater handling – no significant discharge of process wastewater to waters of the state.
- NR 151.06: Clean Water Diversions – runoff must be diverted away from contacting feedlots, manure storage areas and barnyards located in a water quality management area.
- NR 151.07: Nutrient Management – manure, commercial fertilizer and other nutrients shall be applied in conformance with a ***nutrient management plan (NMP).***

The Manure Management Prohibitions (NR 151.08) 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

ATCP 50 identifies the cost-shareable conservation practices listed in the following table in order to maintain compliance with the NR 151 standards. Specifically, the ATCP 50.78 establishes the requirements that NMPs must meet to comply with the NR151.07 Nutrient Management Standard.

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.

Table: Conservation Practices under ATCP 50

Practice or Activity	ATCP 50 Cost Share Rate	Funding Source
Land taken out of agricultural production	70%	Structural
Riparian land taken out of agricultural production	70%	Structural
Manure storage systems	70%	Structural
Manure storage closure	70%	Structural
Access road	70%	Structural
Trails and walkways	70%	Structural
Conservation cover	70%	SEG
Conservation crop rotation	$10/ac/yr	SEG
Contour farming	$9/ac/yr	SEG
Cover crop – single species + termination	$60/ac/yr	SEG
Cover crop – single species	$35/ac/yr	SEG
Cover crop – multi species	$75/ac/yr	SEG
Critical area stabilization	70%	Structural
Diversions	70%	Structural
Field windbreaks	70%	Structural
Filter strips	70%	Structural
Grade stabilization structures	70%	Structural
Habitat diversification	70%	SEG
Harvestable buffers (based on county soil rental rate)	Ac/yr	SEG
Hydrologic restoration	70%	Structural
Livestock fencing	70%	Structural
Livestock watering facilities	70%	Structural
Milking center waste control systems	70%	Structural
Nutrient management for cropland or pasture (4 yrs)	$10/ac/yr	SEG
Nutrient treatment systems	70%	Structural
Pesticide management	70%	Structural
Relocating or abandoning animal feeding operations	70%	Structural
Residue management	$18.50/ac/yr	SEG
Riparian buffers	70%	Structural
Roofs	70%	Structural
Roof runoff systems	70%	Structural
Sediment basins	70%	Structural
Sinkhole treatment	70%	Structural
Streambank and shoreline protection	70%	Structural
Stream restorations	70%	Structural
Stream crossing	70%	Structural
Strip-cropping	$13.50/ac/yr	SEG
Subsurface drains	70%	Structural
Terrace systems	70%	Structural
Underground outlet	70%	Structural
Waste transfer systems	70%	Structural
Wastewater treatment strips	70%	Structural
Water and sediment control basins	70%	Structural
Waterway systems	70%	Structural
Well decommissioning	70%	Structural
Wetland restoration	70%	Structural

Incorporation into County Ordinances

The county has adopted the Manure Management Prohibitions (NR 151.08) into the Oconto County Animal Waste Management ordinance enacted in March 2001 (Section 18.100 through and including 18.115) and has been updated since to include the Agricultural Performance Standards NR 151.02, NR 151.03, NR 151.04, NR 151.05, NR 151.055, NR 151.06 and NR 151.07. 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 & Water Conservation Department (LWCD),*** but citations are issued 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 to the total number of AU. Nutrient management planning is required to comply with AU numbers. Adopting an ordinance has established procedures allowing for a proactive approach to proposed farmstead projects because they must be submitted during the early planning phase for review by the LWCD.

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 “Old Copper Culture” 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 sawmill 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.

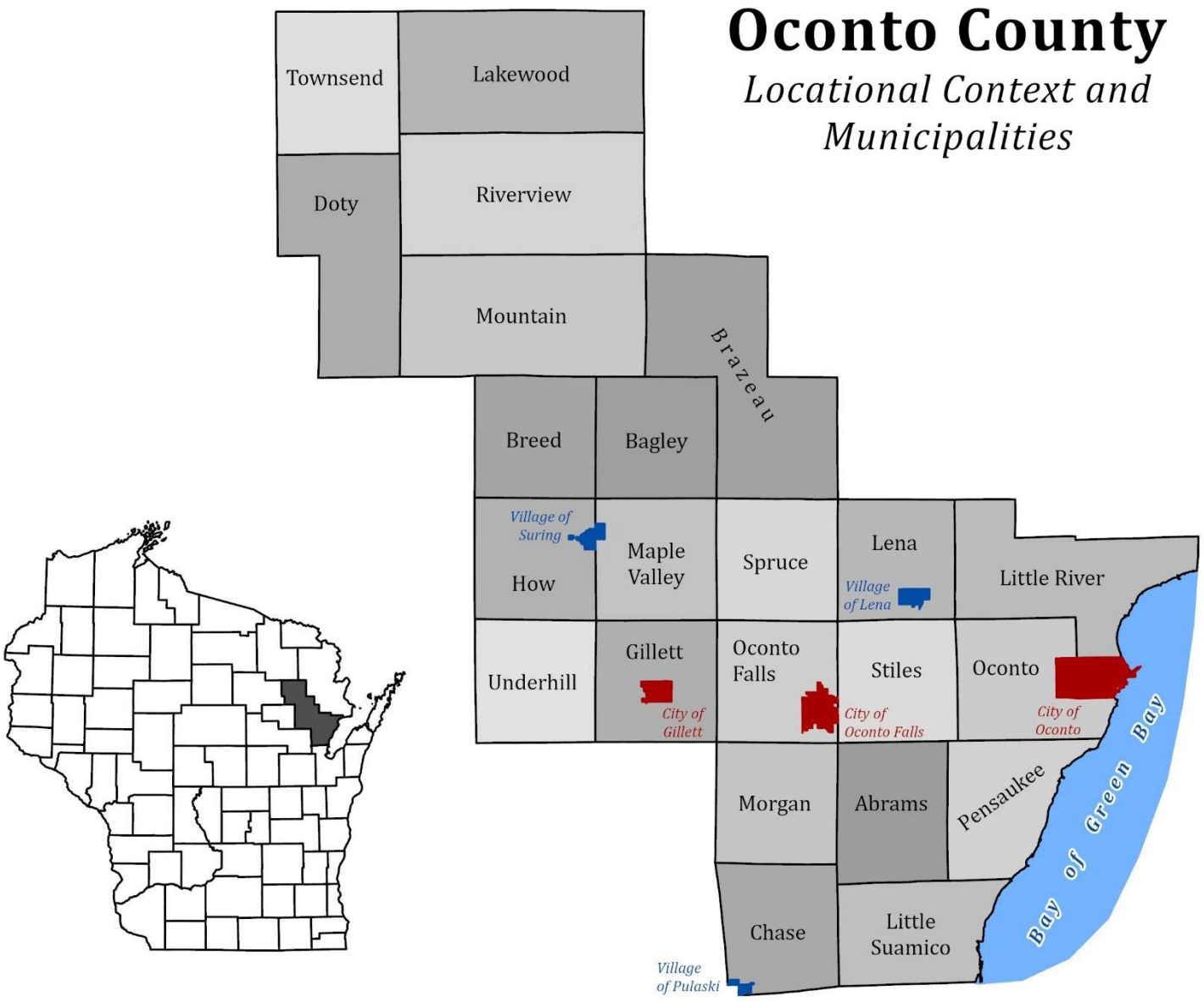
In 1855, the first road between the cities of Green Bay and Menominee began construction, northward. On March 11 of 1869 Oconto was chartered as a city by an Act of Legislature. Lumbering gave way to homestead farming, and in particular, dairying, in the latter half of the 1800's. Oconto County was an 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 651,000 acres, is located in Northeast Wisconsin. Oconto County, as of the 2020 Census, had 38,965 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). Part of the Village of Pulaski is also within Oconto County with its remaining portions in Brown and Shawano Counties. 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 map below provides 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.

Climate Change and Conservation

In recent years, climate change has played in role in conservation work and is expected to continue to. A noticeable change has been seen with consistent changes in the form of temperature rise and precipitation intensity. Of those two categories, the precipitation intensity is more pertinent to soil and water conservation specifically as it applies to the issue of increased erosion and the design of BMPs that are installed to reduce or prevent such erosion. BMP designs that control water flow, such as grassed waterways or grade stabilization structures have thus far and will continue to factor in greater storm intensities; particularly those rain events that produce greater than two inches of rainfall in a 24 hour timeframe and five inches of rainfall in the same timeframe. Data from the University of Wisconsin-Madison Nelson Institute, Center for Climatic Research show that those types of storm events will increase when comparing historical data from 1981 to 2010 with projections for 2041 to 2060. Additional data suggests that much of this added precipitation will also seasonally shift to occur in the winter months when the ground may be frozen and soil exposed. The use of BMPs such as reduced tillage and planting of cover crops have increased in the past decade within Oconto County and will continue to play a large part in reducing erosion in the fall through spring. Furthermore, indirect water control practices such as wetland restorations and properly designed stream crossings will also play an important part in controlling the impacts of increased rainfall. This data and how it may affect erosion, water quality, and flooding potential has played a role in the development of the goals of this plan.

Geology

Bedrock

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 map of the bedrock depth is included below.

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 geological processes have resulted in rock outcrops which can be found 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. Other areas of the county rise above those named points with a maximum elevation in the far northwest at 1791 feet.

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 lakes and outwash plains. This region is very low in elevation compared to the rest of the county being as low as 552 feet above sea level. A map showing the difference in elevation from northwest to southeast follows.

Landcover

Wetlands are the most abundant landcover type in the county with approximately 217,000 acres and 33% of all cover. Open herbaceous and forested wetlands were included in this category. There are many pocket wetlands in field depressions and wooded areas that contribute to this acreage. However, the major expanses of wetlands surround various branches of the Oconto River, Peshtigo Brook, and the shoreline of Green Bay. Wetlands located close to the Green Bay shoreline provide rich habitat for plants and animals and greatly influence the larger ecosystem processes of the Great Lakes. 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 including the Oconto Marsh, County Line Swamp, Pensaukee River Wetland Complex, Charles Pond, and Mud Creek Wetland as a way to guide future planning efforts.

About 184,000 acres of land in the county was comprised of agricultural land as of the most recent survey completed in 2023 by the ***United States Geological Survey (USGS)***. Agriculture is found mainly in the central and southern portions of the county. This includes cultivated land for crop production as well as dedicated pastureland. Agricultural land slightly edges out forested land as the second most abundant landcover type at 28.3% of the county's surface area.

The next most abundant landcover is forested land with about 183,000 acres which comprises 28.1% of all surface cover in the county. Woodlands maintain watershed cover, provide shade, serve as a windbreak, and help reduce soil erosion. The primary timber types are aspen, softwoods, swamp hardwoods, and northern hardwoods. Most of the forested land is situated in the northern third of the county. Publicly owned land makes up approximately half of the forested areas in Oconto County as shown in the corresponding map that follows. The Nicolet National Forest consists of 138,000 acres in the Northern third of the county while Oconto County Forest comprises another 43,345 acres located in the northern and southern portions of the county.

Other landcover types such as developed land (including roads), grasslands, and open water, cover the rest of the county. Oconto County contains approximately 25 miles of 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. A mapped representation of the landcover throughout the county can be seen below.

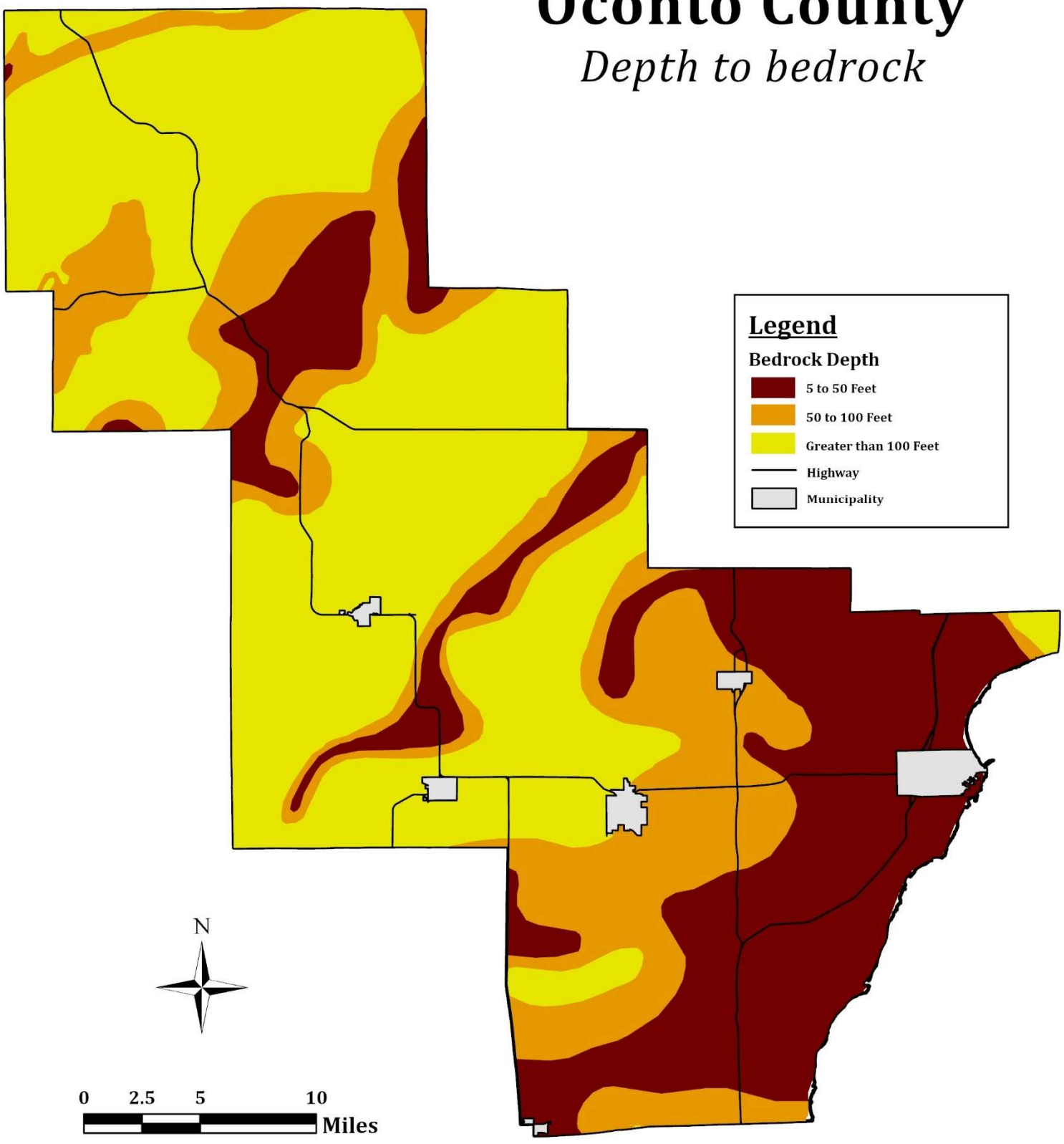
Soils and Erosion

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.

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 problem potential. 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. A soils map is included below to visually depict the distribution of various soil textures.

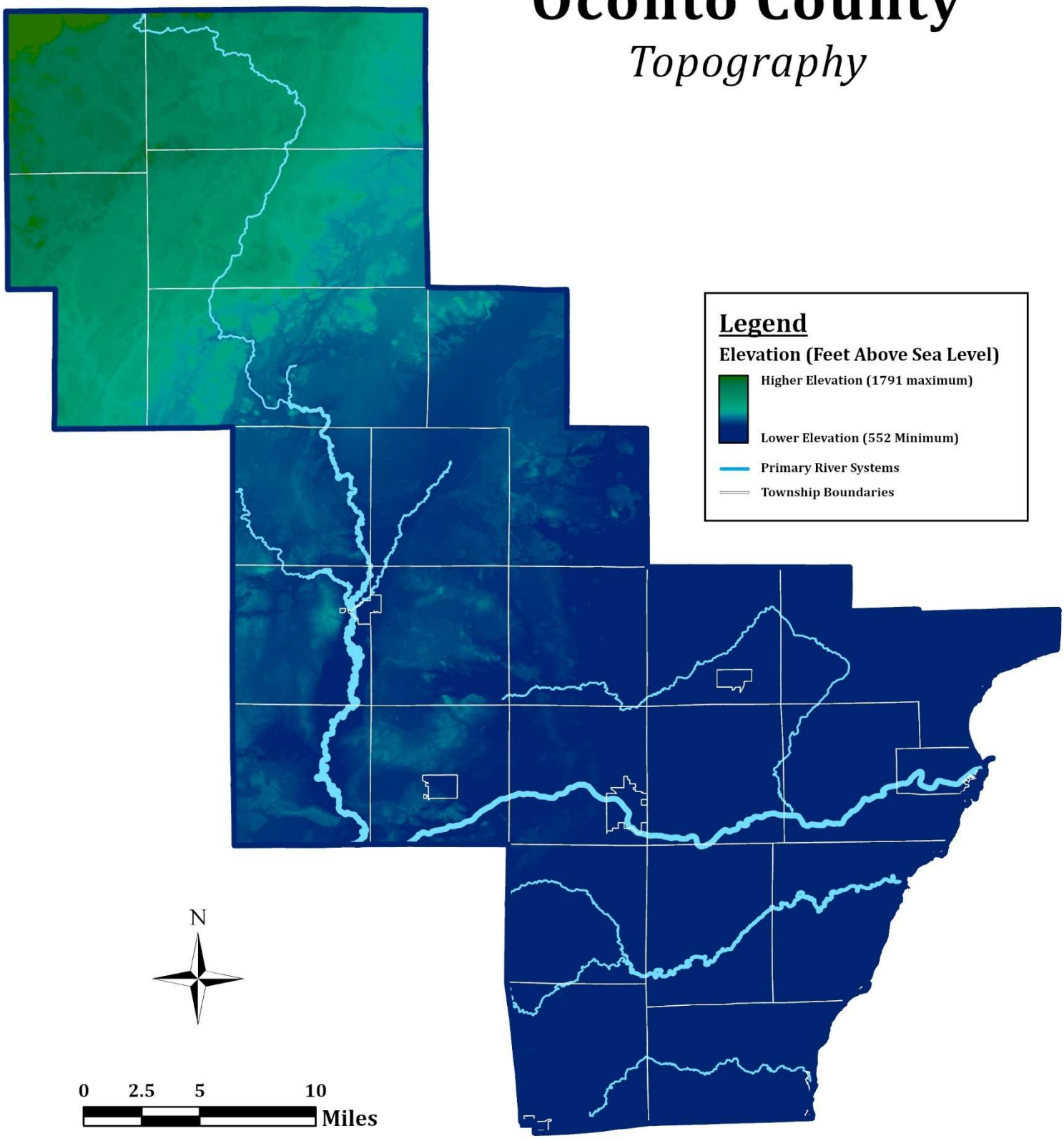
Oconto County

Depth to bedrock



Oconto County

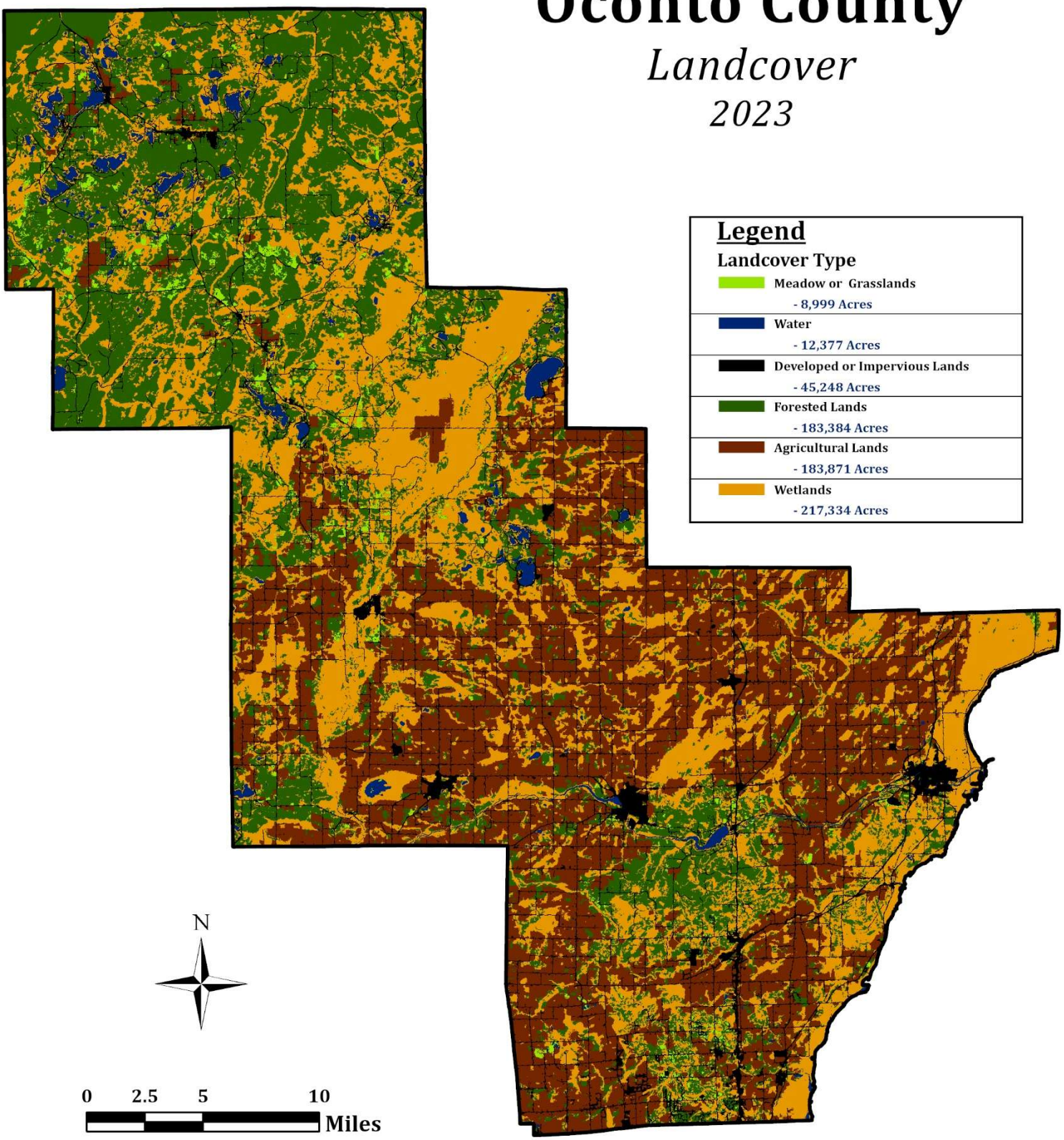
Topography



Oconto County

Landcover

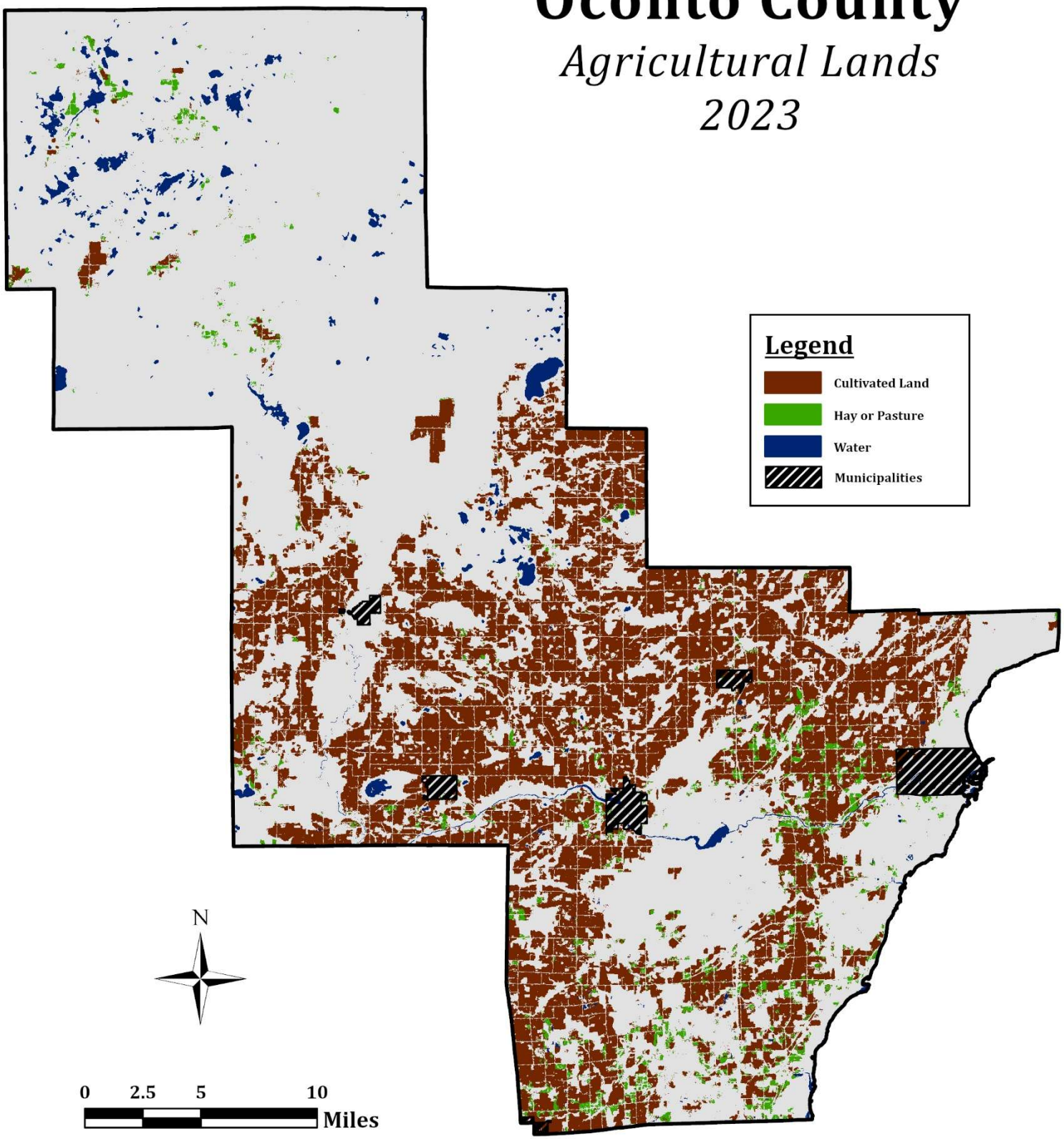
2023



Oconto County

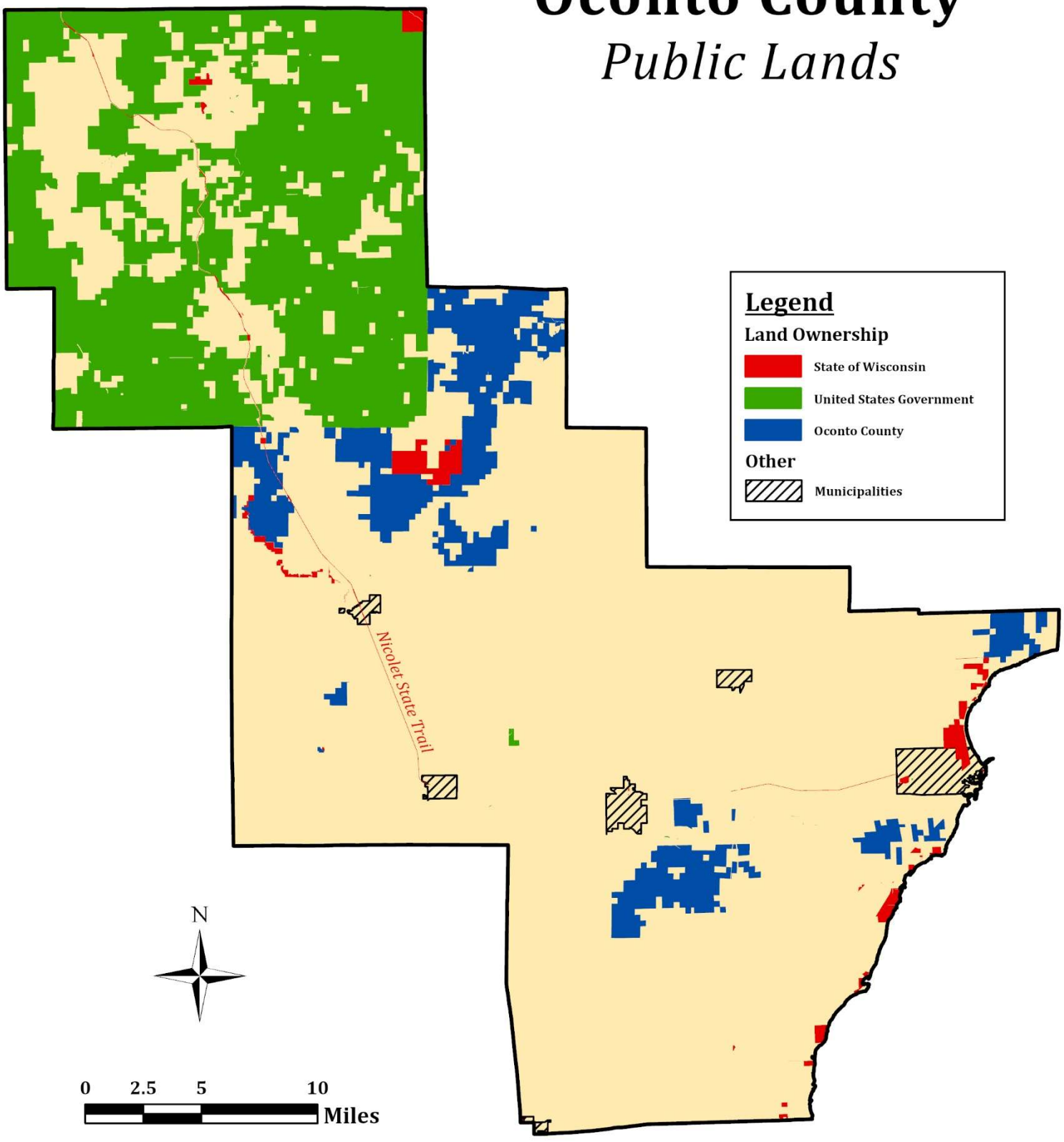
Agricultural Lands

2023



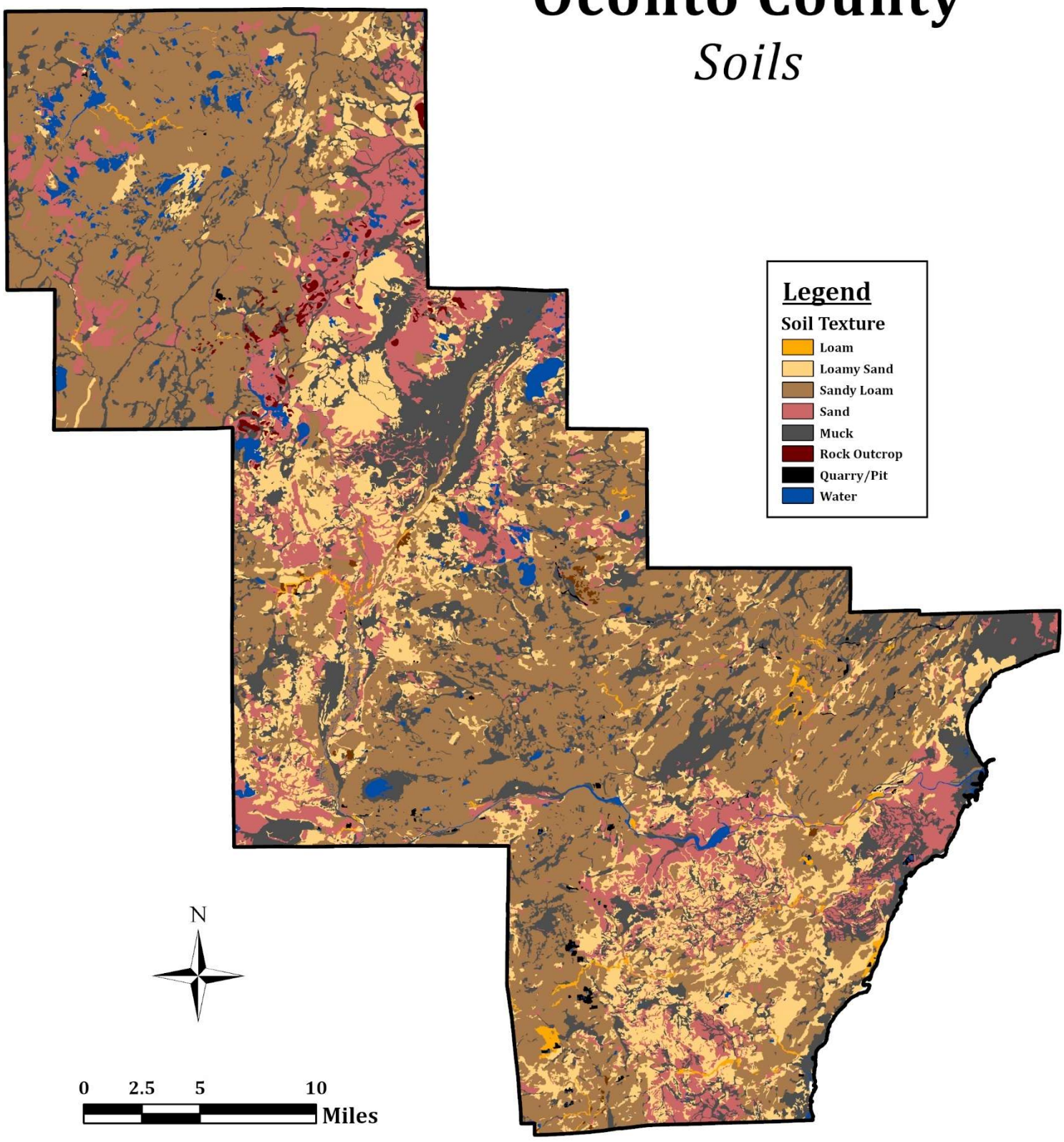
Oconto County

Public Lands



Oconto County

Soils



NATURAL RESOURCES

Surface Water

Approximately 4 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, Pensaukee and Little River. 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. Major waters, in this case, include lakes and ponds greater than 100 surface acres and substantial river basins. The surface waters of the county also provide quality habitat for waterfowl and wildlife in addition to recreational opportunities. Over 450 miles of Oconto County streams are considered classified trout streams, meaning they support a sport trout fishery population through the existence of suitable habitat and water temperatures. Some of the streams may support sufficient natural reproduction and some require stocking to remain viable sport fisheries. The location and distribution of these classified trout waters can be seen on the map on page 24.

Table: Lake Data for Oconto County

Size (Acres)	Number of Lakes	Total Size (Acres)
Under 10	228	761
10-29	74	1,331
30-49	29	1,097
50-99	17	1,152
100 or Greater	27	8,309
Total	**375**	**12,560**

Table: Stream Data for Oconto County

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

Table: 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

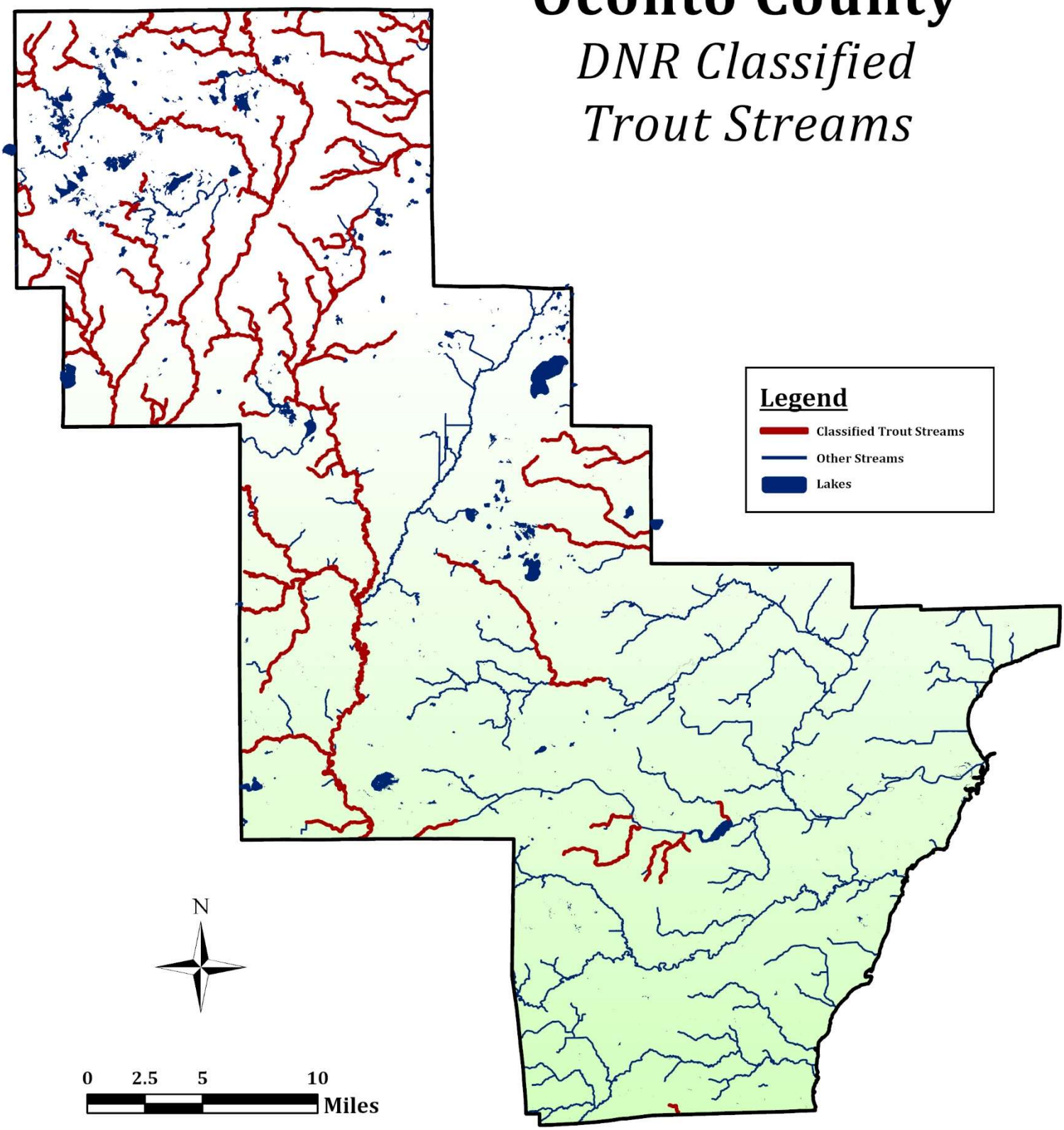
Table: Oconto County Major Rivers

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 DNR

Oconto County

DNR Classified Trout Streams



Watersheds

Oconto County includes portions of twelve watersheds, ten of which are part of the larger Lake Michigan Basin. All of those ten watersheds drain indirectly into Lake Michigan through the bay of Green Bay via one of the county's major rivers. Of those, there are six watersheds in which most of the drainage area resides in the Oconto County boundary, two that are have moderate land areas within the county, and four of which have minute portions within the county. Following the brief summary on water quality testing below, there is a map of the watersheds with substantial drainage area within the county followed by a series of maps showing each watershed on its own with its respective major water resources and contextual elements. Accompanying each map is a brief description of the watershed including any unique features or resource concerns.

Water Testing

The extent of watershed evaluation within Oconto County is minimal but does exist. Although there were some studies done on other watersheds, recent studies and water testing done by the Wisconsin DNR and Oconto County LWCD have focused on the Little River Watershed and its subwatersheds, comprised in large part by agricultural land use. The studies and data available are present day observations and impart no indications of load reduction targets. Below are the summaries of studies and testing done to date.

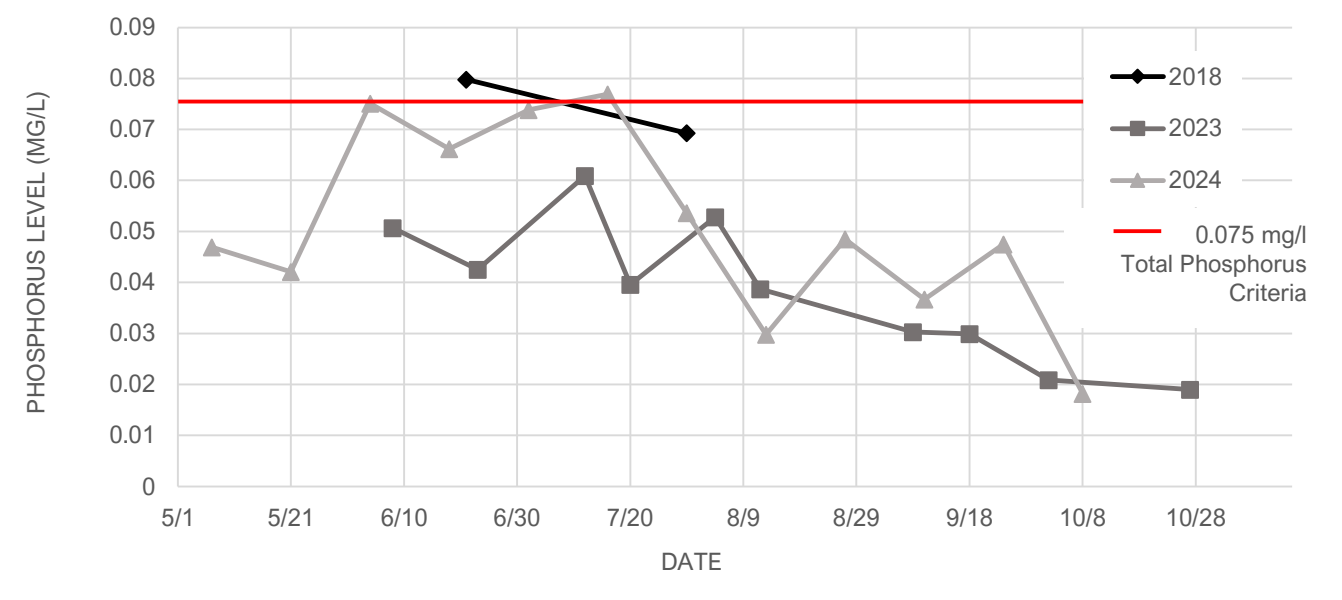
There were assessments from 2012 and 2013 of the Lower Oconto River Watershed by Andrew Hudak, a Water Quality Biologist with the DNR. These studies entailed water temperature monitoring, electroshock fish surveys, habitat surveys, and macroinvertebrate sampling in the Oconto River and select tributaries. Habitat quantity tended to be fair to good in all sampling locations. Fish surveys were "consistent with expectations," 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.

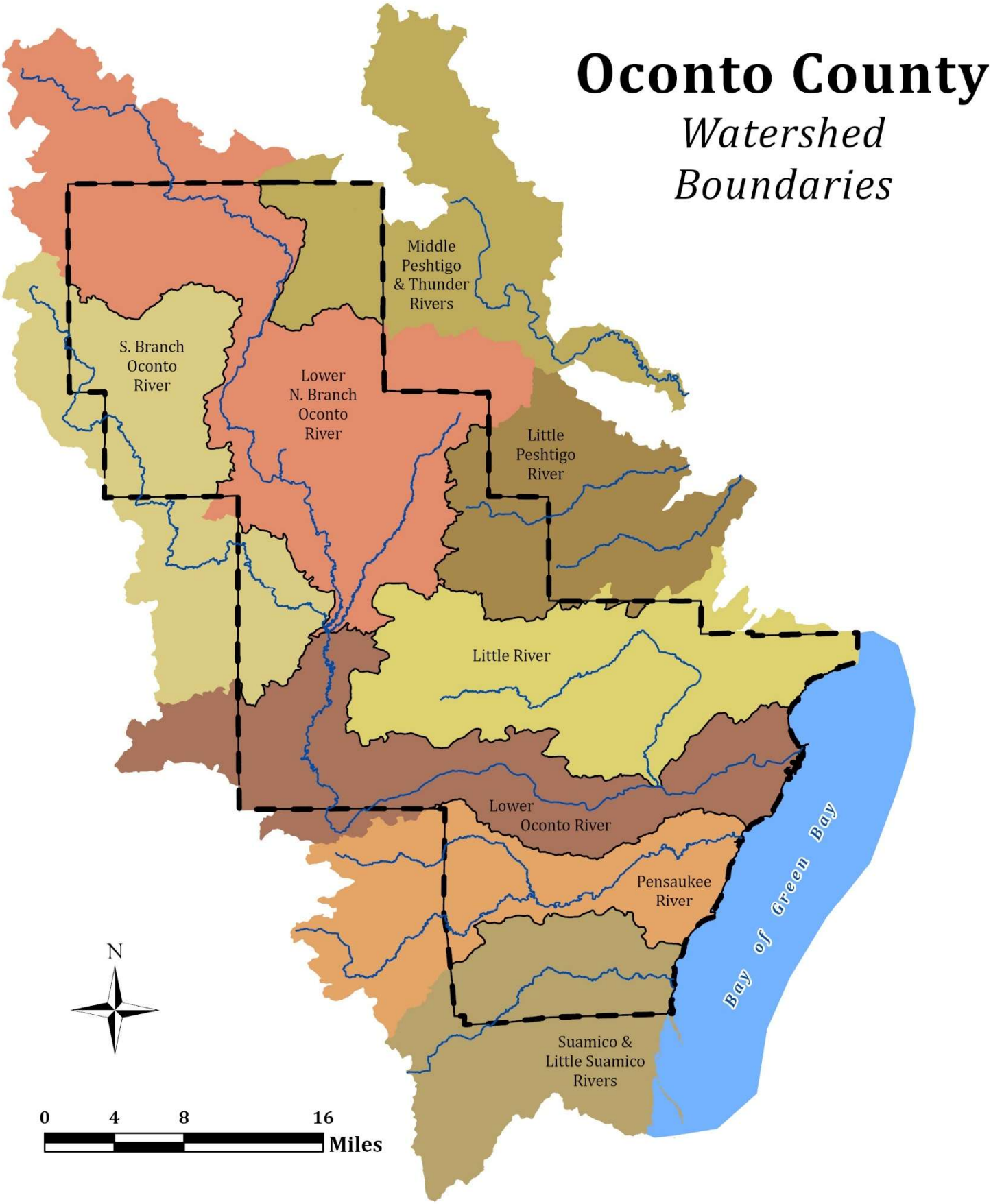
In addition, there was a DNR study of the Little Suamico River watershed with compiled data from 2005 to 2014. This study was even less thorough than the Lower Oconto, and most results were deemed as having been drawn from insufficient data.

In 2018, an ambitious water quality and impairment study was initiated by Hudak to assess the impairment contributions from different stream stretches of the Little River watershed. This study was launched in response to the lower 9 miles of the Little River watershed being listed on the ***303(d)*** **waters** list for total phosphorus. Testing showed that in Spring of 2018, the Little River mainstream was double the criteria of 0.075 mg/L total phosphorus at the highest runoff times and slightly above the criteria level even during low-flow seasons. Various sub-watersheds within the larger Little River watershed were tested over a two-year period to attempt to locate high pollutant contributing stretches impacting the waters of Little River. In 2018 the upper three sub-watersheds being North Branch, Kelly Brook and Headwaters of Kelly Brook were sampled for water chemistry, fish index of biotic integrity (IBI), macroinvertebrate IBI, quantitative habitat assessments and a diatom nutrient index. During the growing season water chemistry samples, total phosphorus, total suspended solids and direct runoff potential were collected at the sub watershed outlet locations spanning the Little River watershed. In 2019 these 12 sites were sampled during spring runoff and retested during the growing season. Some tile discharge sites were also sampled in 2019 to understand dissolved reactive phosphorus dynamic in the system during spring, summer and fall seasons.

After Hudak's study was completed in 2021, the Oconto County LWCD began inventorying farmsteads, crop fields, gullies, and streambanks in the North Branch Little River watershed. Key resource concerns were identified, and collaboration began with watershed landowners and farm operators to implement BMPs aimed at improving soil health, reducing erosion, and minimizing livestock runoff, with the goal of reducing phosphorus and sediment entering the mainstream Little River system. Through the National Water Quality Initiative (NWQI), the USDA Natural Resources Conservation Service provided funding to support the installation of these practices. Following five years of implementation, the LWCD began testing water samples from the North Branch Little River for total phosphorus and sediment to evaluate water quality improvements. Monitoring efforts are expected to continue through 2026. In addition, Eric Evensen, Water Resources Management Specialist with the WDNR, plans to build on Hudak's study and continue monitoring water quality throughout the Little River watershed beginning in 2025 and beyond. Hudak's 2018 study identified the Daly Creek and Jones Creek sub-watersheds as areas of high loading for total phosphorus, making them potential priority areas as efforts continue to delist the lower section of Little River. The graph below displays data from 2018, 2023, and 2024.

Graph: Water Sampling Phosphorus Results North Branch Little River at Belgium Road

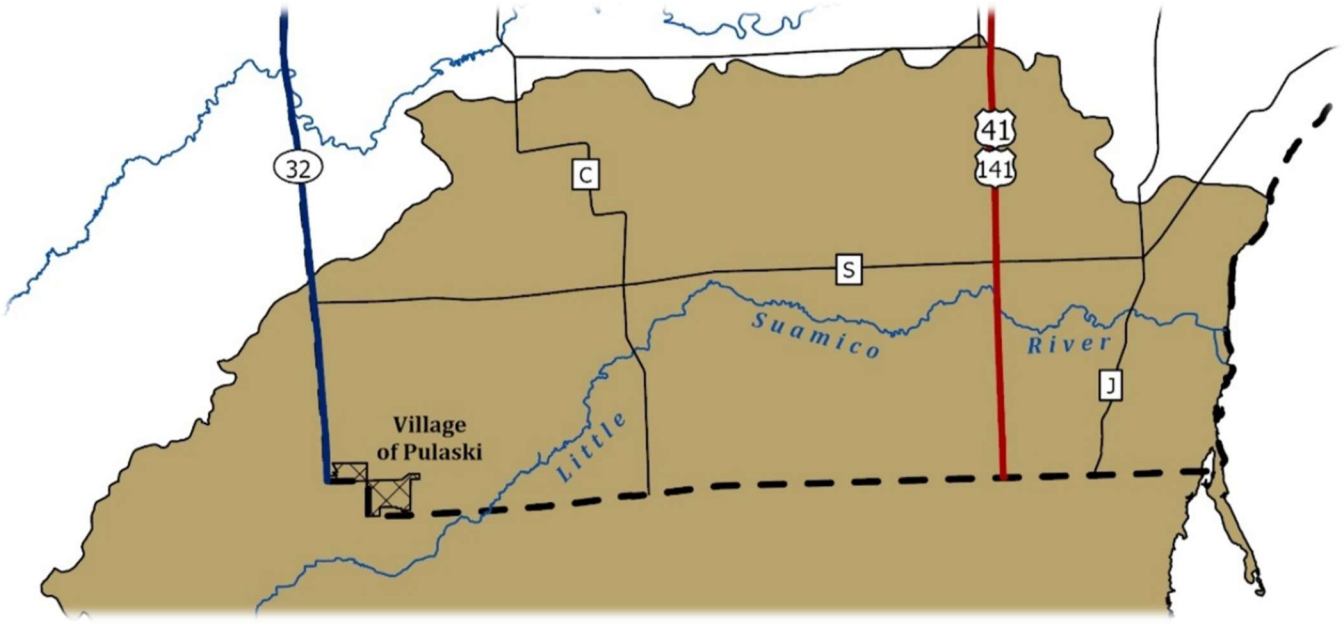



Oconto County
Watershed
Boundaries
Middle
Peshtigo
& Thunder
Rivers
S. Branch
Oconto
River
Lower
N. Branch
Oconto
River
Little
Peshtigo
River
Little River
Lower
Oconto River
Pensaukee
River
Bay of Green Bay
Suamico &
Little Suamico
Rivers
N
0
4
8
16
Miles

Individual Watershed Descriptions

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. While agriculture remains a primary land use in the watershed, the number of residential homes expanding out from the Green Bay area has increased greatly in the past decade. ***Nonpoint source pollution*** impacts the water quality in this watershed. As of 2024 the Little Suamico River can be considered a priority as it was placed on the EPA 303(d) list with total phosphorus named as the major pollutant. A small portion of the Village of Pulaski is located within the Oconto County portion of this watershed, but the unincorporated Little Suamico community adjacent to Highway 41/141 has attained prominence in the past decade due to urban sprawl from the City of Green Bay metropolitan area.

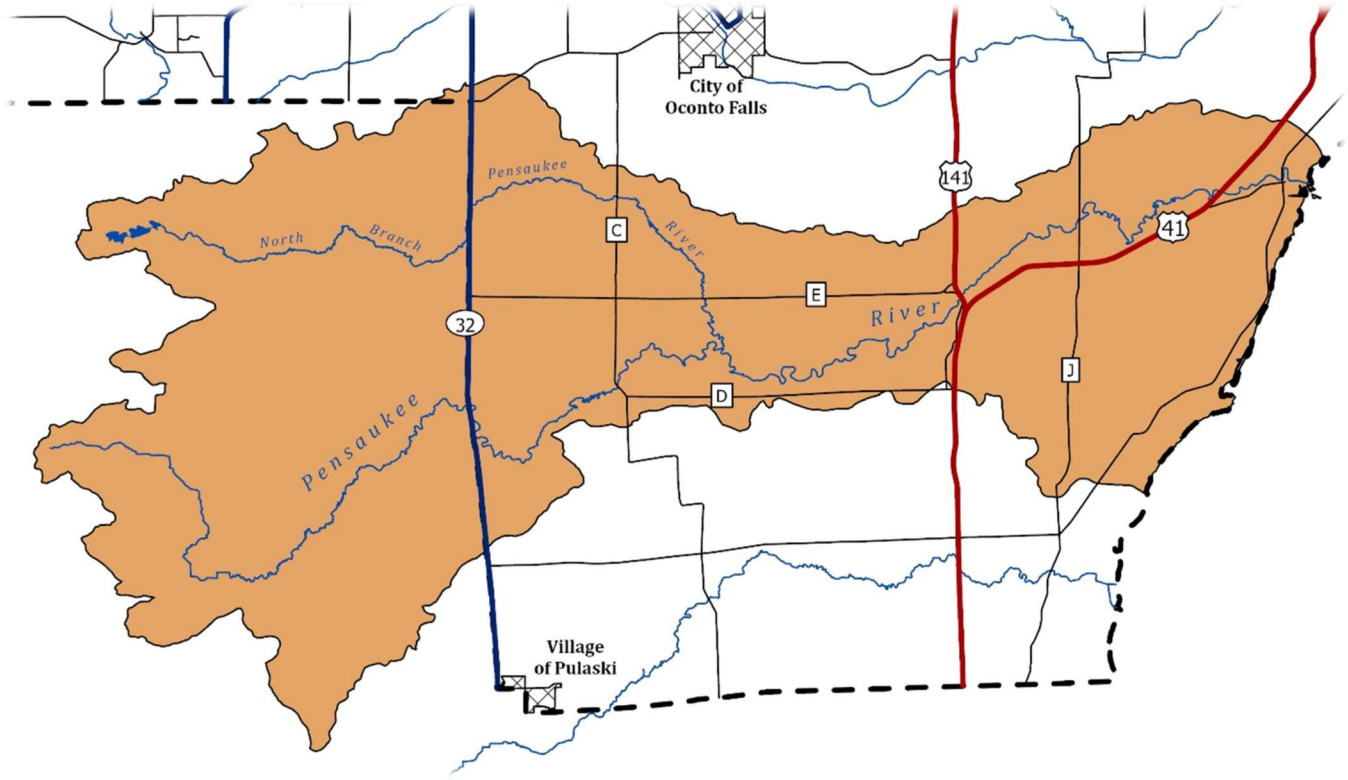


Pensaukee River Watershed (GB02)

The Pensaukee River Watershed originates in eastern Shawano County and flows east through Oconto to Green Bay. The watershed had been involved in the ***nonpoint source pollution abatement program*** from 1996 until 2016 to deal with NPS problems. The overall water resource goals sought through this priority watershed plan effort were as follows:

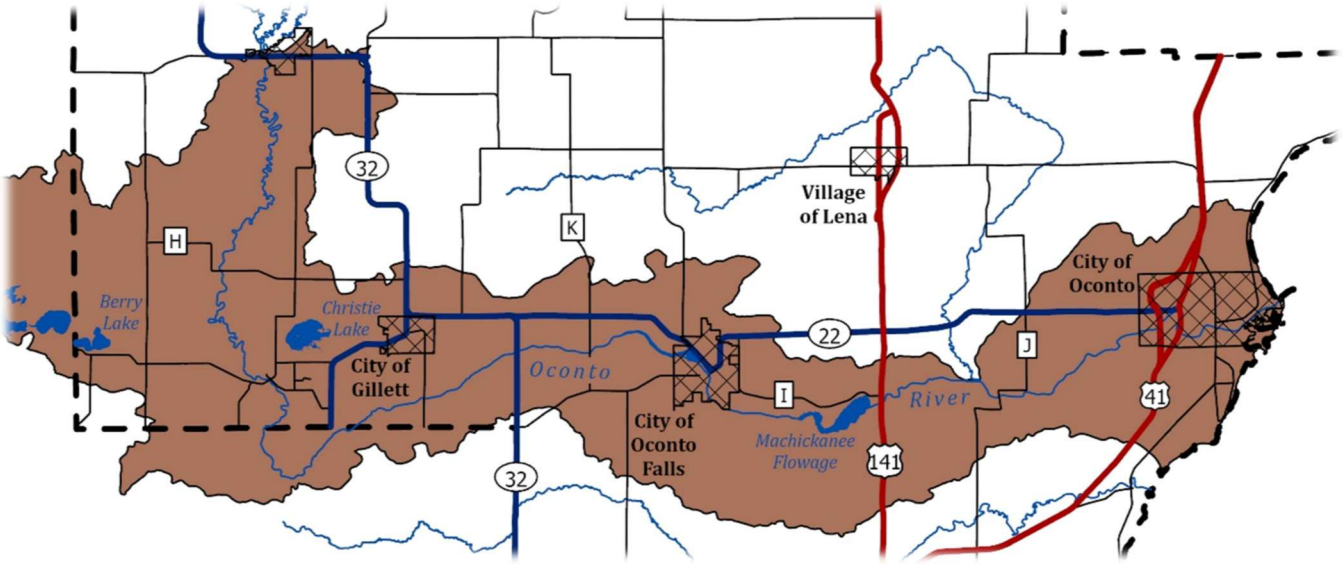
- ► Protect, enhance and restore water quality of the streams of the subwatershed in order to improve the water quality of all the subwatersheds and ultimately Green Bay
- ► Protect, enhance and restore wetlands of the subwatersheds, especially focusing on the near shore areas of Green Bay in order to 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

Despite the improvements that resulted from the program, due to increasingly higher standards from regulatory agencies over the course of time, as of 2024 the Pensaukee River remained as designated by EPA on the 303(d) list with total phosphorus named as the major pollutant and therefore is a priority. Furthermore, the mouth of the river as it meets Green Bay is mentioned separately as having ***Perfluorooctane Sulfonate (PFOS)*** concerns. This watershed contains valuable spawning habitat for some Green Bay sport fish species and the primary land use in the watershed is agricultural.



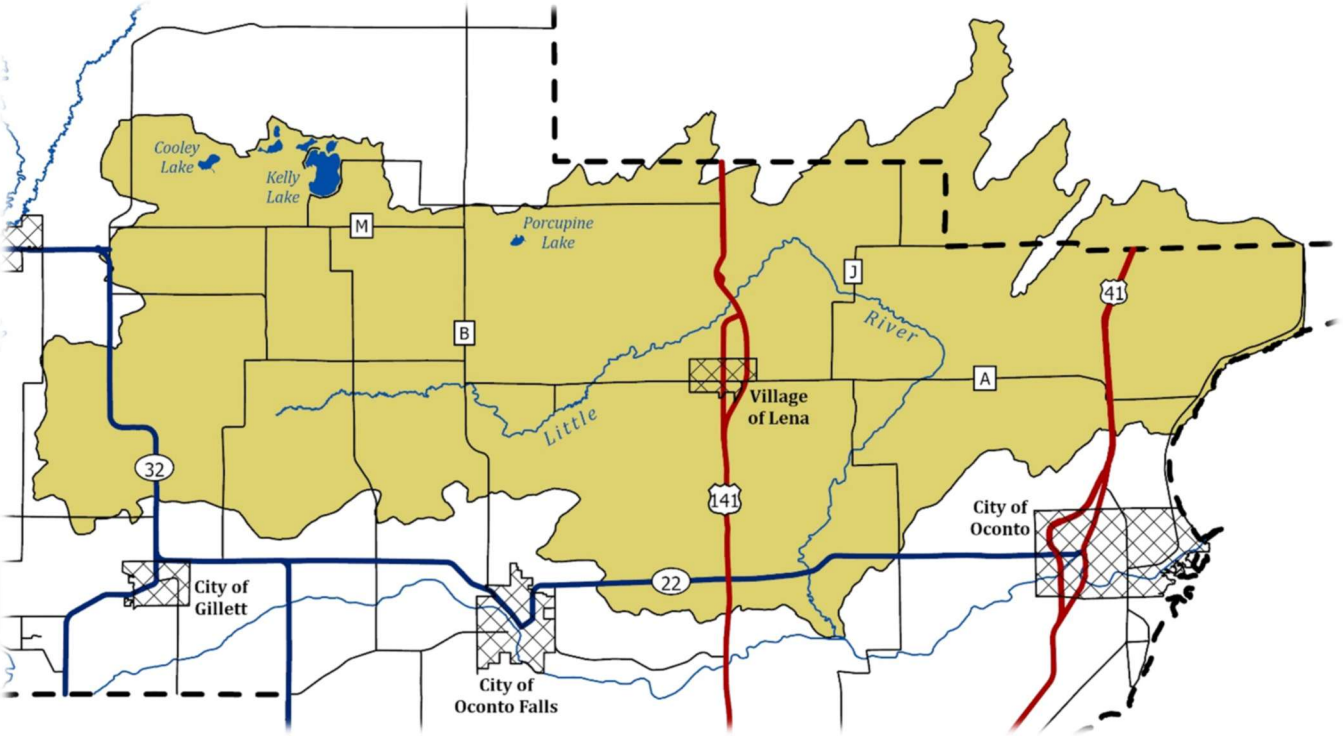
Lower Oconto River Watershed (GB03)

The Lower Oconto River Watershed is located in central Oconto County, with small portions extending into northern Shawano and eastern Menominee counties and it drains into Green Bay. Three hydroelectric power dams operate on the Oconto River in this watershed. There is widespread agricultural activity along this stretch of the Oconto River. Due to the existence of several dams on the stretch of the Oconto River in this watershed, the 303(d) list includes different pollutants of concern for the separate sections of the river between dams. Overall, the pollutants of concern throughout various stretches includes mercury, phosphorus, PFOS, and elevated water temperatures. The cities of Oconto, Oconto Falls, and Gillett all fall within this watershed.



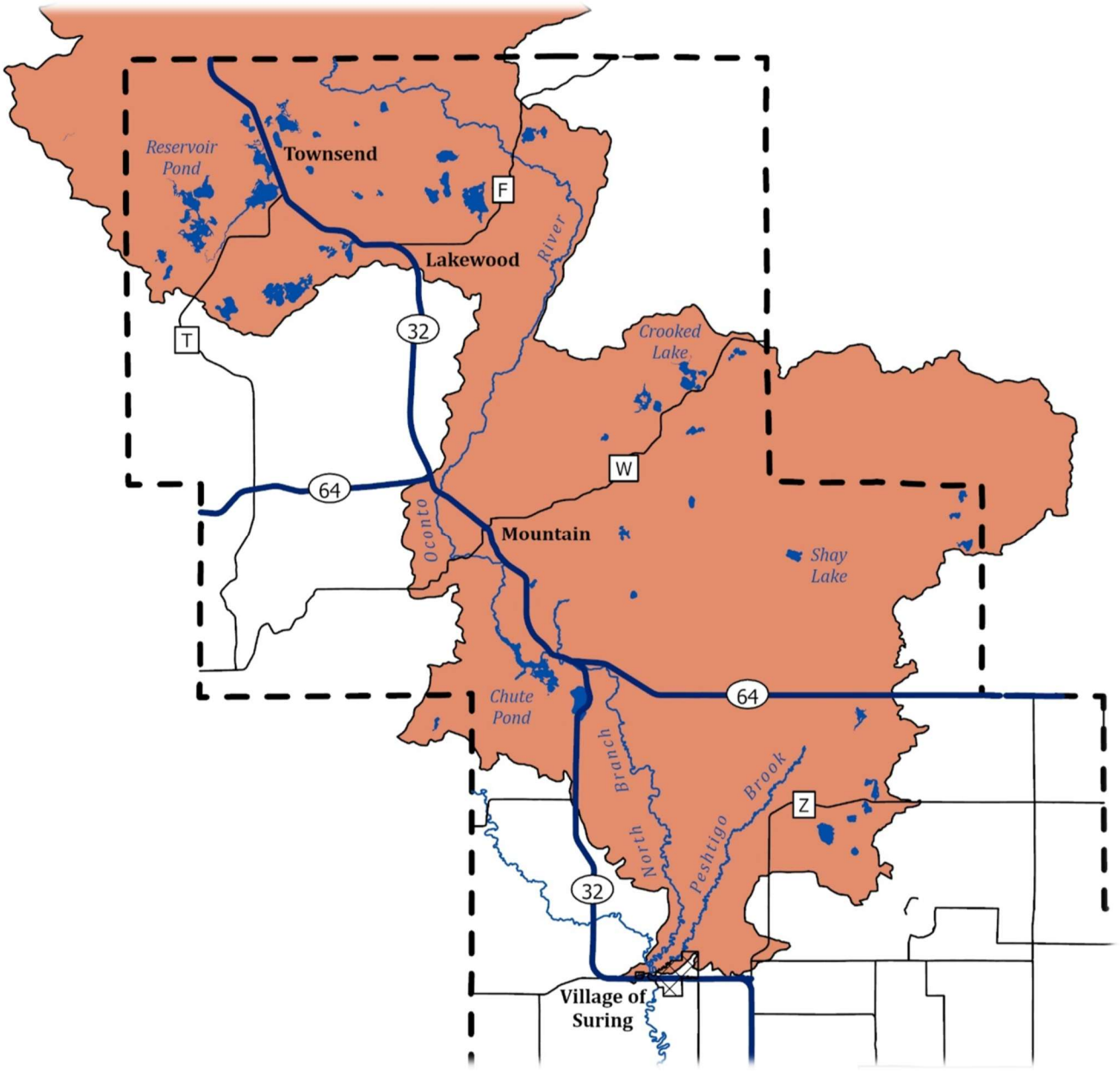
Little River Watershed (GB04)

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 principal 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. As of 2024, the Little River remains on the 303(d) list and thus remains a priority, but water quality conservation practices were promoted in this watershed through an NRCS NWQI watershed grant for the North Branch Little River and water testing has been ongoing since 2018 by the DNR and the LWCD to monitor progress as detailed previously.



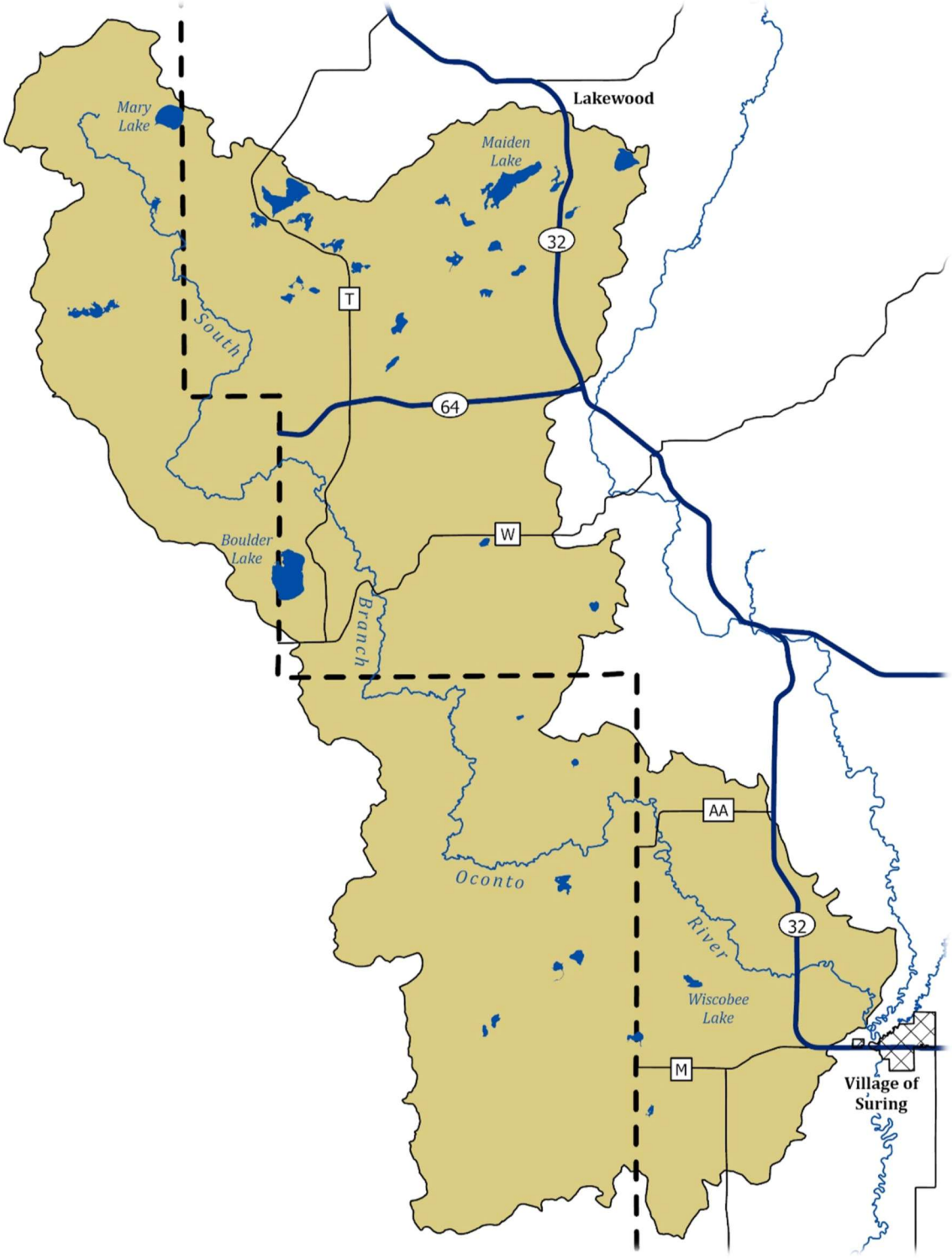
Lower North Branch Oconto River Watershed (GB05)

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. The southern boundary of the watershed lies at the confluence with mainstream Oconto River in the Village of Suring.



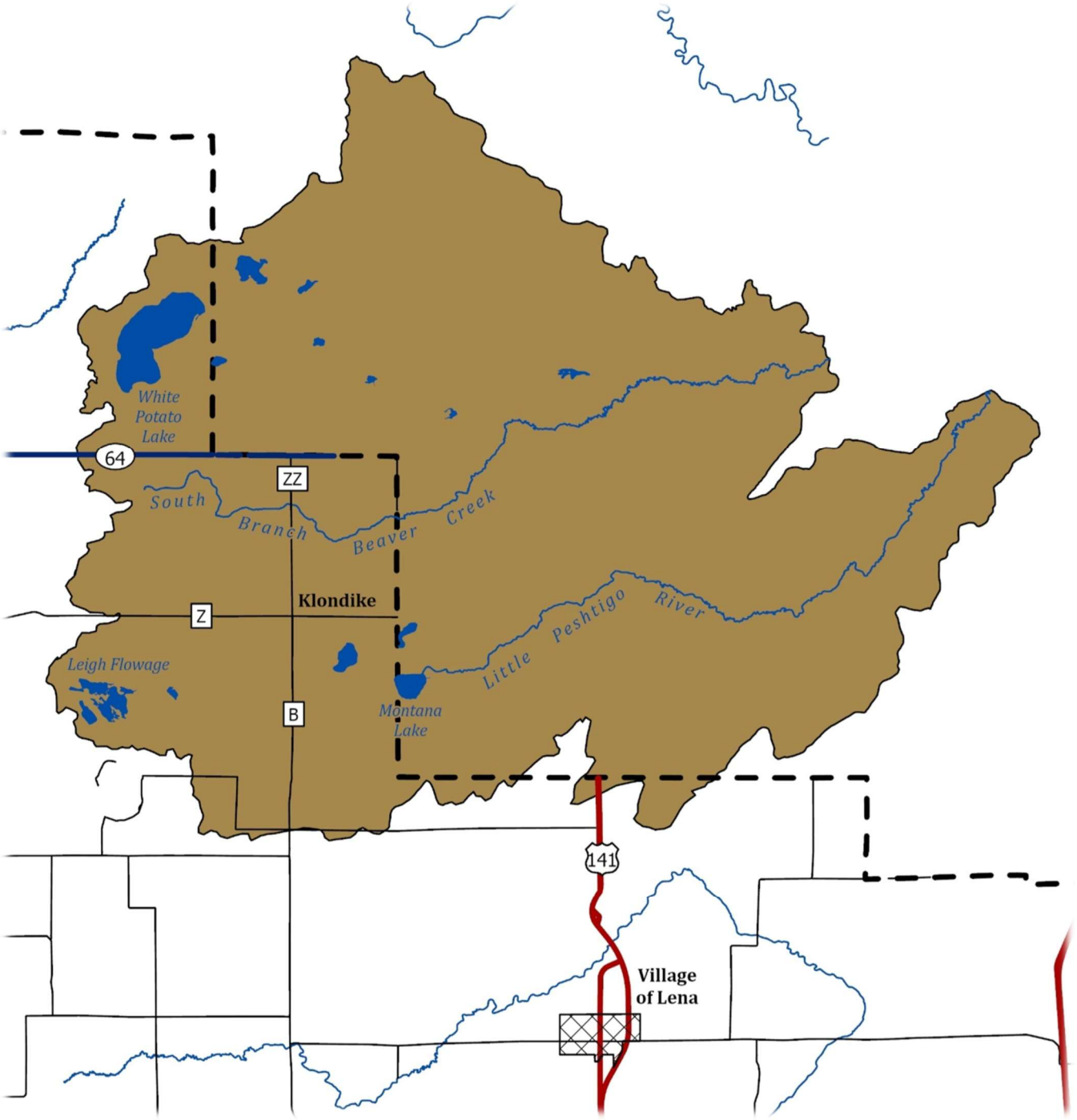
South Branch Oconto River Watershed (GB06)

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.



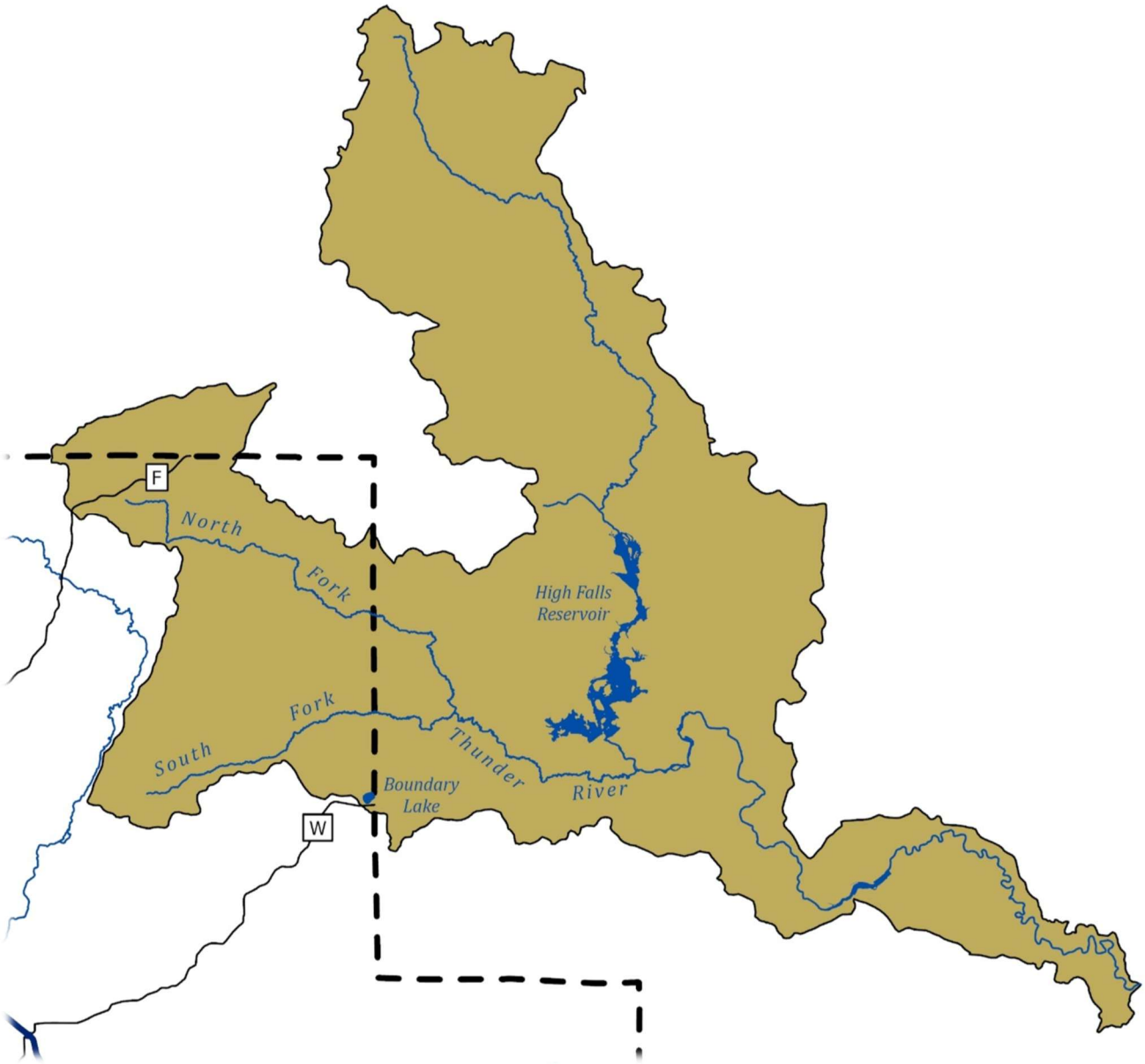
Little Peshtigo River Watershed (GB08)

The Little Peshtigo River has about one-third of its area within Oconto County. Water resources include multiple named lakes and the upper reaches of South Branch Beaver Creek. The Little Peshtigo River itself begins at the outlet of Montana Lake which shares its area with Oconto and Marinette counties. The Little Peshtigo watershed has a mix of agriculture and forest.



Middle Peshtigo and Thunder Rivers Watershed (GB10)

The Thunder River head waters start in Oconto County with the North and South Forks of the Thunder River. The majority of the watershed in Marinette County. The Oconto County Portion of the Thunder River watershed is comprised of mainly forest. The Middle Peshtigo River portion of this watershed lies entirely outside of Oconto County.



Water Quality

Overview

Of the 12 HUC 10 sized 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 seven watersheds which include 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 remain designated on the EPA 303(d) list with total phosphorus identified as the major pollutant. If staff and funding is available, Oconto County intends coordinate with the DNR and other agencies to develop 9 Key Element plans within these watersheds in the future to help restore phosphorus impaired waters.

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

- ► Cropland Soil Erosion - most prevalent in the middle and southern watersheds
- ► 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.

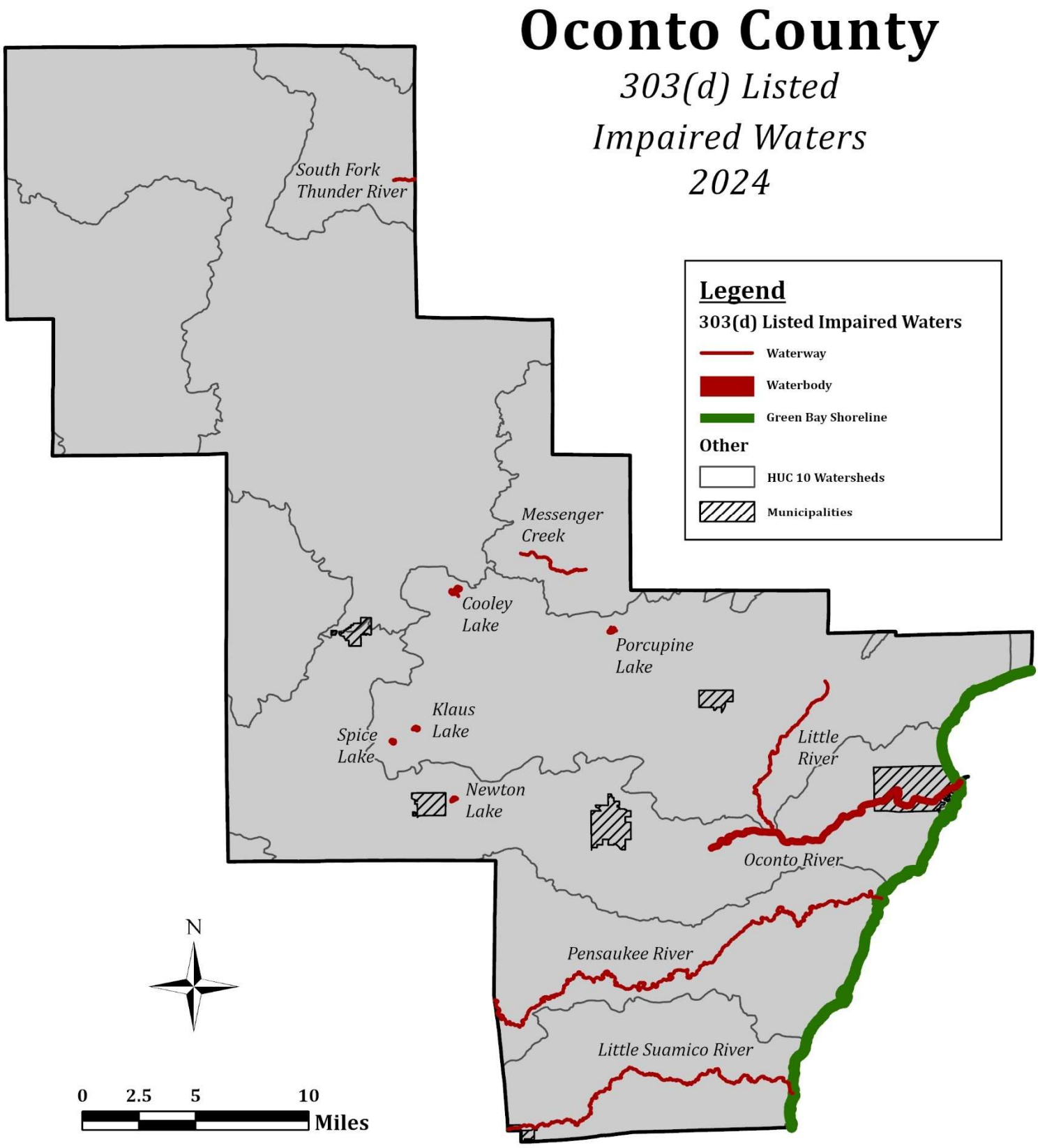
The lower two-thirds of the county from roughly HWY 64 south is the concentrated agricultural and budding urban sprawl from Brown County. The northern one third of the county from roughly HWY 64 north is forested land with small agricultural impacts. The size of the county, and somewhat marked change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

Impaired Waters (EPA 303(d) 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*** list may be listed as a result of airborne or waterborne contamination. Mercury and PFOs contamination account for the main reasons for ***Fish Consumption Advisories (FCA)*** and are on Lower Oconto River and nearshore Green Bay. The Little Suamico River, Little River and Pensaukee River are all listed for total phosphorus and lakes that are listed for total phosphorus are Cooley, Klaus, Newton, Porcupine, and Spice. These waters are organized into a table format below and shown in mapped format following that. Other reasons for listing include elevated water temperatures which can result in algae growth and degraded biological communities which can be detrimental to ecosystemic functions. This plan describes practices and programs available for administration by the LWCD to help restore waters to current water quality standards.

Table: Impaired Waters - EPA 303(d) List *(Source: WDNR via EPA, 2024)*

Water Resource Name	Lake Acres or Waterway Miles	Year Listed	Pollutant	Impairment Indicator
Cooley Lake	62.04	2022	PHOSPHORUS, TOTAL	Impairment Unknown, Excess Algal Growth
Green Bay Shoreline	N/A	2024	PFOS**	PFOS Contaminated Fish Tissue
Klaus Lake	21.81	2022	PHOSPHORUS, TOTAL	Eutrophication, Excess Algal Growth
Little River	9.95	2014	PHOSPHORUS, TOTAL	Impairment Unknown
Little Suamico River	23.8*	2014	PHOSPHORUS, TOTAL	Degraded Biological Community
Messenger Creek	3.77	2018	CAUSE UNKNOWN	Elevated Water Temperature
Newton Lake	19.35	2016	PHOSPHORUS, TOTAL	Excess Algal Growth
Oconto River	14.16*	1998	MERCURY, PFOS	Mercury and/or PFOS Contaminated Fish Tissue
Pensaukee River	49.4*	2014	PHOSPHORUS, TOTAL	Impairment Unknown
Porcupine Lake	32.2	2022	PHOSPHORUS, TOTAL	Impairment Unknown, Excess Algal Growth
South Fork Thunder River	4.36*	2018	CHLORIDE	Chronic Aquatic Toxicity
Spice Lake	20.17	2020	PHOSPHORUS, TOTAL	Impairment Unknown
* May include reaches in adjacent counties. **Perfluorooctane Sulfonate				


Oconto County
303(d) Listed
Impaired Waters
2024
Legend
303(d) Listed Impaired Waters
Waterway
Waterbody
Green Bay Shoreline
Other
HUC 10 Watersheds
Municipalities
South Fork
Thunder River
Messenger
Creek
Cooley
Lake
Porcupine
Lake
Klaus
Lake
Spice
Lake
Newton
Lake
Little
River
Oconto River
Pensaukee River
Little Suamico River
N
0
2.5
5
10
Miles

Water Quality Protection

Outstanding and exceptional resource waters are those waterbodies and waterways identified by the state of Wisconsin, as a derivative of the EPA Clean Water Act, as having qualities that warrant additional protections from pollutants. Those qualities include recreational opportunities, valuable fisheries or habitat, and good water quality. Another key to having an ORW or ERW designation is the lack of human impacts on water quality. ORWs are ranked slightly above ERWs in that they do not have any identified pollutants discharging into them, whereas ERWs may have insignificant pollutant discharges that were present at the time of designation with water qualities standards still being met. ORWs and ERWs are written into state statues (NR102) and therefore fall under legal regulatory authority and permitting. Within Oconto County, 10 named bodies of water are classified as Outstanding Resource Waters and an additional 32 that are classified as Exceptional Resource Waters. Oconto County contains 64 unnamed creek segments that are also classified as Exceptional Resource Waters.

Building on the idea of protecting high quality waters, the DNR initiated a plan in 2022 known as "The Healthy Watersheds, High-Quality Waters Action Plan" in order to create a better balance between protecting waters that are already of high quality and restoring those that may be degraded. High-quality waters in the plan possess at least two of three characteristics: unique or rare resources, attains state water quality standards, or good-to-excellent biotic integrity. Healthy Watersheds were modeled at the HUC12 watershed scale using 26 unique indicators that considered landscape condition, hydrology, geomorphology, habitat, water quality and biology. The 30% healthiest watersheds in the state and within each major drainage basin are the geographic protection priorities for this statewide plan. The portion of that plan of interest to the LWCD is the identification of areas and surface water features of Oconto County that meet parameters to warrant an approach of preserving the existing conditions.

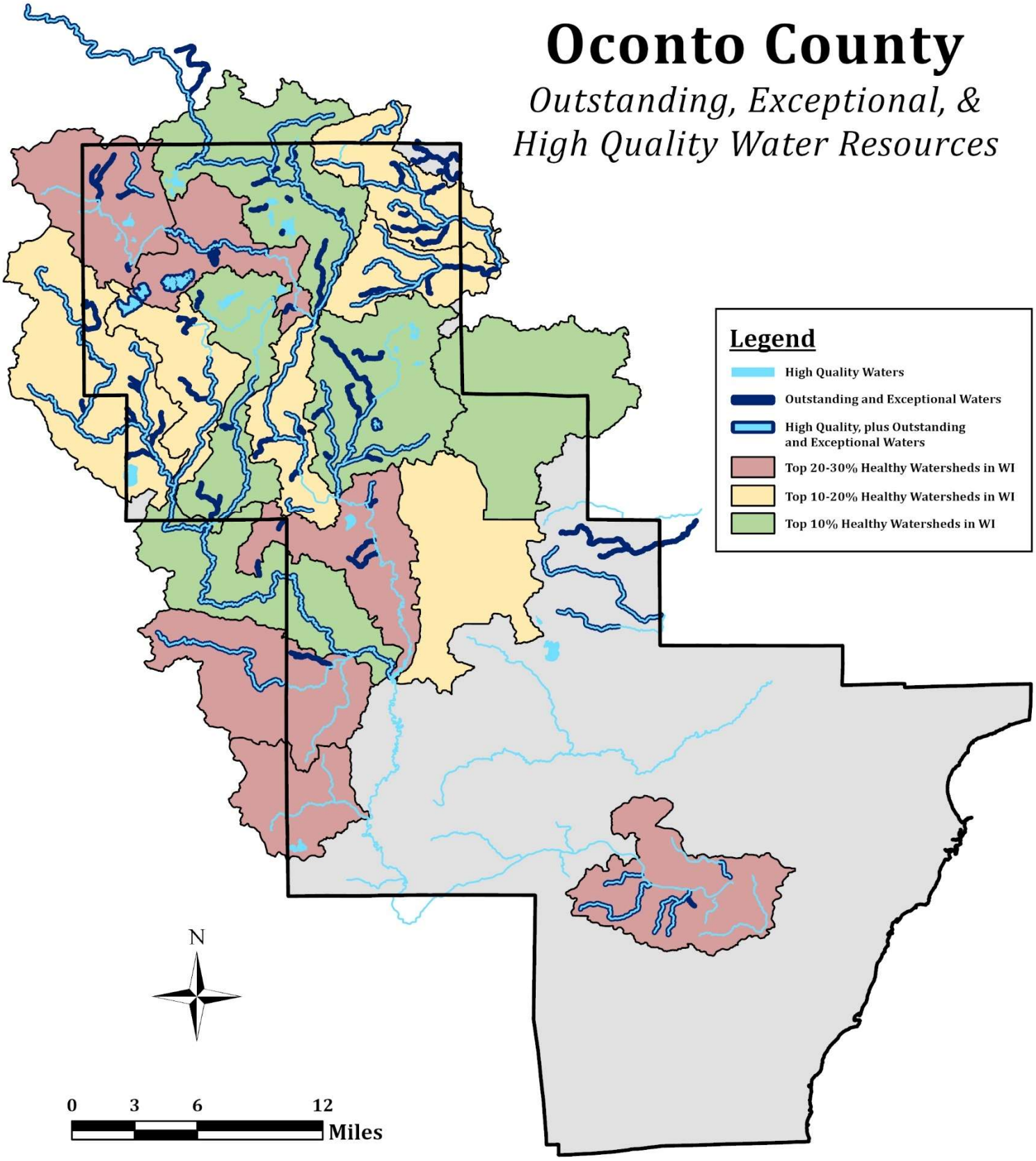
The majority of Oconto County's designated or identified high-quality surface waters tend to be in the forested northern region with the exception of the South Branch Oconto River which flows through the northern part of the agricultural region of the county. Following is a table of the ORW and ERW designations on named surface waters in Oconto County. A map also succeeds the table depicting the location of the ORWs and ERWs, high-quality waters as described above, and watersheds in Oconto County that fall within the top 30 percent of the Healthiest Watersheds statewide. When referencing the map, there is noticeable overlap of ORWs, ERWs, and high-quality waters but it is also evident that each category holds its own distinctiveness resulting in several waters without overlapping. This plan cites several sources the LWCD can use to protect existing high quality 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 very good. There are some northern areas that could be susceptible to groundwater contamination due to shallow soils over bedrock or sandy soils as shown on the Groundwater Contamination Susceptibility map on page 41, sourced from the DNR. Fortunately, much of the contamination sources associated with agricultural practices do not take place in those areas. Past testing has resulted in minimal occurrences of wells exceeding standards for nitrate contamination. No significant contamination linked to nitrates has been documented in public or private wells according to UW-Stevens Point and Madison.

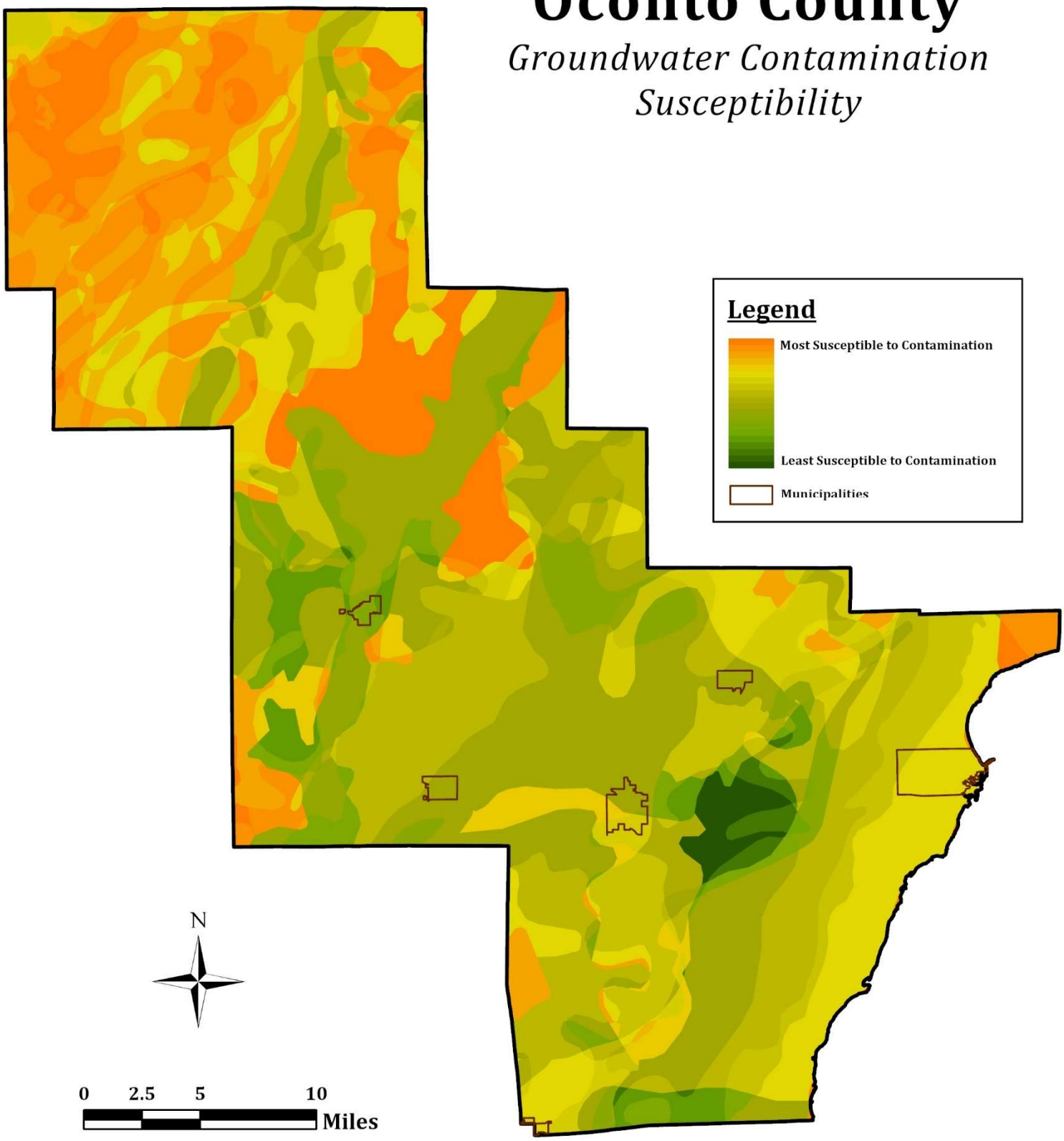
Table: Outstanding and Exceptional Resource Waters, Named Waterbodies Only

Name of Waterbody	Portion of Waterbody
Outstanding Resource Waters	
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
North Fork Thunder River	All
S Branch Oconto River	Hwy 32 to Menominee Reservation
S Branch Oconto River	Above Menominee Reservation
Second S Branch Oconto River	Below junction with Deadman Creek
Exceptional Resource Waters	
Archibald Creek	All
Baldwin Creek	All
Battle Creek	All
Bonita Creek	All
Brehmer Creek	All
Coopman Creek	All
Dump 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
Macauley Creek	All
McDonald Creek	All
McPearson Creek	All
Messenger Creek	Above Hwy B
Mosquito Creek	All
Mountain Creek	All
N Branch Oconto River	Above Chute Pond
Pat Creek	All
S Branch Beaver Creek	All
S Branch Oconto River	Hwy 32 to mouth
S Fork Thunder River	All
Shadow Creek	All
Snow Falls Creek	All
Splinter Creek	Below S28 T28N R20E
Waupee Creek	McCauley Creek to old Hwy 64
W Thunder Creek	All
Wiscobee Creek	All


Oconto County
Outstanding, Exceptional, &
High Quality Water Resources
Legend
High Quality Waters
Outstanding and Exceptional Waters
High Quality, plus Outstanding and Exceptional Waters
Top 20-30% Healthy Watersheds in WI
Top 10-20% Healthy Watersheds in WI
Top 10% Healthy Watersheds in WI
N
0 3 6 12
Miles

Oconto County

Groundwater Contamination Susceptibility



Wildlife and Natural Areas

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 75 rare species occurring within the county, including 10 federally listed species. Oconto County also has 27 state endangered or threatened species and 48 species of special concern. The following table lists all of the endangered and threatened species.

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 "Natural Areas Inventory," 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 "Natural Areas Inventory" (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 Wisconsin's Lake Michigan and Lake Superior coasts. The SAPC defined the NAI sites as "tract[s] of land or water so little modified by man's activity or sufficiently recovered that they contain intact native plant and animal communities believed to be representative of the pre-settlement landscape". The SAPC identified NAI sites independently of the State Natural Areas program; as a result, some sites fall under both programs.

Table: Rare, Threatened, and Endangered Species *(Source: WDNR, 2020)*

Species Classification	Common Name	State Listing	Federal Listing
Bird	Caspian Tern	Endangered	
Bird	Common Tern	Endangered	Species of Concern
Bird	Loggerhead Shrike	Endangered	Species of Concern
Bird	Black Tern	Endangered	Species of Concern
Bird	Red-necked Grebe	Endangered	
Bird	Forster's Tern	Endangered	
Bird	Yellow Rail	Threatened	
Bird	Red-shouldered Hawk	Threatened	
Bird	Cerulean Warbler	Threatened	Species of Concern
Butterfly	Northern Blue Butterfly	Endangered	
Butterfly	Swamp Metalmark	Endangered	Species of Concern
Butterfly	Karner Blue Butterfly	Species of Concern	Endangered
Fish	Longear Sunfish	Threatened	
Fish	Redfin Shiner	Threatened	
Invertebrate	Slippershell Mussel	Threatened	
Plant	Dwarf Bilberry	Endangered	
Plant	Little Goblin Moonwort	Endangered	
Plant	Heartleaf Foamflower	Endangered	
Plant	Lesser Wintergreen	Endangered	
Plant	Pale Green Orchid	Threatened	
Plant	Ram's-head Lady's-slipper	Threatened	
Plant	Calypso Orchid	Threatened	
Plant	Braun's Holly-fern	Threatened	
Plant	Dwarf Milkweed	Threatened	
Plant	Round-leaved Orchid	Threatened	
Plant	Sweet Colt's-foot	Threatened	
Plant	Marsh Valerian	Threatened	
Turtle	Wood Turtle	Threatened	Species of Concern

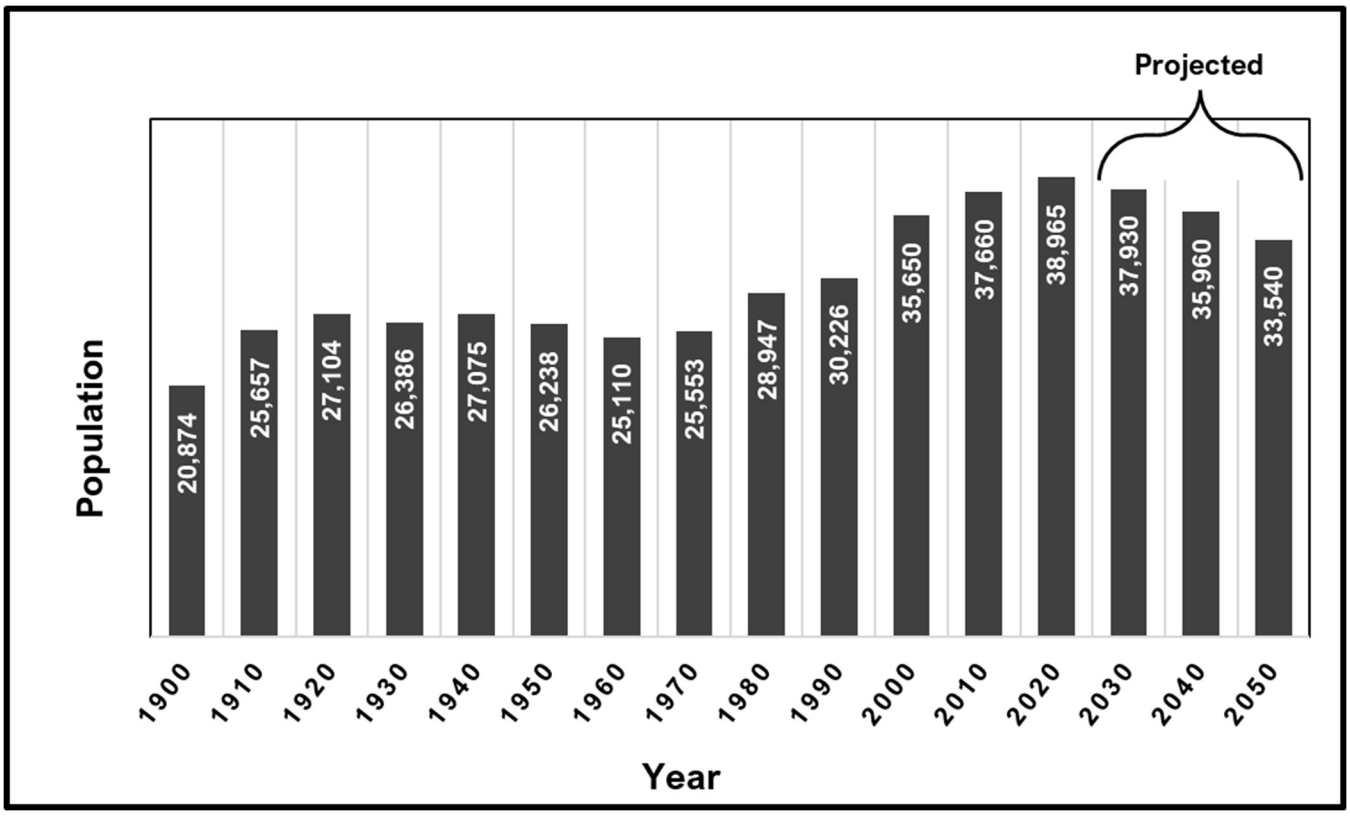
Table: Natural Area Designations *(Source: WDNR, 2006)*

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	

Demographics

Oconto County reached its highest population level of 38,965 in 2020 according to the 2020 census. This has been an 87 percent or 18,091 person population growth since 1900. The largest periods of population growth 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 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. Over the past twenty years the towns of Little Suamico and Chase located in the southern part of Oconto County and bordering Brown County have seen the most population growth. The 2020 census reported a population of 5,536 for the town of Little Suamico which is the largest population of the municipalities in Oconto County. 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 population projections, Oconto County will begin to see declines in population. The projected population for Oconto County in 2030 is 37,930, in 2040 is 35,960 and in 2050 is 33,540. WDOA projections show a similar trend of declining population among many northern counties in the state. Oconto County also has a seasonal population increase with many of these individuals maintaining seasonal cottages and homes in the northern part of the county. As of 2020 the county had an estimated 14,859 additional people considered seasonal residents. The graph below depicts these population changes.

Graph: Oconto County Historical Population and Projections 1900-2050 *(Source: US Census, WI DOA)*



Economy

As mentioned in an earlier section of this plan, Oconto County farmers own and manage the resources on 184,000 acres of land, or about 28 percent of all land in the county. The production, sales and processing of Oconto County's farm products generate employment, economic activity, income and tax revenue. The first two tables that follow show the value of agricultural products sold and how those sales rank within Wisconsin and nationally and then the economic and labor impact of agriculture.

A third table below shows estimated employment by major industry group per the U.S. Bureau of Census and the American Community Survey for Oconto County in 2020 and 2023. Over this time the county's labor force increased by an estimated 491 workers. The number of unemployed county residents was estimated at 465 in 2020 and 407 in 2023. As of 2023 an estimated 2,254 or 23.3 percent of the county workforce was employed in the manufacturing industry and 3,807 or 19.6 percent of the county workforce was employed in the educational, health and social services industry. These two industry groups have historically been the two largest in the county and this trend will likely continue. The agricultural, forestry, fishing and hunting, and mining industry has seen a decrease in employment from an estimated 773 in 2020 to 636 in 2023.

Table: Market Value of Agricultural Products Sold in 2022 *(Source: USDA, 2022)*

	Sales	Rank in State	Counties Producing Item	Rank in U.S.	Counties Producing Item
Total	**$220,802,000**	**33**	**72**	**747**	**3,078**
Crops	**$62,588,000**	**44**	**72**	**1,152**	**3,074**
Grains, Oilseed, Dry Beans, Dry Peas	$51,704,000	36	72	907	2,917
Tobacco	-	-	5	-	267
Cotton and Cottonseed	-	-	-	-	647
Vegetables, Melons	$1,641,000	41	72	702	2,831
Fruits, Tree Nuts, Berries	$353,000	49	71	1,032	2,711
Nursery, Greenhouse, Floriculture, Sod	$1,022,000	46	71	942	6,660
Cultivated Christmas Trees, Short Rotation Woody Crops	$150,000	24	67	258	1,274
Other Crops, Hay	$7,719,000	24	71	449	3,035
Livestock, Poultry, and Products	**$158,214,000**	**26**	**72**	**435**	**3,076**
Poultry and Eggs	$937,000	33	71	801	3,027
Cattle	$13,587,000	44	71	1,086	3,047
Milk from Cows	$141,859,000	18	66	89	1,770
Hogs and Pigs	$69,000	45	68	991	2,814
Sheep, Goats, Wool, Mohair, Milk	$421,000	30	68	474	2,967
Horses, Ponies, Mules, Burros, Donkeys	$235,000	28	65	1,025	2,907
Aquaculture	$6,000	36	53	309	1,190
Other Animals and Byproducts	$1,100	11	71	228	2,909

Table: Economic and Labor Impact of Agriculture 1997-2022 *(Source: USDA, 2022)*

Measure	Date					
	1997	2002	2007	2012	2017	2022
Total Sales	$66,618,000	$73,988,000	$115,830,000	$165,909,000	$145,892,000	$220,802,000
Total Sales per Farm	$70,870	$65,360	$93,111	$178,589	$174,931	$289,766
Total Farm Production Expenses	$51,328,000	$55,883,000	$83,215,000	$125,912,000	$121,976,000	$180,438,000
Total Expenses per Farm	$54,662	$49,149	$66,893	$135,535	$146,254	$236,795
Number of Hiring Farms	388	225	251	283	212	197
Number of Hired Farm Workers	1,250	1,258	1,018	1,107	953	953
Wages Paid to Farm Workers	$4,602,000	$6,192,000	$9,787,000	$12,466,000	$15,153,000	$20,017,000
Total Government Payments	$1,863,000	$3,331,000	$2,388,000	$2,856,000	$1,669,000	$2,261,000
Total Farms receiving Payments	575	551	622	507	386	152
Government Payments per Farm	$3,239	$6,046	$3,839	$5,633	$4,325	$14,877

Table: Employed Population by Industry Group 2020 and 2023 *(Source: U.S. Census, 2020 & 2023)*

Industry	Oconto County Employed Population 16 Years and Older			
	2020 Estimate	Percentage	2023 Estimate	Percentage
Agricultural, Forestry, Fishing and Hunting, and Mining	773	4.1	636	3.3
Construction	1,850	9.8	2,254	11.6
Manufacturing	4,503	23.8	4,536	23.3
Wholesale Trade	315	1.7	323	1.7
Retail Trade	1,765	9.3	1,702	8.8
Transportation and Warehousing, and Utilities	1,059	5.6	1,155	5.9
Information	190	1.0	129	0.7
Finance, Insurance, Real Estate, and Rental and Leasing	1,021	5.4	1,121	5.8
Professional, Scientific, Administrative, and Waste Management	1,092	5.8	1,230	6.3
Educational, Health, and Social Services	3,820	20.2	3,807	19.6
Arts, Entertainment, Recreation, Accommodation, and Food Service	1,263	6.7	1,212	6.2
Other Services (except Public Administration)	692	3.7	660	3.4
Public Administration	607	3.2	676	3.5
Totals	**18,950**	**100**	**19,441**	**100**

CHAPTER 2: PLANNING PROCESS AND GOAL DEVELOPMENT

THE PLANNING PROCESS, PUBLIC PARTICIPATION AND IDENTIFICATION OF CONCERNS

Participants in Plan Development

The development of this plan was led by the Oconto County LWCD who gathered input and assistance from the Land & Water Resource 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 eight members who brought with them a wide range of views from agriculture, business, riparian property ownership, local government, lake associations, and outdoor recreation. A list of CAC members is located on the credits page of this plan. Much 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 & Water Conservation Department, 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 2015 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, available water quality data and impairments, conservation programs and recreational uses spurred early formations of possible goals to include in the new plan.

GOALS AND OBJECTIVES

Development of Goals and Objectives

The quality of Oconto County's 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 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 LWCD mission statement:

"To 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."

Planning Timeline and Approval

The system of gathering the public's view of the state of Oconto County's resources, whether it involved areas of concern for restoration or areas of exceptional resources and high quality waters for protection, incorporated the ideas of a citizen advisory committee. This committee was made up of 8 members of the public covering a range of backgrounds as mentioned earlier in the plan. The names and titles can be seen on Page 4. Through the Oconto County UW Extension agent, a series of meetings were held starting with the "who, what and why" at the first meeting on January 22, 2025. At the second meeting on February 6, issues identified by the members were gathered and were then discussed as a group. Each concern was discussed thoroughly and prioritized.

As this data was collected, the technical advisory committee was to meet and lay out the concerns by priority as determined by the CAC. At the first TAC meeting the task was to begin working out goals, objectives and activities. Once the initial goals, objectives, and activities were drafted, the CAC had the opportunity to review the final set of goals and objectives with discussion on where all the priorities were placed in the tables. Final adjustments were made with a series of brief follow up TAC meetings throughout Spring and Summer.

In June 2025, the draft plan was provided to DATCP and DNR for review to confirm all requirements are met and any other recommendations. Any changes that were recommended by those agencies are referred back to the technical committee for follow-up. Once the final draft was approved it was presented to the Land & Water Resource Committee for approval and then followed the state designated process for final approval.

The goals and objectives in the finalized plan represent 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 TAC led to their development. 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 workplan being implemented over a ten-year span from 2026 through 2035. Possible revisions may take place after the first five years if necessary.

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

Finalized Goals and Objectives

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

Objectives:

1. Reduce soil erosion
2. Control animal waste and nutrient runoff
3. Nutrient and pest management
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. Manage terrestrial and ***aquatic invasive species (AIS)***
2. Protect and enhance lake and stream water quality
3. Improve wildlife and fish habitat
4. Protect and restore wetlands
5. Strengthen the capacity of Lakes and Waterways groups
6. Promote quality recreation opportunities on all lakes and streams

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.

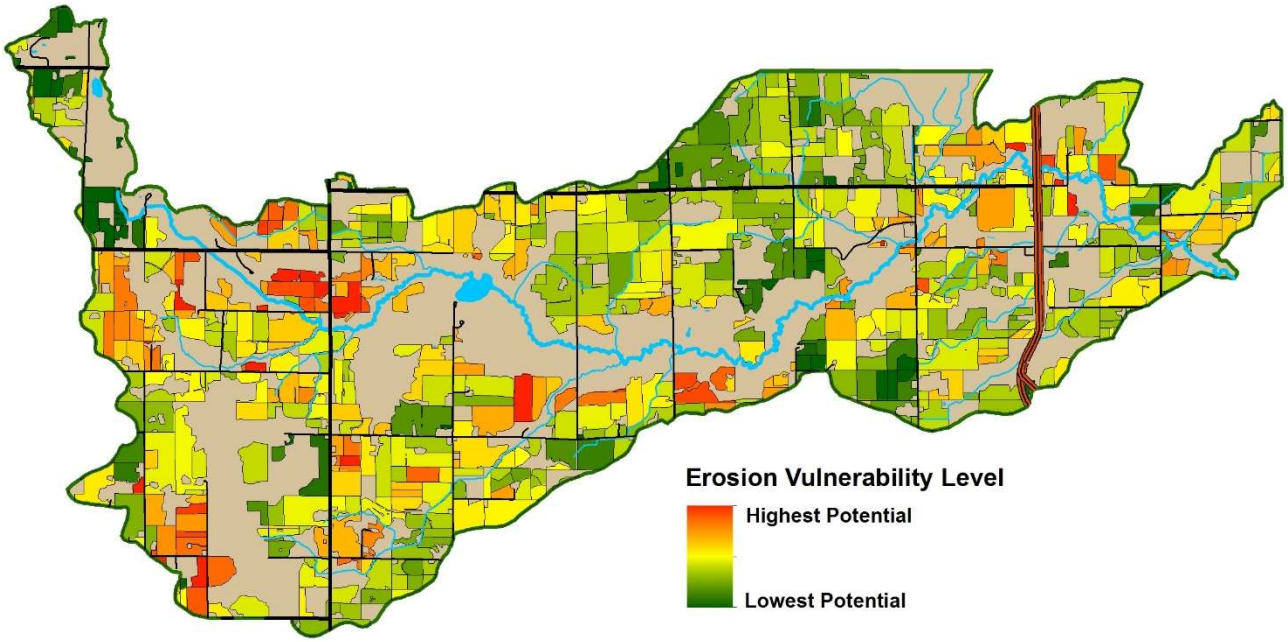
CHAPTER 3: STATE PERFORMANCE STANDARDS AND PROHIBITIONS

IMPLEMENTING STATE PERFORMANCE STANDARDS AND PROHIBITIONS

The goals and objectives detailed in Chapter four are the heart of this plan and will drive soil and water resource management and conservation in Oconto County for the ten-year life of this plan. Implementing the state NR 151 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. The standards that are primarily referenced in regular workload are stated below, however all performance standards included in the Oconto County Animal Waste Ordinance are enforced as needed. The phosphorus index standard is not enforced at this time as it is not included in the Animal Waste Ordinance.

NR 151.02 states “All land where crops or feed are grown shall be cropped to achieve a soil erosion rate equal to, or less than, the “tolerable” (T) rate established for that soil” and NR 151.07 states “Manure, commercial fertilizer and other nutrients shall be applied in conformance with a nutrient management plan”. The following strategy will be employed to meet this directive.

Erosion rates and phosphorus management will be monitored through animal waste ordinance required nutrient management plans submitted yearly for review. Federally funded nutrient management plans are also reviewed and may unveil problem fields or areas. Visual inspections are routinely conducted during daily county travel and can reveal active gullies or sediment deposition in cropland. Areas or fields detected with soil erosion will need to be verified with RUSLE2 program and/or SNAP+ to determine compliance with NR 151.02.



DNR’s Erosion Vulnerability Assessment for Agricultural Lands (EVAAL) has been run in whole or part for much of the county to date which makes it available to reference if necessary to target efforts to the most vulnerable areas of the cropland in the county. This is a very intricate ***Geographic Information Systems (GIS)*** based tool that incorporates aspects such as crop rotation, soil type, management

practices, slopes and rainfall among others into its processes to spatially determine areas with low, medium, or high erosion vulnerability. With this, the LWCD has begun to identify the focus areas within the county in which erosion reduction may be needed with intentions to build upon the EVAAL inventory as time and resources allow. Above is an example of a resulting map highlighting fields vulnerable to erosion using EVAAL data outputs for the North Branch Little River watershed.

Erosion Reduction

Once high 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 (BMP)*** 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 and nutrient management standards will follow guidelines set in NR 151.09. These identified areas will be provided with data and analyses through the following methods:

- ► Identify priority farms with potentially high erosion rates through field verification, referencing GIS data and tools as needed
- ► Verify erosion rates with ***RUSLE II*** or other available planning resources, inventory by tract and expand search to surrounding tracts with same soils, slopes and operators to locate more possible priority sites
- ► Collaborate with landowners and operators to implement conservation practices to achieve compliance with NR 151 soil erosion requirements.

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 and water 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

Nutrient Management

Between NRCS and county programs there are currently 75 farmers that have adopted nutrient management plans covering 95,000 of the 184,000 total cropland acres in the county (51%).

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 last updated in 2018 contains all state prohibitions and standards with the exception of the phosphorus index standard (NR 151.04).

Water Quality Management Areas

Permitting livestock operations through the ordinance is achieved through walk-in applications or cost-shared practice implementation. There is a need to monitor existing farms to see if they continue to meet NR 151 state performance standards. Frequently updated aerial photography can be used to detect possible issues developing over time. From there, on-site investigations must be completed to determine compliance status. 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 walk-in or project implementation basis.

- ► Priority farms will be located using the Oconto County GIS system – farms that fall within WQMAs will be targeted for compliance first, followed by those located outside.

- ► Public cooperation in alerting the LWCD to problem farms will be the final way to seek compliance.

Walk-ins or Program Practice Implementation

As reflected in Goal 1 Objective 2, it is a priority to 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 availability of financial and technical assistance.

COMPLIANCE AND ENFORCEMENT OF STANDARDS AND PROHIBITIONS

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

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

- ► 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 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 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 and Monitoring

- ► 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. a geospatial tracking system may be implemented
- ► Operations in compliance with performance standards and/or within the operations and maintenance period of conservation practices will be periodically inspected for continued compliance

Enforcement Process Under Animal Waste Management Ordinance

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

- ► Oconto County has the first opportunity to work with a landowner/operator addressing noncompliance
- ► DNR will contact the county before contacting a landowner/operator regarding their compliance status
- ► If no action is taken by the landowner or operator to come into compliance after a noncompliance notification has been issued by the county, the county will contact the DNR to discuss options for escalating enforcement
- ► Enforcement by DNR may include a Notice of Noncompliance, Notice of Discharge, Notice of Violation, or enforcement actions pursuant to s. 281.98 Stats. or other appropriate actions

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 & Water Conservation Department shall refer all enforcement to the Oconto County Corporation Council and the Zoning Division enforcement technician for initiation of the enforcement action.

Appeals Process Under Animal Waste Management Ordinance

LWCD determinations can be appealed in regard to compliance status with state standards. If the LWCD findings are verified, the appeal would proceed to the LWRC for review and decision. If the matter remains unresolved, enforcement could proceed as described above.

Under authority of Chapter 68 Wisconsin Statutes, the Oconto County Land & Water 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 & Water Conservation Department in administering the ordinance. The rules, procedures, duties and powers of Land & Water 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 & Water Conservation Department.

CHAPTER 4: INFORMATION AND EDUCATION

INFORMATION AND EDUCATION STRATEGY OVERVIEW

Educational 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 the county's 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.

INFORMATION AND EDUCATION STRATEGY FOR GOAL 1

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

Objectives:

1.) Reduce soil erosion.

► Educational Objectives:
- Increase farmer awareness about the impacts of soil erosion and state erosion standards
- Educate farmers about reducing erosion with conservation best management practices
- Educate farmers about the benefits of soil health

► Target Audiences:
- Farmers – identify by sub-watersheds and down to parcels
- Rural landowners – identify by sub-watersheds and down to parcels
- Agronomists

► Messages:
- High erodibility of some county soil types
- Nutrient transport through soil erosion
- Loss of agricultural productivity as topsoil is eroded
- Simple and cost efficient options are available to reduce soil erosion problems

► Activities:
- Media 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
- In-field demonstrations and annual educational meetings

► Resources:
- UWEX and NRCS publications
- RUSLE II
- EVAAL
- Demonstration Farm Network

2.) Control animal waste and nutrient 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
- Promote implementation of nutrient management plans
- 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
- Commercial manure haulers
- Town officials

► Messages:
- Permits are required for animal waste storage and animal feedlot construction
- 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:
- Issue permits for projects through Animal Waste Management ordinance
- Continue to cooperate with operations within WQMAs
- Identify all animal operations outside WQMAs
- Hold informational meetings

► Resources:
- Oconto County Zoning
- NRCS
- UWEX
- DATCP
- DNR

3.) Nutrient and pest management.

► Educational Objectives:
- Continue to educate farmers/landowners about the benefits of nutrient and pest management planning
- Educate nonagricultural property owners about the impacts of improper application of nutrients and pesticides

► Target Audiences:
- Farmers/landowners who apply organic nutrients or synthetic fertilizers for the purpose of greater crop production
- Nonagricultural property owners – application to lawns and gardens
- Agronomists, custom haulers, custom sprayers, and other agricultural businesses

► Messages:
- Nutrient and pest management planning reduces over-applications and cost of farming operations
- Reduction in over-applications of nutrients limits runoff and ultimately curbs potential explosion in aquatic vegetation growth
- Future fertilizer purchases should be determined by nutrient balance shown on land
- Phosphorous free fertilizer should be used in areas that can easily runoff to surface water

► Activities:
- Require nutrient management plans as companion practices with manure storage facilities in Animal Waste Management ordinance permit operations
- Offer 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 to detail nutrient and pesticide management

► Resources:
- UWEX publications
- NRCS Standard 590- Nutrient Management
- Private Agricultural Agents and Agronomists
- DATCP
- DNR

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
- DNR

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 county's Farmland Preservation Program
- ► Target Audiences:
  - Property owners
- ► Messages:
  - Make landowners aware of the value of farmland within the county
- ► Activities:
  - Incorporate Farmland Preservation information into Planning and Zoning informational publications, websites and other media outlets
- ► Resources:
  - NRCS
  - Planning and Zoning
  - UWEX
  - DATCP

INFORMATION AND EDUCATION STRATEGY FOR GOAL 2

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

Objectives

1.) Manage terrestrial and aquatic invasive species.

- ► Educational Objectives:
  - Introduce best management practices to lake associations, districts, and individuals
  - 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 Invasives Partnership (TIP)*** and the resources available.
- ► Target Audiences:
  - General Public
  - Landowners
  - Lake groups
  - Realtors
- ► Messages:
  - 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 public land and water are unknowingly one of the main transporters of invasive species. Education can help slow the spread and transportation of invasive species
  - Volunteer groups such as ***Clean Boats, Clean Waters (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
- Utilize media outlets to help educate the public

► Resources:
- DNR
- UWEX
- TIP
- OCLAWA

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, and petroleum products
- Encourage soil testing to determine the necessity for lawn fertilizer applications
- Encourage the use of phosphorus free fertilizers when needed

► Target Audiences:
- General Public
- Riparian property owners
- Lake Associations and Districts
- Realtors
- Municipalities, Townships, and County Board

► 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
- Preserving or planting native plants can help stabilize bank material of lakes and streams and provide additional wildlife habitat
- Inform riparian owners that the LWCD will help design, fund, and install best management practices on their shorelines

► Activities:
- Design, fund and install best management practices on shoreline properties
- Media releases stating the importance of the use of phosphorus free fertilizer and installation of best management practices
- Give informational presentations at lake association/district meetings and other events
- Organize tours or visits to established projects to demonstrate and illustrate on-the-ground successful practices and projects

► Resources:
- DNR
- Healthy Lakes & Rivers Program
- UWEX
- OCLAWA

3.) Improve wildlife and fish habitat.

► Educational Objectives:
- Educate the public about the benefits of improving habitat for wildlife and fish
- Educate the public about striving to maintain or restore stream flows and natural ecological functions and biotic conditions

► Target Audiences:
- General Public
- Property owners
- Realtors
- Organizations

► 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

► 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:
- DNR
- UWEX
- USFWS
- Local Conservation Groups
- NRCS

4.) Protect and restore wetlands.

► Educational Objectives:
- Educate the public on the benefits of restoring and maintaining wetlands
- Inform the public of available programs to fund wetland restoration and enhancement projects

► Target Audiences:
- General Public
- Property owners
- 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 publications, websites and other media outlets
- Conduct demonstration projects for the public
- Incorporate wetland information at public events

► Resources:
- DNR
- UWEX
- NRCS
- USFWS

5.) Strengthen the capacity of Lakes and Waterways groups.

► Educational Objectives:
- Establish a comprehensive working relationship with local associations, districts and other groups to create a network of people and organizations

► Target Audiences:
- General Public
- Lake Associations and Districts
- Local Sportsman Clubs
- Other local organizations
- OCLAWA

► 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:
- Work with the established citizen's advisory committee comprised of representatives from various organizations and government representatives to continue planning necessary activities to protect and improve the water resources of Oconto County

► Resources:
- UWEX
- DNR
- NRCS

6.) Promote quality recreation opportunities on all lakes and streams.

► Educational Objectives:
- Promote the vast amount of public land, lakes, and streams available, and educate on the proper use of those public resources so as not to cause degradation

► 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, websites and other media outlets

► Resources:
- Oconto County Forest and Parks
- UWEX
- NRCS
- US Forest Service
- DNR
- TEDCOR

CHAPTER 5: WORK PLAN WITH EVALUATION AND MONITORING AND TARGETED BENCHMARKS

The following monitoring and evaluation explanation and goals tables are meant to illustrate a five-year work plan. The 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.

Monitoring And Evaluation for Goal 1 by Objective:

1) Reduce soil erosion

Past EVAAL computations beginning in 2016 have identified areas of the county with greater potential for erosion, but recent trends in agricultural rotational changes and increased rainfall intensity and frequency led to a more widespread issue. Most erosion monitoring can now be done in the office with greater detailed and more frequent aerial photography. Once problem areas are identified, it will require yearly educational events or publications to get the word out which will hopefully lead to voluntary installed BMPs and rehabilitated gully erosion sites. Severe sites will require NR 151 compliance letters to both the landowner and operator detailing the issue and offering technical support to fix the issue. DNR staff may be contacted for assistance if necessary. Success will be dependent on consistent funding for BMP installation and landowner cooperation. There is a major nationwide push to educate farmers and landowners about soil health issues and conservation practices associated with healthy soils. Soil health related events and publications will be increased by 2 per year to get the word out.

2) Control animal waste and nutrient runoff

By continuing to enforce the Animal Waste Management Ordinance, walk-in and project related standards and prohibitions compliance will be achieved to address priority farms, especially those in priority watersheds. 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. An effort will be made to achieve a complete inventory within 10 years. Currently, approximately 25 percent of farms in the county have been inventoried. The pace will be re-evaluated at the end of the five-year work plan as most priority farms have been identified. Yearly enforcement of NR151 to address at least one operation is a reasonable goal on top of the walk-in compliance. As more operations come into compliance through expansion and permit issuance, then a more aggressive enforcement schedule may be necessary to reach the remaining operations. This enforcement may likely be necessary through involvement with the DNR and their cost share options. DNR receives complaints that may lead to Notice of Intent/Notice of Discharge or ultimately CAFO permitting, which requires LWCD's involvement through the ordinance to design practices or review designs and/or secure cost share from DNR to fund correction of issues identified.

Continuing to discuss the link between agricultural practices and nutrient transport to water resources by gathering existing information to pass on to farmers will be a focus for the county. On-farm, field edge trials and review of available data would be the target achievement of this activity. Another activity of this objective is to continue to formulate 9 Key Element plans for impaired waters within HUC 12 watersheds over the next five years. These plans consist of detailed watershed information collection and comprehensive specific goals for each watershed which take significant time to generate leading to the expanded time frame for completion. Developing such plans creates access to additional federal

and state funds. 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) Nutrient and pest management

There is a continued 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 of nutrient management through yearly educational events and/or publications as well as with priority farms. Recent local nutrient management planning and spreading issues are leading to increased plan reviews, map verification and finally increased field inspections. The Oconto County waste management ordinance requires nutrient management as a companion practice with all waste storage facility practices installed. State standards also require farms that apply nutrients in accordance with a nutrient management plan. Currently, 45 NMPs must be submitted by April 1st and are reviewed yearly. Among federal, state and county programs there are currently 75 farmers that have adopted nutrient management plans covering 51 percent of the cropland acres in the county. As previously stated, the cropland acres are mainly located in the middle to southern regions of the county. The remaining farmers, if not willing to voluntarily signup for nutrient management, must be offered the current state flat-rate cost share to ensure compliance. This will require adequate funding throughout the span of this plan and until all agricultural acres in Oconto County are under nutrient management. Crop consultants and farmers who write their own plans are kept up to date on nutrient management planning changes through one meeting a year. This plan intends to expand nutrient management education to include the effects of chemical applications.

4) Protect groundwater 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. Well water testing may be able to help focus efforts. Improper land spreading of nutrients, herbicides and pesticides can lead to contamination when near direct conduits to groundwater. Oconto County intends to try to educate the public and agricultural producers of these issues through yearly events, publications, and individual contacts. Developing and following NMPs can help minimize or eliminate groundwater contamination, but well abandonments continue to be the best option to limit surface to groundwater contamination issues in the county and 2 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. Efforts to educate farmers of the benefit of the program through yearly event and/or publications will continue. Their best avenue for adoption of the program is through AEAs. The LWCD will attempt to contact farmers to gauge interest on a yearly basis. Finally, the one existing contract will be monitored through field visits until the expiration of the contract.

Monitoring And Evaluation for Goal 2 by Objective:

1) Manage terrestrial and aquatic invasive species

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 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. The county is currently pursuing additional staff for water resource work.

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

Installation of shoreline buffers continues to be the most cost effective and easiest way to influence lake and stream water quality with 5 practices 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. These shoreline plans can be as simple or complex as the landowner wishes and 10 contacts per year should maximize cost share usage. The plans need to be designed and implemented by the county with cost share funding coming from county or state sources. The county also aids shoreland owners with the permitting process which could be streamlined for easy, expedited permits. 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 aid in meeting the target of 3 events per year.

3) Improve wildlife and fish habitat

Changing stream morphology has become an issue as waters widen and slow which warms them and changes the biotic ecosystem. All intentions are to try and return streams to their more natural state by completing one stream project per year. A new DNR general permit for such work has been created which will hopefully make the permitting process easy and streamlined. Lakes are also rapidly changing; another activity would be to encourage lakes groups to find volunteer citizen monitors to detect these changes in early stages. With a one lake increase in monitors per year, negative effects could be mitigated in many instances. A simple cost-effective way to improve waterway habitat is to contact landowners to discuss leaving fallen beneficial woody debris in place. Some wildlife habitats inland are severely impacted by woodlot and wetland grazing. The county will attempt to monitor this issue and make a couple of contacts per year.

4) Protect and restore wetlands

Protection of wetlands greatly impacts the runoff associated with increasingly stronger rainfall events. Restoration of degraded or converted wetlands is to be a focus with creation of 1 acre per year as a benchmark. Landowner education is needed to reveal the value of wetlands as something other than “waste land” by hosting yearly events or making contacts where available. Maintaining funding is essential to wetland restoration projects, along with a simple streamlined permitting process.

5) Strengthen the capacity of lakes and waterways groups

The LWCD would like to assist the ***Oconto County Lakes and Waterways Association (OCLAWA)*** in writing a comprehensive lake and stream management plan by 2030. There is a continued plan to assist DNR and lake groups with lake level monitoring, five lakes per year until finished, then continuous monitoring.

6) Promote quality recreation~~al~~ opportunities on all lakes and streams

Working with local organizations and governmental units to open public lands to handicapped individuals could greatly increase recreational opportunities by increasing access points, five over 10 years. The need to create a general awareness of the value of the expanse of recreational resources of the county needs to be conveyed in as many ways as possible to interested users through a minimum one event or publication per year.

In the Goal Tables that follow, priority activities are in **bold** and the lead agency for each activity is listed first. Cost-share dollars are dependent of number of clients, variation of assistance, and/or occurrences. It is important to note that this could increase cost-share dollars by significant amounts due to the Oconto County LWCD benchmark to assist walk-ins.

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

Objective	Activities	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmarks
1.Reduce soil erosion.	**a. Promote cropping activities that improve soil health.**	**LWCD, NRCS**	**40/yr**	**$1,800**	**$5000/yr**	**Number of events and publications**	**2 per year**
	b. Educate the public on conservation practices.	LWCD, NRCS, UWEX	40/yr	$1,800	$5000/yr	Number of events and publications	2 per year
	c. Promote BMPs that reduce erosion.	**LWCD, NRCS**	**40/yr**	**$1,800**	**$5,000/yr**	**Number of BMP's installed**	**Avg. 2 per year and 25 over 10 years**
	d. Inventory and correct areas of gully erosion.	LWCD,NRCS	250/yr	$11,250	$10,000/yr	Lin.Ft. of gully repaired	500 Lin.Ft. and 5,000 Lin.Ft. over 10 years
		Yearly Totals	**370/yr**	**$16,650**	**$25,000/yr**		
2. Control animal waste and nutrient runoff.	a. Educate agricultural producers on the link between farm practices and nutrient transport.	UWEX, LWCD, NRCS, WDNR	60/yr	$2,700	$2,000/yr	Number of producers reached	50 per year and 500 over 10 years
	b. Promote the use of innovative technologies.	UWEX, LWCD, NRCS	20/yr	$900	$1000/yr	Number of events and publications	1 per year
	c. Enforce animal waste ordinance.	**LWCD, WDNR**	**450/yr**	**$20,250**	**NA**	**Number of permits issued Compliance spotchecks**	**10 per year, long term as needed 10% of permits per yr**
	d. Address priority farms.	**LWCD, WDNR**	**1,200/yr**	**$54,000**	**$500,000/yr**	**Number of farms brought into NR151 compliance**	**1 per year**
	e. Develop 9 key-element plans for impaired waters.	LWCD	700 total	$3,150	NA	Number of plans approved	1 plan approved in 10 years
	f. Work with DNR on Notice of Discharge, Notice of Intent, and Confined Animal Feeding Operations.	**LWCD, WDNR**	**500/yr**	**$22,500**	**Unknown number of cases**	**Number of producers worked with**	**As identified in cooperation with the DNR**
	g. Promote nutrient management practices.	NRCS, LWCD, UWEX	200/yr	$9,000	$8000/yr	Number of NM planned acres	200 acres per year and 20,000 acres over 10 years
	h. County wide farm inventory.	LWCD	430/yr	$19,350	NA	Number of farms inventoried	10 farms per year / completed by 2036 or as needed
	i. Assist walk-in clients.	**LWCD, NRCS**	**1,750/yr**	**$78,750**	**Dependent on number of clients**	**Number of clients assisted**	**Assist 100% of clients**
		Yearly Totals	**5310/yr**	**$210,600**	**$511,000/yr**		

Objective	Activities	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmarks
3. Nutrient and pest management.	**a. Educate the public about nutrient value.**	**UWEX, LWCD, NRCS**	**60/yr**	**$2,700**	**$750/yr**	**Number of events and publications**	**1-2 per year**
	b. Increase field visits.	LWCD	300/yr	$13,500	NA	Number of field visits	25 visits per year and 250 visits over 10 years
	c. Perform reviews of mandatory Animal Waste Management Ordinance plans.	LWCD	240/yr	$10,800	NA	Number of plans reviewed	45 plans per year / increase as needed
	d. Keep agronomists up to date on local NRCS 590 submittal requirements.	**LWCD, UWEX**	**20/yr**	**$900**	**NA**	**Number of meetings**	**1 meeting per year**
	e. Educate on the effects of chemical applications.	NRCS, LWCD, UWEX	20/yr	$900	NA	Number of meetings	1 meeting per year
		Yearly Totals	**640/yr**	**$28,800**	**$750/yr**		
4. Protect groundwater quality and quantity.	a. Cost-share eligible well abandonments.	LWCD	40/yr	$1,800	$2000/yr	Number of wells closed	2 per year / as needed
	b. Educate the public on groundwater quality and quantity.	UWEX, LWCD, NRCS	45/yr	$2,025	$500/yr	Number of events and publications	3 events per year
		Yearly Totals	**85/yr**	**$3,825**	**$2,500/yr**		
5. Maintain prime farmland.	a. Educate and inform farmers on farmland preservation program.	LWCD	20/yr	$900	NA	Number of events and publications	1 per year
	b. Encourage Agricultural Enterprise Areas in Prime farmland areas.	LWCD	20/yr	$900	NA	Number of contacts	5 per year
	c. Maintain FPP compliance with current contracts through field visits.	**LWCD**	**5/yr**	**$225**	**NA**	**Number of certifications**	**100% Compliance**
		Yearly Totals	**45/yr**	**$2,025**	**$0**		

Total Yearly Hours, Costs, and Funding Needed to Accomplish Goal 1		
Staffing Hours	**Staffing Dollars**	**Cost-Share Dollars**
6,450	$261,900	$539,250

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

Objective	Activities	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark
1. Manage terrestrial and aquatic invasive species.	a. Pursue funding for invasive species oriented programs.	LWCD, NRCS	200/yr	$9,000	NA	Number of programs	1 program every 5 years
	b. Pursue funding for Lake Monitoring and Protection staff.	**LWCD**	**80/yr**	**$3,600**	**$18,700/yr**	**Number of staff hired**	**1 full time position**
	c. Educate the public on invasive species control and management.	LWCD, TIP	500/yr	$22,500	$1,000/yr	Number of events held and information distributed	1 event per year and / or 1 information source distributed
	d. Inventory new populations and control existing stands.	LWCD, TIP, WDNR	345/yr	$15,525	$3,000/yr	Number of plots inventoried and controlled	Minimum of 3 plots inventoried per year and control as needed
	e. Update and implement county invasives Strategic Action Plan.	**LWCD**	**600/yr**	**$27,000**	**NA**	**Plan updated and implementation**	**Update plan by 2027 and implementation as needed**
	f. Collaborate with TIP to monitor populations.	**LWCD**	**100/yr**	**$4,500**	**$1,000/yr**	**Number of projects worked on**	**1 project per year**
	g. Continue to update Oconto County website information pertaining to invasive species.	LWCD	10/yr	$450	NA	Website content up to date	Continually update website as needed
	h. Continue Oconto County early detection monitoring program.	LWCD	40/yr	$1,800	NA	Number of boat landings monitored	5 boat landings per year and a continuous long term cycle
	i. Promote an increase in Clean Boats, Clean Waters monitoring hours.	LWCD	40/yr	$1,800	NA	Number of hours monitored	200 additional hours by 2030
		Yearly Totals	**1,915/yr**	**$86,175**	**$23,700/yr**		
2. Protect and enhance lake and stream water quality and quantity.	**a. Design and implement shoreline conservation practices.**	**LWCD, WDNR**	**1,750/yr**	**$78,750**	**$40,000/yr**	**Number of practices**	**5 practices installed per year**
	b. Promote county cost-share fund use for shoreline restoration.	LWCD	120/yr	$5,400	NA	Number of contacts	10 contacts per year and 1 social media release
	c. Educate riparian landowners on the impacts of property management.	**LWCD, UWEX, WDNR**	**200/yr**	**$9,000**	**NA**	**Number of events and individual contacts**	**1 event per year and 5 contacts per year**
	d. Educate the public on water quality and quantity.	LWCD, UWEX, WDNR	40/yr	$1,800	NA	Number of events	3 events per year
		Yearly Totals	**2,110/yr**	**$94,950**	**$40,000/yr**		

Objective	Activities	Agencies	Staff Hours	Staff Dollars	Cost-Share Dollars	Evaluation and Monitoring Parameters	Target Benchmark
3. Improve wildlife and fish habitat.	**a. Restore stream morphology.**	**LWCD**	**80/yr**	**$3,600**	**$25,000/yr**	**Number of projects**	**1 project per year**
	b. Encourage lakes to participate in the Citizen Lake Monitoring Network to assure quality wildlife waters.	LWCD	40/yr	$1,800	NA	Number new of lakes monitored	1 per year
	c. Promote the removal of livestock grazing from woodlots.	LWCD, NRCS, UWEX	20/yr	$900	NA	Number of contacts	2 contacts per year
	d. Promote tree drops and "fish sticks" on lake shores.	**LWCD**	**40/yr**	**$1,800**	**$2,000/yr**	**Number of contacts**	**2 contacts per year**
	e. Enhance fish passage.	**LWCD**	**500/yr**	**$22,500**	**$80,000/yr**	**Impediments removed**	**3 per year**
		Yearly Totals	**680/yr**	**$30,600**	**$107,000/yr**		
4. Protect and restore wetlands.	a. Restore degraded wetlands.	LWCD, NRCS	240/yr	$10,800	$25,000/yr	Acres	1 acre per year restored
	b. Educate landowners on the benefits of wetlands.	LWCD, NRCS, WDNR	20/yr	$900	NA	Number of contacts	10 contacts per year
		Yearly Totals	**260/yr**	**$11,700**	**$25,000/yr**		
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.	OCLAWA, LWCD	240/yr	$10,800	NA	Plan progress	Completed plan by 2030
	b. Partner with volunteer groups and DNR to monitor lake levels.	**LWCD, DNR**	**80/yr**	**$3,600**	**$250/yr**	**Number of lakes**	**5 lakes per year**
		Yearly Totals	**320/yr**	**$14,400**	**$250/yr**		
6. Promote quality recreation opportunities on all lakes and streams.	a. Work with local organizations and government units to make public lands and waters handicap accessible.	LWCD, DNR, Sportsmen's Clubs	80/yr	$3,600	$5,000/yr	Number of access points improved	5 improvements over 10 years
	b. Create awareness of the value of Oconto County recreational resources.	LWCD, UWEX	40/yr	$1,800	$500/yr	Number of events and media publications	1 per year
		Yearly Totals	**120/yr**	**$5,400**	**$5,500/yr**		

Total Yearly Hours, Costs, and Funding Needed to Accomplish Goal 2		
Staffing Hours	**Staffing Dollars**	**Cost-Share Dollars**
5,405	$243,225	$201,450

CHAPTER 6: PARTNERS AND FUNDING

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 the 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 natural resources. All agencies and private groups are invited to participate in annual reviews and revisions of this plan.

- Oconto County Land & Water Resource Committee
- Natural Resources Conservation Service
- ***University of Wisconsin-Extension (UWEX)***
- Department of Agriculture, Trade and Consumer Protection
- Department of Natural Resources
- U. S. Fish and Wildlife Service
    - ***Natural Resource Damage Assessment (NRDA)*** program

Private Voluntary Organizations

- Oconto County Lakes and Waterways Association (county-wide group)
- Individual Lake Associations and Districts
- Trout Unlimited
- Oconto County Sportsmen's Clubs
- Land and Water Resource Management Plan Citizen's Advisory Committee

FUNDING PLAN IMPLEMENTATION

The Oconto County Land and Water Resource Management 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. The dollar amounts required in order to accomplish this plan's goals were formulated with the assumption of fully funded budgets. Potential funding sources are outlined below.

Local Government Funding Sources

- Oconto County Land and Water Resource Budget (LWCD, Zoning, Forest & Parks)
- Oconto County Cost Share Program
  - $20,000 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 maximum per project.
- Oconto County Healthy Waters Cost Share Program
  - $35,000 per year to work with county lake associations and organizations on water quality BMPs. The funding is capped at $7,000 maximum per project.

Other Local Funding Sources

- Individual Contributions
- Volunteer Hours
- County Lake Associations
- Trout Unlimited
- Oconto County Sportsmen's Alliance
- Ducks Unlimited
- Whitetails Unlimited
- OCLAWA

State Government Funding Sources

- Department of Natural Resources
  - Targeted Resource Management Grants
  - Notice of Discharge Grants
  - Stewardship Funds
  - Surface Water Grants
- Department of Agriculture, Trade and Consumer Protection
  - Land and Water Resource Management Plan Implementation Funds
  - Soil and Water Resource Management Grants

Federal Government Funding Sources

- U. S. Department of Agriculture- Natural Resources Conservation Service
  - ***Environmental Quality Incentives Program (EQIP)***
  - ***Wildlife Habitat Incentives Program (WHIP)***
  - Wetland Reserve Program (WRP)
  - Conservation Stewardship Program (CSP)
- U. S. Department of Interior- Fish and Wildlife Service
  - Natural Resource Damage Assessment (NRDA)
- U. S. Department of Agriculture- ***Farm Service Agency (FSA)***
  - ***Conservation Reserve Program (CRP)***
  - ***Grassland Reserve Program (GRP)***

GLOSSARY

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.
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.

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

ATCP 50: The chapter of Wisconsin's 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 phosphorus.

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

CBCW: Clean Boats, Clean Waters; trained volunteer inspectors that perform boat and trailer checks for invasive species, distribute informational brochures, and collect and report any new AIS presence in waterbodies.

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 state's soil and water conservation programs. The DATCP administers state cost-sharing funds for a variety of LWRC 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 LWRCs, LWCDs 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 nation's 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 support, 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.

FLOW: Forest, Langlade, & Oconto Waterways AIS Program; A cooperative agreement between the namesake counties to manage and educate on aquatic invasive species.

Geographic Information Systems (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.

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 & Water Conservation Department (LWCD): The department of county government responsible for administering the conservation programs and policies of the Land Conservation Committee.

LWRC: Land & Water Resources Committee; The portion of county government empowered, by Chapter 92 of the Wisconsin Statutes, to conserve and protect the county's soil, water and related natural resources.

Natural Resource Damage Assessment (NRDA): Funding to restore habitat and water quality in the area of concern of the bay of Green Bay

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 nonpoint source pollution.

NR 151: DNR's 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 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

Outstanding or Exceptional Resource 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.

Perfluorooctane Sulfonic Acid (PFOS): A persistent, man-made chemical used in various products and known for its stain, grease, and water resistance properties. It has been linked to potential health effects and is regulated due to its persistence in the environment.

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 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.

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

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

TEDCOR: Tourism & Economic Development Corporation Oconto Region**;** Promotes tourism and economic development.

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.

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

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