CHAPTER 5: AGRICULTURE, NATURAL, AND CULTURAL RESOURCES

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CHAPTER 5: AGRICULTURAL, NATURAL, AND CULTURAL RESOURCES

INTRODUCTION

Agricultural, natural, and cultural resources give definition to a community and strongly affect its quality of life. For communities in Waushara County, a tapestry of working farms interwoven with large stands of woodlands and wetlands continue to dominate the rural landscape and help shape the area's identity and culture. The County's natural features such as topographic relief, lakes, streams, wetlands and soils also have a significant bearing on historic and contemporary land use, development patterns and contribute to a strong heritage of outdoor recreational pursuits. Fishing, swimming, hunting, and other outdoor activities are important quality of life past-times. The area's lakes and other scenic landscape features provide attractive home sites for many permanent and seasonal residents. At the same time, many of these environmental elements have limiting conditions that make them less than ideal for supporting particular types of activity or development. Understanding the relationship between these environmental characteristics and their physical suitability to accommodate specific types of activity or development is a key ingredient in planning a community's future land use.

INVENTORY AND ANALYSIS

This chapter provides an inventory of existing agricultural, natural, and cultural resources. In addition, existing policies associated with these resources are discussed.

Agricultural Resources

Waushara County as a whole has had a farming history and tradition that have attracted residents to the area. Waushara County farmers produce a variety of feed and cash crops. Farming and other agricultural activities contribute significantly to the local economy. As with elsewhere in rural Wisconsin, these trends are changing as new developments encroach on productive farmland. The suburbanization trend is of great concern to both farmers and residents of the County. This section will look at important farmland classifications, agricultural land cover and farmland loses, and sales between 1990 and 1997. The UWEX Program on Agricultural Technology Studies is currently finalizing an updated *Wisconsin Town Land Use Databook; Town-Level Farming and Land Use Trends* from 2002 - 2007. This document is to be published in early 2009 and will provide a more comprehensive view of Waushara County's agricultural trends.

Agricultural Land Cover

Agricultural land cover includes row crops (corn, peas, potatoes, snap beans, soybeans and other row crops); forages (hay and hay/mix); and grassland (timothy, rye, pasture, idle, Conservation Reserve Program land, grass and volunteer grasses).[1] ***Agricultural land cover, which includes row crops, forages, and grassland, comprised over 56 percent of the total area of Waushara County*** (Table 5-1).[1]

[1] Jackson-Smith, D., and E. Finnin. 2001. *Wisconsin County Agricultural Trends in the 1990s.*

Table 5-1. Percent of Land Cover, 1991—1993

	Row Crop	Forages	Grassland	Total Farmland
Waushara County	26.6%	9.0%	20.4%	56.0%

Source: UWEX Program on Agricultural Technology Studies, 1999

While 56 percent of the land in Waushara County is farmland, within the individual towns the percentage varies. Towns with a larger share of total farmland include Oasis (81.8%), Hancock (66.3%), Deerfield (66.0%) and Plainfield (63.8%). On the other end, ***towns with a smaller share of total farmland are usually areas with a higher number of lakes*** and include the towns of Springwater (40.4%), Leon (42.7%) and Mount Morris (45.7%). A further breakdown of total farmland includes row crops, forages and grassland. Row crops, within the individual towns, ranges from a high of 45 percent (T. Oasis) to a low of 13.3 percent (Town of Leon). Forages or hay and hay mix cover a smaller land area in the county than row crops and grassland. ***Higher shares of land in forage are generally found in the eastern part of the county*** and include the towns of Aurora (14.9%), Poy Sippi (21.2%) and Bloomfield (20.5%). Exceptions are the towns of Oasis (19.0%) and Hancock (11.6%). ***Towns with lower land area in forages generally have a larger percentage of land in grassland.*** Grassland in the county varies from a high of 36.9 percent in the Town of Coloma to a low of 3.1 percent in the Town of Aurora. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Farmland Losses

Farm and farmland losses are the result of economic pressures within agriculture as well as competition for agricultural lands from residential and recreational development. Within the state and nation there has been a steady decline in the number of farms and farmland acreage. Trends have indicated that, while the number of farms has declined, the acreage per farm has increased. While this may be a state trend, it was not true for Waushara County. Between 1990 and 1997, the average farm size decreased from 291 acres to 278 acres. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

In 1997, an estimated 710 farms existed within Waushara County. This represents a net gain of one farm from 1990 (Table 5-2). Individual towns within Waushara County experienced both significant gains and considerable losses in respect to the total number of farms between 1990 and 1997. During this time period, the largest gain occurred in the Town of Oasis. The total number of farms doubled in Oasis, increasing from 27 farms in 1990 to 54 farms in 1997. Other towns experiencing gains included Aurora (6), Bloomfield (11), Dakota (5), Hancock (8), and Springwater (1). At the other end of the spectrum, farm losses occurred in the towns of Rose (19), Wautoma (9) Warren (1), Plainfield (3), Mount Morris (1), Marion (9), Deerfield (1) and Coloma (1).

In 1997 Waushara County recorded 1.2 farms per square mile.[2] Farms per square mile varied greatly for Waushara County towns. The Town of Bloomfield with the largest total

[2] UWEX Program on Agricultural Technology Statistics. 1999. *Wisconsin Land Use Databook: Town-level Farming and Land Use Trends 1990-1998, Waushara County.*

number of farms (81) in 1997 had an estimated number of 2.3 farms per square mile. On the other hand, the towns of Springwater and Marion with a total of 17 farms in 1997 had an estimated number of 0.5 farms per acre.

Following trends in other areas, dairy farms within Waushara County have declined since 1990 (Table 5-2). ***In 1990, there were 232 in Waushara County; by 1997, the County lost 101 dairy farms.*** The loss in dairy farms represented a loss of 43.5 percent countywide during this time period. Only one town (Richford) saw a gain in dairy farms; the Town gained one dairy farm, between 1990 and 1997. Generally, towns experienced losses in the number of dairy farms between 1990 and 1997. In 1990, the number of dairy farms varied from a high of 39 in the Town of Bloomfield to a low of two in the towns of Hancock and Plainfield. By 1997, the number of dairy farms in Waushara County towns' ranged from a high of 22 in Bloomfield to a low of one in Hancock and Plainfield. ***The major losses in the number of dairy farms generally occurred in the towns that had the largest numbers of farms.*** Therefore the Town of Bloomfield with 39 dairy farms in 1990 lost 17 dairy farms between 1990 and 1997.

Table 5-2. Trends in Farm Numbers, 1990 – 1997

	Estimated Farms				Dairy Farms			
	1990	1997	% Change	Per sq. mile (1997)	1990	1997	% Change	Per sq. mile (1997)
Waushara County	709	710	0.10%	1.2	232	131	-43.50%	0.2

Source: UWEX Program on Agricultural Technology Studies, 1999

Although the total number of farms increased, the total amount of farmland decreased. ***Between 1990 and 1997, 9,066 acres (4.4%) of farmland were lost countywide*** (Table 5-3). Only one town experienced an increase in the acres of farmland on the tax roll. During this time period, the Town of Oasis had 381 acres added to its tax roll. Largest losses were experienced by the towns of Deerfield (1,092 acres) and Marion (930 acres).

Table 5-3. Loss of Farm Acres, 1990 – 1997

	Farmland (Acres)		Percent Change	% of County Taxed as Farmland (1997)
	1990	1997		
Waushara County	206,263	197,197	-4.40%	54.10%

Source: UWEX Program on Agricultural Technology Studies, 1999

When agricultural land is sold in the State of Wisconsin, information is collected by the Wisconsin Department of Revenue regarding whether the land is going to remain in agricultural use. It should be noted that the Wisconsin Department of Revenue only collects information on larger parcels. In 1990 a "large" parcel was 20 acres in area and in 1997 a large parcel was increased to 35 acres in area. ***Between 1990 and 1997, 974 parcels encompassing 43,438 acres was sold in the County*** (Table 5-4). ***Approximately 78 percent (33,881 acres) of this land remained in agricultural use, while 22 percent (9,558 acres) was converted to other uses.*** The largest, in excess of 3,000 acres of farmland per town, was

sold in the towns of Bloomfield (3,357 acres), Hancock (3,574 acres) and Poy Sippi (3,377 acres) between 1990 and 1997. Of this amount, about a quarter (21.6%) was converted to other uses; Bloomfield (1,069), Hancock (282 acres) and Poy Sippi (877 acres).

Table 5-4. Farmland Sales, 1990 – 1997

	No. Parcels Sold	Remain Agricultural	Converted to Other	Total Acres
Waushara County	974	33,881	9,558	43,439

Source: UWEX Program on Agricultural Technology Studies, 1999

Farmland Soils

Waushara County's farmland contributes to the quality of life, provides an open agricultural landscape, and adds to the economy of the area. A classification system rating the suitability of a specific area based on soil type and condition was developed by the U.S. Department of Agriculture.[3] These classifications in order of importance are: 1.) prime farmland, 2.) unique farmland, 3.) farmlands of statewide importance, 4.) farmlands of local importance, and 5.) other lands. Table 6-5 and Exhibit 6-1 summarize the distribution of available farmland in these categories.

Prime farmland, as defined by the U.S. Department of Agriculture is "the land that is best suited for food, feed, forage, fiber, and oilseed crops" when managed according to acceptable farming methods. These lands may be cultivated, pasture, woodland, or other land, however the land cannot be built-up, urbanized, or a water area. Prime farmland produces the highest yields with minimal inputs of energy and economic resources with the least damage to the environment. Criteria used to determine prime farmland include an adequate and dependable supply of moisture from precipitation or irrigation, few or no rocks, high permeability, gently sloping terrain (0 to 6%) and a low erodibility. Prime farmland is not frequently flooded during the growing season or saturated with water for long periods of time. Soils that have a seasonal high water table may qualify as prime farmland if this limitation is overcome by drainage measures.

Unique farmland is defined as land other than prime farmland that is used to produce specific high-value food or fiber crops. It has a moisture supply, either from stored precipitation or irrigation systems, and combines favorable factors of soil quality, growing season, temperature, humidity, drainage, elevation, aspect or other conditions. Examples of specialty crops that typically require a high management and investment level include apple orchards, lettuce, carrots, celery, and cauliflower.

Farmlands of statewide importance are lands in addition to prime and unique farmland that are important to the State of Wisconsin for crop production.

Farmlands of local importance are lands in addition to the previous three categories which are important to Waushara County for crop production.

Other lands are areas which have little value for producing crops.

[3] USDA. 1993. *USDA Handbook 18: Soil Survey Manual*.

According to the above criteria, ***the highest percentage of land within the County is considered unique farmland.*** Within the County, 39.3 percent (160,170 acres) is classified as unique farmland. Of this total approximately 49,095 acres needs to be drained before the land can be utilized. Unique farmland is located throughout Waushara County, but is less predominant to the west of the outer moraine in the towns of Coloma, Hancock and Plainfield. Local importance farmlands are the second most abundant category of farmland (20.4%) with a total of 83,051 acres. These farmlands are scattered throughout the County, but are less common in the eastern tier of the County in the towns of Bloomfield, Poy Sippi and Aurora. ***Prime farmland accounts for 18 percent (73,361 acres) of the land in the Waushara County.*** It is predominant in the eastern tier of the County in the towns of Aurora, Poy Sippi and Bloomfield and between the inner and outer moraine in the Town of Oasis. Approximately 12 percent (47,713 acres) of land is considered other lands, while 8.7 percent (35,449 acres) of the land is classified as State importance farmlands (Table 5-5, Exhibit 5-1). The remaining 8,190 acres are classified as water. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Table 5-5. Important Farmland Classes

	Waushara County	
Farmland Class	Acres	Percent
Prime Farmland	73,361	18.0%
Unique Farmland	160,170	39.3%
State Importance	35,449	8.7%
Local Importance	83,051	20.4%
Other Lands	47,713	11.7%
Water	8,190	2.0%
Total	**407,933**	**100.0%**

Source: USDA-NRCS, 1982, Waushara County, 2003.

Natural Resources

This section will describe the general soils' associations of Waushara County together with the soils' suitability for on-site waste disposal, septage spreading, the potential for building site development and steep slopes. It will also explain the water resources of the area including watersheds and drainage; lakes, ponds and quarries; rivers and streams; floodplains; wetlands and groundwater. Wildlife, parks, open space, recreational and mineral resources will also be touched upon.

Soils

Soils provide the physical base for development and agriculture within a community. Knowledge of their limitations and potential difficulties is important in evaluating crop production capabilities and other land use alternatives such as residential development, and utility installation. The criteria considered by the Natural Resource Conservation Service (NRCS) in establishing the severe rating of soils include wetness, shrink–swell potential, bearing strength, susceptibility to flooding, land spreading, slope steepness, and frost action.[4] Severe

[4] U.S. Department of Agriculture Soil Conservation Service. 1989. *Soil Survey of Waushara County, Wisconsin*.

soil limitations do not necessarily exclude areas from being developed, but instead indicate that more extensive construction measures must be taken to prevent environmental and property damage.

Soils are classified according to their associations, which are a grouping of similar soil types based on geographic proximity, physical characteristics, and permeability. There are eight major soil associations within Waushara County.

Plainfield-Okee-Richford Association soils are sloping to steep sandy soils located on moraines, hills, and terraces. Plainfield soils are rapidly permeable and excessively drained, while Okee and Richford soils are moderately permeable and somewhat excessively drained. Slopes range from 6 to 30 percent. While some of the Richford soils are used for cropland, most acreage in this association is used for woodlands. These soils are especially suited for pine species. This association is found in the central part of the county, from the outer moraine east through the area of drumlins and pitted outwash plans, stopping short of the area that includes the former lake plain.

Plainfield-Richford-Boyer Association soils are nearly level and gentle sloping soils that are well drained to excessively drained sandy soils located on outwash plains and terraces. Most acreage in this association is used as irrigated cropland; a few areas are suitable for woodlands. Soil erosion and very rapid permeability are the main concerns with this association. This association is found in the western part of the county from the outer moraine east and through the towns of Marion, Dakota and Mount Morris.

Kingsville-Meehan Association soils are nearly level and gently sloping soils that are poorly drained sandy soils located on glacial outwash plains, glacial depressions, and lake basins. Most of the acreage in this association is used as cropland; some areas are used as pasture or woodlands. Many of the areas are drained and used as irrigated cropland. The main concerns of this association are wetness and low available water capacity. This association is found in the western corner of the County in the towns of Plainfield and Hancock, and through the central portion of the County in the towns of Richford, Dakota, Wautoma, Springwater, Mount Morris and Leon.

Houghton-Adrian-Willette Association soils are nearly level poorly drained, mucky soils; located in depressions of outwash plains, glacial lake basins, and moraines. Most of the acreage in this association is used for water tolerant native vegetation; however a few areas can be drained and used for specialty crops. The main management concerns are wetness, subsidence when the soils are drained, and a short growing season caused by cold air flowing into depressions. This association is found in the central portion of the County in the towns of Richford, Dakota, Wautoma and Mount Morris and in the eastern tier of the County in the towns of Warren, Leon, Saxeville, Aurora, Poy Sippi and Bloomfield.

Hortonville-Symco-Manawa Association soils are nearly level to sloping, well drained to somewhat poorly drained, silty, loamy, sandy soils, located on moraines and in glacial lake basins. The majority of acreage in this association is used for cropland with some areas used as pasture or woodlands. The majority of soils in this association are poorly suited for septic absorptions fields. Soil erosion is the only major management concern for this association. This association is found in the eastern tier of the County in the towns of Warren, Leon, Saxeville, Aurora, Poy Sippi and Bloomfield.

Plainfield-Pearl-Leola Association soils are moderately well drained sandy soils which are nearly level to gently sloping. These soils are found in glacial outwash plains. The soils within this association range from well to moderately drained (Plainfield and Pearl) to poorly drained (Leola). Most of the acreage in this association is used as irrigated cropland with some areas used as pasture or woodlands. The main concerns of this association are low available water capacity, soil blowing and wetness. This association is found is the western corner of the County in the towns of Plainfield and Hancock and a small area in the Town of Dakota.

Poy-Zittau-Poygan Association soils are somewhat poorly to poorly drained, clayey and silty soils which are nearly level and gently sloping. These soils are found in depressions and drainageways in glacial lake basins and on moraines. Most of the acreage in this association is drained and use as cropland. Some areas are used as pasture or woodlands. The major management concerns are wetness and the low or moderate available water capacity. This association is found in the eastern tier of the County in the towns of Warren, Aurora, Poy Sippi and Bloomfield.

Morocco-Kingsville-Keowns Association soils are nearly level and gently sloping, to poorly drained, sandy and silty soils, located in drainageways and depressions in glacial lake basins. Most of the acreage in this association is used as cropland; however some areas are used as pasture or woodlands. The Morocco and Keowns soils are suited to trees, but the Kingsville soils are poorly suited to this use due to wet conditions during the growing season. The main management concerns are wetness, low available water capacity, and hazard of soil blowing in the areas of the Morocco and Kingsville soils. This association is found in small areas in the eastern tier of the County in the towns of Leon, Bloomfield, Warren and Marion.

On-Site Waste Disposal

Exhibit 5-2 identifies suitability for on-site waste disposal options based on an evaluation of soil characteristics. This map is not intended to serve as a substitute for on-site soil investigations, but rather as an indicator of reasonable expectations for soils underlying a site.

Evaluation of the soil data indicates that the vast majority of the soils in the County (78%) are rated suitable for conventional or at-grade in-ground pressure or mound systems (Table 5-6). Generally, soils near streams and rivers are the least suitable for on-site waste disposal. Areas with high groundwater or characterized by poorly drained soils are also more likely to be unsuitable for on-site systems.

Over three-quarters of the soils in Waushara County are capable of supporting private on-site wastewater disposal systems. ***About 59 percent of the area in the County is suitable for conventional systems; while another 19.2 percent is suitable for at-grade, in-ground pressure and mound systems.*** The remaining 0.1 percent (58 acres) of the soils in the County is rated unsuitable for on-site systems due primarily to wet soil conditions and low permeability. Water features account for 2 percent of the surface area Waushara County. Essentially, areas in the eastern part of the County in the former lake bottom are less suitable for on-site septic systems. The other major area of less suitable materials is found in the northwestern corner of the County to the west of the outer moraine. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Table 5-6. Soil Limitations for On-Site Waste Disposal

	Conventional		At-Grade[1]		Holding Tank[2]		Unsuitable		No Rating		Water		Total
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres
Waushara County	239,768	58.8%	78,302	19.2%	31,415	7.7%	50,199	12.3%	58	0.0%	8,190	2.0%	407,933

[1] Includes in-ground pressure and mound systems.

[2] Includes new technology systems producing 10^4 or less coliform fecal units (cfu) per 100ml.

Source: USDA-NRCS, 1982, Waushara County, 2003.

Building Site Development

The USDA-Natural Resource Conservation Service has evaluated soil characteristics and rated soil potential for building site development based upon wetness, shrink-swell potential, bearing strength, susceptibility to flooding, slope steepness, and frost action. The ratings range from low to very high potential. Typically, areas near flowages and in wetlands have the lowest ratings. Exhibit 5-3 identifies soil potential for building site development. ***Just over one third of the area within County (34.8%, 141,989 acres) has soils that are considered to have a very high suitability for building site development***, while an additional 22.8 percent (93,197 acres) have a medium suitability (Table 5-7). Approximately 40.3 percent (164,557 acres) of the county is rated very low or is not rated for building site developments. Water accounts for two percent of the area. Generally very low ratings are found in the eastern tier of the county in the area of the former lake basin, other areas near flowages and wetlands are scattered throughout the county. The greatest concentration of areas of very high suitability is found to the west of the outer moraine and in the area between the inner and out moraine in the western part of the county. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Table 5-7. Soil Potential for Building Site Development

	Very High		Medium		Very Low, No Rating		Water		Total
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres
Waushara County	141,989	34.8%	93,197	22.8%	164,557	40.3%	8,190	2.0%	407,933

Source: USDA-NRCS, 1982, Waushara County, 2003.

Septage Spreading

The Waushara County Land Conservation Office has evaluated soil characteristics for the suitability of septage spreading based on groundwater depths, permeability, soil texture, slope, wetness, and soil depths (Exhibit 5-4). The ratings range from none or slight to severe. Soils rated slight are relatively free of limitations that affect the intended use or have limitations that are easily overcome. Soils with moderate limitations can normally be overcome with corrective planning, careful design, and good management. Soils rated severe have physical limitations which are severe enough to make the use of the soil doubtful for the proposed use. Septage spreading cannot occur within 300 feet or rivers and streams or within 1,000 feet of lakes unless they are incorporated into the soil within 72 hours of application. Spreading rates need to be based on current soil tests, on-site vegetation, and a septic nutrient test.

Only 28.5 percent (116,303 acres) pose a slight risk to no limitations for septage spreading throughout the County. Approximately 29 percent (118,864 acres) are listed as having a moderate risk, while 40.2 percent (164,043 acres) of the soils in Waushara County are considered a severe risk for septage spreading (Table 5-8). The greatest concentration of areas of none to slight limitations is found to the west of the outer moraine and in the area between the inner and out moraine in the western part of the county. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Table 5-8. Soil Limitations for Septage Spreading

	None to Slight		Moderate		Severe		No Rating		Water		Total
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres
Waushara County	116,303	28.5%	118,864	29.1%	164,043	40.2%	533	0.1%	8190	2.0%	407,933

Source: USDA-NRCS, 1982, Waushara County, 2003.

Geography and Topography (Scenic Resources)

The local communities in the Waushara County are defined by diverse topographical features.[5] ***Evidence of several phases of the Wisconsin Glacier can be found in the County.***[6] ***The western edge of the County is a flat outwash plain.*** A narrow moraine is located on the eastern boundary of this outwash plain extending through the Villages and Towns of Coloma, Hancock and Plainfield. This moraine ridge creates a groundwater divided separating the County's groundwater flow east and west. ***Central Waushara County (City of Wautoma, Village Wild Rose and surrounding Towns) gradually flattens to a rolling plain as you move eastward across the County. The eastern third of the County is a gently rolling lake plain.*** The southeastern areas of Waushara County were once occupied by Lake Oshkosh and are characterized by relatively flat to gently rolling plains. The glacial plain areas of Waushara County have expansive deposits of red clay and organic-rich soils.[7] This combination has resulted in expansive wetlands and valuable agricultural areas.

As a result of glacial activity, land relief within Waushara County is quite varied.[8] ***Within Waushara County, land relief is approximately 390 feet, from a low of 750 feet above sea level near Poygan Marsh to a high of 1,137 feet at the Nordic Mountain Ski Hill (a granite monadnock located in the Town of Mount Morris) .***

Steep Slopes

Exhibit 5-5 indicates areas that have slopes greater than 12 percent. ***Less than ten percent (9.2%, 37,698 acres) of the County is classified as having slopes in excess of 12 percent*** (Table 5-9). ***Steep slopes are scattered throughout Waushara County and are generally found in conjunction with moraines, drumlins, and other glacial features.***

[5] WDNR, *Ecological Landscapes of Wisconsin; 2001*

[6] Dutch, S. 2003. *Lake Oshkosh Drainage*. http://www.uwgb.edu/dutchs/geolwisc/geohist/wi12ka.htm

[7] Attig, J., et al. 2005. *Glacial Lakes Wisconsin and Oshkosh: Two Very Different Late-Glacial Ice-Marginal Lakes*. http://gsa.confex.com/gsa/2005NC/finalprogram/abstract_86950.htm

[8] USGS. 1984. *USGS 7.5 Minute Quadrangle Maps*.

Table 5-9. Steep Slopes

	0-12 Percent		>12 Percent		No Rating, Water		Total
	Acres	Percent	Acres	Percent	Acres	Percent	Acres
Waushara County	361,512	88.6%	37,698	9.2%	8,722	2.1%	407,933

Source: USDA-NRCS, 1982, Waushara County, 2003.

Water Resources

Water resources are sources of water that are useful or potentially useful to humans. Water is important because it is needed for life to exist. Water is used for household, agricultural, recreational, industrial and environmental activities.[9] Essentially all these uses require fresh water.

Watersheds and Drainage

The WDNR has divided the state into 24 hydrological based geographic management units (GMUs) or basins. Each GMU is further divided into smaller units based on smaller sub-watersheds. The Wisconsin DNR has completed several reports analyzing water quality for designated GMUs. [10]

Surface water drainage for Waushara County is located within the Central Wisconsin River Basin, the Upper Fox River Basin and the Wolf River Basin. The Central Wisconsin River Basin (4,021 square miles) includes twenty-nine different sub-watersheds (four within Waushara County). The Upper Fox River Basin covers 2,090 square miles and is comprised of fifteen different sub-watersheds. The Wolf River Basin covers a large area, draining over 3,600 square miles and fifteen sub-watersheds within portions of eleven counties, draining the northeast portion of the state to the Winnebago Pool Lakes in Winnebago County. ***Waushara County is divided into ten sub-watersheds*** (Exhibit 5-5).

- **The Big Roche-A-Cri Sub-watershed** (Central Wisconsin River Basin) drains a large portion of the County's northwest corner into the Big Roche-A-Cri Creek. The Big Roche-A-Cri Creek is a 2.5 mile hardwater trout stream located northwest of the Village of Hancock. Wind erosion is severe in this sub-watershed and it is rated high for stream and wind erosion controls.

- **The Little Roche-A-Cri Sub-watershed** (Central Wisconsin River Basin) is situated in the southwest part of Waushara County. This Sub-watershed lists the Town of Hancock as a priority area for wind erosion control.

- **The Fourteenmile Creek Sub-watershed** (Central Wisconsin River Basin) is situated in northwest Waushara County. Ditching and drainage for agricultural uses have significantly reduced what were once extensive wetlands in the northern portions of this sub-watershed. Water quality concerns for this sub-watershed are high nitrate levels, stream pasturing, and water draw for agricultural uses.

[9] Wikepedia, http://en.wikepedia.org/wiki/Water_resources, 2/16/07.
[10] WDNR. 2002 . *State of the Basin Reports.* http://dnr.wi.gov/org/gmu/stateofbasin.html

- **The Sevenmile & Tenmile Creeks Sub-watershed** (Central Wisconsin River Basin) is a maze of ditches and laterals that were created to drain lowland areas for agricultural activities. Large areas of land are being maintained by the State as grassland ecosystems. This sub-watershed ranks as a high priority watershed. Water quality is impacted by grazing and pivot irrigation systems. Soil erosion due to wind and water is a major concern for this sub-watershed.

- **The Mecan River Sub-watershed** (Upper Fox River Basin) is located in the southwest corner of the County and encompasses 69 square miles. Many of the tributary streams of the Mecan River support high quality cold water fisheries. Agriculture, forestland, and wetland comprise the majority of land use within the Mecan River sub-watershed.

- **The White River Sub-watershed** (Upper Fox River Basin) is generally located in central Waushara County and encompasses 106 square miles. There are a number of streams within this sub-watershed that are classified as exceptional water resources. Large wetland complexes including the White River Marsh State Wildlife Area, Wautoma Swamp, and the Lunch Creek Wetlands fall within this sub-watershed.

- **Fox River/Berlin Sub-watershed** (Upper Fox River Basin) encompasses a small area in the southeast corner of the county consisting of 41 square miles. Agriculture is the primary land use. Sedimentation from agriculture is the largest contributor of non-point pollution. This sub-watershed is a major contributor of phosphorus to the Lake Winnebago Pool Lakes. A calcareous fen, a rare groundwater driven wetland type, is located in this watershed near Berlin.

- **The Pine River and Willow Creek Sub-watershed** (Wolf River Basin) is the southernmost sub-watershed within the Wolf River Basin. This sub-watershed ranked high priority for streams and medium priority for groundwater. The Pine River and Willow Creek drain the center two-thirds of Waushara County.

- **The Waupaca River Sub-watershed** (Wolf River Basin) lies almost entirely in Portage and Waupaca Counties with a small part of the southwester portion of the watershed located in Waushara County (towns of Springwater and Rose). In 1993 this sub-watershed was selected as a priority watershed and a watershed plan was prepared by WDNR, DATCP, NRCS, UW Extension, Portage County Land Conservation Department, Waupaca County Land & Waster Conservation Department, and Waushara County Land Conservation Department. The greatest overall water quality threat is excess nitrates entering groundwater.

- **The Little River and Alder Creek Sub-watershed** (Wolf River Basin) is known as the Walla Walla Creek sub-watershed lies in portions of Waupaca, Waushara and Winnebago Counties. Animal waste, soil loss, and excess nutrient loading are critical influences to surface and groundwater within this sub-watershed and is ranked number one in the Waupaca County Animal Waste Management Plan.

Lakes, Ponds and Quarries

The majority of lakes within Waushara County are natural and of glacial origin. Sandy soils readily allow for the percolation of precipitation into the ground rather than overland flow directly to surface waters. This results in a continual recharge of the shallow aquifer underlying the county and surrounding region.[11] ***There are 136 lakes and/or impoundments found within Waushara County***. See Appendix D, Table D-1 for a detailed list of the County's lakes, ponds and springs. According to the WDNR's website, Lake Poygan is the fourth largest lake in the state, while the Lohrville and Redgranite quarries are the fifth and third, respectively deepest lakes in the state.

Lakes can be described as drainage, seepage, spring, or drained lakes. The vast majority of Lakes within Waushara County are classified as seepage lakes. Seepage lakes do not have an inlet or an outlet and are recharged by precipitation and runoff supplemented by groundwater. Seepage lakes commonly reflect groundwater levels and can fluctuate seasonally.

The second most common type of lake in Waushara County are drainage lakes. These lakes have both an inlet and an outlet; the main water source is stream drainage. Drainage lakes, in which one-half of the maximum depths are dependant on a dam, are considered to be artificial lakes or impoundments.

Waushara County has a small number of spring lakes, primarily scattered throughout north central and south central Waushara County (Towns of Springwater, Saxeville, Mount Morris, Leon, Dakota, and Richford). Spring lakes have an outlet, but have no inlet. The primary source of water is groundwater flowing into the bottom of the lake from inside and outside the immediate surface drainage area. Spring lakes are the headwaters of many streams.

Waushara County has one listed drained lake (located in Mount Morris). Drained lakes have no inlet, but have a continuously flowing outlet. Drained lakes are not groundwater fed. The primary source of water is from precipitation and direct drainage from the surrounding land. Water levels fluctuate depending on the supply of water.

Rivers and Streams

There are forty-six named river/streams in Waushara County totaling approximately 584 miles (See Appendix D, Table D-2)***.*** A number, of them are classified as Outstanding and Exceptional Water Resource rivers and streams. ***The most prominent rivers/ streams within Waushara County are the Mecan River, White River, Pine River and Willow Creek.***

The Mecan River stretches across southwest Waushara County, originating from the Mecan Springs (located in the Town of Richford). This river is classified as a Class I trout stream for about 6.6 miles and is classified as a Class II trout stream for another 10 miles. Northern stretches of the Mecan River (above the community of Richford) are considered as Outstanding Resource Waters with the remainder being considered as Exceptional Resource Waters.

[11] WDNR. 1970. *Surface Water Resources of Waushara County*.

The White River flows to the south through central Waushara County. It is classified as a Class I trout steam and an Exceptional Resource Water above the White River Flowage. The River flows through large wetland complexes including the White River Marsh State Wildlife Area (located in Green Lake and Marquette Counties).

Willow Creek Drains much of Waushara County to the southeast. The upper one-third is considered a Class I trout stream while the middle one-third is considered a Class II trout stream. The head waters for Willow Creek originate from springs and the outlet of Silver Lake located in the Town of Springwater.

The Pine River is a 28 mile tributary to the southwest corner of Lake Poygan; it is divided between the Upper and Lower Pine River. The Lower Pine is a highly productive Class I trout stream, but is degraded by power dams which fluctuate water levels and surface discharge of warm water. The upper portions of the river (Upper Pine) are not influenced by power dams with tributaries that are listed as Exceptional Resource Waters.

There are several unnamed creeks throughout the County. In addition, agricultural ditches have been constructed throughout Waushara County to drain excess water from agricultural fields.

Section 303(d) of the Clean Water Act requires the State to prepare a list of impaired water bodies that will remain so even after the application of technology-based standards typically applied to point sources of pollution. Currently, Waushara County has one creek, Carpenter Creek, and three bodies of water on the 303d list: Kusel, Silver, and Big Hills Lake.

Floodplains

Areas susceptible to flooding are considered unsuitable for development due to potential health risks and property damage. Flood Insurance Rate Maps for the unincorporated portions of Waushara County identify areas lying within the unincorporated parts of the county.[12]

These floodplains are generally associated with The County's stream corridors with large concentrations of floodplain areas located in eastern Waushara County (Exhibit 5-5). Table 5-11 indicates the total number of acres and overall percentages of land which are within the 100-year floodplain. ***Ten percent (40,725 acres) of the land within the County lie in a floodplain***. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Table 5-10. Floodplains

	Acres	Percent
Waushara County	40,725	10.0%

Source: FEMA, 1985, Waushara County, 2001

Waushara County has adopted a floodplain ordinance requiring certain land use controls in designated flood hazard areas, thus making residents eligible to participate in the Federal Flood Insurance Administrative Flood Insurance Program. The program requires all structures that

[12] FEMA. 1985. *Flood Insurance Rate Maps.*

are constructed or purchased in designated flood areas utilizing loans from federally insured banks to be insured by a flood insurance policy.

Wetlands

Wetlands act as a natural filtering system for nutrients such as phosphorous and nitrates. More importantly, wetlands also serve as a natural buffer protecting shorelines and stream banks from erosion. Wetlands are essential in providing wildlife habitat, flood control, and groundwater recharge. Consequently, local, state, and federal regulations place limitations on the development and use of wetlands and shorelands. The Shoreland/Wetland Ordinance adopted by Waushara County regulates development within 1,000 feet of the ordinary high water elevation mark of navigable lakes, ponds, or flowages or 300 feet from the ordinary high water elevation mark of navigable rivers or streams. The U.S. Army Corps of Engineers has authority over the placement of fill materials in virtually all wetlands two acres and larger or adjacent to navigable waters. The Wisconsin Department of Natural Resources and United States Department of Agriculture also have jurisdiction over wetlands within Wisconsin. The U.S. Department of Agriculture incorporates wetland preservation criteria into its crop price support programs. Prior to placing fill or altering wetland resources, the appropriate agencies must be contacted to receive authorization.

The wetlands surveyed according to the Wisconsin Wetlands Inventory Map are shown on Exhibit 5-6.[13] They were identified on aerial photographs by interpreting vegetation, visible hydrology, and geography based on the U.S. Fish and Wildlife Service.

Wetlands are scattered throughout the County and are generally associated with the County's steam corridors and lake shorelines. Eastern Waushara County has the largest concentration of wetlands. Table 5-12 indicates the number of acres and the percentage of wetlands within Waushara County. Not including small tracts of wetlands (less than five acres); ***approximately 15 percent (59,964 acres) of Waushara County is classified as wetlands***. The amount and variety of wetlands have moderate limitations on the future growth and development of the area. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Table 5-11. Wetlands

Community	Acres	Percent
Waushara County	59,964	14.7%

Source: WDNR, 2004; Waushara County, 2008.

Groundwater

In Waushara County, groundwater occurs mostly in the alluvium and glacial drift of the Quaternary Age and in the sandstone of the Cambrian Age. Precipitation in the form of either rain or snow is the largest contributor to recharge of the groundwater aquifers. Recharge is generally greatest in spring when water from melting snow and heavy rains saturates the ground and percolates to the water table. If discharge (the drawing out and use of groundwater) is greater than recharge, the elevation where the groundwater is extracted will

[13] WDNR. 1979. *Wisconsin Wetland Inventory Maps*.

fall and a local depression in the water table will result. Lower water levels cause the pumping lifts to increase and may reduce the yields of some of the wells.

Groundwater within the county occurs under both water table and artesian conditions. Water in the unconsolidated beds of sand and gravel is generally unconfined and occurs under water table conditions. Confined or artesian conditions exist locally where the water in the sand and gravel deposits is confined by layers of silt or clay.

A groundwater divide, located west and parallel to the topographic divide, cuts diagonally through Waushara County. It extends from Marquette County, through the towns of Hancock and Coloma, the Village of Hancock, and east of the Village of Plainfield to the Portage County line.[14] East of this divide, groundwater moves southeasterly toward the Wolf and Fox Rivers. West of this divide groundwater moves westerly toward the Wisconsin River.

According to the well water information obtained from the Central Wisconsin Groundwater Center in Stevens Point, some private wells located in Waushara County contain nitrate levels that are higher than the EPA Safe Drinking Water Act standards of 10 mg/L.[15] These standards apply to municipal water sources only, but are strongly suggested thresholds for private systems. Nitrates originate in both agricultural and residential fertilizers, human sewage, and farm animal waste. Excessive levels of nitrates in drinking water have caused serious illness or death in infants less than six months of age. Pregnant women are also advised not to drink water in which nitrate levels exceed the EPA standards. Due to sandy soils within the County, there is potential for groundwater contamination in the shallower aquifers. However, this potential is greatly reduced in the deeper aquifers. Table 5-12 lists the results of water sample tests conducted between 1990 and 2001.[16] For conversion purposes, 1 part per million (ppm) is the same concentration as 1 mg/L. ***Ninety-six wells within Waushara County exceeded the 10 ppm threshold level for nitrate. The majority of homes within Waushara County are served by private wells.***

Table 5-12. Nitrate Levels (ppm) in Waushara County Wells

	None Detected	0.1 - 2.0 ppm	2 -10 ppm	10 -20 ppm	> 20 ppm
Waushara County	273	277	193	53	43

Source: Central Wisconsin Groundwater Center, UW – Stevens Point, 2001.

Although groundwater is found at varying depths throughout the area, the majority of groundwater in Waushara County is found in depths greater than six feet (Table 5-13 and Exhibit 5-5). ***Groundwater depths of less than two feet are found in just over a quarter (25.8%, 105,049 acres) of the land area***, an additional 13.2 percent (53,787 acres) of the area has groundwater depths of 2 to 6 feet. Groundwater depths exceed 6 feet in 58.9 percent (240,374 acres) of the County. The remaining 2.1 percent (8,723 acres) in the County has either no rating or is surface water. In general, there is a strong correlation

[14] Geology and Ground-Water Resources of Waushara County, Wisconsin, Geological Survey Water-Supply Paper, 1809-B. Map of Waushara County, Wisconsin, Showing Configuration of Water Table, July 1957 and Location of Wells, Springs, and Streamflow-Measurement Sites.

[15] USEPA. 2005. *List of Drinking Water Contaminants & MCLs.* http://www.epa.gov/safewater/mcl.html.

[16] Central Wisconsin Groundwater Center. 2001. *UWEX Private Well Project: Waushara County.*

between areas of high groundwater and wetlands. A greater concentration of higher groundwater is generally found in the eastern part of the county. (For more information please see Agricultural, Natural and Cultural Resource Chapters of the individual town plans.)

Table 5-13. Depth to Groundwater

	< 2 Feet		2-6 Feet		> 6 Feet		No Rating		Water		Total
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres
Waushara County	105,049	25.8%	53,787	13.2%	240,374	58.9%	533	0.1%	8,190	2.0%	407,933

Source: USDA-NRCS, 1982. Waushara County, 2005.

According to the *Wisconsin Administrative Code, Chapter ATCP 30* Atrazine*, Pesticides; Use Restrictions*, atrazine prohibition areas have been established throughout Waushara County. In the prohibitation areas no person can apply, mix or load any atrazine product, except under special conditions. The Department of Agriculture has determined these areas based on well samples. These areas are monitored, and if atrazine is not applied, the levels may diminish and may be removed from the list. ***There are five Atrazine Prohibition Areas within Waushara County*** (Table 5-14, Exhibit 5-1).

Table 5-14. Waushara County Atrazine Prohibition Areas

Name	Township / Range	Sections Numbers
Town of Hancock (PA 93-70-01)	T19N / R08E	4, 5, 8, and 9
Town of Saxeville (PA 93-70-02)	T20N / R12E	31 and portions of 30 and 32
Town of Plainfield (PA 94-70-01)	T20N / R08E	14 & 15 portions of 10, 11, 22, & 23
Town of Warren (PA 96-70-01)	T18N / R12E	20, & portions of 16, 17, 18, 19, 21, 28, 29, & 30
Towns of Rose, Springwater, Mount Morris & Wautoma (PA 04-70-01)	T19-20N / R10-11E	1, 6, 7, 12, 13, 18, 31, 36 and portions of 2, 25, & 26

Source: Wisconsin Department of Agriculture, Trade and Consumer Protection, Register, March 2005

Natural Springs and Artesian Wells

There are a number of natural springs and artesian wells scattered throughout Waushara County. A natural spring can occur when an impermeable layer (usually consisting of clay) forces the water table to the surface or when water-bearing crevasses in fractured rock intersect the surface. An artesian well is created when a well is drilled into a confined aquifer which is recharged from a source located at a higher elevation.[17] The majority of springs within Waushara County are gravity depression springs, generally located in the eastern portions of the County.

Groundwater Planning

Water quality and quantity have been a concern for Waushara County communities. Low lake levels throughout Waushara County underscore a more pressing problem: groundwater quantity

[17] Wisconsin Department of Natural Resources, Source Water Springs and Natural Wells http://dnr.wi.gov/org/water/dwg/OpCert/HTML/chapter2/sw2a.htm,

and quality preservation. Communities throughout East Central Wisconsin have been challenged with a number of issues ranging from potable water supply shortfalls to contamination issues such as elevated arsenic and radium levels. A prolonged drought coupled with increased water demands may be contributing to a declining water table. The anticipated population increases, agricultural irrigation demands, and growing recreational demands will continue to place significant demands on Waushara County's groundwater resources.

With an ever increasing demand on current groundwater supplies, local communities must assess how local and county-wide land use decisions will continue to affect groundwater quantity and quality. Identifying soil characteristics, water table levels, and groundwater susceptibility is just a beginning step in this process. Other underlining geological characteristics such as bedrock, groundwater flow direction, private well information, community groundwater pumping rates, and water table depth will be essential in understanding the current status of groundwater. Moreover, the abundance and quality of surface water is directly tied to groundwater supplies. Many streams and lakes rely on groundwater as their primary source of water; thus, local lake levels are directly tied to groundwater levels. Human impacts such as high capacity wells, irrigation systems, and others also place demands on groundwater supplies.

Additional information and technical expertise is available from several governmental and academic agencies statewide. The Center for Land Use education has completed several case studies and groundwater planning assistance documents for local communities. Additional information can be found at http://www.uwsp.edu/cnr/landcenter/groundwater/index.html.

Wildlife Resources

Wildlife Habitat

Waushara County falls within the following ecological landscapes[18]:

- **Central Sand Plains** is located in western Waushara County, occurring on a flat, sandy lake plain, and supports agriculture, forestry, recreation, and wildlife management. This Ecological Landscape formed in and around what was once Glacial Lake Wisconsin, which contained glacial meltwater extending over 1.1 million acres at its highest stage.

- **Central Sand Hills** encompasses the majority of Waushara County and is located at the eastern edge of what was once Glacial Lake Wisconsin. The landforms in this Ecological Landscape are a series of glacial moraines that were later partially covered by glacial outwash. The area is characterized by a mixture of farmland, woodlots, wetlands, small kettle lakes, and cold water streams, all on sandy soils. The mosaic of glacial moraine and pitted outwash throughout this Ecological Landscape has given rise to extensive wetlands in the outwash areas, and the headwaters of coldwater streams that originate in glacial moraines.

- **Southeast Glacial Plains** is located in the eastern portions of Waushara County, and are made up of glacial till plains and moraines. Most of this Ecological Landscape is composed of glacial materials deposited during the Wisconsin Ice Age.

[18] WDNR, 2002. *Ecological Landscapes of Wisconsin*

The majority of the County falls within the Central Sand Hills ecological landscape, while the eastern portion of the County falls within the Southeast Glacial Plains ecological landscape and the western portion of the County falls within the Central Sand Plains. Together, these ecological landscapes support numerous habitat types throughout Waushara County for a varied and abundant wildlife and fish community. Habitats found within Waushara County include streams, lakes, rivers, woodlands, marshes, open wet meadows, and fallow/abandoned farmland. White-tailed deer and small mammals such as opossum, raccoon, gray and fox squirrels are abundant in wooded areas. Lakes and streams support diverse warm and cold water fisheries. Wetlands attract waterfowl during spring and fall migrations as well as during the nesting season. Other wildlife found in the area include grassland and wetland birds, cottontail rabbits, mink, otter, muskrats, red fox, and a wide variety of songbirds and similar passerines.

Rare, Threatened and Endangered Species and Natural Communities

The Wisconsin Department of Natural Resources maintains a database of rare, special concern, threatened, and endangered species and natural communities in Waushara County.[19] In order to protect these communities from harm, their exact locations are not released to the public; however, Waushara County has access to this database. When a development proposal is presented to the county, the WDNR database is consulted prior to granting approval. Before development, precautions should be taken to minimize adverse impacts which could disturb potential habitats for these flora and fauna (Exhibit 5-6). A list of the rare, threatened, and endangered species and natural communities is included in Appendix D (Table D-3).

Exotic and Invasive Species

Non-native species commonly referred to as exotic or invasive species have been recognized in recent years as a major threat to the integrity of native ecosystems, habitats, and the species that utilize those habitats. Invasive species disrupt native ecosystems by out-competing native plants and animals for valuable resources such as food and space. The resulting competition between native and invasive species has the potential to completely displace native species. Invasive species are found in both aquatic and terrestrial habitats. The WDNR updates a list of plant and animal invasive species in Wisconsin. This list can be found on the Department's website at: http://dnr.wi.gov/invasives/. Human livelihood and quality of life are greatly altered by invasive species; they hamper boating, swimming, fishing, and other water recreation; place an economic burden on local communities in eradication and control costs; and in some instances present a potential fire hazard. Prior to introduction of any non-native fish or wildlife, a permit from the WDNR is required pursuant to Wisconsin Statutes 29.736 and 29.745.

Woodlands

Originally, the majority of Waushara County contained vegetation consisting of a mixture of oak forest species interspersed with pine forests and oak openings with an understory of prairie grasses. Waushara County once encompassed substantial areas of wetland conifers, lowland hardwoods, wet meadows with lowland shrubs, and marshes. Currently, upland forest areas are characterized by an oak-hickory association. Pine species are found throughout much of

[19] WDNR. 2005. *Natural Heritage Inventory Program*. http://dnr.wi.gov/org/land/er/nhi/.

the county, while the wetland conifers have been replaced largely by shrub wetlands, general agriculture, and urban areas. Woodlands are found in large stands as well as scattered throughout the Town. ***Woodlands comprise about 46 percent of the total land area in Waushara County*** (Exhibit 5-6). The majority of wetlands, especially along stream corridors, are predominantly forested. Generally areas in the western part of the County; west of the outer moraine and between the inner and outer moraine and in the eastern part of the county are less forested.

Forests and woodlands can be classified into one of two categories: general (unplanted) woodlands and planted woodlands. General woodlands are naturally occurring forests and hedgerows. Planted woodlands are tree plantations in which trees are found in rows; these areas include orchards, timber tracts, Christmas tree production and other general uses. ***There are 140,879 acres of general woodlands and 44,851 acres of planted woodlands in Waushara County.*** These woodlands should be considered as prime wildlife habitat areas; efforts to protect them from encroaching development should be evaluated (Table 5-15).

Table 5-15. Woodlands

Community	General Woodlands		Planted Woodlands		Total Woodlands		Total
	Acres	Percent	Acres	Percent	Acres	Percent	Acres
Waushara County	140,879	34.5%	44,851	11.0%	185,730	45.5%	407,914

Source: ECWRPC, 2005.

The Forest Crop Law of 1927 (FCL) and the Woodland Tax Law of 1954 (WTL) were established to encourage sound forestry practices on private lands. In 1985, the Managed Forest Law (MFL) replaced both the FCL and WTL.[20] Enrollment in the FCL closed in 1986, and renewal in the program is not permitted. The last WTL contract expired in 2000. The MFL ensures the growth of future commercial crops while balancing individual property owner objectives and society's need for compatible recreational activities, forestry aesthetics, wildlife habitat, erosion control and protection of endangered resources. ***In 2008, a total of 41,102 acres were actively managed within Waushara County under the MFL, while a total of 1,233 acres were managed under F CL*** (Table 5-16).

Table 5-16. Managed Forest Law And Forest Crop Law Lands

Waushara County	Acres	Percent
Managed Forest Law	41,102	22.2%
Forest Crop Law	1,233	0.7%

Source: WDNR, 2008.

Parks, Open Space, and Recreational Resources

Public open space such as parks and parkways are important to the quality of life within a community. These lands serve many purposes including outdoor recreation and education; buffers between different land uses; flood and stormwater management; habitat preservation; air and surface water quality improvements; protection of groundwater recharge areas; and

[20] WDNR. 2005. *Managed Forest* Law. http://dnr.wi.gov/org/land/forestry/ftax/mfl.htm.

aesthetics. They can also enhance the value of nearby properties. (See Utilities & Community Facilities Chapter)

Wisconsin Department of Natural Resources (WDNR) and Public Lands

Since 1876, the State of Wisconsin has been acquiring land to meet conservation and recreation needs. Public lands managed by the Wisconsin Department of Natural Resources provide many opportunities and public spaces to hunt, fish, hike, canoe, or watch or photograph wildlife. All Wildlife Areas are open to a full range of traditional outdoor recreational uses. These include hunting, fishing, trapping, hiking, nature study, and berry picking. Dog training or trialing (hunting dog competitions) may be allowed by permit. A limited number of properties allow additional outdoor recreation at designated locations; like camping, bicycling, horseback riding, and snowmobiling.

State Fishery Areas (SFAs) protect important waterways in Wisconsin by providing a natural buffer from agricultural practices and urban runoff. SFAs often preserve and manage the headwaters or springs of streams which serve as the biological base for fish and other aquatic life. SFAs also increase the availability of public access to navigable waterways throughout the state. ***The WDNR owns approximately 19,736 acres within Waushara County.*** State owned and managed lands are briefly described below (for detailed descriptions, visit the WDNR website at http://dnr.wi.gov/):

State Wildlife Areas:

- ***Greenwood Wildlife Area*** lies on the edge of a pitted outwash plain creating a flat sandy topography and a wooded hilly moraine comprised mostly of oak trees. This area is an important wintering area for a local population of Giant Canada geese. A larger portion of the area, that was once farmed heavily, has been restored to prairie that provides important habitat for grassland dependant species.

- ***Poygan Marsh Wildlife Area*** is over 3,600 acres in size located in east central Waushara County on the western shore of Lake Poygan. Most of the area is open marsh or bottomland timber, with the Pine River, Pumpkinseed Creek and Willow Creek flow through the wildlife area terminating in Poygan Lake.

- ***Lunch Creek Wetlands*** (State Natural Area No. 333) contains one of the most diverse and species rich sedge meadows in Wisconsin. This area is situated within a mainly undisturbed watershed, an uncommon occurrence in Wisconsin. This large wetland complex is free of exotic species and dominated by fern and sedge meadow communities containing a total of 115 plant species.

- ***Mecan Springs*** (State Natural Area 370) protects a large Clearwater springs which are the headwaters to the Mecan River. The Mecan River system contains some of the finest trout streams in central Wisconsin and supports excellent natural trout reproductions. Fen vegetation is present in the saturated soils of the Mecan Springs area.

- ***Karner Blue Meadow*** (State Natural Area No. 327) features a dry sand prairie that is home to a strong population of the federally endangered Karner blue butterfly***.*** The Karner blue is restricted to habitats that contain wild lupine, the larval butterfly's only

food plant. The natural area borders Bonneville Lake, a 15-acre seepage lake surrounded by marshy vegetation that supports a diverse aquatic invertebrate fauna, including several species of dragonflies.

- ***Upper Fox Headwaters*** (State Natural Area No. 265) is made up of three distinct units: Zinke Lake, Upper Chaffee Creek Meadow, and Caves Creek. This area contains a large wetland complex of fen, wet-mesic, and wet prairie with over 100 native plant species present.

- ***Plainfield Tunnel Channel Lakes*** (State Natural Area No. 226) includes Sherman Lake, Second Lake, and Plainfield Lake. This State Natural Area provides specialized habitat for Falsetto's Locoweed, one of the rarest plants found in Wisconsin. This plant is found only on the fluctuating shorelines of lakes in Wisconsin's Central Sands Ecological landscape areas and nowhere else on earth. This area protects three lakes in a string of 13 lakes and ponds lying in a "tunnel channel" created by a meltwater river flowing beneath the glacial ice. The lake basins were created form buried blocks of ice left behind when the tunnel collapsed.

- ***Bohn Lake*** (State Natural Area No. 530) is a 13 acre, 24 foot deep hardwater seepage lake that is part of a geologically significant tunnel channel. The Bohn Lake shoreline fluctuates anywhere from four to six feet depending on the hydrologic cycle and in some dry years contains little water. In wet years, abundant vegetation grows in distinctive concentric rings around the lake due to its fluctuating nature. Each ring has a different combination of species.

- ***Bass Lake Fen*** (State Natural Area No. 178) features a 20 acre calcareous fen located on the underdeveloped shore of Bass Lake. The fen is exceptionally diverse with many small springs, openings, and ponds providing a calcium-rich habitat that supports 125 species of plants. To the east the fen grades into sedge meadow and two communities are bordered on the north by tamarack swamp and on the south by shrub-carr.

State Fishery Areas:

- ***Big Roche-A-Cri Fishery*** provides public access to approximately 493 acres. This public fishery extends along the majority of the Big Roche-A-Cri Creek corridor. The Creek is an important fishery, with the head water areas classified as a Class I trout stream.

- ***Mecan River Fishery Area*** is composed of the Mecan River and three tributaries; Chaffee Creek, Wedde Creek, Little Pine Creek. These streams are high quality trout waters. State ownership is fragmented along the stream corridors, with substantial public access near the headwaters in southwestern Waushara County. Portions of the Wisconsin Ice Age Trail traverse through the Mecan River Fishery area. Zinke Lake is included in this fishery area.

- ***Pine River Fishery Area is composed of the Pine River and seven tributaries:*** Lower Pine, Jones, Davis, Clayton, Upper Pine, Kaminski, and Little Silver Creeks. Humphrey Creek, while not mentioned as one of the seven tributaries on the WDNR website, is a tributary to Pine River and is part of the fishery area. These streams are quality trout waters that are generally crystal clear. State ownership is fragmented

along the stream corridors, with substantial public access following the Pine River as it flows through much of northern Waushara County.

- ***Willow Creek Fishery Area is composed of Willow Creek and three tributaries: Rattlesnake, Thorstad (Bruce) and Cedar Spring Creek.*** These streams are high quality trout waters that are generally crystal clear. State owner ship is fragmented over ten miles of stream corridors with substantial public access within the Willow Creek's watershed where it originates in north central Waushara County.

- ***White River Fishery Area is composed of the White River and four tributaries: Soules Creek, Lunch Creek, Bowers Creek, and the West Branch of the White River.*** These streams are high quality trout waters that are generally crystal clear. State ownership is fragmented along the stream corridors with substantial public access in the headwaters area in south-central and southwestern Waushara County. The White River Fishery Area is about 27 miles in length, and is a tributary of the Fox River.

- ***Carter Creek Fishery Area is located in the Town of Hancock.*** It was created in 1961 and contains about 205 acres.

- ***Pony Creek Fishery Area is located in the Town of Bloomfield.*** It was created in 1961 and encompasses 20 acres at the mouth of Pony Creek and Lake Poygan. It's considered a shallow water fishery and was purchased for fishery habitat protection. Species likely to utilize this area include pan fish, large mouth bass and northern pike.[21]

WDNR Managed Lands:

The State owns/manages a number of areas in Waushara County. These areas are scattered throughout the County and in some cases are easements to the State Fishery, Natural Areas, and the County's water resources. The following are WDNR owned/managed lands that help protect the State Fishery and Natural Areas within the County.

- Extensive WL Habitat
- Ice Age Trail
- Leach Natural Resource Center
- Statewide Natural Area
- Statewide Public Access
- Wild Rose Fish Hatchery
- REM-Carter Creek
- REM-Little Silver Creek
- REM-Pine River
- REM-Pony Creek
- REM-Thorstad Creek

Environmental Corridors

Environmental corridors are continuous systems of open space created by the natural linkage of environmentally sensitive lands such as woodlands, wetlands, and habitat areas that provide

[21] K. Karnke, WDNR. Personal conversation 7/31/09.

important travel ways for a variety of wildlife and bird species. These features are sensitive natural resources; preserving the corridors from development protects habitat and keeps non-point source pollution to a minimum, thus ensuring that high quality groundwater and surface water is maintained and habitat is not impaired.

As stated above the WDNR manages almost 20,000 acres within Waushara County, preserving the County's wild life, invaluable habitat and water resources. It is important that development is directed away from these significant resources and there environmental corridors as well as other privately owned natural corridor areas which are scattered throughout the County.

Mineral Resources

Non-metallic Mineral Resources. Non-metallic mineral resources include all mined minerals other than those mined as a source of metal. Economically important non-metallic minerals include building stone, lime, sand, gravel, and crushed stone. ***There are nineteen active non-metallic mining sites in Waushara County*** (Table 5-17 & Exhibit 5-6).

Table 5-17. Non-metallic Mining Sites

Operator	Total Acres	Location	
		Community	Section number
Amon, B.R. & Sons	8	T. Wautoma	15
Bruan, David	1	T. Aurora	28
Faulks Bros.	11.5	T. Saxeville	21
Gelhar, A.F.	4.5	T. Bloomfield	9
Gelhar, A.F.	4	T. Saxeville	12
Gelhar, A.F.	4	T. Bloomfield	11
Henriksen, Russel	7.5	V. Redgranite	6
Hudziak, David	1.6	V. Wild Rose	25
Jorgensen, Gary	2.8	T. Leon	2
Kelley S & G	4.9	T. Wautoma	15
Kelley S & G	4.9	T. Wautoma	22
Kraemer Company	14.7	T. Plainfield	13
Kraemer Company	24.8	T. Hancock	22
Michels Materials	45	T. Oasis	36
Michels Materials	18	T. Wautoma	23
Northeast Asphalt	18	T. Richford	1
Oakfield Stone Co.	1	V. Lohrville	18
Sebor/CAM Const.	34.8	T. Hancock	27
Stafford Excavating	4.1	T. Deerfield	36

Source: Waushara County Zoning, 2008.

Metallic Mineral Resources. Metallic mineral mining refers to mining of mineral deposits that contain recoverable quantities of metals such as copper, zinc, lead, iron, gold, silver, and others. ***There are no metallic mineral resource sites in Waushara County***.

Solid and Hazardous Waste

The Wisconsin Department of Natural Resources has inventoried the past and current sites which have been used for solid and/or hazardous waste disposal.[22] The list includes active,

Table 5-18. Waste Disposal Sites

Facility Name	Location		
	Township	Range	Section Number
V. Plainfield	T20N	R08E	12
Raebe Flying (Pestecides)	T20N	R08E	10
T. Aurora	T18N	R13E	18
T. Bloomfield	T20N	R13E	8
T. Bloomfield	T20N	R13E	26
V. Coloma	T18N	R08E	23
Art Johnson (Demo)			
C. Wautoma	T18N	R10E	1
WDNR - Deer Pit	T18N	R10E	11
Baum Oil Co.	T19N	R08E	10
V. Hancock	T19N	R08E	11
Ed Fadrowski/Menard's	T19N	R12E	20
T. Leon	T19N	R12E	30
Chicago Pickle Co.	T18N	R11E	12
T. Marion	T18N	R11E	22
T. Mount Morris	T19N	R11E	23
T. Poy Sippi	T19N	R13E	18
T. Rose	T20N	R10E	4
V. Wild Rose	T20N	R10E	35
T. Saxeville	T20N	R12E	21
T. Saxeville	T20N	R12E	21
Camp Wild Rose LF	T20N	R11E	29
Springwater/WR Landfill	T20N	R11E	8
T. Warren	T18N	R12E	17
V. Lohrville	T18N	R12E	18
V. Redgranite	T18N	R12E	6
Waushara County Hwy Dept.	T19N	R10E	14
C. Wautoma	T19N	R10E	22
C. Wautoma	T19N	R10E	22
Kirk Minn. Co.	T19N	R10E	13
Milty Wilty Drive-in	T18N	R10E	1
The Old Dump Grounds	T19N	R11E	21
Joel Vandenhout	T20N	R12E	24
State of Wisconsin	T20N	R11E	32
City of Wautoma Dump	T18N	R10E	3
V. Redgranite	T18N	R12E	7

Source: WDNR, 1999 Registry of Waste Disposal Sites in Wisconsin

[22] Wisconsin Department of Natural Resources. 1999. *Registry of Waste Disposal Sites in Wisconsin.*

inactive, and abandoned landfills and collection sites. Inclusion of a site on the Registry does not mean that environmental contamination has occurred, is occurring, or will occur in the future. Instead, the document is intended to be utilized as a general information resource and planning tool. The list has been updated by WDNR and County staff; generally sites have been removed from the list that are not considered to be of a concern or could not be located. ***There are thirty-six sites in Waushara County that are listed on the WDNR's registry of active, inactive and abandoned sites where solid waste or hazardous wastes were known or likely to have been disposed*** (Table 5-18, Exhibit 5-6).

Air Quality

Air quality, particularly good air quality, is often taken for granted. Clean air is vital to maintain public health. Sound local and regional planning can minimize negative impacts to the air. Development patterns can impact automobile use. As communities become more spread out, the use of automobiles increases dramatically, resulting in more emissions and subsequent decreases in air quality. As residential development moves into rural areas, there are increased conflicts between non-farm residents and agricultural operations that emit odors and dust. Emissions from certain industrial uses also have the potential to impact air quality.

There are no areas in Waushara County which exceed the limits of the National Ambient Air Quality Standards (NAAQS) for ozone, particulates, or carbon monoxide. The nearest ozone monitoring sites are in Brown and Outagamie Counties.[23]

Cultural Resources

Cultural resources, like natural resources are valuable assets which should be preserved. These resources define a community's unique character and heritage. Included in this section is an inventory of historic buildings, sites, structures, objects, archeological sites and districts.

State and National Register of Historic Places.

The Wisconsin Historical Society's Division of Historical Preservation (DHP) is a clearing house for information related to the state's cultural resources including buildings and archaeological sites. A primary responsibility of the DHP is to administer the State and National Register of Historic Places programs. The National Register is the official national list of historic properties in the United States that are worthy of preservation. The program is maintained by the National Park Service in the U.S. Department of the Interior. The State Register is Wisconsin's official listing of state properties determined to be significant to Wisconsin's heritage. The inventory is maintained by the DHP. Both listings include sites, buildings, structures, objects, and districts that are significant in national, state, or local history. Sites are chosen based on the architectural, archaeological, cultural, or engineering significance.

The following three items are listed on the National Register for Waushara County:

- ***Alanson M. Kimball House – Town of Leon***
- ***Waushara County Courthouse, Waushara County Sheriff's Residence and Jail – City of Wautoma***
- ***Whistler Mound Group – Village of Hancock***

[23] U.S. Environmental Protection Agency. 2007. *County Air Quality Report – Criteria Air Pollutants*.

Mr. Kimball was a United States Representative for the 6th Congressional District of Wisconsin from 1875 to 1877[24]. He died in Pine River and is interred at the Pine River Cemetery. The Waushara County Courthouse, Sheriff's Residence and jail. The jail was built in 1908 and was used until 1977. The Sheriff's Residence and jail are open to the public. The Whistler Mound archaeological site (ca.500-1500 AD) is located within Whistler Indian Mounds Park in the Village of Hancock and was entered onto the National Register of Historic Places in 1993. It was listed because of its potential to yield information important to the understanding of prehistory. Specifically, the site helps to answer questions regarding the origins, affiliations, functions, and spatial significance of mounds constructed by indigenous peoples during the Late Woodland stage. During this period people began to settle in large villages and use bows and arrows to hunt.

The National Register is not a static inventory. Properties are constantly being added, and, less frequently, removed. It is, therefore, important to access the most updated version of the National Register properties. This can be found by accessing the DHP website (http://www.wisconsinhistory.org/histbuild/register/index.html) or by contacting the DHP at (608) 264-6500.

Architecture and History Inventory (AHI)

In order to determine those sites that are eligible for inclusion on the National Register, the DHP frequently funds historical, architectural, and archaeological surveys of municipalities and counties within the state. Surveys are also conducted in conjunction with other activities such as highway construction projects. While a minimal amount of this type of survey work has been done in Waushara County. ***A number of properties within Waushara County are included in the Architecture and History Inventory.***

While inclusion in this inventory conveys no special status, rights, restrictions, or benefits to owners of these properties. It simply means that some type of information on these properties exists in the DHP's collections. As is often the case, some of these properties may no longer exist. AHI is primarily used as a research and planning tool. Like the National Register, this is not a static inventory. Properties are constantly being updated. Information can be found on the DHP web site (http://www.wisconsinhistory.org/ahi/search.asp?cnty=WS).

Archaeological Sites Inventory (ASI)

An inventory similar to the AHI exists for known archaeological sites across the state: the Archaeological Sites Inventory (ASI). Due to the sensitive nature of archaeological sites, information as to their whereabouts is not currently made available on-line. This information is distributed only on a need-to-know basis. Archaeological sites are added to ASI as they are discovered; discovery is a continual process. For technical assistance and up to date information on sites within a given area, contact the DHP at (608) 264-6500.

Wisconsin Historical Markers

Wisconsin historical markers identify, commemorate and honor important people, places, and events that have contributed to the state's rich heritage. The Wisconsin Historical Markers

[24] http://en.wikipedia.org/wiki/Alanson_M_Kimball.

Program is a vital education tool, informing people about the most significant aspects of Wisconsin's past. The Society's Division of Historic Preservation administers the Wisconsin Historic Markers Program. Applications are required for all official State of Wisconsin historical markers and plaques.[25]

According to the Wisconsin Historical Society, three historical markers or plaques are located within Waushara County:

- **Sir Henry Wellcome** – Town of Oasis
- **Whistler Mound Group and Enclosure** – Town of Hancock
- **The Auroraville Fountain** – Town of Aurora

The Sir Henry Wellcome Birthplace is located on CTH J. Wellcome was a Wisconsin born, naturalized Briton who in 1932 was knighted by King George of England in recognition of his contributions to the medical sciences. The Whistler Mound Group and Enclosure is described in more detail above under State and National Register of Historic Places. The Auroraville Fountain is a natural spring well or artesian well that was bored in 1867 by John Keneister of Auroraville. Originally the fountain was built in a wooden trough, but it was replaced with a copper vat from a burned out cheese factory in 1927. The Works Project Administration built the ornate stone enclosure around the copper vat in 1936.

Museums/Other Historic Resources

Museums protect valuable historic resources for community enjoyment. Residents are welcome to learn from the exhibits and amenities they have to offer. ***There are a number of museums in and near Waushara County***[26].

- **Waushara County Museum** is housed in the former county jail in Wautoma. The Waushara County Historical Society maintains several exhibits detailing the genealogy, antiques, and the history of the sheriffs department. The original doors and bars of the jail cells have been preserved. Other nearby museums are located in the Oshkosh and Appleton areas.
- **Pioneer Museum** is located in the Village of Wild Rose. This museum encompasses the Victorian era home of Elisha and Jane Stewart, Pioneer Hall (bank and drug store), a country school, barn and carriage house.
- **Woodland Indian Mounds** in Whistler Park. These historic earthen structures were constructed by Woodland Indians during the period of 650 to 1200 AD.
- **Quarry Park** in Redgranite. In 1995, this popular quarry site was designated as a village park. Remains of some of the old quarry works can still be seen from the walking path that surrounds the quarry.
- **Hancock Public Library** in the Village of Hancock is a fully restored historic firehouse.
- **Berlin Historical Society Museum** is located in Berlin, Wisconsin.
- **Clark Schoolhouse** located in Riverside Park in Berlin. The little white school house was built in 1863 and was moved to its present location in 1963.

[25] Wisconsin Historical Markers of the Wisconsin Historical Society. http://www.wisconsinhistory.org/hp/markers/index.asp. Accessed 10/28/08

[26] http://www.explorewisconsin.com/countypages/waushara.asp

Local History[27]

The earliest inhabitants of Waushara County were Native Americans. Considerable evidence of their civilization has been found in the county. A total of 332 mounds, 49 camp and village sites, two spirit stones, two cemeteries, and several other archeological sites have been identified within the County[28]. For more detail, please see the individual community plans.

On October 18, 1846, the Menominee Tribe ceded their land, including Waushara County, to the U.S. Government. In 1848, Isaac and William Warwick, the first white settlers to the area, built a log cabin in the Town of Marion. During the winter of 1848 to 1849, Philip Green settled on the site of the former Village of Wautoma. Other settlers soon followed. By 1849 a crude dirt road was built between Berlin (Strong's Landing) and Wautoma (Shumway Town). The 1849 road roughly corresponds with present day CTH F. The community of Sacramento, located on the south side of the Fox River, was platted in either 1849 or 1850 and a post office was established for the community in 1852. During 1849 and 1850, other settlers began gathering and making settlements in other parts of what is now Waushara County. ***On February 15, 1851, the Wisconsin Legislature established Waushara County and selected Sacramento as the county seat.*** The county originally consisted of a single town, the Town of Waushara***. In 1852, Waushara County was organized for judicial purposes and in September 1854 the county seat was moved to Wautoma.***

Ethnic Origin

In 2000, the most common ancestry identified by Waushara County residents was German (Table 5-19; Appendix D, Table D-4). ***Thirty-eight percent (38.0%) of Waushara County residents claimed German ancestry.*** The highest concentration of individuals claiming German ancestry was in the Town of Bloomfield (51.8%). The other towns

Table 5-19. Top 5 Ancestries

	Ancestry	Total Population in Sample	Percent of Population
Waushara County	German	8,805	38.0%
	Unclassified or Not reported	4,629	20.0%
	Polish	1,681	7.3%
	Irish	1,101	4.8%
	United States or American	1,055	4.6%
	Total Population	23,154	100.0%

Note: Includes individuals who only reported one ancestry and the first response listed for those who reported multiple ancestries.

Source: U.S. Census, 2000 STF 3A

[27] Reetz, E. 1981. *Come Back in Time: Vol. 1*.
Stertz, N. 1996. *Auroraville, Wisconsin*.
http://www.wisconsinhistory.org/turningpoints/tp-061/?action=more_essay

[28] Fox, G., and E.C. Tagatz. *The Wisconsin Archeologist, Indian Remains in Waushara County, Volume 15, October 1916 No. 3*.

along the eastern tier of the county and within the immediate vicinity also had more than forty percent of their residents claiming German Ancestry (T. Poy Sippi - 44.0%, T. Aurora – 49.2%, C. Berlin – 45.6%, T. Saxeville – 41.9% and T. Leon – 43.9%). Other towns with an excess of forty percent included the Town of Richford (45.6%) and the Town of Dakota (44.2%).

Several residents (20.0% Waushara County) could not identify or chose not to report their ancestry. Over a quarter of the residences in five communities in Waushara County could not or chose not to identify their ancestry (T. Coloma – 28.6%, V. Coloma – 28.4%, T. Richford – 27.9%, T. Warren – 25.4%, C. Wautoma – 27.4%). The second most common ancestry identified by Waushara County residents was Polish. Approximately 7.3 percent of Waushara County residents claimed Polish ancestry.

Research has shown that there is a high correlation between those communities with Pennsylvania German ancestry and those communities with concentrations of Amish population.[29] ***Within Waushara County, Amish settlements include 52 households, 291 people, and an average household size of 5.6 persons*** (Appendix D, Table D-5). Thirty-three percent are employed in farming, 23 percent in dairying and 51 percent in woodworking. According to a power point presentation given by UW-Extension[30] in 2000, the Town of Richford had the largest number of Waushara County residents over the age of 5, who speak a Germanic language at home (51 to 100). It further states that "The Amish speak a Germanic language at home" and that "Only in the Towns of Richford, Coloma, Dakota and Aurora do youth (age 5 – 17) speak a Germanic Language at home).

Key Findings

Agricultural Resources

Agricultural Land Cover

- Agricultural land cover, which includes row crops, forages and grassland, comprised over 56 percent of the total area of Waushara County (1991-1993).
- Towns with a smaller share of total farmland are usually areas with a higher number of lakes.
- Higher shares of land in forage are generally found in the eastern part of the county.
- Towns with lower land area in forages generally have a larger percentage of land in grassland.

Farmland Losses

- In 1997, an estimated 710 farms existed within Waushara County. This represents a net gain of one farm from 1990.
- In 1997 Waushara County recorded 1.2 farms per square mile.
- In 1990, there were 232 dairy farms in Waushara County; by 1997 the county lost 101 dairy farms.

[29] UW Madison Applied Population Lab

[30] *Waushara County Demographic Overview, 2008*; as presented by UW-Extension Waushara County. Source data: Wisconsin Department of Administration.

- The major losses in the number of dairy farms generally occurred in the towns that had the largest numbers of farms.
- Between 1990 and 1997, 9,066 acres (4.4%) of farmland were lost in Waushara County.
- Between 1990 and 1997, 974 parcels encompassing 43,438 acres was sold in the County. Approximately 78 percent (33,881 acres) of this land remained in agricultural use, while 22 percent (9,558 acres) was converted to other uses.

Farmland Soils

- The highest percentage of land within the County is considered unique farmland.
- Prime farmland accounts for 18 percent (73,361 acres) of the land in the Waushara County.

Natural Resources

Soils

- About 59 percent of the area in the County is suitable for conventional systems; while another 19.2 percent is suitable for at-grade, in-ground pressure and mound systems.
- Just over one third of the area within County (34.8%, 141,989 acres) has soils that are considered to have a very high suitability for building site development.
- Only 28.5 percent (116,303 acres) pose a slight risk to no limitations for septage spreading throughout the County.

Geography and Topography

- Evidence of several phases of the Wisconsin Glacier can be found in the County.
- The western edge of the County is a flat outwash plain.
- Central Waushara County (City of Wautoma, Village Wild Rose and surrounding Towns) gradually flattens to a rolling plain as you move eastward across the County.
- The eastern third of the County is a gently rolling lake plain.
- Within Waushara County, land relief is approximately 390 feet, from a low of 750 feet above sea level near Poygan Marsh to a high of 1,137 feet at the Nordic Mountain Ski Hill (a granite monadnock located in the Town of Mount Morris).
- Less than ten percent (9.2%, 37,698 acres) of the County is classified as having slopes in excess of 12 percent.
- Steep slopes are scattered throughout Waushara County and are generally found in conjunction with moraines, drumlins, and other glacial features.

Water Resources

Watersheds and Drainage

- Surface water drainage for Waushara County located within the Central Wisconsin River Basin, the Upper Fox River Basin and the Wolf River Basin.
- Waushara County is divided into ten sub-watersheds: Big Roche-A-Cri Creek, Little Roche-A-Cri Creek, Fourteenmile Creek, Sevenmile & Tenmile Creeks, Mecan River, White River, Fox River/Berlin, Pine River and Willow Creek, Waupaca River, Little River and Alder Creek (Walla Walla).

Lakes, Ponds, and Quarries

- There are 136 lakes and/or impoundments found within Waushara County.

Rivers and Streams

- There are forty-six named river/streams in Waushara County. The most prominent rivers/ streams within Waushara County are the Mecan River, White River, Pine River and Willow Creek.

Floodplains

- Ten percent (40,725 acres) of the land within the County lie in a floodplain.

Wetlands

- Approximately 15 percent (59,964 acres) of Waushara County is classified as wetlands.

Groundwater

- A groundwater divide, located west and parallel to the topographic divide, cuts diagonally through Waushara County. It extends from Marquette County, through the towns of Hancock and Coloma, the Village of Hancock, and east of the Village of Plainfield to the Portage County line.
- East of this divide, groundwater moves southeasterly toward the Wolf and Fox Rivers.
- West of this divide groundwater moves westerly toward the Wisconsin River.
- Ninety-six wells within Waushara County exceeded the 10 ppm threshold level for nitrate. The majority of homes within Waushara County are served by private wells.
- The majority of homes within Waushara County are served by private wells.
- Groundwater depths of less than two feet are found in just over a quarter (25.8%, 105,049 acres) of the land area.
- There are five Atrazine Prohibition Areas within Waushara County.

Wildlife Resources

- The majority of the County falls within the Central Sand Hills ecological landscape, while the eastern portion of the County falls within the Southeast Glacial Plains ecological landscape and the western portion of the County falls within the Central Sand Plains.
- Woodlands comprise about 46 percent of the total land area in Waushara County.
- There are 140,879 acres of general woodlands and 44,851 acres of planted woodlands in Waushara County.
- In 2008, a total of 41,102 acres were actively managed within Waushara County under the MFL, while a total of 1,233 acres were managed under F CL.

Parks, Open Space and Recreational Resources

- The WDNR owns approximately 19,736 acres within Waushara County
- State Wildlife areas within Waushara County include: Greenwood Wildlife Area, Poygan Marsh Wildlife Area, Lunch Creek Wetlands, Mecan Springs, Karner Blue Meadow, Upper

Fox Headwaters, Plainfield Tunnel Channel Lakes, Bohn Lake and the Bass Lake Fen State Natural Area.
- State Fishery Areas within Waushara County include: the Big Roche-A-Cri, Mecan River, Pine River, Willow Creek, White River, Carter Creek and the Pony Creek Fishery Areas.
- The State owns/manages a number of areas in Waushara County. These areas are scattered throughout the County and in some cases are easements to the State Fishery, Natural Areas, and the County's water resources.

Mineral Resources

- There are nineteen active non-metallic mining sites in Waushara County.
- There are no metallic mineral resource sites in Waushara County.

Solid and Hazardous Waste

- There are thirty-six sites in Waushara County that are listed on the WDNR's registry of active, inactive and abandoned sites where solid waste or hazardous wastes were known or likely to have been disposed.

Air Quality

- There are no areas in Waushara County which exceeds the limits of the National Ambient Air Quality Standards (NAAQS) for ozone, particulates, or carbon monoxide.

Cultural Resources

- The following three items are listed on the National Register for Waushara County: Alanson M. Kimball House – Town of Leon; Waushara County Courthouse, Waushara County Sheriff's Residence and Jail – City of Wautoma; and Whistler Mound Group – Village of Hancock.
- A number of properties within Waushara County are included in the Architecture and History Inventory.
- According to the Wisconsin Historical Society, three historical markers or plaques are located within Waushara County: Sir Henry Wellcome – Town of Oasis; Whistler Mound Group and Enclosure – Town of Hancock; and The Auroraville Fountain – Town of Aurora.
- There are a number of museums in and near Waushara County.
- The earliest inhabitants of Waushara County were Native Americans. Considerable evidence of their civilization has been found in the county.
- On February 15, 1851, the Wisconsin Legislature established Waushara County and selected Sacramento as the county seat. In 1852, Waushara County was organized for judicial purposes and in September 1854 the county seat was moved to Wautoma.
- In 2000, the most common ancestry identified by Waushara County residents was German. Thirty-eight percent (38.0%) of Waushara County residents claimed German ancestry.
- Within Waushara County, Amish settlements include 52 households, 291 people, and an average household size of 5.6 persons.

INTERRELATIONSHIPS WITH OTHER COMPREHENSIVE PLAN ELEMENTS

Wisconsin's important agricultural base is strongly integrated with its natural resources. Complex agricultural patterns are mixed with the state's natural features to form a patchwork of different land uses. Natural resource issues and concerns are closely linked to activities taking place on agricultural lands, not only adjacent to one another, but in the area. Soil erosion from farm fields and surface water runoff of crop nutrients and agricultural chemicals can impact the quality of streams, rivers, and lakes. Leaching of pesticides and nutrients has the potential to impact underground aquifers and affect drinking water supplies. There is a growing concern, especially in areas where rural residential development is occurring, about the impact of livestock farming on air quality. However, it is important to note that individual farming operations differ in management practices and vary widely in their contribution to these environmental problems.

Although agricultural activities can have negative impacts on the environment, they can also provide positive benefits. People value the open agricultural landscape and the benefits of maintaining wildlife habitats. Other benefits include nutrient recycling and enhanced water recharge.

The long, rich history of farming in Wisconsin has lead to the creation and exposure of many of the state's archaeological sites. In the County it is not uncommon to find evidence of native villages and burial mounds. Architecturally distinctive homes, barns, or entire farmsteads can reflect a significant time period, be associated with a notable person, reflect ethnic building types and construction practices, or represent an example of a once important agricultural specialty.

Economic Development

Agriculture, natural and cultural resources should be considered when developing an economic development plan. It is important to remember that farming is still an important segment of Waushara County's rural economy. There may be specific economic development strategies that could help improve the well-being of local farmers; as long as financial conditions remain difficult, farmers will continue to find alterative uses for their land. Natural resources can provide a positive economic benefit to the area through recreational uses and overall aesthetics. However, protection and impact to the area's natural resources should be considered whenever a new business or development is proposed.

Cultural and natural elements provide opportunities for enhanced quality of life for current residents and can be a valuable tool to bring new workers and employers to the area. Historic preservation can be used to enhance unique qualities found in many of Waushara County's communities and towns.

Housing

Agriculture and natural resources need to be considered when planning for the housing element. Most new residential construction is occurring on agricultural land or adjacent to significant natural resources such as a lake, stream, river, wetland, steep slope, or woods. Although these natural features provide aesthetically pleasing views for new homeowners, residential encroachment has detrimental impacts to the natural resource base. In many areas,

housing development patterns have been rather haphazard. Scattered housing patterns have resulted in high costs to local communities in the form of lost farmland, increased demand for public services, and conflicts between homeowners, farmers, environmentalists, and recreationalists. Demand for home sites also drives land costs upward, reducing the ability of farmers to buy land to either begin farming or expand existing operations.

Existing older housing stock provides community character and reflects the historical development of the area. Older neighborhoods often offer the best opportunities for low income housing that can be rehabilitated using community improvement programs. Abandoned historic industrial buildings and old schools can be retrofitted and preserved to provide unique and attractive affordable housing for the community.

Transportation

Transportation planning should consider the transportation needs of the area. Transportation is critical to the agricultural community because it provides access to suppliers, processors, haulers, and other support industries. The transportation network also allows goods to be brought to local, regional, national, and international markets. An efficient transportation network can increase income levels for Wisconsin farmers. Additionally, when planning for transportation, it is important to consider how rural residential developments and expanding agricultural operations will affect the transportation infrastructure and safety of the local area. Development and subsequent transportation improvements may impact the County's natural resources, wetland areas, and farmland adjacent to existing highway corridors. To minimize this impact, Waushara County and its communities should monitor these situations and consider development techniques that offer greater environmental protection.

When transportation corridors are expanded or proposed, care should be taken to minimize the effects on historical and cultural resources. Sensitivity must be shown for historic buildings and markers as well as archaeological sites and objects. The integrity and identity of a community is dependent on the preservation of its historic character and distinctive natural features. For example, the identity and aesthetics of a historic neighborhood can easily be threatened by a street widening project that removes large trees and narrows street terraces.

Utilities and Community Facilities

Planned development leads to an efficient use of public infrastructure and reduces the amount of sprawl, which leads to the consumption of the rural landscape and other natural resources. Educating local officials and citizens about how local land use decisions impact the agricultural industry is important if the ability to grow and raise food is to be preserved. Diminishing farmland also affects a community's ability to land spread bio-solids, a byproduct of the wastewater treatment process. As large areas of farmland in close proximity to suburban areas decrease, communities must travel longer distances to dispose of this waste, thereby increasing the cost of sewage disposal.

Similar to farmland, our natural resources are limited and are being consumed at an alarming rate. Fossil fuel emissions lead to persistent health and environmental problems; regional haze; acidification of surface waters and forests; mercury in fish and other wildlife; acidic damage and erosion to buildings and other materials; ozone damage to forests; and eutrophication of water bodies. Renewable energy, or an alternative energy source, is created from sustainable natural

resources. Corn and other cellulose products can be used to produce ethanol for alternative fuel vehicles. Wind energy provides an alternative to coal and natural gas boilers.

To maintain our quality of life, it is essential that not only is growth accommodated but that it be done while protecting our natural environment. The quality of the region's surface and groundwater resources are linked to the proper siting, installation, and maintenance of individual on site wastewater systems. Improper treatment and discharge of human waste and bacteria can contaminate public and private water supplies. The impact of increased development and associated impervious area can adversely affect groundwater quality and quantity.

Public buildings such as city or town halls, county courthouses, schools, water treatment plants, water towers, libraries, and fire stations are often architecturally significant landmarks in a community and are an important element of the community's character. Even when these buildings have outgrown their original use, they are often converted into a community center, senior center, housing or another productive use due to the community's attachment to them.

Land Use

Land use is an integral part of all the elements in the plan. County residents value the preservation of agricultural land and the natural resources. There is a need to protect the rural atmosphere while allowing for controlled orderly development. Opportunities for historical preservation should also be considered in all future planning, zoning, and development decisions.

Intergovernmental Cooperation

Many agricultural and natural resource issues go beyond local boundaries. Watersheds and other ecosystems, economic conditions, transportation patterns, and housing can impact regions as a whole. Air and water pass over the landscape so that one jurisdiction's activities can affect other jurisdictions located downwind or downstream. Regional development patterns and neighboring municipal land use policies also affect land price, availability of land, and the economic performance of local farms in adjoining towns. Unless towns, cities, villages, and counties communicate and coordinate effectively, it will be difficult to control growth in agricultural areas that preserves farmland and protects natural resources.

Preserving a community's heritage allows people to connect with the past. Unfortunately, little has been done in Waushara County to establish a base of historically significant buildings and other features. The Wisconsin Historical Society's Division of Historic Preservation provides funding to local governments and non-profit organizations. These funds can be sought independently or collectively with neighboring communities to fund architectural and historical surveys. Communities should work together to utilize existing local expertise on not only the history of the area, but also on historic preservation issues.

POLICIES AND PROGRAMS

State, Regional, County, and Local Policies

Wisconsin Administrative Code. Comm 83, revised during the 1990s to add provisions for new wastewater treatment system technologies and land suitability criteria, came into effect on July 1, 2000. Unlike the code it replaced, the new rules prescribe end results – the purity of wastewater discharged from the system – instead of specific characteristics of the installation. This rule provides land owners with more on-site wastewater treatment options, while at the same time protecting natural resources and groundwater. Within Waushara County, holding tanks are banned for new construction and are not allowed for replacement systems unless the property cannot support any other on-site sewage disposal systems.

NR-103, Water Quality Standards for Wetlands, establishes water quality standards for wetlands.

NR-115, Wisconsin's Shoreland Management Program, requires counties to adopt zoning and subdivision regulations for the protection of all shorelands in unincorporated areas.

NR-116, Wisconsin's Floodplain Management Program, requires municipalities to adopt reasonable and effective floodplain zoning ordinances.

NR-117, Wisconsin's City and Village Shoreland-Wetland Protection Program, establishes minimum standards for city and village shoreland-wetland zoning ordinances.

NR-135 was established to ensure that nonmetallic mining sites are properly abandoned. This law promotes the removal or reuse of nonmetallic mining refuse, removal of roads no longer in use, grading of the nonmetallic mining site, replacement of topsoil, stabilization of soil conditions, establishment of vegetative groundcover, control of surface water flow and groundwater withdrawal, prevention of environmental pollution, development and reclamation of existing nonmetallic mining sites, and development and restoration of plant, fish and wildlife habitat if needed to comply with an approved reclamation plan.

NR-243, Animal Feeding Operations, purpose of this chapter is to implement design standards and accepted manure management practices for concentrated animal feeding operations. This chapter also establishes the criteria under which the department may issue a notice of discharge or a permit to other animal feeding operations which discharge pollutants to waters of the state or fail to comply with applicable performance standards and prohibitions in ch. NR 151 .

Wisconsin State Statutes.

Wis. Stats. S. 93.90 and rule ATCP 51, Livestock Facility Siting Law regulates the siting of new and expanded livestock operations. The statute limits the exclusion of livestock facilities from agricultural zoning districts. It establishes procedures local governments must follow if they decide to issue conditional use or other local permits for siting livestock facilities. It also creates the Livestock Facility Siting Review Board to hear appeals concerning local decisions on permits.

Wis. Stats. S. 823.08, Actions against agricultural uses. The "Right to Farm" law protects farmers from nuisance law suits related to odor and noise in normal agricultural operations provided that pubic health and safety are not endangered.

Regional

East Central Wisconsin Regional Planning Commission. East Central has adopted a regional comprehensive plan. As a part of this Plan, East Central has adopted several core policies and/or goals for agricultural, natural, and cultural resources.

Agricultural Resources

- Encourage appropriate and practical conservation oriented land and wildlife management practices.
- Promote management of renewable resources in ways compatible with sustained yield.
- Support land use patterns which are consistent with soil suitability and other environmental considerations.
- Encourage development on lands not suitable for farming and community recreation.
- Maintain employment and increased income in the agricultural sector.
- Encourage contiguous planned development to eliminate the intermingling of farms and urban land uses.
- Preserve land suitable for the production of food and fiber to meet present and future needs.
- Promote adoption of exclusive agricultural zoning districts to ensure that valuable farming lands are not lost or disrupted by urban land uses.

Natural Resources

- Improve and protect surface and groundwater quality.
- Improve and/or maintain high air quality.
- Preserve and protect environmentally sensitive areas and promote the linking of these areas into environmental corridors.
- Manage wildlife and wildlife habitat in a manner that maintains ecological stability and diversity while considering the social and economic impacts.
- Protect nonmetallic mineral deposit sites.
- Ensure sufficient natural public open space is provided to meet the active and passive recreational needs of all residents while preserving and protecting the region's natural and cultural resources.
- Promote the consideration of design and aesthetics as a means of ensuring that communities and the region as a whole remain attractive as places to live, work, and play.

Cultural Resources

- Establish a regional cultural resource implementation committee to work on pursuing implementation of the regional cultural resources plan.
- Hold an annual Cultural Resources Summit where local organizations, preservation professionals, HP commissioners, and the general public could hear speakers, exchange

ideas and interact with each other, raise and address current issues and needs, and encourage support for cultural resource appreciation, enhancement, and protection.
- Create a web-based clearinghouse to serve the region, offering a variety of resources to support preservation of our prehistoric and historic, archeological, and cultural heritage.
- Ensure that decision makers have an understanding of, and an appreciation for, cultural resource protection.
- Make the public better aware of the tax benefits and protections which are available to local landmarks, state and national register site properties, as well as associated responsibilities.
- Work with the Wisconsin Historical Society to increase access to the WHS WHPD database and expand its usefulness to a broader user base.
- Develop an easy, reliable way to alert local government officials conducting permit reviews, and prospective buyers making land/home purchase decisions, as to the location of culturally significant properties by including these cultural resource status designations in all title transfer records.
- Work with local and regional groups to update the State's list of archaeological and historical inventories.
- Revise the Wisconsin State Statutes (709.02) to expand and include "archaeological sites" as well as historic buildings and sites, in the items which realtors must make known to potential buyers.
- Prevent generational loss of cultural heritage by encouraging the use of more cultural resource programming in the history and social studies curriculum of K-12 and higher education institutions in the region.
- Establish a Cultural Resource Center for the ECWRPC region.
- Encourage greater interaction and sharing of ideas, resource materials, etc. between the private sector and the public sector, volunteers and professionals.

County

Waushara County Zoning Ordinance. The Waushara County Zoning Ordinance regulates zoning for the County's Towns. The following Chapters contain relevant information.

Chapter 22: Article IVs, Manure Waste Storage Ordinance regulates the location, design, construction, installation, alteration, closure, and use of manure storage facilities in order to prevent water pollution and the spread of disease. The county does not currently regulate large animal farming operations (CAFOs); however, regulation of these operations is being investigated and may be included under the Manure Waste Storage Ordinance.

Chapter 58, Zoning defines the different zoning categories and identifies what land uses are permitted in a given zone). Exclusive agricultural zoning is not practiced within the county. The A-G zone is designed primarily for large-scale agricultural uses of land related to growing of crops and the raising of livestock. However, single family residential homes are permitted. The A-R zoning provides a semi-rural type of environment, allowing for general agricultural use. According to the Waushara County Zoning Ordinance, all unincorporated areas within 1,000 feet of the ordinary high water mark of navigable lakes, ponds or flowages within 300 feet of the ordinary high water mark of a navigable river or stream fall under Shoreland Jurisdictional Area. Restrictions meant to protect these areas address lot size, setbacks, building, permitted uses, vegetative shore cover, grading and filling.

Waushara County Farmland Preservation Plan. Waushara County adopted a Farmland Preservation Plan on June 9, 1981. The goal of program is to preserve productive and potentially productive agricultural land, forest land, and environmentally sensitive areas while providing other areas for well planned growth in other appropriate areas of the county. Adoption of this plan allows farmers in preservation areas (existing farms with a minimum of 35 acres of productive cropland that are mapped as preservation areas) to sign a voluntary agreement under the State's Farmland Preservation Act for tax credits. Even though existing cropland is enrolled in this program, farmland in the County continues to be lost as more people seek homesites in rural areas.

Federal and State Programs

Federal

United States Department of Agriculture

Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP). These programs protect sensitive land by reducing erosion, increasing wildlife habitat, improving water quality, and increasing forestland. CREP, a partnership between federal and state agencies and county land conservation departments, allows a landowner to enroll agricultural lands into various land conservation management practices. To be eligible under this program, farmland needs to be highly prone to erosion and must have been planted for 4 to 6 years before the enactment of the 2002 law. Marginal pastureland is also eligible. Producers need to develop and follow a plan for the conversion of cropland to less intensive use and to assist with the cost, establishment, and maintenance of conservation practices. More information can be found at http://www.nrcs.usda.gov/Programs/crp/ and http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cep.

Grassland Reserve Program (GRP). This program is used to protect private grasslands, shrublands, and pasturelands. Agricultural areas which were formerly one of these ecosystems are also eligible for enrollment. The program helps to restore native grasslands and forbs by banning any agricultural practice which requires breaking the ground. Landowners must place their land into an easement for a period of between 10 and 30 years. An accompanying restoration plan delineates how best to return the area to a natural state. Program participants must share in installation costs. More information can be found at http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=grp.

Wildlife Habitat Incentives Program (WHIP). This voluntary program is used to develop or improve wildlife habitat on privately owned land. All private land is eligible for this program unless the land is enrolled in CRP, WRP, or other similar programs. Producers must design and implement a wildlife habitat development plan and assist in the implementation costs. More information can be found at http://www.nrcs.usda.gov/Programs/whip/.

Grazing Lands Conservation Incentive. This program provides cost sharing to improve grazing land management. More information can be found at http://www.nrcs.usda.gov/Programs/glci/.

Environmental Quality Incentives Program (EQIP). This voluntary conservation program promotes agricultural production and environmental quality and compatible goals. Financial assistance and technical help are offered to assist eligible participants in the installation and

implementation of structural improvements and management practices which better protect agricultural land from environmental degradation. All private agricultural land is eligible for enrollment including cropland, grassland, pastureland, and non-industrial private forestland. Participants are required to develop and implement a EQIP plan that describes the conservation and environmental purposes to be achieved. Participants must share in the overall costs. More information can be found at http://www.nrcs.usda.gov/Programs/eqip/.

Forest Land Enhancement Program (FLEP). This program aids landowners in the application of sustainable forestry on private land. The program places a permanent easement on farmland. All non-industrial private forestlands are eligible for financial, technical, and educational assistance. Landowners must develop and implement a management plan to harvest timber while protecting the environmental quality of the forest. More information can be found at http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml.

USDA Farmland Protection Policy Act (FPPA). The purpose of this program is to maintain prime farmland in agricultural use through agricultural conservation easements. This program provides funding for state, tribal, or local government to purchase development rights on prime agricultural land. More information can be found at http://www.nrcs.usda.gov/programs/fppa/.

Wetland Reserve Program. This program which provides financial and technical assistance to private landowners to restore, protect, and enhance wetlands. The management goals include restoring both the functional values of the wetlands and providing optimal wildlife habitat. Most private wetlands that were converted to agricultural uses prior to 1985 are eligible. Participants must develop and follow a plan for the restoration and maintenance of the wetland and, if necessary, assist in the cost of restoration. More information can be found at http://www.nrcs.usda.gov/PROGRAMS/wrp/.

US Environmental Protection Agency

Clean Water Act (1977). The Clean Water Act established the basic structure for regulating discharges of pollutants into the waters of the United States.

National Pollution Discharge Elimination System (NPDES) Storm Water Program. The NPDES program addressed the non-agricultural sources of storm water discharge and the Safe Drinking Water Act.

State

Wisconsin Department of Agriculture, Trade and Consumer Protection

Wisconsin Farmland Preservation Program. The 1977 Wisconsin Farmland Preservation Program was developed to preserve farmland through local planning and zoning; promote soil and water conservation; and provides tax relief to participating landowners. Landowners qualify if their land is located in an exclusively agricultural zoning district or if they sign an agreement to use their land exclusively for agricultural purposes. Participating landowners must comply with soil and water conservation standards set by the state Land Conservation Board.

Wisconsin Department of Revenue

Farmland Tax Relief Credit Program. The Farmland Tax Relief Credit Program provides tax relief to all farmland owners with 35 or more acres. The credit is computed as a percentage of the first $10,000 in property taxes up to a maximum credit of $1,500. The DOR determines the actual percentage based on the estimated number of claims and amount appropriated for the credit.[31]

Wisconsin Department of Natural Resources

Wisconsin Pollutant Discharge Elimination System Permits (WPDES). The Wisconsin Pollutant Discharge Elimination System Permits (WPDES) was instituted as a complement to the NPDES program. WPDES regulates municipal, industrial, and agricultural operations which discharge (or have the potential to discharge) into local surface waters. Depending on the site-specific land use, the program regulates three different uses. Wastewater discharge permits regulate effluents discharged by industries and municipalities into surface and groundwater. Construction sites greater than one acre and industrial sites (non-metallic mining) are regulated through stormwater runoff permits.[32] Concentrated Animal Feeding Operations (CAFOs) with 1,000 animal units or more are regulated as a result of potential contamination from animal waste.[33] If an individual operation is found to be a significant contributor of pollutants, it may be considered a medium-sized CAFO; permits can be issued for medium-sized CAFOs which exceed 300 animal units.

In order to be defined a CAFO, the agricultural operation must first be defined as an animal feeding operation (AFO). CAFOs are facilities which animals are stored, stabled, or fed for at least 45 days within a 12 month period and which vegetation or post-harvest residues are not sustained in the normal growing season over any portion of the facility.[34] Permits require CAFOs to provide runoff management plans for outdoor lots and feed storage areas; a manure storage facility plan/diagram, an annually updated comprehensive manure management plan; and routine monitoring and reporting of daily operations. Permits are issued for a maximum of five years. The permit system regulates land application, manure storage, and runoff management; it does not address noise, land values, traffic, odors, or other similar types of issues because there is no statutory authority to do so. These issues must be regulated by county and local ordinances.

Forest Crop Law and Managed Forest Law. In 1927, the Wisconsin Legislature enacted the Forest Crop Law (FCL), a voluntary forest practices program to encourage sound forestry on private lands. It has promoted and encouraged long-term investments as well as the proper management of woodlands. This law allowed landowners to pay taxes on timber only after harvesting, or when the contract is terminated. Since the program expired in 1986, participants are not allowed to re-enroll in the program. Since 1986, the Managed Forest Law has replaced the Forest Crop Law.

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[31] Wisconsin Department of Revenue. 2002. *Division of Research and Policy Farmland Preservation Credit Program and Farmland Tax Relief Credit Program*.
[32] Wisconsin State Statutes NR 135 and NR 216.
[33] Wisconsin State Statutes NR 243.
[34] U.S. Environmental Protection Agency and U.S. Department of Agriculture. 1999. *Unified National Strategy for Animal Feeding Operations.*

The Managed Forest Law (MFL), enacted in 1985, encourages the growth of future commercial crops through sound forestry practices. To be eligible, a landowner must own at least 10 contiguous acres of woodlands in a village or town. The landowner must implement a forestry management plan for future commercial harvests on the land. Contracts can be entered for a period of either 25 or 50 years. Portions of the land enrolled are open to public access for hunting, fishing, cross-country skiing, sight-seeing, and hiking. The program recognizes individual property owners' objectives while providing for society's need for compatible recreational activities, forest aesthetics, wildlife habitat, erosion control, and protection of endangered resources.

Wisconsin Forest Landowner Grant Program. The Wisconsin Forest Landowner Grant Program assists private landowners in protecting and enhancing their woodlands. Only private non-industrial forest owners of at least 10 acres but no more than 500 acres who have an approved or pending forest stewardship management plan are eligible for assistance. Qualified projects include reforestation; soil and water protection; wetland and riparian protection, restoration, and creation; fish and wildlife habitat enhancement; recreational, historic, and aesthetic forest enhancement; and endangered or threatened resources protection.

Forest Land Enhancement Program (FLEP). The purpose of this program is to assist private landowners in protecting and enhancing their forested lands and water by providing cost-share reimbursement for sustainable forestry practices.

Partners for Fish and Wildlife. Partners for Fish and Wildlife is a program which provides financial and technical assistance to private landowners to restore, protect, and enhance wildlife habitats on their land. This is a voluntary incentive based program. State resource agencies and individual landowners work closely with the Service to help establish priorities and identify focus areas. The restoration of degraded wetlands, native grasslands, streams, riparian areas, and other habitats to conditions as close to natural is emphasized. The program's philosophy is to work proactively with private landowners for the mutual benefit of declining Federal trust species and the interests of the landowners involved. A 50 percent cost sharing is required from individual landowners. Landowners must sign an agreement to retain the restoration for a minimum of 10 years. During this time period, no other private property rights are lost.

Wisconsin Historical Society

The Wisconsin Historical Society (WHS) Division of Historic Preservation (DHP) provides funds for conducting surveys to identify and evaluate historical, architectural, and archaeological resources, nominating properties and districts to the National Register, and carrying out a program of comprehensive historic preservation planning and education. These are available to local units of government and non-profit organizations. Although funding is limited, the DHP identified target communities during each funding cycle. In recent years the DHP has favored underrepresented communities: unincorporated communities or villages or fourth-tier cities with a population less than 5,000. A set of funds is also designated for use by Certified Local Government (CLG) status communities. In addition, many private funding sources specifically target smaller communities in the more rural parts of the state. Other specific programs are listed below.

Federal Historic Preservation Credit. This program returns 20 percent of the cost of rehabilitating historic buildings to owners as a direct reduction in the federal income taxes. To

qualify, buildings must be income producing historic buildings, must be listed on the National Register of Historic Places, or contribute to the character of a National Register Historic District.

Wisconsin Supplemental Historic Preservation Credit. This program returns an additional 5 percent of the cost of rehabilitation to owners as a discount on their Wisconsin state income taxes. Owners that qualify for the Federal Historic Preservation Credit automatically qualify for the Wisconsin supplement if they get National Park Service approval before they begin any work.

25-Percent State Income Tax Credits. This program can be used for the repair and rehabilitation of historic homes in Wisconsin. To qualify, buildings must be either listed on the state or national register; contribute to a state or national register historic district; or be eligible for individual listing in the state register.