

2 Urban Growth, Agriculture Analysis and Open Space Inventory

INTRODUCTION

Information on urban growth characteristics, such as population and household characteristics, agricultural trends, and areas of open space provide an essential basis for the analysis of preservation methods for farmland and open space in Washington County. Existing and forecasted population characteristics and changes in farming have a direct influence on the amount of farmland and open space available now and in the future. The inventory findings are presented in this chapter.

URBAN GROWTH

Population

Washington County has experienced significant population growth, growing from 33,902 persons in 1950 to 117,493 persons in 2000 according to the U.S. Census. This is an increase of 246 percent as presented in Table 1.

Table 1:
Historic Residential Population Levels in Washington County,
Southeastern Wisconsin, and the State of Wisconsin: 1950-2000

Year	Washington County			Southeastern Wisconsin			Wisconsin		
	Population	Change from Preceding Census		Population	Change from Preceding Census		Population	Change from Preceding Census	
		Absolute	Percent		Absolute	Percent		Absolute	Percent
1950	33,902	5,472	19.2	1,240,618	172,919	16.2	3,434,575	296,988	9.5
1960	46,119	12,217	36.0	1,573,614	332,996	26.8	3,951,777	517,202	15.1
1970	63,839	17,720	38.4	1,756,083	182,469	11.6	4,417,821	466,044	11.8
1980	84,848	21,009	32.9	1,764,796	8,713	0.5	4,705,642	287,821	6.5
1990	95,328	10,480	12.4	1,810,364	45,568	2.6	4,891,769	186,127	4.0
2000	117,493	22,165	23.3	1,932,908	122,544	6.8	5,363,675	471,906	9.6

Source: U.S. Bureau of the Census and SEWRPC.

From 1990 to 2000, Washington County's population grew just over 23 percent, adding approximately 22,000 new residents. Washington County's population increased 29.6 percent from 95,328 in 1990 to 123,587 in 2004¹, ranking Washington County among the top five fastest growing counties in Wisconsin by both population increase and percentage change in population.

Population increases have occurred at all municipal levels. Between 2000 and 2004, the Village of Jackson had the highest rate increase at 14.99 percent, followed by the City of Hartford with an increase of 10.73 percent, thirdly, the Village of Kewaskum at 8.54 percent and fourthly, the Town of Richfield at 7.92 percent. The change in population by municipality is displayed in Table 2.

¹ Wisconsin Department of Administration Population Estimates

Table 2:
Resident Population Levels in Washington County: 2000 – 2004

Municipality	2000 Census	2004 Estimate	Numeric Change	Percentage Change
Town Germantown	278	269	-9	-3.24
Town Hartford	4,031	4,023	-8	-0.20
Town West Bend	4,834	4,835	1	0.02
Town Barton	2,546	2,587	41	1.61
Town Kewaskum	1,119	1,138	19	1.70
Town Polk	3,938	4,011	73	1.85
Town Jackson	3,516	3,637	121	3.44
Town Trenton	4,440	4,595	155	3.49
City West Bend	28,152	29,204	1,052	3.74
Town Erin	3,664	3,802	138	3.77
Village Newburg	1,027	1,066	39	3.80
Village Germantown	18,260	19,001	741	4.06
Town Addison	3,341	3,505	164	4.91
Town Farmington	3,239	3,433	194	5.99
Village Slinger	3,901	4,143	242	6.20
Town Wayne	1,727	1,844	117	6.77
Town Richfield	10,373	11,195	822	7.92
Village Kewaskum	3,277	3,557	280	8.54
City Hartford	10,895	12,064	1,169	10.73
Village Jackson	4,938	5,678	740	14.99
Washington County	117,496	123,587	6,091	5.18

Source: Wisconsin Department of Administration Population Estimates

Washington County’s close proximity to Milwaukee’s metropolitan area has helped fuel this population increase. The population forecast for Washington County is estimated to be 149,500 in 2025 and 157,300 in 2035².

Households

In addition to the population growth, the increase in the number of households affects land use in the County. A household includes all persons who occupy a housing unit – defined by the Census Bureau as a house, apartment, a mobile home, a group of rooms, or a single room that is occupied or intended for occupancy, as separate living quarters. Persons not living in households are classified as living in group quarters, such as correctional facilities, college dormitories, and military quarters³. The rate of increase in the number of households exceeded the rate of population growth. Between 1970 and 2000, households increased by 152 percent, while the population increased by 84 percent. Growth in the number of households in Washington County and Southeast Wisconsin is shown in Table 3⁴.

² SEWRPC, 2004

³ SEWRPC, 2004

⁴ SEWRPC, 2004

Table 3:
Households, Household Population,
and Average Household Size in Washington County: 1970-2000

Washington County	Year			
	1970	1980	1990	2000 ^a
Households	17,385	26,716	32,977	43,843
Household Population	63,135	83,946	94,271	116,198
Average Household Size	3.63	3.14	2.86	2.65

^a Reflects Census Bureau-approved corrections to initially released 2000 census data for the County
Source: U.S. Bureau of the Census and SEWRPC and Washington County Planning and Parks Dept.

In 2000, there were 43,843 households in Washington County. This number is expected to grow to 58,800 in 2025 and 62,800 in 2035⁵. Table 4 presents actual and forecasted numbers of households for Washington County.

Table 4:
Actual and Projected Households in Washington County: 2000 – 2035

Year	High Projection			Intermediate Projection			Low Projection		
	Households	Change from preceding year		Households	Change from preceding year		Households	Change from preceding year	
		Absolute	Percent		Absolute	Percent		Absolute	Percent
Actual Households: 2000	43,843	--	--	43,843	--	--	43,843	--	--
Projected Households									
2005	48,960	5,117	11.7	47,534	3,691	8.4	46,267	2,424	5.5
2010	53,154	4,193	8.6	50,864	3,330	7.0	49,055	2,789	6.0
2015	57,285	4,132	7.8	54,042	3,178	6.2	51,640	2,585	5.3
2020	61,314	4,029	7.0	57,037	2,995	5.5	53,994	2,354	4.6
2025	65,148	3,833	6.3	59,769	2,732	4.8	56,050	2,056	3.8
2030	68,221	3,073	4.7	61,738	1,969	3.3	57,347	1,298	2.3
2035	70,373	2,153	3.2	62,833	1,095	1.8	57,806	459	0.8
Change: 2000-2035	--	26,530	60.5	--	18,990	43.3	--	13,963	31.8

Source: SEWRPC, 2004

Land Use

Prior to 1950, urban development in Washington County has generally occurred within the sewer service areas of the established communities of Germantown, Hartford, Jackson, Kewaskum, Newburg, Slinger, and West Bend. Between 1950 and 1970, Washington County saw a significant increase in urban development occurring outside of established sewer service areas. This pattern continued to occur in the decades following 1970, as land development for urban uses increased dramatically. Map 1 illustrates the historic urban development of Washington County since 1900. Between 1950 and 2000, a significant amount of prime agricultural land and open space throughout Washington County was converted to residential, commercial, and industrial development. Between 1950 and 1995, the developed urban area of the County increased at an average rate of about 1.0 square mile per year⁶.

In 2000, urban land uses – consisting of residential, commercial, industrial, governmental and institutional, recreational, and transportation, communication and utility uses - encompassed about 78.7 square miles, or 18 percent of the total area of the County. Of the urbanized land uses, residential land

⁵ SEWRPC, 2004

⁶ A Park and Open Space Plan for Washington County: 2020

comprised the largest urban land use category, encompassing 40.0 square miles, or about 51 percent of all urban land use and 9 percent of the total area of the County. Land uses categorized as transportation, communications, and utilities constituted the second largest urban land use category, encompassing about 24.4 square miles, or about 31 percent of all urban land and 6 percent of the total land in the County. Recreational land uses constituted the third largest urban land use category in the County, encompassing about 4.8 square miles, or about 6 percent of all urban land and 1 percent of the total land in the County. Between 1970 and 1995, urban land uses increased by 28.7 square miles, or about 75 percent. Residential and commercial land uses increased by 125 percent, and industrial land uses increased by 163 percent⁷. (As part of the year 2000 land use inventory, the delineation of existing land use was referenced to real property boundary information not available to prior inventories. As a result of this change, year 2000 land use inventory data are not comparable with earlier inventories⁸.) Urban land uses in Washington County from 1970, 1995, and 2000 are set forth in Table 5.

In 2000, Washington County’s nonurban land – consisting of agriculture, woodlands, wetlands, surface water, landfills, extractive areas, and other open lands - encompassed approximately 356.9 square miles. Agricultural land consists of 221.5 square miles. Woodlands, wetlands, and surface water constitute 109.8 square miles, and the remaining nonurban land, 25.6 square miles, is landfill, extractive areas, and other open lands. Nonurban lands decreased by 28.7 square miles, or 7 percent, between 1970 and 1995 as illustrated in Table 6⁹.

Table 5:
Washington County Urban Land Uses: 1970, 1995, and 2000

Land Use Category	1970			1995			1970-1995		2000 ^a		
	Square Miles	Percent of Subtotal	Percent of County	Square Miles	Percent of Subtotal	Percent of County	Change	Percent Change	Square Miles	Percent of Subtotal	Percent of County
Urban ^b											
Residential.....	15.5	40.4	3.6	34.9	52.1	8.0	19.4	125.2	40.0	50.8	9.2
Commercial.....	0.8	2.1	0.2	1.8	2.7	0.4	1.0	125.0	2.1	2.7	0.5
Industrial.....	0.8	2.1	0.2	2.1	3.1	0.5	1.3	162.5	2.4	3.1	0.6
Governmental and Institutional.....	1.6	4.1	0.3	2.1	3.1	0.5	0.5	31.3	2.3	2.9	0.5
Recreational.....	2.1	5.5	0.5	4.1	6.1	0.9	2.0	95.2	4.8	6.1	1.1
Transportation, Communications, and Utilities.....	16.6	43.2	3.8	20.4	30.4	4.7	3.8	22.9	24.4	31.0	5.6
Undeveloped Urban.....	1.0	2.6	0.2	1.7	2.5	0.4	0.7	70.0	2.7	3.4	0.6
Total	38.4	100.0	8.8	67.1	100.0	15.4	28.7	74.7	78.7	100.0	18.1

Source: SEWRPC and Washington County Planning and Parks Department

^a As part of the year 2000 land use inventory, the delineation of existing land use was referenced to real property boundary information not available for prior inventories. As a result of this change, however, year 2000 land use inventory data are not strictly comparable with data from the 1995 and prior inventories.

^b Parking lots are included with the associated use.

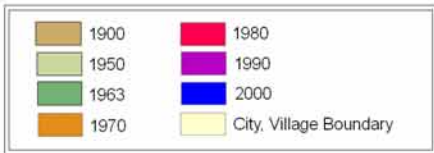
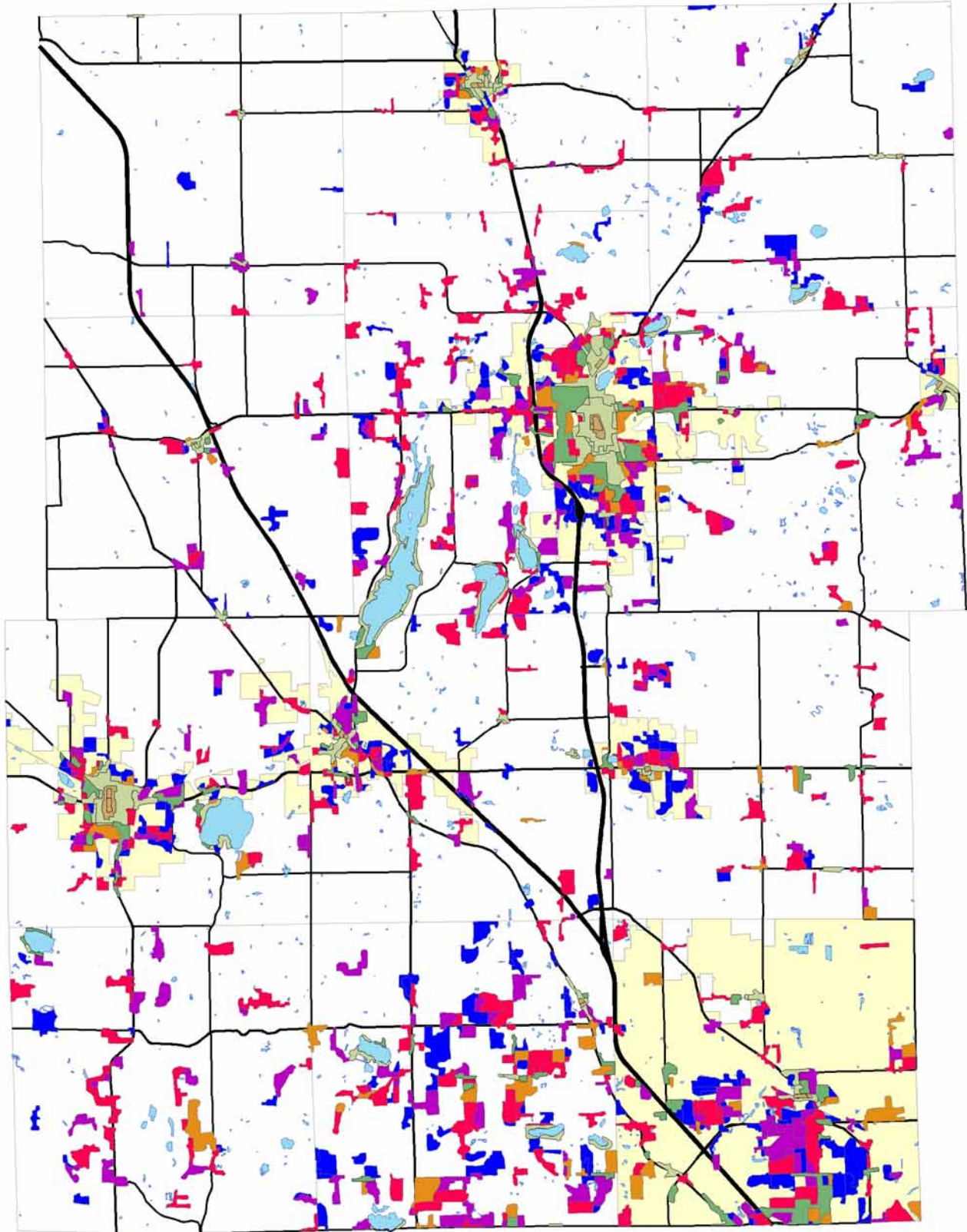
NOTE: Undeveloped urban lands, defined in inventories prior to 2000, are unused lands located within or adjacent to urban areas that are not woodlands, wetlands, or water.

⁷ A Park and Open Space Plan for Washington County: 2020

⁸ SEWRPC, 2004

⁹ A Park and Open Space Plan for Washington County: 2020

Map 1 Historical Urban Growth in Washington County 1900 - 2000



Historic Urban Growth data source: SEWRPC
All information subject to errors and omissions and is not certified by Washington County.
Map produced 1/14/05 by the Washington County GIS and Planning Divisions of the Planning and Parks Department

Table 6:
Washington County Nonurban Land Uses: 1970, 1995, and 2000

Land Use Category	1970			1995			1970-1995		2000 ^a		
	Square Miles	Percent of Subtotal	Percent of County	Square Miles	Percent of Subtotal	Percent of County	Change	Percent Change	Square Miles	Percent of Subtotal	Percent of County
Nonurban											
Agricultural.....	279.6	70.4	64.2	238.7	64.8	54.8	-40.9	-14.6	221.5	62.1	50.9
Woodlands.....	32.7	8.2	7.5	35.0	9.5	8.0	2.3	7.0	36.0	10.1	8.3
Wetlands.....	65.3	16.5	15.0	66.1	17.9	15.2	0.8	1.2	66.8	18.7	15.3
Water.....	6.4	1.6	1.5	6.9	1.9	1.6	0.5	7.8	7.0	2.0	1.6
Landfill and Extractive.....	1.7	0.4	0.4	2.1	0.5	0.5	0.4	23.5	2.0	0.5	0.4
Other Open Lands....	11.6	2.9	2.6	19.8	5.4	4.5	8.2	70.7	23.6	6.6	5.4
Total	397.3	100.0	91.2	368.6	100.0	84.6	-28.7	-7.2	356.9	100.0	81.9

Source: SEWRPC and Washington County Planning and Parks Department

^a As part of the year 2000 land use inventory, the delineation of existing land use was referenced to real property boundary information not available for prior inventories. As a result of this change, however, year 2000 land use inventory data are not strictly comparable with data from the 1995 and prior inventories.

NOTE: Other Open Lands are those unused rural areas not used for agricultural purposes and do not include woodlands, wetlands, or water.

AGRICULTURE

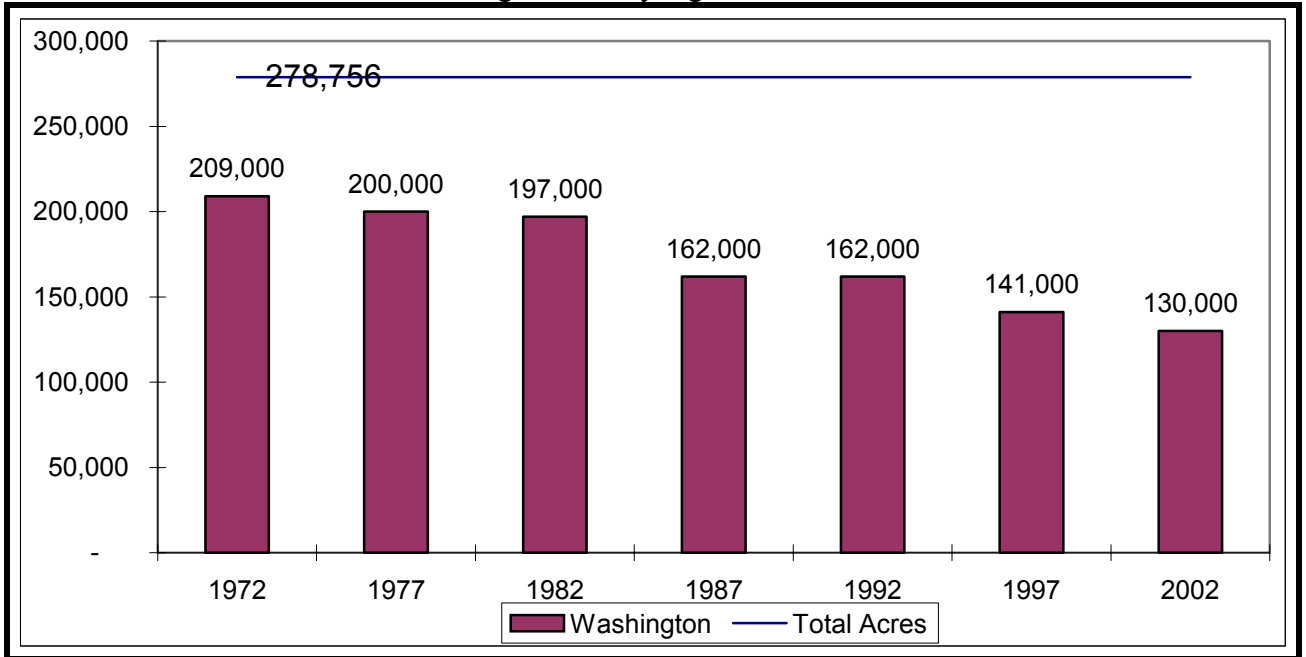
Declining Farmland

Farming in Wisconsin has undergone considerable change in the last few decades. Wisconsin Agricultural Statistical Service statistics show that Wisconsin saw 15 percent of its farmland taken out of agricultural production between 1980 and 2002. Over the same period, Washington County saw 34 percent of its farmland taken out of agricultural production. Chart 1 illustrates this change. Agriculture is the largest single nonurban land use in the County, comprising about 238.7 square miles, or about 55 percent of the area in the County in 1995¹⁰. Chart 2 presents the reduction in farmland acreage between 1972 and 2002 for Washington County and its neighboring counties. Washington County has the largest decline in agricultural land use as a percentage of total land in the County, dropping 29 percent.



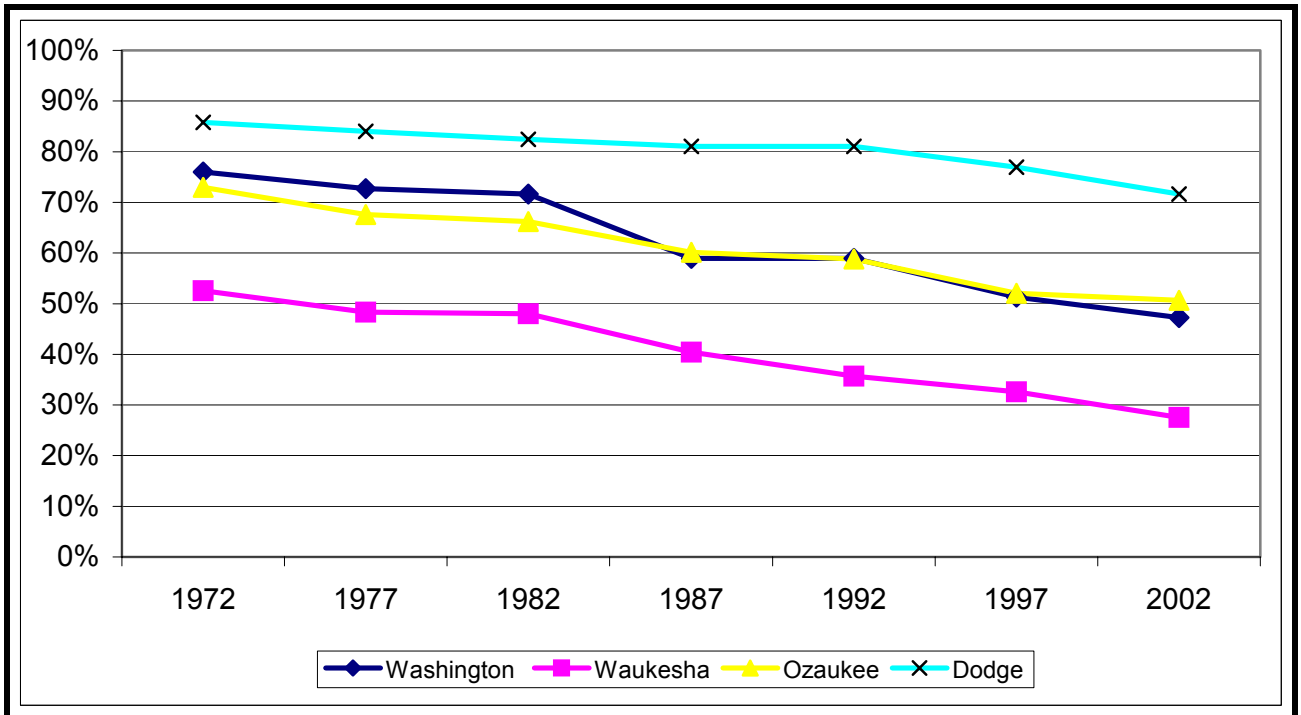
¹⁰ A Parks and Open Space Plan for Washington County: 2020

Chart 1:
Washington County Agricultural Acres



Source: Wisconsin Agricultural Statistics Service

Chart 2:
Percentage of Agricultural Acres vs. Total County Acres



Source: Wisconsin Agricultural Statistics Service

Agricultural Business Trends

Washington County agriculture can be grouped into five categories; dairy, horticulture, cash crops, livestock, and vegetables. The dairy and livestock sectors produce nearly two-thirds of agriculture revenues, followed by crops and horticulture with 36 percent of revenues. Table 7 presents the breakdown of these agricultural sectors in Washington County.

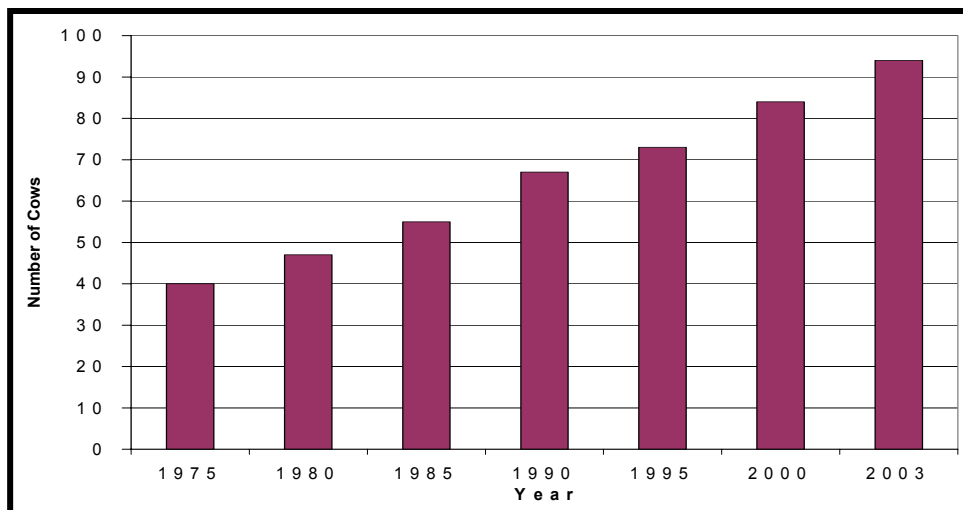
Table 7:
Washington County Agricultural Sectors

Sector	2002 Sales	% of Total Ag Revenues
Dairy	\$33,100,000	49.1%
Horticulture	\$14,000,000	20.8%
Grains (crops)	\$10,600,000	15.7%
Cattle & Calves	\$8,100,000	12.0%
Vegetables	\$1,600,000	2.4%
Total	\$67,400,000	100%

Source: 2002 Census of Agriculture

Washington County dairy sector is a good example of agricultural change since it makes up nearly half of the revenue generated in Washington County. Although the number of cows has decreased since 1975, the number of cows per dairy farm has increased as illustrated in Chart 3. This increase in cows per dairy farm, in conjunction with the trend of smaller sized farms illustrated in Chart 6, may cause future compatibility problems for dairy farms and development.

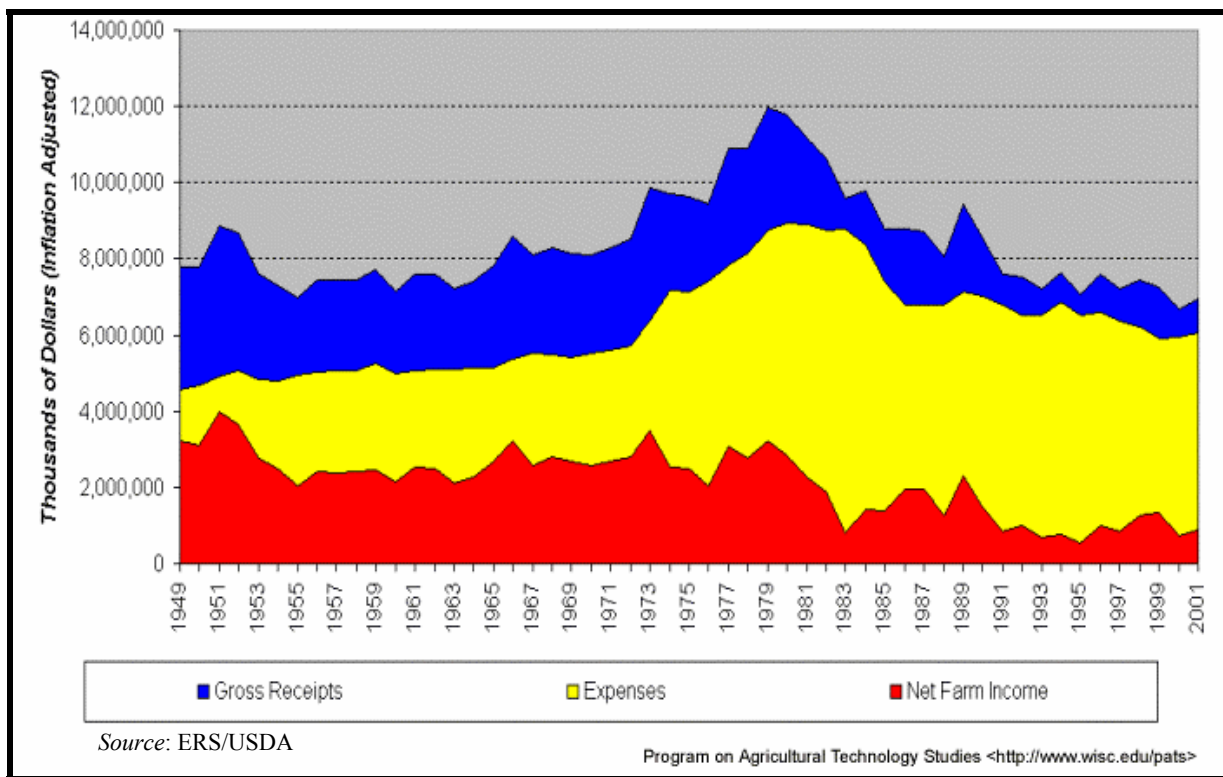
Chart 3:
Average Number of Dairy Cows per Dairy Farm



Source: Wisconsin Agricultural Statistics Service

Chart 4 details aggregate gross receipts, expenses, and net farm income for all farms in Wisconsin from 1949-2001. Starting in the late 1970's, real net farm income declined. The financial situation many farmers experience today is the result of farm commodity prices (receipts) declining in real terms while the cost of production (expenses) has either held steady or increased, resulting in farm expenses consuming a larger percentage of the gross receipts from the farm. Receipts, expenses, and net farm income are adjusted for inflation (to 2000 dollars) in order to portray the real financial situation that farmers experience. The gross receipts (blue section) less total expenses (yellow section) leave the resulting net income (red section). Low profit margins, along with high land prices, resulted in a situation which makes it difficult for new farmers to enter into agriculture and difficult for established farmers to expand, while making selling the farm a financially attractive alternative¹¹.

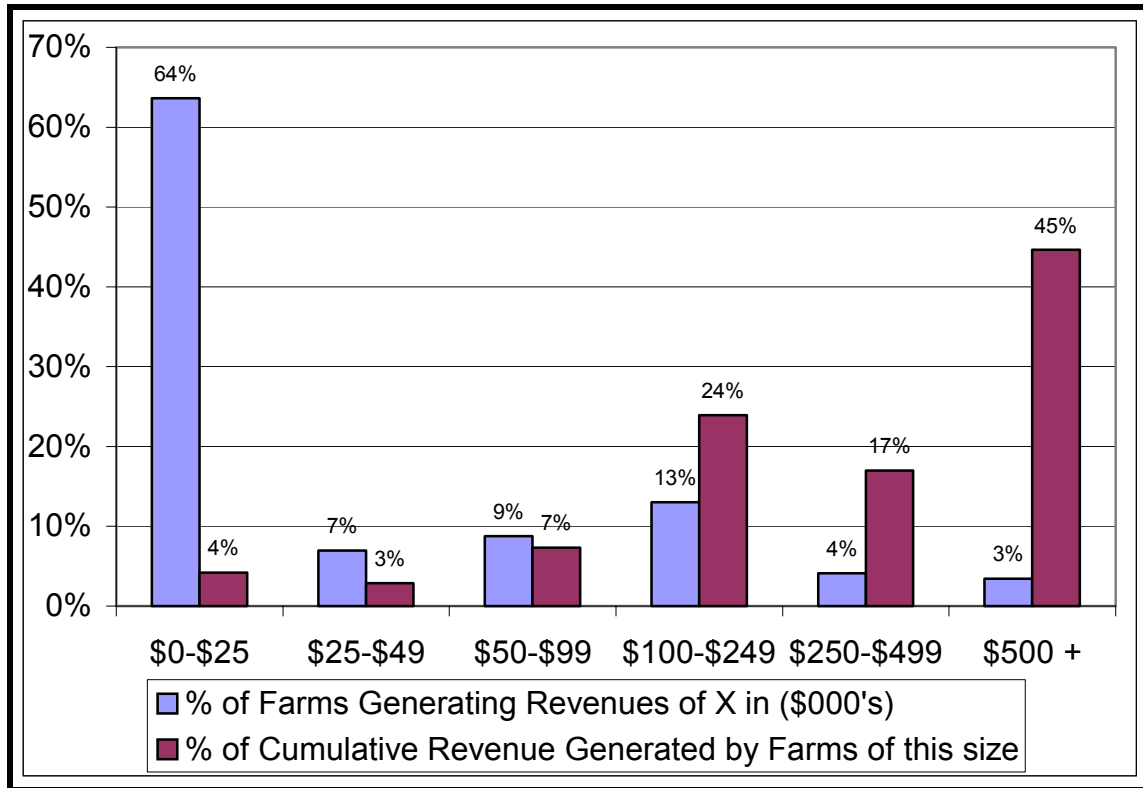
Chart 4:
Gross Receipts, Farm Expenses, and Net Farm Income, Wisconsin 1949-2001
(Deflated by the CPI All Items Index, 2000\$)



The majority of Washington County's 844 farms, 64 percent, generate less than \$25,000 a year, whereas 3 percent of the farms generated \$500,000 or more a year. This is illustrated in blue in Chart 5. The percentage of cumulative revenue generated by each revenue generation category in Chart 4 is displayed in red. For example, farms that generate \$0-\$25 thousand constitute 4 percent of all revenue generated in farming in Washington County, and farms that generate \$500,000 or more in revenue produced 45 percent of the county's cumulative farm revenue.

¹¹ Linnebur, University of Wisconsin Cooperative Extension – Farm Business and Agriculture

Chart 5:
Percentage of Washington County Farms by Revenue Size (\$000's)



Source: 2002 U.S. Census of Agriculture: Table 2 of County Level Data

Economic Impact

Agriculture plays an important part of Washington County's economy. In 2003, agriculture makes up roughly 10 percent, or \$629 million, of the total economic activity in the County. In addition, the agriculture industry accounts for 8 percent of the county's total employment numbers¹².

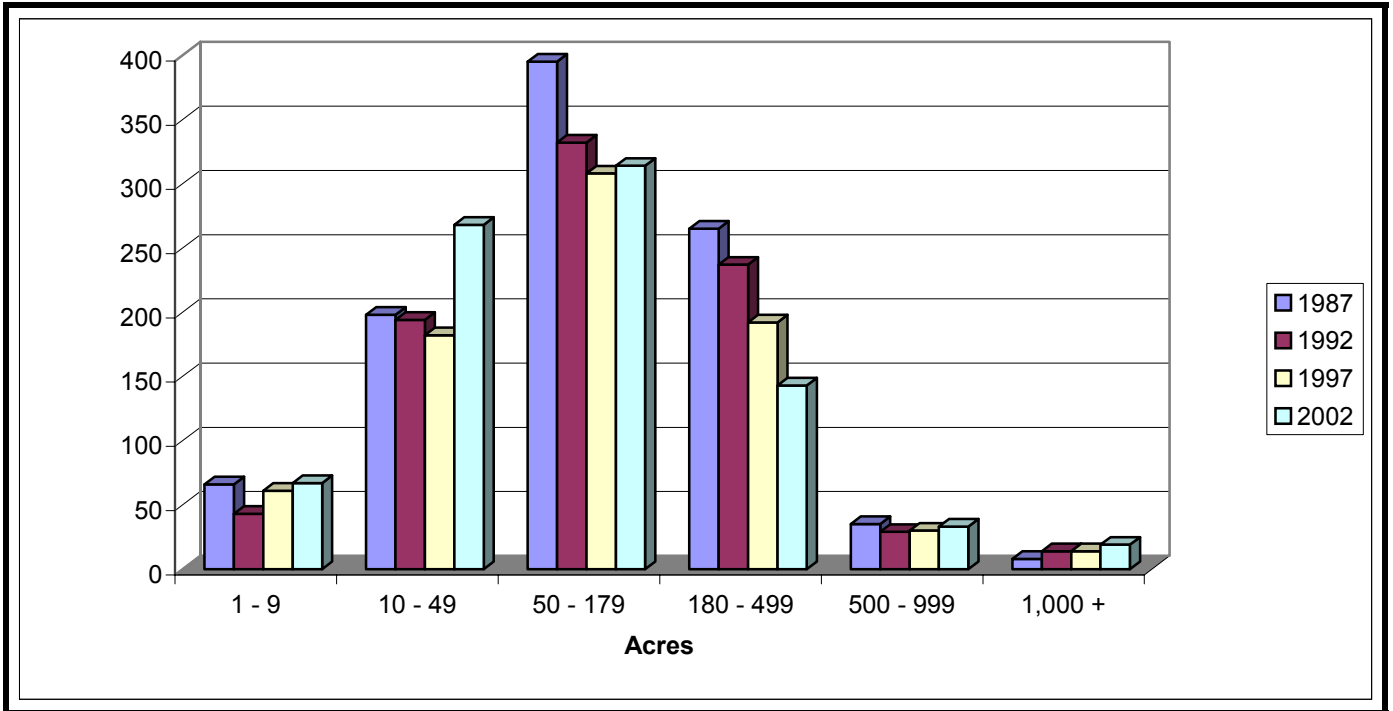
Changing Farm Size

Historically, farm size has been broken down into six categories: 0-9 acres, 10-49 acres, 50-179 acres, 180-499 acres, 500-999 acres, and 1,000+ acres. Between 1997 and 2002, the number of 10-49 acre farms has increased by 47 percent. Since 1987, the number of farms with 50-179 acres decreased by 20 percent. However, this category of farms has shown a relatively stable number of farms since 1997. The number of farms with 180-499 acres declined steadily, dropping 46 percent from 1987 to 2002. The number of farms with 500 acres of land and more are few, but have been slowly increasing. Chart 6 illustrates the change in number of categorized farm sizes between 1987 and 2002.

¹² Wisconsin and the Agricultural Economy, March 2004

Chart 6:

Washington County Farms by Size

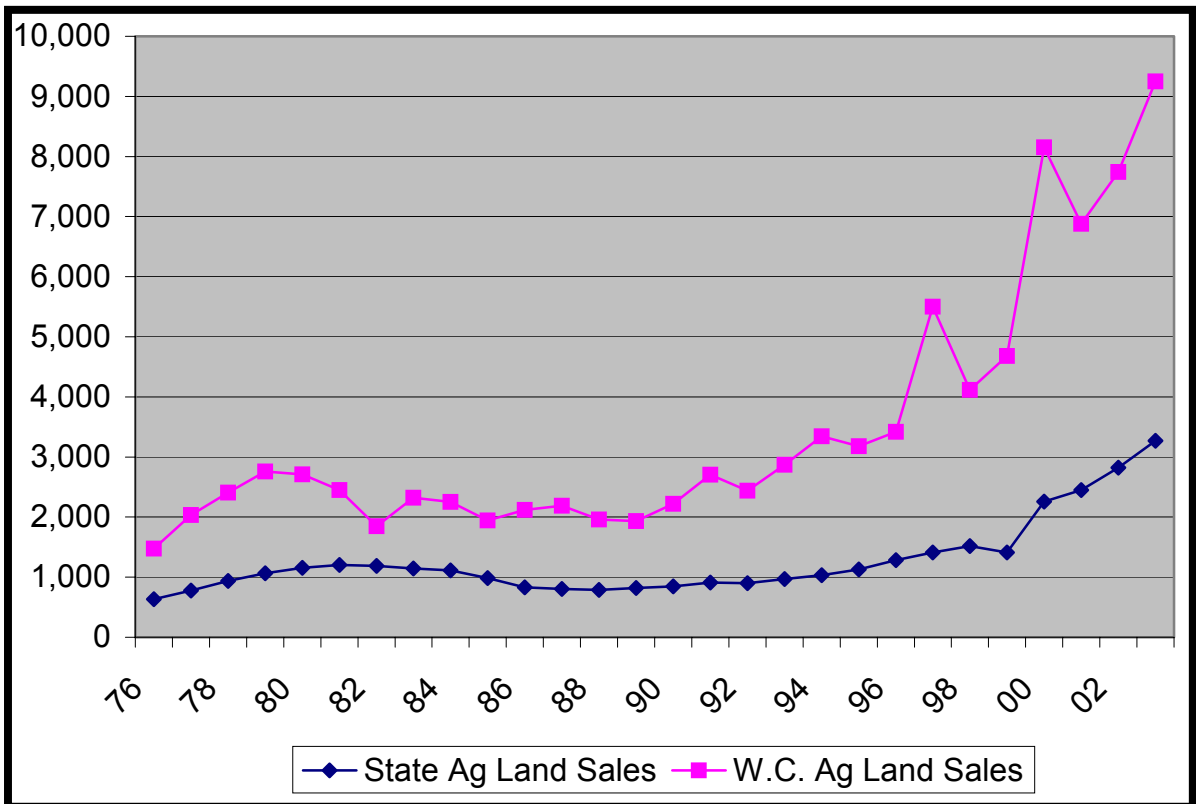


Source: Wisconsin Agricultural Statistics Services

Land Values

Chart 7:

Wisconsin and Washington County Land Price Trends



Source: Wisconsin Agricultural Statistics Services

Washington County agricultural land prices nearly doubled in the four years from 1976 to 1979, and then lost 33 percent of that gain by 1982. Land prices were relatively stable from 1982 through 1990. However, since 1990, agricultural land has seen sharp increases, rising at an average annual rate of 12 percent, as illustrated in Chart 7. Washington County land has been more valuable than the average land values for the state. Current land prices, in Washington County, may create a barrier for entry of new farmers and farmers looking to expand, and provide incentives for farmers to sell their land out of agricultural production¹³.

Prime Agricultural Land

Recommendations in *A Park and Open Space Plan for Washington County: 2020*, is for Washington County and local units of government to preserve to the extent practicable the remaining prime agricultural lands recommended for preservation under the Washington County Farmland Preservation Plan. This plan, adopted by the Washington County Board in September 1981, evaluated farmlands within the County and placed them into one of three classes: primary, secondary, and transitional. The criteria used to classify farmlands are summarized in Table 8¹⁴. Recommended prime agricultural lands to be preserved are shown on Map 2.

Table 8:
Summary of the Criteria Used by
Washington County to Classify Important Farmlands

Criterion	Washington County		
	Primary Farmland	Secondary Farmland	Transitional Farmland
Soil Type ^a	At least 50% Class I, II, or III	Less than 50% Class I, II, or III	No Criteria
Minimum Farm Parcel Size	35 Acres	35 Acres	35 Acres
Minimum Farm Block Size	640 Acres	100 Acres	100 Acres

Source: Stockham & Vandewalle, Washington County Farmland Preservation Plan, 1981

^aSoil classes refer to ratings developed by the U.S. Soil Conservation Service (now the U.S. Natural Resource Conservation Service)

Note: Table taken from page 11 of *A Park and Open Space Plan for Washington County: 2020*

Land Suitable for Cultivation

According to the U.S. Department of Agriculture, there are three soil classes that are considered to be cultivatable, Class I, II, and III. Soil Class I has few limitations that restrict land use. Soil Class II has some limitations such as wetness, erosion, or droughtiness that require conservation practices. Soil Class III has severe limitations that require conservation practices. These soil class types can be found throughout Washington County, but may not have been included as part of the prime agricultural lands based on the criteria used to determine prime agricultural land as illustrated in Map 2. Map 3 illustrates cultivatable land currently in agriculture with Class I, II, or III soil in Washington County. Agricultural land illustrated in Map 3 differs from Map 2 by not including the minimum size criteria and defined by land use attribute codes from SEWRPC, which includes cropland, pasture, lowland pasture, orchards and nurseries, special agriculture and farming buildings.

¹³ Linnebur, University of Wisconsin Cooperative Extension – Farm Business and Agriculture

¹⁴ *A Park and Open Space Plan for Washington County: 2020*

NATURAL RESOURCES AND OPEN SPACE

Natural Resources

The Southeastern Wisconsin Regional Planning Commission (SEWRPC), in its regional planning program, identified and delineated areas, “environmental corridors”, in the region as those that have concentrations of the prime natural resources. Natural resources consist of rivers, streams, lakes, wetlands, woodlands, prairies, wildlife habitat areas, wet and poorly drained soils, and rugged terrain. The following sections briefly describe each of the natural resources. A complete description of these natural resources can be found in *A Park and Open Space Plan for Washington County: 2020*.

Surface Water Resources

Surface water resources, consisting of streams and lakes, form an important element of the natural resource base. Major streams are defined as those, which maintain, at a minimum, a small continuous flow throughout the year except under unusual drought conditions. There are approximately 220 miles of such streams in Washington County. There are 13 major lakes, that is, lakes of 50 or more acres – located entirely in Washington County. These major lakes have a combined surface area of about 2,634 acres in Washington County.



Floodlands

Floodlands are wide, gently sloping areas contiguous to both sides of a stream channel. These areas often contain several resources such as woodlands, wetlands, and wildlife habitat. According to the Federal Emergency Management Agency, these areas are located within the 100-year flood hazard area, covering approximately 64.8 square miles or about 15 percent of the County.

Wetlands

Wetlands are important to the environmental health of the County. They provide habitat for wildlife and act as a flood control by temporarily storing storm water runoff. Wetlands cover approximately 66.1 square miles or 15 percent of the County. Wetlands increased by 0.8 square miles between 1970 and 1995.

Woodlands

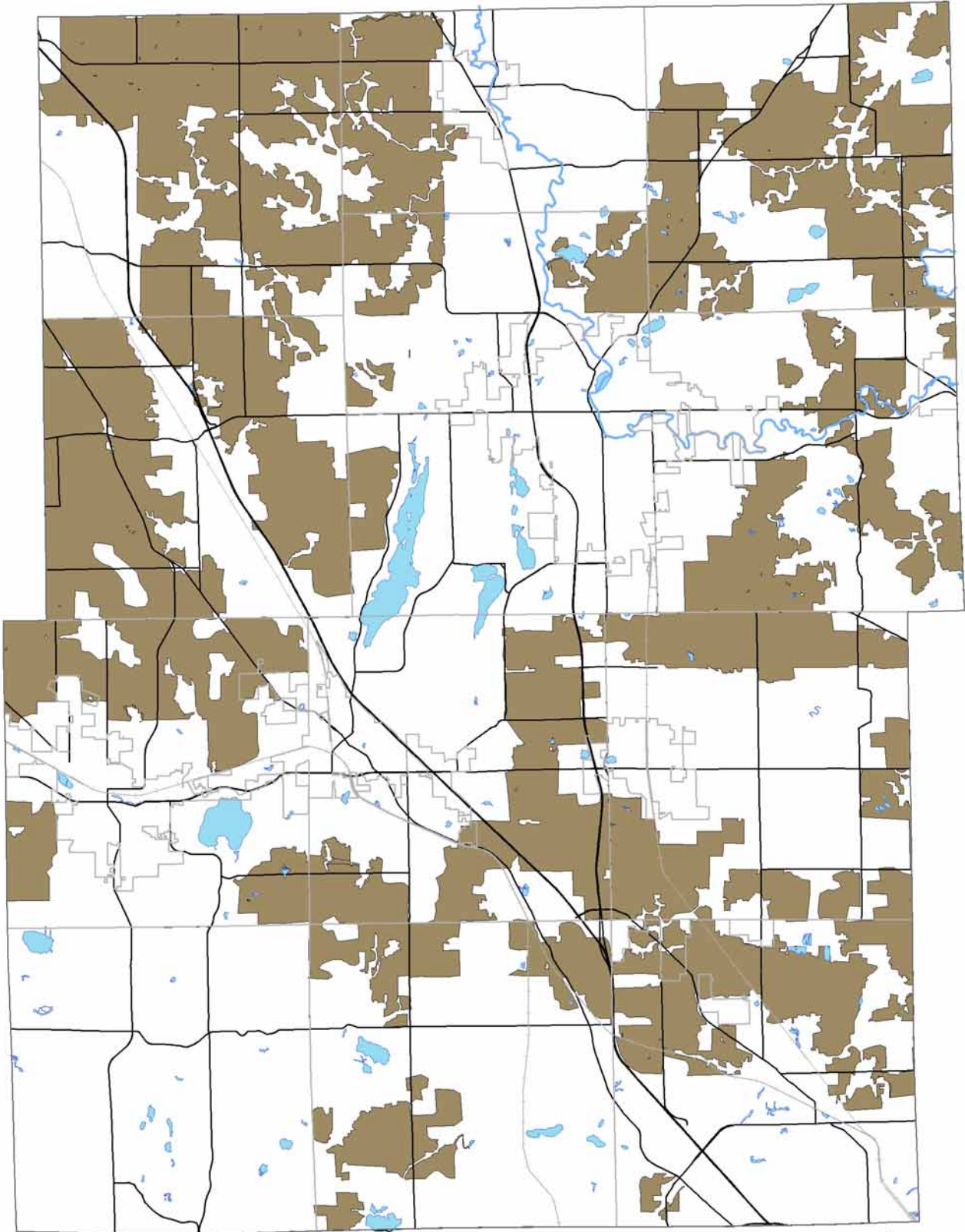
Woodlands are defined as upland areas one acre or more in size having 17 or more deciduous trees per acre, each measuring at least 4 inches in diameter at breast height, and having 50 percent tree canopy coverage. Woodlands cover approximately 35.0 square miles, or 8 percent of the County. Woodlands increased by 2.3 square miles, or about 7 percent between 1970 and 1995¹⁵.

Natural Areas

Natural areas are tracts of land or water so little modified by human activity, or sufficiently recovered from the effects of such activity, that they contain intact native plant and animal communities believed to be representative of the landscape before European settlement. A total of 91 natural areas, encompassing about 15,970 acres, or about 6 percent of the County, were identified in Washington County in 1994.

¹⁵ *A Park and Open Space Plan for Washington County, 2020*

Map 2
Prime Agricultural Lands Under the 2020 Regional Land Use Plan Prepared by the Southeastern Wisconsin Regional Planning Commission and Adopted by the Washington County Board



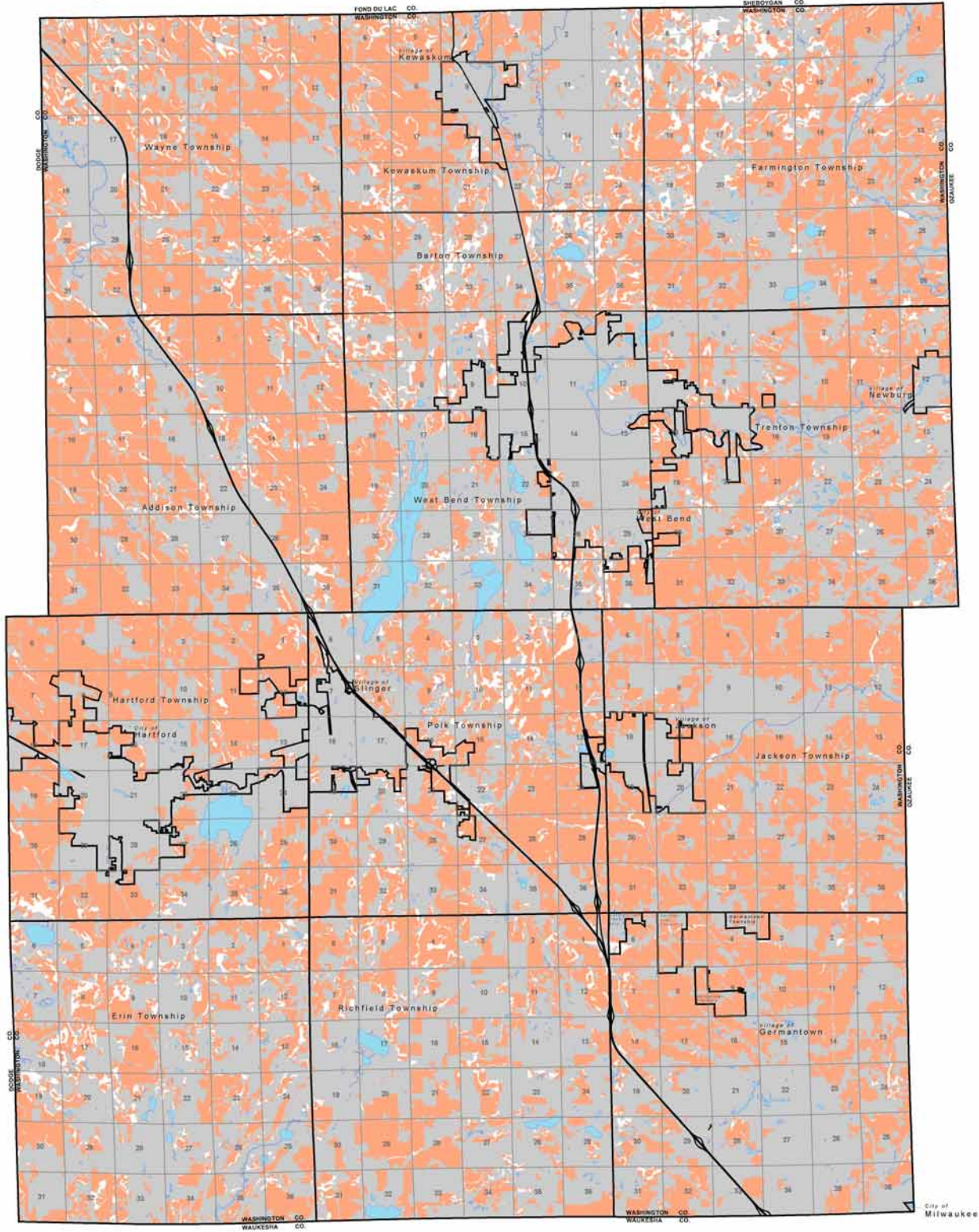
Prime Agricultural Lands







0 1 2 3 4 5 Miles



Prime Agricultural Lands data source: SEWRPC
All information subject to errors and omissions and is not certified by Washington County.
Map produced 1/14/05 by the Washington County GIS and Planning Divisions of the Planning and Parks Department

Map 3: Class I, II, & III Soils within Agricultural Lands



-  PLSS Township
-  PLSS Section
-  Municipal Boundary
-  Surface Water
-  Non-Ag Lands
-  Class I, II, & III Soils within Agricultural Lands

Land suitable for cultivation and other users:

Class I -- Soils with few limitations that restrict use. They are nearly level, generally well drained, and have no specific problems.

Class II -- Soils with some limitations, such as wetness, erosion, or droughtiness that require conservation practices. They can be cultivated safely with simple precautions.

Class III -- Soils with severe limitations that require conservation practices. They can be cultivated safely with special precautions.

Data Sources

Soils - United States Department of Agriculture – Natural Resources Conservation Service.

Non-Ag Lands – Southeastern Wisconsin Regional Planning Commission Land Use 2000 inventory

All Other Data – Washington County Planning and Parks Department



1:125,000

Map printed January 25, 2005

Map prepared by the Geographic Information Systems Division of the Washington County Planning and Parks Department.

This map is subject to errors and omissions and is not certified by Washington County

Environmental Corridors

Environmental corridors contain one or more natural resource elements, which were mentioned earlier in this chapter. These corridors are separated into two categories, primary and secondary environmental corridors. Primary corridors are defined as areas that contain one or more natural resource elements, which cover a minimum of 400 acres, 2 miles in length, and 200 feet in width which occupy about 94.0 square miles or 22 percent of the County. Secondary environmental corridors consist of the same natural resources but usually are found contiguous to primary corridors and are smaller. They are at least 100 acres in size and 1 mile in length and occupy about 15.5 square miles or about 3 percent of the County. If an area is smaller than the secondary corridor, and at least 5 acres in size, the area is termed an “isolated natural resource area”¹⁶. These areas occupy 10.2 square miles or about 2 percent of the County. Environmental corridors and isolated natural resource areas encompass about 119.7 square miles or about 27 percent of the County. These corridors are illustrated on Map 4.

Critical Species Habitat

Critical species habitat sites are those areas, outside of natural areas, where the chief value lies in their ability to support rare, threatened, or endangered species. Such areas contribute “critical” habitat that is important to the survival of a particular species or group of special concern. A total of 13 sites supporting threatened or rare plant or bird species have been identified in Washington County. These sites encompass an area of about 332 acres. A total of 60 aquatic sites supporting threatened or rare fish, reptile, or mussel species have also been identified in the County. There are 187.9 stream miles and 2,760 lake acres of critical aquatic habitat in Washington County. These critical species habitat sites are identified on Map 5 and Table 9.

Geological Sites

A total of 11 sites of geological importance, including 4 bedrock geology sites and 7 glacial features, were identified in the County in 1994. These sites encompass about 5,949 acres in Washington County, with the Kettle Moraine Interlobate Moraine accounting for the vast majority of the area. These geological sites are identified on Map 5.

Open Space

Open space, as defined in *A Park and Open Space Plan for Washington County: 2020*, consists of the following: primary environmental corridors, secondary environmental corridors, isolated natural resource areas, natural areas, critical species habitat sites, geological and archeological areas, and prime agricultural land. In addition, open space includes lands located within established Department of Natural Resources project boundaries, which in Washington County include the Loew Lake, Northern, and Pike Lake Units of the Kettle Moraine State Forest, the North Branch Milwaukee River Wildlife and Farming Heritage Area, and the Allenton Marsh, Jackson Marsh, and Theresa Marsh Wildlife Areas. Map 5 illustrates the amount of open space, geological sites, natural areas, and critical species habitat sites as defined by *A Park and Open Space Plan for Washington County: 2020*. Table 9 lists each natural area site, geological site, and critical species habitat sites.



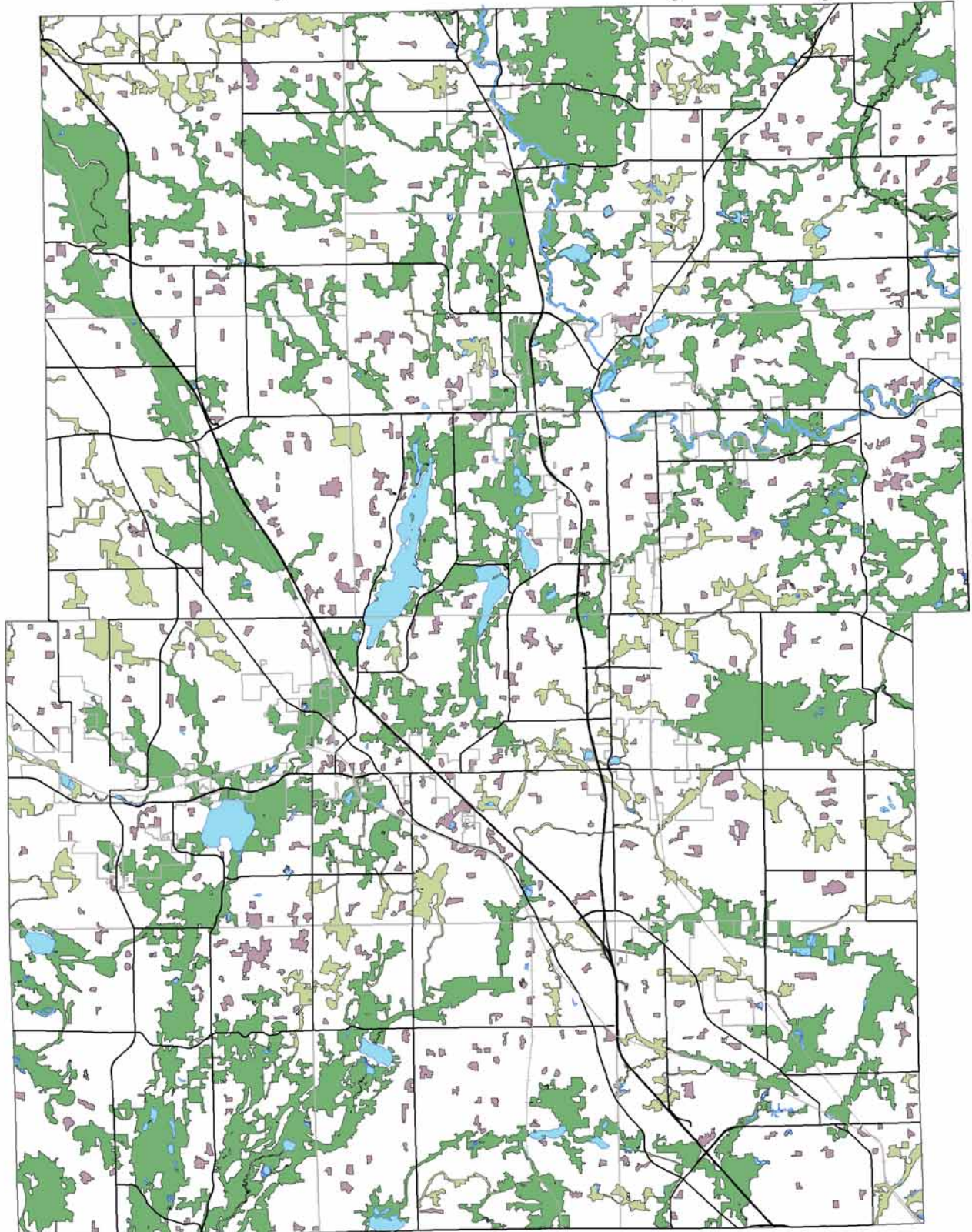
¹⁶ *A Park and Open Space Plan for Washington County, 2004*

SUMMARY

This chapter has presented data relating to existing demographics, agricultural trends, open space, and natural areas in Washington County. The key findings are as follows:

- Washington County has seen a household increase of 152 percent and a population increase of 84 percent since 1970.
- Land use has seen dramatic changes over the decades. Specifically, residential and commercial land uses, which have increased by 125 percent between 1970 and 1995.
- Farm acreage has decreased steadily, losing 68,000 acres (34 percent) since 1980.
- Since 1970, farm net income has decreased substantially as a result of declining profit margins.
- Low profit margins, along with high land prices, make it difficult for new farmers to enter into agriculture and difficult for established farmers to expand and provide incentives for farmers to sell their land out of agricultural production.
- In Washington County, the dairy sector generates 49 percent of the revenue generated by the entire County's agriculture industry.
- Washington County agricultural land prices have seen sharp increases in value throughout the 1990's and up to current 2003 data.
- Environmental Corridors and Isolated Natural Resource Areas in Washington County occupy approximately 119.7 square miles, or about 27 percent, of the County in 2004.
- Natural areas consisting of wetlands, woodlands, wildlife habitats, major lakes and streams, and associated shorelands, floodlands, and outdoor recreation sites, when combined, result in an essentially linear pattern in the landscape referred to by the Regional Planning Commission as environmental corridors.

Map 4 Environmentally Sensitive Lands in Washington County: 2000



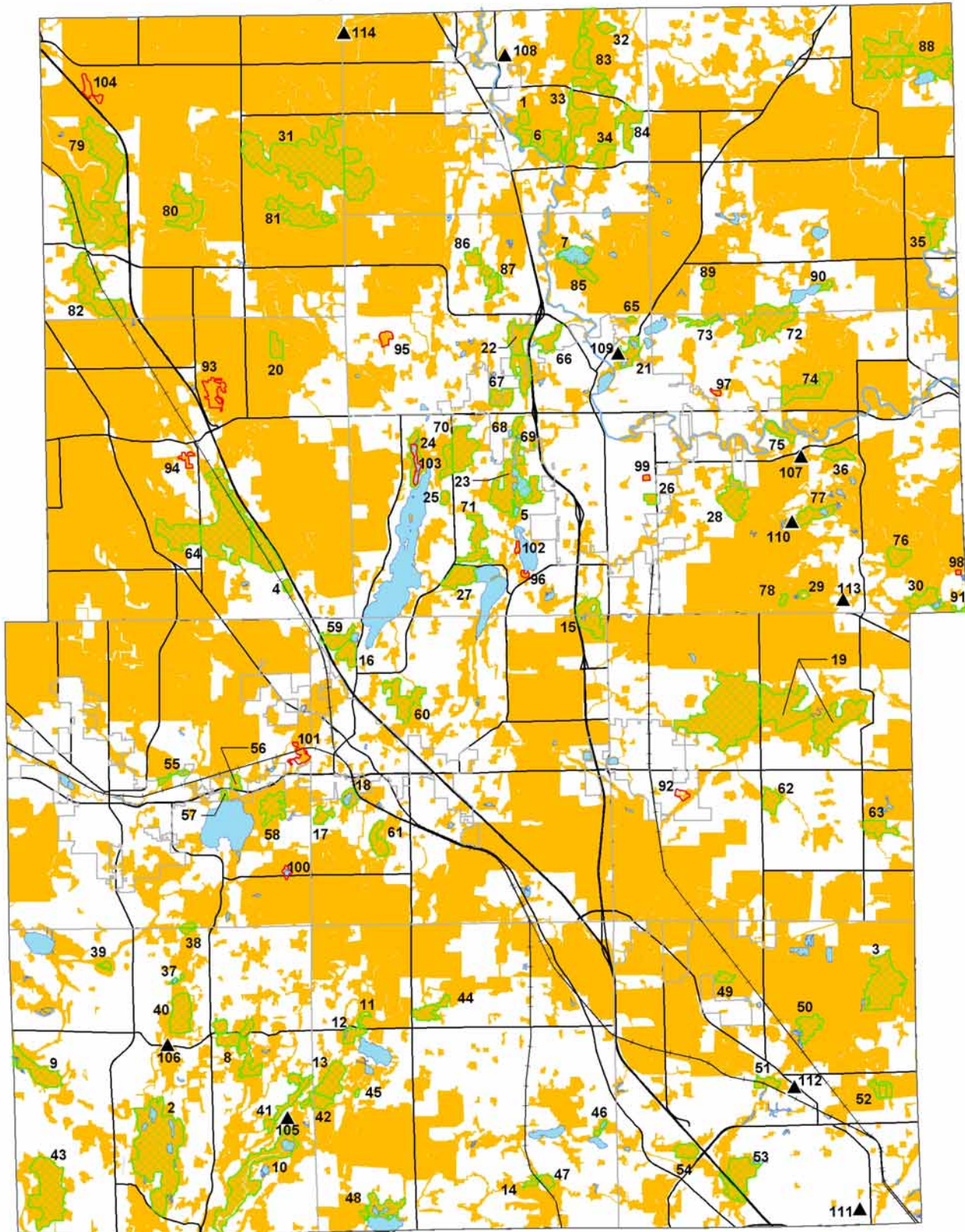
- Primary Environmental Corridor
- Secondary Environmental Corridor
- Isolated Natural Resource Area





0 1 2 3 4 5 Miles



Environmental Corridor data source: SEWRPC
All information subject to errors and omissions and is not certified by Washington County.
Map produced 1/14/05 by the Washington County GIS and Planning Divisions of the Planning and Parks Department

Map 5 Open Space, Natural Areas, Critical Species Habitat Sites, and Geological Sites in Washington County



-  Open Space
-  Natural Areas
-  Critical Species
-  Geological Sites



Natural Areas, Critical Species Habitat Sites, and Open Space as defined in
A Park and Open Space Plan for Washington County: 2020.
 All information subject to errors and omissions and is not certified by Washington County.
 Map produced 1/14/05 by the Washington County GIS and Planning Divisions of the Planning and Parks Department.

Table 9

OPEN SPACE AND GEOLOGICAL, NATURAL AREA AND CRITICAL SPECIES HABITAT SITES IN WASHINGTON COUNTY

Number on Map 4	Area Name	Classification Code ^a	Location	Ownership	Size (acres)	Description and Comments
1	Kewaskum Maple-Oak Woods State Natural Area	NA-1 (SNA, RSH)	T12N, R19E Sections 10, 15 Town of Kewaskum	Department of Natural Resources and private	86	An extremely rich and relatively undisturbed southern mesic and dry-mesic forest, located just east of the Milwaukee River on undulating morainal topography. The northern two-thirds constitute a designated State Natural Area, which consists of two tracts separated by pine plantation. A number of regionally uncommon species are present. Kettle depressions hold water part of the year
2	Murphy Lake-McConville Lake Wetland Complex	NA-1 (RSH)	T9N, R18E Sections 21, 22, 27, 28, 33, 34 Town of Erin	The Nature Conservancy; Boy Scouts of America, Milwaukee County Council; and other private	890	Large wetland complex surrounding undeveloped hard-water seepage lakes that are located in a large glacial basin. The variety of plant communities includes shrub-carr, alder thicket, lowland hardwoods, sedge meadow, deep and shallow marsh, and both young and mature tamarack forest. Good to excellent quality overall
3	Germantown Swamp	NA-1	T9N, R20E Sections 1, 12 Village of Germantown	Village of Germantown and private	374	Located along the headwaters of the Menomonee River, this is a large low-lying woods that has apparently suffered only minimal human disturbance, although ditching near the perimeter has had some effect. This is predominantly a southern lowland hardwoods of silver and red maple, green ash, American elm, and basswood, but with substantial inclusions of northern wet-mesic forest of yellow birch, tamarack, and white cedar. At the north end is an upland stand of sugar maple and beech. The ground flora contains a mixture of northern and southern elements. The large size of the woods, together with its relatively undisturbed nature and unique combination of species, makes this a valuable site. A severe windstorm in late June 1991 toppled a large number of trees, mostly yellow birch and silver maple
4	Aurora Road Fen	NA-1 (RSH)	T11N, R18E Section 35 Town of Addison	Private	22	High-quality calcareous fen, with sedge meadow and tamarack relict associated with cold trout stream that is tributary to the Rock River. Location of swamp metal-mark, a State-designated threatened butterfly species. Threatened by surrounding incompatible land use
5	Paradise Lake Fen	NA-1 (RSH)	T11N, R19E Sections 22, 27 Town of West Bend	Private	22	Undeveloped nine-acre lake with good-quality calcareous sedge mat and deep and shallow marsh
6	Milwaukee River Floodplain Forest State Natural Area	NA-1 (SNA)	T12N, R19E Sections 14, 15 Town of Kewaskum	Department of Natural Resources and private	135	One of the best riverine forests remaining in the Region. Quality varies, but some areas are relatively undisturbed. Upland "islands" contribute to a rich and diverse ground flora
7	Smith Lake and Wetlands	NA-1 (RSH)	T12N, R19E Sections 26, 35 Town of Barton	Private	130	Shallow lake rich in aquatics bordered by sedge meadow, tamaracks, and good-quality calcareous fens on northeast and east sides
--	Subtotal	NA-1	7 sites	--	1,659	--
8	Holy Hill Woods	NA-2	T9N, R18E Sections 2, 11, 14 Town of Erin	Carmelite Fathers and other private	256	Moderate- to good-quality, medium-aged southern mesic and dry-mesic woods located on gently sloping to steep interlobate kettle moraine topography. Dominated by sugar maple, red oak, red maple, white ash, white oak, and basswood. Total wooded area is large, but dissected by highways. However, it remains as one of the larger, better-quality upland hardwood forests locally
9	Toland Swamp	NA-2	T9N, R18E Sections 18, 19, 20 Town of Erin	Private	193	Large, wooded wetland mixture of shrub-carr, lowland hardwoods, and tamarack relict, with a history of disturbance

Table 9 (continued)

Number on Map 4	Area Name	Classification Code ^a	Location	Ownership	Size (acres)	Description and Comments
10	Loew Lake Wetland Complex	NA-2 (RSH)	T9N, R18E Sections 24, 25, 26, 34, 35 Town of Erin	Department of Natural Resources and private	481	Undeveloped drainage lake and wetland corridor associated with the upper Oconomowoc River. The diverse wetland communities are in generally good condition, and include sedge meadow, lowland hardwoods, emergent aquatics, shrub-carr, and tamarack swamp. Swamp metalmark butterfly and queen snake have been documented
11	Daniel Boone Bogs	NA-2 (RSH)	T9N, R19E Sections 7, 8 Town of Richfield	Daniel Boone Conservation Club	21	A pair of good-quality, relatively undisturbed sphagnum bogs located within a dry-mesic forest matrix. A number of uncommon species are present, including common bog arrow-grass (<i>Triglochin maritimum</i>), a State-designated special concern species
12	Glacier Hills Park Bogs and Upland Woods	NA-2 (RSH)	T9N, R19E Sections 7, 17, 18 Town of Richfield	Washington County and private	60	Steep, interlobate kettle moraine topography supporting two good-quality bogs in kettle hole depressions. Southern mesic and dry-mesic hardwood forest covers the surrounding uplands, with small stands of dry hill prairie containing the State-designated threatened kittentails (<i>Besseyia bullii</i>)
13	Friess Lake Tamarack Swamp	NA-2	T9N, R18E Section 24 Town of Erin T9N, R19E Sections 18, 19 Town of Richfield	Private	228	Large, mostly wooded, wetland complex, consisting of young to medium-aged tamarack swamp, shrub-carr, and shallow marsh. South portion divided by high east-west crevasse fill
14	Colgate Fen-Meadow	NA-2 (RSH)	T9N, R19E Sections 26, 35 Town of Richfield	Private	23	Good-quality fen-sedge meadow complex, with tamarack relict, bordering the headwaters of the Bark River
15	Mud Lake Swamp	NA-2 (RSH)	T10N, R19E Section 1 Town of Polk T11N, R19E Section 35 Town of West Bend	Private and Wisconsin Department of Transportation	186	Good-quality, undeveloped calcareous head-water lake surrounded by lowland hardwoods and tamarack swamp. Fen and bog floral elements are present. Adversely affected by construction of USH 45
16	Big Cedar Lake Bog	NA-2	T10N, R19E Section 6 Town of Polk	Private	89	Good-quality, relatively large sphagnum bog, surrounded by a tamarack fringe. Regionally uncommon species are present. Some past attempts at ditching
17	Mud Lake Upland Woods	NA-2	T10N, R19E Section 19 Town of Polk	Private	54	Relatively undisturbed southern dry-mesic woods on rolling morainal topography. Dominated by red and white oaks, with an admixture of red maple, sugar maple, basswood, and white ash. Few exotics present. Threatened by encroaching residential development. A good example of this forest type
18	Mud Lake Meadow	NA-2 (RSH)	T10N, R19E Section 19 Town of Polk	Private	59	Good-quality open meadow to the east and north of a small, shallow, alkaline seepage lake. Dominated by wire-grass sedges. Fen elements are present, as well as a few scattered patches of tamaracks. A site of unusual species composition
19	Jackson Swamp	NA-2 (RSH)	T10N, R20E Sections 1, 2, 8, 9, 10, 14, 15, 16, 17 Town of Jackson	Department of Natural Resources and private	1,571	Large forested wetland, consisting mainly of disturbed lowland hardwood swamp with green ash and red and silver maples. There are smaller, higher-quality inclusions of white cedar-dominated northern wet-mesic forest. Changes in hydrology have allowed reed canary grass to invade canopy gaps. The large forest interior is invaluable for a number of native breeding birds
20	St. Anthony Beech Woods	NA-2	T11N, R18E Section 2 Town of Addison	Private	68	An old-growth remnant of the once-extensive mesic woods, dominated by mature beech and sugar maple. Located on a moderate, east-facing slope. Not undisturbed, but in good condition

Table 9 (continued)

Number on Map 4	Area Name	Classification Code ^a	Location	Ownership	Size (acres)	Description and Comments
21	Lac Lawrann Conservancy Upland Woods and Wetlands	NA-2 (RSH)	T11N, R19E Sections 1, 12 Town of Barton	City of West Bend and private	101	A good-quality wet- and dry-mesic hardwood forest, with a deep and shallow marsh, shrub-carr, and floating sedge mat around a pond. The area contains a good example of kame and esker formation. Location of the State-designated threatened forked aster (<i>Aster furcatus</i>)
22	Blue Hills Woods	NA-2 (RSH)	T11N, R19E Section 3 City of West Bend, Town of Barton Section 10 Town of Barton	City of West Bend, Department of Natural Resources, and private	266	Relatively large, good-quality mesic and dry mesic woods on glacial topography of significant relief. Recovering from past grazing and selective cutting. Recently disturbed by construction of USH 45 along east edge
23	Silverbrook Lake Woods	NA-2 (RSH)	T11N, R19E Sections 15, 21, 22, 27 Town of West Bend	Girl Scouts of Milwaukee Area, Inc., Washington County, Cedar Lakes Conservation Foundation, and other private	404	A large area surrounding Silverbrook Lake, consisting mainly of good-quality southern mesic to dry-mesic hardwoods. Fairly diverse ground flora. Low area contains tamaracks and lowland hardwoods. Residences are beginning to encroach on south and west. Important to preserve as an intact block of relatively contiguous woods
24	Gilbert Lake Tamarack Swamp	NA-2	T11N, R19E Sections 17, 20 Town of West Bend	Cedar Lakes Conservation Foundation and other private	130	A lightly developed lake surrounded by a wetland complex of tamarack swamp, bog, sedge meadow, and cattail marsh
25	Hacker Road Bog	NA-2	T11N, R19E Section 20 Town of West Bend	Department of Natural Resources	25	Good-quality sphagnum bog, bordered by sedge meadow, shallow marsh, and shrub-carr
26	Muth Woods	NA-2 (RSH)	T11N, R19E Section 24 City of West Bend	Private	30	A good-quality, medium-aged stand of southern mesic hardwoods, with an exceptionally rich and diverse ground flora that includes some uncommon species. A depression near the center of the woods contains lowland hardwoods
27	Little Cedar Lake Wetlands	NA-2	T11N, R19E Sections 32, 33 Town of West Bend	Cedar Lakes Conservation Foundation	137	Extensive wetlands at west end of Little Cedar Lake, containing good-quality deep and shallow marsh, sedge meadow, shrub-carr, tamarack relicts, and lowland hardwoods
28	Schoenbeck Woods	NA-2	T11N, R20E Sections 20, 29 Town of Trenton	Private	195	Relatively large, moderate- to good-quality forested tract, consisting of lowland hardwoods, shrub-carr, southern mesic forest, and southern dry-mesic forest
29	Bellin Bog	NA-2	T11N, R20E Section 33 Town of Trenton	Private	17	A good-quality sedge mat and tamarack swamp, with many fen elements, that border a shallow, undeveloped pond
30	Reinartz Cedar Swamp	NA-2	T11N, R20E Sections 35, 36 Town of Trenton	Private	119	Good-quality northern wet-mesic forest, dominated by white cedar, tamarack, yellow and paper birch, red maple, and black ash. A number of species with more northerly affinities are present. Uplands to the east support a disturbed mesic woods
31	Wayne Swamp	NA-2	T12N, R18E Sections 13, 14, 23, 24 Town of Wayne T12N, R19E Sections 18, 19 Town of Kewaskum	Private	1,126	A large depression in rolling moraine supports several wetland communities, including second-growth lowland hardwoods, northern wet-mesic forest, shrub-carr, and tamarack-fen, with southern mesic forest on isolated uplands
32	Kettle Moraine Drive Bog	NA-2	T12N, R19E Section 1 Town of Kewaskum	Department of Natural Resources and private	39	A good-quality forested bog of tamarack and lack spruce over a layer of ericads, with yellow and paper birch established in older areas. A number of regionally uncommon species are present
33	Glacial Trail Forest	NA-2	T12N, R19E Sections 11, 14 Town of Kewaskum	Department of Natural Resources and private	223	One of the largest intact tracts of contiguous southern mesic and dry-mesic forest remaining in the Region. Located on steep, irregular kettle moraine topography. Good overall quality; recovering from past selective cutting. Important to maintain as intact as possible

Table 9 (continued)

Number on Map 4	Area Name	Classification Code ^a	Location	Ownership	Size (acres)	Description and Comments
34	St. Michael's Woods	NA-2	T12N, R19E Sections 13, 14, 24 Town of Kewaskum	Department of Natural Resources and private	84	Rolling interlobate moraine supporting southern mesic to dry-mesic hardwoods, dominated by sugar maple, red oak, and basswood. Moderately rich ground flora. Relatively recent selective logging
35	North Branch Woods	NA-2	T12N, R20E Section 25 Town of Farmington	Private	96	Good-quality wooded tract bordering the North Branch of the Milwaukee River. Consists of southern mesic and wet-mesic hardwoods. Threatened by future logging operations
36	Myra Wetlands	NA-2	T11N, R20E Section 15 Town of Trenton	Private	69	Good-quality wetland complex of shallow lake, marsh, sedge meadow, shrub-carr, and lowland hardwoods
--	Subtotal	NA-2	29 sites	--	6,350	--
37	Hults Bog and Marsh	NA-3	T9N, R18E Sections 3, 10 Town of Erin	Private	14	Small, moderate-quality sphagnum bog-tamarack swamp and associated shallow marsh. Marsh is stopover spot for migrating waterfowl
38	CTH E Wetlands	NA-3	T9N, R18E Section 3 Town of Erin T10N, R18E Section 34 Town of Hartford	Private	28	Wetland complex of shrub-carr, sedge meadow, and shallow marsh that has suffered from past disturbance
39	Erin Sedge Meadow	NA-3	T9N, R18E Sections 4, 5 Town of Erin	Private	17	Moderate-quality sedge meadow
40	Thompson Swamp	NA-3	T9N, R18E Section 10 Town of Erin	Private	182	Large but disturbed wetland complex of lowland hardwoods, shrub-carr, sedge meadow, and tamarack relict. Contains some northern species, including white pine
41	Donegal Road Woods	NA-3	T9N, R18E Sections 13, 24 Town of Erin T9N, R19E Section 18 Town of Richfield	Department of Natural Resources and private	137	Large, irregularly shaped dry-mesic woods on steep, southeast-facing slopes
42	St. Augustine Road Sedge Meadow	NA-3	T9N, R18E Section 24 Town of Erin	Private	11	Good-quality southern sedge meadow
43	Mason Creek Swamp	NA-3	T9N, R18E Sections 30, 31 Town of Erin	University of Wisconsin-Milwaukee and private	432	Large lowland hardwoods area
44	CTH J Swamp	NA-3	T9N, R19E Section 9 Town of Richfield	Kettle Moraine Audubon Society and other private	100	Moderate- to good-quality complex of shrub-carr, lowland hardwoods, and mesic hardwoods, with scattered spring seepages
45	Hubertus Road Sedge Meadow	NA-3	T9N, R19E Section 19 Town of Richfield	Private	7	Good-quality southern sedge meadow bordering the Oconomowoc River
46	Amy Bell Lake and Lowlands	NA-3	T9N, R19E Sections 24, 25 Town of Richfield	YMCA	20	Small, undeveloped lake with a narrow bog fringe, associated with a tamarack relict and shrub-carr that have suffered from past disturbance
47	Colgate Shrub-Carr	NA-3	T9N, R19E Sections 26, 35 Town of Richfield	Private	38	Shrub-carr surrounding small, shallow lake; disturbed by access road
48	Lake Five Woods	NA-3 (RSH)	T9N, R19E Sections 31, 32 Town of Richfield	Private	152	Low- to moderate-quality mesic, dry-mesic, and xeric woods on steep kettle moraine terrain on north side of Lake Five. Depression contains small seepage pond and disturbed wetland plant communities. Small patches of dry hill prairie are located within the xeric woods and contain the State-designated threatened kittentails (<i>Besseyia bullii</i>). Threatened by surrounding development
49	Faber-Pribyl Woods	NA-3	T9N, R20E Sections 4, 9 Village of Germantown	Private	39	Small but good-quality remnant of mesic woods which still exhibits characteristics of an old-growth forest. Dominated by sugar maple and basswood, with some beech. Adjoining wet-mesic woods to north are of lesser quality

Table 9 (continued)

Number on Map 4	Area Name	Classification Code ^a	Location	Ownership	Size (acres)	Description and Comments
50	Hoelz Swamp	NA-3	T9N, R20E Sections 10, 11, 14, 15 Village of Germantown	Private	109	A moderate-quality lowland hardwoods within the headwaters area of the Menomonee River. Dominated by silver and red maple and yellow birch, with some northern forest understorey elements. Valuable for watershed protection
51	Lake Park Swamp	NA-3	T9N, R20E Sections 21, 22 Village of Germantown	Village of Germantown and private	54	A disturbed silver maple-dominated lowland hardwood forest, important for protection of two intermittent streams tributary to the Menomonee River
52	Schoessow Woods	NA-3 (RSH)	T9N, R20E Section 24 Village of Germantown	Private	51	A relatively small but good-quality mix upland and basswood, are of medium-age. Very good species diversity, including two State-designated special concern species: American gromwell (<i>Lithospermum latifolium</i>) and goldenseal (<i>Hydrastis canadensis</i>). Threatened by residential subdivisions
53	USH 41 Swamp	NA-3	T9N, R20E Sections 28, 33 Village of Germantown	Private	228	An extensive floodplain forest dominated by silver maple, with green ash, black ash, and American elm. Due to Dutch elm disease, dissection by USH 41-45, a logging history, and artificial drainage, its ecological value is low. Important for protection of Menomonee River tributaries
54	Kleinman Swamp	NA-3	T9N, R20E Section 29 Village of Germantown	State of Wisconsin and private	71	Lowland hardwood forest of silver maple and some yellow birch. Low ecological value
55	Rubicon Lowlands	NA-3	T10N, R18E Sections 15, 21, 22 Town of Hartford	Washington County and private	30	Moderate-quality southern sedge meadow along the Rubicon River
56	STH 60 Swamp	NA-3	T10N, R18E Sections 14, 23 Town of Hartford	Private	32	Lowland hardwood swamp of moderate quality, containing some northern elements. Dominated by yellow birch and black ash
57	Pike Lake Sedge Meadow	NA-3 (RSH)	T10N, R18E Section 23 Town of Hartford	Wisconsin Department of Transportation and private	14	Good-quality southern sedge meadow and shallow marsh at north end of Pike Lake
58	Pike Lake Woods	NA-3	T10N, R18E Section 24 Town of Hartford	Department of Natural Resources	131	Low- to medium-quality dry-mesic woods that has suffered from past disturbance, including grazing and selective logging. The irregular kettle moraine topography includes a prominent wooded kame at the southeast corner
59	Mueller Woods	NA-3	T10N, R19E Section 6 Town of Polk	State of Wisconsin and private	97	Relatively large dry-mesic woods of moderate quality, located on rolling moraine with some deep kettle holes. Evidence of past grazing and selective logging. Site has recently been disturbed by road and residence in interior, and highway construction along western border
60	Slinger Upland Woods	NA-3	T10N, R19E Sections 8, 9 Town of Polk	Private	196	Relatively large area of disturbed southern mesic and dry-mesic hardwoods on kettle and kame topography
61	Heritage Trails Bog	NA-3	T10N, R19E Sections 20, 29 Town of Polk	Washington County and private	94	Relatively undisturbed tamarack bog within an interlobate morainal depression. Other associated communities include lowland hardwoods and shrub-carr
62	Kowalske Swamp	NA-3	T10N, R20E Section 22 Town of Jackson	Private	83	Young to medium-aged northern wet-mesic hardwoods, disturbed by past selective cutting and windthrow. The ground flora is relatively diverse. A knoll at the northeast corner supports upland mesic woods
63	Sherman Road Swamp	NA-3	T10N, R20E Section 25 Town of Jackson	Private	96	A lowland hardwood swamp dominated by red maple, green ash, and American elm on level terrain
64	Allenton Swamp	NA-3	T11N, R18E Sections 22, 26, 27, 28, 35 Town of Addison	Department of Natural Resources and private	1,091	Large, disturbed wetland complex along the Rock River, including southern sedge meadow, lowland hardwoods, shrub-carr, emergent aquatics, and relict tamaracks

Table 9 (continued)

Number on Map 4	Area Name	Classification Code ^a	Location	Ownership	Size (acres)	Description and Comments
65	Newark Road Wetland	NA-3	T11N, R19E Section 1 Town of Barton	Private	9	A kettle-hole wetland
66	Sunset Park Wetlands	NA-3	T11N, R19E Sections 2, 3 City of West Bend	Private	85	Disturbed wetland complex containing shallow marsh, fresh (wet) meadow, and a good stand of tag alder (<i>Alnus rugosa</i>)
67	Albecker Park Wetlands	NA-3	T11N, R19E Sections 9, 10 City of West Bend	Washington County and private	91	Shallow marsh and disturbed fresh (wet) meadow complex with some shrub-carr and scattered lowland hardwoods. Disturbances include water-level changes due to past draining efforts and filling
68	Silver Creek Marsh	NA-3	T11N, R19E Section 15 City of West Bend	Washington County and private	27	Good-quality deep and shallow marsh and sedge meadow
69	University Fen	NA-3 (RSH)	T11N, R19E Section 15 City of West Bend	University of Wisconsin Center-Washington County	1	A small, moderate-quality calcareous fen and lowland hardwood forest recently disturbed by adjacent highway construction
70	CTH Z Upland Woods and Wetlands	NA-3 (RSH)	T11N, R19E Sections 16, 17, 20, 21 Town of West Bend	Cedar Lake Conservation Foundation and other private	281	Mature mesic hardwood forest on rough interlo-bate moraine, dominated by sugar maple, red oak, beech, and basswood. The moderately rich herb layer includes several uncommon species. Threatened by ongoing logging operations. Adjacent large wetland complex of shrub-carr, sedge meadow shallow marsh, and tamarack relict is divided by CTH Z
71	Ziegler Woods	NA-3	T11N, R19E Section 28 Town of West Bend	Private	170	Large tract of southern mesic to dry-mesic hardwoods, dominated by sugar maple and red oak, on irregular glacial terrain. Past disturbance includes grazing and selective logging; more recently, wide horse and all-terrain-vehicle trails have degraded the site, allowing a number of exotic species to invade
72	Sandy Knoll Swamp	NA-3	T11N, R20E Sections 4, 5 Town of Trenton T12N, R20E Section 33 Town of Farmington	Washington County and private	339	Large, patchy lowland hardwood forest with areas of tamarack. Some portions contain good-quality wet-mesic forest ground flora. Past disturbances include selective cutting and clear-cutting, and water-level changes due to ditching
73	Sandy Knoll Wetlands	NA-3	T11N, R20E Sections 5, 6 Town of Trenton	Washington County and private	47	A small but good-quality wetland complex containing tamaracks, lowland hardwoods, shrub-carr, shallow marsh, and sedge fen associated with a spring-fed stream
74	Poplar Road Lacustrine Forest	NA-3	T11N, R20E Sections 9, 10 Town of Trenton	Private	177	A disturbed lowland hardwoods stand
75	Fellenz Hardwood Swamp	NA-3	T11N, R20E Section 16 Town of Trenton	Private	58	A southern wet to wet-mesic hardwood forest, located within the Milwaukee River floodplain. Disturbances include selective cutting and excessive siltation
76	Paradise Drive Tamarack Swamp	NA-3 (RSH)	T11N, R20E Sections 26, 35 Town of Trenton	Washington County and private	81	Northern wet-mesic forest, tamarack swamp, and shrub-carr of moderate quality
77	Camp Wowitan Wetlands	NA-3 (RSH)	T11N, R20E Sections 21, 22, 27, 28 Town of Trenton	YMCA and other private	109	Relatively undeveloped lake and wetland complex with a well-developed esker. A good-quality calcareous fen, tamarack swamp, and mesic forest occur on the site
78	Schalla Tamarack Swamp	NA-3	T11N, R20E Section 33 Town of Trenton	Private	16	A tamarack swamp
79	Theresa Swamp	NA-3	T12N, R18E Sections 17, 18, 19, 20, 29, 30 Town of Wayne	Department of Natural Resources and private	944	Lowland hardwood forest bordering the Rock River, composed of large silver maple, plus black ash, green ash, American elm, and swamp white oak. Canopy has been opened by Dutch elm disease

Table 9 (continued)

Number on Map 4	Area Name	Classification Code ^a	Location	Ownership	Size (acres)	Description and Comments
80	Wayne Creek Swamp	NA-3	T12N, R18E Sections 21, 22, 27, 28 Town of Wayne	Private	178	Disturbed lowland hardwood forest along Wayne Creek. Openings in canopy from Dutch elm disease
81	Stockcar Swamp	NA-3 (RSH)	T12N, R18E Sections 23, 24, 25, 26 Town of Wayne	Private	240	Forested wetland of northern lowland hardwoods, tamarack-fen, shrub-carr, and alder thicket, of moderately good quality. A number of uncommon species are present
82	Rock River Marsh	NA-3	T12N, R18E Sections 30, 31, 32 Town of Wayne	Department of Natural Resources and private	326	Shallow marsh within the Rock River floodplain, dominated by cattails. Bisected by railway right-of-way
83	Kettle Moraine Drive Woods	NA-3 (RSH)	T12N, R19E Sections 2, 11, 12 Town of Kewaskum T13N, R19E Section 35 Town of Auburn	Department of Natural Resources	287 (plus 30 in Fond du Lac County)	Long, north-south-trending, irregularly shaped southern mesic and dry-mesic forest that is recovering from past grazing and selective cutting. Located on steep-sided, gravelly ridges of the interlobate kettle moraine. Forest is mostly second-growth. Important as linkage between other large forest blocks to the north and south
84	STH 28 Woods	NA-3	T12N, R19E Sections 12, 13 Town of Kewaskum	Private	145	Good-quality southern mesic hardwoods, dominated by sugar maple, ironwood, and basswood, located on kettle moraine topography. Recent cutting, roads, trails, and new homesite construction are threatening the integrity of the woods
85	Smith Lake Swamp	NA-3	T12N, R19E Section 35 Town of Barton	Private	38	Mixed lowland hardwood and conifer swamp bordering Smith Lake
86	Lange Hardwoods	NA-3	T12N, R19E Section 28 Town of Barton	Private	53	Good-quality southern mesic hardwood forest on steep kettle moraine topography
87	Wildwood Hardwood Swamp	NA-3	T12N, R19E Sections 33, 34 Town of Barton	Private	98	A lowland hardwood forest area
88	Milwaukee River Swamp	NA-3	T12N, R20E Sections 1, 2, 11, 12 Town of Farmington	Private	546	A large but disturbed wetland complex of lowland hardwoods, northern wet-mesic forest, shrub-carr, and sedge meadow bordering the Milwaukee River
89	Lizard Mound Woods	NA-3	T12N, R20E Sections 31, 32 Town of Farmington	Washington County	28	Mature dry-mesic hardwoods dominated by sugar maple, red oak, basswood, white ash, beech, and white oak. Contains Indian effigy mounds of statewide significance
90	Green Lake Bog	NA-3	T12N, R20E Section 34 Town of Farmington	Private	19	Small but good-quality undeveloped bog lake bordered by sphagnum mat, conifer swamp, and mesic hardwoods
91	Cedar-Sauk Low Woods	NA-3	T11N, R20E Section 36 Town of Trenton T10N, R21E Sections 5, 6 Town of Cedarburg T11N, R21E Sections 31, 32 Town of Saukville	Private	14 (plus 204 in Ozaukee County)	Lowland hardwood forest of silver maple, green and black ash, and American elm, with evidence of abundant past disturbances, including grazing, power-line right-of-way, and two highways. Stream flows through area from Cedarburg Bog
--	Subtotal	NA-3	55 sites	--	7,961	--
--	Total	All Natural Areas	91 sites	--	15,970	--

^aNA-1 identifies Natural Area sites of statewide or greater significance.

NA-2 identifies Natural Area sites of countywide or regional significance.

NA-3 identifies Natural Area sites of local significance.

SNA, or State Natural Area, identifies those sites officially designated as State Natural Areas by the State of Wisconsin Natural Areas Preservation Council.

RSH, or Rare Species Habitat, identifies those sites which support rare, threatened, or endangered animal or plant species officially designated by the Wisconsin Department of Natural Resources.

Table 9 (continued)

Number on Map 5	Site Name and Classification Code ^a	Location	Site Area (acres)	Ownership	Species of Concern ^b
92	Jackson Woods (CSH-P)	T10N, R20E, Section 20	24	Village of Jackson and private	American gromwell (<i>Lithospermum latifolium</i>) (R)
93	St. Anthony Maple Woods (CSH-P)	T11N, R18E, Section 10	90	Private	American gromwell (<i>Lithospermum latifolium</i>) (R)
94	Doll Woods (CSH-P)	T11N, R18E, Section 16	22	Private	American gromwell (<i>Lithospermum latifolium</i>) (R)
95	Riesch Woods (CSH-P)	T11N, R19E, Section 6	34	Private	American gromwell (<i>Lithospermum latifolium</i>) (R)
96	Silver Lake Swamp (CSH-P)	T11N, R19E, Section 34	10	Private	Showy lady's slipper (<i>Cypripedium reginae</i>) (R)
97	Cameron Property (CSH-P)	T11N, R20E, Section 8	12	Private	Small yellow lady's slipper (<i>Cypripedium parviflorum</i>) (R)
98	Fechters Woods (CSH-P)	T11N, R20E, Section 36	6	Private	Golden seal (<i>Hydrastis canadensis</i>) (R)
99	High School Woods (CSH-P)	T11N, R19E, Section 24	7	West Bend School District	Ginseng (<i>Panax quinquefolius</i>) (R)
100	Unnamed Wetland (CSH-B)	T10N, R18E, Section 25	17	Private	Black tern (R) (Colony)
101	Unnamed Wetland (CSH-B)	T10N, R18E, Section 13	40	Private	Black tern (R) (Colony)
102	Silver Lake (CSH-B)	T11N, R19E, Section 27	7	Private	Red-shouldered hawk (T)
103	Gilbert Lake (CSH-B)	T11N, R19E, Sections 17, 20	10 ^c	Private	Black Tern (R) (Colony)
104	Unnamed Wetland (CSH-B)	T12N, R18E, Section 7	53	Private	Great egret (T)
Total	Critical Species Habitat Sites	--	332	--	--

^aCSH-P identifies a critical plant species habitat site; CSH-B identifies a critical bird species habitat site.

^b"R" refers to species designated as rare or special concern; "T" refers to species designated as threatened.

^cAbout 100 acres of this 110 acre site are within the Gilbert Lake Natural Area.

Table 9 (continued)

Number on Map 5	Site Name	Classification Code ^a	Site Area (Acres)	Location	Ownership	Description
105	Freiss Lake (Hogsback) Crevasse Filling	(GA-1)	25	T9N, R19E Section 19 Town of Richmond	Private	Excellent example of a crevasse filling
106	Erin Esker	(GA-2)	192	T9N, R18E Sections 10, 15, 16, 21 Town of Erin	Private	A good example of an esker, easily demonstrated on an agricultural landscape. Some development impacts
107	Myra Esker	(GA-2)	16	T11N, R20E Sections 15, 16 Town of Trenton	Private	A well-developed, little-disturbed east-west trending esker covered by natural vegetation
108	Kewaskum Kame	(GA-2)	47	T12N, R19E Section 3 Town of Kewaskum	Private	A well-developed, isolated conical kame which serves as the "gateway" to the Northern Unit of the Kettle Moraine Forest
109	Lac Lawrann Kame and Esker	(GA-3)	12	T11N, R19E Section 1 City of West Bend	City of West Bend	Good example of kame and esker formation
110	Camp Wowitan Esker	(GA-3)	57	T11N, R20E Sections 27, 28 Town of Trenton	YMCA & Private	Well-developed northeast-southwest trending esker
111	Little Menomonee River Reef District	(GA-2)	10	T9N, R20E Sections 35, 36 Village of Germantown	Private	Silurian Racine Dolomite reef rock exposures. Considerable importance in scientific research. Contains a wide variety of reef features
112	Germantown Roadcut	(GA-3)	5	T9N, R20E Section 22 Village of Germantown	Wisconsin Dept. of Transportation	Roadcut providing excellent cross-section through Racine Dolomite, revealing fossils and rock types
113	Trenton Quarry and Lime Kiln	(GA-3)	3	T11N, R20E Section 34 Town of Trenton	Private	Small quarry exposing massive Silurian dolomite. Primitive, relatively undisturbed kilns
114	Kewaskum Quarry and Lime Kiln	(GA-3)	5	T12N, R19E Section 6 Town of Kewaskum	Private	Old quarry and lime kiln expose dolomite containing abundant brachiopod fossils. Relatively undisturbed lime-burning operation
Total	Geological Sites	--	372	--	--	--

^aGA-1 identifies Geological Area sites of statewide or greater significance; GA-2 identifies Geological Area sites of countywide or regional significance; and GA-3 identifies Geological Area sites of local significance.

Source: Wisconsin Department of Natural Resources, Wisconsin Geological and Natural History Survey, SEWRPC, and Washington County Planning and Parks Department