CHAPTER 2: COUNTY SETTING, NATURAL RESOURCES AND TRENDS

General Characteristics

Wood County, in the Central part of Wisconsin, has a total area of 516,544 acres. Of this total, 507,428 acres is land and 9,116 are water. In 2000, the population of Wood County was 75,555. Wisconsin Rapids, the county seat in the southeast part of the county had a population of 18,435. Marshfield, the largest city, in the northern part of the county, had a population of 18,800. Twenty-two townships make up the county. Wood County is bordered on the north by Marathon County, on the east by Portage County, on the south by Adams and Juneau Counties, and on the west by Clark and Jackson Counties.

History and Development

The earliest settlement of Wood County began soon after what is now Wisconsin came under the authority of the United States in 1815. Daniel Whitney, with others, erected a sawmill at what is now Nekoosa in 1831.

The vast stands of quality timber, especially white pine, attracted lumbermen, and the lumber industry grew rapidly. The sandy parts of the county were logged first because the trees there were almost entirely pine, which was the only timber cut by the early lumbermen. Settlers followed the lumbermen, but because the sandy areas were poorly suited to farming, the settlers soon moved to the northern part of the county, where soils are finer textured. They frequently burned the hardwood timber to clear the land for farming.

Wood County was created in 1856 from a part of Portage County. Several boundary changes followed until 1872, when the present boundaries were established.

Wheat and rye were the principal crops at first, but about the turn of the century dairying began to increase in importance. Butter was the main dairy product, but cheese soon became more important. In 1925, more than 12 million pounds of cheese was produced in Wood County.

The culture of cranberries began in early 1870's, and today Wood County is the leading cranberry producing county in Wisconsin.

Paper mills replaced the sawmills as the era of lumbering drew to a close. Numerous sites on the Wisconsin River between Nekoosa and Biron provide waterpower to operate the paper mills. The river supplies the vast quantities of water needed in making paper. Paper is now the principal industrial product in Wood County.

The census of 1860, the first to include Wood County, showed a population of 2,425 people. By 1900 the population was 25,865, of which about one-third was in urban areas. In 1950, 50,000 people lived in the county, and slightly more than half were classified as urban residents.

Climate

The Soil Survey of Wood County Wisconsin (1977) states that Wood County winters are long, cold, and snowy and summers are warm and occasionally humid, and spring and fall are sometimes short and are mixtures of summer and winter.

An average of nine days a year have temperatures of 90° F or higher. An average of 32 days a year have temperatures of 0° F or lower. Heat growth units during the growing season, about 50° F threshold, average 2,240.

Approximately 60 percent of the annual precipitation falls in May through September. Total annual precipitation is about 31 inches. The annual snowfall averages 50 inches, but has ranged from 22 inches in 1958 to 81 inches in 1956.

Prevailing winds are from the west and northwest in winter and from southerly directions in summer. The sunshines an average of 60 percent of the time possible in summer and winter. The average date of the last 32° freeze in spring is May 17, and of the first in fall, September 27.

Soils

The use and management of soil has many impacts on the communities in Wood County. Soil forms the foundation that all other ecosystems depend on – plant life, wildlife, streams, wetlands, and lakes. Soils may also pose limitation to our use of the land in activities such as agricultural production, forestry, building development, and road construction.

The soils in the northern two-thirds of Wood County formed in “two-storied” parent material. That is, the upper 20 to 26 inches of the soils formed in silty wind-laid material, and the lower part of the soils formed either in glacial till or in residuum weathered from underlying bedrock.

If a line were drawn east and west approximately through Wisconsin Rapids, it would roughly separate the loamy soils north of the line from the sandy soils south of the line. The loamy soils have a cap of wind laid silty material that averages about 24 inches in thickness.

In the northwestern part of the county, the soils formed partly in the underlying loamy glacial till. These are soils of the Withee, Marshfield, Santiago, and Mann series.

In the northeastern part of the county, the material below the silty cap is loam residuum weathered from the underlying gneissic rock. Milladore, Eaupleine, and Sherry soils formed in this silt and residuum.

An area north of Powers Bluff in Richfield and Arpin Townships and areas in Sigel, Sherry, and Rudolph Townships have soils that formed partly in underlying clayey residuum weathered from schistose bedrock. These are soils of the Dolph and Altdorf series.

A broad belt across the middle of the county is soils that formed in the silty cap and underlying layers of residuum from weakly cemented sandstone and acid clay shale. These are soils of the Kert, Vesper, Hiles, and Veedum series.

Most of the soils in the southern part of the county formed in sandy material deposited by glacial melt waters along the Wisconsin River or in Glacial Lake Wisconsin. Soils of the Nymore, Plainfield, Friendship, Meehan, and Newson Series formed in these materials.

Some small areas in the southern part of the county are soils that formed in residuum weathered from sandstone. These are soils of the Plainbo, Eleva, and Elkmound series.

Some soils in Wood County formed in organic material that accumulated in depressions. Markey, Cathro, Rifle, Dawson, and Greenwood soils formed in this kind of material.

The USDA-Natural Resources Conservation Service, formerly known as the Soil Conservation Service (SCS) has grouped the soils of Wood County into eleven major soil associations. Their location can be seen on Map 2-1 they include:

Withee – Marshfield – Santiago Association
The soils of this association are on the glacial ground moraine in the northern and northwestern parts of the county.

- Current land cover: Most of this association is cultivated, but woodlots are common.
- Other important features: In recent years extensive residential development has taken place in parts of this association.

Milladore – Eaupleine – Sherry Association
The soils of this association are on broad upland plains in the northeastern part of the county and around Rudolph.

- Current land cover: Most of this association is cultivated, but some areas are in woodlots.
- Other important features: Most of the soils of this association have a seasonal high water table. The potential for recreational use is moderate to good.

Dolph – Altdorf Association
The soils of this association are on broad upland plains around Rudolph and Powers Bluff.

- Current land cover: About half of this association is cultivated, and the rest, mostly on wetter sites, is in woodland or native pasture.
- Other important features: Most of the soils of this association have a seasonal high water table and are wet in spring.

Fenwood – Rietbrock Association
This association consists of soils on prominent hills in the north-central and west-central parts of the county.

- Current land cover: Most of this association is in woodland and native pasture.
- Other important features: Potential for recreational use is good.

Vesper – Kert Association
The soils of this association are on the upland plain in a broad belt across the middle of the county.

- Current land cover: About 60 percent of the association is cultivated. The rest is in woodland, native pasture, or wildlife habitat.
- Other important features: Much of this association has good potential for wildlife habitat.

Elm Lake – Merrillan Association
The soils of this association are on the northern edge of Glacial Lake Wisconsin in the area west of Dexterville and in a small area west of Wisconsin Rapids.

- Current land cover: Most of this association is in woodland, but some small areas are cultivated.
- Other important features: This association has moderate potential for woodland and good potential for wildlife habitat.

Plainfield – Friendship Association
The soils of this association are on outwash plains on either side of the Wisconsin River and extend from the vicinity of Wisconsin Rapids southward.

- Current land cover: Most of this association is in woodland.
- Other important features: This association has good potential for irrigated crops.

Newson – Meehan Association
Most of the soils of this association are on nearly level outwash plains and glacial lakebeds east of Wisconsin Rapids and in the southwestern and south-central parts of the county.

- Current land cover: Most of this association is in woodland. Some areas were once cultivated but have been planted to trees or have reverted to woodland.
- Other important features: This association has good potential for wildlife habitat.

Markey – Rifle Association
The soils of this association are on the glacial lake plain in the south-central part of the county and in a small area in the northeastern part of the county.

- Current land cover: Most of this association is in woodland or wildlife habitat. A few small areas are used for native pasture and large areas are in cranberries.
- Other important features: These soils have good potential for use as wildlife habitat.

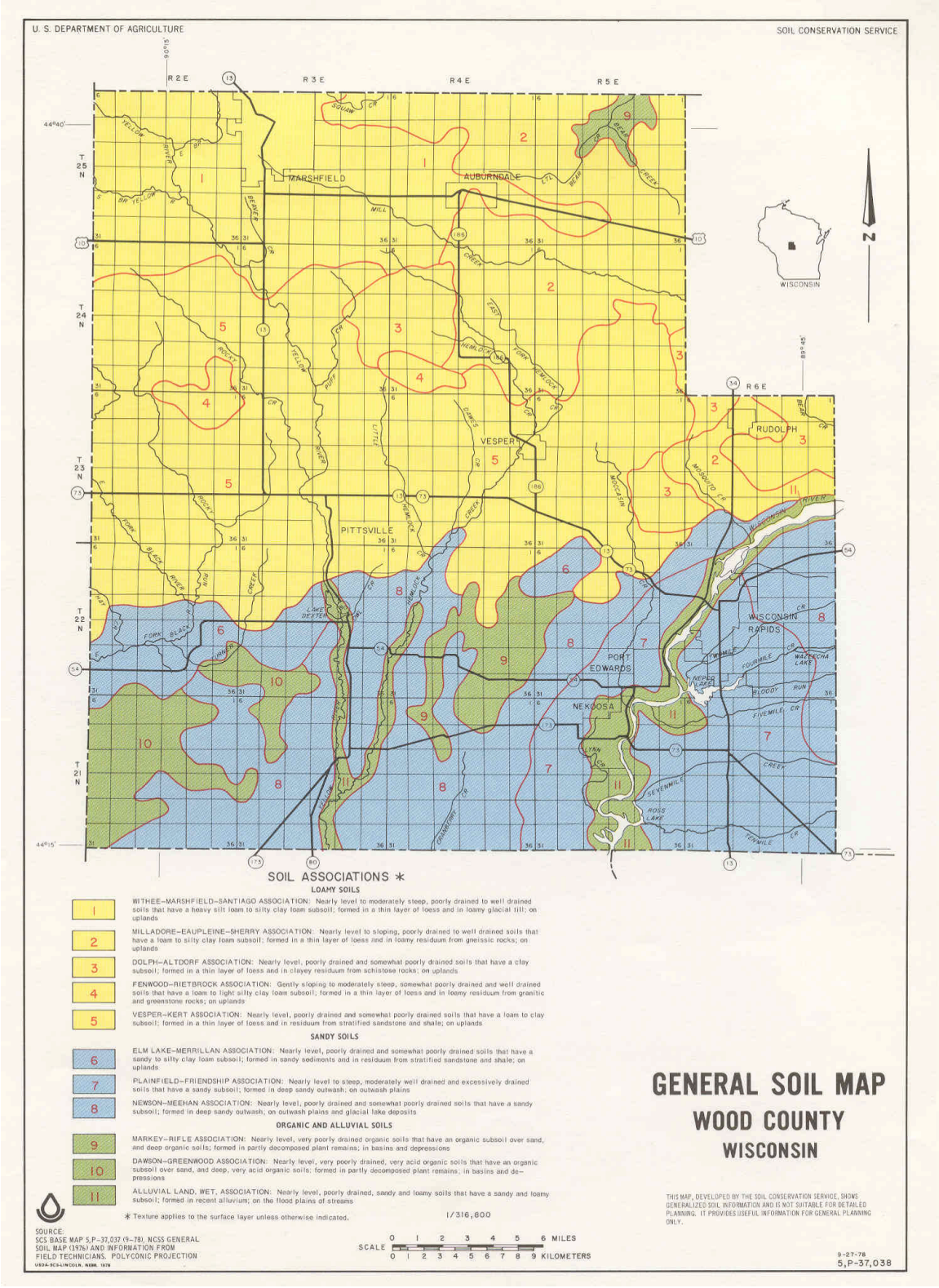
Dawson – Greenwood Association
The soils of this association are on the glacial lake plain in the extreme southwest part of the county.

- Current land cover: Most of this association is in woodland or wildlife habitat. Some areas are used for growing cranberries.
- Other important features: These soils have good potential for wildlife habitat.

Alluvial land, wet Association
This association consists of bottomlands, islands, and sloughs along the Wisconsin and Yellow Rivers.

- Current land cover: Most of this association is in woodland and wildlife habitat, but some areas are in native pasture.
- Other important features: Floods are frequent and the water table is high.

(2-1)


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
R2E
R3E
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T25N
T24N
T23N
T22N
T21N
MARSHFIELD
AUBURNDALE
VESPER
RUDOLPH
PITTSVILLE
PORT EDWARDS
NEKOOSA
WISCONSIN RAPIDS
WISCONSIN
SOIL ASSOCIATIONS *
LOAMY SOILS
1 WITHEE–MARSHFIELD–SANTIAGO ASSOCIATION: Nearly level to moderately steep, poorly drained to well drained soils that have a heavy silt loam to silty clay loam subsoil; formed in a thin layer of loess and in loamy glacial till; on uplands
2 MILLADORE–EAUPLEINE–SHERRY ASSOCIATION: Nearly level to sloping, poorly drained to well drained soils that have a loam to silty clay loam subsoil; formed in a thin layer of loess and in loamy residuum from gneissic rocks; on uplands
3 DOLPH–ALTDORF ASSOCIATION: Nearly level, poorly drained and somewhat poorly drained soils that have a clay subsoil; formed in a thin layer of loess and in clayey residuum from schistose rocks; on uplands
4 FENWOOD–RIETBROCK ASSOCIATION: Gently sloping to moderately steep, somewhat poorly drained and well drained soils that have a loam to light silty clay loam subsoil; formed in a thin layer of loess and in loamy residuum from granitic and greenstone rocks; on uplands
5 VESPER–KERT ASSOCIATION: Nearly level, poorly drained and somewhat poorly drained soils that have a loam to clay subsoil; formed in a thin layer of loess and in residuum from stratified sandstone and shale; on uplands
SANDY SOILS
6 ELM LAKE–MERRILLAN ASSOCIATION: Nearly level, poorly drained and somewhat poorly drained soils that have a sandy to silty clay loam subsoil; formed in sandy sediments and in residuum from stratified sandstone and shale; on uplands
7 PLAINFIELD–FRIENDSHIP ASSOCIATION: Nearly level to steep, moderately well drained and excessively drained soils that have a sandy subsoil; formed in deep sandy outwash; on outwash plains
8 NEWSON–MEEHAN ASSOCIATION: Nearly level, poorly drained and somewhat poorly drained soils that have a sandy subsoil; formed in deep sandy outwash; on outwash plains and glacial lake deposits
ORGANIC AND ALLUVIAL SOILS
9 MARKEY–RIFLE ASSOCIATION: Nearly level, very poorly drained organic soils that have an organic subsoil over sand, and deep organic soils; formed in partly decomposed plant remains; in basins and depressions
10 DAWSON–GREENWOOD ASSOCIATION: Nearly level, very poorly drained, very acid organic soils that have an organic subsoil over sand, and deep, very acid organic soils; formed in partly decomposed plant remains; in basins and depressions
11 ALLUVIAL LAND, WET, ASSOCIATION: Nearly level, poorly drained, sandy and loamy soils that have a sandy and loamy subsoil; formed in recent alluvium; on the flood plains of streams
* Texture applies to the surface layer unless otherwise indicated.
1/316,800
SOURCE: SCS BASE MAP 5,P–37,037 (9–78), NCSS GENERAL SOIL MAP (1976) AND INFORMATION FROM FIELD TECHNICIANS. POLYCONIC PROJECTION
SCALE 0 1 2 3 4 5 6 MILES
0 1 2 3 4 5 6 7 8 9 KILOMETERS
GENERAL SOIL MAP
WOOD COUNTY
WISCONSIN
THIS MAP, DEVELOPED BY THE SOIL CONSERVATION SERVICE, SHOWS GENERALIZED SOIL INFORMATION AND IS NOT SUITABLE FOR DETAILED PLANNING. IT PROVIDES USEFUL INFORMATION FOR GENERAL PLANNING ONLY.
9-27-78
5,P-37,038

Woodland

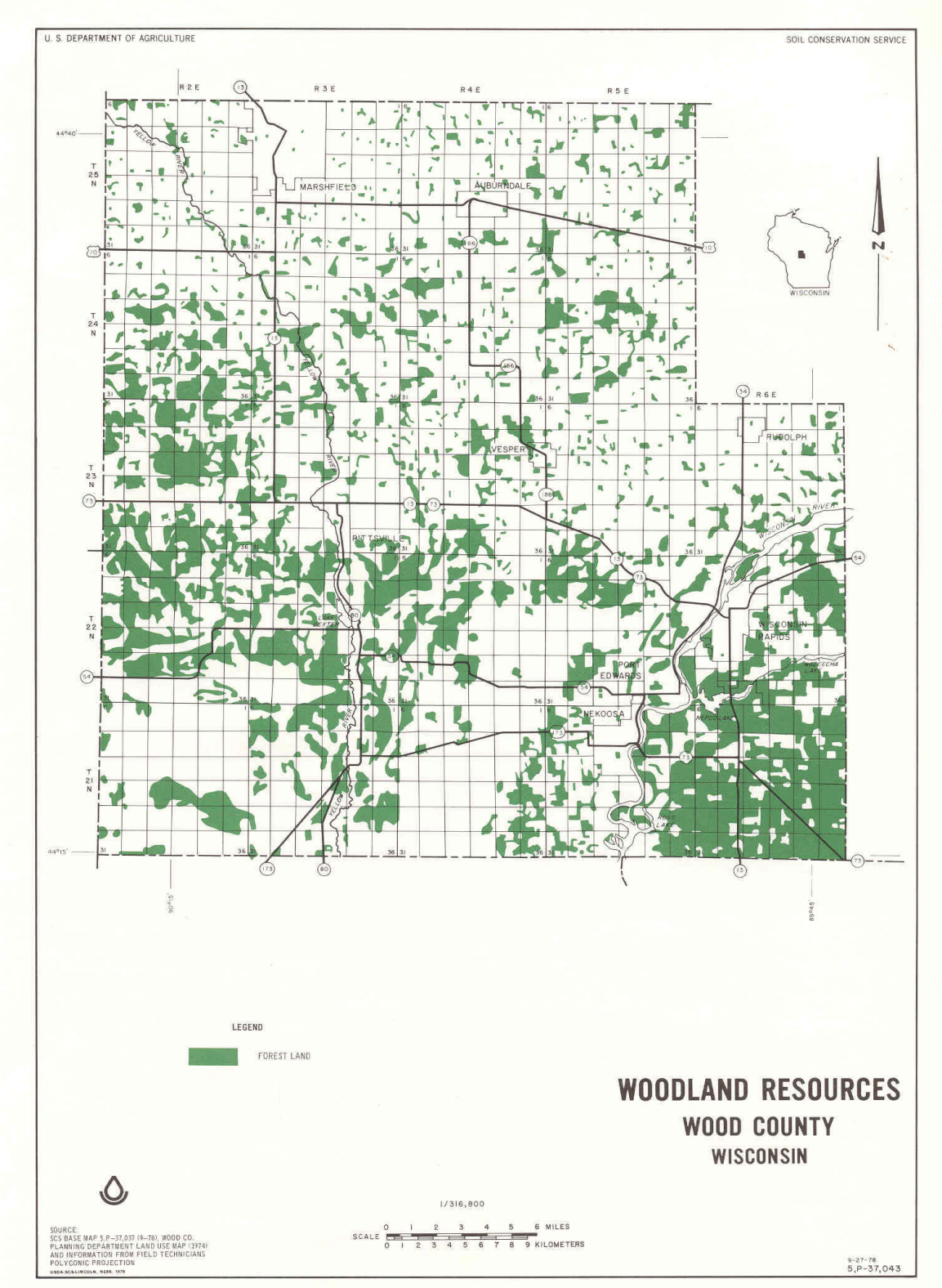
Woodland is one of the most prominent land cover features found in Wood County. Woodlands are important to the county's resource base, culture, and economy. Woodland serves many functions, adds value to both the local economy and quality of life. They provide wildlife habitat, recreational opportunities, timber, and pulpwood.

Woodlands occupy a major portion of the land area in Wood County with aspen, oak, white birch, and conifers being the dominant species. Much of the forests are used by the paper mills for huge amounts of pulpwood, which is vital for paper production. There are also a significant number of tree farms specializing in Christmas trees located in the southern part of the county. Of the 516,544 acres in the county, 206,500 acres or 40 percent are classified as woodland (see map 2-2). The county forest contains 37,536 acres of woodland. In the 1850's county forests were covered primarily with stands of white pine and tamarack. Between 1850 and the early 1930's when the county first acquired forestland, portions of the county were cutover, drained, burned, and farmed. Because of soil condition many farms failed, leaving tax delinquent lands with acquisitions beginning in the 1930's. The Wood County Forest generates significant revenues for the county, primarily through pulpwood harvests.

An increasing share of the property tax burden continues to shift to forestland owners, primarily due to use-value assessment and the rising assessed value of forestland. Use-value assessment is lowering the property tax burden for owners of agricultural land, thus placing more demand on non-agricultural properties. Rising property taxes for forestland owners have led to a sharp increase in Managed Forest Law (MFL) program enrollment. This WDNR program provides a property tax break for forest owners who agree to adopt a forest management plan, conduct a timber harvest, and pay a 5% tax on the timber sale.

As one of only 29 counties with county forestland, the Wood County Forest is a unique community resource. The landscape of the county forest supports thriving forest communities and abundant recreational opportunities. Hunting, fishing, hiking, biking, camping, canoeing, kayaking, ATVs, snowmobiles, boating, cross-country skiing, bird watching, and sight seeing are all important elements of Wood County's culture and economy that are supported by the County Forest.

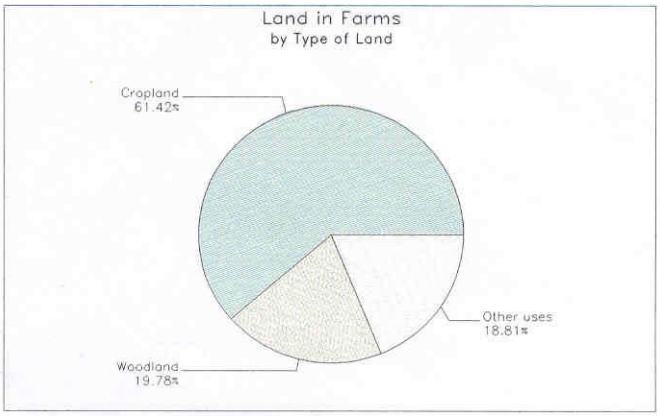
(2-2)

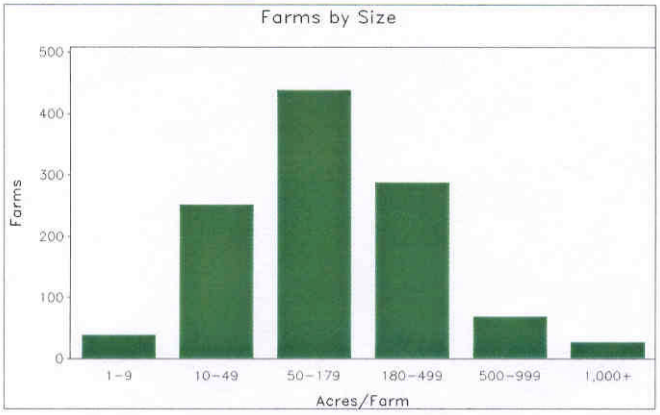

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
R2E
R3E
R4E
R5E
R6E
T25N
T24N
T23N
T22N
T21N
MARSHFIELD
AUBURNDALE
VESPER
RUDOLPH
PITTSVILLE
WISCONSIN RAPIDS
PORT EDWARDS
NEKOOSA
WISCONSIN
N
LEGEND
FOREST LAND
WOODLAND RESOURCES
WOOD COUNTY
WISCONSIN
1/316,800
SCALE
0 1 2 3 4 5 6 MILES
0 1 2 3 4 5 6 7 8 9 KILOMETERS
SOURCE:
SCS BASE MAP 5,P-37,037 (9-78), WOOD CO.
PLANNING DEPARTMENT LAND USE MAP (1974)
AND INFORMATION FROM FIELD TECHNICIANS
POLYCONIC PROJECTION
9-27-78
5,P-37,043

Farmland and Agriculture

Farming in Wisconsin has undergone considerable change in the last few decades. U.S. Census statistics suggests that the state lost almost 13 percent of its farms and over 10 percent of its farmland between 1987 and 1997. The decline in farm numbers was particularly severe for midsized commercial livestock farms. During this period, the number of hog farms dropped by almost 60 percent, dairy farms fell by 40 percent and farms with any harvested cropland declined by more than 20 percent according to the Wisconsin Agriculture in the 1990's (Buttel, 1999). Meanwhile, when dairy and hog farm number declines are removed from the equation, census results show that there was actually significant growth in part-time and hobby farm numbers during the 1990s in Wisconsin.

The most recent Census of Agriculture (2002) reported the top five agriculture commodities in Wood County based on value of sales as follows: 1) milk and dairy products; 2) fruits, tree nuts, and berries; 3) cattle and calves; 4) grains, oilseeds, dry beans, and dry peas; and 5) other crops and hay. Wood County ranks number one in Wisconsin for cranberry production.





Crop Production

Over the long term, levels of crop production have been relatively stable for the majority of commodities. Crop production and crop acreage for Wood County is reported below:

• farms	1,108 units
• land in farms	228,050 acres
• average size of farm	206 acres
• alfalfa and other forage	57,747 acres
• corn for grain	26,603 acres
• soybeans	10,951 acres
• corn silage	8,863 acres
• cranberries	4,682 acres
• oats for grain	3,061 acres
• Christmas trees	755 acres

Dairy

The 2005 Wisconsin Agriculture Statistics report states that there are 291 dairy herds in Wood County. This represents a decrease from the 2002 report, which shows that Wood County had 330 dairy herds. The following contains additional information regarding cow numbers and production in Wood County.

• number of cows	23,500
• milk per cow (pounds)	17,100
• total milk produced (pounds)	401,850,000

Other Livestock

Although the dairy industry is the largest in Wood County, other farm operations produce hogs, sheep and horses. The following contains information regarding these other animal types.

• total cattle (beef, dairy & calves)	47,000
• hogs and pigs	4,100
• horse & ponies	1,366
• sheep & lambs	1,006

Agriculture Connections

Agriculture not only produces food and fiber, but is also linked to many other components of the economy. Agriculture supports equipment and implement manufacturers and dealers, the vegetable and meat processing industries, the construction trade, trucking, veterinary services, genetic research, and many others.

Agriculture is connected to Wisconsin's culture and heritage. Barns, cows, fields, and silos paint the scene that so many define as Wisconsin's rural character. Farm families include some of the earliest settlers of many areas and provide a sense of continuity to a community. Public opinion surveys conducted by the American Farmland Trust, the U.S. Department of Agriculture, the American Farm Bureau, Wisconsin counties, and other local units of government show that Wisconsin citizens place a high value on the presence of agriculture and agriculture lands.

Agriculture has many considerations relative to the natural environment, both positive and negative. Farms provide green space, wildlife habitat, enhanced groundwater recharge, and nutrient recycling. Farms can also be sources of soil erosion, polluted runoff, odors, and damage to riparian areas. Agriculture is connected to other land uses. The interaction between farms and rural residential development has impacted land values, property taxes and the right to farm. The distance from farm related services, markets for farm commodities, processing industries, and other critical land uses can determine the long-term success of an agricultural area.

State of Dairy in Wisconsin

Dairy farming is vital to the total agriculture picture in Wisconsin. Milk sales account for more than half of Wisconsin farm cash receipts. According to the Wisconsin Agriculture Statistics Service, significant trends in Wisconsin's dairy industry include decreasing numbers of dairy farms, decreasing numbers of cows, increasing milk production, and a shift toward large farms and herds. The number of Wisconsin dairy farms has dropped from more than 140,000 in the 1950s to 18,400 in 2001. At the same time the average herd size grew from 20 cows in the 1950s to 70 in 2001. The net result is a decline in the total number of Wisconsin dairy cows, dropping from over 2 million in the 1950s to less than 1.4 million in the 1990s.

The State of Wisconsin is now producing more milk with fewer cows. In contrast to the declining numbers of farms and cows, milk production has been on the rise over the long term. Wisconsin's milk production has declined since 2000, most likely due to devastating milk pricing, but since the 1950s, milk production has increased by more than 50%.

The trend toward larger farms and herd sizes has grown out of the need to experience greater scales of economy. Larger dairies are able to produce greater volumes of milk and are therefore able to tolerate a smaller profit margin. The only growth in dairy farm numbers since 1997 has been in farms with more than 100 cows, with the most significant growth in farms with 200 or more cows. Fifty-four Wisconsin Counties have 500 cow dairies. Twenty-nine Wisconsin Counties have 1,000 cow dairies.

A nation-wide shift in milk production from the Midwest to Western states is continuing to occur. Since the 1970s, Idaho, New Mexico, and Washington have replaced Iowa, Ohio, and Missouri in the top 10 milk producing states. In 1998 the western states (California, Idaho, and Washington) were responsible for 24% of U.S. milk production.

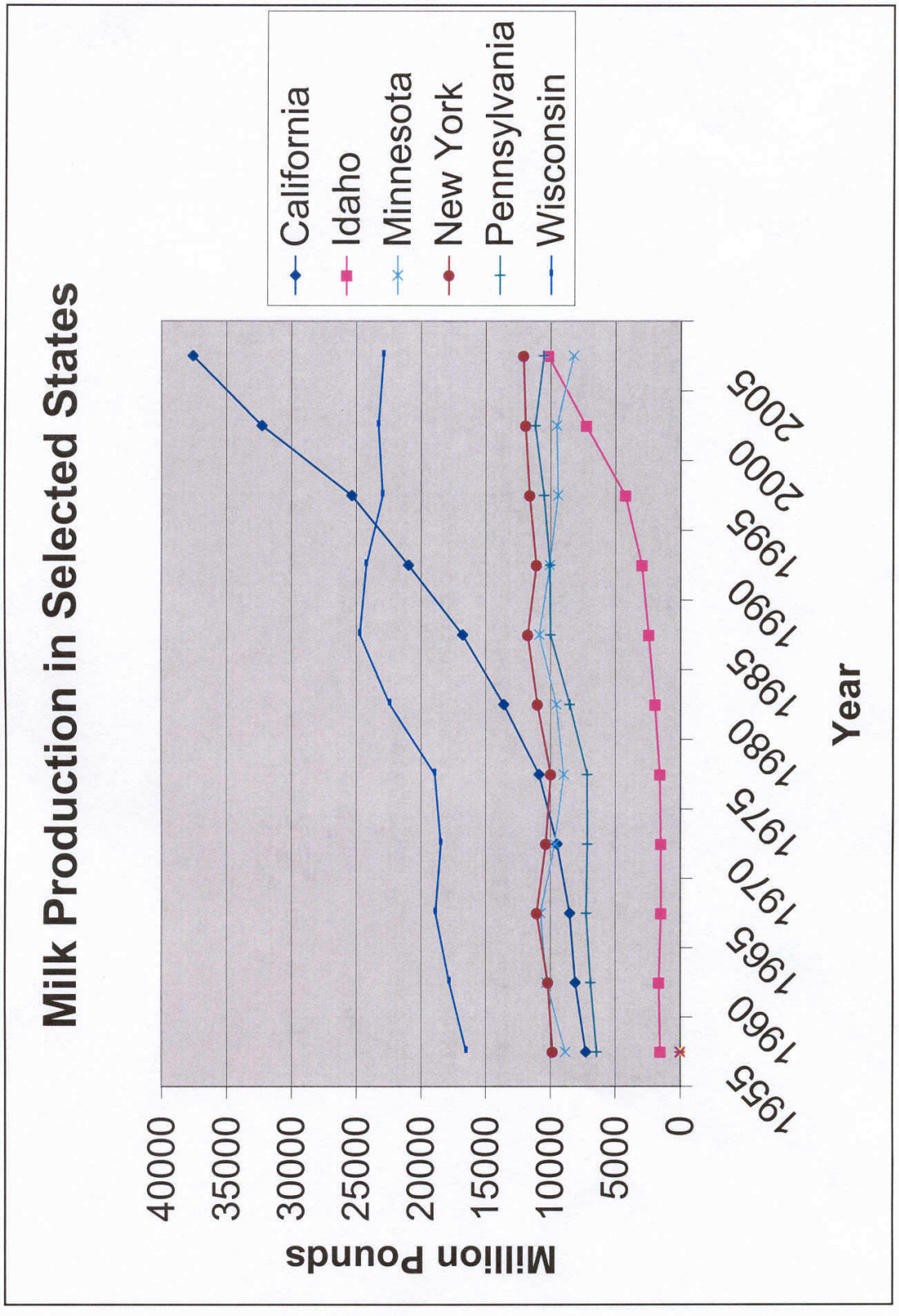
By 2002, these states were responsible for 29%. The share of milk production coming from the Midwest experienced the opposite trend. Midwest states in the top 10 for milk production include Wisconsin, Michigan, and Minnesota. These three states were responsible for 24% of U.S. milk production in 1998, and 21% in 2002.

The geographic shift also appears to be influenced by the scale of economies, as Western states have a greater share of the nation's large dairy farms. In 2002, operations with 500 or more cows were responsible for 42% of U.S. milk production (U.S. Department of Agriculture). The State of Wisconsin trails both California and Idaho in number of dairy farms with 500 or more cows.

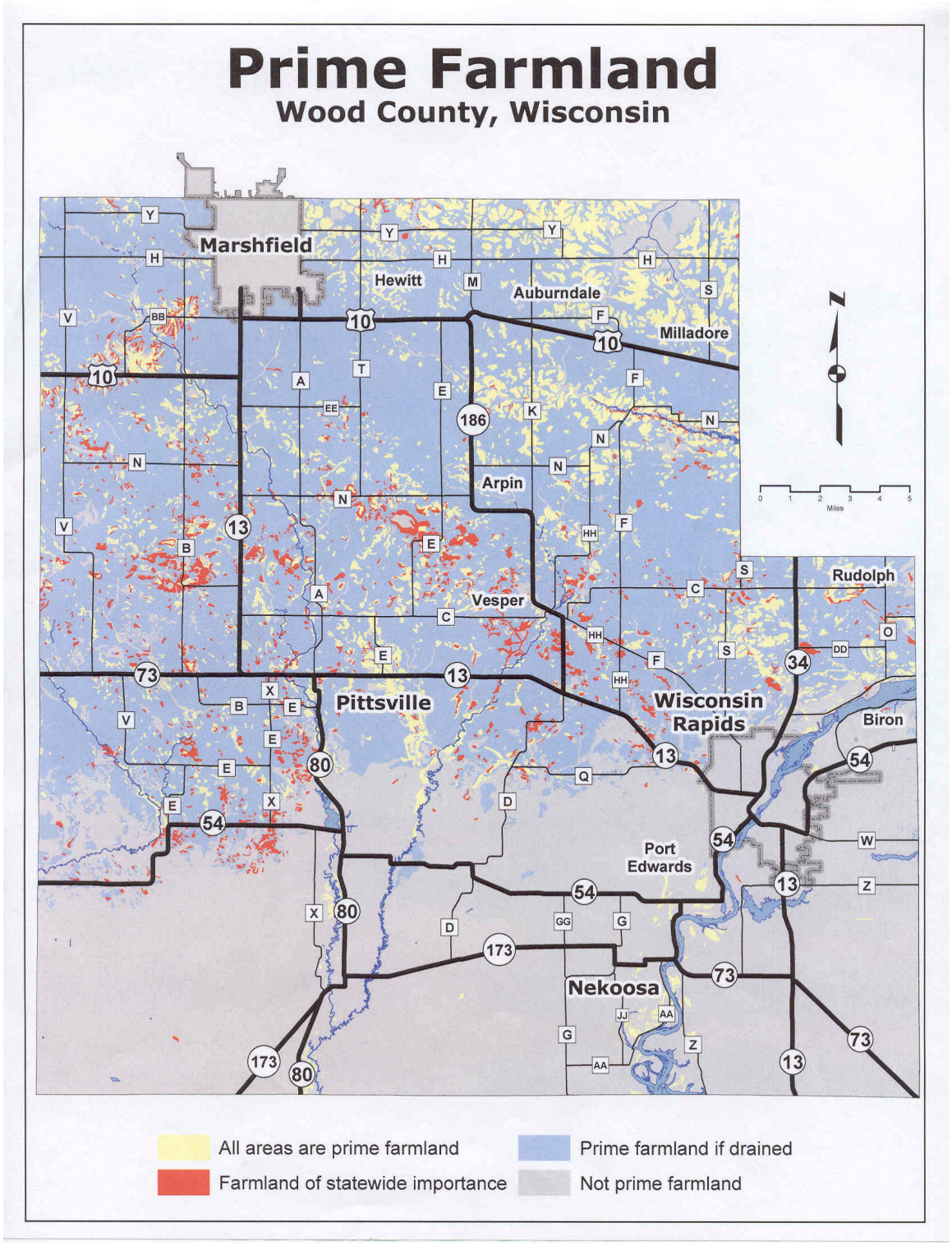
There is a growing risk of losing the Midwest's dairy processing infrastructure with the continued geographic shift in milk production to Western states. On a positive note, Wisconsin continues to lead the nation in the production of most varieties of cheese, organic dairy production, and total cheese. Wisconsin's strengths in retaining its local and regional processing infrastructure include continued growth in the total amount of milk produced each year, close proximity to Eastern U.S. population centers, and a large specialty cheese processing industry.

Prime Farmland

Prime farmland soils (See map 2-3), displays information regarding prime agricultural soils in Wood County. The U.S.D.A. Natural Resources Conservation Service identifies prime farmland soils as those soils with the fewest limitations for agricultural operations. Limitations to agriculture include high erodibility, extreme wetness, low moisture holding capacity and low productivity. Soils characterized, as "prime if drained" would be well suited to agriculture if extreme wetness can be overcome with drainage. Prime farmland soils are mostly found north of a line drawn from Wisconsin Rapids west through Pittsville. However, the greatest concentration of non-drained prime farmland is found north of Auburndale and Milladore in the northeast part of Wood County.


Milk Production in Selected States
California
Idaho
Minnesota
New York
Pennsylvania
Wisconsin
Million Pounds
40000
35000
30000
25000
20000
15000
10000
5000
0
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
Year

(2-3)


Prime Farmland
Wood County, Wisconsin
Marshfield
Hewitt
Auburndale
Milladore
Arpin
Vesper
Rudolph
Pittsville
Wisconsin Rapids
Biron
Port Edwards
Nekoosa
All areas are prime farmland
Farmland of statewide importance
Prime farmland if drained
Not prime farmland

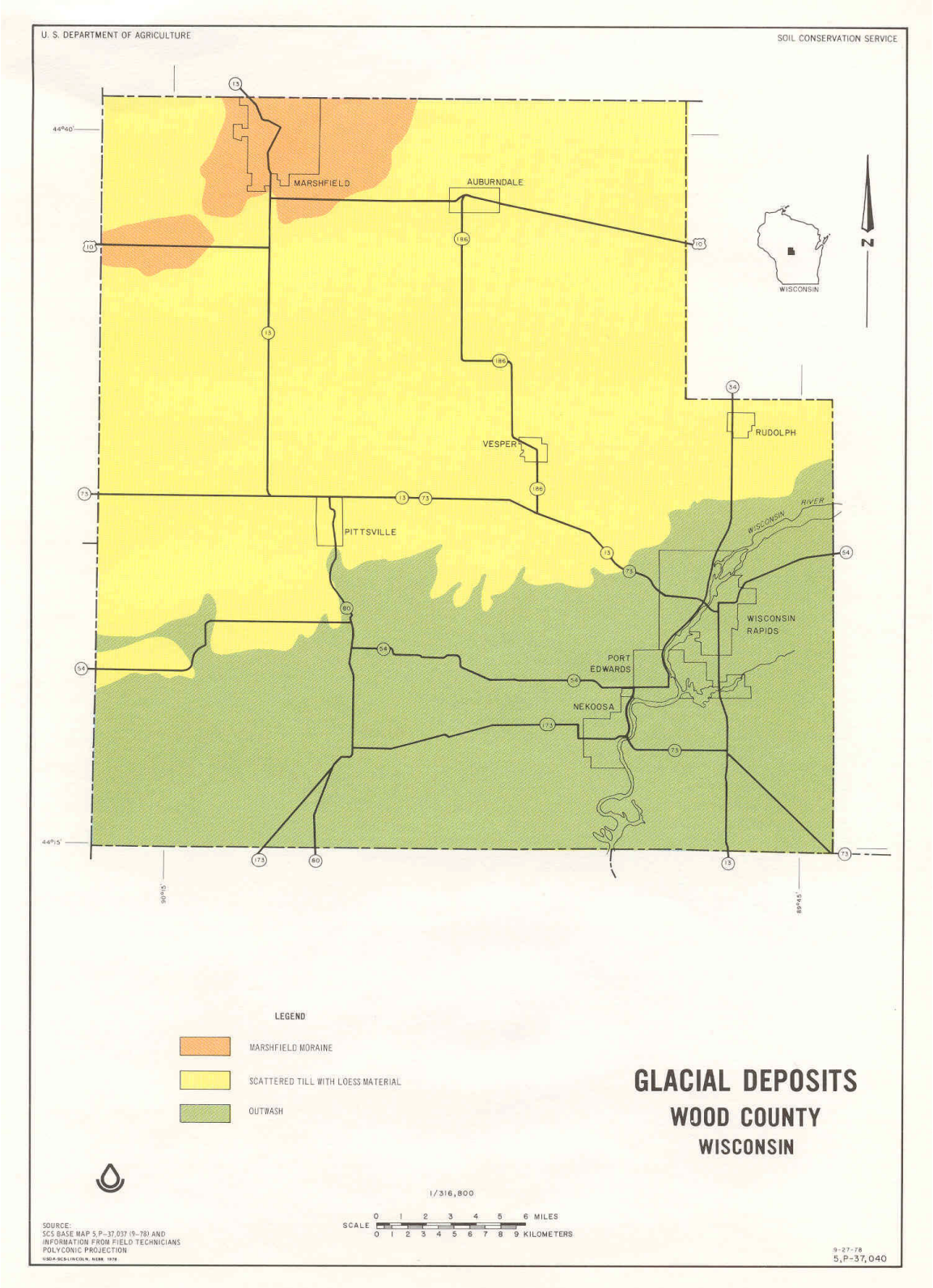
Physiology, Geology, and Drainage

Wood County lies in two geographic provinces of Wisconsin. The northern one-third is part of the Northern Highland, and the rest of the county is part of the Central Plain according to the Soil Survey of Wood County, Wisconsin.

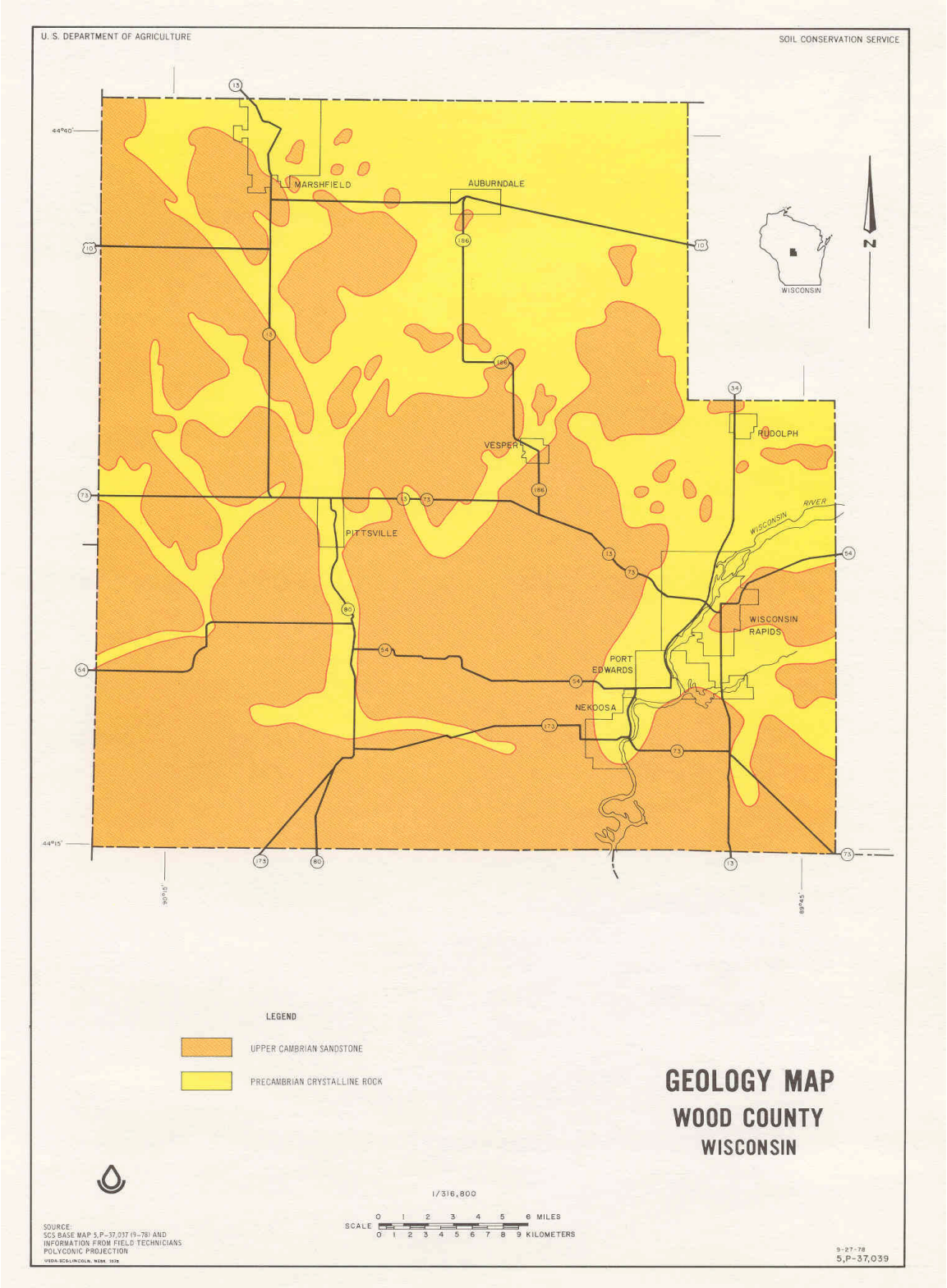
In general, the Northern Highland region has underlying bedrock that consists of Precambrian crystalline rocks. The western half of this region has a mantle of heavy loam glacial till over bedrock. The rest of this region has, over the bedrock, a layer, which varies in thickness; this layer is loamy residuum weathered from Precambrian rock. The entire region was covered by a layer, about two feet thick of wind-deposited silt.

The central plain region has underlying bedrock that consists of Cambrian sandstone interbedded with varying amounts of shale. The Shale layers are generally thin or absent in parts of Sigel and Hansen Townships, but are thick and very prominent in the western part of the county. Glacial till covers the sandstone and shale in the northwestern part of the county and on a few broad, low ridges south of Powers Bluff, but the rest of the Central Plain in Wood County is residual. One to two feet of loess cover the entire region except the lake plain and outwash parts. (See maps 2-4 and 2-5).

(2-4)


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MARSHFIELD
AUBURNDALE
VESPER
RUDOLPH
PITTSVILLE
WISCONSIN RAPIDS
PORT EDWARDS
NEKOOSA
WISCONSIN RIVER
WISCONSIN
N
LEGEND
MARSHFIELD MORAINE
SCATTERED TILL WITH LOESS MATERIAL
OUTWASH
GLACIAL DEPOSITS
WOOD COUNTY
WISCONSIN
1/316,800
SCALE 0 1 2 3 4 5 6 MILES
0 1 2 3 4 5 6 7 8 9 KILOMETERS
SOURCE:
SCS BASE MAP 5,P-37,037 (9-78) AND
INFORMATION FROM FIELD TECHNICIANS
POLYCONIC PROJECTION
9-27-78
5,P-37,040

(2-5)


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MARSHFIELD
AUBURNDALE
VESPER
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PITTSVILLE
WISCONSIN RAPIDS
PORT EDWARDS
NEKOOSA
WISCONSIN RIVER
WISCONSIN
N
LEGEND
UPPER CAMBRIAN SANDSTONE
PRECAMBRIAN CRYSTALLINE ROCK
GEOLOGY MAP
WOOD COUNTY
WISCONSIN
1/316,800
SCALE 0 1 2 3 4 5 6 MILES
0 1 2 3 4 5 6 7 8 9 KILOMETERS
SOURCE:
SCS BASE MAP 5,P-37,037 (9-78) AND
INFORMATION FROM FIELD TECHNICIANS
POLYCONIC PROJECTION
9-27-78
5,P-37,039

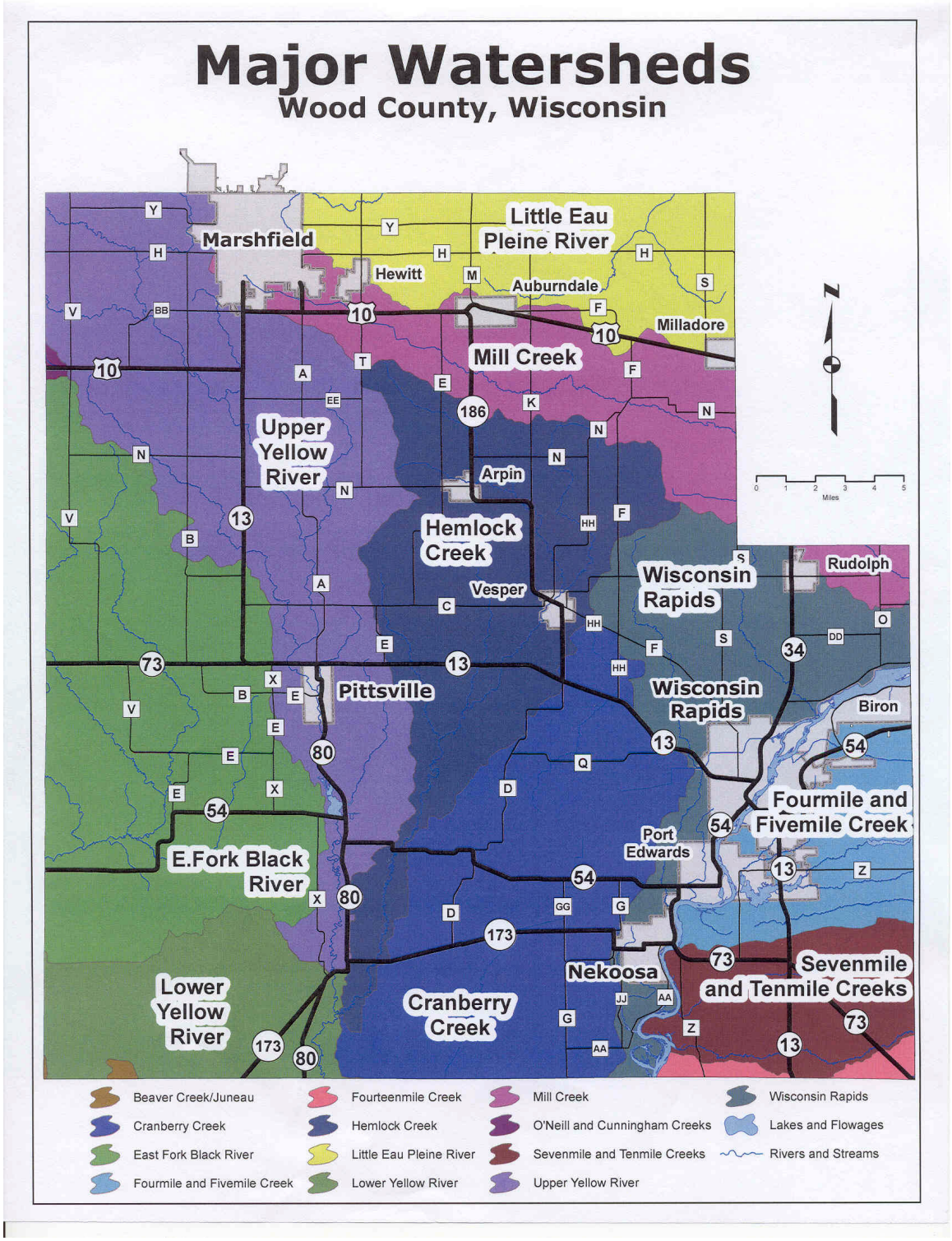
Wood County is drained by four primary drainage systems. The Wisconsin River flows through the southeastern quarter of the county and intercepts a number of small creeks that drain the eastern part of the county. Mill Creek flows eastward from Marshfield, draining part of northern Wood County. The Yellow River and Hemlock Creek system, which flows southward, drains the central and largest part of the county. The extreme western part of the county is drained by the westward-flowing East Fort of the Black River. A few small creeks in the extreme northern part of the county flow northward into the Little Eaupleine River in adjoining Marathon County. The watershed divides are generally low and ill-defined, as is characteristic of an area of low relief and somewhat poorly drained or poorly drained soils.

Watersheds and Drainage

A watershed can be defined as an interconnected area of land draining from surrounding ridge tops to a common point such as a lake or stream confluence with a neighboring watershed. All lands and waterways can be found within one watershed or another. Wood County watersheds are shown in (map 2-6). In Wisconsin, watersheds vary in scale from major river systems to small creek drainage areas and typically range in size from 100 to 300 square miles. River basins encompass several watersheds. There are 32 river basins in Wisconsin, which range in size from 500 to over 5,000 square miles. Wisconsin's 32 river basins are then divided in 23 geographic management units. These units or "GMUs" are the basis for the reorganized DNR and form the nucleus around which programs are implemented in the regions.

Wood County is located within two geographic management units (GMUs) including the Black-Buffalo-Trempeauleau, and the Central Wisconsin GMU. Within these GMUs, Wood County is located within two different river basins including the Central Wisconsin River Basin and the Black River Basin. Within these basins, ten distinct watersheds can be found.

(2-6)


Major Watersheds
Wood County, Wisconsin
Marshfield
Little Eau Pleine River
Hewitt
Auburndale
Milladore
Mill Creek
Upper Yellow River
Arpin
Hemlock Creek
Vesper
Wisconsin Rapids
Rudolph
Pittsville
Wisconsin Rapids
Biron
Fourmile and Fivemile Creek
Port Edwards
E.Fork Black River
Nekoosa
Sevenmile and Tenmile Creeks
Lower Yellow River
Cranberry Creek
N
Miles
Beaver Creek/Juneau
Cranberry Creek
East Fork Black River
Fourmile and Fivemile Creek
Fourteenmile Creek
Hemlock Creek
Little Eau Pleine River
Lower Yellow River
Mill Creek
O'Neill and Cunningham Creeks
Sevenmile and Tenmile Creeks
Upper Yellow River
Wisconsin Rapids
Lakes and Flowages
Rivers and Streams

Wetlands

According to Wisconsin State Statues, Chapter NR 103, wetlands are areas which water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

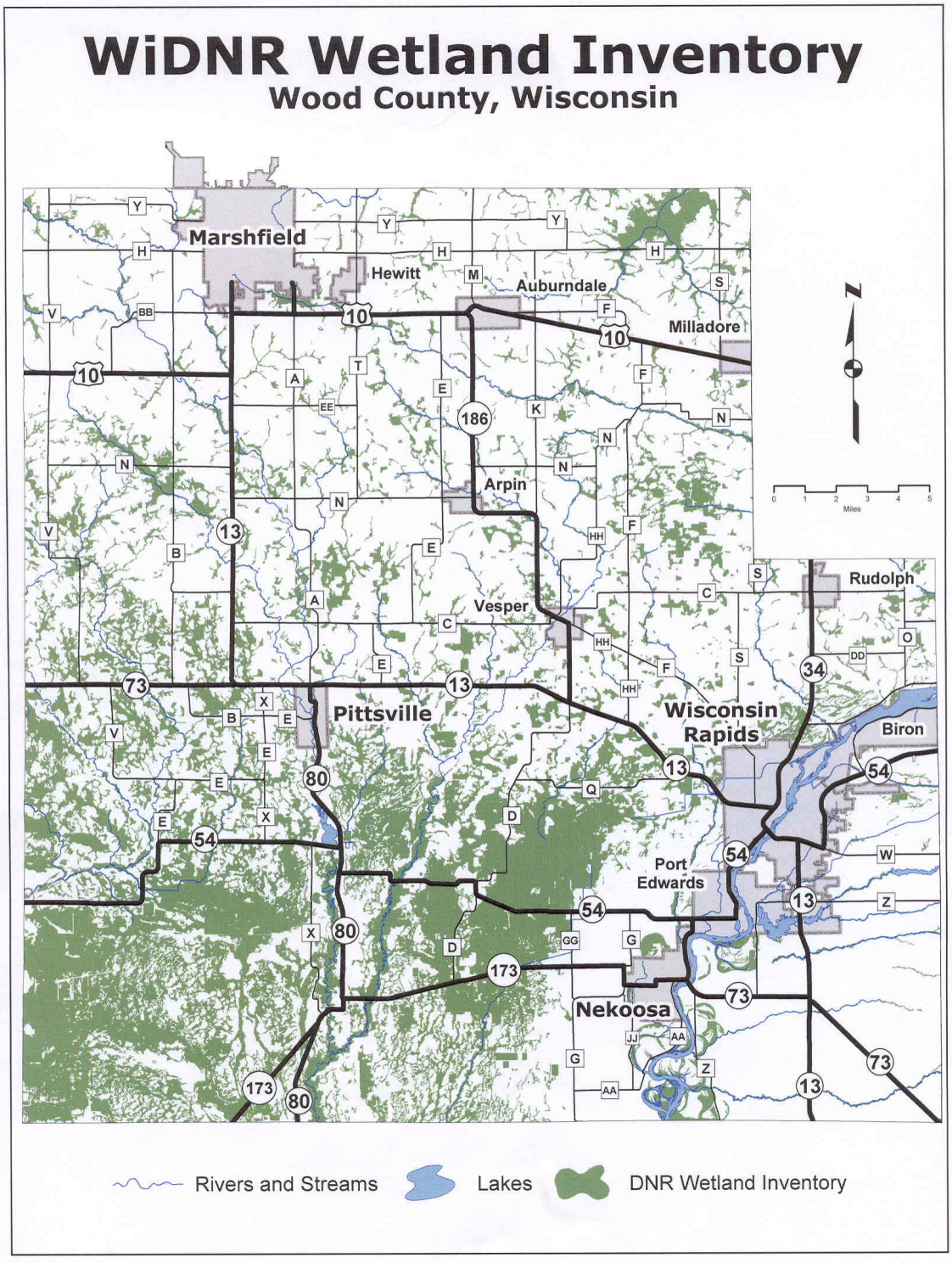
Wetlands may be seasonal or permanent and are commonly referred to as swamps, marshes, fens or bogs. Wetland plants and soils have the capacity to store and filter pollutants ranging from pesticides to animal wastes. Wetlands provide storage of floodwaters preventing damage to developed areas. Wetlands can make lakes, rivers, and streams cleaner, and drinking water safer. Wetlands also provide valuable habitat for fish, plants, and animals.

As is the case statewide and nationally, Wood County has experienced a decline in the number of quality wetlands. According to the WDNR, there are 131,068 acres of wetland in Wood County or 25.31% of total acres in the county. WDNR mapped wetlands for Wood County are shown in (map 2-7).

Construction of new, and expanded cranberry beds has traditionally been done in wetlands. Now, however, new construction is usually done in upland soil types, avoiding wetlands.

The Wisconsin DNR and the US Army Corp of Engineers require mitigation when natural wetland sites are destroyed. Several mitigations have taken place in Wood County during the past ten years. In many cases, the mitigated wetlands are of lesser quality than the destroyed wetlands.

(2-7)

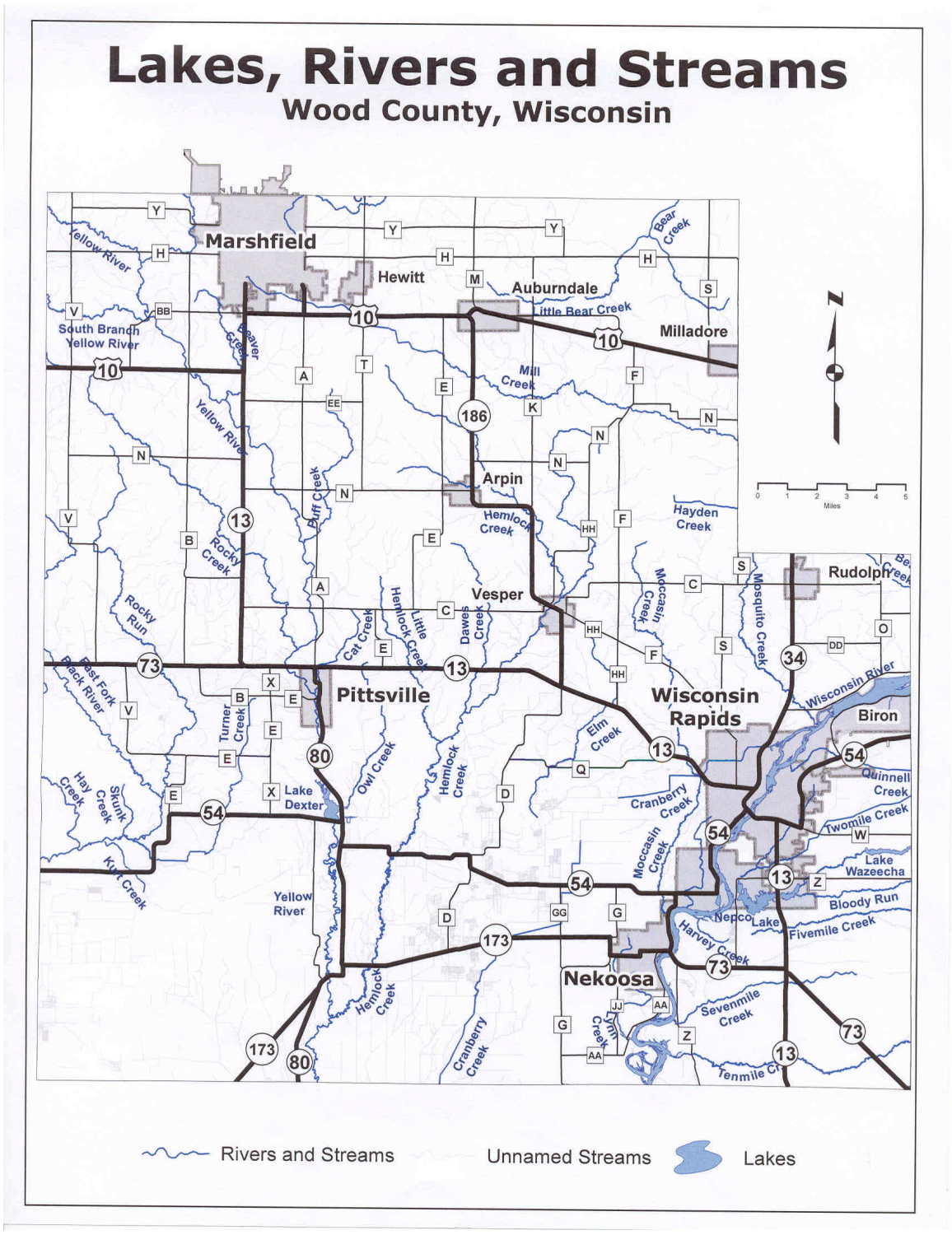

WiDNR Wetland Inventory
Wood County, Wisconsin
Marshfield
Hewitt
Auburndale
Milladore
Arpin
Vesper
Rudolph
Pittsville
Wisconsin Rapids
Biron
Port Edwards
Nekoosa
N
0 1 2 3 4 5
Miles
Rivers and Streams
Lakes
DNR Wetland Inventory

Surface Water Resources

Wood County has a total water surface of 7,250 acres, which includes nine named lakes, 70 unnamed lakes/flowages and 82 streams. Except for cranberry flowages, Wood County has very few lakes. Major lakes include Lake Wazeecha, Nepco Lake and Dexter Lake. All of these are impoundments.

The total stream length is 389.7 miles. Of this total, 26.4 miles are classified as trout streams. Major rivers in the county include, the Yellow River, Hemlock Creek, Mill Creek, East Fork Black River and the Wisconsin River (see map 2-8).

(2-8)


Lakes, Rivers and Streams
Wood County, Wisconsin
Marshfield
Hewitt
Auburndale
Milladore
Arpin
Vesper
Rudolph
Pittsville
Wisconsin Rapids
Biron
Nekoosa
Lake Dexter
Nepco Lake
Lake Wazeecha
Yellow River
South Branch Yellow River
Rocky Run
Hemlock Creek
Little Hemlock Creek
Cat Creek
Dawes Creek
Mill Creek
Little Bear Creek
Bear Creek
Beaver Creek
Bluff Creek
Hayden Creek
Moccasin Creek
Mosquito Creek
Elm Creek
Owl Creek
Cranberry Creek
Quinnell Creek
Twomile Creek
Bloody Run
Fivemile Creek
Sevenmile Creek
Tenmile Creek
Harvey Creek
Lynn Creek
Turner Creek
Hay Creek
Skunk Creek
Kurt Creek
East Fork Black River
Wisconsin River
N
0 1 2 3 4 5
Miles
Rivers and Streams
Unnamed Streams
Lakes

Impaired Waters

The listing of waters under the Clean Water Act (s.303(d) must, under current U.S. Environmental Protection Agency (EPA) requirements occur every two years. This list identifies waters which are not meeting water quality standards, including both water quality criteria for specific substances or the designated uses, and is used as the basis for development of Total Maximum Daily Loads (TMDLs) under the provisions of section 303(d)(1)(c) of the Act. The 303(d) list has been characterized as an impaired waters list.

There are three listed impaired water bodies in Wood County, according to the WDNR. These waters are listed within Wisconsin's 303(d) Waterbody Program and are managed by the WDNR's Bureau of Watershed Management. They include Lake Dexter, Mill Creek above Junction City, and the Wisconsin River near Port Edwards.

The one-mile stretch of the Wisconsin River near Port Edwards is on the list because of fish consumption advisory due to mercury contamination and contaminated sediment. Lake Dexter is on the list because of beach closings due to bacteria. 16.7 miles of Mill Creek in Wood County are on the list because of low levels of dissolved oxygen due to high amounts of phosphorus.

Outstanding and Exceptional Waters

Wisconsin has classified many of the State's highest quality waters as Outstanding Resource Waters (ORWs) or Exceptional Resource Waters (ERWs). Chapter NR 102 lists the ORWs and ERWs. The WDNR conducted a statewide evaluation effort in the early 1990's to determine which waters qualified for ORV and ERW classification. By January 1993, a significant number of waters were added to Chapter NR 102 as ORWs and ERWs. Wood County has 9.5 miles of Class I trout water classified as exceptional resource waters. This would include 3.2 miles of Bloody Run Creek, 2.0 miles of Five Mile Creek 1.0 mile of Lynn Creek, 0.3 miles of Rocky Creek, and 3.0 miles of Seven Mile Creek.

Groundwater

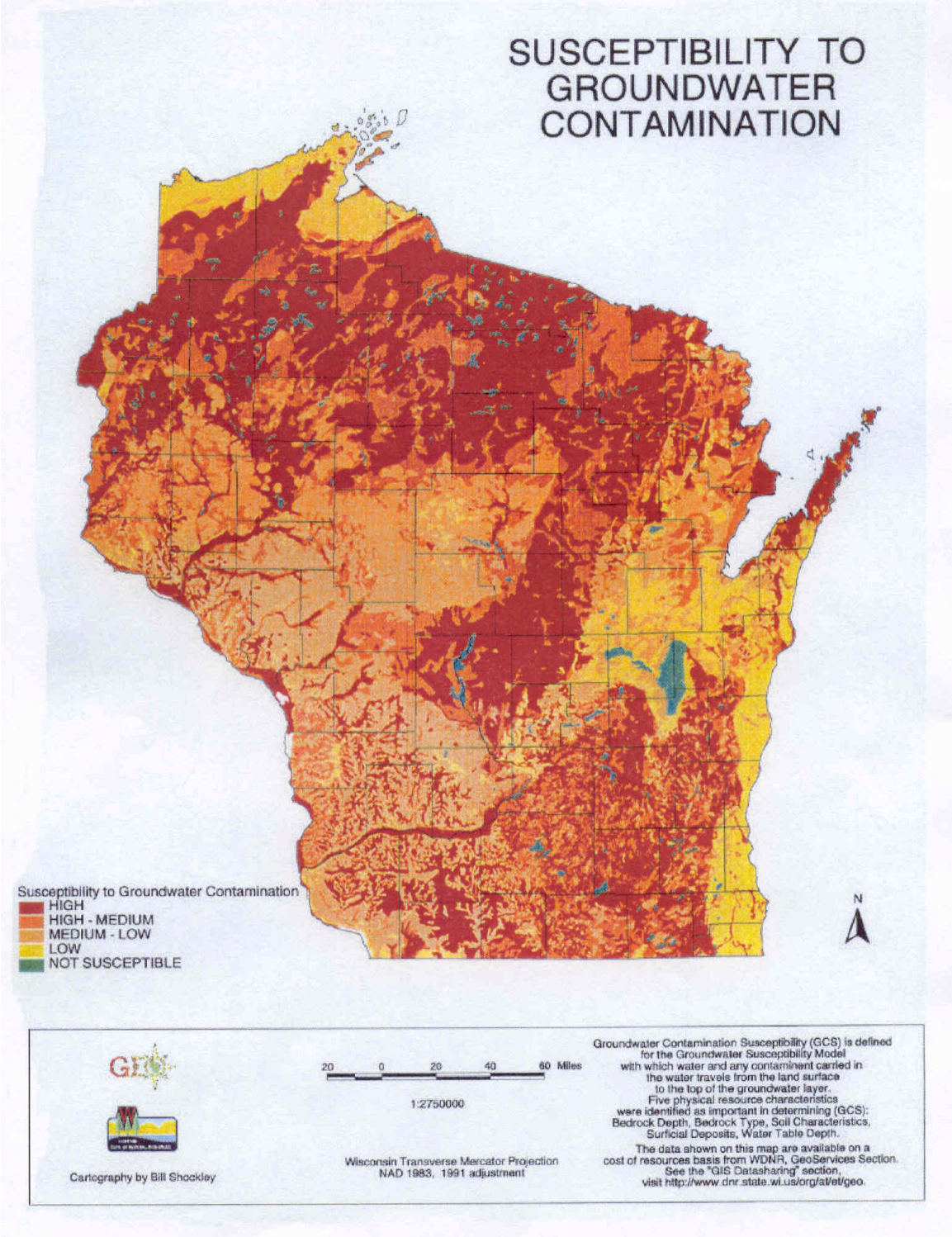
Groundwater is the source of all drinking water in Wood County and supplies many agricultural and industrial processes as well. Groundwater is a limited resource, and both its quality and quantity are important factors. These factors are primarily influenced by local geology and local land use. Groundwater in Wood County is generally abundant and of good quality.

Groundwater contamination is most likely to occur where fractured bedrock is near the ground surface, or where only a thin layer of soil separates the ground surface from the water table. According to WDNR map, Susceptibility To Groundwater Contamination, the northern two-thirds of the county ranked low to medium for susceptibility and the southern one-third of the county generally ranked medium to high for susceptibility to

groundwater contamination (see map 2-9). Potential sources of groundwater contamination include:

- Chemical storage
- Land spreading of sewage treatment plant sludge
- Road salt usage and storage
- Animal feedlots
- Use and spillage of fertilizers and pesticides
- Accidental spills
- Septic tanks and drain fields
- Underground storage tanks
- Underground pipelines and sewers
- Landfills
- Mines, pits, and quarries

(2-9)


SUSCEPTIBILITY TO GROUNDWATER CONTAMINATION
Susceptibility to Groundwater Contamination
HIGH
HIGH - MEDIUM
MEDIUM - LOW
LOW
NOT SUSCEPTIBLE
N
20 0 20 40 60 Miles
1:2750000
Wisconsin Transverse Mercator Projection
NAD 1983, 1991 adjustment
Cartography by Bill Shockley
Groundwater Contamination Susceptibility (GCS) is defined for the Groundwater Susceptibility Model with which water and any contaminent carried in the water travels from the land surface to the top of the groundwater layer.
Five physical resource characteristics were identified as important in determining (GCS): Bedrock Depth, Bedrock Type, Soil Characteristics, Surficial Deposits, Water Table Depth.
The data shown on this map are available on a cost of resources basis from WDNR, GeoServices Section. See the "GIS Datasharing" section, visit http://www.dnr.state.wi.us/org/at/et/geo.

Animal Waste Management

Because agriculture is so prevalent in Wood County, one of the most significant potential groundwater contamination sources is animal waste. Both storage and spreading of animal waste can contaminate groundwater if not done properly.

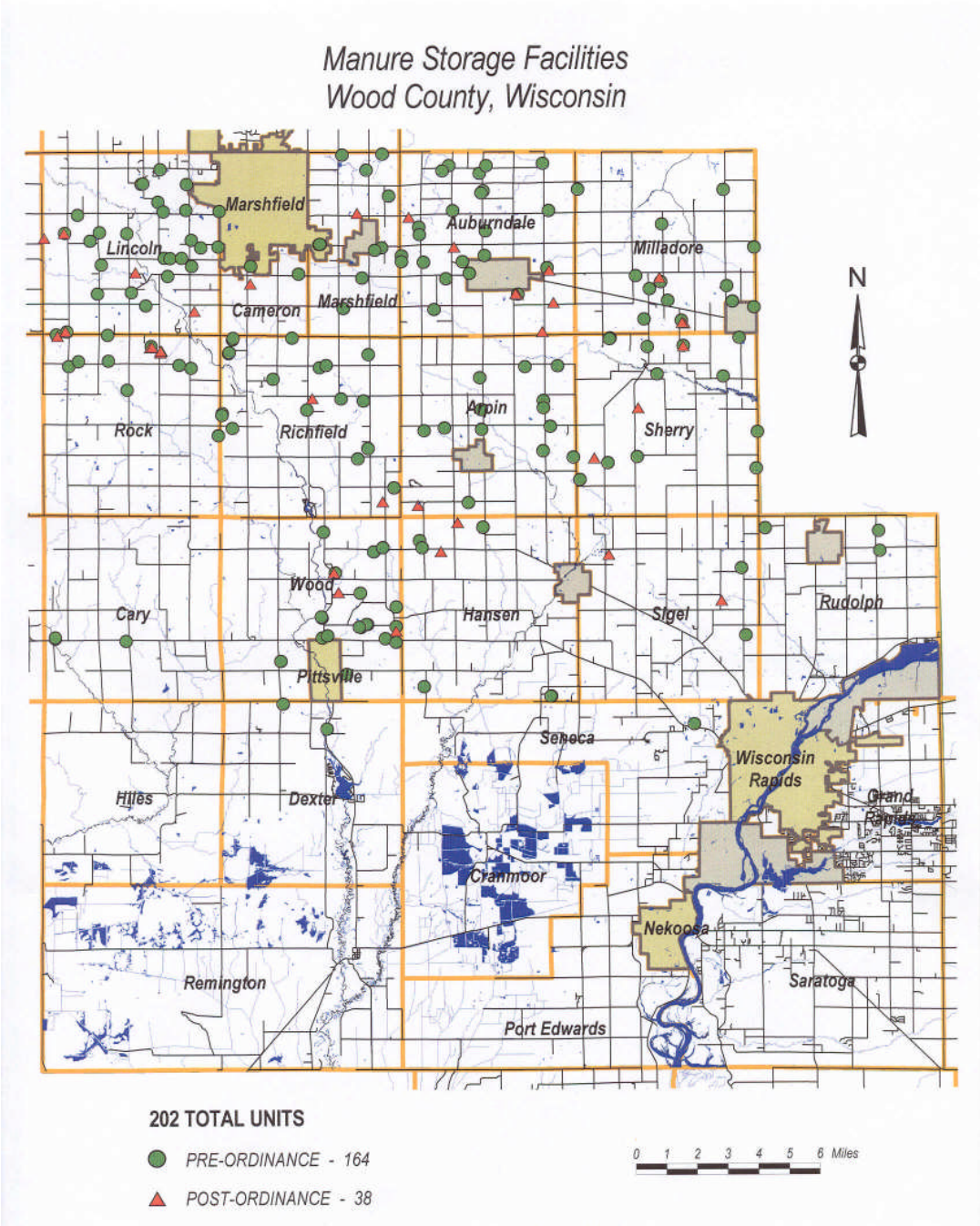
Animal waste storage facilities currently in use range from manure pits dug 50 years ago to newly engineered and installed storage structures. Currently there are 188 animal waste storage facilities in Wood County (see map 2-10). According to Land Conservation Department records, 84 of these structures were designed and installed to meet technical standards and specifications that were in effect at the time they were built. It is estimated that there are 104 manure storage facilities that do not meet any type of technical standards for design and installation. Wood County regulates the location, design, and installation of animal waste through its Animal Waste and Manure Management Ordinance. This ordinance ensures that all new, substantially altered, and abandoned manure storage facilities are completed in compliance with approved standards and specifications. The ordinance also requires that permitted storage facilities submit and follow an annual nutrient management plan.

The State of Wisconsin regulates livestock operations with 1,000 animal units or more and those livestock operations with less than 1,000 animal units that have discharges that significantly affect water quality.

The WDNR has also created Agriculture Performance Standards and Prohibitions through Administrative Rule NR 151, State Statutes. The performance standards and prohibitions were created to control polluted runoff from farms, as well as other sources, to help protect Wisconsin's lakes, streams, and groundwater. The agriculture performance standards apply to all farm operations in Wisconsin.

(2-10)

MAP OF WOOD COUNTY ANIMAL WASTE FACILITIES



Agricultural and Natural Resource Trends and Outlook

The following are anticipated farmland trends for the next five years in Wood County.

- Increased pressure to convert farmland to other uses.
- The size of the average farm will continue to show moderate increases.
- The number of dairy farms will continue to decline.
- Dairy herd sizes will continue to increase.
- Expect an increase in the number of large dairies that are required to obtain WPDES permits.
- Decreased interest in farmland preservation programs.
- Increased interest in cash cropping.
- Dairy herd production will continue to increase.

The following trends are anticipated with respect to forest resources within the county.

- Demand for forest products is predicted to increase, while forestlands managed for timber harvest are expected to decrease.
- Property tax burden will increase for private forest owners not enrolled in a management program (MFL).
- Interest in voluntary management programs that supply a property tax break including MFL will increase.
- Forestland sales at rising prices for recreational purposes will continue.
- Continued interest in "living in the woods" will lead to additional forest fragmentation.
- The variety of recreational uses requested in the county forest will increase.
- The number of recreation enthusiasts attempting to use the county forest will increase.

The following are other anticipated trends with regard to agricultural, natural, or cultural resources within the county.

- Interest in using water features for recreational purposes will continue.
- The county's woodlands and highland areas will be desired as residential building sites.
- Demand for sand and gravel resources will continue.
- Livestock grazing along waterways will continue.
- Challenges to groundwater resources will grow including increasing quantity of withdrawal and increasing potential contamination sources.

Land Use

As populations continue to grow, more emphasis will be needed on protecting the natural resources. Land use in Wood County is predominately agriculture and woodland. Agricultural land occupies 46 percent of the total area of the county or 240,000 acres. Approximately 77 percent of the farmland is in cropland with corn, oats, hay, and soybeans being the main crops. Cranberries are the next major agricultural crop with between 65 and 70 marshes in operation; these cranberry marshes total between 5,000 and 6,000 acres in some stage of production.

Woodlands also occupy a major portion of the land area in Wood County with aspen, oak, white birch, and conifers being the dominant species. Much of the forests are used by the paper mills for huge amounts of pulpwood, which is vital for paper production. There are also a significant number of tree farms specializing in Christmas trees located in the southern part of the county. Of the 516,544 acres in the county, 206,500 or 40 percent, are classified as woodland. The County forest contains 37,536 acres of woodland.

The Wisconsin Department of Natural Resources provides forest management assistance to woodland owners in Wood County. The WDNR forester, located in Wisconsin Rapids provides help in tree planting, timber sale establishment, non-commercial thinning and pruning, and general land management planning. The WDNR also administers the forest Stewardship Program, the Wisconsin Forest Landowner Grant Program and provides technical assistance to the Farm Service Agency and the Natural Resources Conservation Service on other forestry cost-sharing program.

Sediment Delivery

The Wood County Land Conservation Department conducts an annual countywide transect survey of cropland to gather information on conservation tillage and soil loss rates. The survey provides a database of reliable information that can be used to monitor trends. These trends can be used to direct program activities. The data from this survey estimates that 92 percent of cropland fields in Wood County have soil loss rates below tolerable soil loss levels. Although soil erosion is not a prominent water quality problem in Wood County, it does provide a means of transporting nutrient rich soil particles and animal waste to lakes and streams. It is important to prevent the migration of nutrients to surface waters by installing best management practices that reduce erosion rates.

Air Quality

In order to evaluate the quality of the air and to protect the public health, a series of National Ambient Air Quality Standards has been developed by the U.S. Environmental Protection Agency as established in Section 109 of the Clean Air Act. According to the Wisconsin Air Quality Report, as prepared by the Wisconsin Department of Natural Resources, the air pollutants affecting Wisconsin include sulfur dioxide, suspended particulate matter, carbon monoxide, ozone, oxides of nitrogen, lead, sulfates, and nitrates. Although wind erosion is not a prominent air quality problem in Wood County, it does provide a means at certain times of the year of displacing topsoil particles into the air causing poor visibility and other air quality issues. It is important that the Wood County Land Conservation Department continues to work with the Central Wisconsin Partners (CWWP) to assist potato and vegetable growers in the central sands region of Wood County with wind erosion control. The (CWWP) is a cooperative venture of the Wisconsin Potato and Vegetable Growers Association; the Vegetable Processing Industry; the Land Conservation Committees of Adams, Juneau, Portage, Waushara, and Wood Counties; the Golden Sands Resource Conservation and Development Area; the Natural Resources Conservation Service; the University of Wisconsin; and the University of Wisconsin Cooperative Extension Service. The (CWWP) assists growers with wind erosion control by offering a full service windbreak establishment and maintenance program, conducting on-farm conservation tillage demonstrations, and providing education and information to growers.