Fond du Lac County Land & Water Resource Management Plan

2013-2017

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PREFACE

In 1996, Wisconsin Land and Water Conservation professionals proposed a locally led conservation concept of land and water resource management plans in response to a state legislative call to "redesign" the Wisconsin's nonpoint pollution abatement programs. The Land and Water Resource Management Plan concept evolved from a long-stated need to establish a locally driven process that ensures local decision making and increased program delivery mechanisms. It also ensures the utilization of local, state and federal funds for greater effectiveness toward the protection of land and water resources within the counties.

In 1997, the Land and Water Resource Management Plan concept became law as Chapter 92.10 of the Wisconsin Statutes was amended. The basic concept of this legislation is meant to:

- Drive a locally led process for plan development and implementation;
- Provide maximum flexibility in program grants and funding sources;
- Drive a comprehensive watershed based approach without excessive planning;
- Support innovation and cost effectiveness toward achieving plan objectives;
- Integrate programs and funding sources, making use of a wide variety of implementation tools; and
- Ensure meaningful program evaluation and accountability.

Now, Chapter 92 is the legislation that requires counties to develop a County Land and Water Resource Management Plan that must outline a strategy for implementation and enforcement of state performance standards. Chapter 92 also intended this plan to also provide structured means that will integrate and leverage available programs, funds and other resources to:

- Guide the process for resource management planning and decision making;
- Compile information for evaluating land and water resource conditions;
- Develop a multi-year work plan to address land and water resource problems by watershed;
- Strengthen partnerships with landowners, other agencies, municipalities and organizations;
- Integrate efforts with other county and basin level Natural Resource Management Plans;
- Coordinate with Township and County comprehensive land use planning efforts;
- Develop effective information and education strategies that will strengthen and maintain community support for the planned Land and Water Resource Management Plan goals and objectives; and
- Track progress toward the achievement of the plan's goals and objectives.

The driving force behind the development of the Fond du Lac County Land and Water Resource Management Plan is to, at a minimum, maintain funding levels needed to implement the conservation practices and programs to make a positive impact on resources in the county. That means individual citizens, units of government, and local, state, and federal agencies must work together to develop a framework which positively integrates natural resource management programs and funding sources. They must also provide the necessary flexibility to allocate staff and financial resources where they will do the most good toward accomplishing resource management objectives

CHAPTER 1

FOND DU LAC COUNTY LAND USE INFORMATION

PHYSICAL HISTORY OF COUNTY

As the various stages of the glacier advanced and withdrew it left deposits, which in combination with the bedrock formation, formed the major topographic features of the county. Glacial moraines and other deposition features such as drumlins, kames and eskers form the hills and valleys of the eastern half of the county. The Niagara Escarpment forms the high ridge, which runs just east of Lake Winnebago and swings southwest past Oakfield. The low, flat area around Lake Winnebago was the bed of a large glacial lake. The gently rolling topography of the western part of the county is mostly ground moraine, and the ridges and outcrops near Ripon and Fairwater are bedrock controlled. Lake Winnebago and the Horicon Marsh are part of a long broad valley carved by a lobe of the glacier in the relatively soft shale bedrock previously found there.

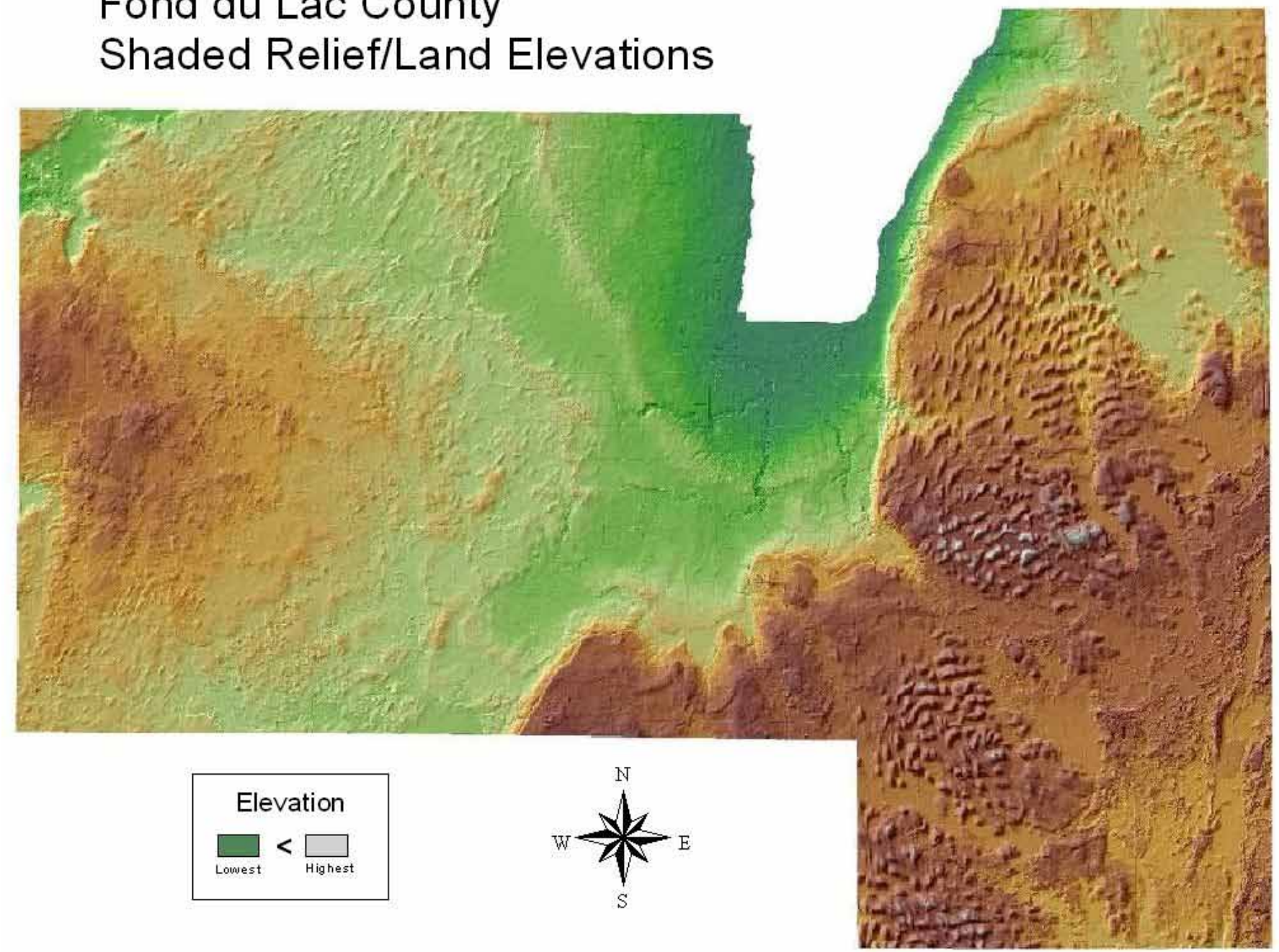
There are two main types of bedrock under Fond du Lac County: the older crystalline rock such as granite and the younger sedimentary rocks such as dolomite, sandstone and shale. In some places, this bedrock appears at the surface, as does the dolomite of the Niagara Escarpment and the sandstone and granite at the western edge of the county. In most parts of the county, however, the bedrock is covered with unconsolidated overburden consisting of sand, gravel and clay. This overburden was left by the Pleistocene glaciers last seen in Wisconsin about 10,000 years ago, and it ranges in thickness from several feet to several hundred feet. In some places, this overburden is well sorted; for example, the several hundred feet of clay deposited by the glacial lakes or the sand and gravel found in kames and eskers.

CIVIL HISTORY OF COUNTY

The earliest known inhabitants of the Fond du Lac area were members of the Winnebago tribe. Historic records indicate that the first person of European ancestry to explore the area around present day Fond du Lac was Allovez, a missionary explorer, in 1670. French traders occupied Fond du Lac as early as 1785. Permanent settlement occurred in Fond du Lac in 1835 with the formation of the Fond du Lac Company for the purpose of acquiring and selling land on the south end of Lake Winnebago. The first home was built in Fond du Lac the following year.

In 1847, Fond du Lac incorporated as a village of 519 persons. Fond du Lac established itself as a lumbering center. The community had a water powered sawmill, followed by a steam powered saw mill. In 1852, a 40-mile plank road was constructed linking Fond du Lac to Sheboygan and Lake Michigan. Fond du Lac incorporated as a city that same year with a population of 1,940.

Fond du Lac County
Shaded Relief/Land Elevations



GENERAL CHARACTERISTICS

Fond du Lac County is located in east central Wisconsin at the southern end of Lake Winnebago. The total land area of the county is about 724 square miles or 463,360 acres. The county is divided into 21 civil towns, 9 villages and 3 cities. Refer to Map 1-1 on the following page.

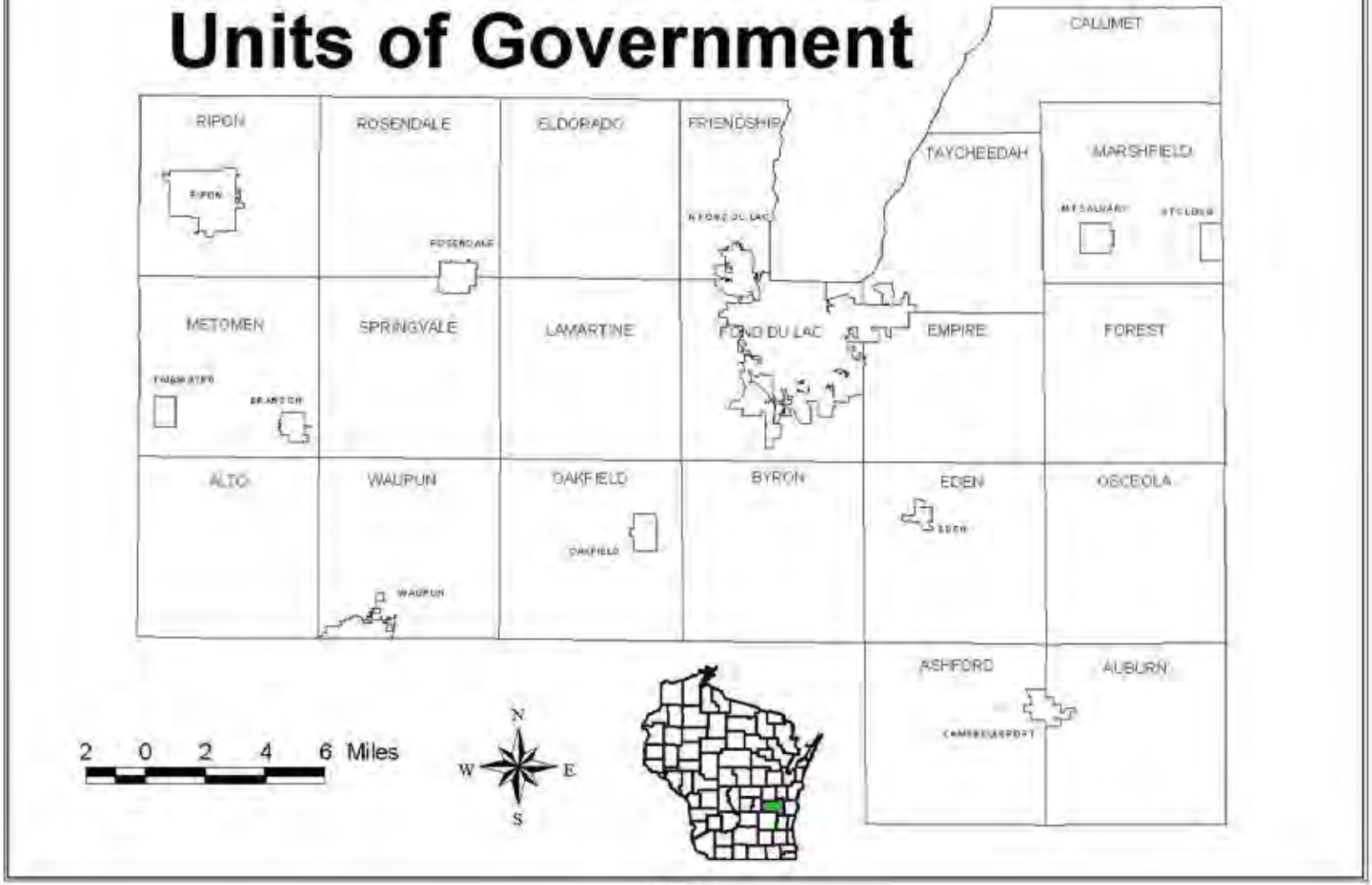
A total of 101,633 people live in Fond du Lac County, according to estimates from the most recent U.S. Census. About two-thirds of the population lives in the cities and villages; the City of Fond du Lac alone contains over 43,021 people. The other third of the population is scattered throughout the 21 unincorporated towns, with some concentrations along Lake Winnebago and near Fond du Lac in the Towns of Empire, Fond du Lac, Friendship and Taycheedah.

LAND USE TRENDS:

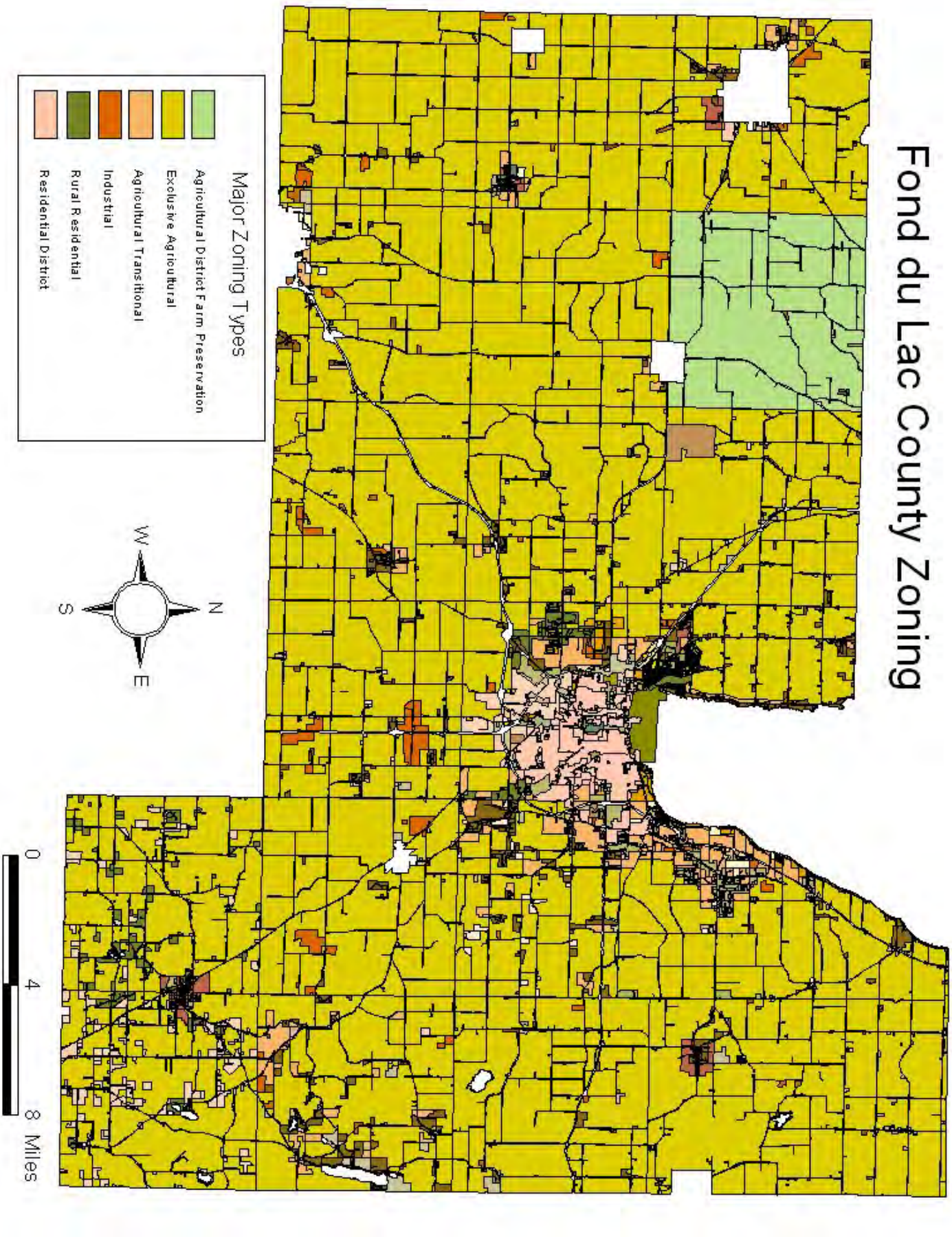
The county is located between two major industrial concentrations in the state; the Fox River Valley to the north which is one of the fastest growing development areas in Wisconsin, and the Milwaukee area to the south. Therefore, it lies in the path of expanding urbanization pressures. Agriculture remains a major land use within the county and is expected to retain that role for years to come even as development continues to encroach and put pressure on the county's natural resources. Refer to Map 1-2. Fond du Lac County has a diverse workforce dominated by jobs in manufacturing, services and retail trade. In 1999, there were 96,678 people living in Fond du Lac County and the estimated population of the county by 2020 was expected to increase to 99,568. In 2005 the population of Fond du Lac County was 99,337. Land use planning is needed to control the type and direction that growth is taking. Fond du Lac County along with the townships is continuing to work on the development of comprehensive land use plans. There are many common concerns that face a continually growing township:

- Preserve, protect and keep in production agricultural lands;
- Conserve and protect the integrity of environmental, scenic, cultural and historical resources;
- Encourage urban development that is consistent with the preservation of agricultural lands;
- Promote a land use pattern for the efficient and cost effective provision of public facilities with surrounding towns and with the county;
- Encourage the development of recreational areas;

Fond du Lac County
Units of Government



Map 1-1


Fond du Lac County Zoning
Major Zoning Types
Agricultural District Farm Preservation
Exclusive Agricultural
Agricultural Transitional
Industrial
Rural Residential
Residential District
W
N
S
E
0
4
8 Miles

Map 1-2

AGRICULTURE TRENDS:

Fond du Lac County has a diverse agricultural economy. Dairy production leads the way with nearly 100 million dollars in annual sales. Grain crops, cattle, and vegetable crops combine for an additional 60 million dollars in annual sales. Economic, political and social factors will continue to impact agriculture and related rural areas. Some of the more important trends and changes are as follows:

- The number of dairy farms continues to decline. In 2005, there were 414 dairy farms. This compares to 703 farms in 1995 (Source: Wisconsin Ag Statistics Service).
- Dairy farms are getting larger with more cows. In fact, total cow numbers have been on a steady increase in recent years and according to the USDA National Ag. Statistics Service in 2010 dairy cow numbers was roughly 52,000 which tied for third in the state.
- Total milk production and production per cow are steadily increasing. Total milk production put Fond du Lac County about 5th overall in the State in 2010. Average milk produced per cow stayed steady at 22,500 in 2009 and 2010.
- Average crop yields are generally increasing, especially corn for grain and silage.
- Soybean acreage has rapidly increased over the past 20 years. Over 45,000 acres are currently grown (compared to less than 30,000 acres in 1995). Most of this increase has come at the expense of oat and vegetable crop acres.
- Forage crops remain important to the dairy industry and there has been a significant upward trend in the number of corn acres harvested for silage.
- Fond du Lac County held its position as a leading producer of commercial vegetables (primarily sweet corn and green peas) and winter wheat. Still, acreage of sweet corn and peas has been lost to the central sands area of Wisconsin.
- Land values and land rents have been increasing dramatically.
- The number of “hobby farms” continues to grow. Many keep some livestock, including horses.

All of the above changes have impacted the economic, social, political, and environmental landscape of rural Fond du Lac County. Finding a balance that will insure agricultural profitability, protect landowners’ rights, and provide for a sustainable environment continues to challenge both county leaders and residents.

CHAPTER 2

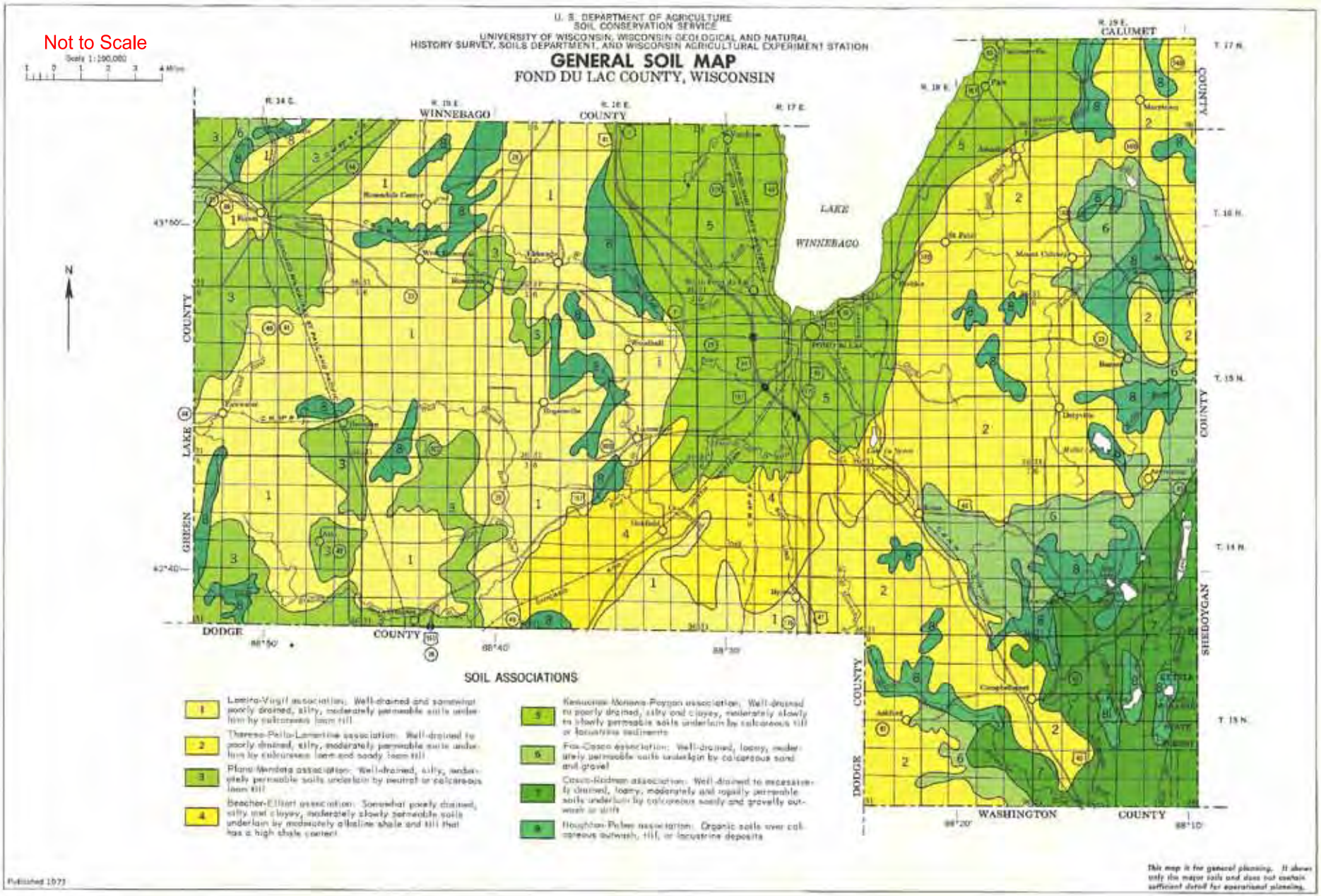
LAND & WATER RESOURCE DESCRIPTIONS AND ASSESSMENTS

To understand the importance of natural resources within Fond du Lac County and the surrounding area, it is essential to recognize that, in addition to the countless environmental benefits they provide, those resources bring in millions of dollars in revenue to local communities throughout the county each year. That revenue comes primarily from the vast array of rural, urban and recreational users of the natural resources. While it is difficult to place a specific dollar value on these resources, straight-line logic tells us that we absolutely cannot afford to waste them and must do all we can to protect them for present and future generations.

SOIL RESOURCES

Soil is naturally made as organic and geologic features breakdown. Even though the generation of soil naturally occurs over time, soil that is suitable to growing crops and other vegetation should be considered a finite resource. Soil loss is measured in relation to the tolerable soil loss for a given soil type, or "T" value. The "T" value refers to the amount of soil that can be replaced through the natural soil building process for a specific soil type. The tolerable soil loss for most soils in Fond du Lac County is between 3 and 5 tons per acre per year. Operating cropland at or below the tolerable soil loss levels will help maintain the agricultural productivity of the soil and possibly reduce runoff to nearby lakes and streams.

There are different characteristics to each soil type, which influences the kind of land use and management taking place within the county. The Fond du Lac County Land and Water Conservation Department uses detailed descriptions of each soil type, including soil patterns, relief and drainage features to determine cropland erosion estimates and sediment load calculations. This in turn determines the type and extent of agricultural practices and management techniques to recommend. See Map 2-1.


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF WISCONSIN, WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY, SOILS DEPARTMENT, AND WISCONSIN AGRICULTURAL EXPERIMENT STATION
GENERAL SOIL MAP
FOND DU LAC COUNTY, WISCONSIN
Not to Scale
Scale 1:190,000
N
LAKE WINNEBAGO
WINNEBAGO COUNTY
CALUMET COUNTY
FOND DU LAC COUNTY
GREEN LAKE COUNTY
DODGE COUNTY
SHEBOYGAN COUNTY
WASHINGTON COUNTY
SOIL ASSOCIATIONS
1 Lamira-Virgil association: Well-drained and somewhat poorly drained, silty, moderately permeable soils underlain by calcareous loam till
2 Theresa-Pella-Lamartine association: Well-drained to poorly drained, silty, moderately permeable soils underlain by calcareous loam and sandy loam till
3 Plano-Mendota association: Well-drained, silty, moderately permeable soils underlain by neutral or calcareous loam till
4 Beecher-Elliott association: Somewhat poorly drained, silty and clayey, moderately slowly permeable soils underlain by moderately alkaline shale and till that has a high shale content
5 Kewaunee-Manawa-Poygan association: Well-drained to poorly drained, silty and clayey, moderately slowly to slowly permeable soils underlain by calcareous till or lacustrine sediments
6 Fox-Casco association: Well-drained, loamy, moderately permeable soils underlain by calcareous sand and gravel
7 Casco-Rodman association: Well-drained to excessively drained, loamy, moderately and rapidly permeable soils underlain by calcareous sandy and gravelly outwash or drift
8 Houghton-Palms association: Organic soils over calcareous outwash, till, or lacustrine deposits
This map is for general planning. It shows only the major soils and does not contain sufficient detail for operational planning.
Published 1971

Map 2-1

FOND DU LAC COUNTY SOIL TYPES & DESCRIPTIONS

LOMIRA-VIRGIL ASSOCIATION

These soils are well drained to somewhat poorly drained, silty, moderately permeable underlain by calcareous loam till. The largest area for these soils is between Rosendale and Brandon. This association consists of 24 percent of the county. The most common use of this association is cropland.

THESEA-PELLA-LAMARTINE ASSOCIATION

This association is well drained to poorly drained, silty, moderately permeable soils underlain by calcareous loam and sandy loam till. These soils are found mainly in the eastern third of the county. This association consists of 22 percent of the county. The most common land use is cropland.

PLANO-MENDOTA ASSOCIATION

These soils are well drained, silty, moderately permeable soils underlain by calcareous loam till. The landscape of this association is one that is gently sloping and sloping low ridges and knobs and nearly level uplands and depressions. This association consists of 9 percent of the county. The majority of land use is cropland.

BEECHER-ELLIOTT ASSOCIATION

These soils are somewhat poorly drained, silty and clayey with moderately slow permeable soils underlain by moderately alkaline shale and till that has high shale content. You will find most of this association in the Oakfield and Byron Townships. This association consists of 6 percent of the county. The major land use is cropland.

KEWAUNEE-MANAWA-POYGAN ASSOCIATION

This association is well drained to poorly drained and is silty and clayey in nature. These soils are moderately slow to slowly permeable soils underlain by calcareous till or lacustrine sediments. These soils are mainly in the area bordering Lake Winnebago. This association consists of 15 percent of the county. The primary land use is cropland.

FOX-CASCO ASSOCIATION

This association is well drained, loamy and has moderately permeable soils underlain by calcareous and gravel. These soils are found on outwash plains and terraces. This association consists of 8 percent of the county. The primary land use is cropland.

CASCO-RODMAN ASSOCIATION

These soils are well drained to excessively drained, loamy, moderately and rapidly permeable soils underlain by calcareous sand and gravelly outwash or drift. These soils occupy the Kettle Moraine area of the county, which is a series of ridges and knobs. This association consists of 8 percent of the county. The majority of the land use is for woodland, wildlife or recreational purposes.

HOUGHTON-PALMS ASSOCIATION

Poorly drained soils that are subject to ponding. These organic soils overlay calcareous outwash, till or lacustine deposits. It occupies large, nearly level depression and wetland areas throughout the County. This association consists of 8 percent of the county. Wetness is a major limitation of these soils for cropland. The majority of land use is for permanent pasture or idle ground.

THE NIAGRA ESCARPMENT

Over half of Fond du Lac County is covered by the Niagara Escarpment, which has emerged as a statewide critical natural resource area in recent years due to its unique geology, the presence of rare plants and animals, sensitivity to groundwater contamination, and growing development pressure. The global uniqueness of the Niagara Escarpment was documented in **THE NIAGARA ESCARPMENT** *INVENTORY FINDINGS 1999-2001 AND CONSIDERATIONS FOR MANAGEMENT* **FINAL REPORT, May, 2002.** This study also documents the relationships of rare plant and animal communities that rely on the Niagara Escarpment.

MINERAL RESOURCES

The most important minerals produced in the county in order of value are limestone, sand and gravel, lime and clay. These minerals provide aggregate for construction, dimension stone for building and landscaping, sand, gravel and crushed stone for road building and maintenance, industrial sand for export out-of-state for the oil industry and lime for agricultural purposes, masonry and the paper industry.

In 1966, a field survey conducted by the Department of Local Affairs and Development showed that there were 564 pits or quarries in Fond du Lac County. Many of those pits were abandoned or unused, which created an unsightly scar in the landscape and an entry point for potential groundwater contamination.

Due to the legacy of abandoned mines in Wisconsin and the absence of regulations Chapter NR 135 of the Wisconsin Administrative Code, titled Nonmetallic Mining Reclamation was developed. The purpose of the chapter is to require reclamation of nonmetallic sites. By law, every county (except Milwaukee) in Wisconsin is required to enact an ordinance and administer a program that regulates the reclamation of nonmetallic mining sites. The nonmetallic mining

reclamation program will ensure that mine sites are returned to a productive and beneficial land use once mining is completed.

The implementation of NR 135 encourages operators and communities at the county and town levels to assess the opening of new pits or quarries and carefully plan in the best interest of both the mineral industry and the consumer to utilize the mineral resources and preserve the natural beauty of the landscape.

As of January 2012 there are 52 nonmetallic mining reclamation permits issued for mines in Fond du Lac County. Landowners of **p**roperty that contain marketable, nonmetallic mineral deposits are encouraged to register nonmetallic mineral deposits with the intent to reserve natural resources for the need of future generations.

SURFACE WATER RESOURCES

According to the Wisconsin Lakes Book there are 42 lakes total in Fond du Lac County. Of these lakes, 31 are named and 11 are unnamed. Lake Winnebago is by far the largest of these lakes, and provides good opportunities for fishing and water sports. Public access to Lake Winnebago is adequate, but not well developed outside of the City of Fond du Lac.

Other lakes include Rush, Long, Kettle Moraine, Wolf, and Mauthe. All have public access and are well used for recreational purposes. Of the major lakes in the county, only Lake De Nevue and Mullet Lake are not readily accessible to the public.

There are about 50 streams and rivers within Fond du Lac County, but most are small, slow and shallow. The longest sections of stream are the Milwaukee River, the Rock River and the Fond du Lac River.

Fishing is poor in most of the local streams, although some trout do exist at the headwaters of the East Branch of the Milwaukee River in the Kettle Moraine area, and in Parsons Creek before its confluence with the East Branch of the Fond du Lac River.

Exceptional Resource Waters (ERW)

These surface waters have excellent water quality and valued fisheries but already receive discharges. In some cases, new discharges to exceptional waters may be allowed to correct an environmental or public health problem. These streams are listed in NR 102.

Waterbody Name	Portion Within ORW/ERW	Classification Status
Dotyville Creek	All above town rd bisecting S31-32 T15N R19E	ERW
Feldner's Creek	From headwarters to Mischo's Millpond	ERW
Lake Fifteen Creek	Entire Creek above & below Lake Fifteen	ERW
Parsons Creek	To CTH B - Both feeder streams	ERW

303(d) IMPAIRED WATERS

The U.S. Environmental Protection Agency (EPA) has directed the WDNR to establish a list of waters that do not meet water quality standards. This list, also known as the 303(d) list, includes both water quality criteria for specific substances and/or the designated uses of the waters. The EPA has directed the DNR to establish action plans to improve the waters to meet standards.

Impaired waters in Wisconsin are addressed through an analysis, known as a Total Maximum Daily Load (TMDL). A TMDL is the amount of a pollutant a waterbody can receive and still meet water quality standards. Basically it is a pollution "budget" for a water body or watershed that establishes the pollutant reduction needed from each pollutant source to meet water quality goals.

Overview of TMDL Process

The TMDL process was developed as part of Section 303(d) of the Clean Water Act. A TMDL is the amount of a pollutant a waterbody can receive and still meet water quality standards.

TMDL = Wasteload Allocation (WLA) + Load Allocation (LA) + Margin of Safety (MOS).

The WLA is the total allowable pollutant load from point sources (municipal and industrial wastewater facilities, CAFOs, and MS4s). The LA is the load assigned to nonpoint sources (agricultural runoff, non-regulated urban areas). The MOS is the margin of safety which accounts for uncertainty in the modeling.

To establish the TMDL, goals are defined using numeric water quality standards or applicable water quality targets based on narrative water quality standards. Water quality monitoring determines current pollutant loads to the water body. Sources of the pollutants are determined through monitoring and modeling. Modeling determines the existing load and the target load to calculate the load reduction from each pollutant source.

TMDLs involve a public process, including a minimum 30-day public comment period. Once comments are addressed, the TMDL is approved by the State of Wisconsin and the US Environmental Protection Agency. TMDL Implementation occurs through other programs such as the WPDES program and NPS program.

This list identifies waters in Fond du Lac County that are not currently meeting water quality standards:

- Lake Winnebago
- Keifer/ Kummel Creek
- West Br. Rock River
- Anderson Creek
- Campground/Byron Creek
- Denevue Creek
- Fond du Lac River
- Forest Lake
- Kummel Creek
- Long Lake
- Mauthe Lake
- Parsons Creek
- Mosher Creek
- Sevenmile Creek
- Silver Creek
- South Branch Rock River
- Long Lake
- Milwaukee River
- Van Dyne Creek
- Unnamed, E. Br. Trib to Denevue Crk
- Unnamed, East Trib to Parsons Crk

DNR BASINS & WATERSHEDS

To develop a direction that addresses non-point source pollution and the impact it has on the environment one must first evaluate the natural resources within the county. The assessment of these resources is based on type, extent and location that are unique to the county. Fond du Lac County has land, which lies in five different drainage basins. A basin is an area of land that is made up of smaller watersheds. This makes it extremely important and beneficial for Fond du Lac County to develop and maintain working relationships with neighboring counties to address common goals and objectives to improve natural resources within basin areas

Surface waters in Fond du Lac County drain either to the Mississippi River Drainage Basin or the Lake Michigan Drainage Basin. In Fond du Lac County these two major drainage basins are comprised of five different DNR Management Basins which are made up of 13 major watersheds (Map 2-1).

The Beaver Dam Watershed, The Upper Rock River Watershed, & and The East Branch of the Rock River are all part of the Rock River Basin. The Rock River Basin is the only basin in Fond du Lac County that drains to the Mississippi River Basin.

The Upper Grand River Watershed, Big Green Lake Watershed, Fox River Watershed, Fond du Lac River Watershed, & East Lake Winnebago Watershed are all part of the Upper Fox River Basin. The Manitowoc River Watershed is part of the Manitowoc River Basin. The Sheboygan River Watershed and the Mullet River Watershed are part of the Sheboygan River Basin. The

East / West Branch Milwaukee River Watershed and the North Branch Milwaukee River Watershed are part of the Milwaukee River Basin. The Upper Fox River Basin, the Manitowoc River Basin, The Sheboygan River Basin, and the Milwaukee River Basin all drain to the Lake Michigan Basin.

The watershed summaries which follow provide a general description and location of the watersheds and assessments of the type of non-point source pollution that impacts these watersheds (See Table 2-1).

UPPER FOX RIVER BASIN:

Fox River Watershed

Big Green Lake Watershed - Previously a Priority Watershed Project Area

Grand River Watershed

Lake Winnebago East Watershed - Previously a Priority Watershed Project Area

Fond du Lac River Watershed - Previously a Priority Watershed Project Area

Winnebago West Watershed - Previously a Priority Watershed Project Area

UPPER ROCK RIVER BASIN:

Beaver Dam Watershed - Previously a Priority Watershed Project Area

Rock River Watershed

SHEBOYGAN RIVER BASIN:

Sheboygan River Watershed - Previously a Priority Watershed Project Area

Mullett River Watershed

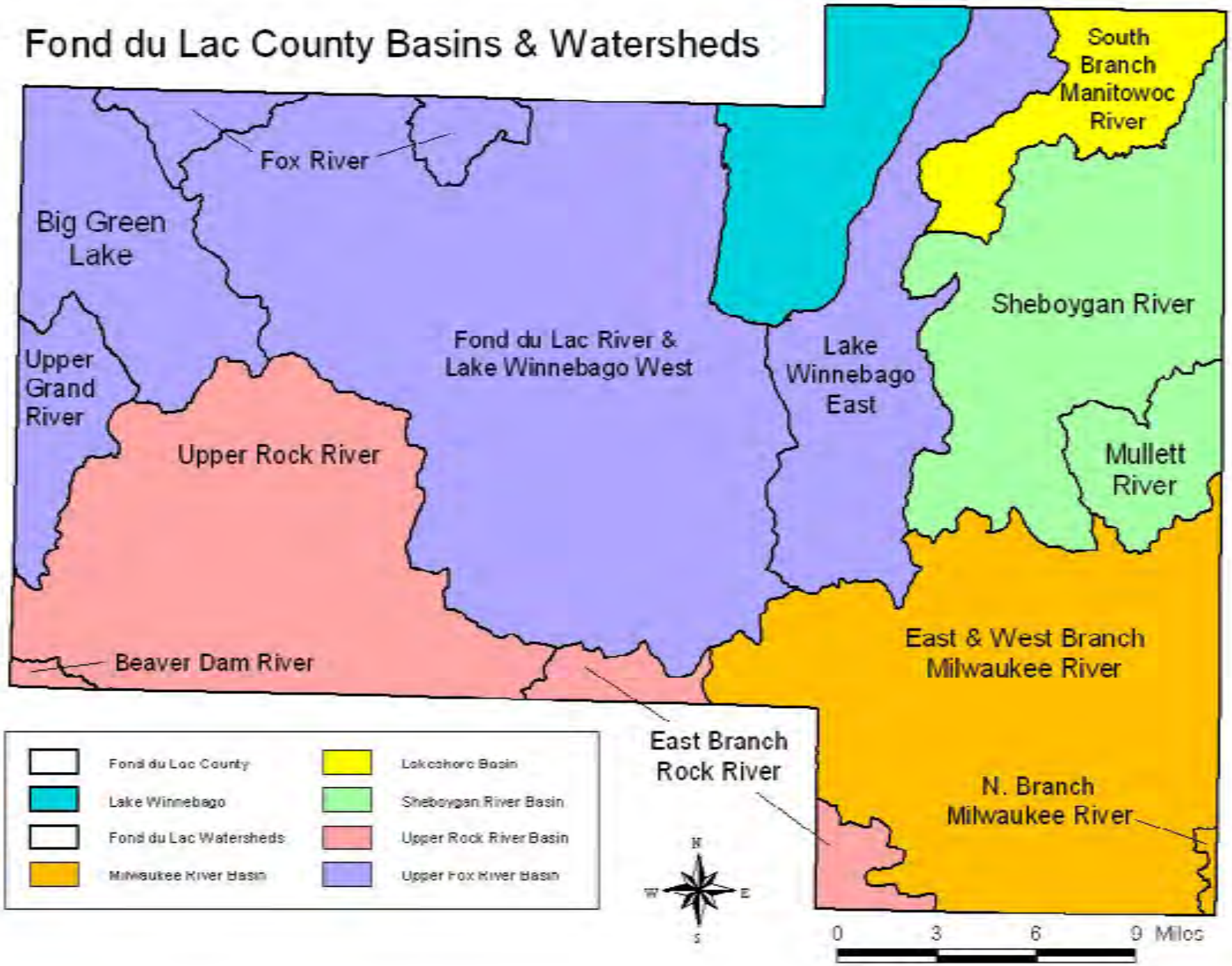
LAKESHORE BASIN:

Manitowoc River Watershed

MILWAUKEE RIVER BASIN:

East/West Branch Milwaukee River Watershed - Previously a Priority Watershed Project Area

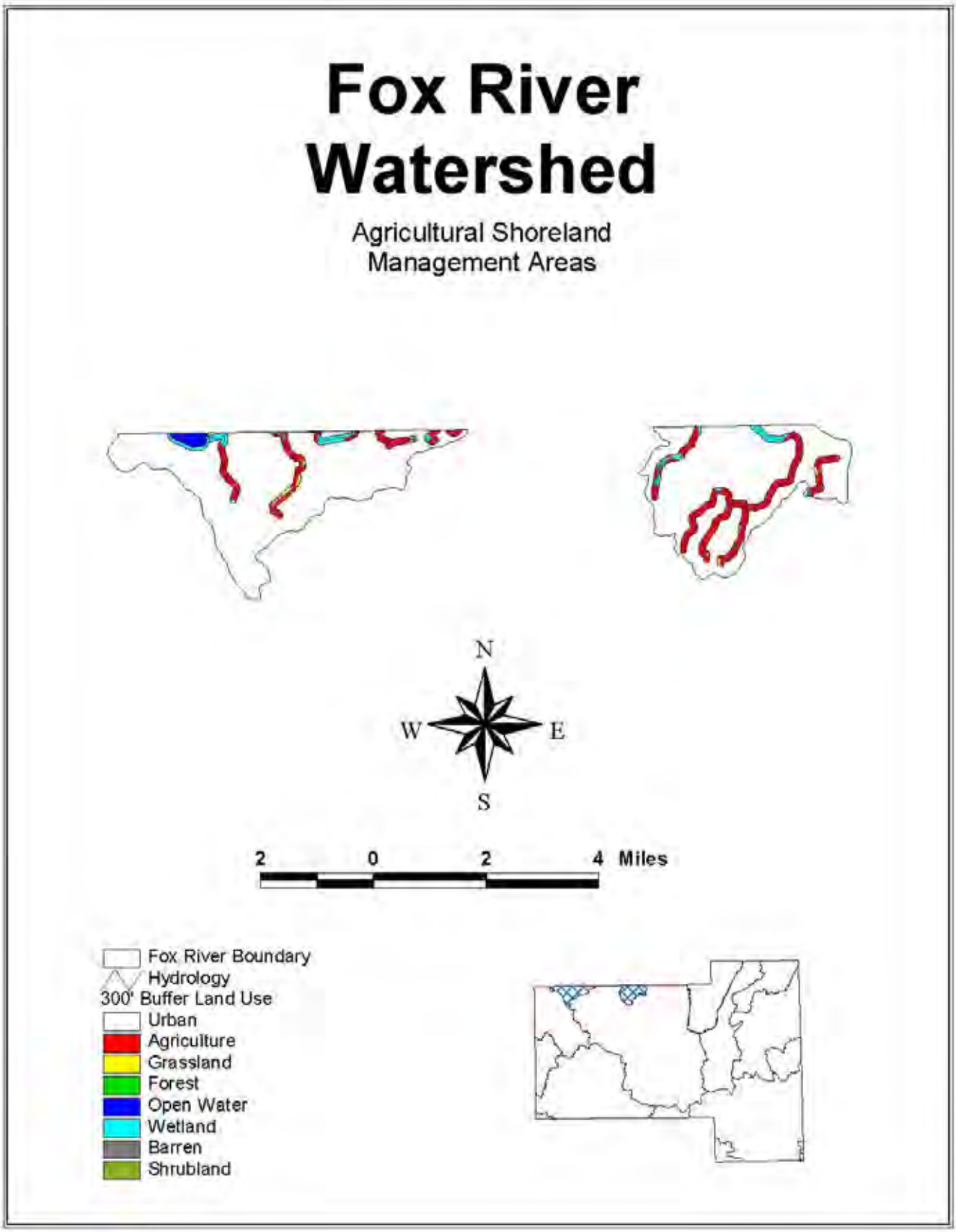
North Branch Milwaukee River Watershed - Previously a Priority Watershed Project Area


Fond du Lac County Basins & Watersheds
South Branch Manitowoc River
Fox River
Big Green Lake
Sheboygan River
Fond du Lac River & Lake Winnebago West
Lake Winnebago East
Upper Grand River
Upper Rock River
Mullett River
East & West Branch Milwaukee River
Beaver Dam River
East Branch Rock River
N. Branch Milwaukee River
Fond du Lac County
Lake Winnebago
Fond du Lac Watersheds
Milwaukee River Basin
Lakeshore Basin
Sheboygan River Basin
Upper Rock River Basin
Upper Fox River Basin
N
W
E
S
0
3
6
9 Miles

Map 2-2

TABLE 2.1: WATERSHED SUMMARY

Watershed	DNR Watershed ID	Cropland acres within Fond du Lac County	Streambanks/ Shoreline within Fond du Lac County	Area in 300' Water Quality Management Area (WQMA)	Cropped area in 300' Water Quality Management Area
Fox River	UF05	7,520 Acres	16 Miles	1,235.5 Acres	951.1 Acres
Big Green Lake	UF07	20,068 Acres	45 Miles	3,229.9 Acres	1,590.3 Acres
Grand River	UF12	9,423 Acres	21 Miles	1,392.1 Acres	734.4 Acres
Lake Winnebago East	UF02	25,283 Acres	84 Miles	5,509.8 Acres	2,971.4 Acres
Fond du Lac River	UF03	86,753 Acres	310 Miles	21,151 Acres	11,235.9 Acres
Beaver Dam River	UR03	821 Acres	2 Miles	133.9 Acres	102.6 Acres
Upper Rock River	UR12	49,696 Acres	112 Miles	8,142.3 Acres	3,768.5 Acres
East Branch Rock River	UR13	6,699 Acres	15 Miles	1,116.5 Acres	767.9 Acres
Sheboygan River	SH03	36,212 Acres	82 Miles	5,768.3 Acres	2,824.2 Acres
Mullett River	SH05	6,363 Acres	15 Miles	812.0 Acres	218.7 Acres
Manitowoc River	MA05	13,434 Acres	28 Miles	2,048.2 Acres	1,285.7 Acres
East/West Branch Milwaukee River	MI06	45,460 Acres	143 Miles	9,478.4 Acres	2,543.6 Acres
North Branch Milwaukee River	MI05	393 Acres	1 Mile	46.4 Acres	26.1 Acres
	TOTALS	308,125 Acres	874 Miles	60064.3 Acres	29020.4 Acres


Fox River
Watershed
Agricultural Shoreland
Management Areas
N
W
E
S
2
0
2
4 Miles
Fox River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

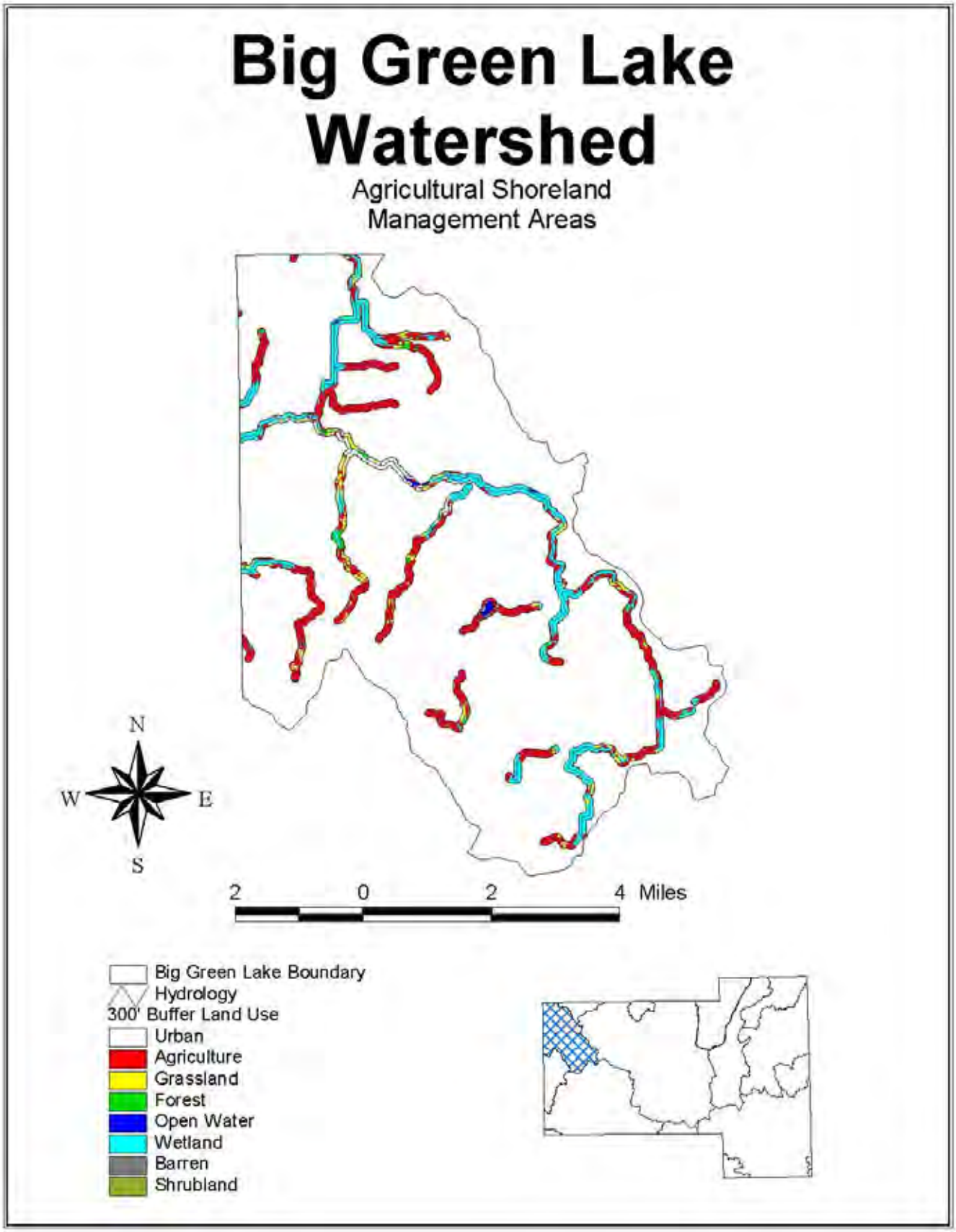
Map 2-3

UPPER FOX RIVER BASIN

The Upper Fox River Basin is located in east central Wisconsin and encompasses a number of counties including all of Marquette County and portions of Adams, Calumet, Fond du Lac, Green Lake, Winnebago, Columbia, and Waushara Counties. The Upper Fox River Basin is very diverse in land use and landscape. Agriculture, urbanization, recreation, and forestland are some of the major land uses that impact the basin. For more information on the Upper Fox River Basin please refer to the Wisconsin Department of Natural Resources Upper Fox State of the Basin Report October, 2001 WT-665-2001 available at http://dnr.wi.gov/org/gmu/stateofbasin.html.

FOX RIVER WATERSHED (Map 2-3)

The Fox River Watershed is part of the Fox River/Rush Lake Watershed. There are many wetland complexes that lie in this watershed. Only a small portion of this watershed is in Fond du Lac County the rest extends into Winnebago County. The primary land use of this watershed is agriculture consisting of cash grain and small dairies. The non-point source of pollution in this area is mainly from agriculture related practices.


Big Green Lake Watershed
Agricultural Shoreland Management Areas
N
W
E
S
2 0 2 4 Miles
Big Green Lake Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

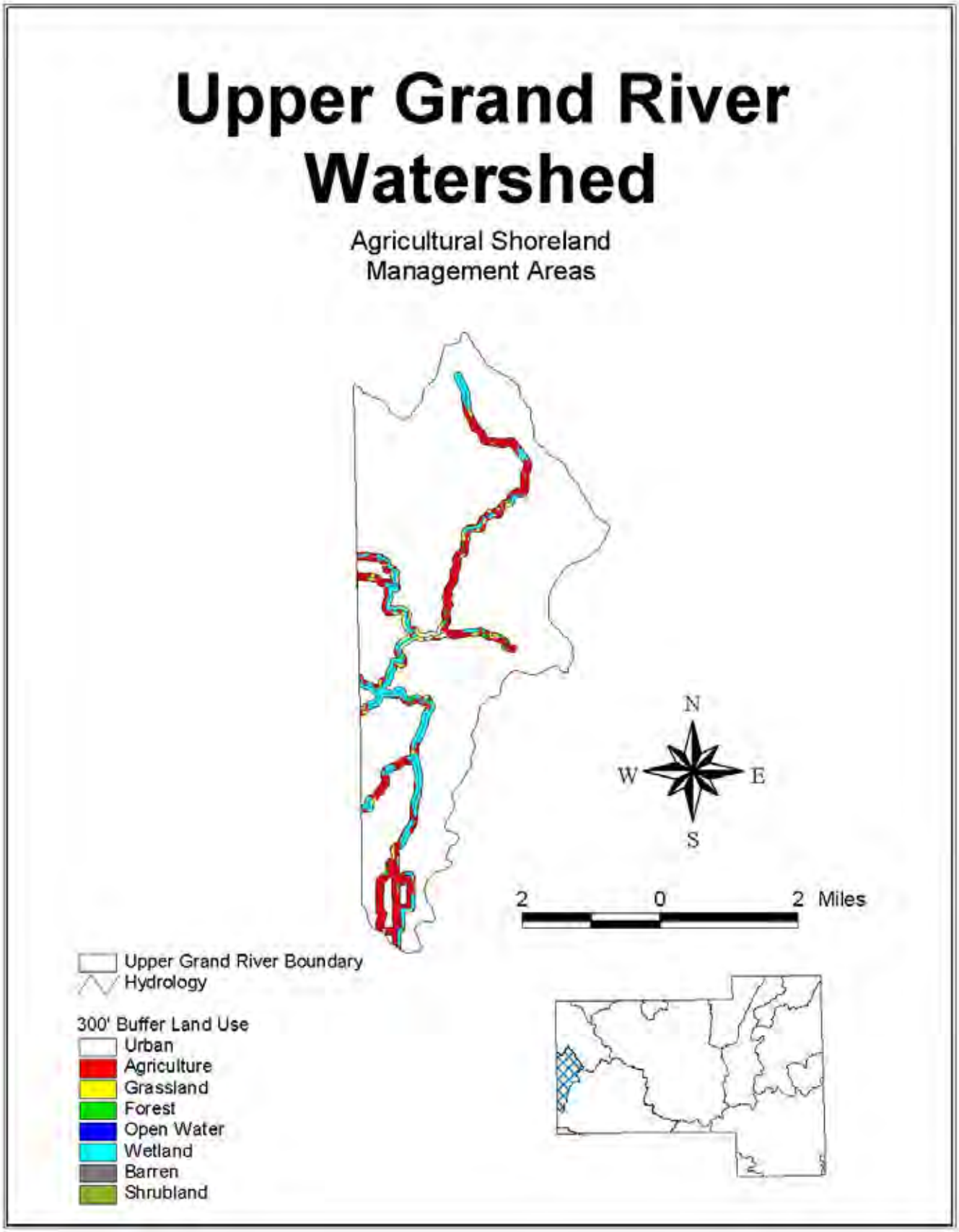
Map 2-4

BIG GREEN LAKE WATERSHED (Map 2-4)

This watershed is located in the northwestern corner of Fond du Lac and extends into Green Lake County. Green Lake is 7,346 acres in size and has a maximum dept of 236 feet. Green Lake is the second largest lake in Wisconsin by volume surpassed only by Lake Winnebago. Because of its size and depth, Big Green boasts a variety of both warm and cold water sport fisheries. The total drainage of this watershed is approximately 114 square miles with 42.6 square miles located in Fond du Lac County.

Big Green Lake's diversity in depth and volume tends to mask its water quality issues. Long term monitoring indicates that Green Lake is moving toward a more nutrient rich state. This trend has been traced to high annual sediment and nutrient loading from the surrounding area .This watershed was selected in 1981 as a priority watershed under the Wisconsin Non-point Source Water Pollution Abatement Program and ended in 1992. Conservation Partners in the Green Lake Watershed are currently developing a Lake Restoration Plan. Partners for this plan include the Green Lake Sanitary District, Green Lake Association, Green Lake County LWCD, Green Lake Conservancy, Wisconsin Department of Natural Resources, United States Geological Survey, along with interested citizens.

Silver Creek (14 miles) drains the largest sub-watershed (58 sq. mi) in the Big Green Lake Watershed. It drains through predominately agricultural areas, but also drains urban areas including the City of Ripon. Stream monitoring data from 1988 to 1995 on this creek shows 15,432 lbs. P to the Green Lake inlet site. The most significant source of P is likely from upland sediment from agricultural fields. This creek is listed on the 303(d) list as a water source not currently meeting water quality standards.


Upper Grand River Watershed
Agricultural Shoreland Management Areas
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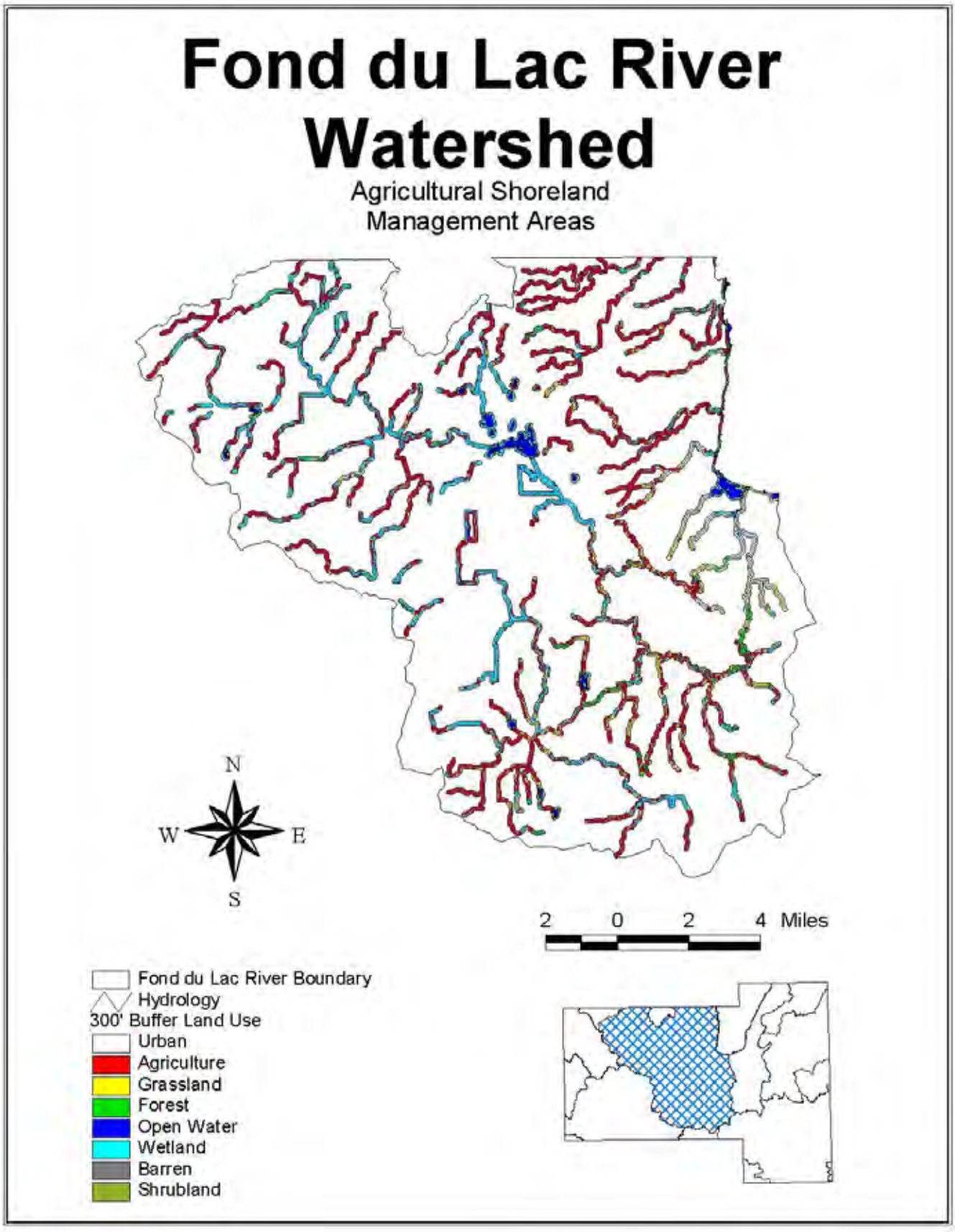
2
0
2 Miles
Upper Grand River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

Map 2-5

GRAND RIVER WATERSHED (Map 2-5)

This watershed is located in the southwestern part of Fond du Lac County and extends into Green Lake County. The watershed is 62 square miles and 18 square miles of it is located in Fond du Lac County. The river shoreline varies in nature according to the adjacent land use. Common shoreline uses are open marsh, farm pasture, and cultivated cropland. Non-point source pollution in this watershed is coming from agricultural practices.


Fond du Lac River Watershed
Agricultural Shoreland Management Areas
N
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2 0 2 4 Miles
Fond du Lac River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

Map 2-6

FOND DU LAC RIVER WATERSHED (Map 2-6)

This watershed is located in the western half of Fond du Lac County. The watershed drains approximately 249 square miles west of Lake Winnebago and extends into Winnebago County. Eighty three percent of the watershed is located within Fond du Lac County.

This watershed was selected as a priority watershed through the Non-point Source Water Pollution Abatement Program in 1995 and inventory work started in 1996. Results from the inventory showed that sediment and nutrient loading from agricultural practices to be the most significant source of non-point source pollution. The Winnebago Comprehensive Management Plan lists the watershed as being a major contributor of sediment to the Lake Winnebago System. Agriculture is the major land use in the watershed with dairy, grain and production of canning crops being the dominant uses. This watershed was combined with Winnebago West Watershed and run as one Priority Watershed Project.

East Branch (14.5 miles) This branch of the Fond du Lac River drains an area of 82.1 square miles. The dominant land use is agriculture, which is mainly dairy, cash-cropping, and vegetable production. Of all the surface water in this watershed, the East Branch has a very low gradient and therefore is susceptible to sedimentation. The existing biological use for the East Branch is Warm Water Sport Fish (WWSF). However; surveys conducted throughout the summer of 1996 showed very few sport fish being present. Rough fish and several species of forage fish dominated the survey. The East Branch travels through the most intensively managed agricultural land in the entire watershed. Factors impacting water quality include sediment and nutrient loading from agricultural fields, barnyard runoff, stream bank erosion, turbidity, lack of habitat, low dissolved oxygen, common carp, hydrologic manipulation, channelization, urban runoff and construction site erosion.

West Branch (26 miles) This river has a drainage area of 85.1 square miles and originates from a small wetland south of Rosendale Center. The current biological use for the West Branch Fond du Lac River is Warm Water Sport Fish (WWSF). The dominant land use in this watershed is agriculture, habitat restoration areas, large wetlands, narrow woodlots, urban development and small rural subdivisions. The impact on water quality is sediment and nutrient loading from agricultural fields, barnyard runoff, stream bank erosion, periods of turbidity, wetland loading, hydrologic manipulation, urban runoff and construction site erosion.

Stream Reclassification Studies for Campground Creek, Parsons Creek, and the Rosendale Tributary to the West Branch Fond du Lac River were conducted by Mike Reif, WDNR and documented the following findings and recommendations for improving water quality in those subwatersheds:

Campground Creek Subwatershed:

A review draft of the Stream Classification of Campground Creek is in progress that addresses specific concerns regarding Use Classification. The Campground Creek Subwatershed is separated into further subwatersheds to define specific problems there. The Department is addressing the changing of the Campground Cr. in the Campground Origin Subwatershed from Class II Trout Water to Class I Trout Water and putting it on the Exceptional Resource Waters (ERW) listing. The major problem that keeps the Origin Subwatershed from meeting its Use Classification is sedimentation from cropland & streambank erosion. These problems will have to be addressed and solved before restoration of the Class I Trout Waters.

The Campground Main Wetland Complex Subwatershed also cannot meet its Use Classification due to lack of a defined channel and connected enlargements that are warming the Creek and taking out its oxygen. This will have to be solved for a restoration to trout waters. Other problems in this subwatershed are the many springs coming off the escarpment that are being warmed prior to entering the Creek.

The Campground Spring Tribributary Subwatershed which enters Campground Creek downstream from River Road has similar sediment runoff and habitat degradation problems as does the Origin Subwatershed. As a result, it cannot meet its current Use Classification of Class II Trout Water.

Parsons Creek Subwatershed:

The Parsons Creek Subwatershed has also been separated into 3 separate subwatersheds to describe problems that exist and are keeping it from meeting its Use Classification. The Parsons Church Road Subwateshed has severe bank and watershed erosion problems at least in part due to the high gradient. Below Church Road, the subwatershed is degraded due to ditching and tile-line drainage of the large wetland and muck soils that exist there. This drainage causes the baseflow to go lower during dry times and higher during wet periods of the year. This causes more unstable hydraulic conditions which aid in keeping the downstream parts of Parsons Creek from meeting its Use Classification as Class I Trout Waters. As Class I Trout Waters it is notable that Parsons Creek is automatically classified as ERW. Another concern in the subwatershed that illustrates problems that exist along many streams in Fond du Lac County is a connected enlargement that exists below Church Road adjacent to the Stream and farmland there. The connected enlargement discharges spring flow via a stand pipe through a rocked area along the Creek. Discharges like this cool the stream spring inputs too much in the winter and warm them too much in the summer. It also has a negative effect on the baseflow similar to the tile-lines.

The East Trib. Subwatershed to Parsons Creek that drains to the eastern part of the Parsons Creek Subwatershed and enters the Main Stem near the upper part of Hobbs Woods is affected by sediment runoff and erosion caused by agriculture adjacent to HWY 175. The hydraulics of the Creek

appear to be significantly affected by quarries that are adjacent to the Trib. as well as at least one of the smaller tributaries to the East Tributary. The origin area of the East Trib. above HWY B is also negatively affected by a connected enlargement (pond) that was dug in a spring fed wetland area of the Trib. that has been documented as cooling the Trib. too much in the winter and warming it too much in the summer. The Trib. currently is classified Class I Trout Water but cannot meet that classification due to concerns summarized here.

The third subwatershed of Parsons Creek is called the Hobbs Woods Subwatershed. It starts where the East Trib. enters Parsons Creek and extends to the confluence of Parsons Creek with the East Branch of the Fond du Lac River. The Creek in Hobbs Woods has been found to be fed by enough spring flow to maintain a stable temperature regime which can allow it to contain trout. Class I Trout Water is its Use Classification but it cannot meet that Use at the present time due to upstream problems addressed above and other concerns. In Hobbs Woods the Creek has been widening and becoming shallow due to erosion apparently caused by people access. This has significantly reduced the trout cover and needs to be addressed if the Creek can be restored to trout status. Other concerns below Hobbs Woods are bank erosion and stream widening (especially below HWY B).

Rosendale Tributary to the West Branch of the Fond du Lac River:

The Rosendale Tributary Subwatershed is also separated into 3 Sections to describe the system and problems that need to be addressed. The uppermost Section (Section I) originated in a large wetland at the SW1/4, NE1/4, Sec. 8, T15N, R15E and stretched to Center Road. The gradient was fairly low and was found to go dry during the dry times of the driest years. Concerns in the tributary are mainly agriculture and water storage.

Section II of the Rosendale Trib. was found to have urban stormwater concerns as well as concerns related to an impoundment located below HWY 23 that inhibits fish migration.

Section III below Hill Rd. (below HWY 23) down to the confluence with the West Branch of the Fond du Lac River was found to have the highest quality of the Rosendale Trib. It is being used as the reference for the Trib. It is fed by several springs below Hill Rd. down to Rose-Eld Rd. These springs were found to keep the temperatures in the Trib. cool enough in the summer to meet cool water Use conditions. The springs work because of a confining layer above the local dolomite bedrock. This confining layer needs to be kept intact for the springs to work and baseflow to stay stable. Section III was the only part of the Rosendale Trib. that was found to be truly a continuously flowing stream. This baseflow caused by the stable spring inputs will be necessary for that to be maintained.

WINNEBAGO WEST WATERSHED

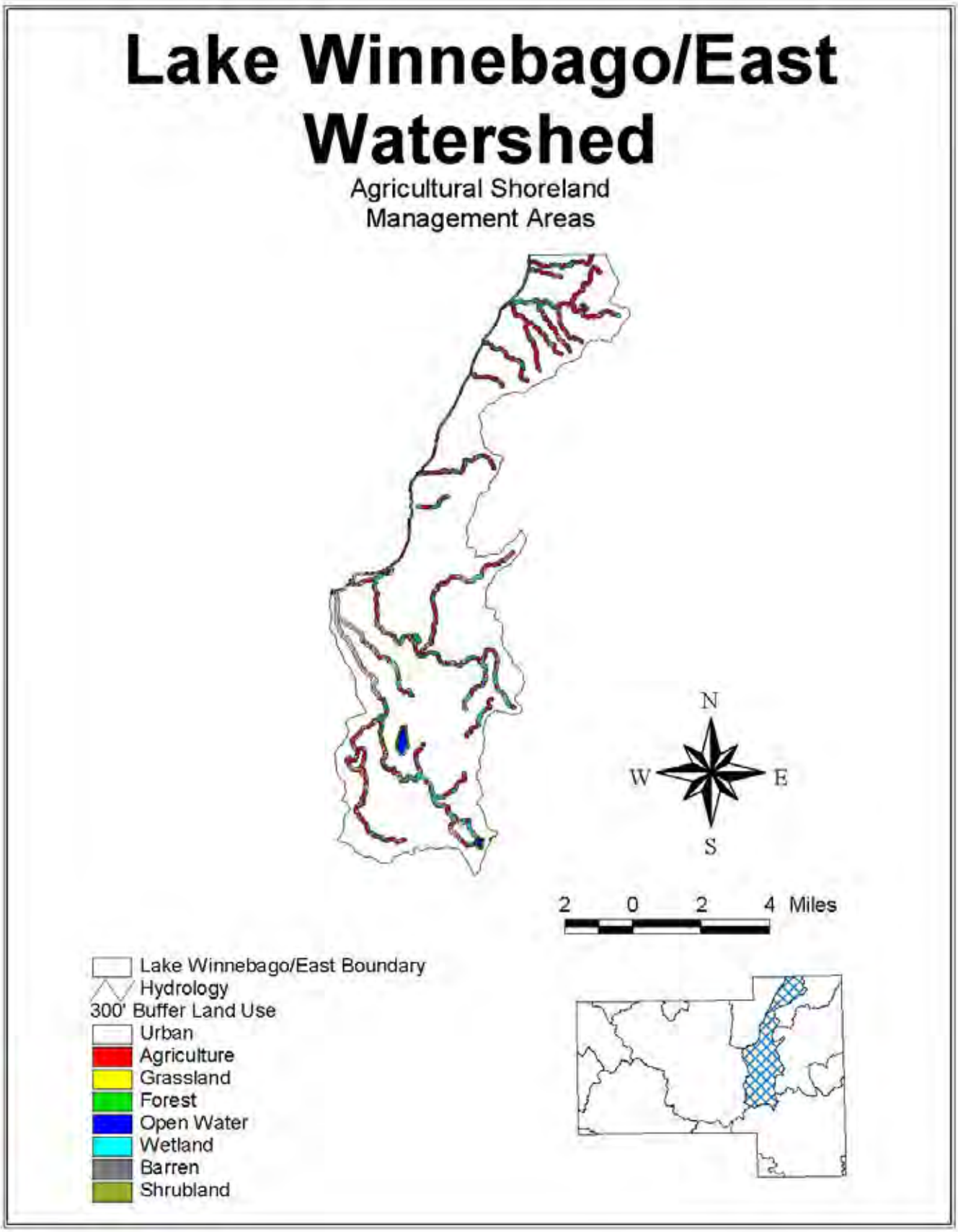
This watershed is located west of Lake Winnebago and is located in Fond du Lac and Winnebago Counties. The City of Oshkosh is located on the north and the City of Fond du Lac is located on the south end of this watershed.

In 1995 this watershed was selected and combined with the Fond du Lac River Watershed under Wisconsin's Non-point Source Water Pollution Abatement Program to become a priority watershed project. Numerous storm sewer outlets discharge directly into Lake Winnebago from this area. Currently there are several large drainage ditch systems that drain large expanses of agricultural land. Urban development is expected to continue in this area so runoff is expected to increase in the future.

Mosher Creek (3 miles) This intermittent stream flows northeasterly through the center of the Village of North Fond du Lac. The current biological use is considered intermittent for 2.8 miles and fish and aquatic life for 0.2 miles. Fish surveys were not conducted on this creek due to the intermittent nature. The land use in this area is predominately agriculture and urban development with areas of small woodlots and small wetlands. Nutrient and sediment loading from urban and agricultural runoff, loss of habitat, low flow, low dissolved oxygen, high temperatures, stream bank erosion and construction site erosion are factors all influencing the water quality in this area.

Anderson Creek (5 miles) This intermittent stream flows easterly to Lake Winnebago on the north side of the Village of North Fond du Lac. During high runoff periods this creek turns very flashy which then delivers excessive sediment and nutrients. The land use in this area is intensive agriculture and small wetlands with increasing urban development. Sediment and nutrient loading from agriculture, urban practices, and construction site erosion influence the water quality of this creek. Habitat evaluations were conducted on this creek and were rated fair to poor due to the intermittent nature of the creek.

Van Dyne Creek (8 miles) This intermittent tributary originates in the township of Eldorado and drains an area of 9.59 square miles with a gradient of 13.7 feet per mile. Agriculture, urban development, narrow wetlands and small woodlots are the dominant land uses. Factors influencing water quality include sediment and nutrient loading from urban, agricultural and barnyard runoff, intermittent nature of stream flow, high temperatures, low dissolved oxygen, loss of habitat, and channelization of stream and construction site erosion. Habitat evaluations were conducted at eleven locations reflecting a fair to poor habitat score.


Lake Winnebago/East Watershed
Agricultural Shoreland Management Areas
N
W
E
S
2 0 2 4 Miles
Lake Winnebago/East Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

Map 2-7

WINNEBAGO EAST WATERSHED (Map 2-7)

This watershed is located east of Lake Winnebago and is located in Fond du Lac and Calumet Counties. This watershed drains from approximately 93 square miles with 66 percent of the watershed located in Fond du Lac County.

Under the Wisconsin Non-point Source Water Pollution Abatement Program this watershed was a priority watershed starting in 1989 and ending in 2004. Two land features dominate the watershed; the rolling land in the eastern and southern parts of the watershed and the more level lands found in the western part. The Niagara Escarpment or "ledge" as it is known locally predominates throughout this watershed. The soils within this watershed are characterized as heavy clay soils with poor infiltration and high fertility. Predominate land use in this watershed has been agriculture; however, there is continual pressure from urban development. The eastern half of the City of Fond du Lac is located within this watershed. The non-point source pollution in this area can be contributed to the sediment and nutrient loading from agriculture and urban practices, loss of habitat, and construction site erosion.

Taycheedah Creek (10 miles) This stream is one of the major streams in the Lake Winnebago East watershed. Most of Taycheedah Creek is classified as a warm water sport fish community. Evaluations of water quality in the Taycheedah Creek show that it is in a degraded state. After rainfall or snowmelt the stream is very turbid and water clarity is very poor. Agriculture and increased urbanization pressure are the suspected sources. Habitat evaluations classify the Upper Taycheedah as fair habitat compared to the Lower Taycheedah.

DeNeveu Creek (11 miles) This is the longest stream in the Lake Winnebago East Watershed. The land use is agriculture and urban with increased pressure of urbanization along this stream. The majority of the City of Fond du Lac's storm water is pumped through the storm water sewer system, which goes directly into DeNeveu Creek. Water quality impacts are water turbidity, loss of habitat, hydrologic modifications, sediment and nutrient loading from urban and rural sources. After snowmelt or rainfall this stream can become extremely turbid. This stream is classified as supporting warm water forage fish community.

Beaver Dam River Watershed

Agricultural Shoreland Management Areas

Beaver Dam River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

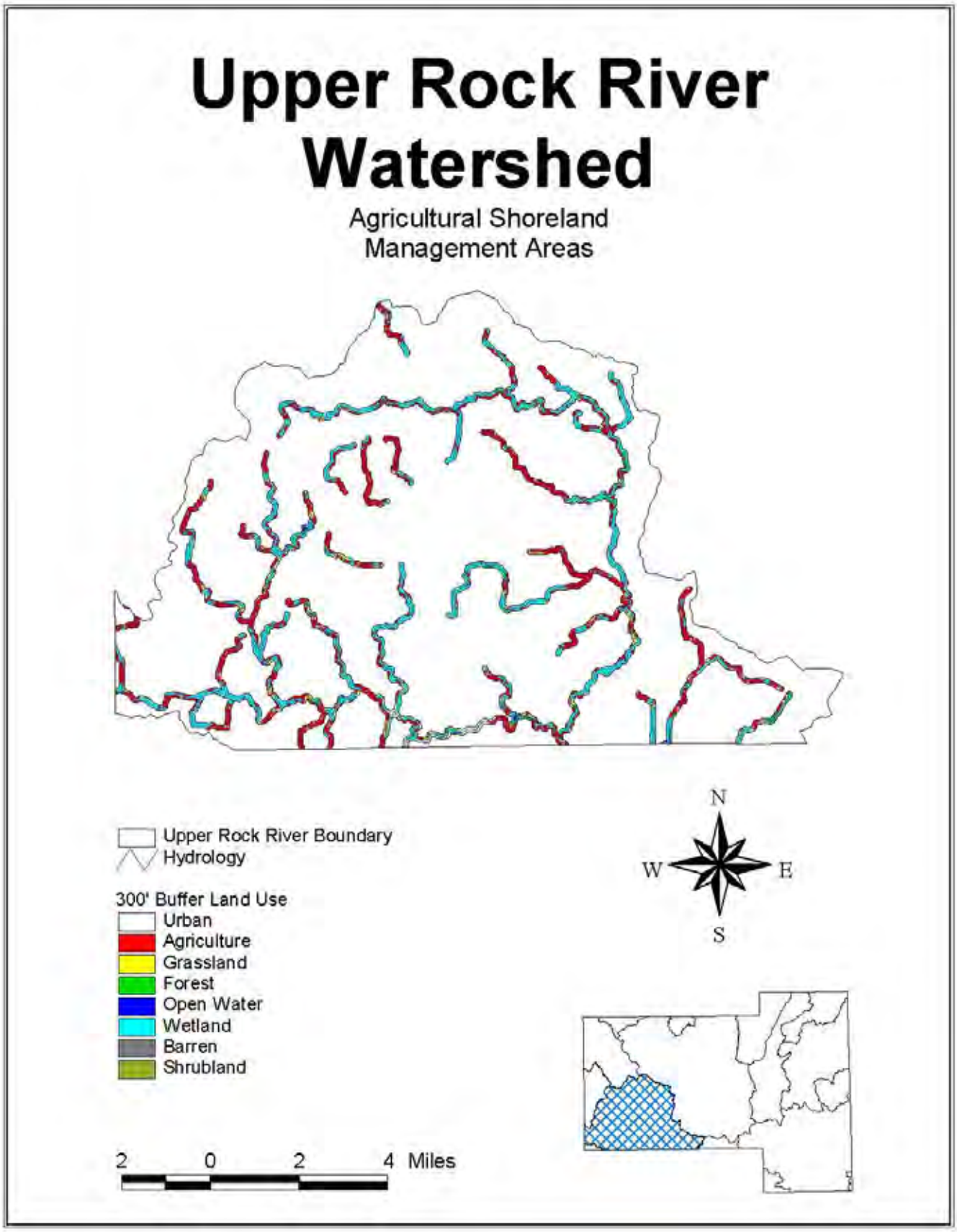
Map 2-8

ROCK RIVER BASIN

The Upper Rock River Basin is part of the lager Rock River Basin and is primarily located in southern Wisconsin. The Rock River Basin covers over ten counties and is made up of 28 smaller watersheds that eventually drain to the Mississippi River. Due to the size of the basin the land uses within its boundaries are quite varied and range from agricultural cropland to large urban areas. Portions of the Beaver Dam Watershed, The Upper Rock River Watershed, and East Branch of the Rock River Watershed are all located in the Rock River Basin and make up the southwestern part of Fond du Lac County. For more information on the Upper Rock River Basin please refer to the Wisconsin Department of Natural Resources Rock River State of the Basin Report April 2002 PUBL # WT-668-2002 available at http://dnr.wi.gov/org/gmu/stateofbasin.html.

BEAVER DAM WATERSHED (Map 2-8)

There is a small segment of the Beaver Dam Watershed located in the extreme southwestern portion of Fond du Lac County. The land use in this watershed is mainly agriculture. Water quality monitoring indicates that the streams are affected by non-point source pollution from barnyard, cropland, construction site erosion as well as other urban runoff. This watershed contains the Fox Lake, Beaver Dam Lake, and Lost Lake, which are shallow and experience eutrophication. The Beaver Dam Watershed was selected for a priority watershed project in 1990.


Upper Rock River Watershed
Agricultural Shoreland Management Areas
Upper Rock River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland
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W
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2 0 2 4 Miles

Map 2-9

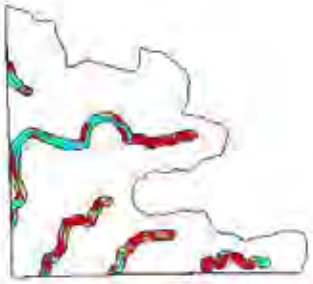
UPPER ROCK RIVER WATERSHED (MAP 2-9)

The northern half of this watershed lies within Fond du Lac County and the southern half lies within the boundaries of Dodge County with a small portion of it in Green Lake County. The primary land use is agriculture with many wetland complexes in this watershed including Horicon Marsh. The loss of wetlands, streambank and riparian zone erosion, livestock access, heavy waterfowl impact and cropland erosion are some of the reasons for the poor water quality.

The Horicon Marsh is the largest freshwater cattail marsh in the United States and has been designated as a “Wetland of International Importance” one of fifteen named in the U.S. at an international conference on wetlands in 1990. The Wisconsin Department of Natural Resources owns the southern one-third and the upper two-thirds is owned by the U.S. Fish & Wildlife Service. Non-point source pollution such as sediment and nutrient loading and infestation of carp has degraded the water quality of the Marsh.

East Branch Rock River Watershed

Agricultural Shoreland Management Areas



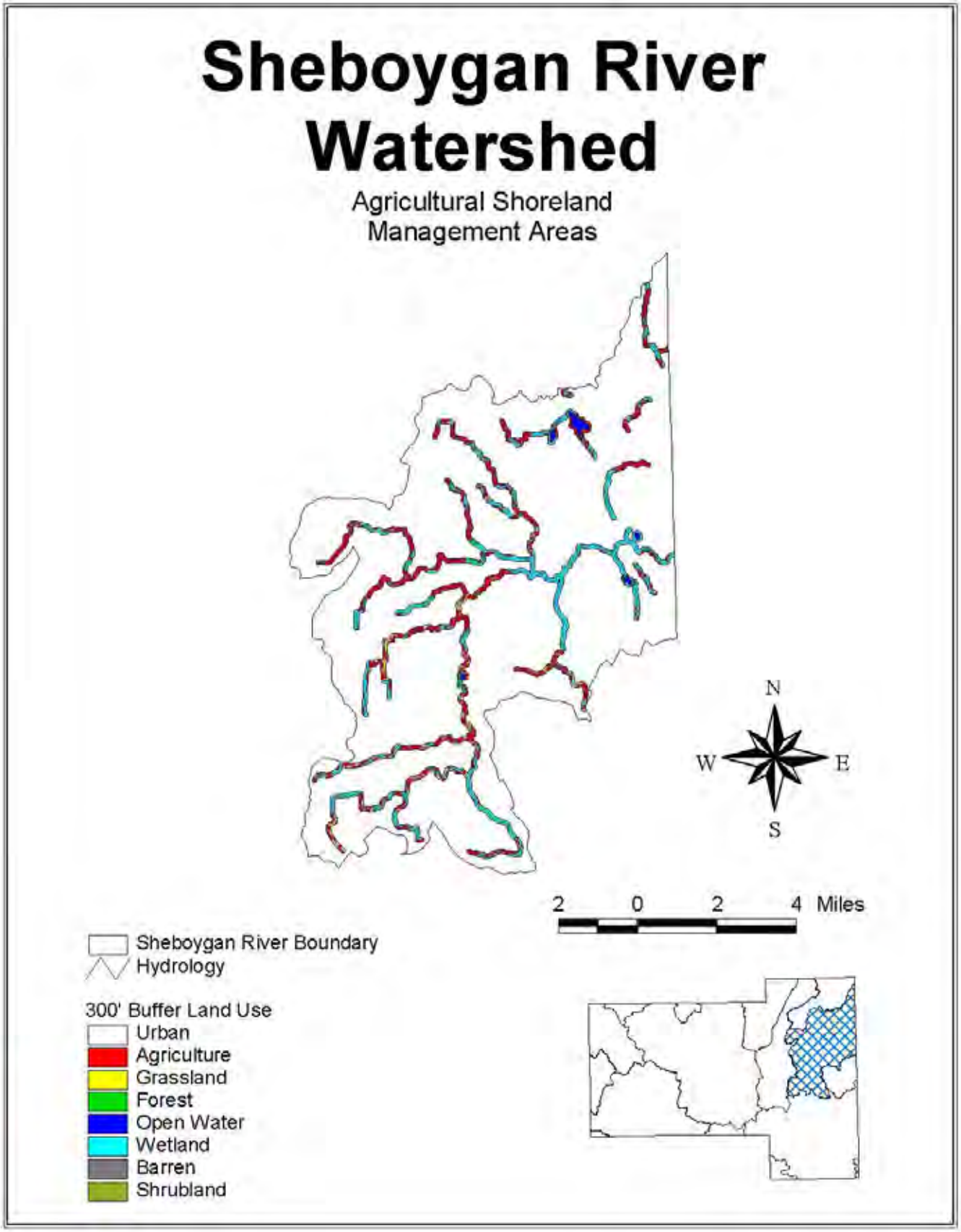
2 0 2 4 Miles

East Branch Rock River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

Map 2-10

EAST BRANCH ROCK RIVER WATERSHED (MAP 2-10)

This watershed extends through three counties: Washington and Dodge with a small portion in Fond du Lac County. It is located to the east of and drains into Horicon Marsh. The primary land use is agriculture. Non-point pollution is a major concern and therefore the east branch and its tributaries are only partially meeting its full potential.


Sheboygan River Watershed
Agricultural Shoreland Management Areas
N
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2 0 2 4 Miles
Sheboygan River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

Map 2-11

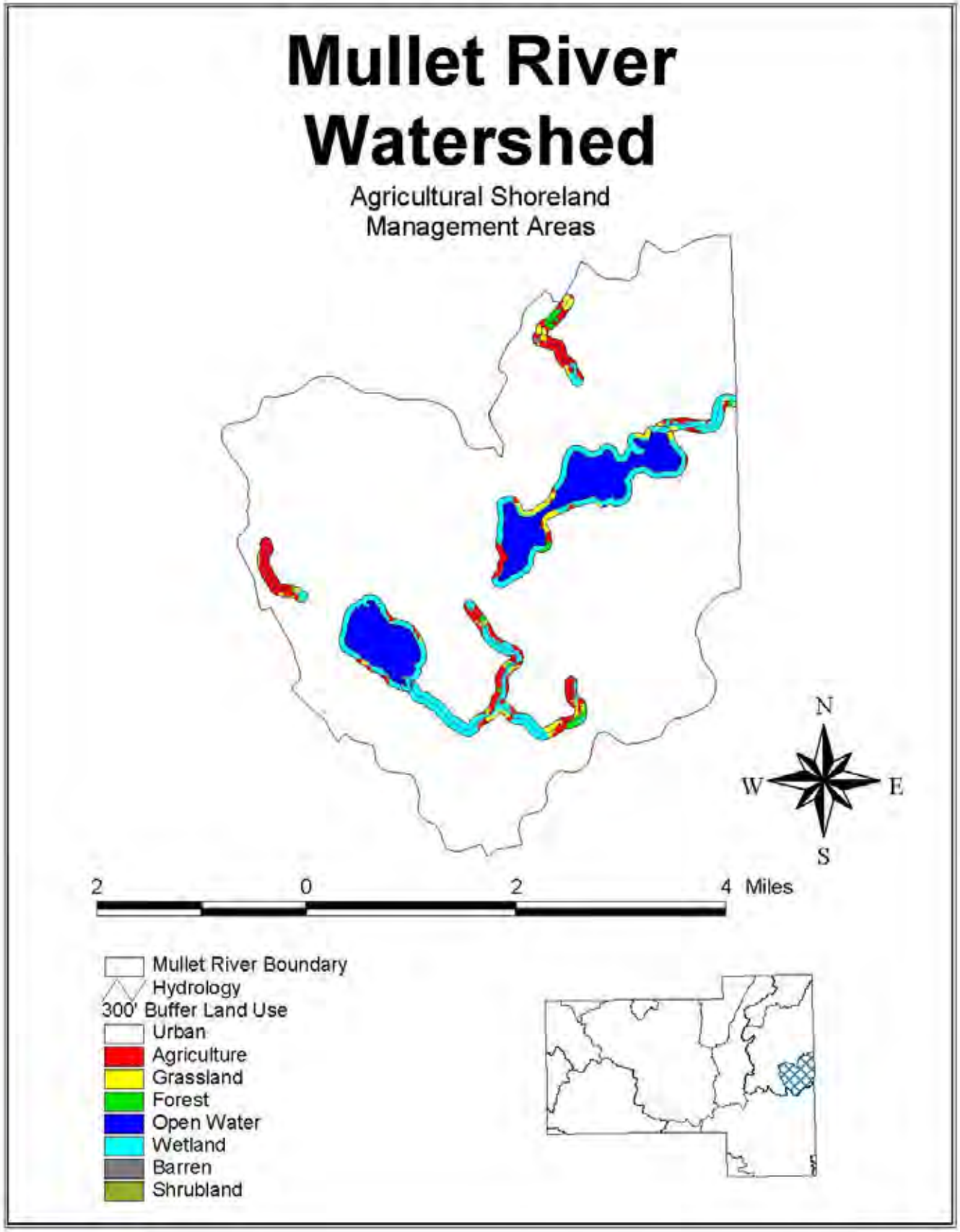
SHEBOYGAN RIVER BASIN

The Sheboygan River Basin is located in eastern Wisconsin on the west shore of Lake Michigan. The Basin is comprised of six large watersheds is located in portions of Sheboygan, Fond du Lac, Manitowoc, Calumet, and Ozaukee Counties. The Sheboygan River and Mullet River both originate in eastern Fond du Lac County and flow to Lake Michigan. For more information on the Sheboygan River Basin please refer to the Wisconsin Department of Natural Resources The State of the Sheboygan River Basin October, 2001 PUBL WT 669 2001 available at http://dnr.wi.gov/org/gmu/stateofbasin.html.

SHEBOYGAN RIVER WATERSHED (Map 2-11)

This watershed drains an area of land between Lake Winnebago and Lake Michigan and lies in portions of four counties: Sheboygan, Fond du Lac, Calumet and Manitowoc. Seventy-four square miles or thirty percent of this watershed is located in Fond du Lac County.

The Sheboygan River Watershed was selected in 1985 as a priority watershed through Wisconsin's Non-point Source Water Pollution Abatement Program. This priority watershed ended in 2002. The land uses in this watershed include agriculture, open spaces, wetlands, woodlands and urban areas. The topography of the Sheboygan River is characterized by drumlin fields, irregular ridges and drift hills all which were left by the glacier when it receded. Most of the land use in the Fond du Lac County portion of watershed is agriculture with a few small communities throughout that are experiencing growth pressures. Woodlands, wetlands and surface water comprise the rest of the watershed.


Mullet River Watershed
Agricultural Shoreland Management Areas
N
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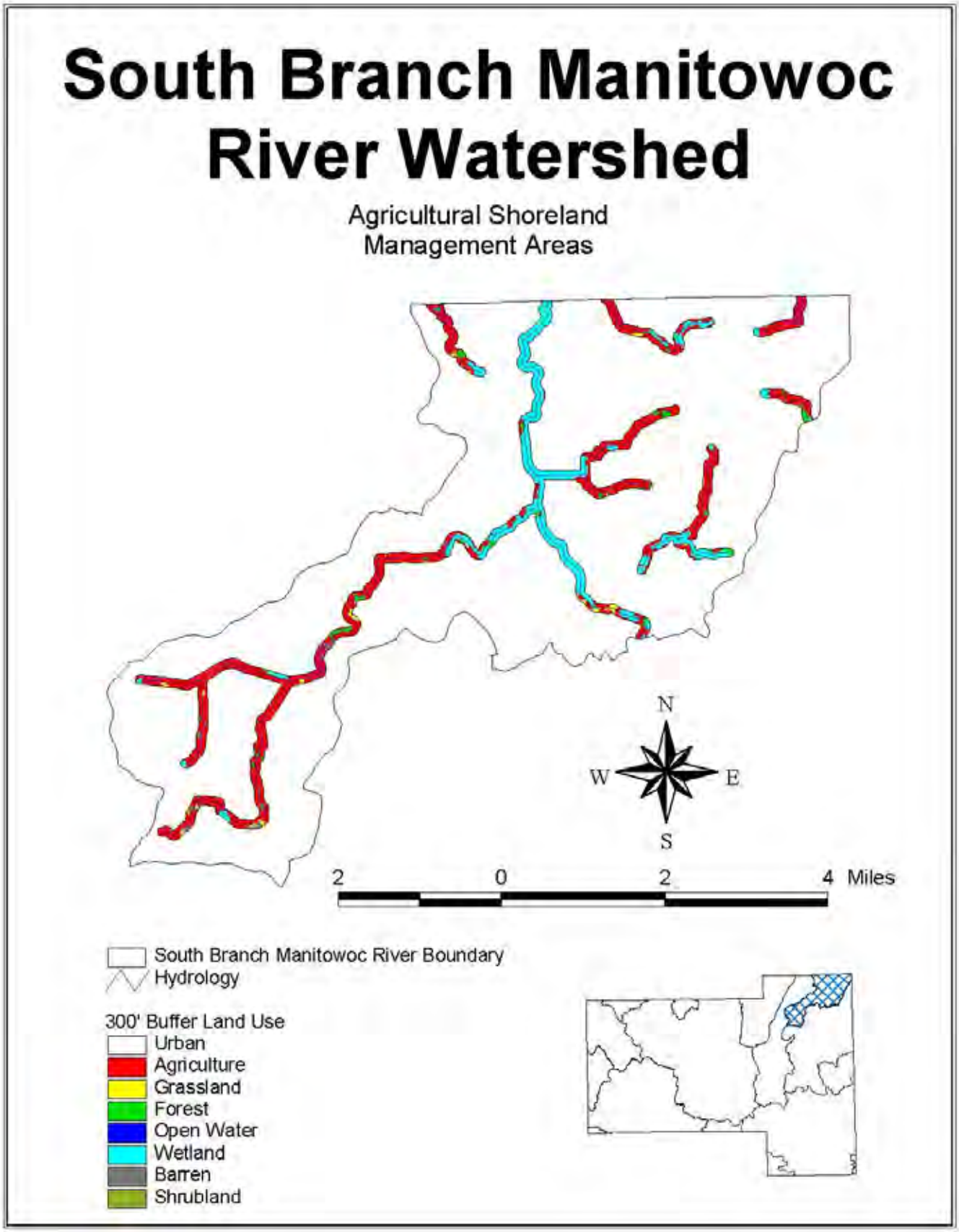
2
0
2
4 Miles
Mullet River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

Map 2-12

MULLETT RIVER WATERSHED (Map 2-12)

The Mullett River is the outlet stream from Mullett Lake, which is a shallow 200-acre lake valued primarily for waterfowl hunting and wildlife. Annual winterkill conditions, due to the shallow depth of the lake, and the rooted aquatic plants limit the fishing opportunities. The Mullett River is one of two main tributaries to the Sheboygan River which confluence with the Sheboygan River in the Town of Sheboygan Falls, 17 miles upstream from Lake Michigan.


South Branch Manitowoc River Watershed
Agricultural Shoreland Management Areas
N
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4 Miles
South Branch Manitowoc River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

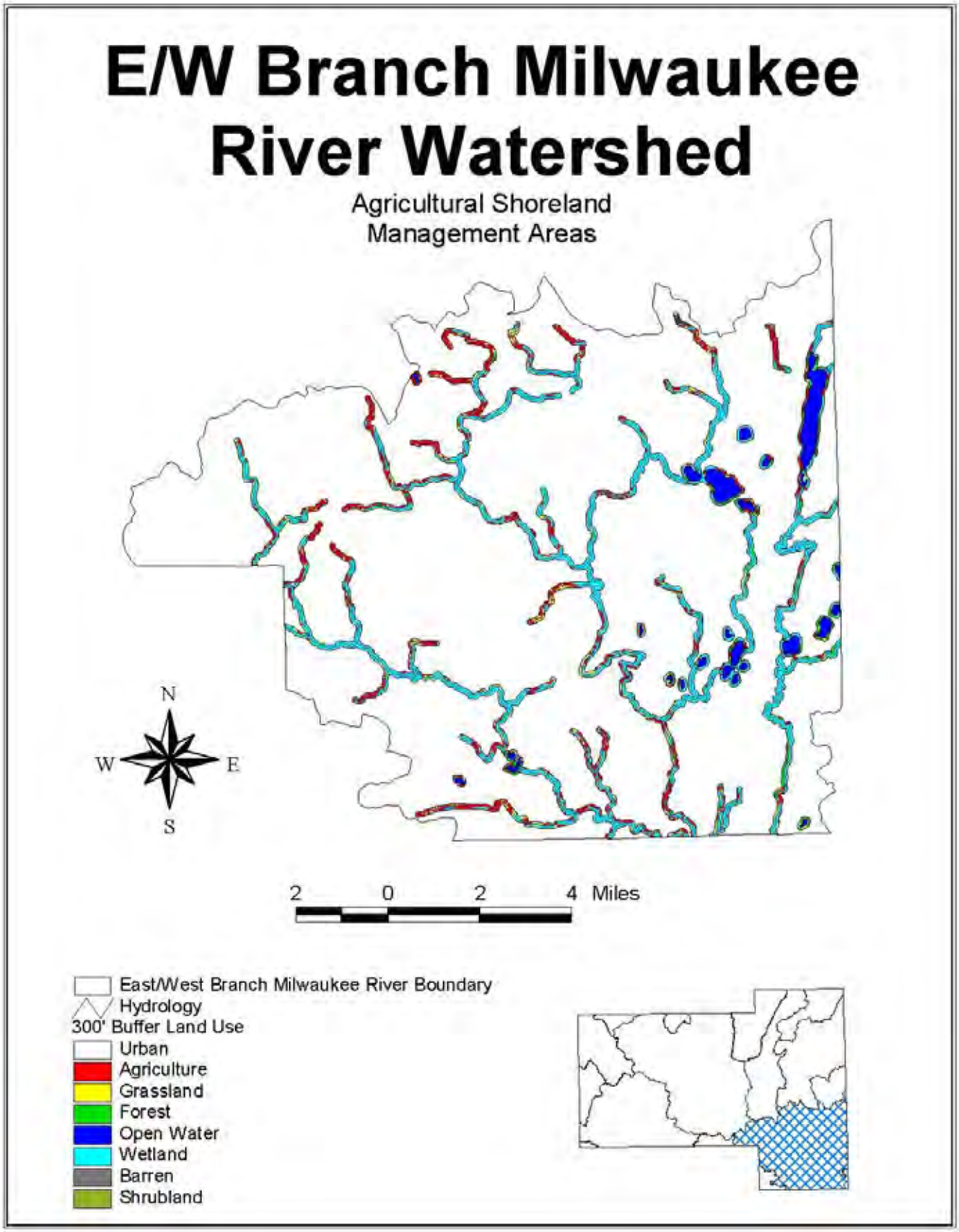
Map 2-13

LAKESHORE BASIN

The Lakeshore Basin is located along the western lakeshore of Lake Michigan and the eastern shore of Green Bay and encompasses all of Door and Kewanee Counties and parts of Brown, Manitowoc, Calumet, Fond du Lac, and Sheboygan Counties. The Lakeshore basin is comprised of 12 large watersheds. A portion of the South Branch of the Manitowoc River Watershed extends down into Fond du Lac County. For more information on the Lakeshore Basin please refer to the Wisconsin Department of Natural Resources The State of the Lakeshore Basin, 2001 PUB WT 667 2000 available at http://dnr.wi.gov/org/gmu/stateofbasin.html.

MANITOWOC RIVER WATERSHED (Map 2-13)

The Manitowoc River Basin is comprised of four watersheds that extend throughout five counties. The South Branch of the Manitowoc River begins in the northeastern tip of Fond du Lac County. The major land use in this watershed is agricultural. Sediment and nutrient loading are the major sources of non-point source pollution. Of the farms in the watershed over half have barnyards within a quarter mile of the streams. There are many streams with little to no streambank buffering.


E/W Branch Milwaukee River Watershed
Agricultural Shoreland Management Areas
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2 0 2 4 Miles
East/West Branch Milwaukee River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

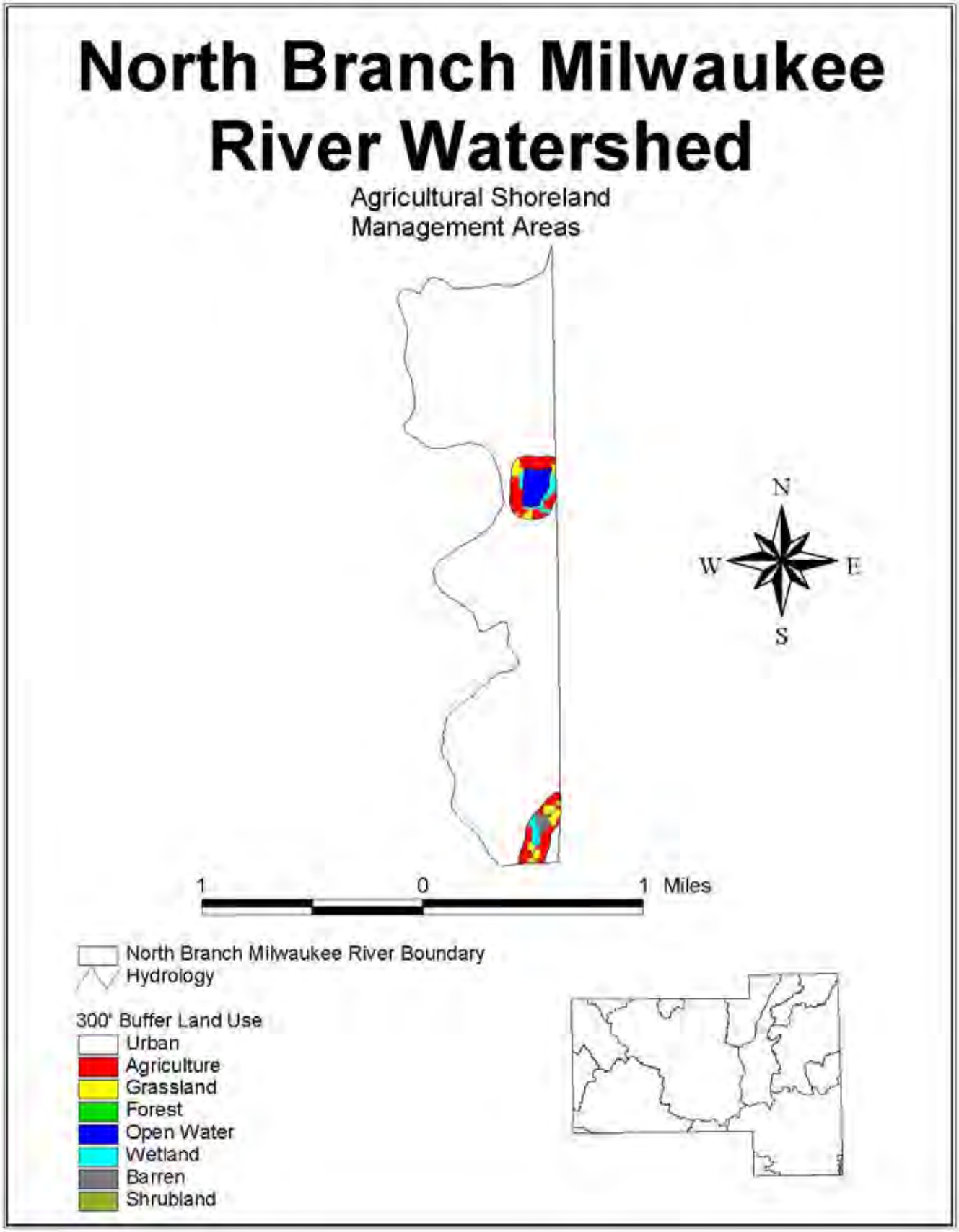
Map 2-14

MILWAUKEE RIVER BASIN

The Milwaukee River Basin is 838 square miles and includes six drainage areas, which are the North Branch, East/West Branch, Milwaukee River South, Menomonee, Cedar Creek, and the Kinnickinnic. The basin drains through the city of Milwaukee and into Lake Michigan and occupies portions of seven counties. The basin houses more than a million people and contains nearly 500 miles of streams and 21 major lakes with a combined surface area of 3400 acres. For more information on the Milwaukee River Basin please refer to the Wisconsin Department of Natural Resources The State of the Milwaukee River Basin August, 2001 PUBL WT 704 2001 available at http://dnr.wi.gov/org/gmu/stateofbasin.html.

EAST/WEST BRANCH MILWAUKEE RIVER WATERSHED (MAP 2-14)

The East/West Branch of the Milwaukee River is one of five watersheds in the Milwaukee River Basin. This watershed was designated as a priority watershed in 1984 under Wisconsin's Non-point Source Water Pollution Abatement Program and was completed in 2001. Approximately 50 percent of this watershed lies in the southeastern portion of Fond du Lac County. The predominant land use is agriculture, wetlands, surface water, woodlands and urban uses. Siltation, nutrient enrichment, elevated bacteria, channelization, urbanization and degraded impoundment are the principal factors limiting the quality of the recreational and aquatic life uses in these streams.


North Branch Milwaukee River Watershed
Agricultural Shoreland Management Areas
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1 Miles
North Branch Milwaukee River Boundary
Hydrology
300' Buffer Land Use
Urban
Agriculture
Grassland
Forest
Open Water
Wetland
Barren
Shrubland

Map 2-15

NORTH BRANCH MILWAUKEE RIVER WATERSHED (MAP 2-15)

The North Branch is one of five drainage areas in the Milwaukee River Basin. It was designated as a priority watershed in 1984 by Wisconsin's Non-point Source Water Pollution Abatement Program. Only about 1 percent (1.3 square miles) is located in Fond du Lac County. This area borders the Kettle Moraine State Forest. Its land use is predominately agriculture and other open spaces. Sediment and nutrient loading are major contributors to non-point source pollution.

GROUNDWATER RESOURCES

Groundwater comes from water that soaks into the ground when it rains or when snow melts. The water that is not used up by plants and other organisms as it trickles through the soil becomes groundwater. An aquifer is a rock or soil layer capable of storing, transmitting and producing potable water for human consumption. In Fond du Lac County there are several aquifers; the *sandstone aquifer* is the source of the most potable water and is used by many of the major cities within Fond du Lac County. The *Platteville-galena aquifer* is composed primarily of dolomite and provides adequate water to private wells. The *Silurian or Niagara dolomite aquifer* is a source of potable water and is in high demand because of the quantity and quality and is moderately susceptible to contamination. *Sand and gravel aquifer* consists of permeable sediments of unconsolidated glacial deposits and is the most susceptible to contamination.

Groundwater is the source of most public, industrial and private water supplies in Fond du Lac County. The City of Fond du Lac currently gets its drinking water from a series of municipal wells in and around the city. The municipal drinking water for the City of Fond du Lac has had a history of radium detections in the groundwater supply. As a way to meet new federal radium standards, the City of Fond du Lac decided to continue using groundwater from the municipal well system as its sole source of drinking water and treat the water to reduce radium levels down to the new the federal standard.

The groundwater quality throughout the county is considered generally good, however some regions in the county have reported increased occurrence of bacterial and nitrate contamination. This has been the case in parts of the county that have predominantly karst, or shallow to bedrock soils, particularly along the Niagara Escarpment areas of the county. The formation of the bedrock and shallow soils found in these areas provide little if any protection from contaminants reaching the groundwater. Contamination issues in other parts of the State with similar karst areas have shown the need for increased groundwater protection in these areas.

Sinkholes are holes that form naturally in the ground and are usually found in karst areas. Sinkholes can range in size from a few inches in diameter to hundreds of feet across and they can pose a significant risk to ground water resources by allowing runoff to drain directly to ground water. Sinkholes can vary greatly in size which can make them very difficult to identify and protect. Fond du Lac County LWCD has been actively collecting sinkhole information to establish a database for protection and possible treatment of sinkholes in the county.

Much like sinkholes, old and unused wells are direct conduits to the ground water supply and if they have not been properly abandoned they can pose a significant risk for groundwater contamination and physical safety. Fond du Lac County has been very active in trying to properly abandon old and or unused wells through landowner cooperation. Because of their knowledge of private drinking well activities, well drillers that work in Fond du Lac County have been essential

in the success of this program. However, because older wells can predate current recording methods, is not known exactly how many old or unused wells exist throughout the county.

More specific information about Fond du Lac Counties groundwater can be found in the UW-Extension publication Fond du Lac County Groundwater, A Community Resource, K.C. Masarik, D. Tscheschlok, D.J. Mechenich, 2010.

WETLAND RESOURCES

Wetlands, once classified as wastelands with little to no value, are now being recognized as having extremely beneficial values. The positive effect of wetlands on providing critical habitat for wildlife, flood storage, protecting and enhancing water quality, and recreational activities for sports persons and wildlife watchers alike has become very evident. Until the 1970s, state and federal programs encouraged the draining of wetlands to promote more area for cultivation. This resulted in the loss of nearly 50% of Wisconsin's original wetland acreage. The implementation of the Clean Water Act of 1972 helped to quell this loss, but did not stop loss to urbanization or the degradation of the remaining wetlands.

Currently Fond du Lac County has around 70,000 acres of wetland comprising about 15.0% of the total land area in the county, according to the Wisconsin Department of Natural Resources Wetland Inventory. Fond du Lac County's wetland acreage accounts for about 1.3% of the state of Wisconsin total wetland acreage. A portion of the county's wetlands are owned and/or managed by the state and federal government. Wisconsin DNR owns and manages large areas like Eldorado Marsh and Mullet Creek Wildlife Area as well as numerous smaller wetland complexes throughout the county. The federal government also owns and/or manages many acres of wetlands in Fond du Lac County including Horicon Marsh to the south. Most wetlands in Fond Du Lac County are small, less than 10 acres, and under private ownership.

Fond du Lac county wetlands fall into several categories of wetland types. Most of the county's wetlands would fall into the emergent marsh (having herbaceous plants that emerge from the water surface) category. Eldorado Marsh and Horicon Marsh are good examples of this category. The other categories represented include aquatic bed (deeper standing water with floating or submerged vegetation), scrub-shrub (dominated by woody species other than trees), and forested (dominated by trees) wetlands. These other categories can be found in pockets throughout the county.

Urban and agricultural runoff and invasion by exotic species still impact the quality of wetlands in Fond Du Lac County. The future of the wetland resource in Fond Du Lac County will rely on protecting the existing resource and restoring degraded or drained wetlands to near original conditions.

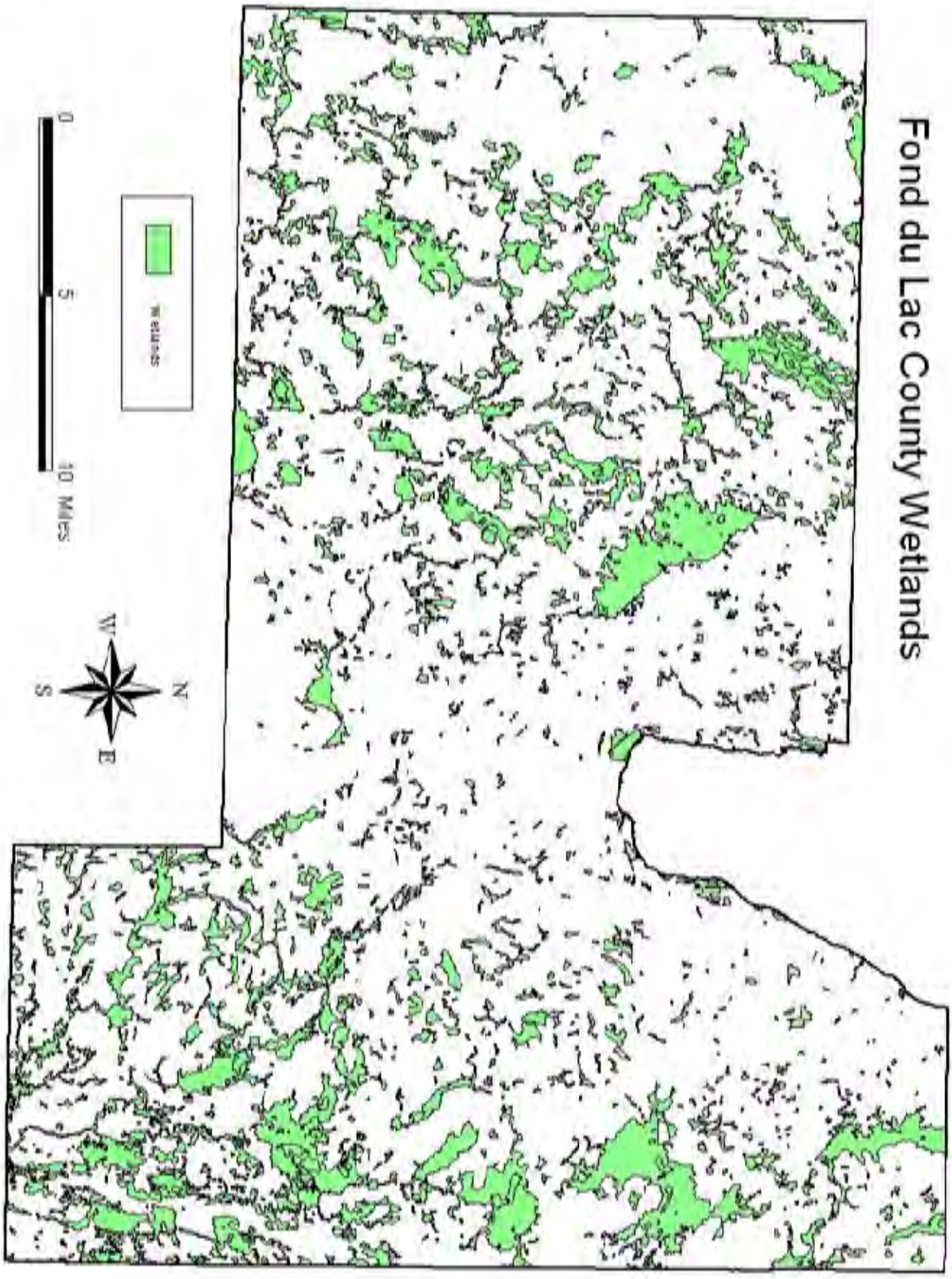
Securing a positive future for the wetland resource in Fond Du Lac County is crucial. The wildlife, flood mitigation, and water quality benefits of wetlands, by themselves, are essential to

the health of the county. These benefits are not just environmental, but socioeconomic as well. The wildlife benefit provides recreational opportunities to county as well as out of county individuals, creating revenue for local businesses and promoting the county as a whole. The flood mitigation benefit helps to lower the damage to private and public areas from excessive flooding, which could become costly. The water quality benefit will help to enhance local wildlife, crop production and public water resources. Properly managing this resource is vital for these reasons and many more.

With most of the wetlands in Fond du Lac County under private ownership public outreach and education is the key to protecting the wetland resource. Informing the public on the values of wetlands and guiding them on the proper way to manage their wetlands is essential. Information on private, county, state and federal programs that provide technical guidance and/or funding for wetland management should be made readily available. As well as, continuing to operate programs that help to mitigate the upland practices that degrade wetlands. Excessive sedimentation and nutrient runoff into wetlands is a major concern that must be monitored and controlled. Cooperation between government and private wetland conservation groups needs to be maintained. With the general impression of most landowners still being that a wetland is wasteland, public outreach will be essential in preserving this resource

Monitoring and mapping of the resource is also essential. Understanding the importance of landscape position and the health of a wetland complex enhances its values. By managing and/or restoring wetlands in critical areas we can greatly enhance their functional value. Restoring wetlands in flood prone areas, areas with critical wildlife dependant on wetlands, and/or areas that have water quality issues would be beneficial.

Fond du Lac County has many conservation minded individuals living in it. We need to nurture their interest and that of others. The local conservation clubs and other individuals have shown a lot of interest in protecting and enhancing this resource. We must work with them and other government and private groups to protect the future of all of our Natural Resources.



Map 2-16

WILDLIFE RESOURCES

Fond du Lac County's pre-Euro-American settlement vegetation was a mix of tall grass prairie/oak savanna in the western 2/3 and upland/lowland southern hardwood forest and scattered pockets of swamp conifer forest in the eastern 1/3, with the entire countryside scattered with sedge meadow/emergent wetlands. This mosaic of diverse native plant communities created a rich diversity of wildlife species. Pre-Euro-American settlement wildlife sightings included wild turkey, passenger pigeon, bison, elk, wolves, prairie chickens and sharp-tailed grouse. But as the county began to be settled in the 1840's, the prairies were turned over, forests were cutover and cleared, wetlands were drained; combined with unregulated harvest most of the county's wildlife species declined or disappeared. What occurred was a dramatic transformation of the native plant communities to agriculture and town development. Today, Fond du Lac County's land base is 85% agricultural.

A slow awakening that Wisconsin's natural resources were not infinite began with the 20th century. Starting in the 1920's, the concept of habitat preservation and restoration evolved to the point that in some cases we are able to bring wildlife populations back to historic levels and beyond, to the point that some wildlife species have become a nuisance problem. The reintroduction of the wild turkey in the county, 1989-91, is an excellent example of what can happen when you have the support and cooperation of private landowners, non-profit conservation organizations and county/state government agencies. The restoration and proper management of woodlands combined with using wild stock Missouri turkeys resulted in a successful reintroduction program. Potential exists for other wildlife species to follow this same course.

Today, wildlife provides significant opportunities in the county. All wetlands, streams and lakes provide wildlife habitat to many wildlife species. Muskrat, mink, beaver, otter, sandhill crane and sedge wren are common to these communities. They provide recreational opportunities such as wildlife observation and trapping. All of our amphibians and reptiles, such as eastern gray tree frog, American toad, Blanding's turtle (threatened species) and Butler's garter snake (threatened species) has some part of their life cycle associated to these communities. There are numerous state and federal funding programs, such as WI Waterfowl Stamp, Federal Waterfowl Production Areas, Wetland Reserve Program, and DU-Marsh available to producers and recreational landowners to restore drained wetlands and enhance degraded wetlands for wetland dependent wildlife species in the county. We will never return to historic county wetland acreage levels but we can return to pre-1970 levels.

The continued loss of farmland, wetland and woodland habitat to urban/rural residential development, invasion of exotic species, and intensive row crop cultivation will have consequences to the county's wildlife resource. The county's wildlife resource future will be determined in large part by Comprehensive Smart Growth Planning that is now required of each

township, municipality and county. These plans will provide the framework and context to consider when making future land use decisions and each plan has an agricultural/natural resource/cultural element providing the documentation supporting the municipality when making land use decisions.

Tremendous strides are being made improving local surface water quality through nutrient management planning, buffer initiatives, and storm water runoff management programs. The Department of Agriculture, Trade and Consumer Protection (DATCP) Working Lands Initiative will be a critical program determining the future of farming in Wisconsin. The best way to preserve the county's rural character is to maintain our farming heritage through conservation easements, purchasing development rights (PDR's) and transfer of development rights (TDR's).

Another plan, known as the Comprehensive Wildlife Conservation Plan, is the result of a statewide effort to identify which of our native Wisconsin species are of greatest conservation need. The Action Plan presents priority conservation actions to protect the species and their habitats. Fond du Lac County is located in the Southeast Glacial Plain ecological landscape. A few of the wildlife species of concern include red-headed woodpecker, northern harrier, and dickcissel. A complete list of wildlife species identified with the greatest conservation need can be found at http://dnr.wi.gov/landscapes/index.asp?mode=detail&Landscape=9&Section=species. The plan identifies specific threats and issues and conservation actions for each wildlife species. The State Wildlife Grant is the critical funding source for these specific wildlife species.

The DNR conducts annual wildlife surveys in the county to monitor wildlife occurrence, abundance and population trends. Some of the surveys are:

Frog and Toad Surveys – One each in Eden and Springvale Townships
Spring Waterfowl Survey
Mid-Winter Waterfowl Survey
Pheasant Crowing Survey
Summer Upland Game Bird Brood Observations
Grassland Passerine Bird Survey – Western Fond du Lac County
Eagle/Osprey Survey
Summer Deer Observations
Chronic Wasting Disease Testing
Deer Aging Survey
Otter Survey

Local sporting clubs and other interested conservation groups are working hard to preserve, protect and maintain wildlife populations for future generations in Fond du Lac County. There are many county, state and federal programs available to landowners providing technical advice and

cost-share assistance that has slowed the loss of wildlife habitat. We are not responsible for our heritage but we are responsible for our future.

PLANT RESOURCES

Once, native tall grass prairie and oak savanna were the most extensive native plant communities in the county. Today, there are only a few remnant sites in the county that have been placed in the WDNR State Natural Areas program to protect these very rare gems. Ripon Dry Prairie, Oakfield Railroad Prairie and Oakfield Ledge SNA are some of those gems.

Fond du Lac County was once home to two native prairie grouse species, greater prairie chicken and prairie sharp-tailed grouse. They have been replaced by ring-necked pheasants better adapted to an intensive agricultural land base. A number of habitat restoration programs such as Glacial Habitat Restoration Area Project and Conservation Reserve Program are making great accomplishments in restoring grassland habitat. They will never replace the native grasslands but they do provide the necessary life requirements for our grassland dependent wildlife species. Those programs have been successful enough that the WDNR will be doing a feasibility study to determine if prairie grouse can successfully be reintroduced into the county and surrounding counties.

WOODLAND RESOURCES

Woodlands once covered between 40 and 80 percent of Fond du Lac County, and now only make up between 10 and 30 percent of the land cover. Woodland acreage has declined in the county from pre Euro-American settlement times but not to the extent that wetlands and grasslands have experienced. Woodlands, even small ones on farms, are a valuable resource in this highly agricultural county. Areas where woodlands still exist are areas of public ownership such as the Northern Unit of the Kettle Moraine State Forest, or areas that have physical characteristics that make them poor farmland. Areas of high bedrock, some wet soils, steep slopes and similar terrain that did not make good farmland have been left in trees and now comprise a valuable asset to the environment. They provide wildlife habitat, reduce soil erosion, help to cleanse the air, and provide recreational opportunities.

Today, the eastern 1/3 of Fond du Lac County is where the majority of the woodland acres occur. The Northern Unit-Kettle Moraine State Forest is the largest, continuous block of forest cover in the county, >10,000 acres. Primarily due to the steep topography left during the Wisconsin glacial period, around 10,000 years ago, made it impossible to be converted to agriculture. Not to say it was not impacted as it has all been cutover and we are witnessing the second growth. Secondly, it has been impacted by cattle grazing. Both of these factors allowed for invasive species to negatively impact regeneration of our woodlands especially the oak-hickory forest type. Invasive species such as garlic mustard, boxelder, buckthorn, black locust

and prickly ash create such a dense understory, there is not enough light reaching the forest floor to allow the germination of oak acorns and hickory nuts. Poor oak and hickory seedling survival is due to over browsing by an overpopulated white-tail deer herd in the county. Forest research in Minnesota has discovered the negative impact caused by invasive European earthworms in our sugar maple-basswood-ash forest type. Lastly, the forests have not been properly managed to ensure their regeneration Funding and programs, such as Turkey Stamp dollars and Managed Forest Law are available to woodland owners to manage their woodlands in a sustainable manner. This will benefit all woodland dependent wildlife species, such as tree squirrels, wild turkeys, white-tailed deer and many passerine bird species.

FISHERY RESOURCES

Fond du Lac County is known for its warm water fishery. Lake Winnebago is the most popular area lake. It is heavily fished by residents and visitors to the county. Fish species like northern pike, walleye, bass, sturgeon, catfish and various panfish can be found in the waters throughout the county. The Winnebago System is known throughout the Midwest for its walleye and Lake Sturgeon fishery.

As with wildlife, the destruction of habitat is resulting in reductions in desirable fish populations. Fish spawning habitat and shoreline cover is being progressively destroyed which leads to the decline in desirable fish populations. Annual fish winterkills affect a number of the county's lakes. Nonpoint source pollution causes eutrophication or over fertilization and water clarity problems in lakes. Most of the streams in Fond du Lac County offer minimal fishing opportunities. Contributing factors resulting in reduced gamefish populations in county streams include high fertility, siltation, pollution, grazed streambank, rough fish and extremes of flood and drought.

More fisheries information for Fond du Lac County can be found in the Watershed descriptions at the beginning of this chapter.

AIR QUALITY

Air quality is a concern that the Citizen Advisory Committee felt needed to be included as a resource in this plan. Air quality through the natural water cycle can have an impact on soil and water resources. The committee expressed concerns over particulates that are given off during maintenance burns for wildlife habitats, as well as, other pollutants that are given off from recreational outdoor fire pits and outdoor boilers for home heating. The increasing number and size of manure storage facilities also presents a new challenge for odor abatement technology. While the air quality of Fond du Lac County appears to be good, the LWCD currently has no air quality data to make an appraisal of the overall air quality for Fond du Lac County. The WDNR is currently in the process of updating its Air Quality Monitoring Plan and is planning to install an

ozone monitoring station in Fond du Lac County. Additional air quality information can be found at http://dnr.wi.gov/topic/airquality/monitor.html and http://airnow.gov/

CHAPTER 3

RESOURCE ISSUES & GOALS

This chapter is intended to identify the main issues impacting the land & water resources within the county and to outline actions to guide the LWCD and partnering agencies with achieving the defined goals.

Identification of Resource Issues

Identification of the resource issues and ultimately the goals and objectives for this Land & Water Resource Management Plan was based upon existing resource management plans for the county, concerns expressed by county residents, the experience of local LWCD staff and the Citizen Advisory Committee. Planning staff worked with the Wisconsin Department of Natural Resources along with other conservation partners to develop resource summaries and appraisals and to also provide input on resource goals and objectives.

Issue: *Soil Erosion & Sedimentation from Cropland*

Webster's Dictionary defines erosion as a natural process by which earth or rock is gradually worn away and removed by wind, water, ect. Human activities can accelerate the rate at which this process naturally occurs and excessive soil erosion can have huge environmental impacts. The degradation of soil quality and productivity can be very obvious, such as, the formation of a gully through a field. Other times it is so subtle that it may go unnoticed for years until eventually crops cannot be grown in part of a field. Maintaining good soil quality and reducing soil erosion is important both to the environment and to the economy of Fond du Lac County.

Sedimentation occurs when eroded soil is deposited into surface waters such as local rivers, lakes, streams, or wetlands. Sedimentation can be devastating to water quality and aquatic life. Sedimentation reduces water clarity blocking sunlight to aquatic plants, causes irritations on the gills of fish, and fills in critical fish spawning habitats. Sediment often has nutrients, pesticides, and heavy metals attached to soil particles that can cause algae blooms and can be toxic to humans and aquatic life.

Goal: ***Maintain soil productivity and reduce soil erosion and sedimentation.***

Objectives:

1. Reduce soil erosion rates to “T” or lower for all croplands.
2. Promote the adoption of soil conservation practices to improve soil quality and reduce soil erosion.
3. Promote the establishment of grassed waterways and vegetative buffers to reduce sediment reaching surface waters.

Issue: *Land Disturbing and Land Development Activities*

Rapidly developing areas can greatly impact soil and water resources by significantly increasing the amount of sediment, nutrients and other pollutants that reach local lakes, streams and wetlands. Poorly planned development activities can increase peak flow rates causing increased flooding and bank erosion potentials. It can also reduce base flow rates of streams or lower water levels of local lakes which adversely impacts fish habitat water resource potential. Land disturbing and development activities can impact area groundwater resources by reducing groundwater recharge rates and increasing the potential for pollutants to reach drinking water supplies.

Along with increased runoff, land development and urbanization causes the loss of prime cropland. In developing areas, the loss of cropland increases agricultural and developmental pressure on remaining cropland. This increased pressure often leads to increased nuisance complaints about odor and over spreading of manure on fields next to residential areas. Along with increased complaints, higher taxes and rental rates on remaining cropland also adds to land use pressures.

Loss of wetlands and wildlife habitat from development activities also adversely affects water quality and enjoyment of natural resources within the county. Wetlands provide habitat for an endless variety of wildlife and store flood water and filter out sediment and pollutants before they reach surface and ground water resources.

Goal: *Minimize the impacts of land disturbing and land development activities within the county.*

Objectives:

1. Reduce overland flow and increase infiltration in developing areas.
2. Minimize urban sprawl.
3. Minimize the loss of prime agricultural lands, wetlands, wildlife habitats.
4. Preserve and protect stream corridors.

Issue: *Nutrient and Pest Management*

Landowners apply nutrients to the soil to enhance crop production levels. High yielding crops are essential to maintain profitability on the farm. However, without proper soil testing, and precise nutrient crediting from the on farm nutrient sources such as legumes and manure, the potential for excessive nutrient applications exists. Knowledge of both inorganic and organic sources of nutrient is imperative for any landowner. Without correct application rates and proper nutrient crediting, these nutrients have the potential of running off site to environmentally vulnerable areas. The result of nutrient flow off site can cause both surface and groundwater contamination. Excessive nutrients in surface water causes unwanted weed growth, lowers dissolved oxygen and increases algal growth. This degradation severely stresses aquatic life and their habitat. Bacteria levels increase as well, which impedes recreational activities.

Nutrients and bacteria can also be transported through the soil profile, into cracks and bedrock crevices. The leaching of these materials has the potential of contaminating groundwater to an unsafe level for human consumption. Infants, along with pregnant and nursing women have to be particularly cautious if they are drinking well water. Nitrate levels in drinking water must be monitored to stay below 10 parts per million.

The urban sector is not exempt when it comes to nutrient management. Homeowners must also follow labels and directions when applying nutrients. The land practices that the urban communities enact could also cause harm to the natural resources if they are not cognitive of their nutrient application methods.

Pest management plans must also be implemented so that the environment is not detrimentally affected. Both the rural and urban sector has to know the pest they are targeting and then select the correct product for combating that pest. Identification of the pest is integral when developing a pest management plan. Misuse of pesticides can harm the environment and the food chain.

Goal: *Minimize runoff, leaching, and drift of nutrients and pesticides to surface and ground water.*

Objectives:

1. Promote and enforce the development and implementation of nutrient management plans among the rural sector.
2. Promote proper nutrient use among the urban sector.
3. Advocate correct use of pesticides in both rural and urban sectors.

Issue: *Runoff and Storage of Animal Waste and Feed*

Animal waste runoff from livestock operations contains nutrient and biologic contaminants that can be detrimental to surface and ground water quality. Runoff from animal waste is high in phosphorus that causes excessive weed growth and algae blooms and also lowers oxygen levels in nearby lakes and streams. Nitrates found in animal waste and leachate from animal feed storage can leach down through the soil profile contaminating ground water resources. Animal effluent and leachate from feed storage can also be a source for bacteria and other pathogens that can contaminate drinking water wells and can be harmful or even fatal to humans and wildlife. Excessive bacteria and pathogen levels in surface and ground water are becoming more frequent which can lead to increased beach closures on area lakes and boiling advisories for drinking water.

Goal: *Reduce the impacts from runoff and storage of animal waste and feed.*

Objectives:

1. Ensure that animal waste storage facilities are constructed and abandoned according to the most current USDA-NRCS Technical Standards.
2. Identify sites for correcting animal waste runoff problems.
3. Work with livestock operators to ensure compliance with NR 151.08 Manure Management Prohibitions.
4. Promote the adoption of best management practices that reduce runoff of animal waste and leachate.
5. Continue the enforcement of the Erosion and Stormwater Management Ordinance.

Issue: *Degradation of Groundwater Quality and Quantity*

Water in the form of rain and melting snow begins a long and slow journey through the many layers of soil and rock before it becomes ground water. As water passes through these layers of soil and rock it becomes naturally purified. Runoff of nutrients, biological organisms, pesticides, and petroleum along with other human activities can cause this natural purification process to “short circuit” and contaminate ground water resources. Landforms and other geological features like the Niagara Escarpment and karst areas have elevated risks of ground water contamination. Fractured bedrock, sinkholes, along with old and unused drinking water wells act as direct conduits for runoff to reach ground water supplies.

Municipalities, businesses, and citizens of Fond du Lac County depend on ground water as the primary source of drinking water. Ground water is a finite resource with an ever

growing demand which places a huge emphasis on the protection of ground water resources.

Pharmaceuticals are showing up in the water in some areas of the country. Flushing them down the drain is no longer an approve disposal method. Municipal wastewater treatment facilities and private septic systems do not properly treat many drugs. Pharmaceuticals are also used to treat livestock and may be passed through to the environment.

Goal: *Protect and Conserve Ground Water Quality and Quantity within the County*

Objectives:

1. Abandonment of old unused wells.
2. Increase protection of karst areas, sinkholes, and other geologic features that pose elevated risks of ground water contamination.
3. Minimize usage of groundwater resources.
4. Educate residents about drinking water wells and potential contaminants.
5. Educate residents about proper storage and disposal of chemicals.
6. Educate residents about the proper disposal of pharmaceutical supplies and medical wastes.

Issue: *Runoff from Urban Areas*

Soil erosion and sediment delivery in urban areas of the county originate primarily as construction sites where areas of exposed soil remain for extended periods of time. University research has shown that soil loss from construction sites range from 10 to 50 tons or more of silt and sediment per acre. This source of sediment is currently being addressed through the county stormwater management and construction site erosion control ordinances.

Runoff from fertilizers and pesticides in urban areas also has an impact on area water quality. Lawn fertilizers and pesticides that are over applied or ill timed can runoff to nearby storm drains without any chance of buffering before reaching local surface waters. Over applications of fertilizers and pesticides can also pollute drinking water resources.

Goal: *Minimize Impacts of Runoff from Urban Areas.*

Objectives:

1. Increase educational efforts to bring awareness of potential urban pollution sources.
2. Minimize erosion of shoreline and stream banks in urban areas.

3. Reduce runoff from construction sites.
4. Increase infiltration of stormwater from existing and developing areas.
5. Reduce over application of fertilizers & pesticides.

Issue: *Development and Coordination of Lake Organizations*

It has long been recognized that lakeshore owners play a vital role in the overall health and wellbeing of their lake. Lake organizations can provide numerous information and education opportunities for lakeshore owners and users, as well as, become a unified voice for improvement and protection of their lakes resources.

Unfortunately, many lakes in the county either do not have lake organizations, or if they do, they lack participation that is necessary to effectively coordinate activities.

Goal: *Develop and Improve Coordination of Lake Organizations.*

Objectives:

1. Assist lakeshore owners and lake organizations with information and education projects that improve and protect the water quality of their lake.

Issue: *Loss and Degradation of Critical Fish and Wildlife Habitats*

Many fish and wildlife resources within the county are not meeting there resource potentials due to degrading habitat quality or loss of habitat altogether. Many rivers and streams are impacted by sedimentation and nutrient runoff limiting the reproduction of native fisheries. Years of sedimentation has filled in natural spawning areas making it impossible for native fish species to reproduce. Many rivers and streams are also adversely affected by increased water temperatures. Increased water temperatures decreases survival of high quality cold water fish species that are less tolerant of warm water temperatures. The result of warming of surface water is the increase of less desirable rough fish that are more tolerant to warm water temperatures.

Pressure from development and more intensive farming practices has adversely impacted the amount of quality wildlife habitat in the county. The once abundant wildlife habitat becomes fragmented due to urban sprawl and other development. More intensive row crop production allows little cover for wildlife during nesting periods of the year. More intensive farming also causes the decline of critical streambank corridor habitats.

Goal: *Restore and Preserve Critical Fish & Wildlife Habitats.*

Objectives:

1. Identify critical fish and wildlife habitats to landowners for protection and/or restoration.

2. Identify relic native prairie reservoirs, such as pastures, cemeteries, old railroad grades, etc. for preservation or expansion.

Issue: *Exotic & Invasive Species*

Invasive species are plants or animals that have the potential to take over native species populations and upset the fragile balance of native ecosystems. Exotic species are plants and animals that are not native to an area and are transplanted by human or animal activities. Because exotic species are not native to the area, they often do not compete with other plants or animals that keep populations in check and have a huge potential of becoming invasive to other native plants and animals. When exotic and invasive species populations are not kept in check with natural predators or human activities, they can flourish wiping out other native species and wreaking havoc on entire ecosystems.

Goal: *Minimize the Threat and Spread of Exotic & Invasive Species.*

Objectives:

1. Educate landowners about the ecological and economic impacts of exotic & invasive species.
2. Work with Lake Organizations to promote proper management techniques of exotic & invasive aquatic weeds and organisms to reduce their spread.

Issue: *Energy Use & Air Quality*

Poor air quality can be attributed to a wide variety of factors; however, the use of coal and oil for energy production and transportation impacts local air quality. The environmental effects of poor air quality can directly and indirectly impact our health as well as our environment. Poor air quality can be linked to a variety of respiratory ailments, as well as, the cause of acid rain. Parts of southeast Wisconsin already experience Air Quality Watches or Advisories to warn residents about unhealthy air quality caused by ozone and other particulates.

Goal: *Use Less Energy and Improve Air Quality*

Objectives:

1. Educate residents about the affects of poor air quality, what it's caused from, and how they can improve air quality.
2. Educate residents about ways they can conserve energy.

3. Educate residents about the use of alternative fuels and “Green” technologies that produce less harmful emissions and improve gas mileage for commercial and passenger vehicles.
4. Educate residents about steps to conserve energy on the road, in the home and on the farm.

CHAPTER 4

PLAN COORDINATION & IMPLEMENTATION STRATEGIES

The goals of the Fond du Lac County Land and Water Resource Management Plan cannot be accomplished without the assistance and cooperation of landowners, private local and national organizations and our government agency partners on all levels. This plans coordination and implementation strategies are essential for effective implementation of the goals that have been outlined. Fond du Lac County has always attempted to make the best use of all resources in addressing conservation issues. Program issues and ideas are discussed frequently with staff from all agencies. The following outlines common conservation partners, programs and/or resources that are typically used for conservation efforts in Fond du Lac County, however additional programs and partners are continually sought out to assist with accomplishing conservation goals:

National and Federal Conservation Partners:

United States Department of Agriculture (USDA) Programs –

Environmental Quality Incentives Program (EQIP).
Provides cost-sharing for a variety of conservation practices (see BMP definitions in appendix) to address erosion and nutrient management issues.

Wildlife Habitat Incentives Program (WHIP).
Provides cost-sharing for fish and wildlife habitat improvement practices.

Conservation Reserve Program (CRP).
Provides incentives to set aside land for conservation purposes.

Conservation Reserve Enhancement Program (CREP).
A multi-agency effort (DATCP, FSA, NRCS, and Fond du Lac County) that provides incentives to create buffers along streams and waterways.

Wetlands Reserve Program (WRP).
Provides cost-sharing to restore wetlands previously altered for agricultural use.

Animal Plant & Health Inspection Service (APHIS).
Provides Federal leadership and expertise to resolve wildlife conflicts and create a balance that allows people and wildlife to coexist peacefully.

US Fish and Wildlife Service (USF&W) Programs –

US Fish and Wildlife Programs are used in Wisconsin to assist in wetland restoration, fish and wildlife habitat improvement, and restoration of habitats of special concern.

Upper Rock River Special Project.

This program provides special funding from the USF&W and the Environmental Protection Agency (EPA) for LWCD staff to assist landowners in the Upper Rock River Watershed with information and education of Federal, State, & Local conservation programs that are available to reduce nonpoint source runoff.

United States Geological Survey (USGS)

The USGS serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

As the Nation's largest water, earth, and biological science and civilian mapping agency, the U.S. Geological Survey (USGS) collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems.

Pheasants Forever (PF) –

Pheasants Forever is dedicated to the conservation of pheasants, quail and other wildlife through habitat improvements, public awareness, education and land management policies and programs.

Trout Unlimited (TU) –

Trout Unlimited is dedicated to improving trout fisheries through improved water quality, habitat improvements, public awareness, education and land management policies and programs.

Fish America Foundation –

The FishAmerica Foundation is the conservation and research foundation of the American Sportfishing Association—keeping our nation’s fish and waters healthy. FishAmerica provides grants to non-profits, conservation minded groups to enhance fish populations, restore fisheries habitat, improve water quality and advance fisheries research to improve sportfishing opportunities and success. The Fond du Lac County LWCD has partnered with the Fish America Foundation to attain grants and coordinate cost sharing for conservation projects.

Regional and State Conservation Partners

Wisconsin Department of Natural Resources (DNR) Programs –

Targeted Resource Management Program (TRM).
Counties can apply for grants through this program to offer cost sharing on a variety of conservation practices to address nonpoint source runoff.

DNR Tree Sale Program.
Landowners can purchase large quantities of tress for planting on their land.

Wildlife Damage Control
Wildlife damage abatement in conjunction with USDA-APHIS.

Wisconsin Department of Agriculture, Trade, & Consumer Protection (DATCP) Programs

Soil and Water Resource Management (SWRM).
This program provides grants to counties to hire staff and to cost-share the installation of conservation practices on private land.

Working Lands Initiative (WLI)
The Wisconsin Working Lands Initiative was signed into law in 2009 and is comprised of the following three programs:

Farmland Preservation Program (FPP).
This program provides income tax relief to participants to protect farmland by complying with manure management and agricultural performance standards set forth by the State of Wisconsin.

Agricultural Enterprise Area Program
Local communities can voluntarily pursue designation of an "agricultural enterprise area" (AEA) by submitting a petition to the Department of Agriculture, Trade and Consumer Protection (DATCP). Through this designation, the community can encourage continued agricultural production and investment in the agricultural economy. Farmers within designated AEAs are eligible to enter into *voluntary* farmland preservation agreements to collect the farmland preservation tax credits.

Purchase of Agricultural Conservation Easement Program (PACE)
The Working Lands Program establishes a new program to provide up to 50% of the cost of purchasing agricultural conservation easements, including transaction costs. Through the Purchase of Agricultural Conservation Easements (PACE) program, the state will

provide funding to cooperating local governments or non-profit organizations to purchase easements from willing landowners. Land with an agricultural conservation easement cannot be developed for any purpose that would prevent its use for agriculture.

Agricultural Clean Sweep.

Counties can utilize this program for free collection and safe disposal of hazardous chemicals.

Wisconsin Land & Water Conservation Association (WLWCA)

WLWCA's mission is to assist county Land Conservation Committees and Departments with the protection, enhancement and sustainable use of Wisconsin's natural resources and to represent them through education and governmental interaction.

University of Wisconsin Cooperative Extension (UWEX) Programs –

The University Wisconsin Cooperative Extension provides information and education assistance in the county. Fond du Lac County UWEX has agents that specialize in Dairy & Livestock, Crops & Soils, Family Living, & 4-H & Youth Development.

Multi-Agency Land & Water Education Grant Program (MALWEG).

The Multi-Agency Land and Water Education Grant Program was started to help integrate educational programming and local conservation efforts. Program support comes from the Natural Resources Conservation Service (NRCS), the Wisconsin Department of Natural Resources (WDNR), the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), the Farm Service Agency (FSA), and the University of Wisconsin-Extension (UWEX). Funding for winning grant proposals comes from NRCS, DNR, and UWEX. Fond du Lac County has been utilizing this grant for assistance with nutrient management education.

Great Lakes Nonpoint Abatement Coalition (GLNAC) –

GLNAC is a non-profit organization made up of thirty county Land and Water Conservation Departments, Regional Planning Commission, Wisconsin Department of Natural Resources and other government agencies to reduce nonpoint source pollution in the Great Lakes Basin. The Fond du Lac County LWCD has partnered with the GLNAC to attain grants and coordinate cost sharing for conservation projects.

Resource Conservation & Development (Glacierland RC&D) –

RC&D is a non-biased, rural development program focusing on the conservation, development and utilization of area resources to improve the standard of living. It joins forces with individuals, agencies and groups to improve the social, economic and

environmental opportunities of the local area. The mission of the RC&D is to conserve, develop and utilize local resources to raise the level of economic activity in the area, while enhancing the environment and the standard of living.

Sand County Foundation –

Fond du Lac County LWCD has partnered with the Sand County Foundation to attain grants for conservation projects.

Local Conservation Partners

Fond du Lac County Land & Water Conservation Department –

In cooperation with Federal, State, and county agencies the Fond du Lac County Land & Water Conservation Department is responsible for promoting, protecting, and enhancing the land & water resources of Fond du Lac County. Some of the many services offered by this department are: Administration of State and Local Conservation Programs, Technical & Design Assistance for Conservation Practices, Providing Financial Assistance, Information & Education Equipment and Programs, Manure Spreader Calibrations, Administration of the Livestock Waste Storage Ordinance and also the Erosion Control & Stormwater Management Ordinance, Erosion Control Product Sales & Rental, Tree Sale & Tree Planter rental Programs.

Fond du Lac County Code Enforcement Department–

The County Code Enforcement Office administers the Floodplain Zoning Ordinance, the Private Onsite Wastewater Treatment System (POWTS), the Shoreland Zoning Ordinance, the Automobile, Tire and Junk Ordinance, the Lead Poisoning, Prevention, Control Ordinance, Well Abandonment Ordinance, and the Non-Metallic Reclamation Ordinance.

Fond du Lac County Parks & Planning Department –

The Planning Division is responsible for supervision and budgeting for the division, administration of the land division ordinance and other land regulatory ordinances in the unincorporated areas of the County, and to provide assistance to towns, villages, and cities in the county with planning, zoning, and parks related issues. The purpose of these responsibilities is to help assure the accuracy of land divisions and land transactions and to help assure orderly development and protection of natural resources in the county.

Fond du Lac County Health Department –

Fond du Lac County Health Department prevents disease, protects the community, and promotes healthy living for all.

Local Townships, Cities, & Villages –

All zoning within the county is governed by the individual townships, cities, and villages.

Green Lake Sanitary District –

The District was formed as a means to protect Big Green Lake and its associated resources with respect to sanitation and related land, air and water quality matters. In addition to coordinating solid waste collection in parts of four different Townships, the District also oversees the treatment of wastewater from approximately 1300 homes. The Fond du Lac County LWCD has partnered with the GLSD to attain grants and coordinate cost sharing for conservation projects.

Green Lake Association (GLA)–

The GLA's mission is to promote the conservation of Big Green Lake and its watershed.

Marion University –

Marion University partners with the Fond du Lac County LWCD on a variety of service-learning based community projects.

University Wisconsin Fond du Lac (UW-FDL)–

UW-FDL partners with the Fond du Lac County LWCD on a variety of community conservation education projects.

Moraine Park Technical College (MPTC)–

UW-FDL partners with the Fond du Lac County LWCD on a variety of community conservation education projects.

Area School Districts –

Fond du Lac Area School Districts partner with Fond du Lac LWCD to conduct in class conservation education curriculums.

Mercury Marine –

Fond du Lac County LWCD has partnered with Mercury Marine to sponsor events and attain grants for conservation projects.

Winnebagoland Conservation Alliance –

This group is comprised of hunting and fishing organizations from around the Lake Winnebago Area

NR 151 PERFORMANCE STANDARDS

NR151 of Wisconsin State Statute establishes runoff pollution performance standards for non−agricultural facilities and transportation facilities and performance standards and prohibitions for agricultural facilities and practices designed to achieve water quality standards as required by s. 281.16 (2) and (3), Stats. This section also specifies a process for the development and dissemination of department technical standards to implement the non−agricultural performance standards as required by s. 281.16 (2) (b), Stats. If these performance standards and prohibitions do not achieve water quality standards, this chapter specifies how the department may develop targeted performance standards in conformance with s. NR 151.004.

NR 151 AGRICULTURAL PERFORMANCE STANDARDS

NR 151.02 - 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 - No crop producer may conduct a tillage operation that negatively impacts stream bank integrity or deposits soil directly in surface waters. No tillage operations may be conducted within 5 feet of the top of the channel of surface waters. Tillage setbacks greater than 5 feet but no more than 20 feet may be required to meet this standard. Crop producers shall maintain the area within the tillage setback required in adequate sod or self−sustaining vegetative cover that provides a minimum of 70% coverage.

NR 151.04 **-** Croplands, pastures, and winter grazing areas shall average a phosphorus index of 6 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 - New or substantially altered manure storage facilities shall be designed, constructed and maintained to minimize the risk of structural failure of the facility and minimize leakage of the facility in order to comply with groundwater standards.

The levels of materials in the storage facility may not exceed the margin of safety level. Storage facilities that are constructed or significantly altered on or after January 1, 2011, shall be designed and operated to contain the additional volume of runoff and direct precipitation entering the facility as a result of a 25−year, 24−hour storm.

Closure of a manure storage facility shall occur when an operation where the facility is located ceases operations, or manure has not been added or removed from the facility for a period of 24 months. Manure facilities shall be closed in a manner that will prevent future contamination of groundwater and surface waters.

NR 151.055 - There may be no significant discharge of process wastewater to waters of the state.

NR 151.06 - Runoff shall be diverted away from contacting feedlot, manure storage areas and barnyard areas within Water Quality Management Areas (WQMA's). WQMA's are defined as any wetlands, areas within 300' from rivers or streams and areas within 1000' from any lakes or ponds.

NR 151.07 - Apply manure and other fertilizers according to an approved USDA-NRCS 590 nutrient management plan.

Manure Management Prohibitions:

- *A livestock operation shall have no overflow of manure storage facilities.*
- *A livestock operation shall have no unconfined manure piles within Water Quality Management Areas (WQMA's). WQMA's are defined as any wetlands, areas within 300' from rivers or streams and areas within 1000' from any lakes or ponds.*
- *A livestock operation shall have no direct runoff from a feedlot or stored manure into the waters of the state.*
- *A livestock operation may not allow unlimited access by livestock to waters of the state in a location where high concentrations of animals prevent the maintenance of adequate sod or self−sustaining vegetative cover.*

NR 151.10 NON−AGRICULTURAL PERFORMANCE STANDARDS

NR 151.11 - Construction site performance standard for new development and redevelopment.

NR 151.12 - Post−construction performance standard for new development and redevelopment.

NR 151.13 - Developed urban area performance standard.

NR 151.14 - Non−municipal property fertilizer performance standard.

NR 151.20 TRANSPORTATION FACILITY PERFORMANCE STANDARDS

NR 151.23 - Construction site performance standard

NR 151.24 - Post–construction performance standard

NR 151.25 - Developed urban area performance standard

IMPLEMENTATION OF NR 151 PERFORMANCE STANDARDS

Fond du Lac County is firmly committed to voluntary implementation of State performance standards and will exhaust every option available to bring a site into compliance voluntarily before any enforcement action is taken. Changes to the Wisconsin Farmland Preservation Program (FPP) now require all participants to achieve compliance by no later than Dec.31st, 2015. In 2009, Fond du Lac County had a 73 % participation rate with over 1000 landowners claiming the FPP Tax credit and the FPP program has now become Fond du Lac County's primary mechanism for voluntarily achieving compliance with the NR 151 Performance Standards.

The following outlines the strategy for implementation of the Performance Standards for landowners that are not claiming the FPP tax credit:

Priority Farm Strategy

Farms will be prioritized for review of compliance of State performance standards and prohibitions in the following way:

1. All Non-WPDES Permitted Livestock Operations (0-999 animal units)
2. All Land Operated by a Livestock Operation
3. Cash Grain Producers Operating 1,000 acres or more
4. Cash Grain Producers Operating between 750-999 acres
5. Cash Grain Producers Operating between 500-749 acres
6. Cash Grain Producers Operating between 250-499 acres
7. Cash Grain Producers Operating between 0-249 acres

Based on current staff numbers and workload, the LWCD will try to review an average of 5 Priority 1 operations per year for compliance of State Performance Standards.

NR 151 COMPLIANCE REVIEW & NOTIFICATION PROCESS

Record Reviews

A records inventory shall be used initially to determine current compliance to the performance standards. Existing conservation plan information developed for FPP, LWRM & Watershed participant files as well as data gathered for barnyard, manure storage, and streambank inventories shall be used as a starting point.

A complete records review will also be conducted when landowners request technical assistance, cost sharing, livestock waste storage permit applications, and stormwater and erosion control permit application. Each review will be accompanied by a NR 151 Compliance Status Report. The NR 151 Compliance Status Report documents initial findings from the record review and compliance or non-compliance with performance standards.

Initial Notification

Upon completion of a records review if a landowner is shown to be in compliance, a notification letter will be sent documenting compliance of performance standards. The notification letter will also explain to the landowner the continued obligation of meeting the performance standards. If the record review documents potential non compliance an initial notification will be sent to the landowner/operator stating the need for an on-site evaluation. Once this notification letter is sent, a follow up contact shall be made within two weeks of the date on the notification letter.

On Site Evaluations

After a record review has been conducted and an initial notification has been made, the LWCD will conduct on site evaluations. On site evaluations will also be conducted for sites that have: (1) Reports of environmental incidents with the potential to adversely affect public health & safety such as fish kills and well contamination, or (2) Complaints regarding violations on a particular site or sites.

The on-site evaluation will identify and document all resource concerns on the property. All on-sites must have an updated BARNY, Streambank, or Shoreline inventory. Once the on-site evaluation is made and the Compliance Status Report is completed, compliance determination can be made.

As record reviews are completed and on-site evaluations are conducted, farms will be prioritized for targeting limited cost share funding and technical assistance. Prioritization for funding and technical assistance will be reviewed annually to ensure that the limited cost share funding and technical assistance are targeted to the most severe sites.

Compliant Sites

After completion of an on-site evaluation and the landowner is found to be in compliance, a letter documenting full compliance with Chapter NR 151, Wis. Admin. Code will be sent. This letter documents the record review has been completed, any necessary on-sites have been conducted, and states the landowner's obligation with compliance of the performance standards, now and in the future.

Non-Compliant Sites

Once an on-site is made and the landowner is found to be out of compliance with an Ag. Performance Standard, a notification letter will be sent. This letter will document that a record review has been conducted, necessary on-sites have been conducted, and states that the landowner is out of compliance with the performance standards and is required to take corrective actions. This letter will also include the following:

- Ø Explanation of the State's Performance standards and the areas that the landowner is noncompliant.
- Ø Corrective measures prescribed for meeting compliance of Performance Standard's that are currently noncompliant An estimated cost for installation of corrective measures along with a list of appropriate technical standards and maintenance schedule will also be included.
- Ø The status of cost share eligibility and funding sources for noncompliant sites.
- Ø The time table for compliance with Performance Standards. The time table for compliance will be a maximum of 1 year to begin implementation of corrective BMP's and a maximum of 2 years to complete the installation of BMP's.
- Ø A notice of process and procedure for appeals on the compliance determination.

If funding is not immediately available for installation of the BMP's, the landowner will be advised that funding is not available at this time and they will be notified when funds are available.

Appeal of Compliance Determinations

Landowners may appeal their determination for compliance with State Performance Standards. The following outlines the procedures for appeals. The rules, procedures, duties and powers of the committee and provisions of Wis. Stats. Ch. 68 shall apply to appeals under this article.

1. A request for an appeal shall be filed with the department within 30 days of landowner notification.
2. The appeal shall be heard by the committee at a regularly scheduled meeting with public notice as required by Wis. Stats. 19.81. The appeal shall be heard within 45 days of the date the appeal is filed with the department. A copy of the meeting notice shall be sent to the applicant and the appropriate town board. The department shall transmit to the committee all documents constituting the record from which the appeal was taken.
3. A written decision regarding the appeal shall be made within 30 days.
4. The final decision on an appeal shall be in the form of a written determination signed by the chairperson or secretary of the committee. The determination shall state the specific facts that are the basis for the committee's decision and shall affirm, reverse, vary or modify the order, requirement, decision or determination appealed, in whole or in part; or deny the appeal for lack of justification.

Enforcement of State Performance Standards

LWCD staff will exhaust every option with the landowner to achieve voluntary compliance with State Performance Standards. The following questions will act as a check list to determine why the site has not been brought into compliance:

(1) Has cost sharing & technical assistance been offered?
(2) Will the landowner agree to an implementation schedule?
(3) Has a cost share agreement been signed with no installation of BMP's within the 2 year installation period?
(4) Are there extenuating circumstances that prohibit the landowner from complying within the two years allowed?

Sites that have been designated by the LWCD as noncompliant, were unsuccessful in their appeal to change their status, have refused cost sharing and technical assistance, and have refused to bring the site into compliance voluntarily will be served with a Notice of Noncompliance stating that they are subject to enforcement action. The case will then be forwarded to the appropriate DNR Regional Office to begin the process of enforcement action.

LOCAL ORDINANCE IMPLEMENTATION

The LWCD enforces local ordinances to assist with compliance of State regulations. The County will revise ordinances in order to keep current with new technical standards and state laws. The following is a list of ordinances that impact land and water activities in Fond du Lac County:

Animal Waste Storage Ordinance (Chapter 14)

This ordinance is administered by the LWCD and the purpose of this article is to assure the safe handling and spreading of manure as well as to regulate the location, design, construction, installation, alteration, operation, and maintenance of all new livestock manure storage facilities. Also regulate the closure of livestock manure storage facilities in order to prevent water pollution, protect the health and safety of residents and transients, prevent the spread of disease, and promote the prosperity and general welfare of the citizens of Fond du Lac County. The Fond du Lac County Board adopted an Animal Manure Storage Ordinance on April 23, 1996, with revisions to the Ordinance being adopted on June 30, 2004.

Erosion Control & Stormwater Management Ordinance (Chapter 17)

This ordinance is administered by the LWCD and the purpose of this chapter is to set forth requirements for land development and land disturbing activities aimed to minimize sedimentation, water pollution, flooding and related property and environmental damage caused

by soil erosion and uncontrolled stormwater runoff during and after construction, in order to diminish the threats to public health, safety, welfare, and the natural resources of Fond du Lac County. An ECSM permit may be required if any of the following applies:

A. Land Disturbance (Erosion Control Permit Only)

1. Disturbs 4,000 square feet or more of total land surface area;
2. Involves 400 cu. yd. of excavation, filling or any combination thereof;
3. Disturbs 100 lineal feet of road ditch, grass waterway or other drainage flows;
4. Other land disturbing activities, having a high risk of polluting water.

B. Land Development (Erosion Control and Stormwater Management Permit)

1. Divides an existing tax parcel into 5 separate parcels of 5 acres or less each;
2. Involves the construction of any new public or private roads (Serving 2 or more houses);
3. Ultimately results in the addition of impervious surfaces of 20,000 square feet or greater in total area, including smaller individual sites that are part of a common plan of development; or
4. Other land development activities, having a high risk of polluting water.

Under subchapter III of NR 216, Wis. Adm. Code, a notice of intent shall be filed with the DNR by any landowner who disturbs one or more acres of land. This disturbance can create a point source discharge of storm water from the construction site to waters of the state and is therefore regulated by DNR. Agriculture is exempt from this requirement for activities such as planting, growing, cultivating and harvesting of crops for human or livestock consumption and pasturing or yarding of livestock as well as sod farms and tree nurseries. Agriculture is not exempt from the requirement to submit a notice of intent for one or more acres of land disturbance for the construction of structures such as barns, manure storage facilities or barnyard runoff control systems. (See s. NR 216.42(2), Wis. Adm. Code.) Furthermore, construction of an agricultural building or facility must follow an erosion and sediment control plan consistent with s. NR 216.46, Wis. Adm. Code and including meeting the performance standards of s. NR 151.11, Wis. Adm. Code. An agricultural building or facility is not required to meet the post-construction performance standards of NR 151.12, Wis. Admin. Code. (07/31/08 MAL)

Shoreland Zoning Ordinance (Chapter 44)

This ordinance is administered through the Fond du Lac County Code Enforcement Department and its purpose is to (1) Further the maintenance of safe and healthful conditions and prevent and control water pollution; (2) Protect spawning grounds, fish and aquatic life; (3) Control building sites, placement of structures and land uses; and (4) Preserve shore cover and natural beauty.

Non-metalic Mining Ordinance

This ordinance is administered through the Fond du Lac County Code Enforcement Department and applies to operators of non-metallic mining sites within the county operating on or after August 1st, 2001.

Private Onsite Wastewater Treatment Ordinance (Chapter 58)

This ordinance is administered through the Fond du Lac County Code Enforcement Department and its purpose is to provide a basis for the regulation of siting, construction, and maintenance of Private Onsite Wastewater Treatment System (POWTS), as well as to regulate the disposal of septage and sewage from such systems, in order to protect the public health.

INFORMATION & EDUCATION STRATEGY

A key component of the Land & Water Resource Management Planning process is the development and implementation of an Information and Education strategy. Behavioral change can sometimes take a long time, however the time it takes to adopt behavioral changes can be expedited if sound information is provided to decision makers showing that the benefits of changing outweigh the status quo. The benefits of adopting behavioral or management changes that effect our environment often comes down to economics versus stewardship. It is easier for a decision maker to adopt management changes when there is a positive economic and a positive stewardship benefit.

The goal of the Fond du Lac County LWCD Information and Education strategy is to provide landowners with the information they need to make decisions that have a positive environmental impact. The Information and Education Strategy will focus on providing information that: (1) Raises awareness of environmental issues and regulations; (2) Raises knowledge of best management practices needed to correct environmental problems and maintain compliance with regulations; (3) Raises awareness of programs and cost share opportunities for adopting best management practices; (4) Promotes a sense of ownership of the environment. The following activities will be implemented as part of the Information & Education strategy:

One on One Contacts:

One on one contacts will be used as a way to inform and educate landowners about conservation issues and regulations. One on one contacts are typically the most effective way to communicate and pass along information to landowners. However, factors such as limited LWCD staff make it difficult to make one on one contacts with all landowners.

Newsletters & Mailings:

The LWCD coordinates with the Farm Service Agency to send out a quarterly newsletter. This newsletter is used to inform operators in the county about programs that are offered through FSA, NRCS, and LWCD. Mailings will also be sent as necessary to provide information to relevant groups.

Workshops & Tours:

Educational workshops and tours will continue to be conducted to get people involved and provide them with the skills and information that they need to become good stewards of the land. Workshops and tours will be targeted to specific groups such as coops, contractors, operators, landowners, and nutrient management groups.

Shows/Fairs:

Events with large attendance such as county fairs and farm shows are excellent venues for using a display and handout materials to reach large amounts of people. Depending on the type of event will determine whether the display will be manned or not. These displays are well supplied with fact sheets and informational handouts pertaining to the environment, soil & water quality, and nonpoint source pollution.

Mass Media:

Newspapers, radio, and television are effective ways to distribute information because they can reach large amounts of people. News releases can be used to describe the impact of nonpoint source pollution on our natural resources.

County Website & Email:

County websites can be efficient ways to provide needed documents such as permit applications as well as other planning documents pertaining to the LWCD. Email can also be an effective way to inform and educate. The LWCD will continue to expand its web services as opportunities arise.

Classroom Education:

Curriculums have been prepared for grades 1-5 that educate students about the importance of protecting our soil and water resources. The LWCD will continue classroom education for elementary grades within the county.

Hands-on Activities:

River Clean-up and Storm Drain Stenciling are hands-on activities that help citizens build a sense of ownership with local rivers and lakes. LWCD works in partnership with the Fond du Lac High School Environmental Club to conduct an annual River Clean-up.

I & E Goals & Evaluation

Accomplishing the goals of the I & E strategy will require a collaborative effort between the Fond du Lac County LWCD and many other agencies and groups. As part of the annual accomplishment report, the county will prepare a summary of its information and education efforts over the year. The report will address how the Information & Education strategy was implemented, how residents participated, and a measure of behavior changes.

The staff will summarize the Information & Education activities they accomplish during the year. If the I & E strategy was used to select and plan activities, it can be seen as an indication that the strategy should be working. Whether the activities actually reached their intended audiences and whether they caused participants to successfully change their behavior can be measured by evaluation participation rates and the BMP adoption process.

Since the strategy depends on activities to get people aware and involved, participation at activities can help evaluate the success of the Information & Education efforts. Participation means more than just attendance at field days and volunteer events, but also includes newsletter readership, requests for information, and signed cost-share agreements. If residents are attending planned I & E events and signing cost share agreements, I & E activities are probably having their desired impact. If residents never call the LWCD office to learn more about the project or attendance at field days and demonstrations are consistently low, this would probably indicate that new activities were needed.

The first step of monitoring the adoption process involves evaluating Information & Education activities as they occur. Such techniques include informal discussion with participants, confidential discussion, observation and polls. The staff will use the information gathered to improve each activity. The second step of monitoring the adoption process involves determining if the Information & Education objectives are being achieved. The same techniques described above can be used to evaluate the objectives. More formal and time-consuming ways to evaluate include phone surveys, focus groups and examining performance records.

Evaluating I & E success based primarily on participation can be misleading since participation is not an indicator of successful BMP adoption. For example, just because someone attended a demonstration does not mean that they are using it successfully. To determine if the I & E Strategy is causing residents to successfully adopt BMPs involves monitoring the performance of the participants.

Evaluating the adoption process involves keeping careful records of the successes and failures in the beginning of the projects that participants had with the BMPs along with documentation of their performance with the new BMP. This means that the staff will continue working with the participants after the BMP is installed to ensure that the practice has been adopted successfully. Success means that the BMP benefits both the participant's operation and water quality.

CHAPTER 5
WORKPLAN & BUDGET

This work plan is intended to summarize the goals of the Land & Water Resource Management Plan, prioritize objectives, and to identify timelines and agencies for accomplishment of objectives. All goals are of equal importance and priority. The objectives and actions have been ranked from highest to lowest priority to target actions for goals accomplishment.

GOAL: *Maintain soil productivity and reduce soil erosion and sedimentation from cropland.*

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Activity Status
Reduce soil erosion rates to "T" or lower for all croplands.	Review conservation plans for determination of compliance with NR 151 State Performance Standard.	Plan Years 1-5	200-275 Conservation Plans Annually	LWCD	Ongoing, Funded
	Develop or revise conservation plans for compliance with NR 151 State Performance Standard.	Plan Years 1-5	10-20 Conservation Plans Annually	LWCD, NRCS	Ongoing, Funded
	Continue County-wide Transect Survey to monitor Soil Erosion Rates	Plan Years 1-5	Once Annually	LWCD	Discontinued, unfunded
Promote the adoption of soil conservation practices to improve soil quality and reduce soil erosion.	One-on-One Contacts	Plan Years 1-5	As Opportunities Arise.	LWCD, NRCS, UWEX,	Ongoing, Funded
	Newsletter Articles	Plan Years 1-5	As Opportunities Arise.	LWCD, NRCS	Ongoing, No Specific Funding
	Local Radio and Newspaper Interviews	Plan Years 1-5	As Opportunities Arise	NRCS, FSA	Ongoing, No Funding
Promote establishment of grassed waterways and vegetative buffers to reduce sediment reaching surface waters.	Targeted One-on-One contacts to reach landowners eligible for CREP.	Plan Years 1-5	As Opportunities Arise.	LWCD, NRCS, FSA	Ongoing, Funded
	Newsletter Articles	Plan Years 1-5	As Opportunities Arise	LWCD, NRCS, FSA	Ongoing, No Specific Funding
	Local Radio Interviews	Plan Years 1-5	As Opportunities Arise	NRCS, FSA	Ongoing, No Specific Funding

GOAL: ***Minimize the impacts of land disturbing and land development activities within the county.***

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Activity Status
Reduce overland flow and increase infiltration from developing areas	Review Stormwater Management & Erosion Control Plans for the implementation of the Erosion and Stormwater Management Ordinance.	Plan Years 1-5	Average of 3 Plans Annually	LWCD	Ongoing, Funded
	Review Stormwater Management & Erosion Control Ordinance for revisions to adequately treat stormwater and construction site erosion issues	Plan Year 2	Every 5 Years	LWCD	Ongoing, No Specific Funding Req.
Minimize Urban Sprawl	Encourage townships to develop or revise strategic plans to limit development to areas that have planned or existing services	Plan Years 1-5	As Opportunities Arise	LWCD, Parks & Planning Dept.	Ongoing, No Specific Funding Req.
	Encourage participation in Farmland Preservation Program	Plan Years 1-5	As Opportunities Arise	LWCD, WDATCP	Ongoing, Funded
Minimize the loss of prime agricultural land, wetlands, & wildlife habitats due to development.	Identify these areas for protection using GIS and encourage landowners to protect these areas through long-term conservation planning.	Plan Years 1-5	As Opportunities Arise	LWCD, P&PD, Code Enforcement	Ongoing, No Specific Funding
	Encourage townships to develop or revise strategic plans to protect these areas from future development.	Plan Years 1-5	As Opportunities Arise	LWCD, P&PD, Local Townships	Ongoing, No Specific Funding Req.
	Encourage landowners to participate in Farmland Preservation Program	Plan Years 1-5	As Opportunities Arise	LWCD, WDATCP	Ongoing, Funded
	Continue Tree Sale Program to increase wildlife habitat	Plan Years 1-5	Annually in Spring	LWCD, WDNR	Ongoing, Funded
	Administer CRP & CREP Programs to restore and enhance wildlife habitat.	Plan Years 1-5	As Opportunities Arise	LWCD, DATCP, NRCS, FSA	Ongoing, Funded
Preserve and protect stream corridors	Promote benefits of existing programs that establish or restore stream corridor areas	Plan Years 1-5	As Opportunities Arise	LWCD, DNR, NRCS, FSA	Ongoing, Funded

GOAL: ***Minimize runoff, leaching, and drift of nutrients and pesticides to surface and ground water.***

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Activity Status
Promote and enforce the development and implementation of nutrient management plans (NMP) among the rural sector.	Visit with farmers on an individual basis to teach the NMP development process and the implementation strategy for approx. 2000-4000 new NMP acres.	Plan Years 1-5	2000-4000 new NMP acres annually as farmers begin the NMP process	LWCD, NRCS, UW-EX	Ongoing, Funded
	Make sure all farmers who own manure spreaders and haul their own manure have the spreader calibrated.	Plan Years 1-5	Annually, Average of 10-15 manure spreaders. All livestock farmers that have not had spreaders calibrated before or have changed equipment or methods of application whether it is a change in manure type or speed.	LWCD	Ongoing, Funded
	Conduct NMP training workshops for both development and implementation of the 590 standard	Plan Years 1-5	As needed	LWCD, UW-Extension	Ongoing, Funded
	Review NMP's as they are submitted to the LWCD office for accuracy, applicability and 590 compliance	Plan Years 1-5	Annually, Review an average of 50,000 NMP acres	LWCD and WDATCP upon request	Ongoing, Funded
Promote proper nutrient use among the urban sector.	Write newsletter articles to promote proper nutrient applications	Plan Years 1-5	As Opportunities Arise	LWCD UW Extension	Ongoing, No Specific Funding
	Partner with UW Extension for educating the urban sector & continue trouble shooting when concerned citizen call regarding manure applications.	Plan Years 1-5	As Opportunities Arise	LWCD UW Extension	Ongoing, No Specific Funding
Advocate correct use of pesticides in both rural and urban sectors.	Review pesticide program as NMP is being reviewed for CNMP's	Plan Years 1-5	As Opportunities Arise	LWCD	Ongoing w/ No Specific Funding
	Write newsletter articles pertaining to pesticide use for urban sector. Partner this effort with UW Extension	Plan Years 1-5	As Opportunities Arise	LWCD UW Extension	Ongoing w/ No Specific Funding

	Conduct Annual Pesticide Certification Training	Plan Years 1-5	Annually	UW Extension	Ongoing
	Radio	Plan Years 1-5	As applicable to the season of the year	UW Extension	Ongoing w/ No Funding

GOAL: ***Reduce the impacts from runoff and storage of animal waste and feed.***

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Activity Status
1. Ensure that animal waste storage facilities are constructed and abandoned according to most current USDA-NRCS technical standards.	Review manure storage designs for the enforcement of the Livestock Manure Management Ordinance	Plan Years 1-5	Average of 3 designs annually.	LWCD, NRCS, WDATCP	Ongoing, Funded
	Provide technical assistance to ensure that construction and abandonment of animal waste storage facilities meet current NRCS Specifications	Plan Years 1-5	Average of 3 farms annually	LWCD, WDATCP, NRCS	Ongoing, Funded
	Review the County Livestock Manure Management Ordinance for revisions to ensure that waste storage facilities meet current NRCS standards and specifications.	Plan Year 3	Every 5 years	LWCD	Ongoing, No Specific Funding Req.
2. Identify sites for correcting animal waste runoff problems	Begin inventory of farms based on the priority farm strategy outlined in Chapter 3 of this plan.	Plan Years 1-5	Approx. 100 annually	LWCD	Ongoing, Funded
	Track livestock facilities using GIS for compliance with State Performance Standards	Plan Years 1-5	Approx. 100 annually	LWCD	Ongoing w/ No Specific Funding
3. Work with livestock operators to ensure compliance with NR 151.08 Manure Management Prohibitions.	Develop inspection schedule for compliance with NR 151.08 Manure Management Prohibitions	Plan Years 1-5	Approx. 100 annually	LWCD	Ongoing, Funded
4. Promote the adoption of best management practices that reduce runoff of animal waste and leachate.	One-on-One	Plan Years 1-5	Ongoing as opportunities arise	LWCD, NRCS	Ongoing, Funded
	Provide design and technical assistance for the installation of BMP's to reduce animal waste and leachate runoff	Plan Years 1-5	Ongoing as opportunities arise.	LWCD, NRCS	Ongoing, Funded

5. Continue enforcement of the Erosion and Stormwater Management Ordinance	Review ordinance to minimize the effects of runoff to surface and ground water resources.	Plan Year 2	Every 5 Years	LWCD	Ongoing, No Specific Funding Req.

GOAL: *Protect and Conserve Ground Water Quality and Quantity within the County.*

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Funding Status
1. Abandonment of old or unused wells.	Continue to work with Licensed Well Drillers and Pump Installers to identify wells for proper abandonment	Plan Years 1-5	Average of 5-10 Well Abandonment Projects Annually	LWCD, Code Enf., Health Dpt., NRCS, DNR	Ongoing, Funded
	Newsletter articles	Plan Years 1-5	As Opportunities Arise	LWCD	Ongoing, No Specific Funding
	Track well abandonment projects using GIS	Plan Years 1-5	Beginning in 2013	LWCD	No Specific Funding
	Continue coordination with municipalities and County Health Department to identify unused or nonconforming wells needing abandonment	Plan Years 1-5	Annually	LWCD, Code Enf., Health Dpt., Municipalities	Ongoing, No Specific Funding Req.
2. Increase protection of karst areas, sinkholes, and other geologic features that pose elevated risks of ground water contamination.	Identify karst areas using GIS for additional protection.	Plan Years 1-5	As Opportunities Arise	LWCD, Code Enforcement, P&PD	No Specific Funding
	Continue to identify active sink holes for treatment and additional protection	Plan Years 1-5	As Opportunities Arise	LWCD, Code Enforcement	Ongoing, No Specific Funding
	Increase adoption of clean water infiltration practices	Plan Years 1-5	As Opportunities Arise	Municipalities, Private Landowners	Ongoing, No Specific Funding
3. Minimize usage of groundwater resources.	Develop educational strategy to provide ways residents can conserve usage of ground water.	Plan Years 1-5	As Opportunities Arise	Municipalities, LWCD, UWEX, DNR	No Specific Funding
4. Educate residents about drinking water wells and potential contaminants.	Newsletter Articles	Plan Years 1-5	As Opportunities Arise	LWCD	Ongoing, No Specific Funding
	Update Educational Pamphlet	Plan Years 1-5	As Needed	LWCD	Ongoing, No Specific Funding Req.
5. Educate residents about proper storage and disposal of chemicals, pharmaceutical and medical waste.	Newsletter Articles	Plan Years 1-5	As Opportunities Arise	LWCD, UWEX, WDNR, WDATCP	Ongoing, No Specific Funding
	Conduct "Clean Sweeps" for proper disposal of chemicals, pharmaceutical and medical waste.	Plan Years 1-5	As Opportunities Arise	LWCD, WDATCP, UWEX, WDNR	Ongoing, Funded

6. Educate residents about proper storage and disposal of pharmaceutical and medical wastes	Newsletter Articles	Plan Years 1-5	As Opportunities Arise	LWCD, Health Dept., WDNR	Ongoing, No Specific Funding

GOAL: *Minimize Impacts of Runoff from Urban Areas.*

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Funding Status
1. Increase educational efforts to bring awareness of urban pollution sources.	Conduct storm drain stenciling activities in municipalities throughout the county.	Plan Years 1-5	Biannually	LWCD, UWEX, Municipalities	Ongoing, No Specific Funding
2. Minimize erosion of shoreline and stream banks in urban areas	Conduct assessments of streambanks and shorelines in urban areas for repair, stabilization, and protection.	Plan Years 1-5	As Opportunities Arise	LWCD, Municipalities, Private Landowners	No Specific Funding
	Encourage municipalities to establish and preserve vegetative buffers along shoreline and streambank areas.	Plan Years 1-5	As Opportunities Arise	LWCD, WDNR	Ongoing, No Specific Funding
3. Reduce runoff from construction sites.	Encourage frequent review and revision of municipal zoning codes to minimize construction site erosion control.	Plan Years 1-5	As Opportunities Arise	LWCD, Municipalities	Ongoing, No Specific Funding Req.
	Encourage increased inspection of construction site erosion control.	Plan Years 1-5	As Opportunities Arise	LWCD, Municipalities	Ongoing, No Specific Funding
4. Increase infiltration of storm water from existing and developing areas.	Encourage frequent review and revision of municipal zoning codes to adequately address stormwater runoff.	Plan Years 1-5	As Opportunities Arise	LWCD, Municipalities	Ongoing, No Specific Funding
	Educate urban residents about the benefits of rain gardens	Plan Years 1-5	As Opportunities Arise	LWCD, Municipalities, UWEX, WDNR	No Specific Funding
5. Reduce over application of fertilizers & pesticides.	Support the banning phosphorus in lawn fertilizers.	Plan Years 1-5	As Opportunities Arise	LWCD, Municipalities, WDNR	Ongoing, No Specific Funding

GOAL: *Develop and Improve Coordination of Lake Organizations*

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Funding Status
1. Assist lakeshore owners and existing lake organizations with information and education projects that improve and protect the water quality of their lake.	Develop database of lakeshore owners to target lake organization information and education projects.	Plan Years 1-5	As Opportunities Arise.	Fond du Lac County Exec., P&PD	No Specific Funding
	Provide interested lakeshore owners with the information about the development of lake organizations.	Plan Years 1-5	As Opportunities Arise.	LWCD, WDNR, UWEX, WAL, Municipalities	Ongoing, No Specific Funding
	Assist lake organizations with coordination of information and education events	Plan Years 1-5	As Opportunities Arise.	LWCD, Municipalities, WDNR	Ongoing, No Specific Funding

GOAL: Restore and Preserve Critical Fish & Wildlife Habitats

Objectives	Activities	Implementation Year(s)	Frequency	Cooperating Agencies	Funding Status
1. Identify critical fish and wildlife habitats to landowners for protection and/or restoration.	Inventory and identify these areas using GIS	Plan Years 1-5	As Opportunities Arise.	DNR, USFW, LWCD, Municipalities, Private Org.	No Specific Funding
	Assist landowners with protection and restoration of identified areas.	Plan Years 1-5	As Opportunities Arise.	DNR, USFW, NRCS, LWCD, Private Org.	Ongoing, No Specific Funding
2. Identify relic native prairie reservoirs, such as pastures, cemeteries, old railroad grades.	Propagate desirable native species on other suitable sites	Plan Years 1-5	As Opportunities Arise.	DNR, USFW, NRCS, LWCD, UWFDL	No Specific Funding

GOAL: Exotic & Invasive Species

Objectives	Activities	Frequency	Cooperating Agencies	Funding Status
1. Educate landowners about the ecological and economic impacts of exotic & invasive species.	Newsletter articles	As Opportunities Arise	LWCD, DNR, USFW	Ongoing w/ No Specific Funding
	Educational Displays	As Opportunities Arise	LWCD	Ongoing w/ No Specific Funding
	Maintain funding for County EIS Coordinator	Ongoing	FDL County, RC&D, DNR	Ongoing, Continue Funding

	Boat Launch Monitoring & Education	As Opportunities Arise	RC&D, DNR, Lake Associations	Unfunded

GOAL: Use Less Energy and Improve Air Quality

Objectives	Activities	Frequency	Cooperating Agencies	Funding Status
1. Educate residents about the affects of poor air quality, what it's caused from, and what they can improve air quality.	Newsletter Articles	As Opportunities Arise.	LWCD	No Specific Funding
2. Educate residents about the use of alternative fuels and "Green" technologies that produce less harmful emissions and improve gas mileage for commercial and passenger vehicles.	Newsletter Articles	As Opportunities Arise.	LWCD	No Specific Funding

PLAN IMPLEMENTATION BUDGET

Sufficient funding for this Land & Water Resource Management Plan is essential for successful implementation and attainment of its goals. Presently, the majority funding for the LWCD is primarily comprised of county funding combined with grants received from DATCP and the DNR. Current funding levels for staff and cost sharing needed to successfully implement portions of this plan are insufficient. Until funding increases, projects will need to be selected for cost share funding based the highest water quality priority and/or pollution reduction achieved.

A lack of individual farm data along with other unknown economic variables makes it difficult to fully determine the type and quantity of practices needed to meet the goals set forth in this plan. Therefore, until a complete county-wide inventory can be completed, all estimates are preliminary and subject to change. The following budgets reflect the estimated funding needed for cost sharing and staff over the next five years. Please note that these estimates utilize methodology that is based on the maintenance of all currently funded staff positions over the next five years.

Estimated Cost Share Budget for Best Management Practices

Category	2013	2014	2015	2016	2017	Total
Livestock Waste Runoff Management	$25,000	$25,000	$25,000	$25,000	$25,000	$125,000
Streambank Protection & Stabilization	$15,000	$15,000	$15,000	$15,000	$15,000	$75,000
Nutrient & Management Planning	$35,000	$35,000	$35,000	$35,000	$35,000	$175,000
Upland Sediment Control	$8,000	$8,000	$8,000	$8,000	$8,000	$40,000
Ground Water Protection	$25,000	$25,000	$25,000	$25,000	$25,000	$125,000
Total	$108,000	$108,000	$108,000	$108,000	$108,000	$540,000

Estimated Staffing Budget

Category	2013	2014	2015	2016	2017	Total
Wages	$387,800	$395,556	$403,467	$411,536	$419,767	$2,018,126
Fringes	$172,345	$180,962	$190,010	$199,511	$209,486	$952,314
Staff Support	$81,510	$82,510	$83,510	$60,000	$62,000	$369,530
Total Staff & Support Costs	$641,655	$659,028	$676,987	$671,047	$691,253	$3,339,970
State Stat. Required Staff Contribution	$ 201,993	$207,547	$213,652	$219,977	$226,532	$1,069,701
Estimated State Contribution for Staffing	$125,118	$125,118	$125,118	$125,118	$125,118	$625,590

CHAPTER 6
PLAN EVALUATION

The LWCD will evaluate achievement of goals and objectives outlined in this plan annually by departmental review of activities and assessment of quantifiable data. Along with evaluation of overall progress towards reaching goals, specific activities will also be assessed for effectiveness.

Annual Progress Reports

Accomplishments will be reported annually to DATCP and DNR. Annual reports will act as the mechanism for monitoring accomplishments based on results of activities conducted throughout the previous year. The annual report will include information on the following activities:

Landowner Contacts
Technical Assistance and BMP installation
Conservation Planning
Nutrient Management Planning
Cost Agreements and Reimbursements
Information & Education
Permitting Activities
Progress with NR 151 Implementation

The LWCD will evaluate activities to determine their effectiveness of reaching targeted audiences and goals and will make decisions to either change or discontinue certain activities.

Monitoring Vs. Modeling

It is accepted that the best way to determine achievement of water quality goals is to directly monitor water resources. However lack of resources to gather current water quality data makes it 1) difficult to determine sources and locations of pollution and 2) adequately measure reductions from activities. Until more comprehensive water quality monitoring can be conducted locally, LWCD will continue to encourage and support DNR, USGS, and citizen based monitoring and evaluation of water quality, as well as, relying on other various statewide and regional monitoring data.

Modeling is an alternative to actual water quality monitoring, but because modeling is usually based on hypothetical scenarios it often does not carry the weight that actual monitoring does, thus it can be viewed as subjective. Modeling, however, can still provide useful data for use in planning. Examples of other computer programs that are used by the LWCD that utilize modeling are Snap-Plus & Rusle 2 for evaluating soil loss and BARNY for evaluating barnyard runoff. As resources or technology become available that utilize modeling, the LWCD will evaluate whether to use those resources and technologies for assessing water quality within the county.

APPENDIX A

COMMON BEST MANAGEMENT PRACTICES DEFINITIONS

Contour Farming: The farming of sloped land so that all operations from seedbed preparation to harvest are done on the contour.

Contour Stripcropping: Growing alternating strips of row crops and grasses or legumes on the contour.

Field Diversions: A channel constructed across the slope with a supporting ridge on the lower side, to divert excess water to safe outlet in other areas.

Terraces: A system of ridges and channels with suitable spacing and constructed on the contour with a suitable grade to prevent erosion in the channel.

Grassed Waterways: A natural or constructed channel shaped, graded and established with suitable cover as needed to prevent erosion by runoff waters.

High Residue Management: A system, which leaves at least 30 percent of the ground, covered with crop residue after crops are planted.

Nutrient Management: The management and crediting of nutrients from all sources, including legumes, manure, and soil reserves for the application of manure and commercial fertilizers. Management includes the rate, method and timing of application of all sources of nutrients to minimize the amount of nutrients entering surface and groundwater. This practice includes manure nutrient testing, routing soil testing and residual nitrogen soil testing.

Cropland Protection Cover (Green Manure): Cropland protection cover are close-growing grasses, legumes or small grain grown for seasonal soil erosion protection and soil improvement.

Intensive Grazing Management (Rotational Grazing): Intensive grazing management is the division of pastures into multiple cells that receive a short but intensive grazing period followed by a period of recovery of the vegetative cover. Rotational grazing systems can correct existing pasturing practices that result in degradation and should replace the practice of summer dry-lots when this practice results in water quality degradation.

Critical Area Stabilization: The planting of suitable vegetation on nonpoint source sites and other treatment necessary to stabilize eroding lands.

Grade Stabilization Structure: A structure used to reduce the grade in a channel to protect the channel from erosion or to prevent the formation or advance of gullies.

Agricultural Sediment Basins: A structure designed to reduce the transport of sediment of other pollutants eroded from agricultural fields to surface waters and wetlands.

Shoreline and Streambank Stabilization: The stabilization and protection of stream and land banks against erosion and the protection of fish habitat and water quality from livestock access.

Buffers: Permanently vegetated areas immediately adjacent to lakes, streams and wetlands that filter pollutants from nonpoint sources.

Shoreline Buffers: A permanently vegetated area immediately adjacent to lakes, streams, channels and wetlands designed and constructed to manage critical nonpoint sources or to filter pollutants from nonpoint sources.

Lake Sediment Treatment: Lake Sediment treatment is a chemical, physical or biological treatment of polluted lake sediments. Sources of pollution to the lake must be controlled prior to treatment of Lake Sediments. Treatment does not include dredging.

Wetland Restoration: The construction of berms or destruction of the function of tile lines or drainage ditches to create conditions suitable for wetland vegetation.

Barnyard Runoff Management: Structural measures to redirect surface runoff around the barnyard, and collect, convey or temporarily store runoff from the barnyard.

Barnyard Abandonment or Relocation: Relocation of an animal lot from a critical site such as a floodway to a suitable site to minimize the amount of pollutants from the lot to surface or groundwater.

Manure Storage Facility: A structure for the storage of manure for a period of time that is needed to reduce the impact of manure as a nonpoint source of pollution. Livestock operations where this practice applies are those where manure is winter spread on fields that have a high potential for runoff. The facility is needed to store and properly spread manure according to a 590 management plan.

Manure Storage Facility Abandonment: Manure storage system abandonment is the proper abandonment of leaking and improperly sited manure storage systems, including: a system with bottom at or below groundwater level; a system whose pit fills with groundwater; a system whose pit leads into the bedrock; a system which has documented reports of discharging manure into surface or groundwater due to structural failure; and a system where there is evidence of structural failure. The practice includes proper removal and disposal of wastes, liner materials and saturated soil as well as shaping, filling and seeding of the area.

Milkhouse Center Waste Control Systems: A milking center waste control system is a piece of equipment, practice or combination of practices installed in a milking center for purposed of reducing the quantity or pollution potential of the wastes.

Roofs for Barnyard Runoff Management and Manure Storage Facilities: Roofs for barnyard runoff management and manure storage facilities are a roof and supporting structure constructed specifically to prevent rain and snow from contacting manure.

Livestock Exclusion from Woodlots: The exclusion of livestock from woodlots to protect the woodlots from grazing by fencing or other means.

Cattle Mounds: Cattle mounds are earthen mounds used in conjunction with feeding and dry lot operations and are intended to provide a dry and stable surface area for cattle.

Structural Urban Best Management Practices: These practices are source area measures, transport systems and end-of-pipe measures designed to control storm water runoff rates, volumes and discharge quality. These practices will reduce the amount of pollutants carried in runoff and flows destructive to stream habitat. These measures include such practices as infiltration trenches, porous pavement, oil water separators, sediment chambers, sand filtration units, grassed swales, infiltration basins and detention/retention basins.

Easements: Easements are legally binding restrictions on land titles. Easements are purchased to provide permanent vegetative cover.

Land Acquisition: The purchase of land or the interest in land, which is contributing or will contribute nonpoint source pollution or for the construction of an urban structural practice.

BIBLIOGRAPHY

Fond du Lac County Planning Department, 1980, Fond du Lac County Farmland Preservation Plan.
Wisconsin Department of Natural Resources, September 1993, Lower Green Bay Remedial Action Plan 1993 Update.

Fond du Lac County, Bureau of Local and Regional Planning State of Wisconsin, Department of Local Affairs and Development, May 1970, Fond du Lac County Comprehensive Planning Program Part 1.

Fond du Lac County, Bureau of Local and Regional Planning State of Wisconsin, Department of Local Affairs and Development, February 1971, Fond du Lac County Comprehensive Planning Program Part 2.

Wisconsin Department of Natural Resources, December 1989, Winnebago Comprehensive Management Plan.

Department of Community Development, March 1990, City of Fond du Lac Comprehensive Plan Volume 1.

Department of Community Development, November 1995, City of Fond du Lac Comprehensive Plan Volume 2.

Fond du Lac County Planning Department, July 1993, Fond du Lac County Shoreland Zoning Ordinance.

United States Department of Agriculture Soil Conservation Service, April 1973, Soil Survey of Fond du Lac County, Wisconsin.

United States Department of Agriculture Soil Conservation Service. January 1994, Mosher-Anderson Creek Watershed Environmental Assessment.

Fond du Lac County Land and Water Conservation Department, Dodge County Land Conservation Department, Ozaukee County Land Conservation Department, Sheboygan County Land Conservation Department, Washington County Land Conservation Department, Department of Natural Resources, Department of Agriculture,Trade and Consumer Protection, February 1989, Nonpoint Source Control Plan for the East and West Branches of the Milwaukee River Priority Watershed Project.

Fond du Lac County Land and Water Conservation Department, Ozaukee County Land Conservatio Department, Sheboygan County Land Conservation Department, Washington County Land Conservation Departments, Department of Natural Resources, Department of Agriculture, Trade and Consumer Protection, July 1989, Nonpoint Source Control Plan for the North Branch Milwaukee River Priority Watershed Project.

Fond du Lac County Land and Water Conservation Department, Winnebago County Land and Water Conservation Department, Department of Natural Resources, December 1997, Nonpoint Source Control Plan for the Fond du Lac River Priority Watershed Project (draft form).

Fond du Lac County Land and Water Conservation Department, Calumet County Land Conservation Department, Department of Natural Resources, January 1994, Nonpoint Source Control Plan for the Lake Winnebago East Priority Watershed Project.

Fond du Lac County Land and Water Conservation Department, Sheboygan county Land Conservation Department, Calumet County Land Conservation Department, Manitowoc County Land Conservation Department, Department of Natural Resources, Department of Agriculture, Trade and Consumer Protection, July 1993, Nonpoint Source Control Plan for the Sheboygan River Priority Watershed Project.

Wisconsin Department of Natural Resources, May 1989, Upper Rock River Basin Area-wide Water Quality Management Plan.

Wisconsin Department of Natural Resources, May 1997, Manitowoc River Basin Water Quality Management Plan.

Winnebago County Land & Water Conservation Department, October 1998, Winnebago County Land & Water Resource Management Plan.

Green Lake County Department of Land Conservation, October 1999, Green Lake County Land & Water Resource Management Plan.

Dodge County Land Conservation Department, October 1999, Dodge County Land and Water Resources Management Plan.

East Central Wisconsin Regional Planning Commission, March 1998, Town of Empire Comprehensive Plan.

Fond du Lac County Planning Department, Alto Planning Committee, Alto Town Board, December 1998. Town of Alto Land Use Plan.

Fond du Lac County Planning Department, Ripon Land Use Planning Committee, Ripon Town Board, May 1999, Town of Ripon Land Use Plan.

East Central Wisconsin Regional Planning Commission, October 1998, Town of Eldorado Land Management Plan (draft).

Ruekert & Mielke, Inc., April 1998, Town of Waupun Land Use Plan.

Wisconsin Department of Agriculture, Trade and Consumer Protection, 1999, Wisconsin Agricultural Statistics.

Wisconsin Department of Natural Resources, Bureau of Endangered Resources, Natural Heritage Inventory Program, The Niagara Escarpment Inventory findings 1999-2001 and Considerations for Management Final Report, May 2002

Wisconsin Department of Natural Resources, October 2001, Upper Fox State of the Basin Report, WT-665-2001

Wisconsin Department of Natural Resources, April 2002 **,** Rock River State of the Basin Report, PUBL # WT-668-2002

Wisconsin Department of Natural Resources, October 2001, The State of the Sheboygan River Basin, PUBL WT 669 2001

Wisconsin Department of Natural Resources, 2001, The State of the Lakeshore Basin, PUB WT 667 2000

Wisconsin Department of Natural Resources, 2001, The State of the Milwaukee River Basin August, PUBL WT 704 2001

USDA National Agricultural Statistic Service, 2010-2011data

United States Census Bureau, 2010 data

University of Wisconsin-Extension, Center for Watershed Science and Education/UW-Stevens Point, July 2010, Fond du Lac County Groundwater**:** *A community resource*