

## Chapter II

### INVENTORY FINDINGS

#### INTRODUCTION

The proper formulation of a park and open space plan necessitates the collection and collation of data related to existing demographic and economic characteristics, existing land uses, and natural resources. Such data provide an important basis for determining the need for additional park and open space sites and facilities and for designing a plan to meet those needs. The inventory findings are presented in this chapter.

#### DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

##### Population

The area that is now the Southeastern Wisconsin Region was first included in the Federal census in 1850. In that year, the Region had a resident population of about 113,400 persons, or about 37 percent of the total population of the State. By 1990, the year of the most recent decennial census, the Region population was about 1,810,364 persons, also comprising about 37 percent of the total population of the State. Historic population levels within Washington County, the region, and the State are provided in Table 1.

Population growth in Washington County from 1850 to 1990 is graphically summarized by Figure 1. In 1850, Washington County had a resident population of about 19,500.<sup>1</sup> The County's population remained relatively stable from 1860 through 1910, then beginning to increase slowly but steadily until 1940. Following 1940, the resident population of the County increased rapidly, with the highest rate of growth, over 17,700 persons, or a 38 percent increase, occurring between 1960 and 1970. The largest increase in the absolute number of residents occurred between 1970 and 1980, when the population increased by about 21,000 persons, or about 33 percent. This large increase in Washington County's population contrasts markedly with trends during the same 10-year period in the Region as a whole, which grew in population by only 0.5 percent, and in the State, which grew by only 6.5 percent. Population growth in both the Region and Washington County occurred at more moderate levels in the decade between 1980 and 1990, with the rate of population growth in the County

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<sup>1</sup>*Washington County in 1850 included all of present-day Washington County and all of present-day Ozaukee County. Ozaukee County was formed in 1853 from portions of Washington County. The 1850 population of that portion of Washington County that was not detached to form Ozaukee County was 11,204 persons.*

slowing to about 12 percent, from 84,848 to 95,328 persons, and population growth in the Region increasing to about 3 percent, from 1,764,919 to 1,810,364 persons.

The City of West Bend is the most populous community in the County, with 23,916 residents, or about 25 percent of the County's population, in 1990. Other population centers include the Village of Germantown, with 13,658 residents in 1990, or about 14 percent of the County's population, and the City of Hartford, with 8,188 residents in 1990, or about 9 percent of the County's population. The most populous town in the County in 1990 was the Town of Richfield, which had 8,993 residents, or about 9 percent of the County's population.

##### Population Distribution

Following World War II, the highest rates of population increase in the Region took place in the suburban and exurban areas of Ozaukee, Washington, and Waukesha Counties, as opposed to the more developed counties and central cities of Kenosha, Milwaukee, and Racine. This decentralization of population, or movement of persons from the older, central urban areas of the Region to outlying areas, has markedly changed the development pattern of the Region and, in some cases, has led to a demand for the provision of urban services and facilities in areas that are generally rural in character. Providing urban services and facilities to scattered, low-density urban development in outlying areas is often inefficient and costly. Such facilities and services include sanitary-sewer and water-supply services, public transit, and public parks providing facilities for such nonresource-oriented recreational activities as tennis, soccer, and baseball.

##### Households

Trends in the number of households in the County and the Region are shown on Table 2. Both the County and Region experienced significant gains in the number of new households between 1970 and 1990. The rate of increase in the number of households has been much larger than the rate of population increase in all cases. Between 1970 and 1980, the number of households in the County increased by about 54 percent, compared to a 33 percent increase in total population. In the Region during this period, the number of households increased by about 17 percent, while the total population increased by less than 1 percent. Between 1980 and 1990, the number of households in the County increased by about 23 percent, almost double the 12 percent increase in population, while in the Region the rate of increase in the number of new households, about 8 percent, was more than double the 3 percent population increase. Between 1970 and 1990, the rate of increase in the number of households was 89 percent in the County and 26 percent in the Region,

compared to a population increase of 49 percent in the County and 3 percent in the Region. With the number of households increasing at a faster rate than the population, the number of persons per household has decreased.

The number of households is a population characteristic of particular importance for land use planning, because it greatly influences the demand for converting rural land to urban use to accommodate additional residential development. It is also an important component in creating demand for transportation and other facilities and services, including parks and recreational facilities.

#### Age Distribution

The age distribution of the population may be expected to influence the location and type of recreational areas and facilities provided within the County. The age distribution of the population of the County and Region in 1970, 1980, and 1990 is set forth in Table 3. The total population of the County increased dramatically between 1970 and 1990, with significant increases in the number of adults of all ages but only slight increases in the number of children. This trend differs from that of the Region as a whole, which experienced decreases in all age groups except those aged 25 to 44 and those 65 or over.

#### Employment

Trends in job growth in the County and Region are set forth in Tables 4 and 5. The jobs are enumerated at the workplace and the data thus reflect the number of jobs within the County and Region, including both full- and part-time jobs. An increase in the number of jobs may be expected to attract additional residents to the County, thus influencing population growth to some extent. It should be noted, however, that a substantial number of Washington County residents who work, 22,704 of the 49,772 workers in 1990, or about 46 percent, worked outside the County.

As indicated in Table 4, employment growth was significant in the County between 1970 and 1990, with the number of The historic urban development of Washington County during this century is presented on Map 1. Prior to 1950, urban development in the County had generally occurred in tight concentric rings around the established communities of Germantown, Hartford, Jackson, Kewaskum, Newburg, Slinger, and West Bend and along the shorelines of several of the larger lakes in the County. The period between 1950 and 1963 saw a significant increase in urban development within the County, a portion of which occurred in scattered enclaves throughout the County rather than adjacent to the established urban centers. In the decades following 1963, land development for urban uses increased dramatically, most of which occurred in a generally scattered and diffuse pattern throughout the County and outside established urban centers. The historic urban development of Washington County during this century is presented on Map 1. Prior to 1950, urban development in the County had generally occurred in tight

jobs almost doubling, from 24,271 to 46,057 jobs. The rate of increase in the number of jobs in the County exceeded the rate of increase in the Region during the same period, which experienced an increase of 283,066 jobs, or about 36 percent.

Table 5 shows the number of jobs in the County and Region in 1970, 1980, and 1990 by occupational category. Manufacturing, with almost 13,000 jobs, was the largest employment category in the County in 1990. Services and retail trade were the second- and third-largest categories, providing about 9,000 and about 7,600 jobs, respectively, in 1990. Between 1970 and 1990, the number of jobs in the County increased in all categories except agriculture, which declined by 524 persons, or by about 27 percent.

The largest employment category in the Region in 1990 was the service field, which provided over 305,000 jobs. Manufacturing- and retail trade-related jobs also constituted a large share of total jobs in the Region in 1990. As in Washington County, the number of jobs in the agricultural category decreased within the Region between 1970 and 1990. Unlike Washington County, the Region experienced a loss in the number of jobs of almost 13 percent in the manufacturing category. The number of jobs increased in all other categories.

#### **HISTORIC URBAN GROWTH AND EXISTING LAND USES**

Land use is an important determinant of both the supply of, and the demand for, outdoor recreation and related open space facilities. Accordingly, an understanding of the amount, type, and spatial distribution of urban and rural land uses within the County, as well as the historic conversion of rural lands to urban use, is essential to the development of a sound park and open space plan. This section presents a description of the historic urban development and existing land uses in the County.

#### Historic Urban Growth

concentric rings around the established communities of Germantown, Hartford, Jackson, Kewaskum, Newburg, Slinger, and West Bend and along the shorelines of several of the larger lakes in the County. The period between 1950 and 1963 saw a significant increase in urban development within the County, a portion of which occurred in scattered enclaves throughout the County rather than adjacent to the established urban centers. In the decades following 1963, land development for urban uses increased dramatically most of which occurred in a generally scattered and diffuse pattern throughout the County and outside established urban centers.

#### Existing Land Uses

Land uses in Washington County in 1995 are summarized by Map 2 and by Table 6. Urban land uses occupied about 42,953 acres, or about 15 percent of the County. Intensive urban development, including virtually all commercial, industrial, and multi-family residential development, is

concentrated within or near the communities of Germantown, Hartford, Kewaskum, Newburg, Slinger, and West Bend. Large concentrations of low-density residential development occurs outside these communities, especially in the southern portion of the County. The single largest urban land use within the County in 1995 was single-family residential development, which encompassed about 21,262 acres, or about 50 percent of urban land uses and about 8 percent of the total area of the County.

Land uses categorized as transportation, communications, and utilities constituted the second-largest urban land use category in 1995, encompassing about 13,047 acres, or about 30 percent of the area developed for urban use and about 5 percent of the total area of the County. Streets and highways occupied about 11,540 acres, or over 88 percent of the uses in this category. Major arterial highways serving the County include USH 45 and USH 41, which traverse the County in a generally northwest-southeast direction, and STH 33 and STH 60, which traverse the County in a generally east-west direction. Other uses in the transportation, communications, and utilities category within the County include three railroad freight-service lines, two of which are operated by the Wisconsin Central Transportation Corporation and one by the Wisconsin & Southern Railroad Company, and three public use airports: the West Bend Municipal Airport, owned by the City of West Bend; the Hartford Municipal Airport, owned by the City of Hartford; and the Hahn Sky Ranch, which is privately owned.

Recreational land uses constituted the third-largest urban land use category within the County in 1995, encompassing about 2,627 acres, or about 5 percent of the area developed for urban use and less than 1 percent of the total area of the County. These figures include only those areas that are developed for intensive recreational use, such as tennis courts, baseball diamonds, playfields, and accessory uses. Areas used for passive recreational purposes, such as hiking and nature study, are generally designated as open lands or woodlands. A description of park and open space sites within the County is presented in Chapter III.

About 235,880 acres, or about 85 percent, of the approximately 278,833 acres within the County in 1995 were nonurban lands, including agricultural lands, wetlands, woodlands, surface water, and other open lands. Agriculture was the largest single land use in the County, accounting for about 152,735 acres, or about 55 percent of the area of the County.

#### Prime Agricultural Land

The Washington County Farmland Preservation Plan was adopted by the Washington County Board in September 1981. That plan evaluated farmlands within the County and placed them into one of three classes: primary, secondary, and transitional. The criteria used to classify farmlands is sum-

marized on Table 7. The County plan recommends that primary farmlands be used only for intensive agricultural uses. The plan further recommends that commercial and industrial uses in primary farmland areas be limited to those related to agricultural production and that residential development be limited to homes for farm owners or workers. In secondary farmland areas, the plan recommends that residential, commercial, and industrial uses not related to agricultural production be permitted on a limited basis, provided they do not interfere with farming operations on nearby land. Transitional agricultural lands are those located within planned urban service areas which are expected to be converted to urban use within a 10- to 20-year period. It is envisioned that about 80,400 acres of primary farmlands would remain in agricultural uses under plan conditions.

Subsequent to the adoption of the County farmland plan, the Regional Planning Commission identified prime agricultural lands as part of the 2010 regional land use plan. The criteria used by the Commission for defining prime agricultural lands is also summarized on Table 7. The extent of prime agricultural lands in Washington County under the 2010 regional land use plan is about 106,800 acres. Lands in Washington County identified as prime agricultural lands on the 2010 regional land use plan include all lands identified as primary farmlands in the Washington County Farmland Preservation Plan. The regional plan also designates as prime agricultural land those lands identified as secondary farmlands in the County farmland preservation plan in which all three of the following criteria are met: 1) the farm unit must be at least 35 acres in size, 2) at least 50 percent of the farm unit must be covered by soils which meet U. S. Natural Resource Conservation Service standards for national prime farmland. Subsequent to the adoption of the County farmland plan, the Regional Planning Commission identified prime agricultural lands as part of the 2010 regional land use plan. The criteria used by the Commission for defining prime agricultural land is also summarized in Table 7. The extent of prime agricultural lands in Washington County under the 2010 regional land use plan is about 106,800 acres. Lands in Washington County identified as prime agricultural lands on the 2010 regional land use plan include all lands identified as primary farmlands in the Washington County Farmland Preservation Plan. The regional plan also designates as prime agricultural land those lands identified as secondary farmlands in the County farmland preservation plan in which all three of the following criteria are met: 1) the farm unit must be at least 35 acres in size, 2) at least 50 percent of the farm unit must be covered in soils which meet U.S. Natural Resource Conservation Service standards for national prime farmland or farmland of Statewide importance, and 3) the farm unit must be located in a block of farmland at least 100 acres in size. The Washington County Farmland Preservation Plan used a minimum block size of 640 acres to classify primary farmlands, which accounts for some of the differences between the County and Regional Planning Commission delineation of prime farmland.

Map 3 shows the extent of primary farmlands envisioned in Washington County under the Washington County Farmland Preservation Plan. Lands identified as prime agricultural under the 2010 regional land use plan but not the County plan are also shown. It should be noted that the County plan, in contrast to the 2010 regional land use plan, does not identify any farmlands inside incorporated areas. As shown on Map 3, the regional land use plan identified a considerable amount of prime farmland, about 6,670 acres, in rural portions of the Village of Germantown. These prime farmlands are also reflected in the Village of Germantown land use plan.<sup>2</sup>

Preserving prime farmlands in agricultural use is important to ensure that productive farmland is available for future generations, to protect the agricultural sector of the economy, and to help maintain the rural lifestyle and open space character of the landscape associated with farming activities. Prime farmlands not needed to accommodate anticipated urban growth within, or adjacent to, planned urban service areas should be maintained in agricultural use.

## NATURAL RESOURCES

An important recommendation of the adopted regional land use and park and open space plans is the preservation of the most important elements of the natural resource base of the Region. Since the preparation and adoption of the year 2000 Washington County park and open space plan in 1989, additional inventory information concerning the location and extent of natural resources has been collected. This section presents such information as it relates to Washington County.

### Surface Water Resources

Surface water resources, consisting of streams and lakes, form a particularly important element of the natural resource base. Surface water resources provide recreational opportunities, influence the physical development of the County, and enhance its aesthetic quality. Watershed boundaries and major streams and lakes within the County are shown on Map 4.

Lakes and streams are readily susceptible to degradation through improper land use development and management. Water quality can be degraded by excessive pollutant loads, including nutrient loads, which enter from malfunctioning and improperly located onsite sewage-disposal systems, from overflows from sanitary sewers, from construction and other urban runoff, and from careless agricultural practices. The water quality of lakes and streams may also be adversely affected by the excessive development of riparian areas and by the filling of peripheral wetlands, both of which remove valuable nutrient and sediment traps while adding

nutrient and sediment sources. It is important that existing and future development in riparian areas be managed carefully to avoid further water quality degradation and to enhance the recreational and aesthetic values of surface water resources.

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, located within three watersheds: the Menomonee River, Milwaukee River, and Rock River watersheds. The Menomonee River watershed generally encompasses the area within the Village and Town of Germantown. In that portion of the watershed within Washington County, the Menomonee River is the only major stream. Major streams in the Milwaukee River watershed, which includes the area in generally the eastern half of the County outside Germantown, are the Milwaukee River, East Branch Milwaukee River, North Branch Milwaukee River, Kewaskum Creek, Cedar Creek, Little Cedar Creek, North Branch Cedar Creek, Evergreen Creek, Quaas Creek, Silver Creek, Stony Creek, and Wallace Creek. Major streams in the Rock River watershed, which includes the area in generally the western half of the County, are the East Branch Rock River, Ashippun River, Coney River, Kohlsville River, Limestone Creek, Mason Creek, Oconomowoc River, Little Oconomowoc River, and Rubicon River.

There are 14 major lakes, that is, lakes of 50 or more acres, within Washington County. Major lakes in the Milwaukee River watershed are Barton Pond, Big Cedar Lake, Little Cedar Lake, Green Lake, Lucas Lake, Silver Lake, Smith Lake, Lake Twelve, and Wallace Lake. Major lakes in the Rock River watershed are Bark Lake; Druid Lake; Friess Lake; Lake Five, a portion of which is located in Waukesha County; and Pike Lake. There are no major lakes within that portion of the Menomonee River watershed lying in Washington County. Together, these major lakes in the County have a combined surface area of about 2,634 acres. The three largest lakes are Big Cedar Lake, with a surface area of about 932 acres; Pike Lake, with a surface area of about 522 acres; and Little Cedar Lake, with a surface area of about 246 acres.

### Floodlands

Floodlands are the wide, gently sloping areas contiguous to, and usually lying on both sides of, a stream channel. For planning and regulatory purposes, floodlands are normally defined as the areas, excluding the stream channel, subject to inundation by the 100-year recurrence interval flood event. This is the flood that may be expected to be reached or exceeded in severity once in every 100 years or, stated another way, there is a one percent chance of this event being reached or exceeded in severity in any given year. Floodland areas are generally not well suited to urban development, not only because of the flood hazard, but also because of the presence of high water tables and, generally, of soils poorly suited to

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<sup>2</sup>*Documented in the report entitled Comprehensive Master Plan for the Village of Germantown, prepared by Vandewalle & Associates, August 1993.*

urban uses. Floodland areas often contain important natural resources, such as high-value woodlands, wetlands, and wildlife habitat and, therefore, constitute prime locations for parks and open space areas. Every effort should be made to discourage incompatible urban development on floodlands, while encouraging compatible park and open space uses.

As shown on Map 4, in 1995 floodlands were located along all of the major streams in Washington County. About 41,480 acres, not including surface water in lakes and existing stream channels, or about 15 percent of the total area of the County, were located within the 100-year recurrence interval flood-hazard area.

#### Wetlands

The location and extent of wetlands in the County in 1995, as delineated by the Regional Planning Commission, are shown on Map 2. At that time, wetlands covered about 42,305 acres, or about 15 percent of the County. The three largest wetland complexes, Allenton Marsh, Jackson Marsh, and Theresa Marsh, are designated as State of Wisconsin wildlife areas and managed by the Wisconsin Department of Natural Resources.

Wetlands are defined by the U. S. Army Corps of Engineers, the U. S. Environmental Protection Agency, and the Regional Planning Commission as “areas that are inundated or saturated by surface water or groundwater at a frequency, and with a duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”

The definition of wetlands used by the U. S. Natural Resource Conservation Service (NRCS), formerly the U. S. Soil Conservation Service, differs somewhat from the definition used by the Corps and EPA. The NRCS definition may include some lands that have been converted to cropland, but those lands would not be regulated under Federal wetland programs unless certain conditions are met.<sup>3</sup> The Corps and EPA definition used by the Commission in the Southeastern Wisconsin Region is essentially the same as the NRCS definition.

A third definition, which is applied by the State of Wisconsin Department of Natural Resources, defines a wetland as “an area where water is at, near, or above the land surface long

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<sup>3</sup>Lands designated as prior converted cropland, that is, lands that were cleared, drained, filled, or otherwise manipulated to make them capable of supporting a commodity crop prior to December 23, 1985, may meet the criteria of the NRCS wetland definition, but they would not be regulated under Federal wetland programs. If such lands are not cropped, managed, or maintained for agricultural production for five consecutive years, and in that time the land reverts back to wetland, the land would then be subject to Federal wetland regulations.

enough to be capable of supporting aquatic or hydrophytic vegetation, and which has soils indicative of wet conditions.”

In practice, the State definition is more inclusive than the Federal and Commission definitions in that the State may include some soils that do not show hydric field characteristics as wet soils, but which are capable of supporting wetland vegetation, a condition which may occur in some floodlands.<sup>4</sup>

As a practical matter, application of either the State wetland definition or the definition used by the Corps, EPA, and Regional Planning Commission has been found to produce reasonably consistent wetland delineations in the majority of situations within the Southeastern Wisconsin Region. In any case, the precise delineation of a wetland area requires an onsite field investigation.

Wetlands are important resources for the ecological health and diversity of the County. They provide essential breeding, nesting, resting, and feeding grounds and provide escape cover for many forms of fish and wildlife. Wetlands also contribute to flood control, because such areas naturally serve to store excess runoff temporarily, thereby tending to reduce peak flows. Wetlands may also serve as groundwater recharge areas. In addition, wetlands help to protect downstream water resources from siltation and pollution by trapping sediments, nutrients, and other water pollutants.

In view of the important natural functions of wetland areas and their recreational value for hunting, fishing, and wildlife viewing, continued efforts should be made to protect these areas by discouraging wetland draining, filling, and urbanization, which can be costly in both monetary and environmental terms.

#### Woodlands

Woodlands are defined as those upland areas one acre or more in size with 17 or more deciduous trees per acre, each measuring at least four inches in diameter at breast height, and with 50 percent or more tree canopy coverage. Coniferous tree plantations and reforestation projects are also classified as woodlands.

Woodlands provide an attractive natural resource of immeasurable value. Under good management, woodlands can serve a variety of beneficial functions. In addition to contributing to clean air and water and regulating surface

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<sup>4</sup>Although prior converted cropland is not subject to Federal wetland regulations unless cropping ceases for five consecutive years and the land reverts to a wetland condition, the State may consider prior converted cropland to be subject to State wetland regulations if the land meets the criteria set forth in the State wetland definition before it has not been cropped for five consecutive years.

water runoff, the maintenance of woodlands within the County can contribute to sustaining a diversity of plant and animal life. The existing woodlands in the County, which required a century or more to develop, can be destroyed through mismanagement within a comparatively short time. The deforestation of hillsides contributes to rapid stormwater runoff, the siltation of lakes and streams, and the destruction of wildlife habitat.

Woodlands, as shown on Map 2, occur in scattered locations throughout the County. In 1995, woodland areas covered about 22,417 acres, or about 8 percent of the County. These woodlands should be maintained for their scenic, wildlife habitat, recreational, and air and water quality protection values.

#### Natural Areas, Critical Species Habitat, and Geological Sites

A comprehensive inventory of natural and geological resources in the County was conducted by the Regional Planning Commission in 1994 as part of the natural areas and critical species habitat protection and management plan being prepared by the Commission. The inventory systematically identified all remaining high-quality natural areas, critical species habitat, and sites having geological significance within the Region. Recommendations developed through that program for the protection and management of identified natural areas, critical species habitat, and geological sites have been incorporated into this park and open space plan.

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. Natural areas sites are classified into one of three categories: natural areas of Statewide or greater significance (NA-1), natural areas of countywide or regional significance (NA-2), and natural areas of local significance (NA-3). Classification of an area into one of these three categories is based on consideration of the diversity of plant and animal species and community types present; the structure and integrity of the native plant or animal community; the extent of disturbance from human activity, such as logging, agricultural use, and pollution; the commonness of the plant and animal community; unique natural features; the size of the site; and the educational value.

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. Of the 91 identified sites, seven are classified as NA-1 sites and encompass about 1,659 acres, 29 are classified as NA-2 sites and encompass about 6,350 acres, and 55 are classified as NA-3 sites and encompass about 7,961 acres. Map 5 depicts the locations of natural areas identified in 1994. Table 8 sets forth a description of each natural area.

Critical Species Habitat: Critical species habitat sites are those areas, outside of natural areas, whose chief value lies in their ability to support rare, threatened, or endangered species. Such areas constitute "critical" habitat that is important to ensure survival of a particular species or group of species of special concern.

A total of 13 sites supporting threatened or rare plant or bird species have been identified in Washington County. These sites, which together encompass an area of about 332 acres, are shown on Map 6 and described in Table 9.

Geological Sites: A total of 11 sites of geological importance, including four bedrock geology sites and seven glacial features, were identified in the County in 1994. The geological sites included in the inventory were selected on the basis of scientific importance, significance in industrial history, natural aesthetics, ecological qualities, educational value, and public access potential. The 11 sites selected in Washington County include two sites of Statewide significance (GA-1), four sites of regional or county significance (GA-2), and five sites of local significance (GA-3). Together, these sites encompass about 5,950 acres. Map 7 depicts the locations of geological sites identified in 1994. Table 10 sets forth a description of each site.

Many of the geological features within Washington County may be attributed to the continental glacier which once covered much of the County. The Kettle Moraine is the County's dominant physiographic feature, oriented in a generally northeast-southwest direction across the central portion of the County and consisting of kames, or conical-shaped hills; kettles, or depressions formed from melting blocks of glacial ice; and eskers, or narrow ridges of drift deposited in drainage ways located beneath the glacier. The Kettle Moraine is one of the two GA-1 sites within the County; the other is the Friess Lake Crevasse Filling in the Town of Richfield.

#### Environmental Corridors and Isolated Natural Resource Areas

One of the most important tasks completed under the regional planning program for Southeastern Wisconsin has been the identification and delineation of those areas in the Region in which concentrations of the best remaining elements of the natural resource base occur. The preservation of such areas in essentially natural, open uses is vital to maintaining a high level of environmental quality in the Region, protecting its natural heritage and beauty, and providing recreational opportunities in scenic outdoor settings.

Identification of environmental corridors is based upon the presence of one or more of the following important elements of the natural resource base: 1) rivers, streams, lakes and associated shorelands and floodlands, 2) wetlands, 3) woodlands, 4) prairies, 5) wildlife habitat areas, 6) wet, poorly

drained, and organic soils, and 7) rugged terrain and high relief topography. The presence of elements that are closely related to the natural resource base, including park and open space sites, natural areas, historic sites, and scenic viewpoints, are also considered in the delineation of environmental corridors. Many of the natural resource elements which form elongated areas which have been termed "environmental corridors" by the Regional Planning Commission.<sup>5</sup> Primary environmental corridors are a minimum of 400 acres in size, two miles in length, and 200 feet in width. Secondary environmental corridors connect with the primary environmental corridors and are at least 100 acres in size and one mile in length. Areas at least five acres in size which contain important natural resource base elements but are separated physically from primary and secondary environmental corridors by intensive urban or agricultural land uses have also been identified and have been termed "isolated natural resource areas." Environmental corridors and isolated natural resource areas within Washington County in 1990 are shown on Map 8. At that time, such areas encompassed about 76,601 acres, or about 27 percent of the County.

In any consideration of environmental corridors and isolated natural resource areas, it is important to note that the preservation of such resources serves many beneficial purposes in addition to protecting the important natural resources that make up the corridors. Corridor lands provide areas for the storage of floodwaters away from homes and other developed areas, help to protect water quality by filtering sediment and fertilizer from runoff before it enters surface waters, provide wildlife habitat and corridors for the movement of animals, and contribute to the scenic beauty of the Region. Excluding urban development from environmental corridors helps to prevent problems such as water pollution, wet and flooded basements, and building and pavement failures.

In addition, because of the many interacting relationships between living organisms and their environment, the destruction or deterioration of any one element of the natural resource base may lead to a chain reaction of deterioration and destruction. The draining and filling of wetlands, for example, may destroy fish spawning grounds, wildlife habitat, groundwater recharge areas, and the natural filtration and floodwater-storage functions which contribute to maintaining high levels of water quality and stable streamflows and lake stages in a watershed. The resulting deterioration of surface water quality may, in turn, lead to the deterioration of the quality of the groundwater which serves as a source of domestic, municipal, and industrial water supply and on which low flows in rivers and streams may depend. Similarly, the

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<sup>5</sup>A detailed description of the process of refining the delineation of environmental corridors in Southeastern Wisconsin is presented in SEWRPC Technical Record, Vol. 4, No. 2 (March 1981), pp. 1-21.

the basis for corridor delineation have been described in the preceding sections of this chapter.

The delineation on a map of the natural resource and resource-related elements specified above results in an essentially linear pattern of relatively narrow, destruction of woodland cover may result in soil erosion and stream siltation, more rapid stormwater runoff and attendant increased flood flows and stages, as well as destruction of wildlife habitat.

Although the effects of any one of these environmental changes may not in and of itself be overwhelming, the combined effects will eventually create serious environmental and developmental problems. The need to maintain the integrity of the remaining environmental corridors and isolated natural resource areas thus becomes apparent.

Primary Environmental Corridors: As shown on Map 8, the primary environmental corridors in Washington County are located along the major rivers and their tributaries, around the major lakes in the County, in large wetland areas, and in the Kettle Moraine. In 1990, about 60,183 acres, comprising about 22 percent of the total area of the County, were encompassed within the primary environmental corridors.

The primary environmental corridors contain almost all the best remaining woodlands, wetlands, and wildlife habitat areas in the County and are, in effect, a composite of the best remaining elements of the natural resource base. Such areas have immeasurable environmental and recreational value. The protection of the primary environmental corridors from additional intrusion by incompatible land uses, and thereby from degradation and destruction, is one of the principal objectives of this park and open space planning program.

Secondary Environmental Corridors and Isolated Natural Resource Areas: As shown on Map 8, secondary environmental corridors in Washington County are located chiefly along the small perennial and intermittent streams within the County. About 9,889 acres, comprising about 3 percent of the County, were encompassed within secondary environmental corridors in 1990. Secondary environmental corridors contain a variety of resource elements and are often remnants of primary environmental corridors that have been developed for intensive agricultural or urban uses. Secondary environmental corridors facilitate surface water drainage and provide corridors for the movement of wildlife and for the dispersal of seeds for a variety of plant species. Such corridors should be considered for preservation in natural, open uses or incorporated in developing areas as drainageways, stormwater detention or retention areas, or as local parks or recreation trails.

As also shown on Map 8, isolated natural resource areas within Washington County include a geographically well-

distributed variety of isolated wetlands, woodlands, and wildlife habitat; in 1990, these areas encompassed about 6,529 acres, or about 2 percent of the County. Isolated natural resource areas may provide the only available wildlife habitat in an area, provide good locations for local parks and nature areas, and lend aesthetic character and natural diversity to an area. Such areas should be preserved in natural open uses insofar as practicable, being incorporated for use as parks and open space reservations or stormwater detention or retention areas where appropriate.

## SUMMARY

### Demographic and Economic Characteristics

In 1990, the resident population of the County was 95,328 persons. The population more than doubled between 1960 and 1990, with particularly rapid growth in the 1970s and 1980s. About 24,000 persons, or about 25 percent of the County population, resided within the County's largest community, the City of West Bend. Much of the new urban residential development within the County in recent decades has occurred in a generally scattered and diffused pattern in areas outside the County's established urban centers. Providing urban services and facilities, including facilities typically provided in City and Village neighborhood and community parks, to such scattered, low-density urban development is often inefficient and costly.

The large increase in the total population was exceeded by the increase in the number of households and in the number of jobs within the County. Between 1970 and 1990, the number of households increased by about 89 percent, compared to a population increase of about 49 percent. The number of jobs in the County increased by almost 90 percent during this period.

The population increase in the County was not evenly distributed among all age groups. The number of children (those under 18 years of age) increased only slightly between 1970 and 1990, while the number of adults, particularly those aged 25 to 44, grew significantly.

### Existing Land Uses

An inventory of land uses in the County in 1995 indicated that about 15 percent of the County, or about 42,953 acres, were developed with urban uses, including residential, commercial, industrial, transportation, and governmental and institutional land uses. Residential use accounted for the largest percentage of lands developed for urban use, encompassing about 22,361 acres, or about 8 percent of the County and about 50 percent of its urban lands in 1995. About 235,880 acres of the total County area of 278,833 acres, or about 85 percent of the County, were devoted to nonurban uses in 1995. Agricultural uses occupied a significant portion of the County, encompassing about 152,735 acres, or about 55 percent of the total area of the County. Prime farmlands are those lands which, by virtue of farm size, total area being farmed, and

soil characteristics, are best suited for the production of food and fiber. The Washington County Farmland Preservation Plan envisions about 80,400 acres of prime farmland would remain in Washington County under the plan.

Preserving prime farmlands in agricultural use is important to assure that productive farmland is available for future generations, to protect the agricultural sector of the economy, and to help maintain the rural lifestyle and open space character of the landscape associated with farming activities. Prime farmlands not needed to accommodate anticipated urban growth within or adjacent to planned urban service areas should be maintained in agricultural use.

### Natural Resources

Surface Water Resources: Surface water resources, consisting of streams and lakes, form a particularly important element of the natural resource base. Surface water resources provide recreational opportunities, influence the physical development of the County, and enhance its aesthetic quality.

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, located within three watersheds: the Menomonee River, the Milwaukee River, and the Rock River watersheds. There are also 14 major lakes, that is, lakes of 50 acres or more, within Washington County.

Lakes and streams are readily susceptible to degradation through improper land use development and management. Water quality can be degraded by excessive pollutant loads, including nutrient loads, from malfunctioning and improperly located onsite sewage-disposal systems, from sanitary-sewer overflows, from construction and other urban runoff, and from careless agricultural practices. The water quality of lakes and streams may also be adversely affected by the excessive development of riparian areas and by the filling of peripheral wetlands, which remove valuable nutrient and sediment traps while adding nutrient and sediment sources. It is important that existing and future development in riparian areas be managed carefully to avoid further water quality degradation and to enhance the recreational and aesthetic values of surface water resources.

Floodlands: The floodlands of a river or stream are the wide, gently sloping areas contiguous to, and usually lying on both sides of, a river or stream channel. For planning and regulatory purposes, floodlands are normally defined as the areas, excluding the stream channel, subject to inundation by the 100-year recurrence interval flood event. Floodland areas are generally not well suited to urban development, not only because of the flood hazard, but also because of the presence of high water tables and, generally, of soils poorly suited to urban uses. The floodland areas also generally contain



important natural resources such as high-value woodlands, wetlands, and wildlife habitat and, therefore, constitute prime locations for parks and open space areas. Every effort should be made to discourage indiscriminate and incompatible urban development on floodlands, while encouraging compatible park and open space uses. About 41,480 acres, not including surface water in lakes and existing stream channels, or about 15 percent of the total area of the County, were located within the 100-year recurrence interval flood hazard area in 1995.

Wetlands: In 1995, wetlands covered about 42,305 acres, or about 15 percent of the County. The three largest wetland complexes, Allenton Marsh, Jackson Marsh, and Theresa Marsh, are designated as State of Wisconsin wildlife areas and managed by the Wisconsin Department of Natural Resources.

Wetlands are important resources for the ecological health and diversity of the County. They provide essential breeding, nesting, resting, and feeding grounds and provide escape cover for many forms of fish and wildlife. Wetlands also contribute to flood control, because such areas naturally serve to store excess runoff temporarily, thereby tending to reduce peak flows. Wetlands may also serve as groundwater recharge areas. In addition, wetlands help to protect downstream water resources from siltation and pollution by trapping sediments, nutrients, and other water pollutants.

In view of the important natural functions of wetland areas and their recreational value for hunting, fishing, and wildlife viewing, continued efforts should be made to protect these areas by discouraging wetland draining, filling, and urbanization, which can be costly in both monetary and environmental terms.

Woodlands: In 1995, woodland areas covered about 22,417 acres, or about 8 percent of the County. Woodlands can serve a variety of beneficial functions, including contributing to clean air and water, regulating surface water runoff, and sustaining a diversity of plant and animal life. Remaining woodlands should be maintained for their scenic, wildlife habitat, recreational, and air and water quality protection values.

Natural Areas and Geological Sites: A comprehensive inventory of natural and geological resources in the County was conducted by the Regional Planning Commission in 1994 as part of the natural areas and critical species habitat protection and management plan being prepared by the Commission. The program systematically identified all remaining high quality natural areas and rare species habitat, including areas of geological significance. 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. The 91 sites were distributed into seven NA-1 sites, encompassing about 1,659 acres; 29 NA-2 sites, encompassing about 6,350 acres, and 55 NA-3 sites, encompassing about 7,961 acres.

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 constitute habitat that is important to ensure survival of a particular species or group of species of special concern. A total of 13 sites supporting threatened or rare plant or bird species have been identified in Washington County. Together these sites encompass about 332 acres.

A total of 11 sites of geologic importance, including four bedrock geology sites and seven glacial features, were identified in the County in 1994. These included two sites of Statewide significance (GA-1), four sites of regional or county significance (GA-2), and five sites of local significance (GA-3), together encompassing about 5,950 acres.

Environmental Corridors and Isolated Natural Resource Areas: One of the most important tasks completed under the regional planning program for Southeastern Wisconsin has been the identification and delineation of those areas in the Region in which concentrations of the best remaining elements of the natural resource base occur. The protection and preservation of such areas in essentially natural, open uses is crucial for maintaining both the ecological balance and the natural beauty of the Region and County.

Primary environmental corridors include the best remaining woodlands, wetlands, and wildlife habitat areas and are, in effect, a composite of the best remaining residual elements of the natural resource base of the County. Primary environmental corridors in 1990 encompassed about 60,183 acres, or about 22 percent of the County. These corridors have truly immeasurable environmental and recreational value. The protection of the primary environmental corridors from intrusion by incompatible rural and urban uses, and thereby from degradation and destruction, should be one of the principal objectives of the County park and open space plan. Their preservation in an essentially open, natural state, including park and open space uses, limited agricultural uses, and very-low-density residential uses, will serve to maintain a high level of environmental quality in the County, protect its natural beauty, and provide valuable recreation opportunities.

Secondary environmental corridors in Washington County are located chiefly along the small perennial and intermittent streams within the County, and in 1990 encompassed about 9,889 acres, or about 3 percent of the County. Secondary environmental corridors serve as ideal locations for urban stormwater detention areas and associated drainage ways and for the development of local trails. Such areas should be preserved in open, natural uses to the extent practicable.

In addition to the environmental corridors, other, small pockets of concentrations of natural resource base elements exist within the County. These areas, known as isolated natural resource areas, may provide the only available wildlife

habitat in an area, provide good locations for local parks and open space sites, and lend unique and aesthetic character and natural diversity to an area. Isolated natural resource areas in 1990 encompassed about 6,529 acres, or about 2 percent of the County. Such areas should also be preserved in open, natural uses to the extent practicable.

**Table 1**

**HISTORIC RESIDENT POPULATION LEVELS IN WASHINGTON COUNTY,  
 SOUTHEASTERN WISCONSIN, AND THE STATE OF WISCONSIN: 1850-1990**

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
1850	19,485	--	--	113,389	--	--	305,391	--	--
1860	23,622	4,137	21.2	190,409	77,020	67.9	775,881	470,490	154.1
1870	23,919	297	1.3	223,546	33,137	17.4	1,054,670	278,789	35.9
1880	23,442	-477	-2.0	277,119	53,573	24.0	1,315,497	260,827	24.7
1890	22,751	-691	-2.9	386,774	109,655	39.6	1,693,330	377,833	28.7
1900	23,589	838	3.7	501,808	115,034	29.7	2,069,042	375,712	22.2
1910	23,784	195	0.8	631,161	129,353	25.8	2,333,860	264,818	12.8
1920	25,713	1,929	8.1	783,681	152,520	24.2	2,632,067	298,207	12.8
1930	26,551	838	3.3	1,006,118	222,437	28.4	2,939,006	306,939	11.7
1940	28,430	1,879	7.1	1,067,699	61,581	6.1	3,137,587	198,581	6.8
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	1,764,919	8,836	0.5	4,705,767	287,946	6.5
1990	95,328	10,480	12.4	1,810,364	45,445	2.6	4,891,769	186,002	4.0

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

**Table 2**

**NUMBER OF HOUSEHOLDS IN WASHINGTON COUNTY AND THE  
 SOUTHEASTERN WISCONSIN REGION: CENSUS YEARS, 1970-1990**

Year	Washington County			Southeastern Wisconsin		
	Number of Households	Change from Previous Census		Number of Households	Change from Previous Census	
		Number	Percent		Number	Percent
1970	17,385	--	--	536,486	--	--
1980	26,716	9,331	53.7	627,955	91,469	17.0
1990	32,887	6,171	23.1	676,593	48,638	7.7

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

**Table 3**

**AGE DISTRIBUTION OF THE POPULATION OF WASHINGTON COUNTY  
 AND THE SOUTHEASTERN WISCONSIN REGION: CENSUS YEARS, 1970-1990**

Age Group	Washington County							
	1970		1980		1990		Change 1970-1990	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent
Under 5.....	6,627	10.4	7,108	8.4	7,240	7.6	613	9.3
5-17 .....	19,525	30.6	21,488	25.3	19,877	20.9	352	1.8
18-24 .....	5,879	9.2	9,629	11.4	8,628	9.0	2,749	46.8
25-44 .....	15,616	24.5	25,316	29.8	31,641	33.2	16,025	102.6
45-64 .....	10,945	17.1	14,182	16.7	18,000	18.9	7,055	64.5
65 and Older.....	5,247	8.2	7,125	8.4	9,942	10.4	4,695	89.5
All Ages	63,839	100.0	84,848	100.0	95,328	100.0	31,489	49.3

Age Group	Southeastern Wisconsin							
	1970		1980		1990		Change 1970-1990	
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent
Under 5.....	153,243	8.7	128,085	7.3	138,286	7.7	-14,957	-9.8
5-17 .....	472,342	26.9	375,653	21.3	339,722	18.8	-132,620	-28.1
18-24 .....	193,211	11.0	234,264	13.3	181,211	10.0	-12,000	-6.2
25-44 .....	412,831	23.5	482,615	27.3	590,955	32.6	178,124	43.1
45-64 .....	354,845	20.2	349,008	19.8	333,818	18.4	-21,027	-5.9
65 and Older.....	169,415	9.7	195,294	11.0	226,372	12.5	56,957	33.6
All Ages	1,755,887	100.0	1,764,919	100.0	1,810,364	100.0	54,477	3.1

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

**Table 4**  
**NUMBER OF JOBS IN WASHINGTON COUNTY AND THE**  
**SOUTHEASTERN WISCONSIN REGION: 1970-1990**

Year	Washington County			Southeastern Wisconsin		
	Number of Jobs	Change from Previous Decade		Number of Jobs	Change from Previous Decade	
		Number	Percent		Number	Percent
1970	24,271	--	--	784,136	--	--
1980	34,992	10,721	44.2	945,186	161,050	20.5
1990	46,057	11,065	31.6	1,067,202	122,016	12.9

Source: U. S. Bureau of Economic Analysis and SEWRPC.

**Table 5**

**NUMBER OF JOBS BY MAJOR EMPLOYMENT CATEGORY IN WASHINGTON COUNTY  
 AND THE SOUTHEASTERN WISCONSIN REGION: 1970, 1980, AND 1990**

Washington County					
Major Employment Category	Number of Jobs			Change 1970-1990	
	1970	1980	1990	Number	Percent
Agriculture.....	1,975	1,919	1,451	-524	-26.5
Construction.....	1,099	1,777	3,082	1,983	180.4
Manufacturing.....	9,254	10,899	12,837	3,583	38.7
Transportation, Communication, and Utilities.....	1,010	1,134	1,697	687	68.0
Wholesale Trade.....	323	1,003	1,562	1,239	383.6
Retail Trade.....	3,740	5,535	7,648	3,908	104.5
Finance, Insurance, and Real Estate.....	1,125	2,641	3,509	2,384	211.9
Services.....	3,105	5,826	8,965	5,860	188.7
Government and Government Enterprises <sup>a</sup> .....	2,433	3,967	4,851	2,418	99.4
Miscellaneous <sup>b</sup> .....	207	291	455	248	119.8
<b>Total</b>	<b>24,271</b>	<b>34,992</b>	<b>46,057</b>	<b>21,786</b>	<b>89.8</b>

Southeastern Wisconsin					
Major Employment Category	Number of Jobs			Change 1970-1990	
	1970	1980	1990	Number	Percent
Agriculture.....	11,689	10,023	7,090	-4,599	-39.3
Construction.....	32,373	33,786	46,060	13,687	42.3
Manufacturing.....	254,337	264,193	221,593	-32,744	-12.9
Transportation, Communication, and Utilities.....	38,448	42,152	46,042	7,594	19.8
Wholesale Trade.....	37,174	46,148	54,934	17,760	47.8
Retail Trade.....	133,674	153,590	186,408	52,734	39.4
Finance, Insurance, and Real Estate.....	47,491	75,241	86,192	38,701	81.5
Services.....	140,100	214,090	305,449	165,349	118.0
Government and Government Enterprises <sup>a</sup> .....	86,192	101,583	107,008	20,816	24.2
Miscellaneous <sup>b</sup> .....	2,658	4,380	6,426	3,768	141.8
<b>Total</b>	<b>784,136</b>	<b>945,186</b>	<b>1,067,202</b>	<b>283,066</b>	<b>36.1</b>

<sup>a</sup>Excludes armed forces.

<sup>b</sup>Includes agricultural services, forestry, commercial fishing, and mining.

Source: U. S. Bureau of Economic Analysis and SEWRPC.

**Table 6**  
**LAND USES IN WASHINGTON COUNTY: 1995**

Land Use Category	Acres	Percent of Subtotal	Percent of County
<b>Urban<sup>a</sup></b>			
Single-Family Residential.....	21,262	49.5	7.6
Multi-Family Residential <sup>b</sup> .....	1,099	2.6	0.4
Commercial.....	1,141	2.7	0.4
Industrial.....	1,341	3.1	0.5
Governmental and Institutional.....	1,377	3.2	0.5
Recreational.....	2,627	6.1	0.9
Transportation, Communications, and Utilities			
Streets and Highways.....	11,540	26.8	4.1
Other.....	1,507	3.5	0.5
Undeveloped Urban <sup>c</sup> .....	1,059	2.5	0.4
Subtotal	42,953	100.0	15.3
<b>Nonurban</b>			
Agricultural.....	152,735	64.8	54.8
Woodlands.....	22,417	9.5	8.1
Wetlands.....	42,305	17.9	15.2
Water.....	4,410	1.9	1.6
Landfill and Extractive.....	1,339	0.5	0.5
Other Open Lands.....	12,674	5.4	4.5
Subtotal	235,880	100.0	84.7
<b>Total</b>	<b>278,833</b>	<b>--</b>	<b>100.0</b>

<sup>a</sup>Parking lots are included with the associated use.

<sup>b</sup>Includes two-family residential.

<sup>c</sup>Includes excess transportation rights-of-way, undeveloped portions of partially developed lots or subdivisions, and residual lands or outlots attendant to existing urban development.

Source: SEWRPC.



**Table 7**

**SUMMARY OF THE CRITERIA USE BY WASHINGTON COUNTY  
 AND SEWRPC TO CLASSIFY IMPORTANT FARMLANDS**

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

<sup>a</sup>Soil classes refer to ratings developed by the U.S. Soil Conservation Service (now the U.S. Natural Resource Conservation Service).

Source: Stockham & Vandewalle, *Washington County Farmland Preservation Plan*, 1981, and SEWRPC.

**Table 8**  
**LOCATION OF NATURAL AREAS IN WASHINGTON COUNTY: 1994**

Number on Map 5	Area Name	Classification Code <sup>a</sup>	Location	Ownership	Size (acres)	Description and Comments
1	Kewaskum Maple-Oak	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 surround-
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 hardwood forest 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 metalmark, 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	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
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,
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
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 condi-

Number on Map 5	Area Name	Classification Code <sup>a</sup>	Location	Ownership	Size (acres)	Description and Comments
						tion, 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 cal-
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
20	St. Anthony Beech Woods	NA-2	T11N, R18E Section 2 Town of Addison	Private	68	An old-growth remnant of the
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	T11N, R19E Sections 15, 21, 22, 27	Girl Scouts of Milwaukee Area,	404	A large area surrounding Silver-

Number on Map 5	Area Name	Classification Code <sup>a</sup>	Location	Ownership	Size (acres)	Description and Comments
		(RSH)	Town of West Bend	Inc., Washington County, Cedar Lakes Conservation Foundation, and other private		
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 sur-
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 include 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 black 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
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 sup-
35	North Branch Woods	NA-2	T12N, R20E Section 25 Town of Farmington	Private	96	Good-quality wooded tract border-
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
37	Hults Bog and Marsh	NA-3	T9N, R18E Sections 3, 10 Town of Erin	Private	14	Small, moderate-quality sphag-
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

Number on Map 5	Area Name	Classification Code <sup>a</sup>	Location	Ownership	Size (acres)	Description and Comments
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 com-
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-
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 com-
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
50	Hoelz Swamp	NA-3	T9N, R20E Sections 10, 11, 14, 15 Village of Germantown	Private	109	A moderate-quality lowland hard-
51	Lake Park Swamp	NA-3	T9N, R20E Sections 21, 22 Village of Germantown	Village of Germantown and private	54	A disturbed silver maple-domi-
52	Schoessow Woods	NA-3 (RSH)	T9N, R20E Section 24 Village of Germantown	Private	51	A relatively small but good-quality
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. Because of 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

Number on Map 5	Area Name	Classification Code <sup>a</sup>	Location	Ownership	Size (acres)	Description and Comments
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 moraine 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 are 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
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 calcare-
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 interlobate 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

Number on Map 5	Area Name	Classification Code <sup>a</sup>	Location	Ownership	Size (acres)	Description and Comments
						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
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
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 border-
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,
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 sleep 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	Washington	28	Mature dry-mesic hardwoods dominated by sugar maple, red oak,

Number on Map 5	Area Name	Classification Code <sup>a</sup>	Location	Ownership	Size (acres)	Description and Comments
			Town of Farmington			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 undevel-
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

<sup>a</sup>NA-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

Source: Wisconsin Department of Natural Resources and SEWRPC.



**Table 9**  
**CRITICAL SPECIES HABITAT SITES LOCATED**  
**OUTSIDE NATURAL AREAS IN WASHINGTON COUNTY: 1994**

Number on Map 6	Site Name and Classification Code <sup>a</sup>	Location	Site Area (acres)	Ownership	Species of Concern <sup>b</sup>
1	Jackson Woods (CSH-P)	T10N, R20E,	24	Village of Jackson	American gromwell ( <i>Lithospermum latifolium</i> ) (R)
2	St. Anthony Maple Woods	T11N, R18E,	90	Private	American gromwell ( <i>Lithospermum latifolium</i> ) (R)
3	Doll Woods (CSH-P)	T11N, R18E,	22	Private	American gromwell ( <i>Lithospermum latifolium</i> ) (R)
4	Riesch Woods (CSH-P)	T11N, R19E,	34	Private	American gromwell ( <i>Lithospermum latifolium</i> ) (R)
5	Silver Lake Swamp (CSH-P)	T11N, R19E,	10	Private	Showy lady's slipper ( <i>Cypripedium reginae</i> ) (R)
6	Cameron Property (CSH-P)	T11N, R20E,	12	Private	Small yellow lady's slipper
7	Fechters Woods (CSH-P)	T11N, R20E,	6	Private	Golden seal ( <i>Hydrastis canadensis</i> ) (R)
8	High School Woods (CSH-P)	T11N, R19E,	7	West Bend School District	Ginseng ( <i>Panax quinquefolius</i> ) (R)
9	Unnamed Wetland (CSH-B)	T10N, R18E,	17	Private	Black tern (R) (Colony)
10	Unnamed Wetland (CSH-B)	T10N, R18E,	40	Private	Black tern (R) (Colony)
11	Silver Lake (CSH-B)	T11N, R19E,	7	Private	Red-shouldered hawk (T)
12	Gilbert Lake (CSH-B)	T11N, R19E,	10 <sup>c</sup>	Private	Black Tern (R) (Colony)
13	Unnamed Wetland (CSH-B)	T12N, R18E,	53	Private	Great egret (T)
Total	--	--	332	--	--

<sup>a</sup>CSH-P identifies a critical plant species habitat site; CSH-B identifies a critical bird species habitat site.

<sup>b</sup>"R" refers to species designated as rare or special concern; "T" refers to species designated as threatened.

<sup>c</sup>About 100 acres of this 110 acre site are within the Gilbert Lake Natural Area.

Source: SEWRPC.

**Table 10**  
**SIGNIFICANT GEOLOGICAL SITES IN WASHINGTON COUNTY: 1994**

Number on Map 7	Site Name and Classification Code <sup>a</sup>	Site Type	Ownership	Site Area (acres)	Location	Description
1	Kettle Moraine Interlobate	Glacial	Department of Natural Resources and private	5,577 <sup>b</sup>	Central portion of County	Interlobate moraine consisting of
2	Friess Lake (Hogsback)	Glacial	Private	25	T9N, R19E Section 19 Town of Richmond	Excellent example of a crevasse
3	Erin Esker (GA-2)	Glacial	Private	192	T9N, R18E Sections 10, 15, 16, 21 Town of Erin	A good example of an esker, easily
4	Myra Esker (GA-2)	Glacial	Private	16	T11N, R20E Sections 15, 16 Town of Trenton	A well-developed, little-disturbed east-west trending esker covered by natural vegetation
5	Kewaskum Kame (GA-2)	Glacial	Private	47	T12N, R19E Section 3 Town of Kewaskum	A well-developed, isolated conical kame which serves as the "gateway" to the Northern Unit of the Kettle Moraine Forest
6	Lac Lawrann Kame and	Glacial	City of West Bend	12	T11N, R19E Section 1 City of West Bend	Good example of kame and esker formation
7	Camp Wowitan Esker	Glacial	YMCA and private	57	T11N, R20E Sections 27, 28 Town of Trenton	Well-developed northeast-
8	Little Menomonee River	Bedrock	Private	10	T9N, R20E Sections 35, 36 Village of Germantown	Silurian Racine Dolomite reef rock exposures. Considerable importance in scientific research. Contains a wide variety of reef features
9	Germantown Roadcut (GA-3)	Bedrock	Wisconsin Department	5	T9N, R20E Section 22 Village of Germantown	Roadcut providing excellent cross-section through Racine Dolomite, revealing fossils and rock types
10	Trenton Quarry and	Bedrock	Private	3	T11N, R20E Section 34 Town of Trenton	Small quarry exposing massive Silurian dolomite. Primitive, relatively undisturbed kilns
11	Kewaskum Quarry and	Bedrock	Private	5	T12N, R19E Section 6 Town of Kewaskum	Old quarry and lime kiln expose dolomite containing abundant brachiopod fossils. Relatively undisturbed lime-burning operation
Total	--	--	--	5,949	--	--

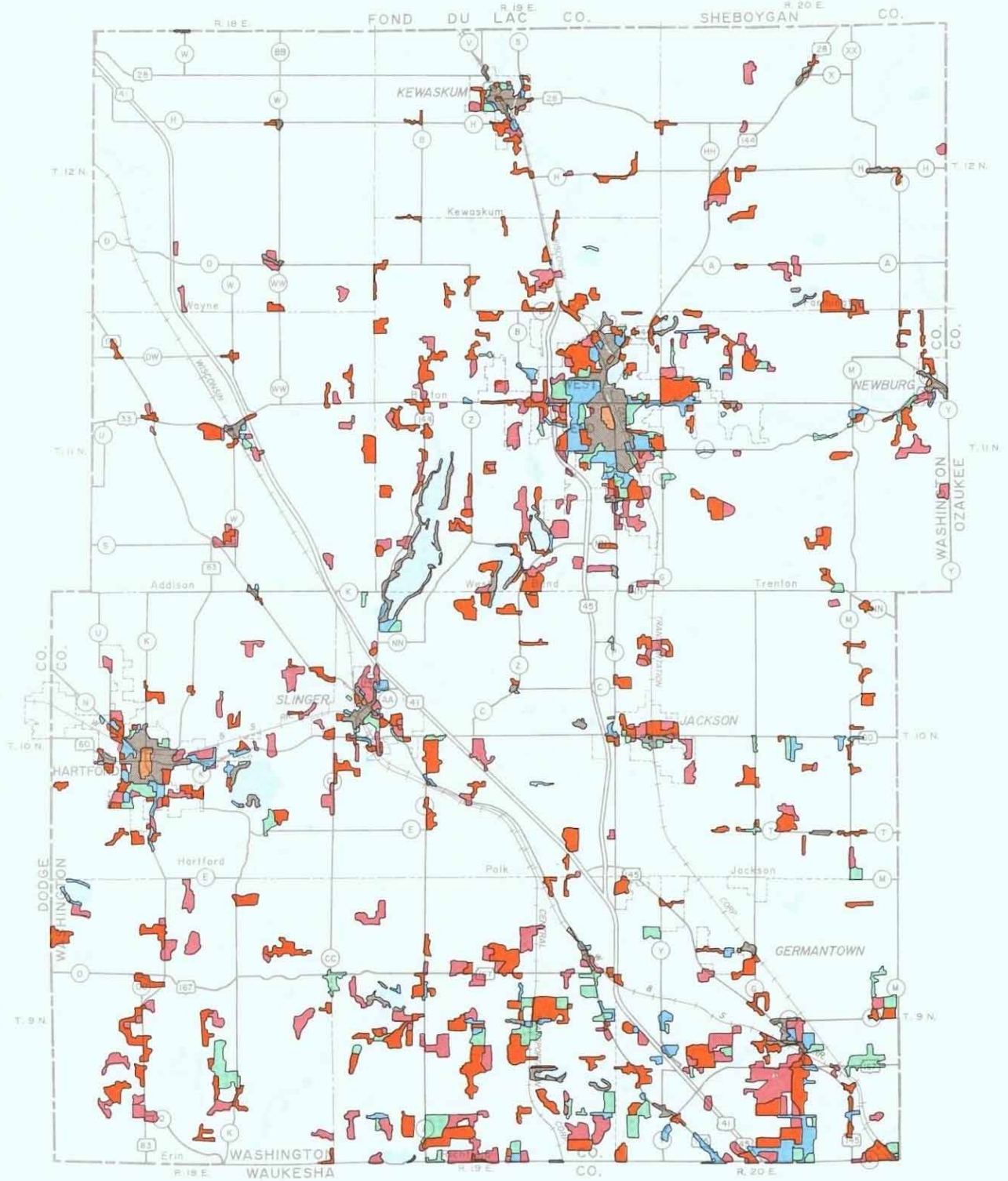
<sup>a</sup>GA-1 identifies Geological Area sites of statewide or greater significance; GA-2 identifies Geological area sites of countywide or regional significance; and GA-3 identifies Geological Area sites of local significance.

<sup>b</sup>Includes the area within the established project boundaries of the Loew Lake and Northern Units of the Kettle Moraine State Forest within Washington County.








Source: Wisconsin Department of Natural Resources, Wisconsin Geological and Natural History Survey, and SEWRPC.

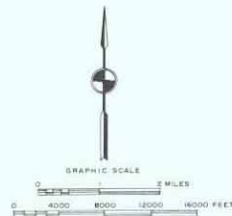
Map 1

URBAN GROWTH IN WASHINGTON COUNTY: SELECTED YEARS, 1900-1990



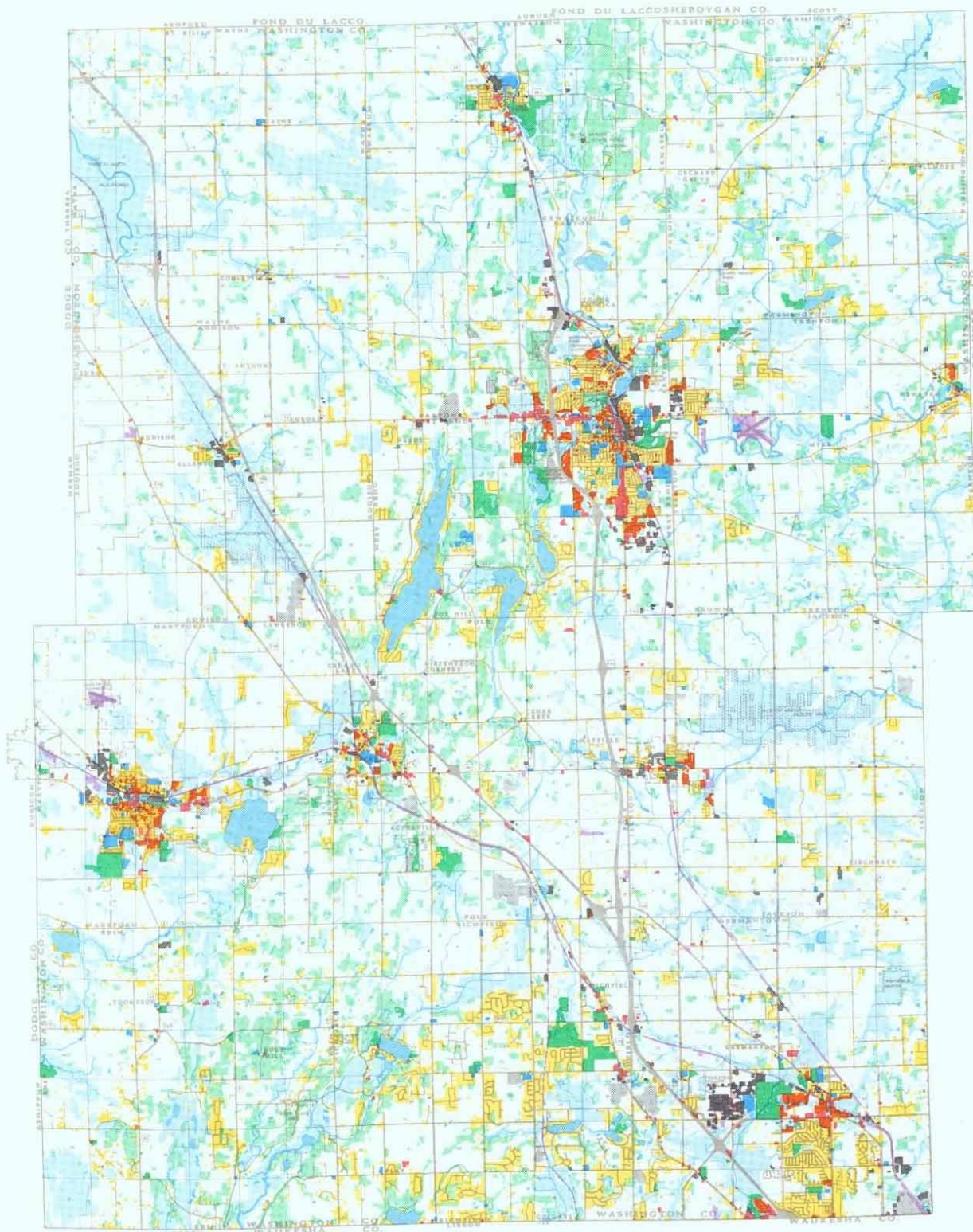
LEGEND

- |   |      |   |               |
|---|------|---|---------------|
|  | 1900 |  | 1980          |
|  | 1950 |  | 1990          |
|  | 1963 |  | SURFACE WATER |
|  | 1970 |   |               |



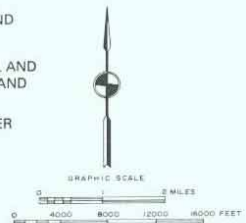
Source: SEWRPC.

LAND USES IN WASHINGTON COUNTY: 1995



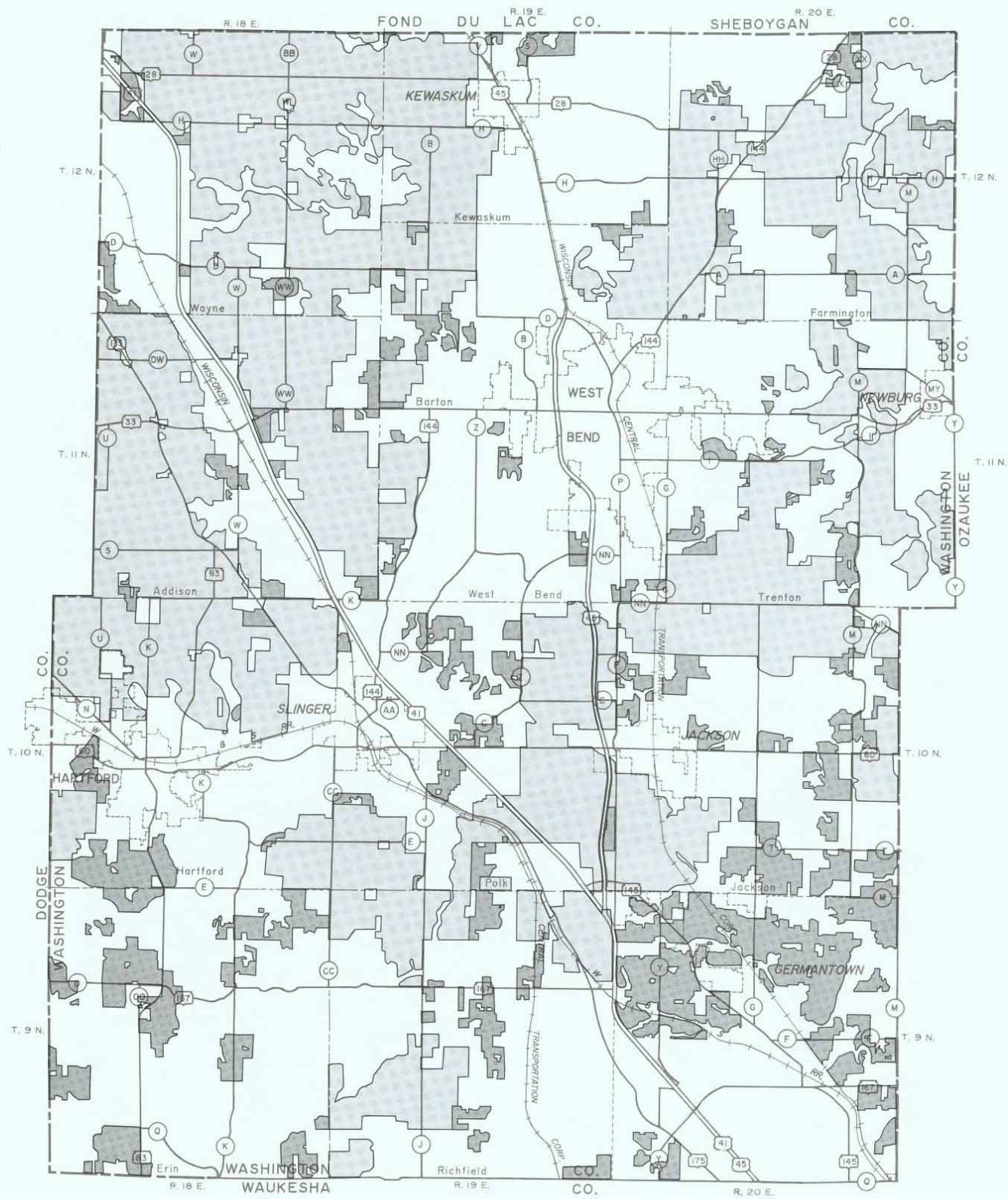
LEGEND

- |  |  |  |
|--|--|--|
|  SINGLE-FAMILY RESIDENTIAL                    |  GOVERNMENTAL AND INSTITUTIONAL |  EXTRACTIVE AND LANDFILL          |
|  MULTI-FAMILY RESIDENTIAL                     |  RECREATIONAL                   |  AGRICULTURAL AND OTHER OPEN LAND |
|  RETAIL AND SERVICE                           |  STREETS AND HIGHWAYS           |  SURFACE WATER                    |
|  MANUFACTURING, WHOLESALE, AND STORAGE        |  WETLANDS                       |  |
|  TRANSPORTATION, COMMUNICATION, AND UTILITIES |  WOODLANDS                      |  |



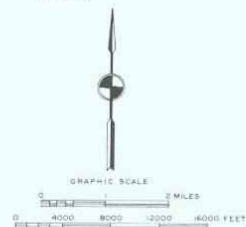
Source: SEWRPC.

**COMPARISON OF THE LOCATION AND EXTENT OF PRIMARY FARMLAND ENVISIONED UNDER THE WASHINGTON COUNTY FARMLAND PRESERVATION PLAN AND PRIME AGRICULTURAL LANDS ENVISIONED UNDER THE 2010 REGIONAL LAND USE PLAN**



**LEGEND**

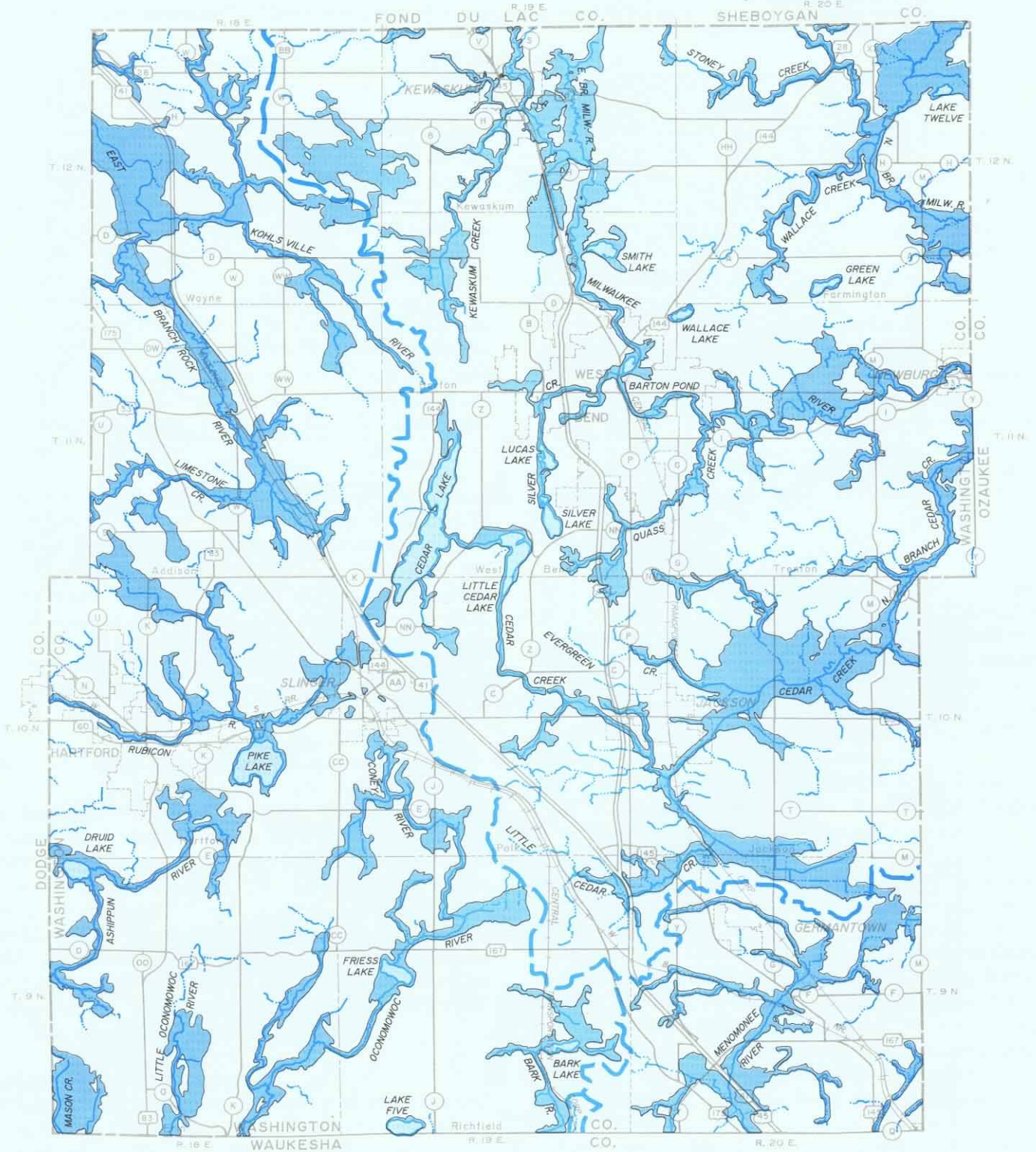
- PRIMARY FARMLAND UNDER THE WASHINGTON COUNTY FARMLAND PRESERVATION PLAN
- PRIME AGRICULTURAL LAND UNDER THE 2010 REGIONAL LAND USE PLAN








Source: Washington County and SEWRPC.

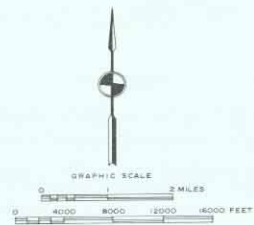
Map 4

SURFACE DRAINAGE AND FLOODLANDS IN WASHINGTON COUNTY



LEGEND

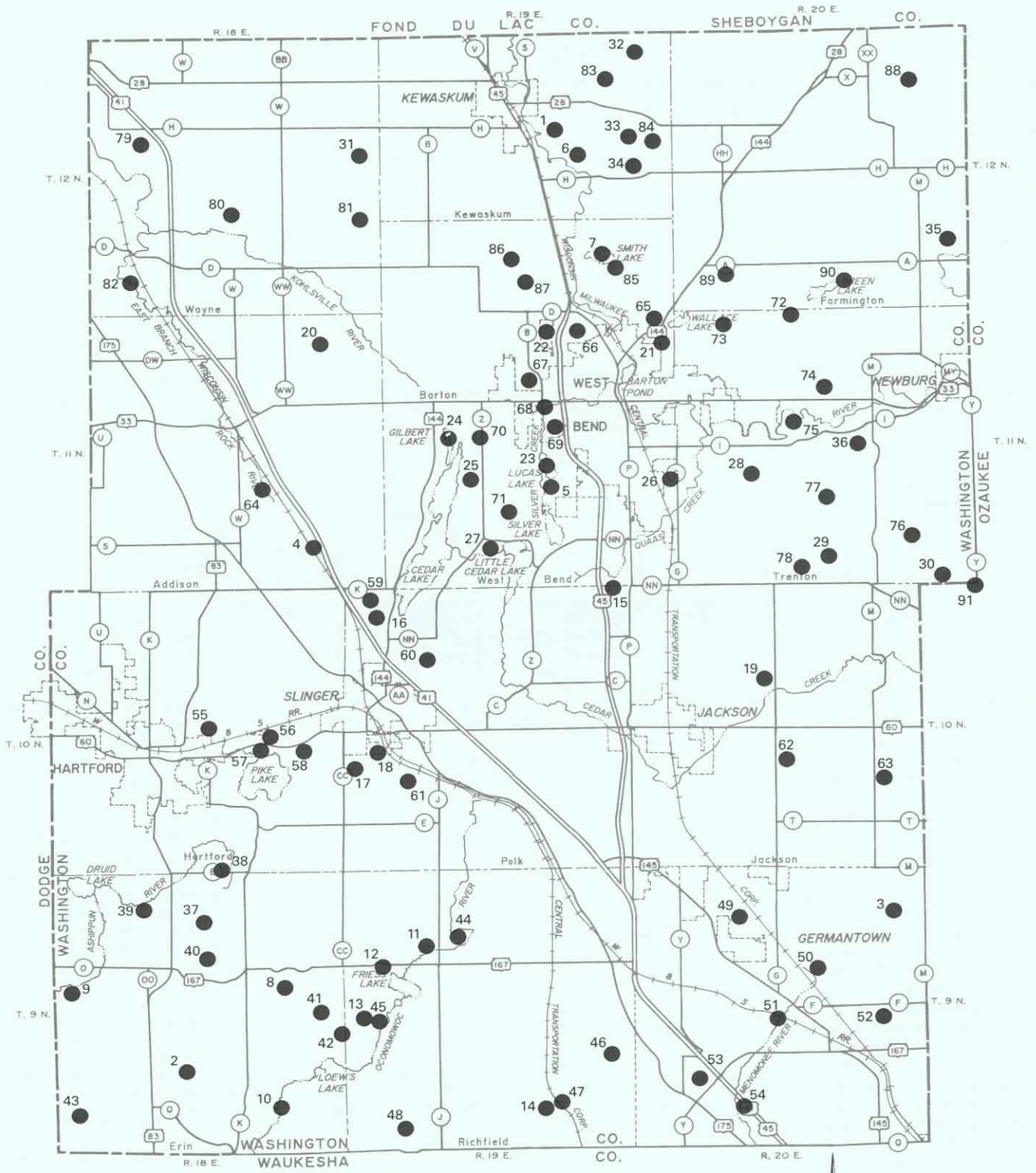
-  WATERSHED BOUNDARY
-  PERENNIAL STREAM
-  INTERMITTENT STREAM
-  MAJOR LAKES
-  100-YEAR RECURRENCE INTERVAL FLOODPLAIN



Source: Federal Emergency Management Agency and SEWRPC.

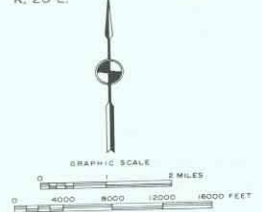
Map 5

LOCATION OF NATURAL AREA SITES IN WASHINGTON COUNTY: 1994



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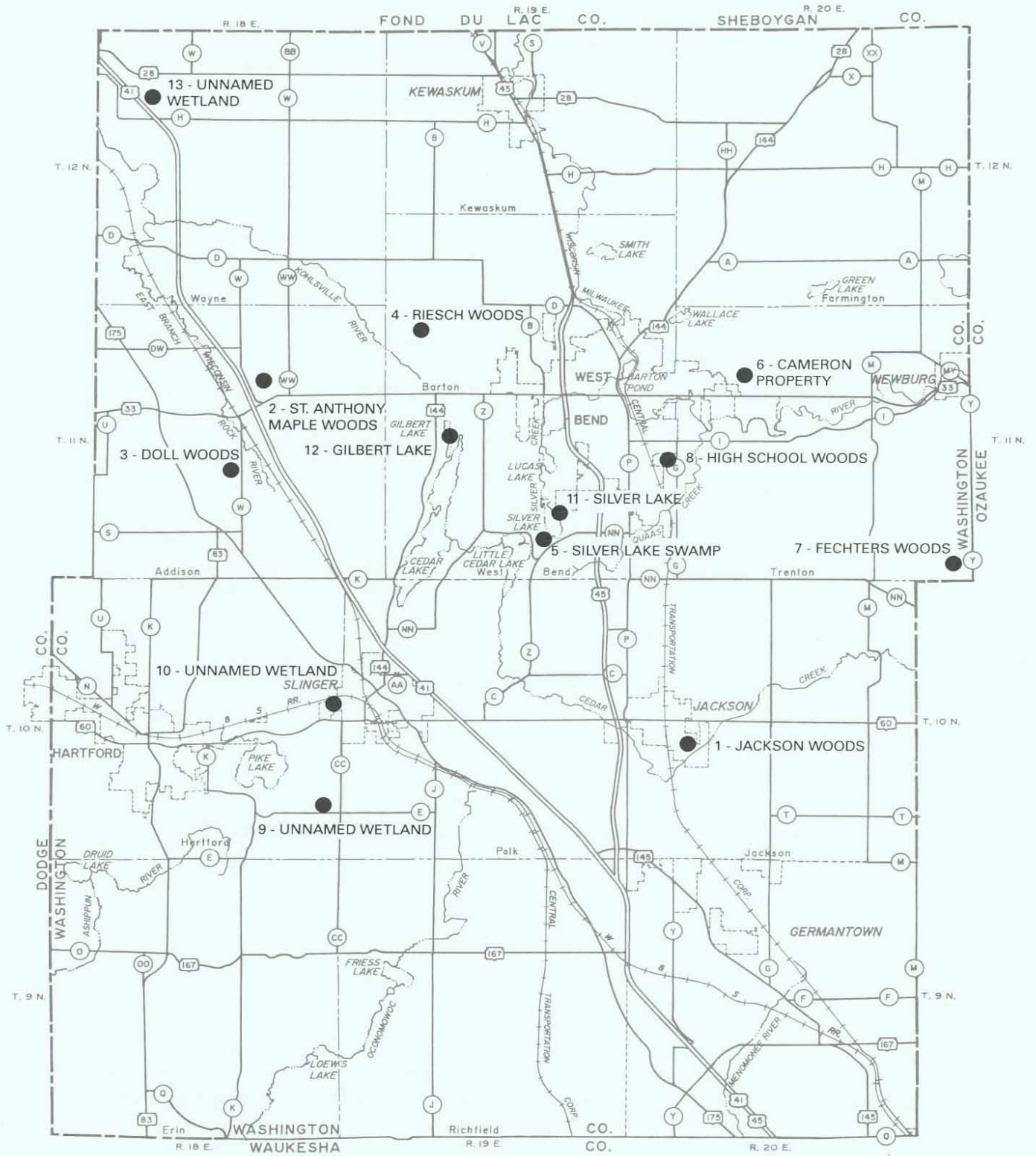
- NATURAL AREA SITE
- 91 REFERENCE NUMBER (SEE TABLE 8)



Source: Wisconsin Department of Natural Resources and SEWRPC.

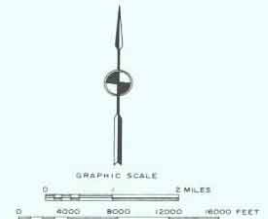
Map 6

CRITICAL SPECIES HABITAT SITES LOCATED  
OUTSIDE NATURAL AREAS IN WASHINGTON COUNTY: 1994



LEGEND

- CRITICAL SPECIES HABITAT SITE
- 13 REFERENCE NUMBER (SEE TABLE 9)

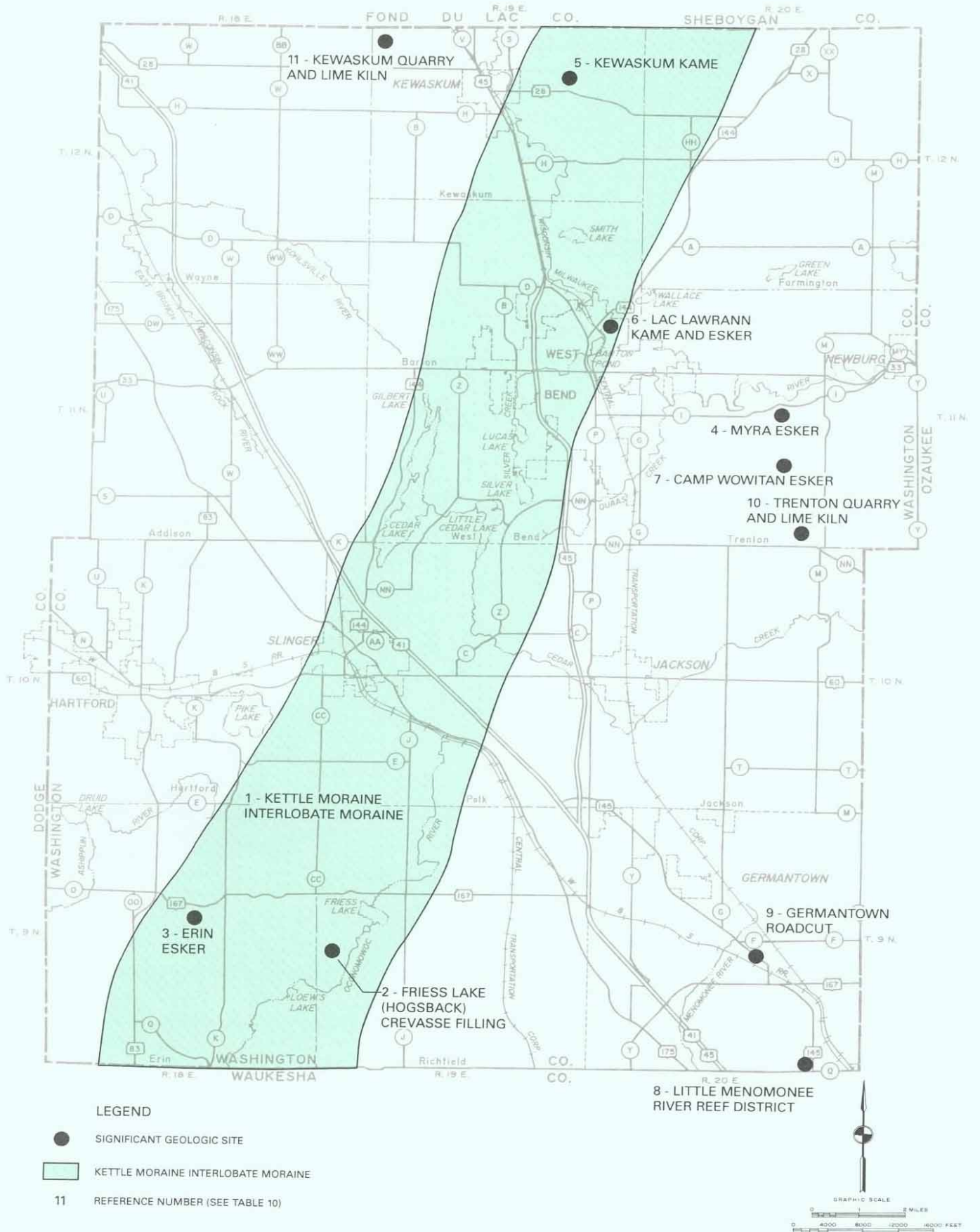


Source: SEWRPC.



Map 7

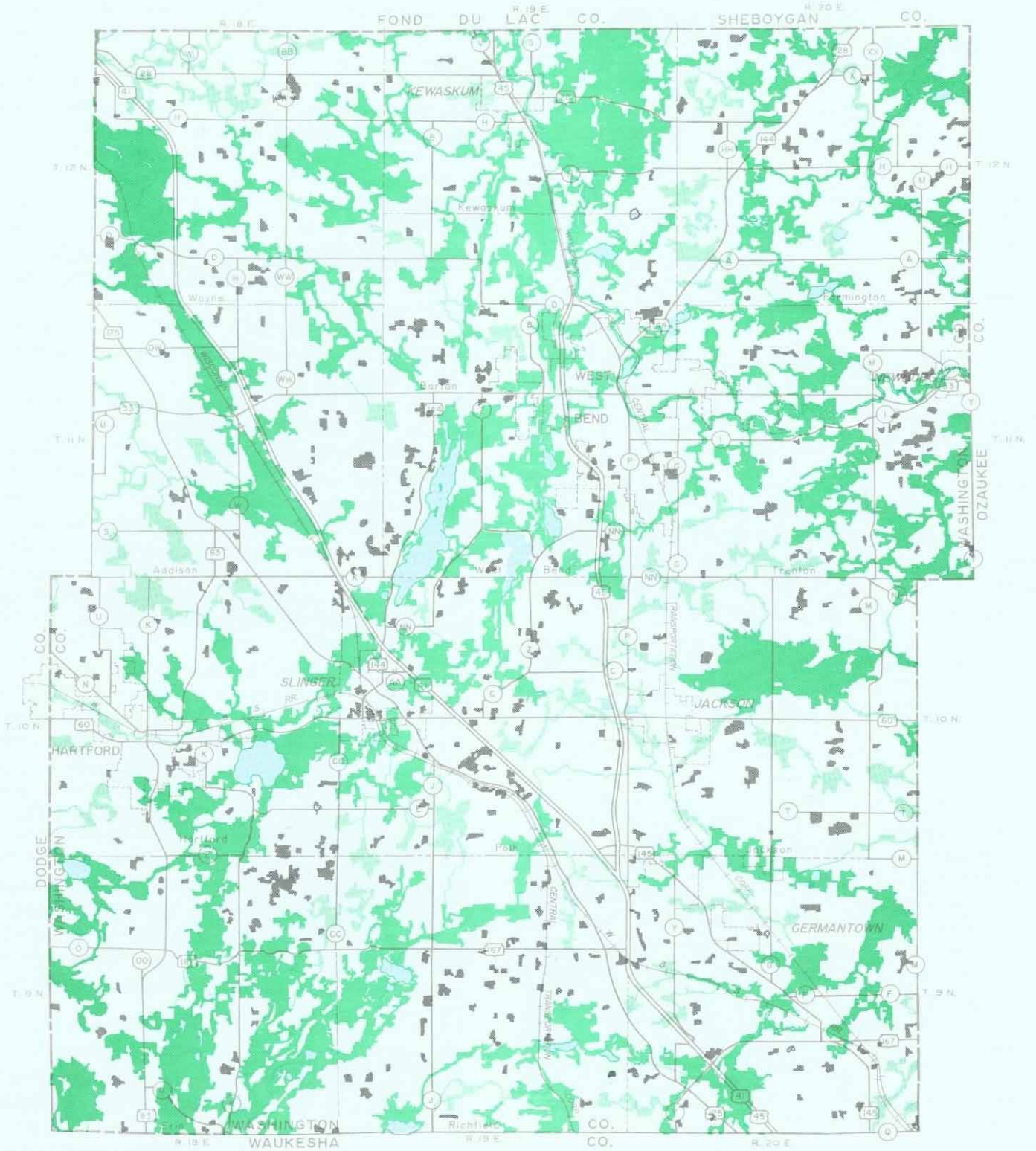
SIGNIFICANT GEOLOGICAL SITES IN WASHINGTON COUNTY: 1994



Source: Wisconsin Department of Natural Resources, Wisconsin Geological and Natural History Survey, and SEWRPC.

Map 8

ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS IN WASHINGTON COUNTY: 1990



LEGEND

- PRIMARY ENVIRONMENTAL CORRIDOR
- SECONDARY ENVIRONMENTAL CORRIDOR
- ISOLATED NATURAL RESOURCE AREA
- SURFACE WATER



Source: SEWRPC.