

Trempealeau River delta

# Chapter 5

## Statewide Needs and Resources

*The previous chapter described specific, named Legacy Places (arranged by ecological landscape) believed to be critical to meet Wisconsin’s conservation and recreation needs over the next fifty years. In addition to these places there are potentially others that will also be critical to meet future needs, but which are difficult to specifically identify for a number of reasons. Reasons why these “statewide needs and resources” do not fit well in the preceding chapter include:*

- » Some resources are scattered throughout the state and are more appropriately evaluated as a resource type rather than by ecological landscape. Wetlands are an example of this type of resource.
- » Some important places are small and widely distributed around the state. High quality natural areas (e.g., prairie remnants, old growth forests, pine barrens, oak savannas, and others) are an example.
- » Some resources occur in several locations; which of these are most appropriate to protect will likely be more dependent upon factors such as future threat and opportunity. Large working forests are an example of this type of resource.
- » Some needs could be met at a variety of sites. Identifying appropriate places to meet these needs will be more a function of location and public demand and acceptance, rather than natural resource attributes. Identifying places in close proximity to urban centers to meet growing recreation demands is an example of this type of need.

- » Some needs and resources are not well enough understood to identify the most appropriate places to try to protect. Groundwater recharge areas are examples of such a resource type.
- » Some species have habitat requirements that are geographically diffuse or the needed habitat is not continually stable from year to year (e.g., mudflats and ephemeral wetlands, which are critical to meet the needs of migratory shorebird as stopover sites, can change over time depending on seasonal weather conditions).  
To be sure, many of the specific Legacy Places previously described address some of these statewide needs and resources. Yet, there will likely be other places worthy of protection that are not captured in the 229 named Legacy Places. What follows is a brief description, arranged alphabetically, of needs and resources that occur either scattered throughout the state or where flexibility exists in where protection efforts may best be focused. No doubt, over the next fifty years, this list of statewide needs and resources will evolve.

### Statewide needs and resources

- A. Groundwater recharge areas and places impacting public water supplies
- B. Lakes and undeveloped shoreline
- C. Large working forests
- D. Prairies and savannas
- E. Recreation areas
- F. Scattered natural areas
- G. Trails
- H. Wetlands

Examples of municipalities with known vulnerable aquifers or recharge areas:

Beloit  
Chippewa Falls  
East Troy  
Eau Claire  
Hudson  
Janesville  
La Crosse  
Merrill  
Mosinee  
Plover  
Rhinelanders  
Spooner  
Sturgeon Bay  
Wausau  
Whiting

Examples of municipalities using surface sources for drinking water:

Appleton  
Ashland  
Cudahy  
Green Bay  
Kenosha  
Manitowoc  
Marinette  
Menasha  
Milwaukee  
Neenah  
Oak Creek  
Oshkosh  
Port Washington  
Racine  
Sheboygan  
South Milwaukee  
Superior

## A. Groundwater recharge areas and places impacting public water supplies

Water we use in our daily lives comes from two sources: either from surface waters or from groundwater aquifers. Nearly all rural residents have individual wells that draw groundwater to provide for their needs. Most of Wisconsin's large urban centers use surface sources for drinking water (Lakes Michigan, Superior, and Winnebago account for almost all of this use). Major cities drawing from surface waters are listed at left. Madison and several other cities in the state draw groundwater to provide drinking water.

Of course, all areas of the state play some role in the quality and quantity of water in our streams, rivers, lakes and underground aquifers. As the dominant land uses in the state, forests and farmlands play a critical role in supplying surface and groundwater. Some sites, however, have a significantly greater influence than others on the water that ends up in our surface and groundwater. For example, underground aquifers can be thought of as enormous sponges encased in a jumble of impermeable layers. In places with very sandy or rocky soils, water on the surface can enter underground aquifers quickly; in other places, impermeable clay soils can prevent the precipitation from ever entering the groundwater. Water flows within these "groundwater sponges" as well, moving horizontally and vertically in response to water draining into and flowing out (or being pumped out).

Contaminants can enter groundwater and affect drinking water supplies years before the source of contamination is identified. Thus, finding and mapping where groundwater recharge areas are located is a high priority for the Department and local units of government, particularly those recharge areas that are most significant in replenishing groundwater used in public water supplies. Wisconsin's Wellhead Protection and Source Water Assessment Programs have delineated most of the recharge areas that contribute water to public drinking water wells. The shape and size of these areas depend on well construction, hydrogeologic setting, and amount of water

pumped and can range in size from a few city blocks to several square miles. Many communities attempt to protect all or part of these areas by managing potential sources of contamination, particularly parts of the recharge areas nearest public wells. When recharge areas extend beyond a community's jurisdiction, it is far more difficult to coordinate and implement adequate protection measures.

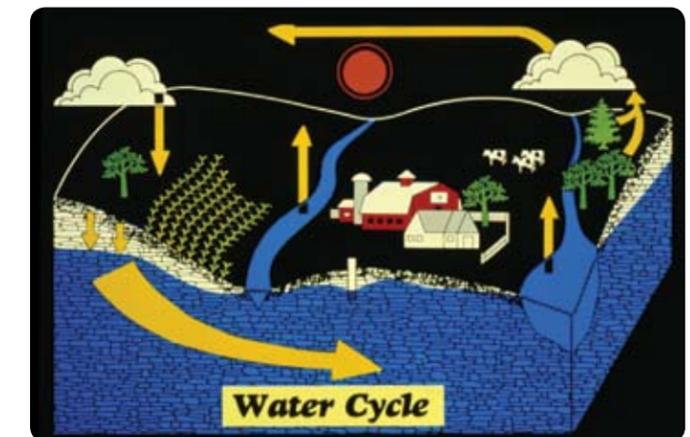
Urban centers using Lakes Michigan, Superior, and Winnebago for public water supplies typically draw water from intake pipes that are placed off shore. As a result, rivers and streams that drain into these lakes near intake pipes likely have a significant, if not the most significant, impact on the quality of these communities' public water supply. Efforts to maintain and improve the quality of these surface waters, through continued emphasis on reducing point-source discharges and non-point pollution, could significantly reduce costs associated with treating public water supplies as well as reduce health risks in the event of a failure in the treatment process. "Point" sources are those that originate from a single location such as an effluent pipe; "non-point" sources are diffuse and primarily result from runoff from urban streets, construction sites, and farm fields. As with groundwater, some lands within a watershed have a greater influence than others on surface water quality. Lands immediately adjacent to surface waters can significantly impact their water quality. Buffer strips along streams, rivers and lakes can dramatically improve water quality by reducing the amount of sediments, excess nutrients, and pollution entering surface waters.

Protecting areas that significantly contribute to surface or groundwater used for public water supplies could be an effective way of simultaneously protecting public health and providing a variety of ecological and recreational benefits. Places important in maintaining the quality and quantity of public water supplies will in many (if not most) cases be near large urban centers, a characteristic that meshes well with the desire to provide recreation opportunities close to where residents live. When establishing greenways, open space, or parks within or close to urban centers, added consideration should be given to source water protection and recharge

areas. Additionally, there is an opportunity to combine efforts to maintain large undeveloped rural landscapes for farming and forestry with efforts to protect and maintain groundwater.

Current source water assessment efforts will likely be completed soon and can be used to determine which of these public water systems can benefit most from various protection strategies. Once the assessments are complete, further prioritization can be conducted with input from communities, counties and regional planning commissions.

At left are lists of some municipalities where efforts to protect drinking water sources would provide substantial benefits. These include municipalities relying on aquifers or recharge areas that, based on data currently available, are most vulnerable to contamination and drawdown problems. Also included are municipalities that use surface sources for drinking water and thus would benefit from efforts to improve water quality in nearby streams and rivers flowing into Lakes Michigan, Superior, and Winnebago.



The water cycle

## B. Lakes and undeveloped shoreline

Wisconsin is blessed with an extraordinary number and variety of lakes. Most lakes are in the northern and eastern parts of the state, dotting the path of the glaciers. Although few in number, the largest lakes comprise the vast majority of the state's almost one million acres of lake surface. At the other end of the spectrum are the many small lakes. Of the approximately 15,000 documented lakes in Wisconsin, almost three-quarters are less than 25 acres in size; two-thirds are less than 10 acres. Many of these small lakes occur in concentrated areas coinciding with glacial activity. Vilas and Oneida Counties contain one of the most densely concentrated assemblages of lakes in the world.

Shorelines, in particular, are exceedingly important in maintaining a lake's health and the diversity of its aquatic biota. In their natural state, shorelines are commonly a mix of aquatic and wetland plants including sedges, bulrushes, or cattails, grading into shrubs and trees as one moves up onto dry land. Trees often fall into the water and slowly decompose. Decaying vegetation supports a wide array of insects that in turn are

Figure 121: Number of lakes in each county<sup>1</sup>

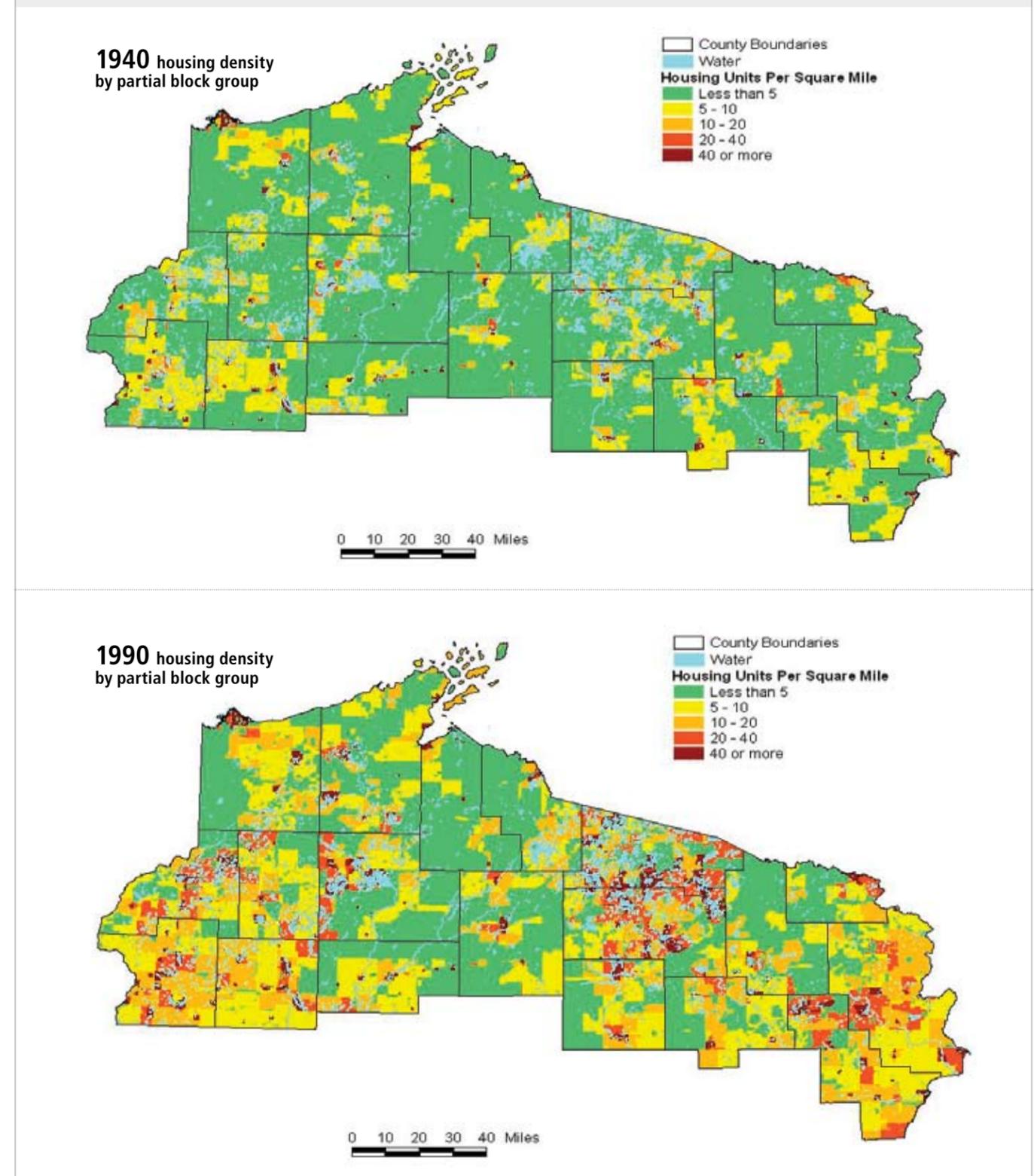


fed on by fish, frogs, and other animals. Many lakes have a variety of substrates along their shores—gravel, sand, and silt—that provide places for fish and frogs to lay eggs and habitat for many insects such as mayflies and dragonflies. Together, this complex environment provides places for northern pike, bluegill, bass, and other fish to spawn, feed, and hide. Loons, ducks, geese, and other water birds nest along banks and feed on aquatic plants and the insects and fish they harbor. Wildlife such as frogs, otters, and mink spend most of their lives along shorelines. Remarkably, eighty percent of the plants and animals on the state's Endangered and Threatened species list spend all or part of their life cycle within the near shore zone and as many as ninety percent of the living things in lakes and rivers are found along their shallow margins and shores.

Lakes have long drawn people to fish, play, boat, and relax on their shores. Studies and surveys repeatedly show that for most people, simply looking out across a body of water is enough to make us feel a sense of contentment. However, reflecting their aesthetic and recreation appeal, most lakes have undergone substantial changes in the last fifty years. Prior to World War II natural shoreline was the norm on Wisconsin's lakes, particularly in the north. Private homes were scarce, crowding meant seeing someone else on the lake, and oars powered boats. Our way of life started to change after World War II; people left farms for the cities and went to college. The number of women working outside the home grew and the idea of owning a little getaway on the water took root. As the demand for lake frontage grew, large plots of land were subdivided.

The maps in *Figure 122* show changes in housing density in northern Wisconsin from 1940 to 1990. In addition to the rapid growth of suburban areas in the southern part of Wisconsin, these maps illustrate the pressure undeveloped lakes and shorelines are under in the northern part of the state. Similar analysis of lakeshores by Department staff shows that since 1965 the number of homes on lakes has doubled and two-thirds of previously undeveloped lakes now have some level of development on their shores. Keyholing, the practice of establishing a relatively narrow shoreline lot that serves as an access point for

Figure 122: Change in housing density across northern Wisconsin, 1940 to 1990<sup>2</sup>

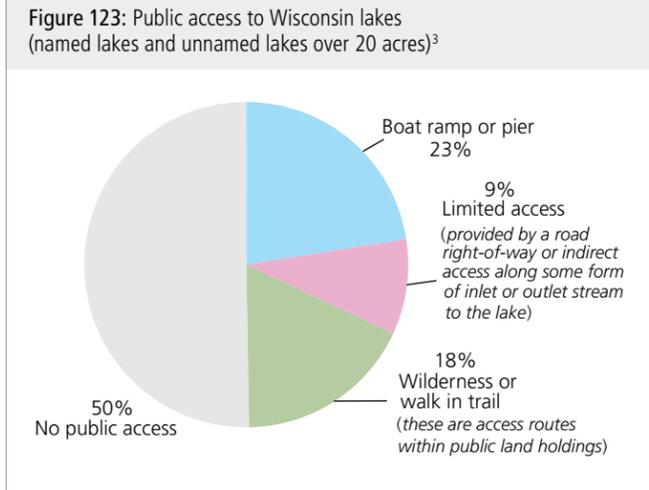




Painted Turtles (*Chrysemys picta*) basking

several “backlots” that do not abut the water, can dramatically increase boating traffic and the clearing of shoreline vegetation. This can lead to a rise in user conflicts and have a detrimental effect on the ecology of the near shore zone. Although a growing number of counties and towns are implementing a variety of measures intended to reduce the adverse impacts that increased shoreline development brings, it appears likely that development pressures on and near lakes will continue to escalate.

Shorelines are often dramatically altered when cabins and houses are built. Many property owners “fix up” the shoreline by removing down trees, cutting back shrubs, and establishing grass lawns down to the water’s edge. Some bring in sand to create swimming beaches. In so doing, landowners, often unwittingly, destroy the very environment that drew them to lake front property in the first place. Mowed lawns send rain runoff carrying fertilizers, pet waste, and lawn clippings into the water where they fuel algae blooms that make swimming less enjoyable. Without a buffer of native aquatic plants, waves erode away the shore. Songbirds that had nested in shrubs and trees along the shore are replaced by geese, which are attracted to manicured lawns and leave behind substantial quantities of droppings. Sand dumped into the lakes can cover gravel spawning beds and silty areas that harbor all stages of insect life. Bit by bit, as lakefront lots are developed and subsequently altered, the cumulative impact results in lower fish numbers, reduced water clarity, and an often dramatic loss in the biological diversity that the lake and its surroundings support.



In response to this land use pressure, and in recognition of the conservation and recreation values of lakes, the state established a requirement for zoning areas near the shoreline and county shoreland zoning ordinances have been adopted. Lake classification systems are also being established in most of the northern counties to help ensure that development and recreation levels are compatible with each lake’s ability to support them. Lake classification may be a tool that can assist in remedying frustration and disappointment over conflicting water uses. Although these efforts have resulted in some protection, considerable work lies ahead if remaining undeveloped and lightly developed lakes are to remain in their natural state.

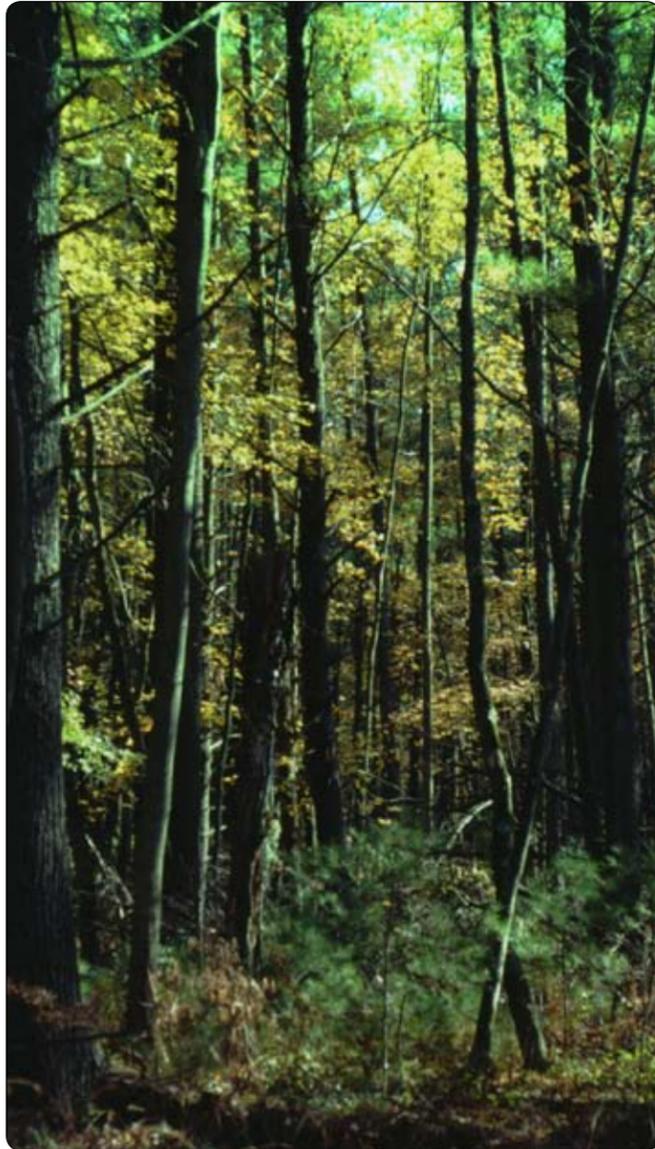
Although protection efforts that do not rely on acquisition of land rights will likely be increasingly important in protecting lakes and their water quality, public access to lakes and along lake shorelines is another concern for many people. Currently, half of the named lakes and unnamed lakes over 20 acres have some form of public access. A far smaller percentage of lakes have places where people can get out of boats, stretch their legs, and explore the shoreline. As such, there is considerable interest in protecting through some form of acquisition these remaining undeveloped, “wild” lakes as well as significant stretches of undeveloped shoreline, not only to maintain critical fish and wildlife habitat, but also to provide opportunities for the general public to use and enjoy them.

Lake name	County	Notable features	Potential needs and opportunities
Big Green Lake	Green Lake	Wisconsin’s deepest natural lake with a maximum depth of 236 feet and mean of 104 feet. Its size combined with excellent water quality and clarity make it one of Wisconsin’s outstanding water resources. The presence of cold water habitat offers opportunities for lake trout management .	Control of nutrients and sediment from its large watershed (57,000 acres). Silver Creek is the main tributary. Eight small streams also drain into the lake.
Trout Lake	Vilas	Approximately 80% of the shoreline is held in public conservation land. Trout Lake is one of a handful of lakes over 100 feet deep and is one of only two lakes with naturally reproducing lake trout populations.	Continued protection of one of Wisconsin’s aquatic gems. Prevent future introductions of exotics. Restoration of lake trout population.
Lake Mendota	Dane	One of the most studied lakes in the world, the head of the Yahara Lake Chain graces Wisconsin’s capital. The lake supports a diverse aquatic community and receives very high recreational use. The lake has good water quality given the degree of urban and agricultural use in its large watershed.	Control of nutrients and sediment, from both urban and rural areas of its large watershed. Rehabilitation of adjacent wetlands. Management of water levels to restore adjacent marshes.
Lulu Lake	Walworth	Lulu Lake, a 95-acre, 40-foot deep, hard-water drainage lake, is situated in the abruptly rolling topography of the interlobate moraine of southeastern Wisconsin. The lake water is clear and supports excellent plant and animal communities. Much of the shore is sedge meadow. An outlet stream flows through sedge meadow to Eagle Spring Lake. East of the lake is a small bog surrounded by tamarack forest with a good complement of northern bog species.	Management of boating activity and recreational use. Management of Eagle Spring Lake, immediately downstream, can influence the fish and plant communities.
Whitefish Lake	Douglas	An example of outstanding water quality and excellent nearshore habitat along undeveloped portions of the lake.	Protection and restoration of nearshore habitat along developed shorelines.
Waupaca Chain of Lakes	Waupaca	Marl lakes that maintain their water clarity despite exceptionally intensive recreation use.	Protection and restoration of near-shore habitat on highly developed lakes. Management of motorboat activity.

Given the sensitive nature of undeveloped or lightly developed lakes, specific lakes that may be of highest conservation and recreation significance are not listed here.

Wild, undeveloped lakes, however, are not the only ones worthy of conservation and protection efforts. As stated before, each lake is unique with its own set of needs and opportunities. Many lakes with housing along their shore, even substantially developed ones, have ecological and environmental value. And, of course, nearly all large, developed lakes are heavily used for a variety of recreation activities including swimming, boating, fishing,

sailing, and water-skiing. For lakes that are extensively developed, there are often many opportunities to address conservation and recreation needs, ranging from efforts to improve water quality to restoring aquatic habitats and species to controlling exotic species. The table above lists some examples of lakes with high conservation and recreation values and some potential needs and opportunities. This list is not meant to be comprehensive, but rather is intended to give readers an indication of the variety of lakes that harbor important conservation and recreation values.



Wisconsin woodlands

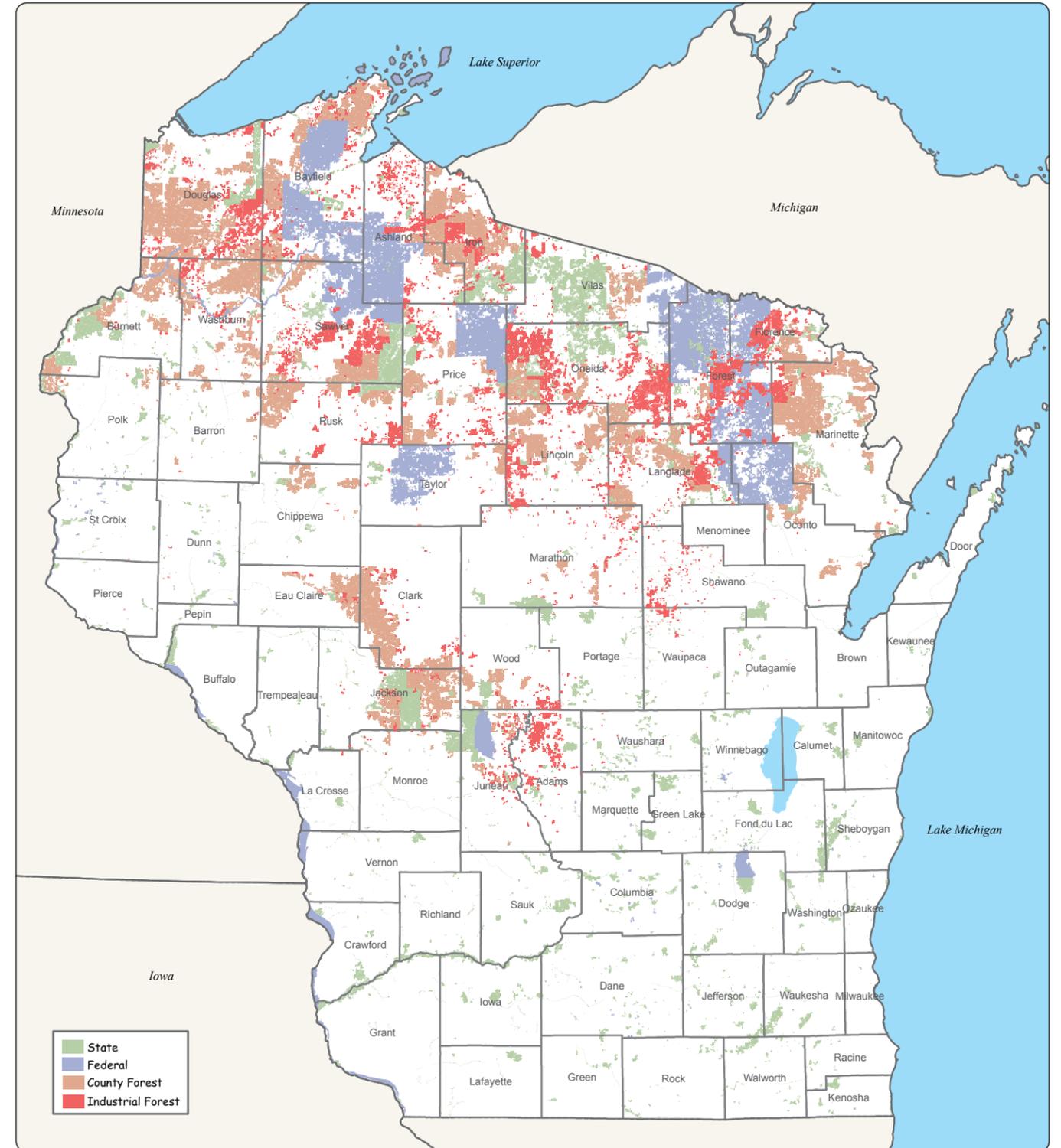
### C. Large working forests

Wisconsin's forests have played a leading role in shaping our state's history and culture. From Native Americans' hunting and gathering of plentiful forest resources, to the Cutover period of the early 1900s, to the current expansion of our forests, Wisconsin's woodlands have influenced how the people of the state view natural resources and approach land stewardship, both to meet our needs and those of future generations. Although most of Wisconsin's approximately 16 million acres of forest land is owned by private individuals, usually in relatively small parcels, a significant amount is owned in large tracts by industrial forest companies and other private corporations (including utilities). These lands, referred to here as "large working forests," are primarily managed to provide pulpwood and sawtimber for local mills and are a critical component of Wisconsin's forest-based economy. Although many owners of these large tracts seek to maximize their economic returns over time, some others, notably utilities, do not need to (or choose not to) focus as much on yearly timber sales. As a result, they have more latitude in their approach to management. These owners are able to more fully incorporate other issues into their long-range plans, including wildlife habitat, recreation opportunities, aesthetics, cultural resources, and water quality. Almost all of these privately-owned, large working forests are located in the central and northern parts of the state.

These working forests have several characteristics that make them well suited to provide conservation and recreation benefits. Maybe most importantly, these forests are typically held in very large blocks, in some cases tens of thousands of acres, with little fragmentation in ownership. As has been mentioned previously, large blocks of land can accommodate certain ecological functions and recreation activities that are simply not possible on smaller tracts.

Often these lands are adjacent to or very near large public properties and as such help buffer and connect county, state, and national parks, forests, and wildlife areas. The importance of buffering and connecting public lands has received increasing attention as they have become increasingly surrounded by various types of development. Even in cases where the working

Figure 124: Industrial forest and public conservation lands in Wisconsin<sup>4</sup>





Harvesting trees

forests are managed for successional stages that are significantly different from adjoining public lands, they still provide substantial buffering and connecting benefits because the lands are relatively undeveloped. Lastly, pockets of old growth forests, high quality wetlands, and undeveloped lakes are scattered through many of these forests.

The majority of these large working forests are enrolled in one of two state forestry programs, often referred to as the “forest tax programs.” These tax deferral programs were born out of a recognition that sustainably managing forests is a long term commitment. Unlike row crops that produce a marketable product each year, owners of forest land must wait decades to harvest trees to generate income. In response to this situation, the forest tax programs are structured to reduce the annual holding costs of these lands thereby encouraging management practices that focus on long term sustainability. Landowners that elect to enroll in the programs get a significant reduction in their annual property taxes in return for practicing sound forestry management over a 25- or 50-year contract period and paying a percent of the value realized when the trees are harvested. Small private landowners can also enroll in this program.

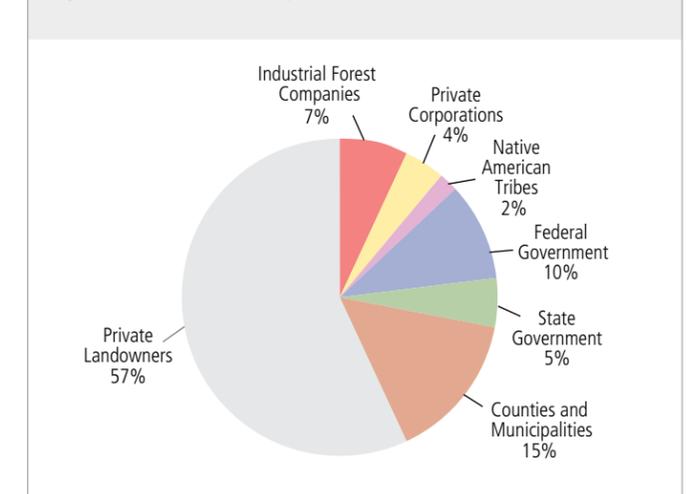
Currently, just over one million acres of large working forest land are enrolled in these programs, known as the “Forest Crop Law” and the “Managed Forest Law,” and are open to the public for hunting and fishing. About three-quarters of these FCL and MFL lands are also open for hiking, skiing, and sightseeing. As a result, these large land holdings are popular recreation destinations and are often an integral component of the local tourist industry.

Since these “forest tax programs” began in the 1930s, enrolled lands have been bought and sold as companies’ business strategies have changed. Although some lands were withdrawn from the program in the past, most were re-enrolled when the 25- or 50-year contract expired. However, these large working forests are now undergoing rapid ownership changes and a significant number of acres are being withdrawn from the programs. Over 90% of the industrial forest lands have been sold in the last few years. In some cases, these lands have shifted from one forest products company to another or to private individuals that have maintained active

forest management. In other cases, the lands have been sold to development companies that have withdrawn them from the program and subdivided the property into small lots.

There are a variety of factors driving these sales and withdrawals, but an important ingredient is the economic return that companies can reap by selling prime development parcels. Although a penalty is imposed for withdrawing lands before the end of the 25- or 50-year FCL or MFL contract, given the rapid increase in land prices (particularly housing sites along lakes and rivers), it appears not to be a sufficient deterrent in many cases. As the economics of the forest industry have changed over the past decade, the financial incentives currently offered may not prevent these large working forests from being fragmented and developed. One solution that has emerged is the federal Forest Legacy program. Wisconsin is participating in this program through which owners of large forest blocks voluntarily sell the development rights from their lands while continuing to own the underlying title. The program allows these lands to be managed for forest products following best management practices, helps maintain local forest-based industries, keeps the lands open for some recreation uses, and helps keep these forests in large blocks.

Figure 125: Forest ownership in Wisconsin<sup>5</sup>



## D. Prairies and savannas

With the uplifting of the Rocky Mountains millions of years ago came an enormous rain shadow that led to the formation of the mid-continental grasslands. Few trees could survive the harsh conditions (parched summers and frigid winters) that blanketed the Plains. In the area that would become Wisconsin, the drying effects of the Rockies gave way to the mixing of warm, moist air rising from the south and cool winds from the north. Here, the vast prairies that dominated lands to the west and south were able to establish only periodic footholds as major climatic changes washed in and out of the state. Prairies made their most recent incursion into the southern and western part of what is now Wisconsin approximately five to six thousand years ago.

As a result of being located at the junction of this “climatic mixing zone,” large portions of the state also harbored the natural communities forming the transition from open grassland to forest. Savannas were the communities in the middle of this continuum and depending on soil, topography, climate, fire frequency and intensity, and other factors, they were a shifting mosaic of sun-loving to shade tolerant species. Open-grown trees, with their thick bark resistant to the effects of the fires sweeping through the grasses and forbs, were scattered at varying densities. In *The Vegetation of Wisconsin*, Curtis divided these savanna-like areas into four categories: oak openings, oak barrens, pine barrens, and cedar glades. Because of the importance of several species of oaks in these communities, they are often collectively referred to as the “oak savannas.”

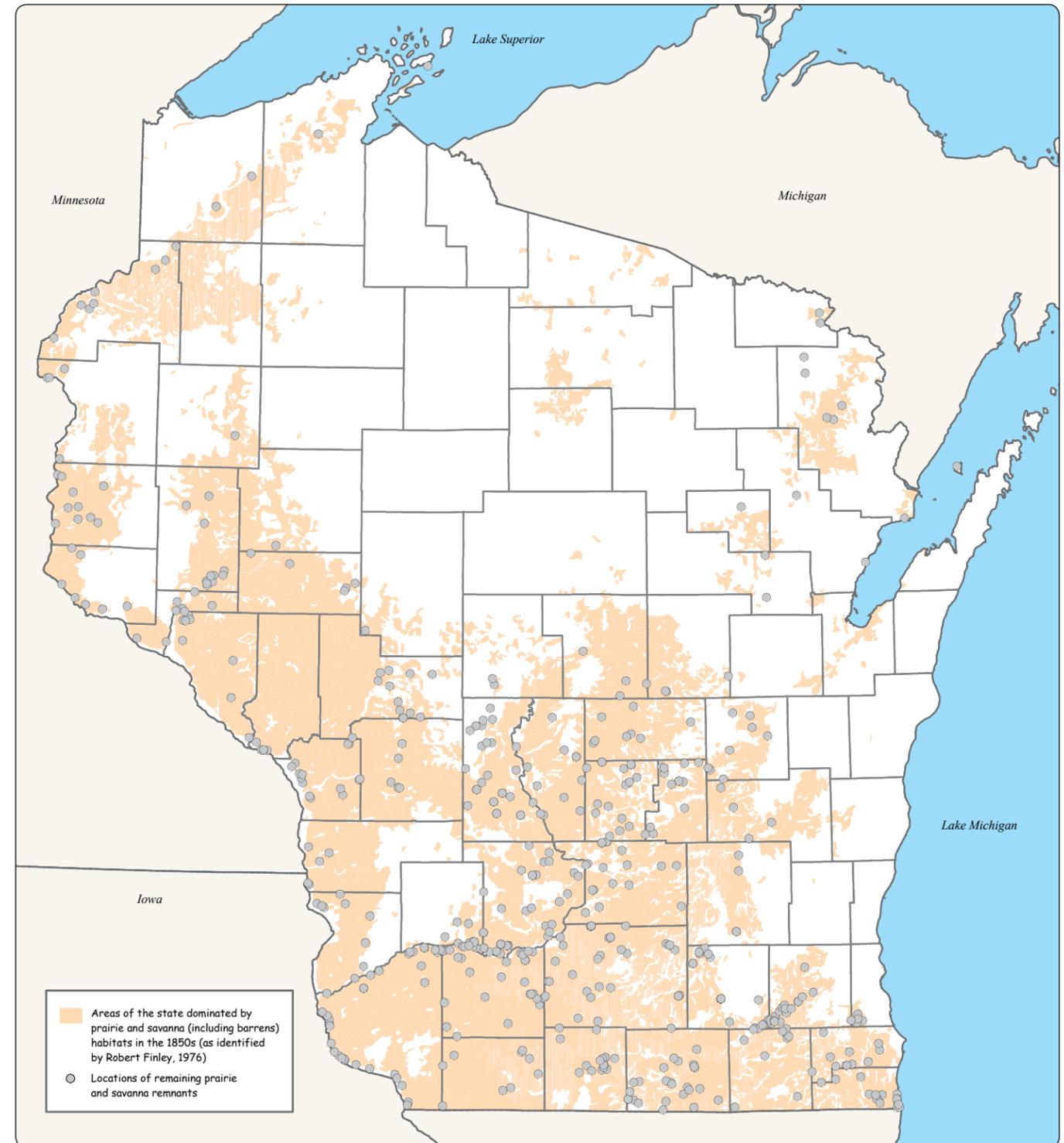
Original land survey records of the 1830s indicate there were 2 million acres of prairie and probably close to 10 million acres of the four types of oak savanna. Together, they represented almost one-third of the state and were dominant components of the Western Prairie, Western Coulee and Ridges, Southwest Savanna, Southeast Glacial Plains, Central Sand Plains, Central Sand Hills, Northwest Sands, and Northeast Sands ecological landscapes.

Although all of the state’s original plant communities have been altered over the past 200 years, few have been as widely impacted as prairies and savannas. With settlement and the introduction of the moldboard plow, much of Wisconsin’s prairie and savanna was converted to farming. Those that were not plowed often were used for grazing or succeeded to forest, primarily due to fire suppression activities that prevented fires from periodically maintaining their open aspect. As a result, many prairie and savanna plants are now restricted to the small remnants scattered through southern and western Wisconsin.

Approximately 2,000 acres of prairie remain in Wisconsin (0.1% of the original acreage) most of which is either quite wet or dry. Of the intermediate type, the “mesic prairie,” only about 100 acres of an original one million remain and these are in small (often linear), scattered parcels of a few acres at best. To put this 99.99% loss into perspective, the state also contains about one million acres of lakes (not including Lakes Superior and Michigan). For a 60-acre lake (about the size of the average lake in Wisconsin), a corresponding loss would shrink the lake down to 260 square feet—about the size of a 2-car garage. Of the oak savanna communities, an estimated 10,000 acres of oak and pine barrens remain (0.25% of the original) and 500 acres of oak openings (less than 0.01% of the original). Prairies and oak openings are widely regarded as two of North America’s most endangered natural communities.

Yet, despite this massive land use change, many prairie and savanna animal species adapted to the agricultural-dominated landscape by making use of “surrogate” habitats. Up until the 1950s, many Wisconsin farms in the southern and western parts of the state were diverse operations that contained a mix of corn, small grains, pasture, hedgerows, and woodlots. With some notable exceptions (including large mammals—bison, elk, and wolves—and several species adapted to specialized habitats, such as ornate box turtle and the long-billed curlew), many birds, mammals, and herptiles were able to maintain their populations at relatively stable levels by utilizing these modified habitats.

Figure 126: Prairies and savannas of Wisconsin, 1850s and 2003<sup>6</sup>



**Figure 127:** Some of the prairie and savanna species of concern in Wisconsin?

**Plants**

Roundstem Foxglove	<i>Agalinis gattingeri</i>
Pale False Foxglove	<i>Agalinis skinneriana</i>
Woolly Milkweed	<i>Asclepias lanuginosa</i>
Kitten Tails	<i>Besseyia bullii</i>
Prairie Dunewort	<i>Botrychium campestre</i>
Great Indian-Plantain	<i>Cacalia muehlenbergii</i>
Sweet-Scented Indian-Plantain	<i>Cacalia suaveolens</i>
Prairie Indian Plantain	<i>Cacalia tuberosa</i>
Clustered Poppy-Mallow	<i>Callirhoe triangulata</i>
Hill's Thistle	<i>Cirsium hillii</i>
Small White Lady's-Slipper	<i>Cypripedium candidum</i>
Pale-Purple Coneflower	<i>Echinacea pallida</i>
Yellow Gentian	<i>Gentiana alba</i>
Prairie Bush-Clover	<i>Lespedeza leptostachya</i>
Marbleseed	<i>Onosmodium molle</i>
Brittle Prickly-Pear	<i>Opuntia fragilis</i>
Clustered Broomrape	<i>Orobanche fasciculata</i>
Hairy Beardtongue	<i>Penstemon hirsutus</i>
Prairie White-Fringed Orchid	<i>Platanthera leucophaea</i>
Rough Rattlesnake-Root	<i>Prenanthes aspera</i>
Nodding Rattlesnake-Root	<i>Prenanthes crepidinea</i>
Ohio Goldenrod	<i>Solidago ohioensis</i>
Prairie Fame-Flower	<i>Talinum rugospermum</i>
Earleaf Foxglove	<i>Tomanthera auriculata</i>

**Vertebrates**

Franklin's Ground Squirrel	<i>Spermophilus franklinii</i>
Henslow's Sparrow	<i>Ammodramus henslowii</i>
Owl Short-Eared	<i>Asio flammeus</i>
Kirtland's Warbler	<i>Dendroica kirtlandii</i>
Yellow-Breasted Chat	<i>Icteria virens</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Western Slender Glass Lizard	<i>Ophisaurus attenuatus</i>
Ornate Box Turtle	<i>Terrapene ornata</i>
Butler's Garter Snake	<i>Thamnophis butleri</i>
Greater Prairie-Chicken	<i>Tympanuchus cupido</i>
Bell's Vireo	<i>Vireo bellii</i>

**Invertebrates**

Red-Tailed Prairie Leafhopper	<i>Aflexia rubranura</i>
Swamp Metalmark	<i>Calephelis muticum</i>
Frosted Elfin	<i>Callophrys irus</i>
Karner Blue Butterfly	<i>Lycaeides melissa samuelis</i>
Powesheik Skipperling	<i>Oarisma powesheik</i>
Liatris Borer Moth	<i>Papaipema beeriana</i>
Pink Sallow	<i>Psectraglaea carnosia</i>
Regal Fritillary	<i>Speyeria idalia</i>
Lake Huron Locust	<i>Trimerotropis huroniana</i>

In the 1950s and 1960s, though, many farms adopted more intensive agricultural practices in response to changing agricultural economics. Pesticides were applied with increasing frequency, small grain and pasture acreage were extensively converted to row crops, and the nature and timing of agricultural disturbances, notably the early and frequent mowing of alfalfa, changed. An unintended consequence of the widespread adoption of more intensive farming practices is what has become decades-long population declines for several prairie and savanna vertebrate species.

Threats to the future survival of our native prairie and savanna flora, fauna, and remnants can be summarized in the following categories:

- A) Continued loss of remnants (both high quality sites and those moderately degraded by grazing) due to:
  - » accelerating invasion by woody growth (e.g., red cedars are now invading dry bluff prairies at such a rapid rate that in 20 years most unmanaged bluff prairies will be completely overgrown)
  - » inappropriate tree planting for wildlife, aesthetics, and timber/fiber production
  - » public opposition to tree removal and fire management needed to restore or maintain open habitats
  - » rural home development
  - » conversion of traditional prairie pastures (unplowed but grazed prairie) to crops
  - » drainage and conversion of wet prairie to farming
- B) Continued loss of post-settlement, surrogate habitats used by prairie and savanna animals (especially birds), due to intensive agriculture and urban development.
- C) Resistance to the use of prescribed fire as a management tool
- D) Invasion by aggressive exotics (e.g., honeysuckle, common buckthorn, reed canary grass, leafy spurge, crown vetch, parsnip, purple loosestrife, etc.)

- E) Continued habitat fragmentation, which results in patch isolation and the creation of edge effects. This is especially harmful to vertebrate animals.

Protecting our prairie and savanna ecosystems may need to follow three paths. First, ensuring the long-term protection of remaining parcels of prairie and savanna. Although these small (and in some cases tiny) sites may not currently be able to support viable populations of many birds, mammals, or herptiles, they will be critical in maintaining the genetic diversity of many plants, insects, and soil organisms. Second, buffering existing prairie and savanna remnants with compatible land use

practices, especially restored native vegetation. However, in many cases, maintaining buffers in the surrogate habitats (pastures, old fields, hay fields, etc.) that many species have adapted to will be sufficient. Third, restoring several large-scale mosaics of prairie and savanna habitats. Although in the absence of periodic fires many savannas have become “overgrown,” most still harbor remnant populations of plants typical of more open conditions and could be restored through thinning and controlled burns. These large prairie and savanna restoration projects will likely be most successful if integrated into a landscape supporting various types and intensities of farming.



Spring Green Prairie in Sauk County

THOMAS MEYER

## E. Recreation areas

One of the reasons Wisconsin has long been a leader in conservation is that our population has understood that how we manage our lands and waters directly influences our quality of life and our economic health. Two of the most renowned conservationists of the late-nineteenth and early-twentieth centuries, John Muir and Aldo Leopold, both came from Wisconsin. Many people attribute this to the conservation stewardship culture that pervades our state. Today, surveys and polls consistently find that Wisconsinites highly value their natural resources and demand that they are appropriately protected and used. However, over the past fifty years, there has been a significant change in our population's exposure to, and daily contact with, the outdoors and there is concern that younger generations may not have adequate opportunities to experience and understand the natural world. In 1950, 42% of Wisconsin's residents lived in rural areas and 174,000 farms were active. Many private lands were open to the public for hunting, fishing, and hiking. Urban residents typically had at least one relative that lived on a farm or owned rural land.

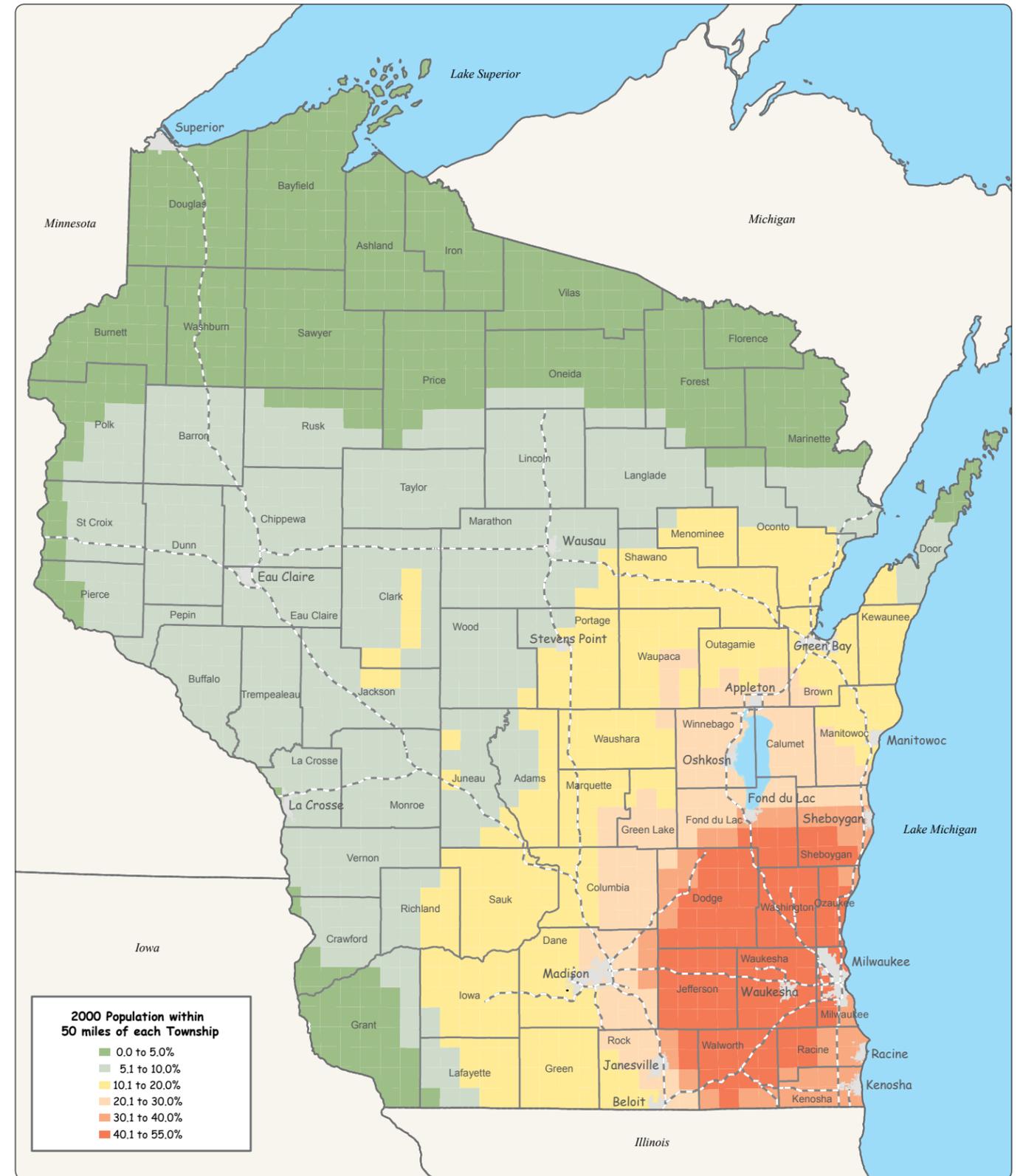
Now, two-thirds of Wisconsinites live in urban settings, fewer than 78,000 farms remain in the state, and many residents have little, if any, direct connection to current rural landowners. For many residents, daily life has become more hectic and fast-paced with less time to devote to pursuing outdoor recreation pastimes that take hours of travel to reach. As we have become progressively more distant from our farming and forestry heritage, a corresponding need to help keep people connected to the natural world has developed. One of the most effective ways to educate citizens on the myriad of issues surrounding land and water management—the environmental benefits that wetlands provide, the different plants and animals found in different types of forests, how water quality can be affected by urban runoff, to name a few—is simply to get people outdoors, watching and listening to nature. And the easiest way to do this is to provide places *close to large population centers* for walking, fishing, wildlife watching, camping, biking, horseback riding, cross-country skiing, and other outdoor recreation activities.

The largest population centers are located primarily in the southern and eastern parts of the state. Of the fifteen largest cities in the state, only Eau Claire and La Crosse are northwest of a line drawn from Green Bay to Madison. Thus, to maximize the number of people served, establishing new recreation areas would need to focus primarily (but not exclusively) in the southern and eastern parts of the state.

Although some recreation activities can be accommodated through acquisition of just public access rights (e.g., easements that provide fishing access to streams), for most outdoor recreation activities providing public use of an area is best met through outright public acquisition of lands. A long-standing dilemma in providing recreation opportunities is the cost of land in areas that are accessible to large numbers of people. The cost of land typically increases as one moves closer to urban centers. Yet, the closer that lands are to cities and villages, the greater the number of people that will be able (and who will take the time) to use them. Thus, spending \$10,000/acre to establish a recreation area that will be used by hundreds of thousands of people a year may be viewed as a bargain compared with lands that are distant from population centers and sell for \$1,000/acre but would rarely be used.

Of course, some types of outdoor recreation require expansive amounts of land in a fairly natural state. Given the smaller parcel sizes and more manipulated habitats that typically occur closer to urban areas, it is not realistic to propose establishing places to provide hunting, wilderness camping, and similar activities near large cities. However, smaller tracts can support many other types of recreation including boat and canoe launch sites, shore-fishing sites, swimming beaches, and shooting ranges. Activities that require larger areas include ATV riding, horseback riding, dog-training and exercising, and off road biking. Although participants in these activities prefer natural settings, these activities do not require high quality natural habitats to provide high quality recreation experiences. Indeed, some types of recreation that could be destructive to high quality natural areas should be located only in less sensitive areas.

Figure 128: Percent of Wisconsin residents living within 50 miles of each township<sup>9</sup>





Cross country skiing

Some lands that were formerly used for other purposes can be restored for recreational use very successfully. Examples of lands that have been turned into recreational assets include Havenwoods State Forest Preserve in Milwaukee (established from the combined lands of a former missile base and a county institution), Richard Bong State Recreation Area in Kenosha County (an area originally slated for an Air Force base), and Wazee Lake Recreation Area in Jackson County (an abandoned open-pit iron mine that filled with water and now provides swimming, scuba-diving and fishing opportunities).

Water-dependent facilities must obviously be located on bodies of water of sufficient size and quality to accommodate the desired use, but for many land-based activities, the location of these “opportunity” recreation areas is not directly dependent upon the natural characteristics of the land. As such, these recreation areas could potentially be accommodated in many different places. As rural residential housing increases, the amount of available land on which to establish outdoor recreation areas diminishes.

Establishing new public properties to meet the growing demand for outdoor, nature-based recreation opportunities can have different types of impacts on nearby landowners and local businesses. As such, they can generate different levels of support and opposition from local residents. Particularly in rural areas not accustomed to many visitors, some local residents may see little value in attracting more campers, trail users, hunters and anglers, and other recreationists. Although some local businesses may benefit, nearby landowners are often concerned about increased traffic, noise, and trespass violations. Efforts to establish new places for public recreation will need to work closely with local landowners to ensure that their needs and expectations are met.

Separating recreation areas of statewide importance from those of local or regional importance is a difficult, subjective process. For lands and waters in more developed parts of the state it becomes even more complex due to the fact that a large percentage of our population now “lives, works, and plays” in urban/suburban areas. Areas of natural vegetation in urban environments tend to be small, isolated, and to varying degrees impacted by invasive species. However, although they typically allow a limited number of recreation activities (walking, wildlife watching, canoeing, fishing, etc.), they tend to be very popular and receive far more visitors than most larger, less-disturbed lands that are further away. In many cases, their educational value cannot be overstated.

Purchasing, developing facilities, and conducting ongoing maintenance at parks, forests, and preserves within population centers has historically been viewed as a local issue, although many communities have received federal and state grants to help fund them. As a greater and greater percentage of our residents live in urban/suburban areas, it may be appropriate for state and federal governments to provide more support to local communities in their efforts to provide quality outdoor recreation opportunities (and help meet water and air quality needs).

Successfully meeting the demand for easily accessible outdoor recreation areas will be less a function of the ecological qualities present, and much more a function of location, the variety of recreation activities that could be supported, community and landowner acceptance, availability of funding, and the opportunity to acquire an adequate amount of land. The places ultimately chosen—places for grandparents to teach grandchildren birdcalls, the names of flowers, where to find morels, when to reel, and how to throw a good skipping stone—will play a critical role in helping generations to come understand and enjoy their natural world.

## Great Wisconsin Birding and Nature Trail

Would you like to know the best times and places to watch peak hawk migrations? Want to watch ancient lake sturgeon migrate upstream to spawn? Are you a shutterbug hoping to photo wildflowers in profusion, chaotic heron rookeries, and dancing sharp-tailed grouse? If so, the newly forming series of Great Wisconsin Birding and Nature Trail might be just for you. The trail—in essence a series of five regional auto tours—will be comprised of a string of “waypoints” which direct travelers to the best places in an area to observe birds and wildlife. Some of the waypoints will provide opportunities to walk, bicycle ride, or even canoe to enjoy some of the state’s most spectacular scenery.<sup>8</sup>

Nearly everyone seems to enjoy watching wildlife. In survey after survey, “wildlife watching” is by far the most popular outdoor recreation activity cited. Nearly 60% of the state’s adult population is estimated to participate in wildlife watching. Furthermore, driven by changing lifestyles and shifting demographics, it (in particular bird watching) is one of Wisconsin’s and the nation’s fastest growing outdoor recreation activities. The Great Wisconsin Birding and Nature Trail hopes to accommodate and nurture this growing demand by combining information on the best sites and times for watching wildlife with travel information describing food, lodging and other nearby points of interest. By connecting nature destinations to local tourist services, the trail hopes to help link local economic benefits with natural resource protection efforts.

The trail is a project of the Wisconsin Bird Conservation Initiative, a cooperative partnership (120 endorsing members) to deliver the full spectrum of bird conservation emphasizing voluntary stewardship. The DNR’s Endangered Resource Program is taking the lead on developing the trail and has planned five initial trails: Lake Superior/North Woods, Mississippi River, Lake Michigan, Central Sands Prairie, Southern Savanna. Similar Great Birding and Nature Trails are being developed in 14 states nationwide.



Snow Bottom State Natural Area in Grant County

## F. Scattered natural areas

Wisconsin harbors a diverse mix of natural biotic communities and native species. Many of the 229 Legacy Places previously described collectively contain much of the biological diversity that exists in Wisconsin. However, some species and natural communities have very limited distribution or only occur at small scattered locations around the state. As a result, there will continue to be a need to find and protect these small pockets of critical habitat—both those that support rare species and those that harbor the highest quality examples of natural communities.

In some cases, these species and natural community types were once far more common than today and the remaining pieces and populations tend to be fragmented and isolated from each other. Examples include all prairie types, southern sedge meadows, and oak savannas. For species that depend on these natural communities, for example Henslow's sparrows, regal fritillary butterfly, and purple milkweed, protecting the remaining parcels of habitat is a crucial first step in their survival.

Other species and natural communities have historically had only a very limited distribution in the state. Wisconsin sits at the very edge of some species' ranges such as the arctic shrew, barn owl, western ribbon snake, and Kentucky coffee-tree. Although these species may be much more common in other parts of the country or Canada, maintaining these edge-of-range populations is believed to be very important in preserving the genetic diversity species need to adapt to changing environmental conditions.

Finally, for a small number of species and natural communities such as Karner blue butterflies, whooping cranes, calcareous fens, and pine barrens, Wisconsin plays a central role in their long-term conservation and protecting key sites remains a high priority.

Other sites that play an important role in maintaining the state's natural diversity include those where migratory birds concentrate in large numbers in the spring and fall, places where thousands of bats or snakes come together to hibernate each winter, and unusual geologic features, including the castellated mounds in

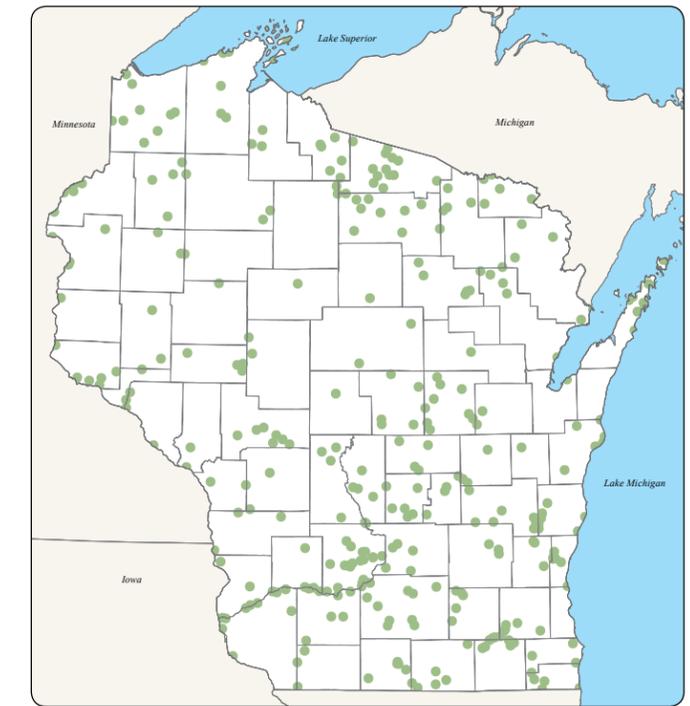
Glacial Lake Wisconsin, talus slopes, eskers, caves, and ice-walled lake plains. Because of the state's unique glacial history, some of North America's most striking examples of glaciation are found here and form the foundation of the Ice Age National Scenic Trail. In addition to their geologic attributes, many of these places also harbor unusual, and often rare, plants and animals.

In 1951 Wisconsin initiated the country's first statewide program to identify and protect areas of outstanding and unique ecological, geological, and archeological value. Now known as the Wisconsin State Natural Areas program, its primary focus is to establish a collection of protected sites that capture the breadth of the state's natural heritage and the ecological processes on which they depend. These natural areas are vital to scientific research because they provide the best remaining examples of natural processes acting over time with limited impacts from human activity. As such, they are valuable benchmarks against which the Department, the academic community, and others can evaluate the affects of humankind's increasing influence on Wisconsin's landscape.

The Wisconsin State Natural Areas program has grown to become the largest and most successful program of its kind in the nation. Over 400 sites, totaling more than 150,000 acres, have been designated as State Natural Areas. These sites range from Ipswich Prairie, a 20-acre prairie remnant along an abandoned railroad line that harbors over 125 plant species, to Quincy Bluff, a 5,000-acre complex of very high quality sedge meadow, northern dry forest, and oak barrens.

Clearly, the Legacy Places described earlier contain many places that would be worthy of protection through the State Natural Areas program. Indeed, State Natural Areas are scattered within and near many of the Legacy Places. However, there will continue to be a need to protect those small, isolated pockets of the landscape that have helped sustain the incredible diversity that once graced our state. Some of these places might be large, but most would likely be only a few hundred acres in size. Collectively, they will help maintain a link with the past when humans lived more closely with nature.

Figure 129: State Natural Areas of Wisconsin<sup>10</sup>





Horseback riding in Governor Dodge State Park

## G. Trails

Trails have crisscrossed Wisconsin for millennia. First created by animals, later used by Native Americans and then Euro-Americans, trails and rivers were the thoroughfares that moved people and goods from one area to another for most of the state's early history. Much of this web of trails would later become the foundation of our road network. Two of the more famous trails include the "Military Road" that ran from Fort Howard outside of Green Bay to Fort Crawford near Prairie du Chien and the historic portage trail between the headwaters of the Brule and the St. Croix Rivers, which linked Lake Superior to the Mississippi River.

Now, we look to trails for recreation outlets and as passageways to experience the natural world. A hundred years ago, the primary recreation trail uses were hiking and horseback riding in the summer and skiing and snowshoeing in the winter. A generation ago, it was common to use a trail and not see or hear anyone else. Even on many of the public lands in the southern part of the state, meeting up with a dozen others over the course of a day was uncommon. And because there were relatively few trail users, few conflicts emerged.

As our population has become progressively urbanized, people have increasingly looked to a variety of different trails as a means to get outdoors. The number of trail users has dramatically increased in recent years and people have found new ways to enjoy trails by inventing new vehicles (e.g., ATVs and snowmobiles) and converting others (e.g., off road bikes and in-line skates). As a result, whether for walking, riding, or paddling, trails now form one of the cornerstones of our current recreation management system.

Wisconsin has a wide variety and large number of trails, in fact, greater than most other states in the Midwest. Some examples of our trail network include:

» Nearly every public park, forest, and wildlife area in the state has some developed trail system. The length and complexity of these trails are, of course, a function of the property's size, terrain, and purpose. Most trails on these public properties are well suited to help meet the need for trips ranging from a few hours to a day.

- » Wisconsin is the nation's leader in the rails-to-trails movement with over 1,000 miles of recreational trails on abandoned rail beds, which have become popular for biking, equestrian, ATV and snowmobile users. The longest stretch of "rail-trail" in Wisconsin is the 125-mile Wild Rivers Trail and at least four others are over 70 miles.
- » The state also boasts at least 15,000 miles of snowmobile trails in a vast network laid out by snowmobile clubs over both public and private lands. Most of these trails are in the northern half of the state, winding through Wisconsin's scenic countryside and by countless supper clubs and restaurants.
- » The popularity of all terrain vehicles (ATVs) has dramatically grown in recent years. Generally, ATVs are allowed on designated trails on public lands.
- » Off road biking has also increased substantially in recent years and although many riders ride on the rail-trails, most prefer a more varied topography and challenging terrain. Currently, most trails open to off road biking are quite distant from population centers.
- » Although horseback riding demands a higher financial commitment than most other recreation pursuits, with its strong connection to earlier lifestyles, it remains popular with both urban and rural residents. Trails for horseback riding need to accommodate the unique needs of horses to ensure safety of both riders and horses.
- » With 32,000 miles of perennial streams and 15,000 lakes, Wisconsin is a natural place to provide abundant water-based recreation. Existing "water trails" range from the 4.5-mile Long Lake Canoe Trail in the Upper Mississippi River National Wildlife and Fish Refuge near Trempealeau to the 92-mile reach of the Lower Wisconsin River with its popular sandbar campsites that allow for multi-day excursions.
- » The newly created Great Wisconsin Birding and Nature Trail system, which will be a state-wide, mapped auto trail providing opportunities to see a wide variety of wildlife at some of Wisconsin's best wildlife watching areas.

In addition to the variety of trails in the state, Wisconsin has many different types of trail users. Some people like long distance trails, others prefer shorter trails that can be covered in only a couple of hours. Some like the speed and power of motorized vehicles; others favor the tranquility of walking, cross-country skiing, snowshoeing, and horseback riding. Some like the relatively flat experiences provided by converted railroad beds, others prefer the challenges and scenery of hilly topography and twisting turns. The number of all types of trail users has rapidly increased in past years and is expected to continue to rise in years to come.

Although many miles of trails have been constructed over the years, the trail network has not grown nearly as rapidly as the number of users. Not surprisingly, with more people using trails in different ways, there has been an increase in conflicts between users. The most notable and persistent conflict is between motorized and non-motorized participants. People seeking quiet hiking, skiing, biking, horseback riding, or paddling experiences often are frustrated with the noise and disruptions caused by ATVs, snowmobiles, and personal watercraft (“jet skis”). Advocates of motorized recreation note that these vehicles allow riders to access remote areas much more quickly and allow many older or less mobile people to enjoy the outdoors. There appears to be little, if any, common ground between motorized and quiet trail users and thus little value in trying to meet both sets of needs with the same trail network. “Multi-use” trails are of little value to those seeking a quiet experience if motorized uses are permitted on the trails. Successfully meeting the needs of different types of trail users and minimizing conflicts likely will entail establishing a variety of separate trails.

Different types of trails have different types of impacts on surrounding landowners and local businesses. As such, they generate different levels of support and resistance from local residents. Because of their growing popularity, trails can draw more and more users into areas not always accustomed to visitors, particularly in areas dominated by farming. Although some local businesses may benefit, many rural landowners may not see any advantage to having more off road

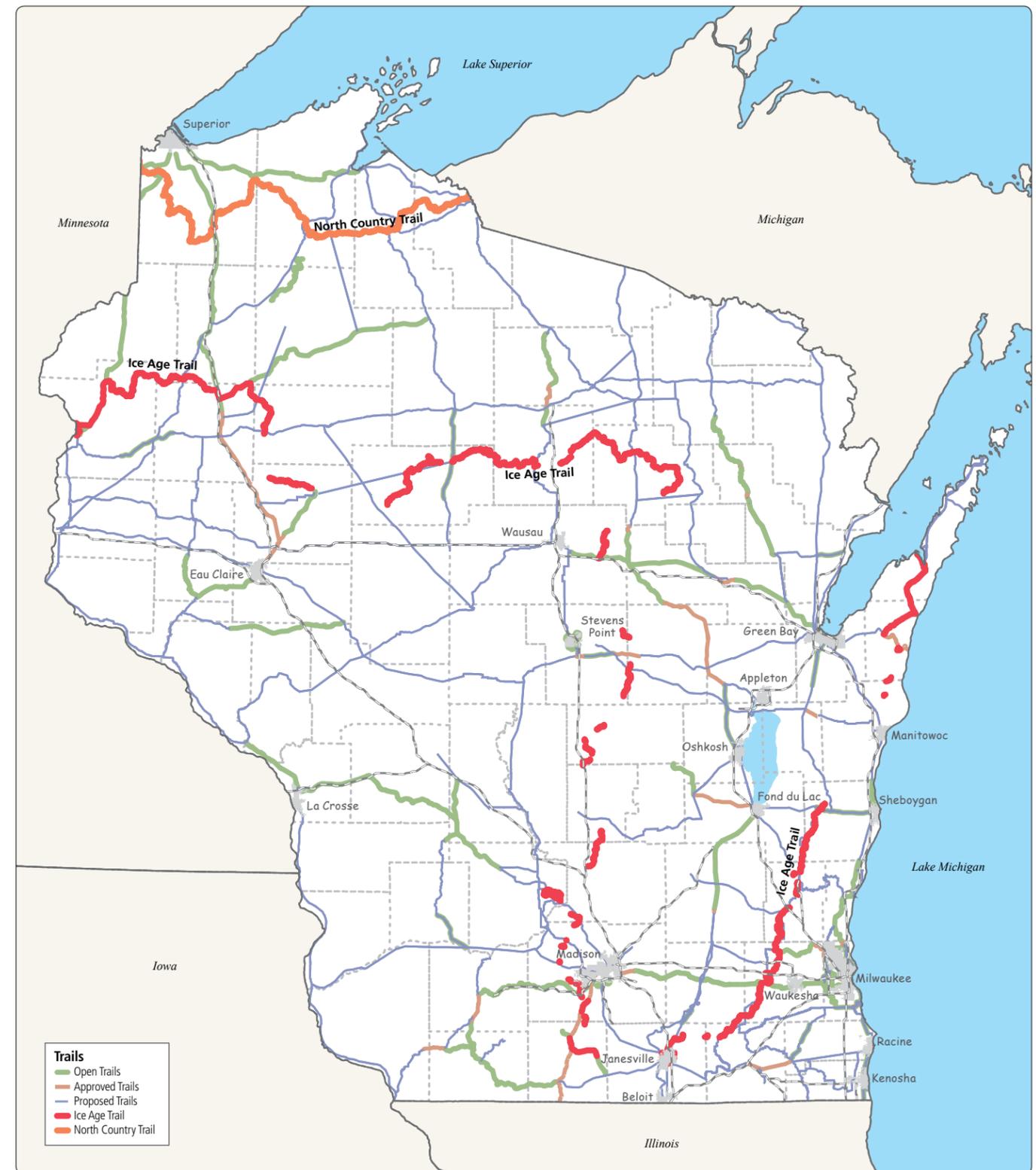
bikers, paddlers, and ATV and horse riders passing through their area. As trail use increases or new trails are proposed, nearby landowners are often concerned about increased traffic, noise, and trespass violations.

With more trail users and more types of uses, particularly uses that are higher impact, several environmental problems can also result. Erosion along trails can be a constant challenge in hilly areas, particularly for those used extensively by horses, ATVs, and off road bikes. Trails also act as “vectors” in the movement of invasive plant species into areas. Seeds of garlic mustard, purple loosestrife, spotted knapweed, leafy spurge, and other invasive plants can be easily spread on the soles of hiking boots, in the treads of bike and ATV tires, and by horse hooves and dung.

Looking forward, it is clear that more trails are needed to alleviate both user conflicts and reduce environmental impacts caused by overuse. Constructing enjoyable, challenging, and scenic trails that do not result in erosion, adverse effects on surrounding vegetation, or unwelcome impacts to nearby landowners can be difficult. Creating multiple networks of trails that can help separate incompatible users will likely be very complicated. Consistent with demands for camping, hunting, fishing, and other outdoor recreation opportunities, a concern for many trail users is that most existing trails are far from where the majority of the state’s population resides. No doubt, one of the attractions of getting away to the outdoors is to *get away* from where one lives. However, the public has repeatedly voiced dissatisfaction with the distance most of the state’s population has to travel to find places to go on long walks, horseback ride, off road bike, and ride ATVs and snowmobiles.

In the past, one of the problems plaguing the creation of new trails was that different user groups typically did not see how their needs were represented in a broader trail network strategy. As such, each time a new trail was proposed, many groups felt the need to “get their oar in the water” and advocate for access. Not surprisingly, this led to a network of predominantly multiple-use trails, rather than a network of trails that, collectively, met multiple uses.

Figure 130: Current and proposed trails in the State Trails Network Plan<sup>11</sup>



In response, the Department worked with the State Trails Council to develop the *State Trails Network Plan*, which was approved by the Natural Resources Board in 2001. The goal of the Plan is to allow different trail users to see how their needs might fit into a broader vision of a statewide trail network. In addition to the 1,600 miles of existing trails in the state, the Plan identifies 1,800 miles of potential new trails on abandoned railroad beds, along utility corridors, and within road right-of-ways. Potential new trails were selected based on six criteria:

1. Proximity to population centers that offer connections to a statewide network of recreation trails.
2. Existing rail corridors with a high potential for abandonment.
3. Existing historical sites, tourist attractions, state and county parks, and other significant features.
4. Links to existing national, state, county and local trails.
5. Links to interstate trails in Illinois, Iowa, Michigan, and Minnesota.
6. Natural feature corridors tied to rivers and other scenic landscape patterns, including major topographic features.

A large percentage of the trails proposed in the *State Trails Network Plan* are along railroad lines. As mentioned before, trails on old rail beds are popular for some users, but lack scenic variations, topographic relief, and other traits that many trail users enjoy. Yet, their number, their relatively even distribution around the state, and the fact that they pass through many small and large cities, make them ideally suited to form a “backbone” network from which a variety of different trail types emanate. Establishing even a portion of these potential trails could help alleviate the overcrowding and overuse afflicting many existing trails and help reduce conflicts between users. Many of these potential trails run through Legacy Places previously described.

Most of the rivers identified as Legacy Places could someday function as quality water trails. Of particular interest to many paddlers and boaters are isolated campsites, accessible only from the

water, that would allow multi-day trips down a river or around a lake. Water trails with this type of camping opportunities available now include the Lower Wisconsin River, the Flambeau River, and around Lake Superior; all are very popular.

The *State Trails Network Plan* only addressed long-distance, natural feature trails in a limited way. Largely, this was due to the fact that this type of trail requires an extensive amount of work to plan, design, and implement and was beyond the scope of the Network Plan. Because these trails follow landscape patterns (such as rivers and geologic features), they typically cross a large number of landowners, even in a relatively short distance.

Wisconsin is home to two of the country’s most ambitious long-distance, natural feature trails: the Ice Age Trail and the North Country Trail. Both were designated National Scenic Trails by Congress in 1980, part of a system that includes just eight such trails in the nation, and designated State Trails in 1987 and 2001, respectively. The Ice Age Trail is a thousand-mile trail between Potawatomi and Interstate State Parks. The North Country Trail is a 4,600-mile trail between the states of New York and North Dakota, with about 200 miles in Wisconsin. The longest continuous segment of either trail is about 60 miles. Opportunities to partner with federal and local governments and non-profit conservation organizations on these trails are far-reaching. Given the challenges facing the completion of the Ice Age and North Country trails, it may be most prudent to concentrate on completing them before pursuing additional long-distance, natural feature trails.

Of course, it is difficult to anticipate how people will want to use trails in the future. It appears likely that motorized uses will continue to remain popular (and, no doubt, new motorized vehicles will be invented). Equally clear is that as our population ages and urbanizes, quiet, low-impact trail use will also remain popular. Meeting these demands will require the continued collaboration of the recreation industry, recreation and conservation organizations, local governments, government agencies, and most importantly, landowners.

## Wisconsin’s National Scenic Trails

### The Ice Age Trail

Over the past 2 million years, in a period often referred to as the Ice Age, enormous glaciers repeatedly blanketed and sculpted the earth. These ice sheets were almost unimaginably large; some were two miles thick and stretched from New York to Montana and as far south as Ohio. The last major advance of the glaciers, known as the Wisconsin Glaciation, ended about 10,000 years ago and left behind a landscape of kettle lakes, drumlins, eskers, kames, outwash plains, and many other features. And it is in Wisconsin that the landforms these great glaciers created can best be seen.

Near the end of the Wisconsin Glaciation, long ridges of material were formed between the Green Bay and Lake Michigan lobes of the glacier. It was along these ridges (what would become known as the Kettle Moraine) that the idea of an Ice Age Trail was born. Recognizing the future need for hiking opportunities in the state, the Milwaukee Chapter of the Izaak Walton League spawned the effort to protect the Kettle Moraine corridor in the 1920s. The goal, as stated in their 1942 report, was to protect a 100-mile Kettle Moraine corridor in southeast Wisconsin and develop a long-distance trail “for hikers and skiers.” The report further recommended that “hilly land should be acquired before marshy land” and that “a long connected area should be acquired before an acquired area is widened.”

In the 1950s, Milwaukee native Ray Zillmer expanded the vision of a long hiking trail through the Kettle Moraine by continuing it west along the southern-most edge of the glacier’s advance. The Ice Age Park and Trail Foundation was started in 1958 to help Zillmer’s vision become a reality, and in 1980 Congress formally designated the Ice Age Trail a National Scenic Trail.<sup>12</sup>

The trail’s purpose is to combine a hiking and education experience, where users can see firsthand how the glaciers shaped our landscape. Unlike many other long-distance trails, the Ice Age Trail is also designed to connect, rather than avoid, the many cities, villages, and towns that occur along its route. Remarkably, more than 20% of Wisconsin residents live within 10 miles of the trail. About 600 miles of the trail have been completed. Several of the Legacy Places identified in this report occur along some of the gaps in the route of the Ice Age Trail. Acquiring or establishing public access agreements with landowners along mostly upland tracts in a continuous, end-to-end fashion through the following Legacy Places would help complete the trail:

- » Kewaunee River and Grasslands
- » Twin Rivers (East)
- » Millhome Woods
- » Sheboygan River Marshes
- » Kettle Moraine State Forest
- » Middle Kettle Moraine
- » Lake Koshkonong to Kettle Moraine Corridor
- » Shoveler Lakes-Black Earth Trench
- » Baraboo Hills
- » Portage to Buffalo Lake Corridor
- » Oxford Savanna

- » Sand Country Trout Streams
- » Hartman & Emmons Creeks
- » Plover River
- » Langlade Moraine
- » East and West Branches of the Eau Claire River (upper-most reaches)
- » Harrison Hills
- » Timm’s Hill
- » Yellow (Chippewa) River
- » Chippewa Glacial Lakes
- » Blue Hills
- » Haugen-Birchwood Lakeland
- » Straight River Channel
- » Big Rock Creek

### The North Country Trail

A relatively short stretch of this very long National Scenic Trail (at 4,600 miles, it is the longest in the nation) is in Wisconsin, with more than 170 of the proposed 200 miles completed to date.<sup>13</sup> Trail segments open for hiking and skiing run through Iron County Forest, Copper Falls and Pattison State Parks, Chequamegon-Nicolet National Forest, and Brule River State Forest, among other lands. The trail traverses a variety of wooded habitats and goes by numerous waterfalls. A few of the Legacy Places identified in this report occur along some of the gaps in the route of the North Country Trail. Acquiring or establishing public access agreements with landowners along mostly upland tracts in a continuous, end-to-end fashion through the following Legacy Places would help complete the trail:

- » Penokee-Gogebic Range
- » Bad River
- » Bois Brule River
- » Namekagon-Brule Barrens
- » Manitou Falls-Black River
- » Nemadji River and Wetlands



Black-Crowned Night Heron (*Nycticorax nycticorax*)

## H. Wetlands

Many of the specific, named Legacy Places described previously include, or are centered around, wetlands. In most cases, the wetlands or wetland complexes within these Legacy Places are very large, are of exceptional quality, or harbor unique features or species. However, many other wetlands throughout the state will also be important to meet future environmental, conservation, and recreation needs.

Once regarded as waste land, wetlands were drained and filled in the past with only minimal restraint, often as a result of government programs that encouraged landowners to convert them to more economically productive uses. Many wetlands in the southern, central, and eastern parts of the state were ditched and tilled to create highly productive agricultural land. Although wetland conversion enabled landowners, farmers in particular, to generate income from previously idle land, it wasn't until later that there was a recognition that this process came at a cost to other citizens and the environment.

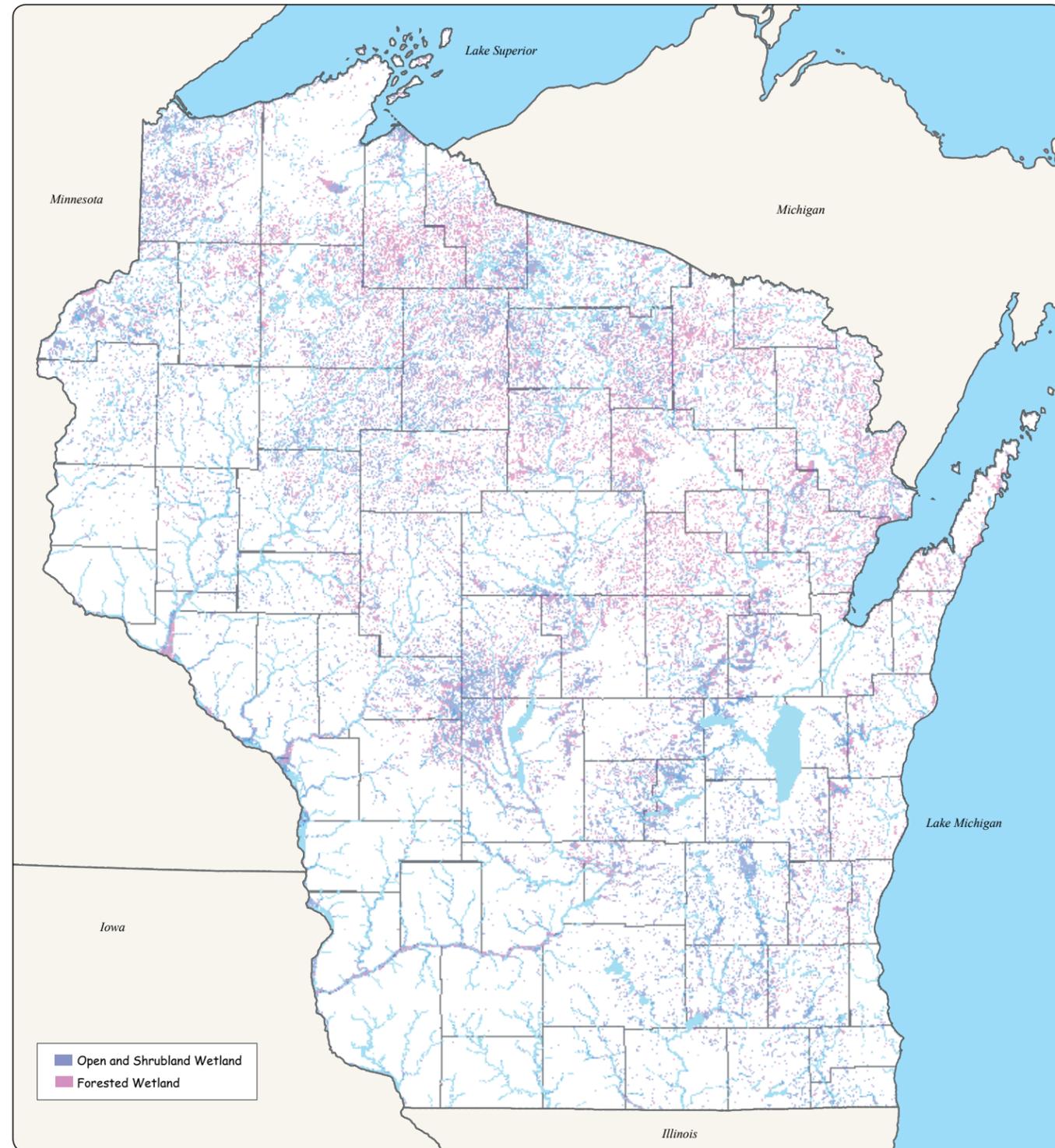
Wetlands not associated with flowing water (e.g., "prairie pothole" wetlands, isolated marshes, and wetlands adjacent to seepage lakes) often have very high conservation value for a variety of plants and animals, chiefly birds and amphibians. Draining and filling of these wetlands can have substantial impacts to the distribution and abundance of a variety of species. Wetlands associated with streams and rivers, whether bogs at the source of a cold water stream or large wetlands along the lower Rock River, can store and then slowly release precipitation following storms. As these types of wetlands are converted there is typically a corresponding increase in quantity and decrease in quality in surface water flows following heavy storms. Importantly, in watersheds where many wetlands have been drained or filled, surface waters become more erratic, with higher peak flows and lower low flows. As a result, significant impacts to habitats, property, and public infrastructure can result.

Wetlands are now widely recognized for the environmental and ecological functions, values and benefits they provide. Many organizations



Morning birdwatching

Figure 131: Wetlands in Wisconsin<sup>14</sup>



and agencies now work together with landowners on a variety of voluntary protection and restoration projects. Some efforts, such as the North American Waterfowl Management Plan and the National Shorebird Conservation Plan, are very large in scale and involve many partners. Others are focused on Wisconsin. Some of the groups most active in wetland protection and restoration in Wisconsin include the Natural Resource Conservation Service, Ducks Unlimited, The Nature Conservancy, the Wisconsin Wetlands Association, the Wisconsin Waterfowl Association, the US Fish & Wildlife Service, the Coastal Zone Management program, and the Department.

Two “Farm Bill” programs offered by the USDA, the Wetland Reserve and Conservation Reserve Programs, have been instrumental in providing cost-sharing assistance that enables farmers and other landowners to voluntarily restore many wetlands and adjacent uplands. Maintaining open space around wetlands will be critical in continuing their ability to provide environmental and ecological benefits. As with other areas of conservation value, wetlands benefit when they are located within, and buffered by, land uses such as agriculture and forestry. Not only do these adjacent open spaces provide habitat values to species occupying wetlands, but the pervious nature of farmland and forest soils also prevents runoff from entering wetlands as quickly as it often does in more developed settings.

Although many wetlands have been protected and restored there are several types of wetlands and areas within the state that should be specifically targeted for future protection and management. Examples include:

- » Large sedge meadows and marshes.
- » High quality, large cattail and bulrush marshes (both shallow- and deep-water), especially those adjacent to lakes.
- » Wild rice lakes and bogs.
- » Great Lakes wetlands.

- » Ephemeral wetlands important to migrating and breeding waterfowl, shorebirds, and herptiles, especially in southern Wisconsin.
- » Wetland areas that are critical components of an area’s hydrology and water quality.

Protection strategies for existing wetlands could take on many different forms. If future generations are to enjoy the many benefits that wetlands provide, it will be particularly important in the years ahead for landowners, organizations, and agencies to build off of past partnership successes.

### Footnotes

<sup>1</sup> Wisconsin Department of Natural Resources, Wisconsin Lake Partnership. See <http://www.dnr.state.wi.us/org/water/fhp/lakes/partners.htm>.

<sup>2</sup> Stewart, S. I., Hammer, R.B., Radeloff, V.C., Dwyer, J.F., & Voss P.R. 2003. *Mapping Housing Density across the North Central U.S., 1940–2000*. Available: <http://www.ncrs.fs.fed.us/IntegratedPrograms/lc/pop/bd/title.htm>. These maps were created as part of a joint venture between the USDA Forest Service’s North Central Research Station and the University of Wisconsin-Madison. The maps are reproduced here with permission.

<sup>3</sup> Wisconsin Department of Natural Resources. *Wisconsin Lakes*. Publication number FM-800 95Rev. For the most recent version, see <http://www.dnr.state.wi.us/org/water/fhp/lakes/list>.

<sup>4</sup> Wisconsin Department of Natural Resources. *Wisconsin Forests at the Millennium: An assessment, 2000*.

<sup>5</sup> Wisconsin Department of Natural Resources. *Wisconsin Forests at the Millennium: An assessment, 2000*.

<sup>6</sup> Wisconsin Department of Natural Resources. Natural Heritage Inventory program.

<sup>7</sup> Wisconsin Department of Natural Resources. Natural Heritage Inventory program. See [http://www.dnr.state.wi.us/org/land/er/working\\_list/taxalists/](http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/).

<sup>8</sup> See <http://www.dnr.state.wi.us/org/land/er/birds/trail.htm>.

<sup>9</sup> This map shows the percent of Wisconsin residents living within 50 miles of each Public Land Survey township. A 50-mile radius circle was drawn around each township and the population values for all census block groups occurring within this circle were totaled and divided by the state’s total population.

<sup>10</sup> Wisconsin Department of Natural Resources. Natural Areas program. See <http://www.dnr.state.wi.us/org/land/er/snal/>.

<sup>11</sup> Wisconsin Department of Natural Resources. *State Trails Network Plan, 2001*.

<sup>12</sup> See <http://www.iceagetrail.org/infocenter/index.html>.

<sup>13</sup> See [http://www.northcountrytrail.org/explore/ex\\_wi/wi.htm](http://www.northcountrytrail.org/explore/ex_wi/wi.htm).

<sup>14</sup> Wisconsin Department of Natural Resources. Map produced from WISCLAND data of the mid-1990s.