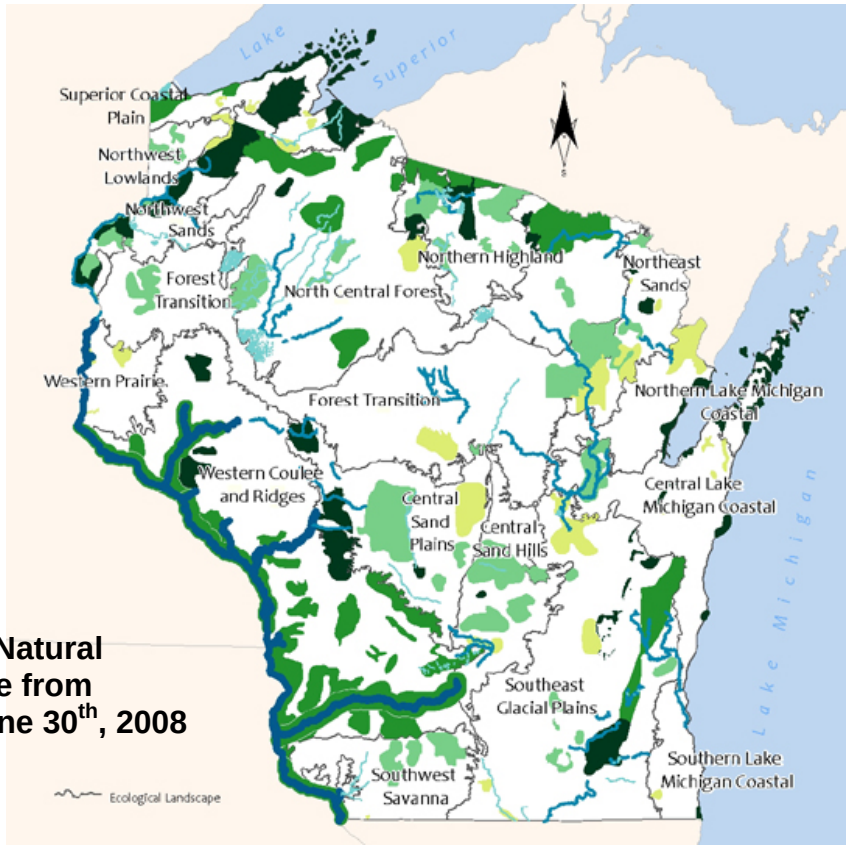
Wisconsin's Wildlife Action Plan (2005-2015)

IMPLEMENTATION: Priority Conservation Actions & Conservation Opportunity Areas



Prepared by:
Wisconsin Department of Natural Resources with Assistance from Conservation Partners, June 30th, 2008

Acknowledgments

Wisconsin's Wildlife Action Plan is a roadmap of conservation actions needed to ensure our wildlife and natural communities will be with us in the future. The original plan provides an immense volume of data useful to help guide conservation decisions. All of the individuals acknowledged for their work compiling the plan have a continuous appreciation from the state of Wisconsin for their commitment to SGCN.

Implementing the conservation actions is a priority for the state of Wisconsin. To put forward a strategy for implementation, there was a need to develop a process for priority decision-making, narrowing the list of actions to a more manageable number, and identifying opportunity areas to best apply conservation actions. A subset of the Department's ecologists and conservation scientists were assigned the task of developing the implementation strategy. Their dedicated commitment and tireless efforts for wildlife species and natural community conservation led this document.

Principle Process Coordinators
Tara Bergeson – Wildlife Action Plan Implementation Coordinator
Dawn Hinebaugh – Data Coordinator
Terrell Hyde – Assistant Zoologist (Prioritization Process Implementation Coordinator)

Lead Scientist
Randy Hoffman – State Natural Areas Ecologist

Science Team

Regional Ecologists
Armund Bartz – West Central Region Ecologist
Catherine Bleser – South Central Region Ecologist
Owen Boyle – Southeast Region Ecologist
Joseph Henry – Northeast Region Ecologist
Ryan Magana – Northern Region Ecologist

Conservation Scientists
Loren Ayers – Research Scientist
Drew Feldkirchner – Conservation Biologist
Christina Isenring – Assistant Ecologist
Rich Staffen – Assistant Zoologist
James Woodford – Conservation Biologist

Terrestrial Opportunity Areas Working Group
Michele Allness – Environment Analysis and Review Specialist
Jerry Bartelt – Wildlife and Forestry Research Section Chief
Eric Epstein – Natural Heritage inventory Ecologist
Vern Everson – Forest Resource Analyst
Colleen Matula – Forest Ecologist
Eunice Padley – Forest Ecologist
Andy Paulios – WBCI Coordinator
Jeff Schimpff - Environment Analysis and Review Specialist
Andrew Stoltman – Science Data Services Specialist

Aquatic Opportunity Areas Working Group
Michele Allness – Environment Analysis and Review Specialist
Jeff Bode – Wetlands Section Chief
Paul Cunningham – Fisheries Ecologist
Bob Dubois – Research Scientist
Paul Garrison - Research Scientist
Joanna Griffin – Fisheries Data Coordinator
Cherie Hagen – Wetlands Team Leader
Bob Hay – Herpetologist
Lisie Kitchel – Freshwater Mussel Specialist
John Lyons – Fish Research Scientist
Bill Smith – Natural Heritage Inventory Zoologist

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Wildlife Action Plan Background:

In 2001, Congress authorized the U.S. Fish & Wildlife Service to implement and fund the State Wildlife Grants (SWG) program, which allows every state and territory to conserve its wildlife resources of greatest conservation need. This program addresses the needs of declining wildlife species before they reach the point of possible listing as endangered or threatened. Wisconsin's first step was to develop a Wildlife Action Plan (WAP). Wisconsin's WAP, titled 'Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need', was completed and approved in 2005. Wisconsin's plan identifies:

1. which **native wildlife species** with low or declining populations are **most at risk** of no longer being a viable part of Wisconsin's fauna (i.e., Species of Greatest Conservation Need [SGCN]),
2. what **habitats** they are associated with,
3. **where they occur** across the state, and
4. a menu of **conservation actions** to be developed into specific on-the-ground projects to "get them off and keep them off" any Endangered or Threatened lists in the future.

Conservation actions that benefit SGCN are important regardless of location, size, or ownership. From a practical standpoint, however, investments will never match the need. To be effective with our limited resources, we must identify actions and locations that increase effectiveness of conservation actions and address multiple species with each action. Further refinement and identification of the highest priority conservation actions and where on the ground they should be applied were recognized as important first steps in implementation of the Wildlife Action Plan.

Wildlife Action Plan Implementation Goals:

- **Focuses** efforts on those native wildlife species that are most at risk of becoming Endangered or Threatened, or are already listed as such by either the state or federal government.
- **Saves** money by working to prevent species from becoming listed as Endangered or Threatened. The Plan identifies proactive steps to take now in order to avoid having to implement expensive actions later needed to recover species when their populations have reached dire conditions.
- **Stresses** the importance of protecting habitat as a means of protecting whole suites of species rather than focusing conservation efforts on individual species.
- **Coordinates and prioritizes** conservation actions that benefit the largest number of SGCN, while providing continued enhancement for other game and non-game species.
- **Provides** a reference document and a dynamic database to support agencies, organizations, and individuals in meeting their conservation goals. The Plan identifies how interests match up with the priority conservation needs described in the document.
- **Builds** partnerships and encourage collaborative approaches to conserving habitats and species at the local level.
- **Adapts** to a changing world. Not only can the database be periodically updated as new data are gathered, but partners and the Department can use the Plan to help react to changing opportunities and threats.
- **Describes** ongoing and future opportunities to monitor SGCN and their habitats as well as establish a process for periodically reviewing and revising the Plan as new information becomes available.
- **Leverages** past efforts to benefit groups of species to ensure Wisconsin remains eligible for federal funding from the State Wildlife Grants Program, and help guide the future allocation of these funds.

The 2007-2008 implementation effort, focuses on identifying Conservation Opportunity Areas (COA) and Conservation Actions that citizens and Department staff believe to be critical to meet the state's long-term goal of conserving our SGCN. The priority conservation actions are our strategy in 2008 given current understanding of ecosystem management, the distribution and abundance of our natural resources, and environmental trends.

First and foremost, the Conservation Opportunities Areas are not a map of places the Department of Natural Resources wants to buy. They are identified as places on the landscape that contain ecological features, natural communities or species habitat for which Wisconsin has a unique responsibility for protecting or contains habitat with dominant responsibility for conservation when viewed from the global, continental or in the upper Midwest perspectives. If we focus our actions in these conservation opportunity areas, we will be most effective and efficient with our limited conservation dollars.

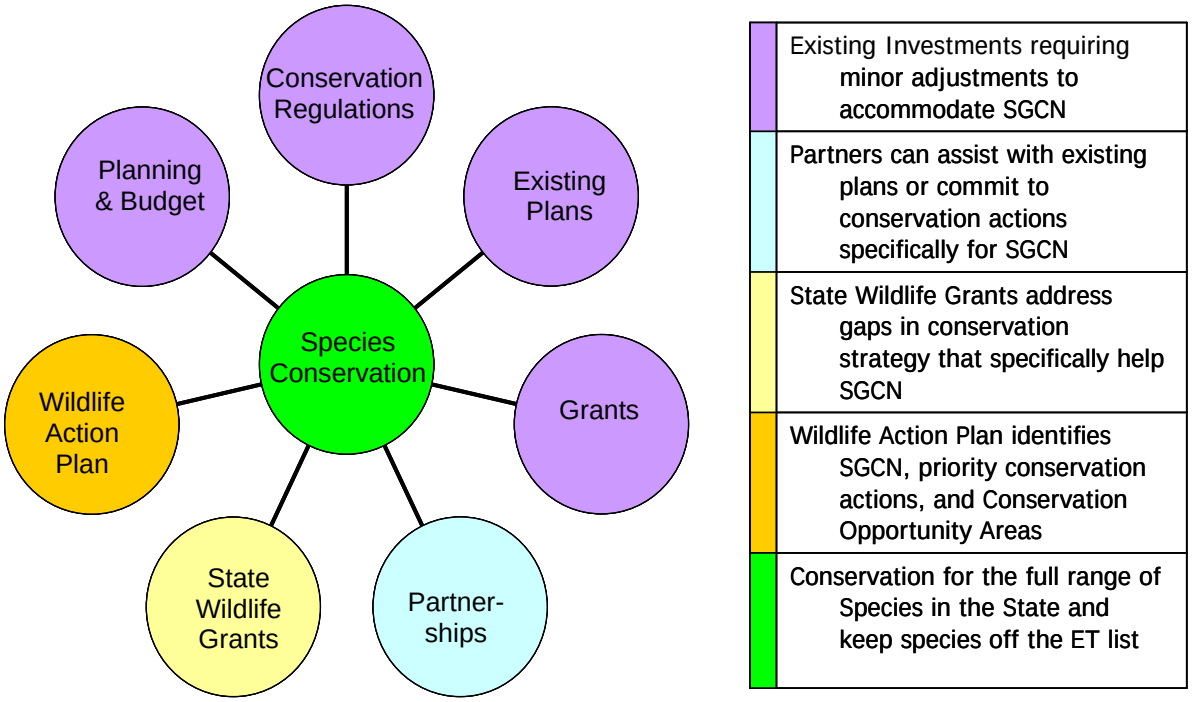
Wisconsin's Wildlife Action Plan (2005-2015)

IMPLEMENTATION: Priority Conservation Actions & Conservation Opportunity Areas

The how or when places in the Conservation Opportunity Areas should be protected or who might take the lead in implementing protection measures is matter of determining the feasibility with public private partnerships. Many partners and stakeholders will need to be intimately involved in evaluating options, opportunities, and conservation actions for these areas. Many of the Conservation Opportunity Areas identified in the Implementation Plan have been the focus of past protection efforts.

WAP priority conservation actions—from over 1700 actions listed—are broad-based, usually focusing on multiple natural communities and species habitats. The plan identifies which priority conservation actions are best suited to address the conservation of SGCN. Several "game" species are listed as SGCN. The listing of those species does not imply that there will be hunting restrictions; their inclusion means that conservation actions should enhance populations and increase hunting opportunities. Another implementation element intends to bring together landowners, nonprofit conservation and recreation groups, local governments, regional planning commissions, businesses, Native American Tribes, state and federal agencies, and others to work together to benefit SGCN.

Finally, this plan is a call to action. It attempts to identify the best places and actions to conserve SGCN, but it does not exclude places or conservation actions from consideration elsewhere. This plan is a dynamic document. We will periodically update the WAP as our knowledge of ecological, social, and economic issues broadens. Certainly, the plan and our implementation actions will need to be evaluated by 2015. It will be left to future generations, however, to measure our success and to judge the overall effects our actions have had on the landscapes we leave behind.



Implementation: Priority Setting Process and Criteria

Goal: Identify the highest priority conservation actions at both the State and Ecological Landscape scales for Species of Greatest Conservation Need (SGCN) and identify geographic areas in which to focus conservation efforts (2008-2015).

I. Gather & Summarize Existing Information

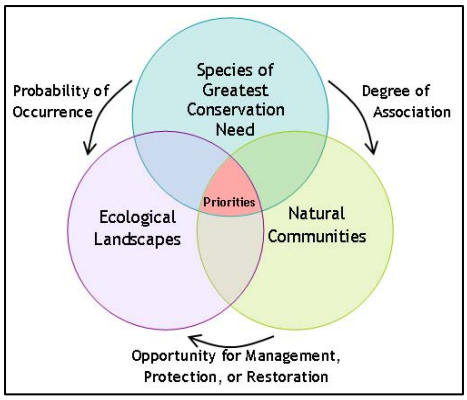
The Wisconsin Wildlife Action plan builds on many prior planning efforts and decades of conservation experience for individual Species of Greatest Conservation Need, natural communities, and Ecological Landscapes. In addition to the information contained in the Plan, past and present conservation efforts and investments in the state were recognized and used as a foundation for future conservation efforts.

a. Summarize the 1700 conservation actions in the Wildlife Action Plan (WAP) into general categories (yellow box)
b. Compile and summarize existing conservation plans which address Species of Greatest Conservation Need (SGCN), and/or identify conservation sites in Wisconsin.
c. Highlight the most imperiled SGCN, using their mean risk scores relative to the scores within their taxa group (Mean Risk is a measure of vulnerability based on rarity, threats, & trends).
d. Identify conservation actions as 'Statewide' if the action requires DNR Secretary or Governor involvement, or if the focus of the action is too broad or cannot be geographically focused at this stage (e.g., species status or inventory).
e. Identify Local & Emerging Issues
f. Use the Wildlife Action Plan (WAP) Ecological Priorities scores to link SGCN and Natural Community actions to specific Ecological Landscapes (see right diagram).

Categories of WAP Conservation Actions	#Actions
Habitat Protection / Landscape Management	597
Enforcement / Regulation / Legislation	220
Research	205
Develop/ Improve Partnerships and Incentives	173
Education	147
Monitoring	95
Planning: Management & Landuse Plans	80
Invasive Species Management	76
Individual Species Strategies	69
Inventory	58

II. Identify Priority Conservation Actions and Compile by Ecological Landscape

Priority conservation actions highlight those of the over 1700 actions listed in the Wildlife Action Plan that are broad-based, usually focusing on multiple natural communities and species habitat. The primary conservation goal of this process is to identify which priority conservation actions are best suited to address and how if implemented can most effectively conserve SGCNs. An additional goal is to provide a common context from which landowners, nonprofit conservation and recreation groups, local governments, regional planning commissions, businesses, the Native American Tribes, state and federal agencies, and others can work together as they approach decisions about conserving SGCN.



Priority Conservation Actions Criteria:

a. Multiple SGCN &/or natural communities positively affected
b. Immediacy of threat (WAP data)
c. SGCN high mean risk score (WAP data)
d. SGCN Wisconsin importance score (WAP data)
e. Actions that target Wisconsin's Significant Ecological Features (blue box)
f. Identified in other conservation plans or initiatives as a high priority
g. Not an existing initiative or otherwise addressed and without current protection or regulation

h. Addresses climate change
i. Repeated Actions (multiple species and communities positively impacted)

Wisconsin's Significant Features [*In-Draft: WDNR Ecosystem Management Planning Team]*

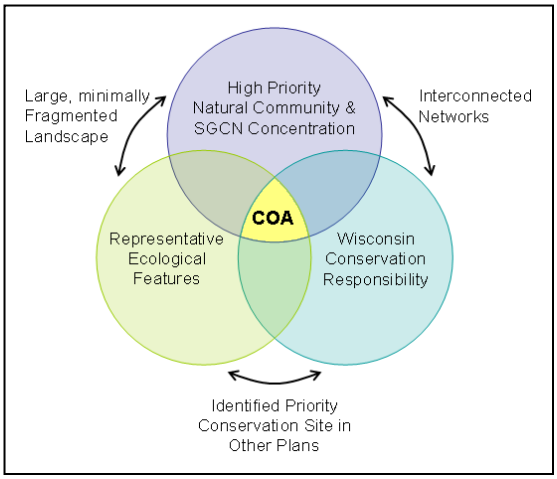
Global Features	Upper Midwest-Regional Features
Great Lakes and their Shorelines	Glacial Lake Wisconsin
No. Highland Kettle Lakes/Pine Forest	Large Blocks of Predominantly Older Nor. Forest
Pine-Oak Barrens	Large Sedge Meadows, Fens, and Prairies
Bur Oak Openings	Caves & Abandoned Mines
Niagara Escarpment	Medium-sized Rivers and Streams
Continental Features	State Features
Driftless Area Features	Extensive Grassland Communities
Large Blocks-OldDeciduous-Coniferous Forest (climate change resistant)	Working Northern Forests Communities
	Floodplain Forest Communities
Boreal Transition Forest	High Quality Wetland Communities
Kettle Moraine Features	Diverse Aquatic Communities
Large River Corridors	Bedrock Communities

III. Map Terrestrial & Aquatic Conservation Opportunity Areas (COA)

Conservation Opportunity Areas (COA) are places on the landscape that contain ecological features, natural communities or SGCN habitat for which Wisconsin has a unique responsibility for protecting or contains habitat with dominant responsibility for conservation when viewed from the global, continental or in the upper Midwest perspectives. If we focus our actions in these conservation opportunity areas, we will be most effective and efficient with our limited conservation dollars. The how or when places in the Conservation Opportunity Areas should be protected or who might take the lead in implementing protection measures is matter of determining the feasibility with public private partnerships. Many partners and stakeholders will need to be intimately involved in evaluating options, opportunities, and conservation actions for these areas.

Conservation Opportunity Area Criteria:

a. Presence of high priority Natural Community and/or species of greatest conservation need (SGCN) concentration
b. Wisconsin's Conservation Responsibility - Representative and significant ecological features (blue box)
c. Identified as a priority conservation site in other initiatives or plans (e.g., Land Legacy, TNC, etc)
d. Establishes an interconnected network
e. Large, minimally-fragmented, ecologically functioning systems



Wisconsin, the setting (adapted from the Wisconsin Land Legacy Report):

The periodic advancement and retreat of continental glaciers shaped our landscape. Over the past 2.5 million years at least a dozen major advances occurred, scouring away vegetation, grinding down mountains, and leaving behind predominately rolling plains with exceptionally fertile and productive soils. Glacial meltwater carved powerful rivers that carved channels and deposited ton after ton of sand and gravel. The last glacier ending in Wisconsin and is a primary reason the state harbors many of the finest examples of glacial landforms in the world. A portion of Wisconsin known as the "Driftless Area" escaped the numerous glacial advances and contains ancient soils and landforms.

The distribution and abundance of plants and animals across the state continues to be determined by environmental factors (e.g. soil, moisture, temperature, and climate), topography, historical events and disturbance patterns both natural and human-induced. Historically, many species reached their range-limits in a narrow band that runs halfway across the state from northwest to southeast. Know as the tension zone, it separates the northern forest from the southern and eastern forest. Also, occurring in conjunction with the southern forest are incursions of western prairie and savanna species proving an ecologically complex and diverse meeting of three biomes in one state.

Wisconsin's forests have seen dramatic changes since the last glacier melted. Early human populations had relatively slight impact on the forests. Conversely, the warming climate permitted a succession progressing from open tundra, taiga, closed spruce-fir forest, pine forest, northern hardwoods with hemlocks and oaks arriving most recently. Small places in the "Driftless Area" harbored conditions that permitted many of the north advance plants and animals to hold on for millennia. The opening of Wisconsin for European style agriculture and supplying lumber for a burgeoning population provided the conditions for massive utilization of our forests. Fortunately, a few areas escaped the original harvest and many of the forested acres have recovered enough to provide habitat for numerous wildlife species.

Wisconsin has a rich diversity of wetlands that play a critical role in our environmental quality and ecological health. Examples of wetlands include marshes, ephemeral wetlands, sedge meadows, bogs, beaver ponds, fens, wet shrub areas and forested wetlands. Wetlands are found throughout the state, although the largest concentrations are in northern, eastern and central Wisconsin. Over the years, Wisconsin has lost nearly one-hale its wetlands. Since 1985, a shift in federal policy regarding wetland drainage and a subsequent state adopted wetland water quality standards; there has been a dramatic slowing of wetland loss. The nearly 5 million acres of remaining wetlands still suffer a number of impacts such as fragmentation, invasive species, impaired hydrologic function and sedimentation to name a few.

Wisconsin's water resources play a vital role in the state's economy, ecology, and the way of life. With over 44,000 miles of rivers and streams, over 15,000 lakes, 800 miles of Great Lakes coastline, and over 250 miles of Mississippi river frontage, Wisconsin lives up to its Ojibwe name of "gathering place of waters." Our lakes and streams are without question, one of Wisconsin's most distinguishing characteristics and ecologically valuable resources. Water quality in many of our rivers has been steadily improving as pollution from "point sources" has been substantially lowered since the 1970s. However, significant challenges remain, especially non-point pollution, in achieving our water quality goals.

Wisconsin's Ecological Conservation Role

The state has a long history of natural resource conservation. Parks and Forests have over 100 years of conservation efforts resulting in permanent protection of some of our most treasured natural resources, such as Interstate Park, Peninsula State Park, Devils Lake State and the Northern Highland American Legion State Forest. Our fish and wildlife programs have been conserving and enhancing game and sport fish for more than 75 years, which also have had spin-off benefits for non-game species. Our State Natural Areas Program that provides ecological reference areas and protection of rare natural community and plant habitat is more than 50 years old. Endangered and threatened species legislation in the 1970s provided legal protection for rare species. Our waters and wetlands programs have extensive focus in the past 25 years.

These programs and their conservation activities have provided stability for many of Wisconsin's species. In concert with federal legislation and agency cooperation, many of our species have seen great enhanced populations over the years. For example, the Pittman-Robertson and Dingall-Johnson pieces of legislation provided funding sources to address the dire needs of waterfowl and sport fisheries more than sixty years ago. These funds focused on certain

groups of species, but included benefits for many other species occupying the same or similar habitats. For instance, wetlands provided for duck production also enhanced populations of other marsh birds. Purchase of spawning wetlands for northern pike, also provides habitat and structure for forage fish and amphibians.

The Wildlife Action Plan strives to build on the back of past conservation, but understands that some species have had little previous emphasis. The federal legislation also encourages states to be effective in their activities. Addressing the gaps becomes a function of understanding the primary responsibility of any state for a species, natural community of ecological landscape.

The Department's ecology staff asked a few basic questions. Is a natural community, ecological feature, or species uniquely restricted to Wisconsin? If so, then, we have the unique role of assuring its future. Does Wisconsin have a significant proportion of a feature, natural community or species population in the state? If so, then Wisconsin has a dominant role in assuring its future. Does Wisconsin have special partnerships, funding sources, or existing programs that are especially effective in conserving natural communities and species habitat? If so, then Wisconsin should pursue those opportunities. For a natural community or species population, will Wisconsin be important as a refuge or provide a migration corridor in the light of climate change? If so, then Wisconsin may provide a needed role in assuring a future.

Significant Ecological Features for Wisconsin

The ecological features described here are those for which Wisconsin has an opportunity and responsibility in helping maintain regionally, continentally, and globally significant populations and/or natural communities. This information, along with maps identifying locations in Wisconsin where these features occur, was used to help set priorities for the State Wildlife Action Plan.

Globally Important Resources in Wisconsin

Great Lakes and their Shorelines.

The Great Lakes are the largest freshwater lakes in the world. Great Lakes shorelines support a diverse and distinct mosaic of natural communities and many regional endemic species. Lake Superior has important fisheries and bird habitat (e.g. lake trout and whitefish spawning and nesting piping plovers). Lakes Superior and Michigan and their shorelines are important migratory bird corridors and provide habitat for wintering waterfowl. The Apostle Islands have exceptional examples of old growth forests, beach and dune complexes, coastal wetlands, and bedrock features. There is a tremendous regional repository of rare biota and intact natural communities here. The freshwater estuaries on the southwest shore of Lake Superior are in relatively good condition (some are "pristine") and unique. Many other Great Lakes estuaries, especially to the east of Wisconsin on the "lower" lakes, are degraded due to poor water quality, development, and serious infestations of invasive species. Ridge and swale complexes are unique features of the Great Lakes shorelines, contain diverse assemblages of natural communities, and are especially prominent along Lake Michigan. The lakeplain prairie complex on southwestern Lake Michigan is the only non-forested ridge and swale system in the state and includes Chiwaukee Prairie. "Sandscapes" (these include sandspits, coastal barrier spits, cuspate forelands, and tombolos) protect a diverse array of important natural communities and provide critical habitat for rare species (e.g., Piping Plover). Major concentrations of migratory birds occur on some of these sandscapes, especially the coastal barrier spits such as Long Island and Wisconsin Point. The Door Peninsula and Grand Traverse Islands have high concentrations of rare species associated with the calcareous soils and exposures of dolomite that characterize shoreline environments. Some "maritime" forests on the mainland and on offshore islands are of high quality.

Northern Highland Kettle Lakes and Pine Forest.

This sandy outwash plain has one of the highest densities of glacial kettle lakes in the world. It is a complex heterogeneous landscape of forested uplands, diverse wetlands, and many lake types. Some lake types, unmanipulated spring ponds, and undeveloped connecting streams, are now quite rare. Some rare lake types feature clear circumneutral water, hard bottoms, exceptionally low nutrient levels, and support rare invertebrates and fish species that are far better represented in this Landscape than anywhere else in the state. Some lakes and low gradient streams support wild rice beds, which are important both ecologically and culturally.

The pine-dominated dry-mesic forests that occur here are different than the matrix of hemlock-hardwood forest that historically vegetated most of northern Wisconsin and surrounds the Landscape. This is the best place in Wisconsin to practice large-scale white pine/red pine forest management, with opportunities to represent all age classes and patch sizes, including those which are currently scarce or absent. Natural red pine forest is at the center of its continental range here, (which is limited to the northern Lake States, Ontario, and the Appalachian Mountains). Wildlife species associated with coniferous forests are especially well-represented here.

Pine-Oak Barrens.

Pine barrens found in Wisconsin are globally significant due to their distinctive ecological characteristics, restricted range, and rangewide rarity. Their species composition differs from the New Jersey pine barrens (which are pitch pine-dominated and well east of the range of many of the prairie species that are so important in the Upper Midwestern barrens). Elsewhere in the upper Midwest, pine barrens are degraded or the remnants small, offering limited opportunities for restoration or management. Wisconsin pine barrens support a high number of rare species, including some that are globally rare (such as the federally endangered Karner blue butterfly and the Kirtland's Warbler), and many on the state list of Species of Greatest Conservation Need. Pine barrens in Wisconsin are dynamic and highly variable fire-driven ecosystems, and can be managed for a continuum of natural structurally distinct community types from semi-open brush prairie, to savannas with scattered trees, to closed canopy dry forest.

Bur Oak Openings.

The Great Plains has savanna communities all along its eastern edge, but those farther south and west are much different than those in Wisconsin. The Nature Conservancy called the savanna found in southern Wisconsin the "northern bur oak opening". This savanna type occurs from central Illinois in a thin strip into Minnesota. The type has a limited range, and Wisconsin is the center of the feature and has the best opportunity for restoration, especially at larger scales. The Southern Unit of the Kettle Moraine State Forest, portions of the Central Sand Hills and Central Sand Plains, and some places in the Western Coulees and Ridges Ecological Landscape, are areas where significant management opportunities exist for this globally rare community. Some of today's scrub oak barrens, or brush prairie communities, were historically Pine Barrens that lost their coniferous component and have been partially restored through mechanical and chemical reduction of woody cover and frequent prescribed burning. "Scrub" oak savannas with short, brushy structure, composed primarily of black and northern pin oaks, could be restored in the Central Sand Plains, Northwest Sands, and Northeast Sands Ecological Landscapes.

Niagara Escarpment.

The Niagara Escarpment is a bedrock feature composed mostly of Silurian dolomite (strictly speaking, it's the steep, exposed side of a gently sloping bedrock ridge or "cuesta") that stretches from Lake Champlain in the northeastern United States westward across the Great Lakes to Wisconsin. Here the Escarpment is exposed from the islands off of the northern tip of the Door Peninsula southwest for over 150 miles into southeastern Wisconsin where it disappears beneath glacial deposits. The Escarpment supports many rare species, most notably a group of globally rare snails, the oldest trees known in Wisconsin, karst topography, and contains important hibernacula for bats. It has value for migratory birds and bats by providing updrafts and generally north-south 'leading line'. Rare or otherwise important natural communities and habitats associated with the Escarpment include dripping cliffs, dry cliffs, talus slopes, unusual conifer forests that contain the state's oldest trees, and, at one site on the Door Peninsula, the globally-rare alvar community.

Continentally Important Resources in Wisconsin

Driftless Area Features.

The Driftless area occurs in southeast Minnesota, northeast Iowa, and northwest Illinois, however approximately 75% of the Driftless Area is in Wisconsin. Unlike most of Wisconsin and the Upper Midwest, the topography here formed over millions of years without glaciation, and is characterized by deep erosional valleys, exposed bedrock-controlled ridges, steep forested side slopes with strong aspect differences that support high species and community diversity, and landscape heterogeneity. The rugged topography led to greater abundance and persistence of remnant community types that have been destroyed or more greatly diminished elsewhere. Forest

cover is relatively extensive compared to other parts of southern Wisconsin. Natural community types and habitats that are especially well-represented here are oak forests, mesic maple-basswood forests, floodplain forests, hemlock and pine "relicts", algific talus slopes, dry (goat) prairie, caves (and abandoned mines) with bat and herptile hibernacula, cliffs and associated rare plants and snails, and spring-fed cold-water streams. The lower reaches of several of Wisconsin's largest rivers occur here including the Wisconsin, Black, and Chippewa Rivers which all flow into the Mississippi River. These river systems are associated with broad floodplains, containing extensive floodplain forests, marshes, and oxbow lakes. Where these are associated with large blocks of upland forest, the diversity of forest dependent wildlife is especially high and many rare species are present. The largest stand of southern bottomland hardwoods in the upper Midwest is located along the Lower Chippewa River.

Large Blocks – Old Deciduous-Coniferous Forest (climate change resistant forest systems)

Large contiguous blocks of this forest type are embedded in a relatively unbroken forested matrix. These deciduous-coniferous forests have some of the most diverse assemblages of breeding birds on the continent. This strip of habitat stretches from Algonquin Park in Ontario to central Minnesota but does not extend very far north or south. Wisconsin is in the heart of this high diversity bird area. These forests are centers of abundance for many species, and are believed to be a source area for broadly distributed species. Distribution maps of many warbler species follow the same boundary and are associated with this forest. Locations in Wisconsin where these forests are extensive and offer good opportunities for large-block management are the Winegar Moraine and Penokee Range.

The Baraboo Hills occur on an outcrop of a unique quartzite formation, and also represent a part of the largest remaining block of dry-mesic and mesic forest in southern Wisconsin. The area has a high diversity of species and is considered one of the state's most important breeding sites for area-sensitive birds, especially those associated strongly with "southern" hardwood forests and Driftless Area conifer "relicts". The best of the conifer stands are imbedded within a matrix of extensive hardwood forest, and are often associated with deep gorges cut through the bedrock by intact and ecologically important headwaters streams. The Baraboo Hills support a wealth of rare species and natural communities, and have been a major focus of conservation efforts for many decades. The unique geological features have attracted worldwide attention.

Boreal Transition Forest.

This forest type is only seen in parts of the coastal strip of Michigan and Wisconsin along the Lake Superior clay plain. It is not found in Minnesota. It is an edaphic feature associated with the local climate and has very different properties from the boreal forests in Canada. Wisconsin historically had white pine and white cedar abundantly represented in this community type, but virtually no primary forest is left. It was heavily converted and much of the area is still managed for aspen. The Lake Superior Clay Plain forest differs from boreal transition forests in Door County. In Door County, the overstory is similar, but the substrate consists of shallow soils over dolomite bedrock, and the ground flora includes Great Lakes shoreline specialists and calciphiles. In the Lake Superior Clay Plain the substrate is mostly deep lacustrine clay soils. Clay soils also have a high calcium status but are relatively impermeable to moisture infiltration, resulting in more wetland-like conditions. The Lake Superior forest has some boreal species not found on Door Peninsula. This area is important to boreal birds in Wisconsin. Climate change modeling suggests that areas next to the Great Lakes may retain the current climate the longest and might be places to concentrate efforts for protecting examples of temperate community types. The "snowbelt" along the Great Lakes may be the best place to manage for hemlock and other species requiring cool climates and constant, relatively high moisture levels.

Kettle Moraine Features.

This is a large glacial interlobate moraine starting east of Lake Winnebago and running southwest for almost 90 miles into southern Wisconsin. It features rugged topography and contains many glacial features such as kames, drumlins and eskers. The vegetation is a complex mosaic of savanna, prairie, sedge meadow, marsh, calcareous fen, and southern forest communities. Presently it is a large forested block in the midst of agricultural lands. Michigan has some similar topography but the interlobate moraine in Wisconsin was less suitable for conversion to agriculture than other regions and many of the natural features that have persisted here have all but disappeared elsewhere. Interlobate moraines with this combination of natural features at this scale are very rare, and possibly restricted to just a few locations in the Upper Midwest.

Large River Corridors.

Wisconsin has a large number of lakes, rivers, and streams. Large rivers such as the Upper Mississippi, Wisconsin, Chippewa, Black, St. Croix, Brule, Wolf and Namekagon, Rivers are significant. An abundance of smaller coldwater streams emanating from glacial moraines and sedimentary bedrock in the unglaciated Driftless Area also occur here. The lower Wolf River is considered to be one of the few remaining rivers with a high degree of natural meandering which is needed by some aquatic species. The Winnebago pool lakes have a very significant population of the lake sturgeon. These waters contain significant populations of fish and rare invertebrates such as mussels and dragonflies, and the larger waterbodies also serve as major migratory bird stopover areas.

Upper Midwest Regionally Important Resources in Wisconsin

Glacial Lake Wisconsin.

This area in central Wisconsin is in and around the bed of extinct Glacial Lake Wisconsin and is a biodiversity hotspot. The feature occurs in the Tension Zone and supports a unique mixture of southern and northern species. Many SGCN, especially habitat and area-sensitive species, thrive in the area. Wet-mesic white pine-red maple forests are found here, which support many sensitive species, and have few if any extant occurrences elsewhere in the Upper Midwest (those in Michigan were cut and have not been restored). Large expanses of dry forest and barrens occur here and the potential for barrens restoration is high. This is one of the two best places in the state and continent to manage for Midwestern barrens vegetation and its associated species. The state's largest area of contiguous wetland occurred here - 'The Great Swamp of Central Wisconsin' – and there are large expanses of wetlands remaining, though many have been altered hydrologically by ditches and dikes. Sandstone buttes, mesas, cliffs, pinnacles, and gorges occur here; some with rare species. These features do not occur in other parts of the Upper Midwest.

Large Blocks of Predominately Older Northern Forest.

The Blue Hills have quartzite bedrock and are similar in some ways to the Baraboo Hills. The area supports large blocks of relatively unfragmented forests. The high-gradient, softwater streams drain intact, forested watersheds, have significant diversity values, and look similar to mountain streams. The area contains unique geological features especially the Felsenmeers ("sea of rocks"), which consist of extensive slopes of open, shattered quartzite talus with unusual lichen communities and dramatic cold air drainages which are responsible for the presence of several notably disjunct northern species.

The Menominee Reservation has vast relatively unbroken hemlock-hardwood forests, scattered lakes, and ecologically important streams within forested watersheds. Large white cedar swamps are common in the eastern portion, where marl lakes supporting calciphilic plants occur. Prominent exposures of granitic bedrock occur along the Wolf River. Most of the forest is older than average for the state and supports significant populations of forest interior species that have become scarce in forests elsewhere.

Other northeast Wisconsin Forest have rock outcrops, rivers, and extensive forests, some with bedrock close to the surface including cliffs, talus slopes, and glade communities. It needs more study as to its regional importance.

Large Sedge Meadows, Fens and Prairies.

Although most of the tallgrass prairie has been lost, Wisconsin has some significant prairie remnants. Avoca Prairie is the largest contiguous prairie east of the Mississippi River. Scuppernong Prairie and Military Ridge have significant numbers of remnants and have very good potential for restoration. Chiwaukee Prairie is the largest wet-mesic prairie in the state. These remnants have high prairie species diversity. Among the largest concentrations of bluff ("goat") prairies in the Upper Midwest occur in Wisconsin's portion of the Driftless Area. Many of these are associated with significant stands of oak forest and restorable oak savanna. The bracken grasslands occurring at Spread Eagle are part of this category.

Wisconsin has a large number of wetlands covered under the heading sedge meadow, especially floodplain forests, marshes, and peatlands (however, Minnesota and Michigan also have many peatlands; Michigan has patterned peatlands that are more diverse) and to a lesser degree, fens, and prairie wetland types. Wetland loss

in neighboring states has been greater than Wisconsin's on a percentage basis. Cedar swamps are common in some parts of the state and harbor many rare plants.

Caves and Abandoned mines.

Wisconsin has several caves and abandoned mines that have become hibernacula for large populations of bats. Neda Mine is considered to contain the largest number of hibernating bats in the Midwest. Even though many parts of the mine were inaccessible for censusing, the population was estimated to include at least 300,000 little brown bats (*Myotis lucifugus*), and hundreds of northern long-eared bats (*Myotis septentrionalis*), eastern pipistrelles (*Pipistrellus subflavus*) and big brown bats (*Eptesicus fuscus*) (Altenbach, unpublished data, 1995). Other abandoned mines known to harbor large numbers of hibernating bats occur along the Mississippi River and in the Penokee Range of far northern Wisconsin. Driftless Area caves also support bat hibernacula.

Medium-sized Rivers and Streams.

These waters contain significant populations of fish and rare invertebrates such as mussels and dragonflies, but have fewer species than the larger waterbodies. River systems such as the Wolf, Jump, Bark and Namekagon fall into this category. They also serve as major migratory bird stopover areas and often times harbor significant streamside natural communities.

The combined relevance of the fore mentioned ecological role goes well beyond our borders. Global, continental and upper Midwest features of importance, for which Wisconsin has a major role to play in the continued existence of a natural communities or species, indicates they should be our foremost conservation priorities. If we don't do it here, then conservation probably will not get done elsewhere and species will suffer the consequences of our actions (or inaction).

State Important Resources in Wisconsin

Even though other natural communities and species ranges may be better addressed elsewhere, we cannot assume they will. We also, have a responsibility to keep natural communities and species native to the state for future generations. Natural community assessments describing the importance in maintaining community types, assess their current condition in the state, and identify opportunities for managing the community type form the basis for additional high priority areas within the confines of the state. These highly rated natural communities and species are also considered priorities in the state.

Extensive Grassland Communities.

Native communities (prairies, sand barrens, and fens) and non-native grasslands such as pastures, hay fields, etc. make up the grassland communities. Wisconsin has some of the best opportunities in the Midwest to preserve and restore tallgrass prairie, and provide habitat for Henslow's Sparrow.

Working Northern Forest Communities.

The 37 counties north of the Tension Zone have about 70% of the state's forested area. The area was drastically disturbed during the Cutover Period (1870 – 1930) and by subsequent fires. Currently maple-basswood and aspen-birch are the two most common forest types. Wisconsin is now one of the nation's top two forestry production states, and forestry is the largest employer in 27 northern forest counties. These large expanses of forest provide habitat for some of our most beloved species such as Ruffed Grouse, Scarlet Tanager, Black Bear, and White-tailed Deer. These species thrive precisely because we have abundant habitat for them. Most places need not be identified for changes in focus, because they are accomplishing many conservation goals with existing direction, but other areas harbor large blocks of mature forest, forested wetland, conifer uplands, or beech-hardwood forest where tweaks in management direct could enhance the viability for several SGCN.

Floodplain Forest Communities.

A mix of hardwoods and wetlands characterize floodplain forest. Smaller patches along mid sized streams harbor some species not found in the forests along the major river ways. Fragmentation by agriculture, water

impoundment, and development has reduced connectivity. Patch size is shrinking, and invasive species are an increasingly serious problem. With these combined factors, a few smaller floodplain forest systems merit priority to focus on resolving the threats and enhancing the potential the species will still be with us in the future.

High Quality Wetland Communities.

Many different kinds of wetland communities have water-saturated soils or other substrates as their common characteristic. Ecological functions and food web relationships are different in wetlands than uplands. In Wisconsin 46% of the original wetlands were lost between 1780 and 1980. Wetlands are used by 43% of all federal listed threatened and endangered species and 32% of the state threatened/endangered species. Large patches of intact ash swamps or even disturbed, ditched and diked wetlands, such as Crex Meadows and Horicon Marsh provide habitat for and often times the largest populations of SGCNs in the state.

Diverse Aquatic Communities.

The amount and high quality of Wisconsin's water resources is rare on a global scale. It ranges from small ephemeral ponds to the largest freshwater lake by surface area in the world, and includes a plentiful supply of groundwater. Runoff pollution, urbanization and development, recreation, fish stocking and harvest, and exotic species invasions are significant threats. Large river systems harbor a vast majority of the aquatic diversity, but several reaches of mid-sized streams provide habitat for specialized species.

Bedrock Communities

These small areas of the landscape often times harbor rarely found or unique species occurrence due to the specialized habitat and harsh growing conditions. Bedrock communities can take the form of relatively flat glades communities, buttes and mesas, or steep-walled gorge communities.

Priority Conservation Actions Tied to Conservation Opportunity Areas

Focus habitat work in on the natural communities that Wisconsin has an especially significant role in perpetuating the ecological features, natural communities, and species habitat. For Wisconsin, the ecological features listed above harbor pine-oak barrens, bur oak openings, warm water rivers, Great Lakes shoreline and estuarine communities, large sedge meadows, dry prairies, large blocks of older southern oak forest and woodland, large blocks of older northern forests, floodplains – including forests and backwaters, and cliffs/karst features of the Niagara Escarpment. Specific conservations actions include:

Global

Great Lakes and their Shorelines

Including dune, beach, forested ridge and swale, boreal forest (restoration sites), shore fens, and estuaries.

- Protect and restore harbor and river mouth shoreline and wetland habitats.
- Preserve and maintain large expanses of sedge meadow, coastal fen and forested wetlands along the coast and manage in the context of a mosaic of community types.
- Monitor community level vegetation changes within coastal fen in light of climate change and lowering lake levels.
- Protect intact examples of forested ridge and swale sites, monitor for invasive exotic species and implement an eradication plan.
- Increase representation of near-shore boreal forest by encouraging retention of white spruce, white pine, white cedar, and balsam fir, especially in older age classes, by adaptive management and selective planting.

Northern Highland Kettle Lakes and Pine Forest

Including hemlock-hardwoods and forested wetland types in north central and pine forest in Northern Highland.

- Develop tax incentives to preserve old-growth forest.

- Manage forest adjacent to old-growth stands and ephemeral ponds to complement the ecological values of the primary feature.
- Work towards a balanced mosaic of age-classes; older age-classes are currently underrepresented.
- Increase representation of red and white pine forests, especially older age classes.
- Use adaptive management techniques to develop pine dominated forest structure and composition.
- Develop techniques for using prescribed fire to reduce other woody competition when establishing and maintaining red and white pine forests.
- Develop educational tools and demonstration areas to articulate the benefits of utilizing prescribed burning for ecological management.
- Develop reliable natural regeneration techniques for red pine and mixed red and white pine forests.

Pine-Oak Barrens

- Create financial incentives to develop jack pine – northern pin oak forests.
- Create financial incentives to address differential market values between plantation forestry and natural regeneration dry forests, for retention of old-growth patches, or prescribed burning in and around core managed areas.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other barrens management practices.
- Manage the full range of barrens succession stages and diverse habitats in a landscape context. A comprehensive landscape plan requires identification and management of early succession cores. The "barrens" also needs to have places managed in a shifting mosaic utilizing timber harvest with many clearcuts, some older than rotation age stands, some thinning of stands for savanna structure and a few protected groves. Many stands should be thinned to a safe amount of residual standing timber, and then burned for stand regeneration while leaving charred legacies. A few selected shallow, publicly owned lakes should have plans for open shorelines on the west and south sides.
- Identify additional sites containing high quality or restorable barrens.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of barrens ecosystems.
- Integrate planning efforts across federal, state, county, local and industrial ownership boundaries.

Bur Oak Openings

- Focus management and restoration efforts in the southern Kettle Moraine conservation opportunity area to emphasize oak openings, oak woodland and low prairie communities with smaller patches of dry prairie, open marshy wetlands, and patches of older closed canopy forest.
- Focus management and restoration efforts in the sandstone-influenced conservation opportunity areas to emphasize oak barrens, oak woodland and sand prairie communities with smaller patches pine relicts, dry prairie, open shrubby barrens, closed canopy oak forest, and rock outcrops.
- Create financial incentives similar to the either the Farmland Preservation Program or Managed Forest Law to protect and manage high quality examples of dry prairie, oak opening, oak woodland or retention of old-growth patches including hemlock and pine relicts, on private land.
- Create financial incentives similar to the Wisconsin Forest Landowner Grant Program (WFLGP) to address the differences in market values between oak savanna restoration and oak forest management or prescribed burning in and around prairie and savanna managed areas.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other prairie and savanna management practices.
- Identify additional sites containing high quality or restorable oak barrens, oak savannas and woodlands.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of oak savanna ecosystems.

Niagara Escarpment.

- In the Niagara Escarpment Conservation Opportunity Area, encourage public and private landowners to maintain natural forest cover, protect surface areas that drain into natural fissures, minimize pesticide infiltration, and do not physically block sinkholes.

- Preserve habitat and protect from conversion to other land uses, those unique areas on the Niagara Escarpment currently occupied by SGCN species.
- On Wisconsin's only large alvar, minimize impacts from quarrying, road construction, and housing development by acquisition of fee title, development rights, transfer of development rights, and zoning.
- Manage alvars by thinning densely vegetated areas and removing aggressive exotic shrubs.

Continental

Driftless Area Features

- Focus management and restoration efforts in the loess-influenced forest Conservation Opportunity Areas to emphasize a matrix of older oak-central hardwood forest with smaller patches of oak woodland, oak opening, regenerating younger forest, native prairies and relict forests.
- Focus management and restoration efforts in the sandstone-influenced Conservation Opportunity Areas to emphasize dry oak savanna, oak woodland and sand prairie communities with smaller embedded patches containing regenerating oak forest, pine relicts, dry prairie, open shrubby barrens, closed canopy oak forest, and rock outcrops.
- Create financial incentives similar to the either the Farmland Preservation Program or Managed Forest Law to protect and manage up to 20,000 acres of high quality examples of goat prairie, oak opening, oak woodland or retention of old-growth patches including hemlock and pine relicts, on private land.
- Create financial incentives similar to the Wisconsin Forest Landowner Grant Program (WFLGP) to address the differential market values between oak savanna restoration and oak forest management, reforestation of old fields to reduce fragmentation, or prescribed burning in and around prairie and savanna managed areas.
- Restore oak openings and woodlands and expand and enhance goat prairie and shrub habitats on public lands in appropriate Conservation Opportunity Areas through fire, ground layer enhancement, and timber management.
- Develop incentives for the start-up cost of converting from row-crop agricultural systems to a rotational grazing or biofuels production systems, which will keep permanent cover on the land, provide grassland habitat and significantly reduce soil loss into streams.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other prairie and savanna management practices.
- Identify additional sites containing high quality or restorable oak barrens, oak savannas and woodlands.
- Zoning of blufflands needs to recognize the critical importance of maintaining goat prairies, oak savanna restoration opportunities, connecting habitat corridors, migratory bird stopover sites, and forested habitat is essential for long-term maintenance of viable SGCN populations.
- Partnering with prairie/savanna/forest restoration groups to manage and protect habitats is vital to effectively keep SGCNs on the landscape.
- Conduct large-scale planning efforts with agencies, state government and partners regarding the upper Mississippi River and its adjacent blufflands.

Large Blocks – Old Deciduous-Coniferous Forest (climate change resistant forest systems)

Baraboo Hills and Boreal Forest Transition

- Develop tax incentives to preserve old-growth forest.
- Manage forest adjacent to old-growth stands and ephemeral ponds the complement to the ecological values of the primary feature.
- Work towards a balanced mosaic of age-classes; older age-classes are currently underrepresented.
- Encourage regeneration or reestablishment of eastern hemlock, Canada yew, yellow birch, white cedar, and other conifer, where appropriate through adaptive management techniques.
- Increase representation of red and white pine forests, especially older age classes.
- Conduct an inventory and map the locations of ephemeral ponds.
- Conduct additional survey work in northern wet forest for boreal birds, invertebrates and other taxa.
- In areas free of exotic earthworms, minimize the likelihood of invasion by earthworms by preventing transportation of worms in soil, potted plants, mulch and compost.

Kettle Moraines Features

Concentrations of calcareous fens, prairies, oak woodlands, oak/central hardwood forest, forested wetlands, and glacial features.

- Focus management and restoration efforts in the middle and north Kettle Moraine areas forest conservation opportunity areas to emphasize a matrix of older oak-central hardwood forest with smaller patches of oak woodland, oak savanna, native prairies and relict forests.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of dry oak forest and oak savanna ecosystems.
- Develop cost share incentives for landowners to burn, eradicate invasive exotic species, and restore oak openings and forests, prairies, fens and sedge meadows.
- Preserve and manage all wet-mesic prairie sites, restore degraded sites (emphasizing restoration of hydrology), and manage the sites in a matrix of surrogate grasslands and other shrub and savanna habitats for area sensitive species.
- Promote private land management of small sites where possible by offering incentives to private landowners for preservation or restoration of prairies.
- Monitor wet-mesic prairies to determine whether prescribed burning and other management activities are maintaining invertebrate diversity.
- Preserve and manage all wet-mesic prairie, calcareous fen and tamarack fen sites; restore degraded sites (emphasizing restoration of hydrology), and manage the sites in a matrix of sedge meadow, surrogate grasslands and other shrub and savanna habitats for area sensitive species.

Large River Corridors, including floodplain forests and backwater areas

- Protect the ecological river corridor gradients from lowlands to uplands, along with protection of the floodplain corridor. This will enlarge the amount of habitat available, allow for the movement of species upslope and downslope as environmental conditions change over time, provide suitable habitat for species that require large areas, provide migratory bird stopover habitat, or are dependent upon a mosaic of interconnected habitats, including a full range of seral stages for their long-term survival.
- Conduct large-scale planning efforts with agencies, state's and partners regarding the upper Mississippi River, its large river tributaries and the adjacent blufflands.
- Manage the sand and gravel-influenced floodplains of the Lower Chippewa and Lower Black Rivers for floodplain savanna conditions to help the recovery of Eastern Massasauga Rattlesnake.
- Manage appropriate native sand prairie and sand prairie restoration sites for nesting Ornate Box and Blanding's Turtles.
- Monitor long-term population status and trends for Eastern Massasauga Rattlesnake.
- Continue head starting program for Ornate Box Turtles.
- Conduct research on the interspecies competition between increasing "channel" shiners and the greatly decreasing Pallid Shiner.
- Protection and restoration of natural lake and stream habitat, including establishment of refuge areas and appropriate management of aquatic plants, are needed for conservation of the Pugnose Shiner, which requires clear waters and littoral zone vegetation.
- Protect and restore appropriate habitat in the lower Wolf River, Mississippi and Lower Wisconsin Rivers for Shoal Chub.

Upper Midwest

Glacial Lake Wisconsin.

- Maintain large blocks of open bog/muskeg habitat and other surrounding wetlands and manage as co-occurring peatland communities by maintaining hydrology and eradicating invasive plant species.
- Maintain large blocks of open sedge meadow and manage as complex in conjunction with associated wetlands such as open bog, poor fen, emergent marsh, shrub-carr, alder thicket and northern wet forest by maintaining hydrology, tree cutting and harvest, prescribed fire and eradicating invasive plant species.

- Maintain lowland shrub communities, especially alder thickets and shrub-carr, and manage the working forest surrounding the shrub communities to benefit Golden-winged Warblers by leaving scattered off site aspen, ash and tamarack in the shrub areas and manage the uplands in a shifting mosaic to provide continuous habitat.
- Survey large peatlands for presence of boreal birds, Lepidoptera and other boreal taxa.
- Restore oak barrens on sites that will increase effective landscape for area sensitive species, such sand areas between large wetlands.
- Manage oaks in the context of oak forest, oak woodland, oak savanna in a gradient from forest to open wetlands.
- Maintain or restore mixed pine-oak forests to represent the range of variability expressed by this type, in a range of patch sizes and age classes.
- Identify and restore oak/conifer barrens and shrub habitats through fire and timber management.

Large Blocks of Predominately Older Northern Forest – Blue Hills and Northeast Wisconsin Forests

- Develop tax incentives to preserve old-growth forest.
- Manage forest adjacent to old-growth stands and ephemeral ponds the complement to the ecological values of the primary feature.
- Work towards a balanced mosaic of age-classes; older age-classes are currently underrepresented.
- Encourage regeneration or reestablishment of eastern hemlock, Canada yew, yellow birch, white cedar, and other conifer, where appropriate through adaptive management techniques.
- Increase representation of white pine forests, especially older age classes.
- Develop reliable natural regeneration techniques for mixed white pine-hardwood forests.
- Conduct an inventory and map the locations of ephemeral ponds.
- Conduct additional survey work in northern wet forest for boreal birds, invertebrates and other taxa.
- In areas free of exotic earthworms, minimize the likelihood of invasion by earthworms by preventing transportation of worms in soil, potted plants, mulch and compost.

Large Sedge Meadows, Fens, and Prairies

- Maintain large blocks of habitat; manage complexes of sedge meadow in conjunction with associated wetlands such as open bog, poor fen, emergent marsh, shrub-carr, alder thicket and northern wet forest where possible.
- Maintain large blocks of open bog/muskeg habitat and other surrounding wetlands and manage as co-occurring peatland communities.
- Where possible, manage for complexes of wet prairie, calcareous fen, shrub-carr and tamarack swamp in the south.
- Utilize prescribed fire or fluctuating water levels to keep an open aspect and prevent woody species invasion.
- In high quality remnants avoid soil disturbance such as pothole creation, or level ditching.
- Focus research on the development of management techniques for maintenance of calcareous fens.

Caves and Abandoned Mines

- Develop statewide bat conservation plan.

Medium-sized Rivers and Streams.

- Protect the ecological river corridor gradients from lowlands to uplands, along with protection of the floodplain corridor. This will enlarge the amount of habitat available, allow for the movement of species upslope and downslope as environmental conditions change over time, provide suitable habitat for species that require large areas, provide migratory bird stopover habitat, or are dependent upon a mosaic of interconnected habitats, including a full range of seral stages for their long-term survival.
- Protection and restoration of natural lake and stream habitat, including establishment of refuge areas and appropriate management of aquatic plants, are needed for conservation of the Pugnose Shiner, which requires clear waters and littoral zone vegetation.

Statewide broad-based priority conservation actions for SGCN

Develop Improve Partnerships and incentives

- Encourage establishment and management of surrogate grassland habitat on private land through tax incentives, such as the Minnesota Prairie Bank Program.
- Focus wintering habitat for neotropical migrant partnerships on those nations harboring significant habitat for those species with high breeding populations in Wisconsin that are most at risk. In Wisconsin, Cerulean, Canada, Connecticut and Golden-winged Warblers are most closely associated with the criteria. For Wisconsin to be most effective, we should work with migratory bird conservation organizations in Costa Rica, Panama, Venezuela, Columbia and Ecuador.

Education

- Develop education materials to inform local zoning and planning partners regarding the positive effects for including wildlife habitat in their planning decisions.

Enforcement/Regulation/Legislation

- Evaluate amending the State Endangered Species Act to include protection of habitat for listed species.

Habitat/Landscape Protection and Management

- Develop a statewide ephemeral (vernal) pond management plan that encompasses maintenance of water quality, habitat disturbance, and biological legacy retention in and around the ponds.
- Protect bat hibernacula and maternity roosts from disturbance.
- Assemble a team to develop an ecological corridor map and habitat network reserve plan to address species and natural community movement opportunities in the face of a changing climate.
- Before the end of fiscal year 2009, assemble a team of wildlife biologists, foresters, researchers, and bird experts to develop a map of priority areas for management of early seral stage forest. The team would focus on the places where the Department could expend limited dollars for applying management to forests where timber sales are problematic. The sites chosen would have the greatest benefit for the greatest number of shrubland species, especially SGCN.
- Develop management objectives for public road-stream crossings that strives to have no stream constriction in priority Conservation Opportunity Areas.
- Maintain a network of stopover sites that provide quality refueling and resting habitat for the full diversity of migratory bird SGCN, particularly in highly altered landscapes along the Great Lakes and Mississippi River flyways.

Invasive Species

- Support research to find biological control agents for especially pernicious invasive exotic species. Especially important is the need to controlling glossy buckthorn, common buckthorn, garlic mustard, zebra and quagga mussels.
- Promulgate rules to prevent new invasive species from entering the state.
- Promulgate rules to prohibit the transport, possession, transfer or introduction of a listed restricted invasive species and establish control requirements for restricted species.
- Follow Best Management practices developed for reducing the spread of invasive species.
- Give priority for monitoring and control of prohibited and early detection species.
- Focus limited funding for control of restricted species in conservation opportunity areas.

Individual Species Management

- Experiment with management regimes that regenerate oaks while maintaining core areas of older forests for Cerulean Warbler.

Inventory

- Conduct a comprehensive inventory and mapping of ephemeral ponds.
- Conduct inventory efforts on the species and communities of "Information Needs", identified in the 2008 Implementation process.

Monitoring

- Develop a monitoring protocol to assess the taxa groups most reflective of maintaining biological diversity in ephemeral ponds and the preferred return interval for ephemeral ponds.

Planning – Landuse and Management

- Inform local zoning and planning partners regarding the positive effects for including wildlife habitat in their planning decisions.

Research

- Collect more information on taxonomy and population trends of shortjaw cisco in Lake Superior as a basis for development a management for the species.
- Research Franklin's Ground Squirrel distribution, habitat use, population size, and mortality factors as a basis for developing an effective management strategy.
- Collect information on the distribution, abundance, and population trends of the Prairie Vole to develop effective conservation efforts.
- Collect distribution and abundance information to better quantify macro- and micro-habitat needs of the Woodland Jumping Mouse.
- Evaluate the biological and sociological impacts of repatriation as a conservation strategy for Eastern Massasauga Rattlesnake.
- Conduct a landscape importance evaluation for the Northeast Wisconsin forests.
- Conduct comprehensive status survey for Phlox moth.
- Conduct comprehensive status survey for Poweshiek skipper.
- Evaluate the status of Swamp Metalmark and assess potential reintroduction sites.
- Conduct comprehensive status surveys for aquatic mussel species, and targeted population monitoring and life history research on the mussel species that require additional information for successful conservation.
- Conduct systematic atlasing and inventory efforts on select species, species assemblages within the invertebrate groups Hemiptera and Odonata.
- Conduct research efforts on the species and communities of "Information Needs", identified in the 2008 Implementation process.

Build on Existing Investments

The following investments are active priorities of the governor and the Department that address many aspects of the Wildlife Action Plan. These investments provide the framework for conserving many of our state's natural communities and their species.

Identified Department of Natural Resources Priorities Relating to SGCN

These bulleted actions capture existing Department high priority conservation actions with programs in place actively working on the actions that have significant effects on SGCN. Modifications in a program's goal, increased funding for on the ground activities, or focusing actions in conservation opportunity areas can enhance these existing program's effectiveness regarding SGCN.

- Utilize the data from the Wildlife Action Plan, Ecological Landscapes Handbook, statewide conservation priorities, and identified conservation opportunity areas to assist the Deer Management Program in evaluating the establishment of deer management unit goals

- Continue to work on the Farm Bill and associated agricultural set-aside programs. Utilize the Wildlife Action Plan as key information for focusing permanent grassland and savanna protection, setting priorities and enhanced payments for critical parcels in conservation opportunity areas.
- Implement and strengthen several Watershed Program initiatives to effectively enhance water quality and aquatic habitat for numerous SGCN, such as
    - Utilize data from the Wildlife Action Plan to assist the Runoff Management program in both urban and rural settings including nutrient management, incentives for controls, and buffer strips to address the foremost/high rated streams and lakes to most effectively address SGCN.
    - Ground water supply program that identifies recharge areas can use the data to help determine effects on priority natural communities, such as calcareous fens and efficacy of issuing permits for high cap wells near those priority areas.
    - Great Lakes – several programs with special focus on brownfields, contaminated sediment clean up, aquatic invasive species, wetland and estuary protection and restoration, can use the WAP data to help keep SGCN in the Great Lakes.
    - Dams and Floodplain Programs can utilize the data and conservation actions from the Wildlife Action plan to help make decision regarding the best locations for dam removal, constructing fish passages, and where to target floodplain zoning ordinance reviews and workshops.
    - Plan, implement and evaluate the Mississippi River Habitat Enhancement and Rehabilitation Program projects and drawdown projects including Pool 8 Islands and Harper's Slough.
    - Aquatic invasive species program that includes education, monitoring and enforcement should use Wildlife Action Plan conservation actions and conservation opportunity areas as a part of the decision tree for dispersing financial assistance grants.
    - Shorelands and shallows assessment tool needs to include Wildlife Actions Plan data for SGCN.
    - Implement "Reversing the Loss" wetland strategy.
    - The Wetlands Team can use the Conservation Opportunity Area map and the conservation actions from WAP in their rapid assessment methodology, ADID wetlands considerations, and Wetland restoration plans.
    - Incorporate WAP into the wetland website.
    - Wetland toolkit is created and widely distributed.
    - Explore ways to include rare wetland types and SGCN habitat into the Department Water Regulation programs.
- Implement actions from the Statewide Forest Plan and the Governor's Council on Forestry issues that positively affect SGCN. Implementation actions will be most effective if applied in conservation opportunity areas. Examples include 1.) Encourage the maintenance of native tree species that are becoming uncommon, 2.) Encourage the maintenance of oak, especially old oak forests 3.) Protect rare ecosystems and species habitats, 4.) Work to minimize the effects of invasive species, 5.) Conserve, protect and manage old-growth forests, 6.) Minimize forest fragmentation, 7.) Best Management Plan for Water Quality, 8.) Apply silvicultural techniques to increase carbon storage, and 9.) Increase the use of prescribed fire as a forest management practice.
- Reduce mercury emissions by working with chemical companies and electric utilities to use mercury free technologies.
- Support zoning and Smart Growth efforts that maintain forest cover in forested areas and grassland cover in grassland areas.
- Continue current system of tribal and state rice bed restoration and harvest regulations.
- Support initiatives to reduce greenhouse gas emissions and focus habitat work in areas where connecting corridors will accommodate species movement or places that contain features that will mitigate the impacts of increased temperatures.
- Complete a statewide assessment of ecological corridors deemed to be critical in the face of a changing climate.
- Implement the Whooping Crane Management Plan.
- Implement Karner Blue Butterfly Habitat Conservation Plan.
- Implement Great Lakes and Mississippi River Joint Ventures.
- Implement Butler's Garter Snake Management Plan.
- Implement Gray Wolf Management Plan
- Implement Piping Plover Recovery Plan.
- Implement Hine's Emerald Dragonfly Recovery Plan.
- Implement the Lake Sturgeon Management Plan.

- Implement Greater Prairie Chicken Management Plan.
- Implement Joint Venture All Bird Plan.
- Implement Wisconsin Bird Conservation Initiative (WBCI) All Bird Plan.
- Implement Department E/T Recovery Plans.
- VHS control and management program.
- Inventory for all Department properties for invasive species.
- Develop a statewide bat conservation plan.
- Implement Lower fox Basin and Upper Green Bay Integrated Management Plans
- Incorporate Wildlife Action Plan data, conservation actions and Conservation Opportunity Area information in Property Master Plan decision-making.
- Inventory and monitoring programs administered by Ecosystem Inventory and Monitoring section and Natural Heritage Inventory collect, house, and interpret information on SGCN that can be used for master planning, habitat management and ET species regulations. Seek stable funding to assure this basic information is available to make sound decisions and help keep these species off the ET list.
- Ecological Reference Areas and protection of unique habitats administered by the State Natural Areas Program provides a baseline for our resource management as an indicator for how well we are doing. These reference areas are often times embedded in more actively managed lands. Managed lands and their accompanying references areas are both needed to accomplish the goals of the Wildlife Action Plan. Seek stable funding to assure this basic management and ecological monitoring keep species off the ET list.

New and increased emphasis conservation priorities from the Governor and Secretary's offices in addition to those listed above will enhance or improve existing programs examples include:

- Legislation modeled after Michigan's ballast water law, which will create uniformity among Great Lakes basin states.
- Ratification of the Great Lakes compact to keep water in the Great Lakes.
- Authority for aquatic invasive boat launch inspections and education
- Create a Forest Legacy Program that will act as a way to further protect forestlands and allow the state more options for purchasing land and easements to maintain large blocks of working forest lands.
- Faster processing of grants to farmers to affect amount of polluted runoff

SPECIES AND NATURAL COMMUNITIES WITH INVENTORY NEEDS

In the 2005 Wildlife Action Plan (WAP), a list of species was not considered for Species of Greatest Conservation Need (SGCN) category, because inventory &/or life history data were insufficient to make a determination (appendix B of the WAP). Over 200 vertebrates and 420 invertebrates need more information. This tally does not include 12 somewhat obscure invertebrate phyla, as well as several major groups within the very large phylum Arthropoda (Table 2-26, page 2-70 in the WAP).

Taxa experts identified a subset of these Species with Information Needs to focus survey/research efforts in the next 5-7 years (prior to the 2015 WAP revision) to move them to either the SGCN list or the "safe" list. Criteria such as the species mean risk scores, area of importance, feasibility of completing work by 2015, ecological importance, and species assemblages were used. Following is the draft list of species or species groups proposed

Vertebrate Species & Species Assemblages with Additional Data Needs

Birds

- Marsh bird surveys – combination of citizen-based monitoring and specialized surveys utilizing playback recordings.
- Owl and other nocturnal birds surveys utilizing federal BBS route methods – citizen-based monitoring opportunity.
- Colonial Waterbirds surveys – contactors or professional staff.
- Shorebirds surveys – citizen-based monitoring opportunity.
- Focused boreal bird surveys - combination of citizen-based monitoring and specialized surveys.

Mammals

- Collect data on population size and trends for:
  - All shrew species
  - All bats species
  - Eastern Mole
  - Fisher
  - Badger
  - Eastern Fox Squirrel
  - Least Chipmunk
  - Plains Pocket Gopher
  - Southern Red-backed Vole
  - Deer Mouse
  - Western Harvest Mouse
  - Southern Bog Lemming
  - Meadow Jumping Mouse
  - Snowshoe Hare

Herps

- Collect data for the Spotted Salamander as part of the statewide salamander data collection.
- Conduct auditory bullfrog surveys – maybe in concert with nocturnal bird surveys – citizen-based monitoring opportunity.
- Cover board surveys for five-lined skink and other SGCN in skink habitats.
- Cover board surveys for Eastern Plains Garter Snake.

Fish

- Document distribution and abundance of the Pirate Perch, (poorly documented distribution)
- Document distribution and abundance of the Pugnose Minnow (a large river species, with poorly documented distribution, usually uncommon)
- Document distribution and abundance of the Weed Shiner (a large river species, with poorly documented distribution, generally uncommon)
- Document distribution and abundance of the Mud Darter (a large river species, with poorly documented distribution, generally uncommon)
- Document distribution and abundance of the Silver Chub (a large river species, with poorly documented distribution, abundance uncertain; hard to sample)
- Document distribution and abundance of the Finescale Dace (specialized habitat and complex genetics)

Invertebrates

When considering threats and Priority Conservation Actions to protect and conserve invertebrate species in Wisconsin, the authors of the Wildlife Action Plan noted that the most formidable obstacle to conservation is our lack of knowledge about the basic biology of many invertebrate species. These authors emphasized that there remain many taxonomic groups for which we cannot even compile a Wisconsin species list much less determine which species are of conservation need. The WAP authors recommended that "additional attention should be focused on [invertebrate] groups for which adequate taxonomic references do not exist and for which little zoogeographical or life history information is available." These authors recommended several "General Invertebrate Priority Conservation Actions" that would enable future iterations of the Wildlife Action Plan to more fully consider invertebrate conservation concerns. This report builds on those recommendations and has identified a subset of the phyla groups using the previously mentioned criteria: ecological role (e.g., nutrient cycling, trophic dynamics, pollination, decomposition), feasibility (resources/expertise available), and species assemblages.

General Conservation Priorities included in the WAP, which can be applied to the identified invertebrate groups targeted for survey efforts, include:

1. Systematic and focused inventories. Identify priority survey areas through predictive models when possible.
2. Support citizen-monitoring through partnerships/projects and Online identification resources
3. Collaborate with individuals/organizations, as many of the invertebrate taxa groups can be collected incidental to other studies/efforts (e.g., Baseline macroinvertebrate sampling) at little additional expense.

Invertebrate Groups with Additional Data Needs

- Conduct systematic species atlasing and inventory efforts on select non-arthropod invetebrates, especially:
  - Freshwater sponges (Porifera)
  - Aquatic and terrestrial flatworms (Turbellaria)
  - Rotifers (Rotifera)
  - Leeches (Hirudinea)
  - Bryozoans (Ectoprocta)
  - Snails (Gastropoda)
- Conduct systematic atlasing and inventory efforts on non-insect arthropods, especially:
  - Water fleas (Cladocera)
  - Copepods (Copepoda)
  - Shrimp (Mysidecea)
  - Spiders (Araneae)
- Conduct systematic atlasing and inventory efforts on poorly known insects, especially:
  - Microlepidoptera (Genera: Noctuidae, Arctiidae, Sphingidae, Notodontidae, Lycaenidae, Hesperiidae, Saturniidae). Near 400 species have been identified as occurring in WI that have very little known about their occurrence and distribution.
  - Ants, bees and wasps (Hymenoptera)
  - Beetles (Coleoptera). Tiger beetles and aquatic beetles assemblages are comparatively well known and were considered for SGCN status, while most other groups of beetles remain poorly known and were not considered.
  - Conduct systematic species atlasing and inventory efforts on prairie invert species, with a focus on the below list that have been nominated for 2015 SGCN listing:
    - Prairiana kansana Ball
    - Paraphlepsius altus (Osborn & Ball)
    - Paraphlepsius nebulosus (Van Duzee)
    - Myndus ovatus Ball
    - Rhynchomitra microrhina (Walker)
    - Bruchomorpha extensa Fitch
    - Ceresa minuta Caldwell
    - Chrysomelidae
    - Longitarsus spp.
    - Cryptocepahlus cuneatus Fall
    - Pachybrachis trinotatus (Melsheimer)
    - Pachybrachis luridus (Fabricius)
    - Ophraella notata (Fabricius)
    - Ophraella communa (LeSage)
    - Coelocephalapion decoloratum (Smith)
    - Fallapion bischoffi (Fall)
    - Fallapion impeditum (Fall)
    - Kissingeria amaurum (Kissinger)
    - Kissingeria capitone (Kissinger)
    - Leconteapion huron (Fall)
    - Sayapion segnipes (Say)
    - Trichapion modicum (Kissinger)
    - Trichapion perforicolle (Fall)
    - Trichapion tenuirostrum (Smith)

Natural Communities/Sites with Inventory Needs

In the 2005 Wildlife Action Plan (WAP), natural community actions included several communities with poorly understood ecology. Furthermore, during internal review of WAP data, several professional biologists recommended areas to be added as Conservation Opportunity Areas. In each case, the reason for not including either as actions or mapped COAs was lack of knowledge. What follows is a draft list of natural communities and biologist recommended COA candidate sites to focus survey/research efforts in the next 5-7 years (prior to the 2015 WAP revision) to move them to either priority natural communities and/or COA sites or the "safe" list. The Bureau of Endangered Resources Citizen-based Monitoring Program may also be able to assist in gathering information.

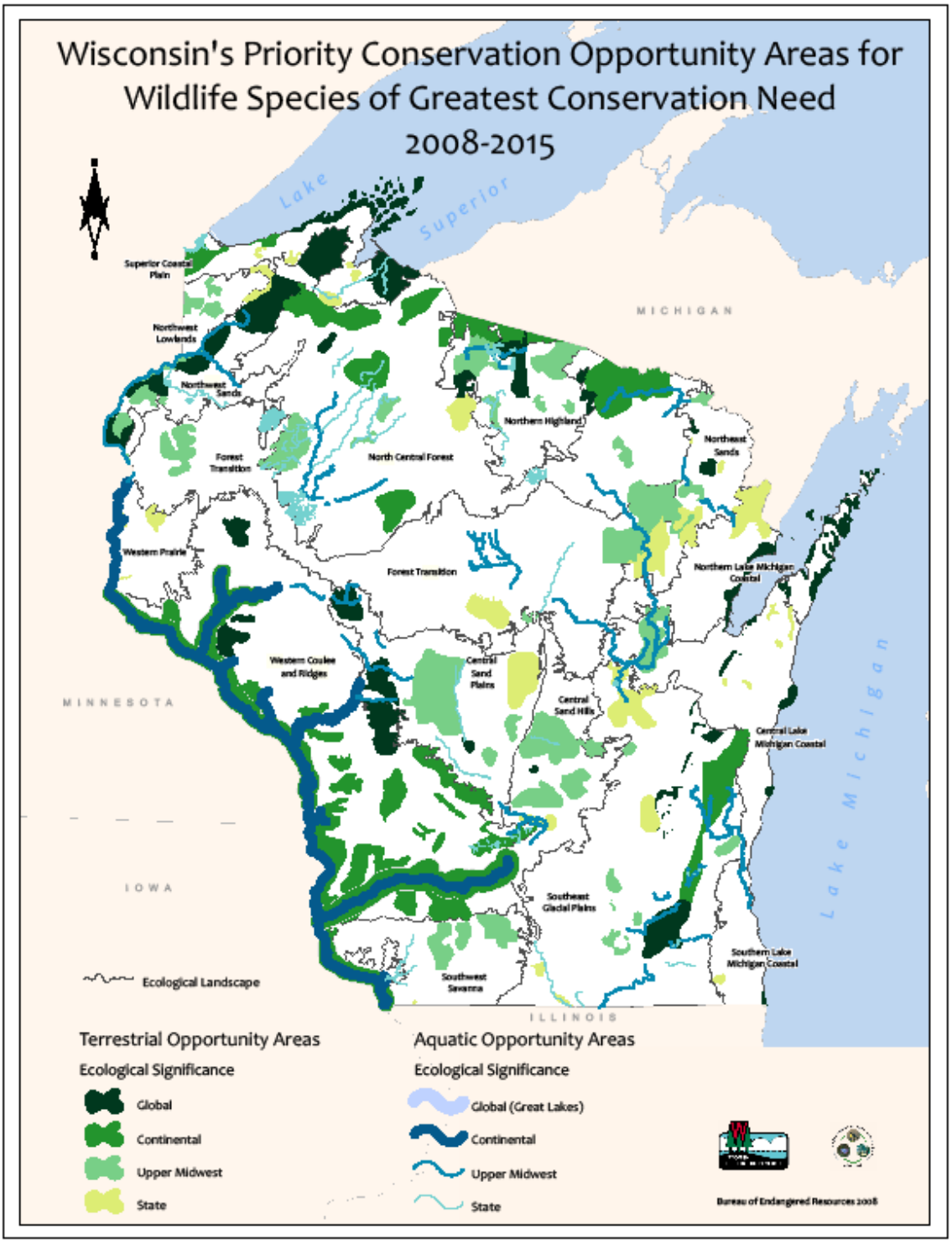
Natural communities with Additional Data Needs

- Northern Wet-mesic Forest (white cedar swamps)
- Central Pine-Oak Forest
- Floodplain Forest (especially differences in seral stages)
- Southern Hardwood Swamps (preferably in conjunction with Emerald ash borer work)
- Northern Lowland Shrubs communities (especially bog birch and willow dominated communities)

Candidate Conservation Opportunity Areas

- Pershing Wildlife Area and its environs
- Kimberly Clark Wildlife Area and its environs
- Superior Coastal Plain Grassland Management Areas
- North Branch of the Milwaukee River Farm Heritage Area
- Des Plaines River
- Turtle Valley Wildlife Area
- Mud Lake (Dodge) Wildlife Area
- Badger (to be evaluated after infrastructure clean-up)
- Richland County Forest Blocks
- Black, Onion, and Pigeon Rivers
- Menominee and Pike Rivers
- Glacial Habitat Restoration Area, including Eldorado Wildlife Area
- Stoney Creek
- Upper Kinnickinnic River, Aquatic (macro-invertebrate surveys needed)

STATE MAP OF CONSERVATION OPPORTUNITY AREAS



CENTRAL LAKE MICHIGAN COASTAL ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- Caspian Tern
- Common Tern
- Forster's Tern
- Great Egret
- Horned Grebe
- Peregrine Falcon
- Mudpuppy
- Banded Killifish
- Lake Sturgeon
- Shoal Chub
- Phyllira Tiger Moth
- Land Snails
- Alvar
- Floodplain Forest
- Great Lakes Beach
- Great Lakes Dune
- Great Lakes Ridge and Swale
- Moist Cliff
- Lake Michigan
- Northern Hardwood Swamp
- Warmwater Rivers

Priority Conservation Actions

- Protect and restore harbor and river mouth shoreline and wetland habitats.
- Improve regulations and increase education to prevent the introduction of additional exotic species and slow the spread of existing invasive species.
- Manage Great Lakes beach and dune habitat as part of a vegetation mosaic that includes forested ridge and swale, interdunal wetland, shrub-carr, and swamp conifer forest with older age classes. Promote concentrated public access points, limited recreational activities in areas where SGCN are present (particularly during breeding seasons), protecting site hydrology, and early detection and management of invasive exotic species.
- Implement new cost-sharing programs and/or continue voluntary programs to monitor for and aggressively eliminate invasive species, especially in Great Lakes beach, dune, and ridge and swale communities.
- In the Niagara Escarpment Conservation Opportunity Area, encourage public and private landowners to maintain natural forest cover, protect areas where surface waters drain into natural fissures, minimize pesticide infiltration, and maintain partially open sinkholes that serve as bat hibernacula.
- Preserve habitat on the Niagara Escarpment and protect ecologically significant areas currently occupied by SGCN from conversion to other land uses.
- Protect Wisconsin's only large alvar (Red Banks) by minimizing impacts from quarrying, road construction, and housing development through acquisition of fee title, development rights, transfer of development rights, and zoning.
- Manage alvars by thinning densely vegetated areas and removing aggressive exotic shrubs.
- Protect and restore habitat in the lower Wolf River to accommodate the habitat preferences of Shoal Chub.
- Maintain and connect large blocks of older floodplain forest to provide habitat for the large number of SGCN that use this habitat while addressing the regeneration difficulties associated with dense stands of reed canary grass.
- Initiate wetland renovation projects for Forster's Tern and use artificial nest platforms to maintain existing Forster's Tern populations.
- Maintain long-term wetland productivity on public properties by mimicking natural hydrologic regimes within an adaptive management framework.
- Protect large insular hardwood swamps from hydrological changes and fragmentation due to road and housing development.
- Develop management and response plans for hardwood swamps to prepare for the probable arrival of emerald ash borer.

Conservation Opportunity Areas

Great Lakes and their Shorelines – Global Significance

Lake Michigan including embayments and Migratory/Winter Bird Habitat.

COA(s): Lake Michigan (A.02)

SGCN – Horned Grebe, Caspian Tern, Common Tern, Lake Sturgeon, Banded Killifish, Mudpuppy, Bald Eagle, Greater Redhorse

Public Land – The lake is public water

Legacy Places – None

Important Bird Areas – Ozaukee Bight Lakeshore Migration Corridor, Harrington Beach Lakeshore Migration Corridor, and Cleveland Lakeshore Migration Corridor.

Lake Michigan Shore Features – including Great Lakes Beach, Great Lakes Dune, Interdunal Wetland, Great Lakes Ridge and Swale, and Emergent Marsh.

COA(s): Green Bay West Shores (8.03); Point Beach and Woodland Dunes (8.05); Kohler-Andrae (8.06)

SGCN – Blanding's Turtle, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, American Golden Plover, American Woodcock, Bald Eagle, Black-billed Cuckoo, Blue-winged Teal, Bobolink, Brown Thrasher, Common Tern, Dunlin, Great Egret, Forster's Tern, Hudsonian Godwit, Least Flycatcher, Marbled Godwit, Northern Harrier, Rusty Blackbird, Short-billed Dowitcher, Solitary Sandpiper, Snowy Egret, Veery, Whimbrel, Willow Flycatcher, Wood Thrush, Yellow Rail, Eastern Red Bat, Hoary Bat, Northern Flying Squirrel, Northern Long-eared Bat, Silver-haired Bat, Water Shrew, Woodland Jumping Mouse, Two-spotted Skipper, and Phyllira Tiger Moth.

Public Land – Point Beach State Forest, Kohler-Andrae State Park, Green Bay West Shores Wildlife Area, Barkhausen County Resource Area, Woodland Dunes Nature Preserve and State Natural Area.

Legacy Places – Fisher Creek, Kohler-Andrae Dunes, Point Beach and Dunes, West Shore Green Bay Wetlands.

Important Bird Areas – Woodland Dunes Nature Preserve, Point Beach State Forest, and Green Bay West Shore Wetlands.

Niagara Escarpment – Global Significance

Dry Cliff, Moist Cliff, Alvar and Bedrock Glade communities.

***COA(s)**: Greenleaf Escarpment (8.09); Red Banks Escarpment (8.10); Red Banks Alvar (8.02)*

SGCN – Sculptured Glyph, Cherrystone Drop, White-tip Dagger, Black Striate, Midwest Pleistocene Vertigo, Iowa Pleistocene Vertigo, Mystery Vertigo, Boreal Top.

Public Land – Red Banks Alvar State Natural Area, High Cliff State Park, Stockbridge Ledge State Natural Area, Brown County Parks, Calumet County Parks, Baird Creek Parkway, Heritage Hill State Park, Scattered Wildlife Areas.

Legacy Places – Niagara Escarpment.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Lower Wolf, Embarrass, and Shioc Rivers, including Floodplain Forest, Northern Sedge Meadow, Emergent Marsh, and Warmwater Rivers.

***COA(s):** Lower Wolf, Embarrass, and Shioc Rivers (A.06); Lower Wolf River Corridor (8.01)*

SGCN – Greater Redhorse, Lake Chubsucker, Lake Sturgeon, River Redhorse, Shoal Chub, Western Sand Darter, Four-toed Salamander, Wood Turtle, American Black Duck, Black-billed Cuckoo, Blue-winged Teal, Great Egret, Least Flycatcher, Prothonotary Warbler, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Veery, Yellow-billed Cuckoo, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Buckhorn, Elktoe, Fawnsfoot, Mapleleaf, Round Pigtoe, Salamander Mussel, Slippershell Mussel, Snuffbox, Clio Stripetail, Easter Red Damsel, Elegant Spreadwing, Elusive Clubtail, Gloyd's Bluet, Lancet Clubtail, Plains Clubtail, Pygmy Snaketail, Stygian Shadowfly, Armored Mayflies, Common Burrower Mayfly, Common Netspinner Caddisfly, Dubiraphia Riffle Beetle, Flat-headed Mayfly, Long-horned Casemaker Caddisfly, Predaceous Diving Beetles, Primitive Minnow Mayfly, Small Minnow Mayfly, Velvet Waterbugs, Water Measurers, Water Scavenging Beetles, Water Scorpions, and White River Crayfish.

Public Land – Deer Creek Wildlife Area, Mack Wildlife Area, Maine Wildlife Area, Navarino Wildlife Area, Outagamie Wildlife Area, Wolf River Bottoms Wildlife Area, Hortonville Bog State Natural Area, Lower Wolf River Bottomlands Natural Resources Area, Wolf River Bottoms State Natural Area.

Legacy Places – Lower Wolf River.

Important Bird Areas – Lower Wolf River Bottoms

High Quality Wetlands – State Significance

Northern Hardwood Swamp, Floodplain Forest, Northern Sedge Meadow, Shrub Carr, and Emergent Marsh

COA(s): *Hardwood Swamps (8.04); Kellner Lake (8.07); Holland Red Maple Swamp (8.08)*

SGCN – Four-toed Salamander, American Woodcock, Least Flycatcher, and Veery.

Public Land – Buzz Besadny Fish and Wildlife Area, Holland Wildlife Area.

Legacy Places – Insular Black Ash Swamps

Conservation Opportunity Area Map

CENTRAL SAND HILLS ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- American Woodcock
- Blue-winged Warbler
- Brown Thrasher
- Field Sparrow
- Great Egret
- Henslow's Sparrow
- Red-headed Woodpecker
- Rusty Blackbird
- Whip-poor-will
- Whooping Crane
- Willow Flycatcher
- Ornate Box Turtle
- Western Slender Glass Lizard
- Gorgone Checkerspot
- Karner Blue Butterfly
- Leafhoppers (Paraphilaenus parallelus, Limotettix psedudosphagneticus)
- Red-tailed Leafhopper
- Spatterdock Darner
- Calcareous Fen
- Central Pine Oak Forest
- Coastal Plain Marsh
- Coldwater Streams
- Oak Barrens
- Sand Prairie
- Southern Dry Forest
- Southern Sedge Meadow
- Wet-mesic Prairie
- Wet Prairie

Priority Conservation Actions

- Identify and restore oak barrens and oak forest on appropriate sites, such as old fields and pasture lands, to expand and connect existing stands.
- Manage oaks as a large-scale mosaic of patches along a successional gradient that includes oak forest, oak woodland, oak opening, and native or surrogate grassland.
- Maintain or restore mixed pine-oak forests to represent the full natural range of variability in patch sizes and age classes.
- Restore oak/conifer barrens and shrub habitats on public lands in appropriate Conservation Opportunity Areas through fire, ground layer enhancement, and timber management.
- Work with private land owners to promote the creation of smaller savanna restorations that provide habitat for Red-headed Woodpeckers.
- Preserve remaining relict old-growth oak forest patches.
- Develop cost-sharing incentives for private landowners to burn, remove invasive exotic species and regenerate oak forests, oak woodlands, and oak openings.
- Preserve and manage wet-mesic prairie, wet prairie, calcareous fen and southern tamarack swamp sites; restore degraded sites (emphasizing restoration of hydrology), and manage for area-sensitive species in a matrix of surrogate grasslands, sedge meadow, shrub carr, and savanna habitats. Monitor restored sites to determine whether the restoration is maintaining sensitive species.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other oak barrens management practices.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of oak barrens ecosystems.
- Continue head starting program for Ornate Box Turtles at appropriate sites.
- Long-term Ornate Box Turtle monitoring is needed to evaluate population status and track trends, especially in light of climate change.
- Implement Karner Blue Butterfly conservation strategies.
- Conduct surveys to find additional occurrence of coastal plain marsh
- Conduct surveys to document invertebrate use of coastal plain marshes.

Conservation Opportunity Areas

Bur Oak Openings – Global Significance

Upland mosaic of dry forest and oak savanna including Central Pine Oak Forest, Southern Dry Forest, Sand Prairie and Oak Barrens.

COA(s): *Oxford Savanna (10.03)*

SGCN – Bullsnake, Ornate Box Turtle, Western Slender Glass Lizard, Blue-winged Warbler, Brown Thrasher, Black-billed Cuckoo, Bobolink, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Henslow's Sparrow, Lark Sparrow, Northern Harrier, Red-headed Woodpecker, Short-eared Owl, Upland Sandpiper, Vesper Sparrow, Western Meadowlark, Whip-poor-will, Eastern Red Bat, Franklin's Ground Squirrel, Northern Long-eared Bat, Karner Blue Butterfly, Gorgone Checkerspot, and Leonard's Skipper.

Public Land – None

Legacy Places – Oxford Savanna.

Large Sedge Meadows, Fens, and Prairies – Upper Midwest Significance

Large wetlands embedded in a complex of upland natural communities. The site encompasses the state significant aquatic feature Chaffee Creek – Northern Wet Forest, Shrub Carr, Wet-mesic Prairie, Southern Sedge Meadow, Calcareous Fen, Wet Prairie, Emergent Marsh, and Submergent Aquatic Marsh. In addition, many restorable upland sites feature a mosaic of dry forest and oak savanna including Central Pine Oak Forest, Southern Dry Forest, Sand Prairie and Oak Barrens.

COA(s): Comstock Bog and Germania Marsh (10.01)

SGCN – Blanding's Turtle, Bullsnake, Four-toed salamander, Ornate Box Turtle, Pickerel Frog, Western Slender Glass Lizard, American Bittern, American Woodcock, Blue-winged Warbler, Blue-winged Teal, Black-billed Cuckoo, Black Tern, Bobolink, Brown Thrasher, Eastern Meadowlark, Field Sparrow, Forster's Tern, Golden-winged Warbler, Grasshopper Sparrow, Henslow's Sparrow, Lark Sparrow, LeConte's Sparrow, Northern Harrier, Red-headed Woodpecker, Rusty Blackbird, Short-eared Owl, Upland Sandpiper, Veery, Whip-poor-will, Whooping Crane, Willow Flycatcher, Yellow-billed Cuckoo, Eastern Red Bat, Franklin's Ground Squirrel, Northern Long-eared Bat, Karner Blue Butterfly, Gorgone Checkerspot, Leonard's Skipper, and a Limotettix leafhopper.

Public Land – Caves Creek Fishery Area, John Lawton Fishery Area, Comstock Bog State Natural Area, Germania Wildlife Area, Glacial Habitat Restoration Area, White River Fishery Area, Lawrence Creek Wildlife Area, Greenwood Wildlife Area, Bass Lake Fen State Natural Area, and Mecan River Fishery Area.

Legacy Places – Comstock-Germania Marshes, Portage to Buffalo Lake Corridor.

Important Bird Areas – Comstock/Germania Bog.

Large wetland dominated complex of natural communities – Northern Wet Forest, Shrub Carr, Southern Sedge Meadow, Calcareous Fen, Wet Prairie, Emergent Marsh, and Submergent Aquatic Marsh. In addition, many restorable upland sites feature a mosaic of dry forest and oak savanna including Southern Dry Forest, and Oak Barrens.

COA(s): *Puckaway and Grand River Marsh (10.02); Fox River Marsh (10.04)*

SGCN – Blanding's Turtle, Bullsnake, Pickerel Frog, American Bittern, American Woodcock, Blue-winged Warbler, Blue-winged Teal, Black-billed Cuckoo, Black Tern, Bobolink, Brown Thrasher, Eastern Meadowlark, Field Sparrow, Forster's Tern, Grasshopper Sparrow, Henslow's Sparrow, Northern Harrier, Red-headed Woodpecker, Rusty Blackbird, Short-eared Owl, Upland Sandpiper, Veery, Whip-poor-will, Willow Flycatcher, Yellow-billed Cuckoo, Eastern Red Bat, Northern Long-eared Bat, and Leonard's Skipper.

Public Land – Glacial Habitat Restoration Area, Grand River Marsh Wildlife Area, French Creek Wildlife Area.

Legacy Places – Grand River Marsh & Lake Puckaway.

Important Bird Areas – Grand River Marsh/Grasslands.

Medium-sized Rivers and Streams – Upper Midwest Significance

COA(s): *Wisconsin River (Dells to Lake Wisconsin) and Lower Baraboo River (A.21)*

SGCN – Lake Sturgeon, Shoal Chub, Paddlefish, Black Buffalo, Least Darter, Midland Softshell Turtle, Osprey, Bald Eagle.

Public Land – Dells of the Wisconsin River, Pine Island Wildlife Area, Leopold District USF&WS, Leopold Reserve.

Legacy Places – Middle Wisconsin River, Baraboo River

Important Bird Areas – Leopold Reserve-Pine Island

Floodplain Forest Communities – State Significance

COA(s): *Pine Island (10.05)*

SGCN – Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Henslow's Sparrow, Red-shouldered Hawk, Regal Fritillary.

Public Land – Dells of the Wisconsin River, Pine Island Wildlife Area, Peters Marsh Wildlife Area, Swan Lake Wildlife Area, Leopold District USF&WS, Leopold Reserve.

Legacy Places – Middle Wisconsin River, Baraboo River

Important Bird Areas – Leopold Reserve – Pine Island.

Diverse Aquatic Communities – State Significance

Cold streams and streamside wet-mesic prairie and calcareous fen communities.

COA(s): *Chaffee Creek (A.04)*

SGCN – Eastern Red Damsel, River Bluet, and Swamp Metalmark.

Public Land – Chaffee Creek Fishery Area.

Legacy Places – Portage to Buffalo Lake Corridor.

High Quality Wetland Communities – State Significance (unmapped)

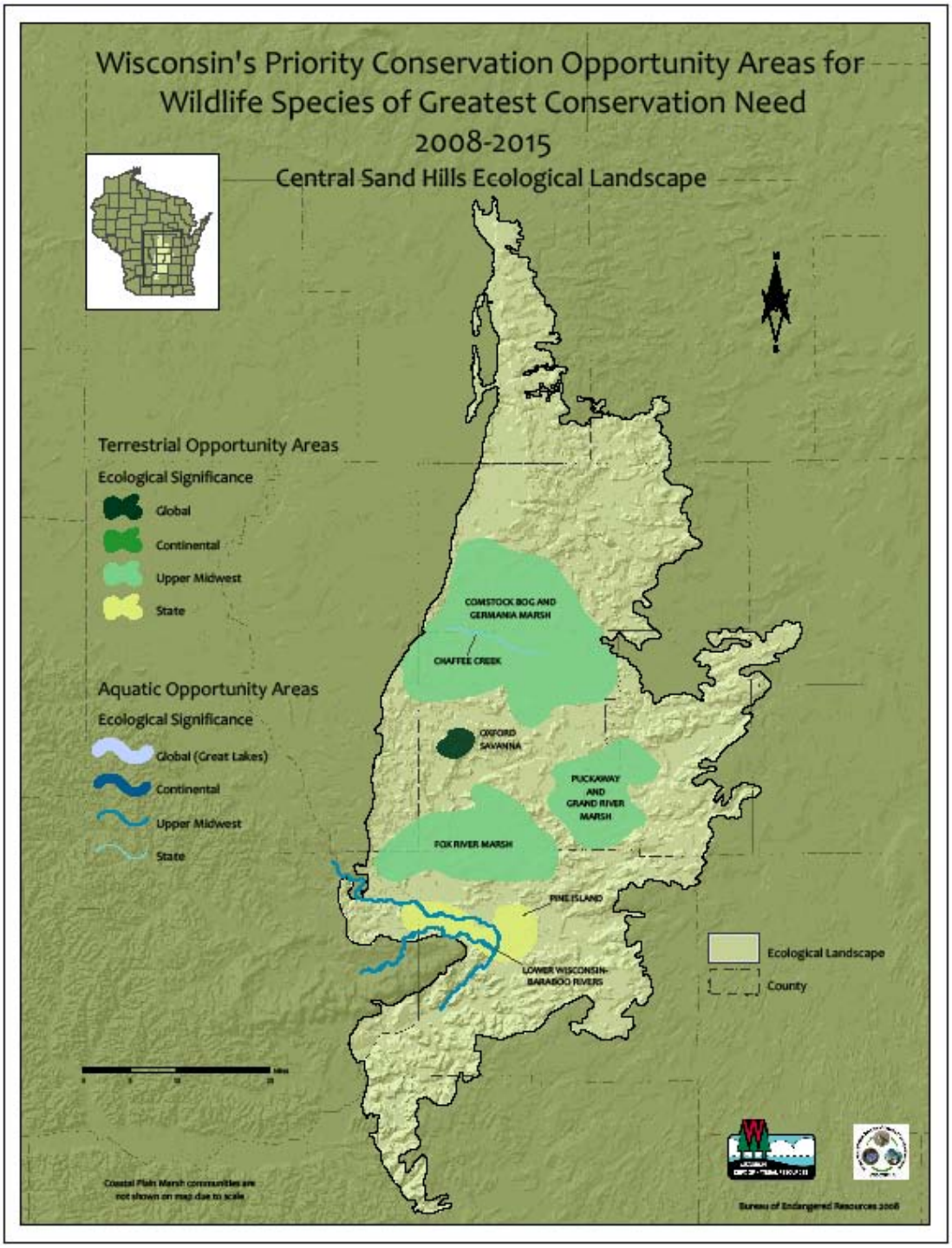
Coastal Plain Marsh is an unmapped feature found predominantly in this Ecological Landscape. The distribution of this community is limited to a few sites within the sandy beds or margins of extinct glacial lakes, on level or gently sloping glacial outwash sands, and, possibly, in glacial tunnel channels. The lake or pond waters are nutrient-poor and acidic, and all known occurrences of the community are small, or at most, medium-sized. Historically the surrounding vegetation included oak and pine barrens; dry acid forests composed of oaks, pines, or mixtures; sand prairie; and various peatland communities. Periodic wildfire would have been the major disturbance force in all of these communities prior to European settlement and the implementation of fire suppression policies. They need to be managed as small patches and not in a landscape context.

SGCN – Solitary Sandpiper, Blanding's Turtle, Northern Long-eared Bat, Spatterdock Darner, Ringed Boghaunter, Sand Snaketail, Warpaint Emerald.

Public Land – None

Legacy Places – Montello Area Coastal Plain Marshes

Conservation Opportunity Area Map



CENTRAL SAND PLAINS ECOLOGICAL LANDSCAPE

High Priority SGCN & Natural Communities

- American Bittern
- American Woodcock
- Black Tern
- Bobolink
- Golden-winged Warbler
- Grasshopper Sparrow
- Greater Prairie Chicken
- Henslow's Sparrow
- Northern Harrier
- Prothonotary Warbler
- Red-headed Woodpecker
- Red-Shouldered Hawk
- Short-eared Owl
- Trumpeter Swan
- Vesper Sparrow
- Western Meadowlark
- Whip-poor-will
- Whooping Crane

- Gray Wolf
- Northern Long-eared Bat
- Prairie Vole

- Blanding's Turtle
- Bullsnake
- Eastern Massasauga Rattlesnake
- Mudpuppy
- Western Glass Lizard

- Ash-brown Grasshopper
- Barrens Snaketail
- Bina Flower Moth
- Clamp-tipped Emerald
- Dusted Skipper
- Frosted Elfin
- Henry's Elfin
- Hoary Elfin
- Jutta Arctic
- Karner Blue Butterfly
- Leafhoppers (*Paraphilaenus parallelus, Limotettix psedudosphagneticus*)
- Persius Duskywing
- Phlox Moth
- Olympia Marble
- Red-tailed Leafhopper
- Ringed Boghaunter
- Spatterdock Darner
- Spotted-winged Grasshopper
- Warpaint Emerald

- Central Pine-Oak Forest
- Cliffs (Escarpment)
- Floodplain Forest
- Northern Sedge Meadow
- Oak Barrens
- Open Bog
- Pine Barrens
- Sand Prairie
- Southern Dry-Mesic Forest
- Surrogate Grasslands
- White Pine – Red Maple Swamp

Priority Conservation Actions

- Protect white pine-red maple swamp hydrology, and promote development of older stands.
- Maintain large blocks of open bog/muskeg habitat and other surrounding wetlands as co-occurring peatland communities by maintaining hydrology and controlling invasive plant species.
- Maintain large blocks of open sedge meadow within a complex of associated wetlands such as open bog, poor fen, emergent marsh, shrub-carr, alder thicket and northern wet forest by maintaining hydrology, tree cutting and harvest, prescribed fire and eradicating invasive plant species.
- Maintain lowland shrub communities like alder thicket and shrub-carr, and manage the surrounding working forest to benefit Golden-winged Warblers by leaving scattered off-site aspen, ash and tamarack in shrub-dominated areas and managing the adjacent upland forest in a shifting mosaic of patch sizes and age classes to provide continuous habitat.
- Restore oak barrens on sites that will increase effective habitat patch size for area sensitive species, such as upland areas between large wetlands.
- Manage oaks as a large-scale mosaic of patches along a successional gradient that includes oak forest, oak woodland, oak opening, and open wetland.
- Maintain or restore mixed pine-oak forests to represent the full natural range of variability in patch sizes and age classes.
- Identify and restore oak/conifer barrens and shrub-dominated habitats through the application of prescribed fire and timber management.
- Work with private land owners to promote the creation of smaller savanna restorations that provide habitat for Red-headed Woodpeckers.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other oak barrens management practices.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of oak barrens ecosystems.

- Implement the Wisconsin Whooping Crane Management Plan.
- Increase the effective size of the Buena Vista and Leola Marsh grassland landscapes by promoting the creation/maintenance/protection of surrogate grassland adjacent to existing patches.
- Reintroduce Eastern Massasauga Rattlesnake to places along the Yellow River where suitable habitat exists.
- Manage appropriate native sand prairie and sand prairie restoration sites for nesting Blanding's Turtles.
- Maintain and connect large blocks of older floodplain forest to provide habitat for the large number of SGCN that use this habitat while addressing the regeneration difficulties associated with dense stands of reed canary grass.
- Implement the Greater Prairie-Chicken Management Plan.
- Encourage landowner enrollment in federal set-aside programs, especially in the Central Wisconsin Grassland project area.
- Work with private land owners to manage wetland impoundments to conserve marsh-nesting birds.

Conservation Opportunity Areas

Pine-Oak Barrens – Global Significance

Upland mosaic of slightly elevated land dominated by poor sandy soils featuring Central Pine-Oak Forest, Southern Dry-Mesic Forest, Oak Barrens, Pine Barrens, Sand Barrens, and Sand Prairie. Embedded wetlands also add significant biodiversity values.

COA(s): Buckhorn (7.04); Robinson Creek (7.06); Black River (7.07); Eau Claire and Clark Barrens Restoration (7.09)

SGCN – Blanding's Turtle, Bullsnake, Ring-neck Snake, Western Glass Lizard, Wood Turtle, Yellow-bellied Racer, Black-billed Cuckoo, Brown Thrasher, Blue-winged Warbler, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Lark Sparrow, Northern Harrier, Upland Sandpiper, Red-headed Woodpecker, Vesper Sparrow, Whip-poor-will, Yellow-billed Cuckoo, Eastern Red Bat, Hoary Bat, Gray Wolf, Northern Long-eared Bat, Prairie Vole, Silver-haired Bat, Short-winged Grasshopper, Spotted-winged Grasshopper, Ash-brown Grasshopper, Sand Locust, Karner Blue Butterfly, Frosted Elfin, Henry's Elfin, Hoary Elfin, Pink-edged Sulphur, Dusted Skipper, Mottled Duskywing, Persius Duskywing, Olympia Marble, Bina Flower Moth, Phlox Moth, Graceful Clearwing, Phyllira Tiger Moth, Sprague's Pygarctia, Limottetix Leafhopper, and Pale Tiger Beetle.

Public Lands – Augusta Wildlife Area, Black River State Forest, Jackson County Forest, Clark County Forest, Eau Claire County Forest, and Buckhorn State Park and Wildlife Area.

Legacy Places – Black River State Forest.

Important Bird Areas – Fort McCoy-Robinson Creek Barrens.

Large River Corridors – Continental Significance

Main stem of the Black River below the dam at Black River Falls, including stream side communities Floodplain Forest, Northern Dry-Mesic Forest, Oak Barrens, Dry Cliff and Moist Cliff.

COA(s): Lower Black River Corridor (A.29)

SGCN – Blanding's Turtle, Midland Smooth Softshelled Turtle, Pickerel Frog, Wood Turtle, Black-billed Cuckoo, Blue-winged Warbler, Blue-winged Teal, Cerulean Warbler, Least Flycatcher, Louisiana Waterthrush, Prothonotary Warbler, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Veery, Yellow-billed Cuckoo, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, Water Shrew, Water Scavenging Beetles, Purse Casemaker Caddisfly, and Barrens Snaketail.

Public Land – Black River State Forest.

Legacy Places – Black River.

Large Sedge Meadows, Fens and Prairies – Upper Midwest/Regional Significance

Predominantly large wetlands with open bogs, shrub swamps, impoundments and sedge meadows including Northern Wet Forest, Alder Thicket, Shrub Carr, White Pine – Red Maple Swamp, Floodplain Forest, Northern Sedge Meadow, Open Bog, and Impoundments.

COA(s): Cottonville Colburn Wetlands (7.01); Quincy Bluff and Wetlands (7.03); Meadow Valley Sandhill (7.05); Dewey Marsh (7.08)

SGCN – Blanding's Turtle, Four-toed Salamander, Eastern Massasauga Rattlesnake, Pickerel Frog, Wood Turtle, American Bittern, American Woodcock, Bald Eagle, Black Tern, Black-billed Cuckoo, Blue-winged Teal, Blue-winged Warbler, Bobolink, Canada Warbler, Connecticut Warbler, Golden-winged Warbler, Henslow's Sparrow, LeConte's Sparrow, Lesser Scaup, Northern Goshawk, Northern Harrier, Osprey, Rusty Blackbird, Sharp-tailed Grouse, Short-eared Owl, Solitary Sandpiper, Trumpeter Swan, Veery, Whooping Crane, Willow Flycatcher, Wilson's Phalarope, Yellow-billed Cuckoo, Yellow Rail, Eastern Red Bat, Gray Wolf, Hoary Bat, Northern Long-eared Bat, Sliver-haired Bat, Water Shrew, Spatterdock Darner, Warpaint Emerald, Clamp-tipped Emerald, Ringed Boghaunter, and Jutta Arctic.

Public Land – Dewey Marsh Wildlife Area, Meadow Valley Wildlife Area, Quincy Bluff State Natural Area, Sandhill Wildlife Area, Wood County Wildlife Area, Colburn Wildlife Area, Jackson County Forest, Monroe County Forest, Wood County Forest, Juneau County Forest, Necedah National Wildlife Refuge, and Buckhorn State Park and Wildlife Area.

Legacy Places – Bear Bluff, Black River, Central Wisconsin Forests, Dewey Marsh, Jay Creek Pines State Natural Area, Lower Lemonweir River, Necedah National Wildlife Refuge, Quincy Bluff and Wetlands, Sandhill-Meadow Valley-Wood County Wildlife Area, Yellow River.

Important Bird Areas – Bear Bluff Peatlands, Quincy Bluff, and Necedah National Wildlife Refuge.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Natural communities are cool and warm water streams of Upper Midwest significance due to their diverse invertebrate populations.

COA(s): Eau Claire River (A.39); Robinson (A.30); Hall's (A.31); Morrison (A.32); Wedge's (A.33) Creeks

SGCN – Buckhorn, Fawnsfoot, Salamander Mussel, Tiger Beetles, Aurora Damselfly, Barrens Snaketail, Clio Stripetail, Elusive Clubtail, Lancet Clubtail, Sand Snaketail, Ski-tailed Emerald, Spendid Clubtail, Skillet Clubtail, Green-faced Clubtail, Stygian Shadowfly, Zebra Clubtail, and Water Shrew.

Public Land – Hall's Creek Fishery Area, Black River State Forest, Jackson County Forest.

Extensive Grassland Communities – State Significance

Features managed surrogate grassland.

COA(s): Central Wisconsin Grassland (7.02)

SGCN – American Golden Plover, Blue-winged Teal, Bobolink, Brown Thrasher, Dickcissel, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Greater Prairie-Chicken, Henslow's Sparrow, Northern Harrier, Sharp-tailed Grouse, Short-eared Owl, Upland Sandpiper, Western Meadowlark, Willow Flycatcher, Regal Fritillary, and Ottoe Skipper.

Public Land – Buena Vista Wildlife Area, Leola Marsh Wildlife Area, Central Wisconsin Grassland Conservation Area, and Big Roche-a-Cri Fishery Area.

Legacy Places – Central Wisconsin Grassland.

Important Bird Areas – Buena Vista/Leola State Wildlife Areas and Paul Olson State Wildlife Area.

Diverse Aquatic Communities – State Significance

River systems feature the main stem of those rivers plus a portion of Hemlock Creek, including stream side communities Floodplain Forest, and Emergent Marsh.

COA(s): Lemonweir River (A.23) and Yellow River- Hemlock Creek (A.24)

SGCN – Blanding's Turtle, Four-toed Salamander, Eastern Massasauga Rattlesnake, Pickerel Frog, Wood Turtle, Black-billed Cuckoo, Blue-winged Warbler, Blue-winged Teal, Cerulean Warbler, Least Flycatcher, Prothonotary Warbler, Red-headed Woodpecker, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Veery, Yellow-billed Cuckoo, Eastern Red Bat, Gray Wolf, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, Water Shrew, Ellipse, Rainbow Shell, Salamander Mussel, and Lancet Clubtail.

Public Land – Buckhorn Wildlife Area, Sandhill Wildlife Area, Juneau County Forest, Wood County Forest, Necedah National Wildlife Refuge, Lemonweir Bottomland Hardwood Forest State Natural Area.

Legacy Places – Black River, Lower Lemonweir River, Necedah National Wildlife Refuge, Sandhill – Meadow Valley – Wood County Wildlife Areas, Yellow (Juneau) River.

Important Bird Areas – Necedah NWR and Bear Bluff Peatlands.

Bedrock Communities – State Significance (unmapped)

Most of Wisconsin has the bedrock buried beneath glacial materials. In the Central Sand Plains the influence of Glacial Lake Wisconsin, and especially where its outflow breached – the Dells of the Wisconsin River – resulted in a concentration of cliff communities. Often the most visible portions of this uncommonly flat landscape, these buttes, mesas and other cliff communities provide limited habitat for SGCN and need to be managed as small patches where they are located. Natural Communities – Dry Cliff, Moist Cliff, Northern Dry-Mesic Forest, and Northern Mesic Forest

SGCN – Bullsnake, Yellow-bellied Racer Dusted Skipper, Frosted Elfin, Karner Blue Butterfly.

Public Land – Mill Bluff State Park, Jackson County Forest, Black River State Forest, Roche-a-Cri State Park, Mirror Lake State Park, Rocky Arbor State Park, Hulburt Creek State Fisheries Area, Clark County Forest, Quincy Bluff and Wetlands State Natural Area, Dells of the Wisconsin River State Natural Area.

Legacy Places – Black River, Quincy Bluff, Greensand Cuesta, Middle Wisconsin River.

Important Bird Areas – Quincy Bluff.

High Quality Wetland Communities – State Significance (unmapped)

Coastal Plain Marsh is an unmapped feature found predominantly in this Ecological Landscape. The distribution of this community is limited to a few sites within the sandy beds or margins of extinct glacial lakes, on level or gently sloping glacial outwash sands, and, possibly, in glacial tunnel channels. The lake or pond waters are nutrient-poor and acidic, and all known occurrences of the community are small, or at most, medium-sized. Historically the surrounding vegetation included oak and pine barrens; dry acid forests composed of oaks, pines, or mixtures; sand prairie; and various peatland communities. Periodic wildfire would have been the major disturbance force in all of these communities prior to European settlement and the implementation of fire suppression policies. Need to managed as small patches and not in a landscape context

SGCN – Solitary Sandpiper, Blanding's Turtle, Northern Long-eared Bat, Spatterdock Darner, Ringed Boghaunter, Sand Snaketail, Warpaint Emerald.

Public Land – Jackson County Forest, Quincy Bluff State Natural Area, Sohlberg Silver Lake State Natural Area.

Legacy Places – Quincy Bluff, Black River State Forest.

Important Bird Areas – Quincy Bluff.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

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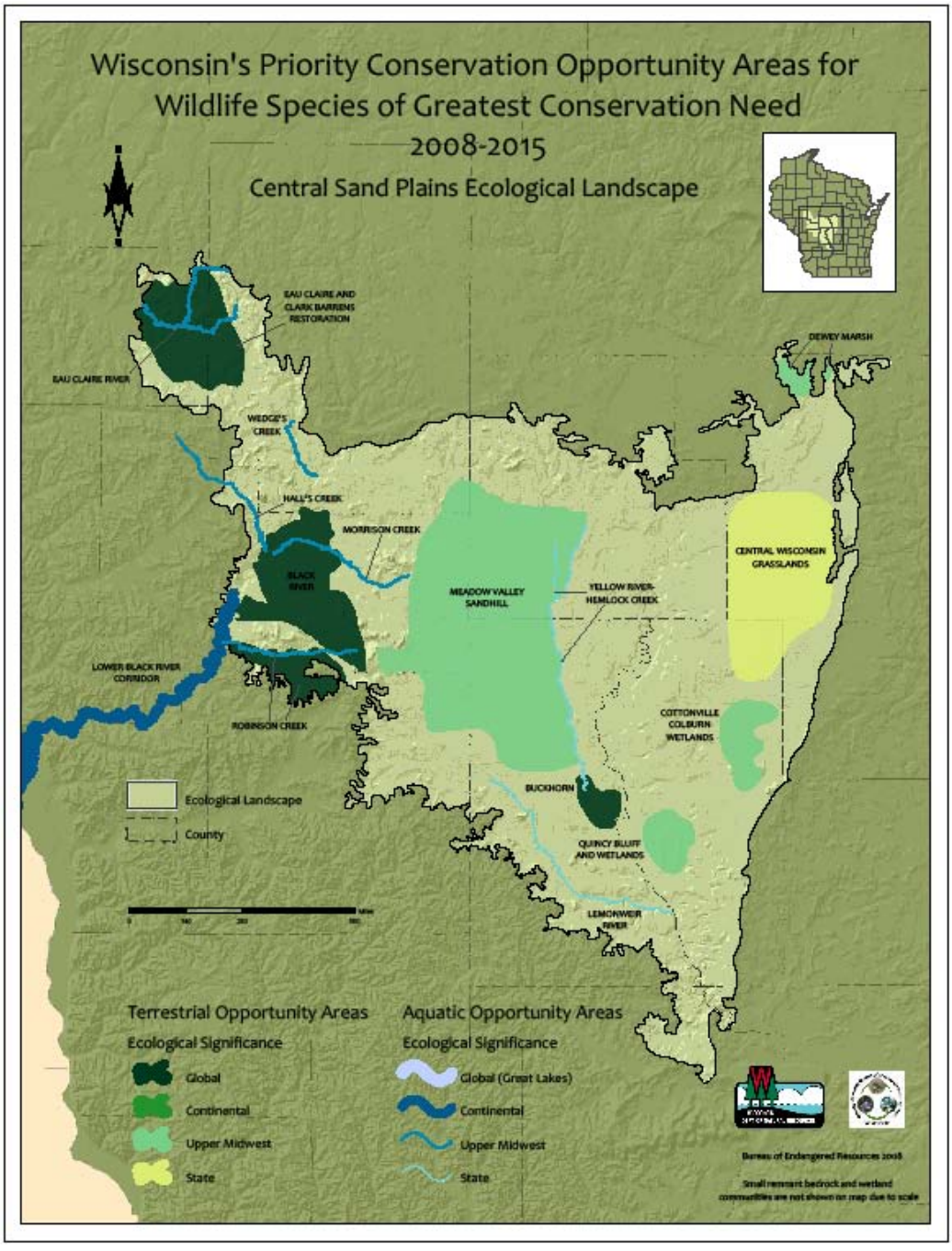
Conservation Opportunity Area Map



FOREST TRANSITION ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- American Golden Plover
- Bobolink
- Dunlin
- Solitary Sandpiper
- Trumpeter Swan
- Wilson's Phalarope
- Black Redhorse
- Redside Dace
- Eastern Red Bat
- West Virginia White
- Impoundments/Reservoirs
- Northern Mesic Forest
- Surrogate Grasslands
- Warmwater Rivers

Priority Conservation Actions

- Maintain the largest blocks of northern mesic and oak forest, especially in the identified Conservation Opportunity Areas.
- Increase connectivity of forest patches, especially in the identified conservation opportunity areas.
- Encourage regeneration and reestablishment of eastern hemlock, Canada yew, white cedar, other conifers and yellow birch, where appropriate through adaptive management techniques.
- Work towards a balance of age classes, especially in the oak conservation opportunity area.
- Research Eastern Red Bat life history, including roosting and foraging habitat, population dynamics, trends, migration, and dispersal patterns.
- Identify and protect refuge areas, and restore coolwater stream Conservation Opportunity Areas to conserve Redside Dace.
- This landscape has an especially important role for managing shorebird habitat at the Big Eau Pleine Flowage and other flowages and impoundments. Through dams and dikes, water levels can be raised to flood these areas, and through water control structures, water levels can be manipulated to benefit shorebirds. Migration phenology and specific habitat requirements must be considered when managing for shorebirds.

Conservation Opportunity Areas

Large Blocks of Predominately Older Northern Forest – Upper Midwest/Regional Significance

Includes the Lakewood District of the Chequamegon-Nicolet National Forest and features Northern Mesic Forest, Northern Wet-mesic Forest, Northern Wet Forest, Northern Dry-mesic Forest, Alder Thicket, and Inland Lakes, especially marl.

COA(s): *Menominee Forest (16.01)*

SGCN – Four-toed Salamander, Pickerel Frog, Wood Turtle, Bald Eagle, Black-billed Cuckoo, Black-throated Blue Warbler, Canada Warbler, Least Flycatcher, Northern Goshawk, Red-shouldered Hawk, Veery, Wood Thrush, Eastern Red Bat, Hoary Bat, Northern Flying Squirrel, Silver-haired Bat, Water Shrew and Woodland Jumping Mouse, and West Virginia White.

Public Land – Chequamegon-Nicolet National Forest, Upper Wolf Fishery Area, Evergreen River Fishery Area, Lakewood Rearing Station, Woods Flowage Fishery Area, Statewide Spring Ponds.

Legacy Places – Chequamegon-Nicolet National Forest, Upper Wolf River, Menominee County, Red River.

Important Bird Areas – Menominee Forest.

Features complexes of oak forest and lakes in the northwest – Northern Mesic Forest, Northern Dry-mesic Forest, Southern Dry-mesic Forest, Northern Wet Forest, and Inland Lakes.

COA(s): *Straight Lake (16.03)*

SGCN – Four-toed Salamander, Wood Turtle, Black-billed Cuckoo, Black-throated Blue Warbler, Cerulean Warbler, Golden-winged Warbler, Northern Goshawk, Least Flycatcher, Red-shouldered Hawk, Trumpeter Swan, Veery, Yellow-billed Cuckoo, Whip-poor-will, Eastern Red Bat, Hoary Bat, Northern Flying Squirrel, and Woodland Jumping Mouse.

Public Land – Balsam Branch Wildlife Area, Clam River Fishery Area, Loon Lake Wildlife Area, McKenzie Creek Wildlife Area, Rice Beds Creek Wildlife Area, Scattered Forest Lands, Sand Creek Fishery Area, Straight Lake Recreation Area.

Legacy Places – Clam River, Balsam Branch Creek and Woodlands, Straight River Channel.

Important Bird Areas – Straight Lake.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Feature Warmwater Rivers, Floodplain Forest, Coldwater/Coolwater streams including stream side communities and Alder Thicket

COA(s): *Lower St. Croix River [part continental] (A.46); Rib and Little Rib Systems (A.26); Wisconsin River, middle (A.20); Little Wolf River (A.07); Wolf River (A.05)*

SGCN – Redside Dace, Greater Redhorse, Lake Sturgeon, Black Redhorse, Redfin Shiner, Four-toed Salamander, Mudpuppy, Pickerel Frog, Wood Turtle, American Golden Plover, Black Tern, Blue-winged Teal, Canvasback, Dunlin, Forster's Tern, Lesser Scaup, Osprey, Short-billed Dowitcher, Solitary Sandpiper, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Water Shrew, Spectacle Case, Purple Wartyback, Butterfly, Elephant Ear, Snuffbox, Higgin's-Eye, Pink Papershell, Winged Mapleleaf, Monkeyface, Wartyback, Salamander Mussel, Buckhorn, Fawnsfoot, Lancet Clubtail, Pygmy Snaketail, St. Croix Snaketail, Armored Mayflies, Small Square-gilled Mayfly, Flat-headed Mayflies, Primitive Minnow Mayflies, Dubirhapia Riffle Beetles, Riffle Beetles, and Water Measurers.

Public Lands – Upper Wolf Fisheries Area, Langlade County Forest, Marathon County Forest, St. Croix National Scenic River.

Important Bird Areas – St. Croix River.

Extensive Grassland Communities – State Significance

Features managed Surrogate Grassland, Impoundments and Northern Mesic Forest.

COA(s): *Mead (16.02)*

SGCN – American Golden Plover, Blue-winged Teal, Bobolink, Brown Thrasher, Dickcissel, Dunlin, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Greater Prairie-Chicken, Henslow's Sparrow, Northern Harrier, Sharp-tailed Grouse, Short-billed Dowitcher, Short-eared Owl, Upland Sandpiper, Western Meadowlark, Willow Flycatcher, Regal Fritillary, and Ottoe Skipper.

Public Land – Mead Wildlife Area, Big Eau Pleine Park, Central Wisconsin Grassland Wildlife Area.

Legacy Places – Central Wisconsin Grassland.

Important Bird Areas – George W. Mead Wildlife Area.

Diverse Aquatic Communities – State Significance

Features Coldwater/Coolwater Streams including streamside communities Northern Wet-Mesic Forest, and Alder Thicket.

COA(s): *Plover River (A.25)*

SGCN – Redside Dace, Four-toed Salamander, Pickerel Frog, Wood Turtle, Osprey, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Water Shrew, Lancet Clubtail and Sand Snaketail.

Public Lands – Plover River Fisheries Area.

Legacy Places –Plover River.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

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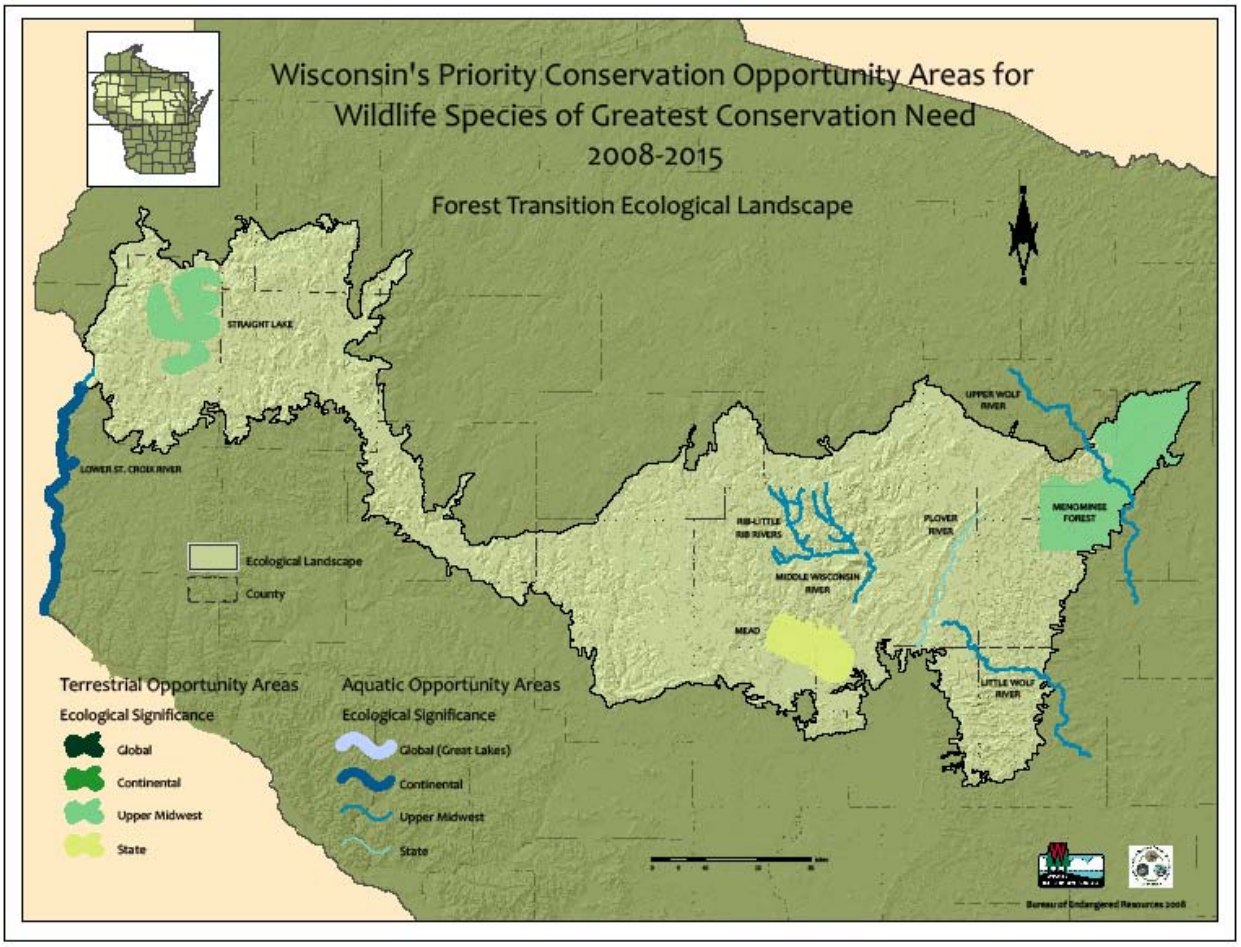
Conservation Opportunity Area Map



NORTH CENTRAL FOREST ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- American Woodcock
- Bald Eagle
- Black-backed Woodpecker
- Black-throated Blue Warbler
- Boreal Chickadee
- Canada Warbler
- Connecticut Warbler
- Least Flycatcher
- Northern Goshawk
- Olive-sided Flycatcher
- Spruce Grouse
- Veery

- American Marten
- Gray Wolf
- Hoary Bat
- Northern Flying Squirrel
- Silver-haired Bat
- Water Shrew
- Woodland Jumping Mouse

- Boreal Chorus Frog
- Four-toed Salamander
- Mink Frog
- Wood Turtle

- Bog Fritillary
- Brown Elfin
- Frigga Fritillary
- Freija Fritillary
- Harris Checkerspot,
- Jutta Arctic
- Laurentian Skipper
- Red-disked Alpine
- West Virginia White

- Coolwater streams
- Ephemeral Pond
- Northern Hardwood Swamp
- Northern Mesic Forest
- Northern Sedge Meadow
- Northern Wet Forest
- Northern Wet-Mesic Forest

Priority Conservation Actions

- Develop clear targets for how much old to old-growth forest we should have.
- Protect existing old-growth stands and defined high conservation value forests on public land, look for opportunities to identify additional areas that can develop into old-growth condition, and connect corridors to accommodate old-growth species movement in the light of climate change. The identified Conservation Opportunity Areas offer the best places to apply this priority.
- Develop tax incentives to preserve relict old-growth forest on private land.
- Provide incentives for reforestation of buffers around old-growth stands and ephemeral ponds.
- Work towards a balanced mosaic of age-classes; older age-classes are currently underrepresented.
- Encourage regeneration or reestablishment of eastern hemlock, Canada yew, white cedar, yellow birch, and other conifer, where appropriate through adaptive management techniques.
- Before the end of fiscal year 2009, assemble a team of wildlife biologists, foresters, researchers, and bird experts to develop a map of priority areas for management of early seral stage forest. The team would focus on the places where the Department could expend limited dollars for applying management to forests where timber sales are problematic. Chosen sites would have the greatest benefit for the greatest number of shrubland species, especially SGCN.
- If a forested parcel lies within a Conservation Opportunity Area, use data from COA Guide as a resource for MFL applicants to encourage management plans that are complementary to the goals of the COA.
- In working forest areas, encourage enrollment of private land in MFL to maintain a high percentage of land in long-term forest cover.
- Restore complexity to the entire forest landscape by retaining biological legacies such as large and cavity trees, snags, boles, large woody debris on the forest floor, herbaceous and understory plants, and forest floor organic matter.
- Develop demonstration sites for field education and training for foresters, wildlife biologists, and land managers to tie on-the-ground application to the old-growth handbook.
- Inventory and map the locations of ephemeral ponds.
- Develop guidelines for silvicultural practices, water quality, and SGCN retention in and around ephemeral ponds.
- Conduct additional survey work in northern wet forest for boreal birds, invertebrates and other taxa.
- Evaluate the need for and reintroduce, if appropriate, American Marten to enhance existing populations and populate new areas.
- Implement a bioregional monitoring design to complete the status assessment of Northern Goshawk in Wisconsin.
- In areas free of exotic earthworms, minimize the likelihood of invasion by earthworms by preventing transport of worms in soil, potted plants, mulch and compost.

- Focus restoration of stream habitat and morphology on areas where land use and other factors suggest the most successful outcomes for Species of Greatest Conservation Need.
- Long-term monitoring and protection of wood turtle nest sites.
- Protection and restoration of appropriate natural stream habitat with focus on accommodating the habitat needs of wood turtle and water shrew.

Conservation Opportunity Areas

Northern Highland Kettle Lakes and Pine Forest – Global Significance

Large extensive area of pine – oak dominated forest with a continuum of Northern Dry Forest, Northern Dry-Mesic Forest, Northern Mesic Forest, and Northern Wet Forest. Also embedded within the upland features is a concentration of glacial lakes with a continuum of Submerged Aquatic, Submerged Aquatic-Oligotrophic, Open Bog, Northern Sedge Meadow, and Inland Lakes.

COA(s): *Rock Lake End Moraine (4.12)*

SGCN – Four-toed Salamander, Mink Frog, Mudpuppy, Wood Turtle, Bald Eagle, Black-throated Blue Warbler, Canada Warbler, Connecticut Warbler, Least Flycatcher, Northern Goshawk, Olive-sided Flycatcher, Osprey, Red Crossbill, Spruce Grouse, Veery, Whip-poor-will, Eastern Red Bat, Gray Wolf, and Northern Flying Squirrel.

Public Land – Chequamegon-Nicolet National Forest, Sawyer County Forest.

Legacy Places – Chequamegon-Nicolet National Forest.

Large Blocks – Old Deciduous – Coniferous Forest (Climate Change Resistant Forest Systems) – Continental Significance

Features large blocks of forest containing a preponderance of older forest in areas where climate change models indicate the climate should be ameliorated by the cooling effects of the Great Lakes. These forests provide an opportunity to manage for the mature to older age classes. Areas feature a continuum of an extensive matrix of older northern hardwood forest with imbedded lakes, wetlands, and bedrock including Northern Mesic Forest, Northern Dry-Mesic Forest, Northern Wet-Mesic Forest, Northern Wet Forest, Open Bog, Muskeg, Northern Hardwood Swamp, Northern Sedge Meadow, and Bedrock Glades.

COA(s): *Gogebic-Penokee Ranges (4.01), Medford Hemlock-Hardwoods (4.02), Sawyer-Ashland Hemlock-Hardwoods (4.04), Nicolet Hemlock-Hardwoods (4.06) and Winegar Moraine – Moose Creek (4.09)*

SGCN – Boreal Chorus Frog, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, Black-backed Woodpecker, Black Tern, Black-throated Blue Warbler, Bobolink, Boreal Chickadee, Canada Warbler, Connecticut Warbler, Golden-winged Warbler (bog edges and stream corridors), Least Flycatcher, Northern Goshawk, Northern Harrier, Olive-sided Flycatcher, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Sharp-tailed Grouse, Spruce Grouse, Veery, Wood Thrush, American Marten, Eastern Red Bat, Gray Wolf, Hoary Bat, Moose, Northern Long-eared Bat, Northern Flying Squirrel, Silver-haired Bat, Water Shrew, Woodland Jumping Mouse, Bog Fritillary, Frigga Fritillary, Freija Fritillary, Harris Checkerspot, Red-disked Alpine, Jutta Arctic, Brown Elfin, West Virginia White, and Laurentian Skipper.

Public Land – Chequamegon-Nicolet National Forest, Board of Commissioners of Public Lands, Moose Lake State Natural Area, Dunn Lake State Natural Area, Underwood Wildlife Area, Northern Highland-American Legion State Forest, Pine-Popple Wild Rivers, Border Lakes State Natural Area, Bay Springs Fishery Area, White River Fishery Area, Iron County Forest, Ashland County Forest.

Legacy Places – Border Lakes Region, Chequamegon-Nicolet National Forests, Chippewa Glacial Lakes, Goodman Forest, Moose Hemlock Woods, Pine-Popple River.

Important Bird Areas – Penokee Range, Upper Chippewa Conifer-Hardwood Forest, Owen-Teal Forest, Perkinstown Hemlock-Hardwood Forest, Moose Lake Old-Growth Forest and Muskeg, St. Peter's Dome-North Country, Lauterman Lake, Camp Nine Pines, and Headwaters Wilderness.

Large Blocks of Predominately Older Northern Forest – Upper Midwest/Regional Significance

Large blocks of forest containing a preponderance of older forest provide an opportunity to manage for the mature to older age classes. These blocks are farther south, more isolated and potentially more susceptible to climate change, therefore, slightly reducing their significance for maintaining SGCN populations. The area features a continuum of an extensive matrix of older northern hardwood forest with imbedded lakes, wetlands, and bedrock including Northern Mesic Forest, Northern Dry-Mesic Forest, Northern Wet-Mesic Forest, Northern Wet Forest, Open Bog, Muskeg, Northern Hardwood Swamp, Northern Sedge Meadow, and Bedrock Glades.

COA(s): *Diamond Roof (4.08), Drumlin Hardwoods (4.07), Blue Hills (4.05) Upper Flambeau Woods (4.10), and Skinner Creek (4.11)*

SGCN – Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, Black Tern, Black-throated Blue Warbler, Canada Warbler, Golden-winged Warbler (bog edges and stream corridors), Least Flycatcher, Northern Goshawk, Northern Harrier, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Veery, Wood Thrush, Eastern Red Bat, Gray Wolf, Hoary Bat, Northern Long-eared Bat, Northern Flying Squirrel, Silver-haired Bat, Water Shrew, Woodland Jumping Mouse, Bog Fritillary, Harris Checkerspot, West Virginia White, and Laurentian Skipper.

Public Land – Chequamegon-Nicolet National Forest, Board of Commissioners of Public Lands, Beverly Lake Fishery Area, Devils Creek Fishery Area, Sawyer County Forest, Rusk County Forest, Barron County Forest.

Legacy Places – Blue Hills, Chequamegon-Nicolet National Forests, Laona Hemlock-Hardwoods, Pipestone Hills.

Important Bird Areas – McCaslin Brook, Blue Hills.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Medium-sized river systems including riparian communities and impoundments – Coldwater Streams, Coolwater Streams, Warmwater Rivers.

COA(s): *Upper Wolf River (A.05), Pine-Popple Rivers (A.09), Jump-Lower Flambeau Rivers (A.40), and Middle Chippewa River (A.36)*

SGCN – Gilt Darter, Greater Redhorse, Lake Sturgeon, Longear Sunfish**,** Four-toed Salamander, Mink Frog, Mudpuppy, Pickerel Frog, Wood Turtle, Bald Eagle, Black tern, Canvasback, Lesser Scaup, Osprey, Solitary Sandpiper, trumpeter Swan, Eastern Red Bat**,** Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, Water Shrew, Lancet Clubtail, Pygmy Snaketail, Elfin Skimmer, Extra-striped Snaketail, St. Croix Snaketail, Crawling Water Beetles, Broad-shouldered Water Strider, Armored Mayflies, Humpless Casemaker Caddisfly, Long-horned Casemaker Caddisfly, Giant Casemaker Caddisfly, Water Measurers, Riffle Beetles, Predaceous Diving Beetles, Water Scorpions, Riffle Beetles, Bullhead, and Purple Wartyback.

Public Land – Chequamegon-Nicolet National Forest, Flambeau State Forest, Sawyer County Forest, Ashland County Forest, Price County Forest, Rusk County Forest, Taylor County Forest, Chippewa County Forest , Langlade County Forest, and Florence County Forest.

Legacy Places – Chequamegon-Nicolet National Forest, Flambeau River State Forest, Goodman Forest, Pine – Popple River, Pipestone Hills, Upper Forks of the Flambeau.

High Quality Wetland Communities – State Significance

Large blocks of bog and swamp containing little touched forested wetlands providing an opportunity to manage for large blocks of muskeg. This area features a continuum of an extensive matrix of bog land including Northern Wet-Mesic Forest, Northern Wet Forest, Open Bog, Muskeg, Northern Hardwood Swamp, and Northern Sedge Meadow.

COA(s): *Bootjack Bog (4.03)*

SGCN – Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, Black-backed Woodpecker, Boreal Chickadee, Canada Warbler, Connecticut Warbler, Golden-winged Warbler (bog edges and stream corridors), Northern Goshawk, Northern Harrier, Olive-sided Flycatcher, Rusty Blackbird, Solitary Sandpiper, Sharp-tailed Grouse, Spruce Grouse, Veery, Eastern Red Bat, Gray Wolf, Hoary Bat, Moose,

Northern Long-eared Bat, Northern Flying Squirrel, Silver-haired Bat, Water Shrew, Woodland Jumping Mouse, Bog Fritillary, Frigga Fritillary, Freija Fritillary, Red-disked Alpine, Jutta Arctic, and Laurentian Skipper.

Public Land – Chequamegon-Nicolet National Forest, Board of Commissioners of Public Lands.

Legacy Places – Bootjack Bog.

Important Bird Areas – Bootjack Muskeg.

Diverse Aquatic Communities – State Significance

Medium-sized river systems including riparian communities including Coldwater Streams, Coolwater Streams, Warmwater Rivers.

COA(s): *Upper Forks of the Chippewa River (A.43), Flambeau River (A.41), and Brunet and Thornapple Rivers (A.53).*

SGCN – Gilt Darter, Greater Redhorse, Lake Sturgeon, Mink Frog, Mudpuppy, Wood Turtle, Bald Eagle, Osprey, Solitary Sandpiper, Eastern Red Bat**,** Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, Water Shrew, Lancet Clubtail, Pygmy Snaketail, Extra-stripped Snaketail, St. Croix Snaketail, Spectacle Case, Mapleleaf, Salamander Mussel, Bullhead, and Purple Wartyback.

Public Land – Chequamegon-Nicolet National Forest, Flambeau State Forest, Sawyer County Forest, Ashland County Forest, Price County Forest.

Legacy Places – Chequamegon-Nicolet National Forest, Flambeau River State Forest.

Unique concentrations of kettle lakes that contain lake communities harboring many SGCN invertebrates

COA(s): *Birchwood Moraine (A.50), Chippewa Moraine (A.49) and the Harrison Hills (A.51) Lakes*

SGCN – Bullfrog, Blanding's Turtle, Wood Turtle, Boreal Top, Honey Vertigo, Bog Fritillary, Delicate Emerald, Elfin Skimmer, Least Clubtail, Riffle Snaketail, Sand Snaketail, Holarctic Clam Shrimp, Giant Casemaker Caddisfly, Predacious Diving Beetles, Water Scavenger Beetles, Velvet Water Bug, and Crawling Water Beetles.

Public Land – Washburn County Forest, Chippewa County Forest, Lincoln County Forest.

Legacy Places – Birchwood, Chippewa Moraine, Harrison Hills.

Bedrock influenced headwater streams harboring many SGCN invertebrates.

COA(s): *Blue Hills Headwater Streams (A.38)*

SGCN – Longear Sunfish, Least Darter, Pugnose Shiner, Weed Shiner, Bullfrog, Blanding's Turtle, Wood Turtle, Bog Fritillary, Elegant Spreadwing, Elfin Skimmer, Extra-striped Snaketail, Least Clubtail, Riffle Snaketail, Sand Snaketail, Giant Casemaker Caddisfly, and Crawling Water Beetles.

Public Land – Barron County Forest, Rusk County Forest, Sawyer County Forest.

Legacy Places – Blue Hills.

High Quality Wetland Communities – (unmapped) State Significance

Large bogs and muskeg features containing little touched forested wetlands providing an opportunity to assess the impacts of a changing climate. These large wetlands have been relatively stable in composition for millennia and occur mostly in isolated basins. Even though the protection of the diversity found in these bogs is better addressed in Canada, our large extensive bogs provide a unique opportunity for assessing the resiliency and resistance to climate change. For this primary purpose and many others, these communities should be managed for their stability. These areas feature a continuum of an extensive matrix of bog land – Northern Wet-Mesic Forest, Northern Wet Forest, Open Bog, Muskeg, Northern Hardwood Swamp, and Northern Sedge Meadow.

SGCN – Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, Black-backed Woodpecker, Boreal Chickadee, Canada Warbler, Connecticut Warbler, Golden-winged Warbler (bog edges and stream corridors), Northern Goshawk, Northern Harrier, Olive-sided Flycatcher, Rusty Blackbird, Solitary Sandpiper, Sharp-tailed Grouse, Spruce Grouse, Veery, Eastern Red Bat, Gray Wolf, Hoary Bat, Moose,

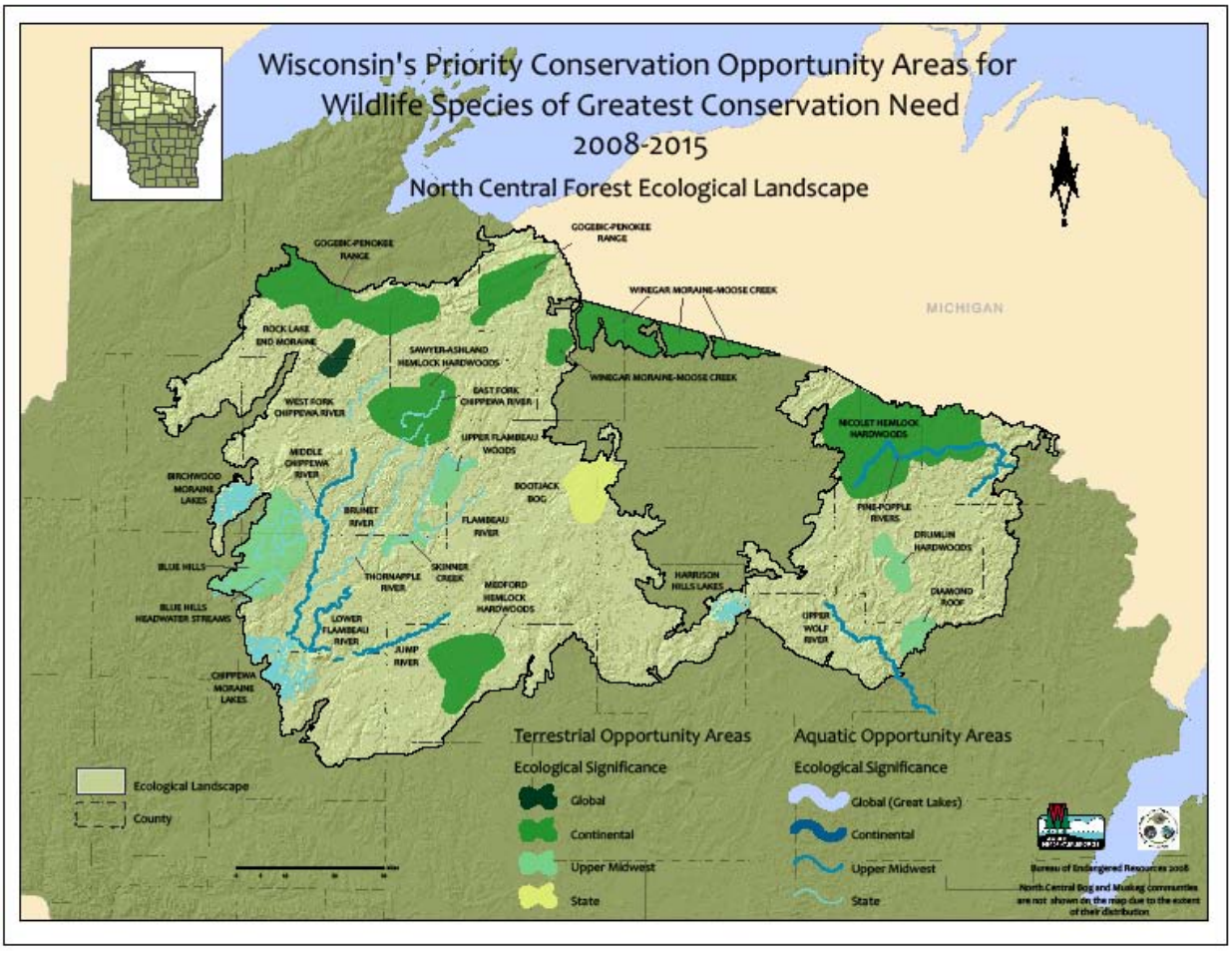
Northern Long-eared Bat, Northern Flying Squirrel, Silver-haired Bat, Water Shrew, Woodland Jumping Mouse, Bog Fritillary, Frigga Fritillary, Freija Fritillary, Red-disked Alpine, Jutta Arctic, and Laurentian Skipper.

Public Land – Langlade County Forest (Bogus Swamp and Kelly Lynn Bogs), Lincoln County Forest (Tomahawk, Squirrel, Budinga, and Bradley Bogs), Chequamegon-Nicolet National Forest (Hiles Swamp), Price County Forest (Million Acre Swamp), Washburn County Forest (Lost Lake Bog and Crystal Bog), Oneida County Forest (Enterprise Swamp).

Legacy Places – Bogus-Kelly Lynn Bogs, Chequamegon-Nicolet National Forest , Lincoln County Bogs.

Important Bird Areas – Lincoln County Muskegs and Bogus Muskeg-Kelly Lynn Bog.

Conservation Opportunity Area Map



NORTHEAST SANDS ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- Black-billed Cuckoo
- Golden-winged Warbler
- Vesper Sparrow
- Mudpuppy
- Wood Turtle
- Chrysus Arctic
- Hoary Elfin
- Northern Blue Butterfly
- Pink-edged Sulphur
- Tawny Crescent
- Bedrock Glade
- Bracken Grassland
- Coolwater streams
- Northern Dry Forest
- Northern Dry-Mesic Forest
- Northern Wet-Mesic Forest
- Pine Barrens

Priority Conservation Actions

- Create financial incentives to manage for jack pine and oak.
- Create financial incentives to address the differential market values between plantation forestry and natural regeneration, retention of old-growth patches, or prescribed burning in and around core managed areas.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other barrens/bracken grassland management practices.
- Manage the full range of barrens successional stages and diverse habitats in a landscape context. A comprehensive landscape plan will require identification and management of early succession cores. The barrens also need to have areas managed in a shifting mosaic of timber harvest with many clearcuts, some older than rotation-age stands, some thinning of stands for savanna structure and a few protected groves. Many small open patches are needed to conserve rare Lepidoptera. To enhance landscape attributes, red pine plantations can be applied to appropriate sites where the historic fire regime indicates that groves occurred.
- Restore oak/conifer barrens and shrub habitats on public lands in appropriate Conservation Opportunity Areas through fire, ground layer enhancement, and timber management.
- Identify additional sites containing high quality or restorable barrens.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of barrens ecosystems.
- Develop conservation partnerships with county forests, private groups, and industrial forest landowners with the goal of planning landscape management.
- Integrate land-use planning efforts across federal, state, county, and local ownership boundaries.
- Eliminate off-trail operation of motor vehicles and off-road vehicles in barrens and bracken grassland restorations that leads to invasive plant establishment, wind and storm erosion, or dominance of Pennsylvania sedge.
- Identify northern blue butterfly habitat restoration opportunities and plant larval host and nectaring species, where appropriate.
- Maintain large blocks of northern wet-mesic forest, especially in older age classes, as habitat for area- and disturbance-sensitive species.
- Imbed and maintain smaller northern wet-mesic forest patches in a matrix of upland forest.
- Focus stream habitat and morphology restoration on areas where land use and wood turtle populations suggest the best success.
- Maintain lowland shrub communities like alder thicket and shrub-carr, and manage the surrounding working forest to benefit Golden-winged Warblers by leaving scattered off-site aspen, ash and tamarack in shrub-dominated areas and managing the adjacent upland forest in a shifting mosaic of patch sizes and age classes to provide continuous habitat.
- Protect and restore large river habitat for Pygmy Snaketail and other aquatic invertebrate SGCN.

Conservation Opportunity Areas

Pine-Oak Barrens – Global Significance

Large outwash plains with a continuum of Pine Barrens, Northern Dry Forest, and Northern Dry-Mesic Forest.

COA(s): Dunbar Barrens (15.05) and Athelstane Barrens (15.06)

SGCN – Blanding's Turtle, Wood Turtle, Black-billed Cuckoo, Brown Thrasher, Canada Warbler, Field Sparrow, Golden-winged Warbler, Northern Goshawk, Northern Harrier, Least Flycatcher, Red Crossbill, Red-shouldered Hawk, Sharp-tailed Grouse, Upland Sandpiper, Veery, Vesper Sparrow, Whip-poor-will, Gray Wolf, Northern Flying Squirrel, Woodland Jumping Mouse, Chrysus Arctic, Tawny Crescent, Henry's Elfin, Hoary Elfin, Northern Blue Butterfly, Pink-edged Sulphur, Leonard's skipper, Cobweb Skipper, Indian Skipper, Pink Sallow, and Graceful Clearwing.

Public Land – Amberg Wildlife Area, Dunbar Barrens State Natural Area, Pike Wild River, Marinette County Forest.

Legacy Places – Athelstane Barrens.

Important Bird Areas – Athelstane Barrens and Dunbar Barrens.

Large Blocks of Predominately Older Northern Forest – Upper Midwest/Regional Significance

Large outwash plains with a continuum of Northern Dry Forest, Northern Dry-Mesic Forest, and small patches of Bracken Grassland

COA(s): Nicolet Dry Forest (15.03), Peshtigo River (15.01)

SGCN – Wood Turtle, Black-billed Cuckoo, Brown Thrasher, Field Sparrow, Northern Goshawk, Least Flycatcher, Red-shouldered Hawk, Whip-poor-will, Northern Flying Squirrel, Woodland Jumping Mouse, Chrysus Arctic, Tawny Crescent, Henry's Elfin, Hoary Elfin, Indian Skipper, and Graceful Clearwing.

Public Land – Chequamegon-Nicolet National Forest, Marinette County Forest, Peshtigo Brook Wildlife Area, and Oconto County Forest.

Legacy Places – Chequamegon-Nicolet National Forest.

Large Sedge Meadows, Fens, and Prairies – Upper Midwest/Regional Significance

The predominant feature is bracken grassland that falls into this category. Additional acres of Northern Dry Forest and Northern Wet forest are found in the COA.

COA: Spread Eagle Barrens (15.07)

SGCN – Wood Turtle, Black-billed Cuckoo, Brown Thrasher, Field Sparrow, Northern Harrier, Least Flycatcher, Upland Sandpiper, Vesper Sparrow, Whip-poor-will, Northern Flying Squirrel, Woodland Jumping Mouse, Chrysus Arctic, Tawny Crescent, Henry's Elfin, Hoary Elfin, Pink-edged Sulphur, Leonard's Skipper, Cobweb Skipper, Indian Skipper, and Graceful Clearwing.

Public Land – Spread Eagle Barrens State Natural Area.

Legacy Places – Spread Eagle Barrens.

Important Bird Areas – Spread Eagle Barrens, and Waupee Lake.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Medium-sized Coolwater River systems including riparian communities.

COA(s): Peshtigo River (A.08), Upper Wolf River (A.05)

SGCN – Lake Sturgeon, Blanding's Turtle, Four-toed Salamander, Mink Frog, Mudpuppy, Pickerel Frog, Wood Turtle, Bald Eagle, Osprey, Solitary Sandpiper, Water Shrew, Lancet Clubtail, Water Scorpions, Extra-striped Snaketail, Riffle Beetles, Pygmy Snaketail, Slippershell Mussel and Snuffbox.

Public Lands –Peshtigo River State Forest, Marinette County Forest.

Legacy Places – Peshtigo River.

High Quality Wetland Communities – State Significance

Large forested wetland blocks with opportunities for focused management to perpetuate old northern wet-mesic forest with some areas featuring northern dry-mesic forest and bedrock glades.

COA(s): Brazeau Swamp (15.02), Northeast Wisconsin Forest (15.04), Coleman Lake (15.08), and Amberg (15.09)

SGCN – Four-toed Salamander, Pickerel Frog, Wood Turtle, Canada Warbler, Golden-winged Warbler, Least Flycatcher, Northern Goshawk, Gray Wolf, Northern Flying Squirrel, Water Shrew, and Woodland Jumping Mouse.

Public Land – Peshtigo Brook Wildlife Area, South Branch Oconto Fishery Area, Marinette County Forest, Oconto County Forest, Chequamegon-Nicolet National Forest, Town Corner Wildlife Area, Amberg Wildlife Area.

Legacy Places – Brazeau Swamp, Menominee Tribal Forest.

Important Bird Areas – Waupee Lake, Athelstane Barrens, and Menominee Forest.

Bedrock Communities – (unmapped) State Significance

Bedrock outcrops supporting glade communities. Most of Wisconsin has the bedrock buried beneath glacial materials. In the Northeast Sands, the bedrock was so resistant to the effects of glacial grind and wear that many bedrock outcrops still persist. These bedrock glades often contain many different plants and animals than the surrounding forest. These glades provide limited habitat for SGCN and need to be managed as small patches where they are located. Natural Communities – Bedrock Glade, Northern Dry Forest, and Northern Dry-Mesic Forest.

SGCN – Bullsnake, Dusted Skipper, Northern Blue Butterfly.

Public Land – Oconto County Forest, Marinette County Forest, Florence County Forest, Chequamegon-Nicolet National Forest.

Important Bird Areas – Athelstane Barrens.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

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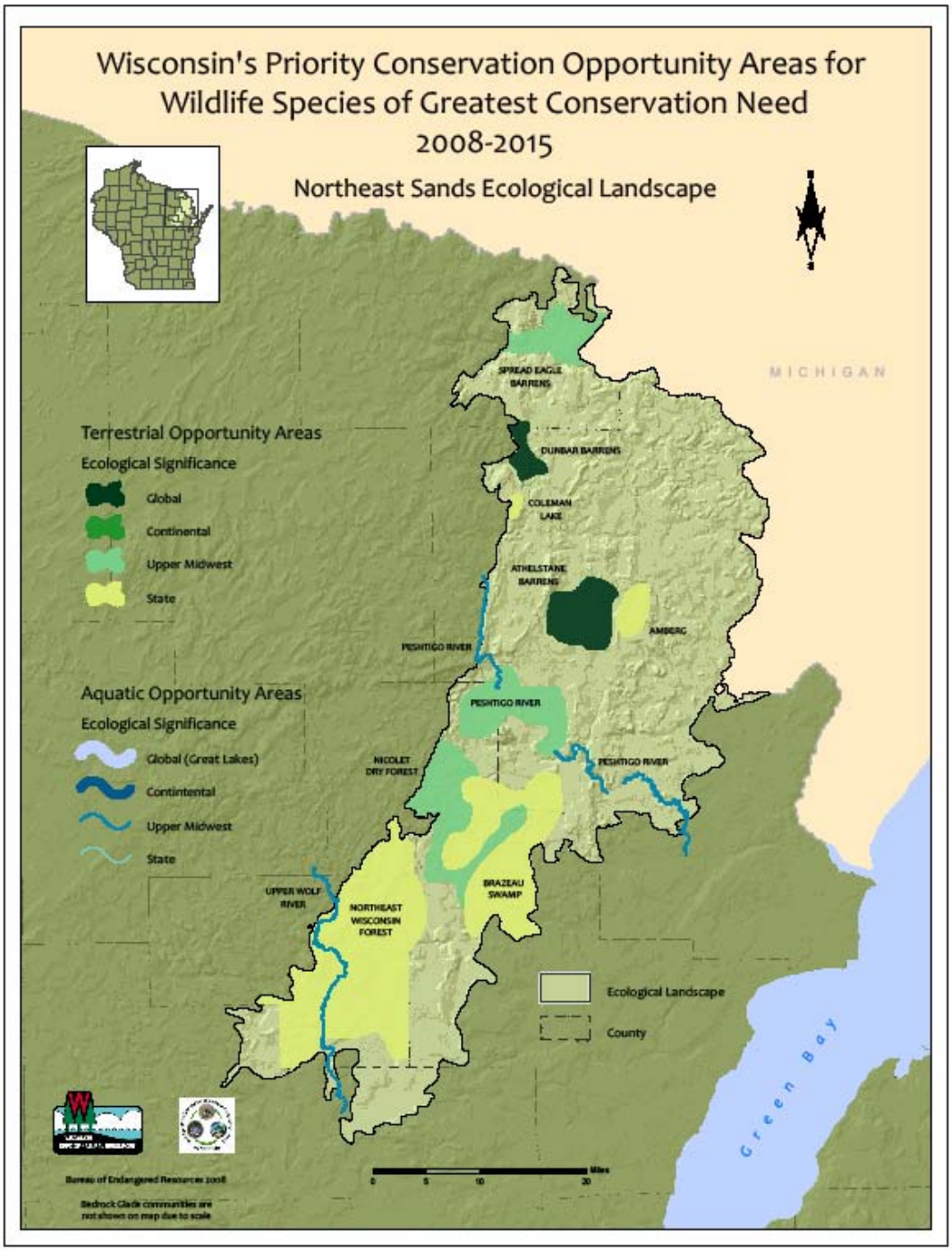
Conservation Opportunity Area Map



NORTHERN HIGHLAND ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- Bald Eagle
- Black-backed Woodpecker
- Boreal Chickadee
- Canada Warbler
- Connecticut Warbler
- Least Flycatcher
- Nelson's Sharp-tailed Sparrow
- Northern Goshawk
- Olive-sided Flycatcher
- Osprey
- Red Crossbill
- Spruce Grouse
- Veery
- Least Darter
- Longear Sunfish
- Pugnose Shiner
- Mink Frog
- Northern Flying Squirrel
- Water Shrew
- Woodland Jumping Mouse
- Bina Flower Moth
- Bog Fritillary
- Bog Copper
- Freija Fritillary
- Frigga Fritillary
- Emergent Marsh – Wild Rice
- Inland Lakes
- Northern Dry-Mesic Forest
- Northern Sedge Meadow
- Northern Wet Forest
- Submerged Aquatic-Oligotrophic

Priority Conservation Actions

- Increase representation of red and white pine forests, especially older age classes.
- Use adaptive management techniques to restore pine-dominated forest structure and composition.
- Develop techniques for using prescribed fire to reduce other woody competition when establishing and maintaining red and white pine forests.
- Develop educational tools and demonstration areas to articulate the benefits of using prescribed burning for ecological management.
- Preserve and maintain large expanses of northern sedge meadow.
- Manage wild rice areas, oligotrophic lakes, and emergent marshes as complexes within other forest and wetland types.
- Where appropriate, focus protection and management of lake and river shoreline areas on the habitat requirements for the Pugnose Shiner and Least Darter, which need shallow densely-vegetated areas for spawning.
- Implement a bioregional monitoring design to provide data needed to complete a status assessment of Northern Goshawk.
- Protection and restoration of natural lake and stream habitat, including establishment of refuge areas and appropriate management of aquatic plants, are needed for conservation of the Pugnose Shiner, which requires clear waters and littoral zone vegetation.
- Maintain large expanses of lowland coniferous forest in the context of older age classes and upland coniferous landscapes.
- Restore habitat for the Longear Sunfish in the few rivers and lakes where they occur.
- Survey large peatlands for presence of boreal birds, Lepidoptera and other boreal taxa.
- Collect more information on the status and biology of the Longear Sunfish to help focus conservation efforts.

Conservation Opportunity Areas

Northern Highland Kettle Lakes and Pine Forest – Global Significance

Large extensive area of pine dominated forest with a continuum of Northern Dry Forest, Northern Dry-Mesic Forest, Northern Mesic Forest, and Northern Wet Forest. Also embedded within the upland features is a concentration of glacial lakes with a continuum of Submerged Aquatic, Submerged Aquatic-Oligotrophic, Emergent Aquatic-Wild Rice, Open Bog, Northern Sedge Meadow, and Inland Lakes.

COA(s): *Trout Lake Pines (5.01), Flambeau Headwaters (5.04), Blackjack Springs (5.05) and Chain-O-Lakes (5.09)*

SGCN – Greater Redhorse, Lake Sturgeon, Least Darter, Longear Sunfish, Pugnose Shiner, Four-toed Salamander, Mink Frog, Mudpuppy, Wood Turtle, , Bald Eagle, Black-throated Blue Warbler, Canada Warbler, Connecticut Warbler, Least Flycatcher, Northern Goshawk, Olive-sided Flycatcher, Osprey, Red Crossbill, Spruce Grouse, Veery, Whip-poor-will, Eastern Red Bat, Gray Wolf, and Northern Flying Squirrel.

Public Land – Northern Highland-American Legion State Forest, Scattered Forest Lands, Vilas County Forest, Chequamegon-Nicolet National Forest, Dunn Lake Pines State Natural Area.

Legacy Places – Chequamegon-Nicolet National Forest, Northern Highland American Legion State Forest, Upper Wisconsin.

Important Bird Areas – Central Northern Highlands, Flambeau Headwaters, and Deerskin River.

Large Sedge Meadows, Fens and Prairies – Upper Midwest/Regional Significance

Large expanse of peatlands with a continuum of Emergent Marsh, Emergent Marsh-Wild Rice, Northern Sedge Meadow, Open Bog, Muskeg, Northern Wet Forest, and Northern Dry-mesic Forest.

COA(s): *Wisconsin River Headwaters (5.02), Squirrel and Tomahawk Rivers (5.03), Manitowish/Powell Peatlands (5.06), Big Swamp (5.07) and Thunder Lake (5.08)*

SGCN – Four-toed Salamander, Mink Frog, Wood Turtle, American Bittern, Black Tern, Black-backed Woodpecker, Blue-winged Teal, Boreal Chickadee, Canada Warbler, Connecticut Warbler, Northern Harrier, Olive-sided Flycatcher, Red Crossbill, Rusty Blackbird, Solitary Sandpiper, Spruce Grouse, Veery, Yellow Rail, Eastern Red Bat, Gray Wolf, Moose, Northern Flying Squirrel, Water Shrew, Woodland Jumping Mouse, Bina Flower Moth, Bog Fritillary, Bog Copper, Freija Fritillary, Frigga Fritillary, Indian Skipper and Pink-edged Sulphur.

Public Land – Northern Highland-American Legion State Forest, Chequamegon-Nicolet National Forest, Squirrel River Pines State Natural Area, Tomahawk River Pines State Natural Area, Powell Marsh Wildlife Area, Turtle Flambeau Scenic Waters, Vilas County Forest, Oneida County Forest, Thunder Lake State Wildlife Area.

Legacy Places – Border Lakes, Northern Highland-American Legion, Deerskin River, Squirrel and Tomahawk Rivers, Upper Wisconsin River, Willow Flowage, Chequamegon-Nicolet National Forest.

Important Bird Areas – Manitowish Peatlands, Upper Wisconsin River Wetlands and Pines, and Rainbow Flowage and Peatlands.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Medium-sized river systems including the drainage lakes through which they flow – Coolwater Streams and Warmwater Streams, including riparian communities.

COA(s): *Trout-Manitowish Headwaters (A.42)*

SGCN – Greater Redhorse, Lake Sturgeon, Least Darter, Longear Sunfish, Pugnose Shiner, Four-toed Salamander, Mink Frog, Mudpuppy, Wood Turtle, Solitary Sandpiper, Eastern Red Bat, Water Shrew, Lancet Clubtail.

Public Land – Northern Highland-American Legion State Forest.

Legacy Places – Northern Highland-American Legion.

Diverse Aquatic Communities – State Significance

Medium-sized river systems including Coolwater Streams and Warmwater Streams, including riparian communities.

COA(s): *Squirrel and Tomahawk Rivers (A.27)*

SGCN – Least Darter, Four-toed Salamander, Mink Frog, Mudpuppy, Wood Turtle, Solitary Sandpiper, Eastern Red Bat, Water Shrew, Pygmy Snaketail.

Public Land – Squirrel River Pines State Natural Area, Tomahawk River Pines State Natural Area.

Legacy Places –Willow Flowage.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

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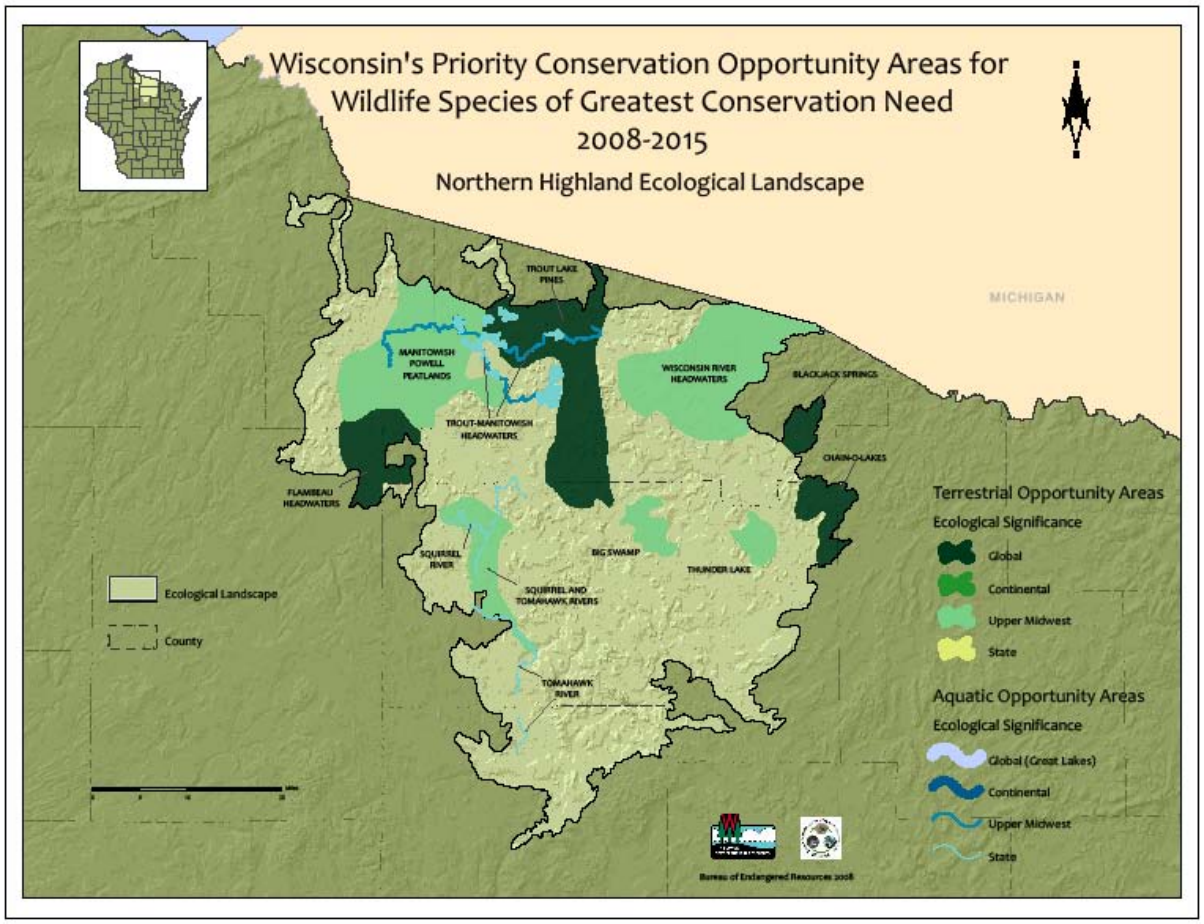
Conservation Opportunity Area Map



NORTHERN LAKE MICHIGAN COASTAL ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- Caspian Tern
- Common Tern
- Eastern Meadowlark
- Forster's Tern
- Great Egret
- Horned Grebe
- Olive-sided Flycatcher
- Piping Plover
- Snowy Egret
- Upland Sandpiper
- Whimbrel
- Lake Sturgeon
- Shoal Chub
- Mudpuppy
- Black Striate
- Boreal Top
- Bright Glyph (snail)
- Cherrystone Drop
- Hine's Emerald Dragonfly
- Iowa Pleistocene Vertigo
- Lake Huron Locust
- Midwest Pleistocene Vertigo
- Mystery Vertigo
- Phyllira Tiger Moth
- Sculpted Glyph
- Swamp Metalmark
- White-lip Dagger
- Boreal Rich Fen
- Boreal Forest
- Emergent Marsh
- Floodplain Forest
- Great Lakes Alkaline Rockshore
- Great Lakes Beach
- Great Lakes Dune
- Great Lakes Ridge & Swale
- Lake Michigan
- Northern Sedge Meadow
- Northern Wet-mesic Forest
- Warmwater Rivers

Priority Conservation Actions

- Protect and restore harbor and river mouth shoreline and wetland habitats.
- Manage forested ridge and swale and boreal rich fen areas as part of a vegetation mosaic that includes other open wetland communities, shrub swamp, and swamp conifer forest by promoting older age classes, protecting site hydrology, and early detection and management of invasive exotic species.
- Increase near shore representation of boreal forest by encouraging retention of white spruce, white pine, white cedar, and balsam fir, especially in older age classes, by adaptive management and selective planting.
- Improve regulations and education to prevent the introduction of additional exotic species and slow the spread of existing invasive species.
- Manage Great Lakes beach and dune habitat as part of a vegetation mosaic that includes forested ridge and swale, interdunal wetland, shrub carr, and swamp conifer forest with older age classes. Promote concentrated public access points, limited recreational activities in areas where SGCN are present (particularly during breeding seasons), protecting site hydrology, and early detection and management of invasive exotic species.
- Implement new cost-sharing programs or continue voluntary programs to monitor for and aggressively eliminate invasive species, especially in Great Lakes beach, dune, and ridge and swale communities.
- Preserve habitat on the Niagara Escarpment and protect ecologically significant areas currently occupied by SGCN from conversion to other land uses.
- Protect and manage water bodies containing Hine's Emerald Dragonfly, monitor populations and conduct basic life history research.
- Protect and restore habitat in the lower Wolf River to accommodate Shoal Chub.
- Maintain long-term wetland productivity on state properties by mimicking natural hydrologic regimes and using adaptive management techniques.
- Initiate wetland renovation projects to enhance Forster's Tern habitat.
- Utilize artificial nest platforms to maintain Forster's Tern populations.
- Keep open aspect to west shore wetlands and sedge meadows by using prescribed fire, fluctuating water levels where appropriate, and tree shearing and harvest.

Conservation Opportunity Areas

Great Lakes and their Shorelines – Global Significance

Lake Michigan including embayments and Migratory/Winter Bird Habitat

COA(s): *Lake Michigan (A.02) including embayments such as Rowley's Bay and Moonlight Bay.*

SGCN – Horned Grebe, Caspian Tern, Common Tern, Lake Sturgeon, Banded Killifish, Mudpuppy, Bald Eagle, Greater Redhorse

Public Land – The lake is public water

Legacy Places – None.

Important Bird Areas – None.

Northern Door County natural community complexes including Great Lakes Beach, Great Lakes Alkaline Rockshore, Great Lakes Dune, Boreal Rich Fen, Floodplain Forest, Northern Sedge Meadow, Northern Wet Forest, Northern Wet-mesic Forest, Boreal Forest, Great Lakes Ridge & Swale, and Northern Hardwood Swamp. These sites also include portions of the Niagara Escarpment including Dry Cliff, Moist Cliff and bedrock communities.

COA(s): Rock Island (14.01), Detroit Harbor (14.02), Big and Little Marsh (14.03), Coffey Swamp (14.04), Jackson Harbor (14.05), Chambers Island (14.06), Gardner Marsh (14.07), Potawatomi State Park (14.08), Bayshore Blufflands (14.09), White Cliff Fen and Forest (14.10), Thorp Pond (14.11), Baileys Harbor to Peninsula (14.12), Kangaroo Lake (14.13), Hibbard Creek (14.14), Logan Creek (14.15), Whitefish Dunes to Sturgeon Bay (14.16), Ellison Bluff (14.17), Door Bluff County Park (14.18), Mink River to Europe Bay (14.19), Boyer's Bluff (14.20) Green Bay West Shores (14.22)

SGCN – Blanding's Turtle, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, American Woodcock, Black-billed Cuckoo, Black Tern, Black-throated Blue Warbler, Blue-winged Teal, Bobolink, Brown Thrasher, Canada Warbler, Caspian Tern, Common Tern, Dunlin, Forster's Tern, Hudsonian Godwit, Least Flycatcher, Marbled Godwit, Northern Goshawk, Northern Harrier, Olive-sided Flycatcher, Rusty Blackbird, Solitary Sandpiper, Snowy Egret, Veery, Whimbrel, Willow Flycatcher, Wood Thrush, Yellow Rail, Eastern Red Bat, Hoary Bat, Northern Flying Squirrel, Northern Long-eared Bat, Silver-haired Bat, Water Shrew, Woodland Jumping Mouse, Lake Huron Locust, Bright Glyph (snail), Hine's Emerald Dragonfly, Swamp Metalmark, Phyllira Tiger Moth, Two-spotted Skipper, Sculptured Glyph, Cherrystone Drop, White-tip Dagger, Black Striate, Midwest Pleistocene Vertigo, Iowa Pleistocene Vertigo, Mystery Vertigo, and Boreal Top.

Public Land – Baileys Harbor Boreal Forest State Natural Area, Bloch Oxbow State Natural Area, Gardner Swamp Wildlife Area, Green Bay West Shores Wildlife Area, Mud Lake Wildlife Area, Newport State Park, Peninsula State Park, Potawatomi State Park, Rock Island State Park, Seagull Bar Wildlife Area, Whitefish Dunes State Park, TNC Mink River Preserve, UW-Green Bay Toft Point, The Ridges Sanctuary, Small Scattered State Natural Areas, Door County Land Trust Preserves, Door County Parks.

Legacy Places – Northern Door County, Green Bay West Shore Wetlands, Oconto Marsh, Peshtigo Harbor, and Seagull Bar and Niagara Escarpment.

Important Bird Areas – Whitefish Dunes - Shivering Sands, Toft Point - Ridges - Mud Lake, and Mink River Estuary - Newport State Park, Green Bay West Shore Wetlands, Lower Peshtigo River, and Seagull Bar.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Including Floodplain Forest, Northern Sedge Meadow, Emergent Marsh, and Warmwater Rivers.

COA(s): *Lower Wolf River (A.06)*

SGCN – Greater Redhorse, Lake Sturgeon, River Redhorse, Shoal Chub, Western Sand Darter, Four-toed Salamander, Wood Turtle, American Black Duck, Black-billed Cuckoo, Blue-winged Teal, Great Egret, Least Flycatcher, Prothonotary Warbler, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Veery, Yellow-billed Cuckoo, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Buckhorn, Elktoe, Round Pigtoe, Salamander Mussel, Snuffbox, Elegant Spreadwing, Elusive Clubtail, Plains Clubtail, Pygmy Snaketail, Stygian Shadowfly, Predaceous Diving Beetles, Caenid Mayfly, Water Scavenging Beetles, Dubiraphia Riffle Beetle, White River Crayfish, and Mississippi Grass Shrimp.

Public Land – None

Legacy Places – Lower Wolf River.

Important Bird Areas – Lower Wolf River Bottoms.

High Quality Wetlands – State Significance

Boreal Rich Fen, Northern Wet-mesic Forest, Northern Wet Forest, Northern Sedge Meadow, Shrub-Carr, and Emergent Marsh.

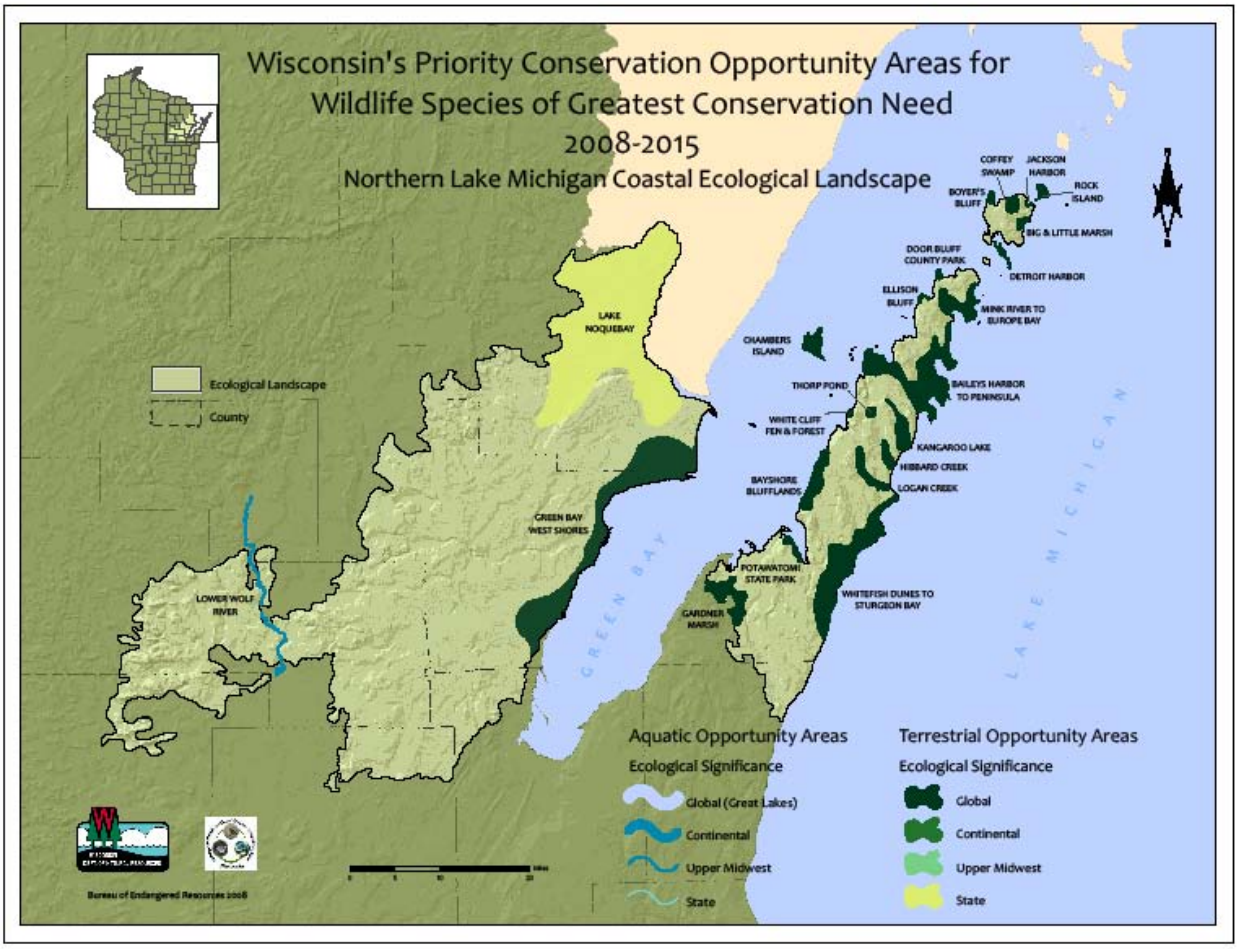
COA(s): *Lake Noquebay (14.21)*

SGCN – Blanding's Turtle, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, American Woodcock, Bald Eagle, Black-billed Cuckoo, Black Tern, Blue-winged Teal, Canada Warbler, Northern Harrier, Osprey, Rusty Blackbird, Veery, Willow Flycatcher, Yellow Rail, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, Water Shrew, and Woodland Jumping Mouse and Two-spotted Skipper.

Public Land – Lake Noquebay Wildlife Area.

Legacy Places – Noquebay Conifer Swamp.

Conservation Opportunity Area Map



Northwest Lowlands Ecological Landscape

High Priority SGCN and Natural Communities

- Black-billed Cuckoo
- Golden-winged Warbler (bog and stream corridors)
- Gilt Darter
- Gray Wolf
- Greater Redhorse
- Least Flycatcher
- LeConte's Sparrow
- River Redhorse
- Bog Fritillary
- Brown Elfin
- Frigga Fritillary
- Freija Fritillary
- Harris Checkerspot
- Higgin's-eye
- Jutta Arctic
- Laurentian Skipper
- Purple Wartyback
- Pygmy Snaketail
- Red-disked Alpine
- St. Croix Snaketail
- Winged Mapleleaf
- Warmwater Rivers
- Open Bog
- Northern Sedge Meadow
- Northern Wet Forest

Priority Conservation Actions

- Maintain large blocks of open bog/muskeg habitat and other surrounding wetlands and manage as co-occurring peatland communities.
- Maintain large blocks of sedge meadow and manage as complex in conjunction with associated wetlands such as open bog, poor fen, emergent marsh, shrub-carr, alder thicket and northern wet forest.
- Maintain lowland shrub communities, especially alder thickets and shrub-carr, and manage the working forest surrounding the shrub communities to benefit Golden-winged Warblers by leaving scattered off site aspen, ash and tamarack in the shrub areas and manage the uplands in a shifting mosaic to provide continuous habitat.
- Survey large peatlands for presence of boreal birds, Lepidoptera and other boreal taxa.
- Protect and restore large river habitat for rare taxa such as freshwater mussels, dragonflies and fish.

Conservation Opportunity Areas

Large Sedge Meadows, Fens and Prairies – Upper Midwest/Regional significance

Large extensive acid peatlands with a continuum from Open Bog, Northern Sedge Meadow, Poor Fen, Muskeg, and Northern Wet Forest.

COA(s): *Northwest Lowland Bogs (3.01)*

SGCN - Boreal Chorus Frog, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, American Woodcock, Black Tern, Blue-winged Teal, Bobolink, Canada Warbler, Connecticut Warbler, Golden-winged Warbler (bog edges and stream corridors), Least Flycatcher, LeConte's Sparrow, Northern Harrier, Olive-sided Flycatcher, Rusty Blackbird, Solitary Sandpiper, Sharp-tailed Grouse, Veery, Eastern Red Bat, Gray Wolf, Hoary Bat, Moose, Northern Long-eared Bat, Northern Flying Squirrel, Silver-haired Bat, Water Shrew, Woodland Jumping Mouse, Bog Fritillary, Frigga Fritillary, Freija Fritillary, Harris Checkerspot, Red-disked Alpine, Jutta Arctic, Brown Elfin, and Laurentian Skipper.

Public Land – Douglas County Forest.

Legacy Places – Chase Creek, Empire and Belden Swamps, Upper Tamarack and Spruce.

Important Bird Areas – Moose Junction Peatlands.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Medium-sized river systems and adjacent terrace communities including Warmwater Rivers and riparian communities, Sand Prairie, Northern Dry Forest, Northern Dry-mesic Forest and Forested Seeps.

COA(s): *Upper St. Croix River (A.45), St. Croix Ridge (3.02)*

SGCN – Gilt Darter, Greater Redhorse, Lake Sturgeon, Longear Sunfish, River Redhorse, Mink Frog, Mudpuppy, Pickerel Frog, Wood Turtle, Golden-wined Warbler (stream corridors), Louisiana Waterthrush,

Osprey, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, St. Croix Snaketail, Pygmy Snaketail, Extra-striped Snaketail, Spectacle Case, Purple Wartyback, Winged Mapleleaf, and Higgin's-eye.

Public Land – Douglas County Forest, Danbury Wildlife Area, St. Croix National Scenic River, Governor Knowles State Forest.

Legacy Places – St. Croix River.

Important Bird Areas – Namekagon-Solon Springs Barrens.

Conservation Opportunity Area Map

NORTHWEST SANDS ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- American Bittern
- American Golden Plover
- Black-backed Woodpecker
- Brown Thrasher
- Connecticut Warbler
- Dunlin
- LeConte's Sparrow
- Marbled Godwit
- Nelson's Sharp-tailed Sparrow
- Northern Harrier
- Red Crossbill
- Sharp-tailed Grouse
- Short-billed Dowitcher
- Solitary Sandpiper
- Trumpeter Swan
- Vesper Sparrow
- Wilson's Phalarope
- Yellow Rail
- Banded Killifish
- Greater Redhorse
- Pugnose Shiner
- Boreal Chorus Frog
- Bullsnake
- Northern Prairie Skink
- Dusted Skipper
- An Issid Planthopper
- Gorgone Checkerspot
- Henry's Elfin
- Karner Blue Butterfly
- Olympia Marble
- Phlox Moth
- Prairiana kansana (Leafhopper)
- Purple Wartyback
- Pygmy Snaketail
- St. Croix Snaketail
- Coldwater streams
- Coolwater streams
- Emergent Marsh-Wild Rice
- Impoundments/Reservoirs
- Inland Lakes
- Northern Dry Forest
- Northern Sedge Meadow
- Northern Wet Forest
- Northern Wet-mesic Forest
- Oak Barrens
- Pine Barrens

Priority Conservation Actions

- Create financial incentives to manage for jack pine and oak.
- Create financial incentives to address the differential market values between plantation production and natural regeneration, retention of old-growth patches, or prescribed burning in and around core managed areas.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other barrens management practices.
- Implement the Northwest Sands Integrated Ecosystem Management Plan to manage the full range of barrens succession stages and diverse habitats in a landscape context. A comprehensive landscape plan requires identification and management of early succession cores. The "barrens" also needs to have places managed in a shifting mosaic of timber harvest with many clearcuts, some older than rotation-age stands, some thinning of stands for savanna structure and a few protected groves. Many stands should be thinned to a safe amount of residual standing timber then burned for stand regeneration while leaving charred legacies. Manage shallow publicly-owned lakes by maintaining open shorelines. To enhance landscape attributes, red pine plantations can be applied to appropriate sites where the historic fire regime indicates groves occurred.
- Restore jack pine and oak barrens and shrub habitats on public lands in appropriate Conservation Opportunity Areas through fire, ground layer enhancement, and timber management.
- Identify additional sites containing high quality or restorable barrens.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of barrens ecosystems.
- The landscape is especially well suited to conduct research to determine Franklin's Ground Squirrel distribution, habitat use, population, and mortality factors.
- Maintain large blocks of habitat; manage complexes of sedge meadow in conjunction with associated wetlands such as open bog, poor fen, emergent marsh, shrub-carr, alder thicket and northern wet forest where possible.
- Protection and restoration of natural lake and stream habitat, including establishment of refuge areas and appropriate management of aquatic plants, are needed for conservation of the Pugnose Shiner, which requires clear waters and littoral zone vegetation.
- This landscape has an especially important role for managing shorebird habitat on public lands at flowages and impoundments. Through dikes, water levels can be raised to flood these areas, and through water control structures, water levels can be manipulated to benefit shorebirds. Migration phenology and specific habitat requirements must be considered when managing for shorebirds.
- Opportunities to manage for boreal birds, Lepidoptera, and other boreal taxa are important considerations in the Brule Spillway and Blueberry Swamp.

Conservation Opportunity Areas

Pine-Oak Barrens – Global Significance

Large outwash plain with a continuum of Pine Barrens, Oak Barrens, Northern Dry Forest, Northern Dry-mesic Forest, Northern Wet-mesic Forest, Northern Hardwood Swamp, Northern Wet Forest, Northern Sedge Meadow, Open Bog, Alder Thicket, Interior Beach, Inland Lakes, and Bedrock Glade.

COA(s): *Crex Barrens and Wetlands (2.02), Namekagon Barrens (2.03), Douglas and Bayfield County Barrens (2.04), Moquah Barrens (2.06) and Fish Lake Barrens and Wetlands (2.07)*

SGCN – Blanding's Turtle, Boreal Chorus Frog, Bullsnake, Four-toed Salamander, Pickerel Frog, Wood Turtle, American Woodcock, Bald Eagle, Black-backed Woodpecker, Black-billed Cuckoo, Blue-winged Teal, Bobolink, Brown Thrasher, Canada Warbler, Connecticut Warbler, Eastern Meadowlark, Field Sparrow, Golden-winged Warbler, Least Flycatcher, Northern Goshawk, Northern Harrier, Osprey, Red Crossbill, Red-headed Woodpecker, Red-shouldered Hawk, Sharp-tailed Grouse, Upland Sandpiper, Veery, Vesper Sparrow, Whip-poor-will, Franklin's Ground Squirrel, Gray Wolf, Northern Prairie Skink, Northern Flying Squirrel, Water Shrew, Woodland Jumping Mouse, Karner Blue Butterfly, Gorgone Checkerspot, Tawny Crescent, Henry's Elfin, Olympia Marble, Dusted Skipper, Mottled Dusky-wing, Cobweb Skipper, Indian Skipper, Pink Sallow, Phlox Moth, Graceful Clearwing and an Issid Planthopper.

Public Land – Brule River State Forest, Crex Meadows Wildlife Area, Douglas County Wildlife Area, Fish Lake Wildlife Area, Namekagon Barrens Wildlife Area, St. Croix National Scenic River, Governor Knowles State Forest, Chequamegon-Nicolet National Forest, Burnett County Forest, Bayfield County Forest, Polk County Forest, Washburn County Forest, Douglas County Forest.

Legacy Places – Danbury to Sterling Corridor, Crex Meadows, Namekagon-Brule Barrens, Chequamegon-Nicolet NF.

Important Bird Areas – Namekagon/Solon Springs Barrens, Crex Meadows, Fish Lake Wetlands and Barrens, and Moquah Barrens.

Large Sedge Meadows, Fens, and Prairies – Upper Midwest/Regional significance

Large sedge meadows and open marshes with a continuum of Northern Sedge Meadow, Emergent Marsh, Emergent Marsh-Wild Rice, Submerged Aquatic, and Surrogate Grassland. Also including impoundments focused on the open water and mudflats during drawdowns.

COA(s): *Fish Lake (2.01), Amsterdam Sloughs (2.08) and Crex (2.09)*

SGCN –Blanding's Turtle, Boreal Chorus Frog, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, American Golden Plover, Black Tern, Blue-winged Teal, Bobolink, Brown Thrasher, Canvasback, Dunlin, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Hudsonian Godwit, LeConte's Sparrow, Lesser Scaup, Marbled Godwit, Nelson's Sharp-tailed Sparrow, Marbled Godwit, Northern Harrier, Red-necked Grebe, Sharp-tailed Grouse, Solitary Sandpiper, Trumpeter Swan, Upland Sandpiper, Yellow Rail, Wilson's Phalarope, Franklin's Ground Squirrel.

Public Land – Amsterdam Sloughs Wildlife Area, Crex Meadows Wildlife Area, Fish Lake Wildlife Area, Polk County Forest, Burnett County Forest.

Legacy Places – Danbury to Sterling corridor, Crex Meadows.

Important Bird Areas – Fish Lake Wetlands and Barrens, and Crex Meadows.

Medium-sized Rivers and Streams – Upper Midwest/Regional significance

The Upper St. Croix River and Namekagon Rivers and the adjacent upland ridges feature medium-sized river systems and the adjacent terraces communities including Warmwater Rivers including riparian communities, Sand Prairie, Northern Dry Forest, Northern Dry-mesic Forest and Forested Seep.

COA(s): *Upper St. Croix River and Namekagon Rivers (A.45)*

SGCN – Gilt Darter, Greater Redhorse, Lake Sturgeon, Longear Sunfish, River Redhorse, Mink Frog, Mudpuppy, Pickerel Frog, Wood Turtle, Golden-winged Warbler (stream corridors), Louisiana Waterthrush,

Osprey, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, St. Croix Snaketail, Pygmy Snaketail, Lancet Clubtail, Extra-striped Snaketail, Spectacle Case, Salamander Mussel, and Purple Wartyback.

Public Land – Burnett County Forest, Douglas County Forest, St. Croix National Scenic River. Governor Knowles State Forest

Legacy Places – St. Croix River.

Important Bird Areas – Namekagon-Solon Springs Barrens.

Diverse Aquatic Communities – State Significance

Including drainage lakes through which flow medium-sized river systems including Coldwater Streams, Coolwater Streams and riparian communities.

COA(s): *Yellow River including Big Sand and Yellow Lakes (A.47)*

SGCN – Banded Killifish, Gilt Darter, Least Darter, Pugnose Shiner, Greater Redhorse, Blanding's Turtle, Boreal Chorus Frog, Mink Frog, Mudpuppy, Pickerel Frog, Wood Frog, Bald Eagle, Osprey, Pygmy Snaketail.

Public Lands – Burnett County Forest, Washburn County Forest.

Legacy Places – Yellow River.

High Quality Wetland Communities – State Significance

Large forested wetlands including the Brule Spillway contain Northern Wet Forest, Northern Wet-mesic Forest, Open Bog, Poor Fen, and Muskeg.

COA(s): *Blueberry Swamp (2.05)*

SGCN – Boreal Chorus Frog, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, Black-backed Woodpecker, Connecticut Warbler, Canada Warbler, Golden-winged Warbler, Olive-sided Flycatcher, Rusty Blackbird, Veery, Northern Flying Squirrel, Water Shrew, Woodland Jumping Mouse.

Public Land – Brule River State Forest, Douglas County Forest.

Important Bird Areas – Brule Glacial Spillway.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

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Conservation Opportunity Area Map

Southeast Glacial Plain Ecological Landscape

High Priority SGCn and Natural Communities

- American Bittern
- American Golden Plover
- Black Tern
- Blue-winged Teal
- Blue-winged Warbler
- Buff-breasted Sandpiper
- Cerulean Warbler
- Common Tern
- Dunlin
- Field Sparrow
- Forster's Tern
- Great Egret
- Hooded Warbler
- King Rail
- Marbled Godwit
- Prothonotary Warbler
- Red-necked Grebe
- Red-shouldered Hawk
- Redhead
- Rusty Blackbird
- Short-billed Dowitcher
- Short-eared Owl
- Solitary Sandpiper
- Whooping Crane
- Willow Flycatcher
- Yellow-billed Cuckoo
- Franklin's Ground Squirrel
- Gravel Chub
- Lake Chubsucker
- Lake Sturgeon
- Least Darter
- Redfin Shiner
- Slender Madtom
- Starhead Topminnow
- Ornate Box Turtle
- Northern Ribbon Snake
- Queen Snake
- Beetles (*Saxinis omogera, Colaspis suggona*)
- Black Striate
- Boreal Top
- Buck Moth
- Cherrystone Drop
- Columbine Dusky Wing
- Dion Skipper
- Leafhoppers (12 SGCN spp)
- Liatris Borer Moth
- Mulberry Wing
- Mystery Vertigo
- Ottoe Skipper
- Poweshiek Skipperling
- Regal Fritillary
- Sculpted Glyph
- Silphium Borer Moth
- Swamp Metalmark
- Two-spotted Skipper
- White-lip Dagger
- Bog Relict
- Calcareous Fen
- Cliff (Escarpment)
- Floodplain Forest
- Impoundments/Reservoirs
- Mesic Prairie
- Oak Opening
- Oak Woodland
- Southern Dry Forest
- Southern Dry-mesic Forest
- Southern Sedge Meadow
- Southern Tamarack Swamp
- Warmwater Streams
- Wet-Mesic Prairie
- Wet Prairie

Priority Conservation Actions

- Focus management and restoration efforts in the Mid to North Kettle Moraine Forest Conservation Opportunity Area to emphasize a matrix of older oak-central hardwood forest with smaller patches of oak woodland, oak opening, native prairies and relict forests.
- Focus management and restoration efforts in the southern Kettle Moraine Conservation Opportunity Area to emphasize oak openings, oak woodland and low prairie communities with smaller patches of dry prairie, open marshy wetlands, and patches of older closed canopy forest.
- Create financial incentives to preserve and protect high quality examples of prairie, oak savanna, and oak opening.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other prairie and savanna management practices within the contest of smoke management and clean air parameters.
- Identify additional sites containing high quality or restorable oak barrens, oak savannas and woodlands.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of dry oak forest and oak savanna ecosystems.
- Develop cost share incentives for landowners to burn, control invasive exotic species, and restore oak openings and forests, prairies, fens and sedge meadows.
- Preserve and manage all wet-mesic prairie sites, restore degraded sites, and manage the sites in a matrix of surrogate grasslands and other shrub and savanna habitats for area-sensitive species.
- Where possible, promote private land management of small sites by offering incentives to private landowners for preservation or restoration of prairies.
- Monitor wet-mesic prairies to determine whether prescribed burning and other management activities are maintaining invertebrate diversity.

- Preserve and manage all wet-mesic prairie, calcareous fen and tamarack fen sites; restore degraded sites (emphasizing restoration of hydrology), and manage the sites in a matrix of sedge meadow, surrogate grasslands and other shrub and savanna habitats for area-sensitive species.
- Conduct inventories to better delineate Cerulean Warbler populations on public and private lands.
- Maintain large blocks of open sedge meadow and manage within a complex of associated wetlands such as wet prairie, emergent marsh, shrub-carr, alder thicket and floodplain forest by maintaining hydrology, tree cutting and harvest, prescribed fire and eradicating invasive plant species.
- This landscape has an especially important role for managing shorebird habitat on public lands at flowages and impoundments. Through dikes, water levels can be raised to flood these areas, and through water control structures, water levels can be manipulated to benefit shorebirds. Migration phenology and specific habitat requirements must be considered when managing for shorebirds.
- Protection and restoration of natural stream habitat for Slender Madtom is needed in areas where they still persist.
- Protect structures used by Queen Snake as hibernacula.
- Preserve and restore specialized riverine habitats used by Gravel Chub, focused on decreasing siltation.
- Protect the ecological river corridor gradients from lowlands to uplands, along with protection of the floodplain corridor. This will enlarge the amount of habitat available, allow for the movement of species upslope and downslope as environmental conditions change over time, provide suitable habitat for species that require large areas or are dependent upon a mosaic of interconnected habitats for their long-term survival, and will provide migratory bird stopover habitat.
- Preserve habitat on the Niagara Escarpment and protect ecologically significant areas currently occupied by SGCN from conversion to other land uses.
- Partner with prairie and savanna restoration groups to more efficiently accomplish habitat management.

Conservation Opportunity Areas

Niagara Escarpment – Global Significance

Cliff, bedrock communities, and bat hibernacula.

COA(s): *Oakfield Ledge (9.14), Fond du Lac Ledge (9.15), Mayville Ledge (9.16), Calumet Escarpment (9.17)*

SGCN – Sculptured Glyph, Cherrystone Drop, White-tip Dagger, Black Striate, Mystery Vertigo, Boreal Top.

Public Land – Oakfield Ledge State Natural Area, Dodge County Ledge Park, Mayville Ledge State Natural Area, Neda Mine State Natural Area.

Legacy Places – Niagara Escarpment.

Bur Oak Openings – Global Significance

Complexes of uplands, wetlands, and rivers including Southern Dry Forest, Southern Dry-mesic Forest, Oak Woodland, Oak Opening, Oak Barrens, Shrub Carr, Alder Thicket, Calcareous Fen, Bog Relict, Wet-Mesic Prairie, Wet Prairie, Southern Sedge Meadow, Dry Prairie, Emergent Marsh, and Submergent Aquatic.

COA(s): *South Kettle Moraine (9.18)*

SGCN – Blanding's Turtle, Four-toed Salamander, Pickerel Frog, Western Ribbon Snake, Acadian Flycatcher, American Woodcock, Black-billed Cuckoo, Blue-winged Teal, Blue-winged Warbler, Bobolink, Brown Thrasher, Cerulean Warbler, Eastern Meadowlark, Field Sparrow, Golden-winged Warbler, Grasshopper Sparrow, Henslow's Sparrow, Hooded Warbler, Kentucky Warbler, Least Flycatcher, Louisiana Waterthrush, Northern Harrier, Red-headed Woodpecker, Rusty Blackbird, Short-eared Owl, Solitary Sandpiper, Upland Sandpiper, Veery, Vesper Sparrow, Whip-poor-will, Willow Flycatcher, Wood Thrush, Yellow-billed Cuckoo, Eastern Red Bat, Franklin's Ground Squirrel, Northern Long-eared Bat, Prairie Vole, Woodland Vole, Red-tailed Leafhopper, Regal Fritillary, Poweshiek Skipperling, Dion Skipper, Mulberry Wing, Two-spotted Skipper, Silphium Borer Moth, Liatris Borer Moth, Ottoe Skipper, Columbine Dusky Wing, Buck Moth.

Public Land – Kettle Moraine State Forest (south, Lapham Peak), Rome Pond Wildlife Area, Prince's Point Wildlife Area, Clover Valley Wildlife Area, Lulu Lake State Natural Area.

Legacy Places – Southern Kettle Moraine.

Important Bird Areas – South Kettle Moraine.

Kettle Moraine Features – Continental Significance

Complexes of uplands, wetlands, and rivers including Northern Wet Forest, Southern Dry Forest, Southern Dry-mesic Forest, Southern Mesic Forest, Oak Woodland, Shrub Carr, Alder Thicket, Calcareous Fen, Bog Relict, Southern Sedge Meadow, Dry Prairie, Emergent Marsh, Submergent Aquatic.

COA(s): *The Mid to North Kettle Moraine (9.08)*

SGCN – Blanding's Turtle, Four-toed Salamander, Northern Ribbon Snake, Pickerel Frog, Acadian Flycatcher, American Woodcock, Black-billed Cuckoo, Blue-winged Teal, Blue-winged Warbler, Bobolink, Brown Thrasher, Cerulean Warbler, Field Sparrow, Golden-winged Warbler, Hooded Warbler, Kentucky Warbler, Least Flycatcher, Louisiana Waterthrush, Northern Harrier, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Upland Sandpiper, Veery, Vesper Sparrow, Whip-poor-will, Willow Flycatcher, Wood Thrush, Yellow-billed Cuckoo, Eastern Red Bat, Northern Long-eared Bat, Swamp Metalmark, Dion Skipper, Mulberry Wing, Two-spotted Skipper, Columbine Dusky Wing, Colaspis Leaf Beetle, Saxinis Beetle, and 12 SGCN leafhoppers.

Public Land – Kettle Moraine State Forest (Northern, Pike Lake, and Loew Lake units), Kiel Marsh Wildlife Area, Sheboygan Marsh Wildlife Area, Mullet Creek Wildlife Area, Manitowoc County Park, Nichols Creek Fisheries Area.

Legacy Places – Campbellsport Drumlins, Kettle Moraine State Forest, Middle Kettle Moraine, Millhome Woods.

Important Bird Areas – North Kettle Moraine.

Large Sedge Meadows, Fens and Prairies – Upper Midwest/Regional significance

Largest examples of Wet-mesic Prairie, Calcareous Fen, large Sedge Meadow, Tamarack Swamp and associated wetlands. In addition smaller patches of these community types persist and need to be managed in small patches and not in a landscape context.

COA(s): *Waterloo Wetlands (9.01), Lake Koshkonong Wetlands (9.02), Jefferson Tamarack Swamp (9.03), Lake Mills Wetlands (9.04), Rush Lake (9.07), White River Marsh (9.12), and Cedarburg Bog (9.13)*

SGCN – Blanding's Turtle, Four-toed Salamander, Pickerel Frog, American Bittern, American Woodcock, Black Tern, Black-billed Cuckoo, Blue-winged Teal, Blue-winged Warbler, Bobolink, Brown Thrasher, Canvasback, Dickcissel, Eastern Meadowlark, Field Sparrow, Forster's Tern, Grasshopper Sparrow, Henslow's Sparrow, King Rail, Lesser Scaup, Northern Harrier, Redhead, Red-necked Grebe, Rusty Blackbird, Short-eared Owl, Willow Flycatcher, Yellow-billed Cuckoo, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat Dion Skipper, Mulberry Wing, Two-spotted Skipper, Columbine Dusky Wing, Colaspis Leaf Beetle, Saxinis Beetle, and 12 SGCN leafhoppers.

Public Land – Waterloo Wildlife Area, Lake Mills Wildlife Area, Jefferson Tamarack Swamp State Natural Area, Storrs Lake Wildlife Area, Lima Marsh Wildlife Area, Fair Meadows State Natural Area, Rush Lake State Natural Area and Wildlife Area, Glacial Habitat Restoration Area, White River Marsh Wildlife Area, Puchyan Prairie State Natural Area, Cedarburg Bog State Natural Area and Jackson Marsh Wildlife Area.

Legacy Places – Cedarburg Bog, Crawfish River-Waterloo Drumlins, Jefferson Marsh, Lake Koshkonong to Kettle Moraine Corridor, Rush Lake, White River Marsh and Uplands.

Important Bird Areas – Greater Lake Koshkonong, White River Marsh, Cedarburg Bog, and Rush Lake.

Medium-sized Rivers and Streams – Upper Midwest/Regional significance

Large warmwater rivers including Floodplain Forest, Northern Sedge Meadow, and Emergent Marsh.

COA(s): *Lower Wolf River (A.05), Milwaukee River (A.03) main branches, Oconomowoc River (A.15), Bark River (A.14), Mukwonago River & Illinois Fox River (A.11), and Turtle Creek (A.13)*

SGCN – Banded Killifish, Black Buffalo, Gravel Chub, Greater Redhorse, Lake Chubsucker, Lake Sturgeon, Least Darter, Longear Sunfish, Ozark Minnow, Pugnose Shiner, Redfin Shiner, Redside Dace, River Redhorse, Shoal Chub, Slender Madtom, Starhead Topminnow, Western Sand Darter, Blanding's turtle, Four-toed

Salamander, Queen Snake, Wood Turtle, American Black Duck, American Woodcock, Black-billed Cuckoo, Blue-winged Teal, Great Egret, Least Flycatcher, Prothonotary Warbler, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Veery, Yellow-billed Cuckoo, Eastern Red Bat, Hoary Bat, Silver-haired Bat, Buckhorn, Elktoe, Ellipse, Rainbow Shell, Round Pigtoe, Salamander Mussel, Slippershell Mussel, Snuffbox, Elegant Spreadwing, Elusive Clubtail, Plains Clubtail, Pygmy Snaketail, Stygian Shadowfly, Fragile Forktail, Lancet Clubtail and Jade Clubtail Predacious Diving Beetles, Caenid Mayfly, Water Scavenging Beetles, Dubiraphia Riffle Beetle, White River Crayfish, and Mississippi Grass Shrimp.

Public Land – North Unit Kettle Moraine State Forest, Milwaukee River Farm Heritage, Mukwonago River State Natural Area, Turtle Creek State Wildlife Area, Lulu Lake State Natural Area, Wolf River Wildlife Areas.

Legacy Places – Lower Wolf River.

Important Bird Areas – Lower Wolf River Bottoms.

Diverse Aquatic Communities – State Significance

Floodplain Forest, Southern Sedge Meadow, Surrogate Grassland, Emergent Marsh, and Submergent Aquatic.

COA(s): *Winnebago Pools (9.06), Sugar River (A.17), Raccoon Creek (A.16), Sugar Creek (A.12)*

SGCN – Banded Killifish, Black Buffalo, Gravel Chub, Greater Redhorse, Lake Chubsucker, Lake Sturgeon, Least Darter, Redfin Shiner, Redside Dace, Starhead Topminnow, Blanding's Turtle, Mudpuppy, Pickerel Frog, Black Tern, Blue-winged Teal, Canvasback, Forster's Tern, Lesser Scaup, Redhead, Ellipse, Slippershell Mussel, Brush-legged Mayfly, Common Burrower Mayfly, and Flat-headed Mayfly.

Public Land – Avon Bottoms Wildlife Area, Mukwa Wildlife Area, Deppe Wildlife Area, Rat River Wildlife Area, Poygan Marsh Wildlife Area, Wolf River Wildlife Area, Glacial Habitat Restoration Area, Lake Butte des Morts Wildlife Area.

Legacy Places – Avon Bottoms, Lower Wolf River Bottomlands, and Lakes of the Winnebago Pools.

Important Bird Areas – Avon Bottoms, and Lower Wolf River Bottoms.

High Quality Wetland Communities – State Significance

Immense cattail marsh, impounded areas with the ability to manipulate water levels and upland grass.

COA(s): *Horicon Marsh (9.09)*

SGCN – Blanding's Turtle, American Black Duck, American Bittern, American Golden Plover, American Woodcock, Black Tern, Blue-winged Teal, Bobolink, Brown Thrasher, Buff-breasted Sandpiper, Canvasback, Common Tern, Dunlin, Eastern Meadowlark, Field Sparrow, Forster's Tern, Grasshopper Sparrow, Henslow's Sparrow, Hudsonian Godwit, King Rail, Lesser Scaup, Marbled Godwit, Northern Harrier, Redhead, Red-necked Grebe, Rusty Blackbird, Short-eared Owl, Short-billed Dowitcher, Solitary Sandpiper.

Public Land – Horicon National Wildlife Refuge, Horicon Wildlife Area, and Glacial Habitat Restoration Area.

Legacy Places – Horicon Marsh, Upper Rock.

Important Bird Areas – Horicon Marsh.

Extensive Grassland Communities – State Significance

Dry Prairie, Dry-mesic Prairie, Surrogate Grasslands and Oak Opening (restoration).

COA(s): *Muralt Bluff (9.11)*

SGCN – Bell's Vireo, Bobolink, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Northern Bobwhite, Vesper Sparrow, Regal Fritillary, Whitney's Underwing Moth.

Public Land – Muralt Bluff Prairie State Natural Area, Buttenhoff/Vale Prairies, Sugar River Trail, Albany Wildlife Area.

Legacy Places – Monroe-Muralt Grasslands.

Floodplain Forest Communities – State Significance

Floodplain Forest, Southern Sedge Meadow, Wet Prairie, Southern Tamarack Swamp, Surrogate Grassland, Emergent Marsh, Submergent Aquatic.

COA(s): *Avon Bottoms (9.10), Lower Wolf Floodplain (9.05)*

SGCN –Blanding's Turtle, Pickerel Frog, Acadian Flycatcher, American Black Duck, American Bittern, American Woodcock, Black-billed Cuckoo, Black Tern, Blue-winged Teal, Blue-winged Warbler, Cerulean Warbler, Prothonotary Warbler, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Veery, Yellow-billed Cuckoo, Yellow-crowned Night-Heron, Yellow-throated Warbler, Ellipse, and Slippershell Mussel.

Public Land – Avon Bottoms Wildlife Area, Mukwa Wildlife Area, Wolf River Wildlife Area.

Legacy Places – Lower Wolf River Bottomlands, Sugar River.

Important Bird Areas – Avon Bottoms, and Lower Wolf River Bottoms.

High Quality Wetland Communities (Southeast Glacial Plain Marshes) – Statewide Significance (unmapped)

Large deep water or hemimarsh features containing high quality and productive wetlands providing an opportunity to protect and manage these scattered features across the landscape. These large wetlands have relatively stable composition and occur mostly in isolated basins. Even though the protection of the diversity found in these wetlands is better addressed in prairie potholes country, our large extensive deep and hemimarshes provide a unique opportunity to manage a broad range of SGCN in concert with existing programs focused on waterfowl. For, this primary purpose, these communities should be managed to capture maximum SGCN diversity. These areas feature a continuum of an extensive matrix of marshland – Southern Sedge Meadow, Bog Relict, Northern Hardwood Swamp, and Surrogate Grassland.

SGCN – Blanding's Turtle, American Black Duck, American Bittern, American Golden Plover, American Woodcock, Black Tern, Blue-winged Teal, Bobolink, Brown Thrasher, Buff-breasted Sandpiper, Canvasback, Common Tern, Dunlin, Eastern Meadowlark, Field Sparrow, Forster's Tern, Grasshopper Sparrow, Henslow's Sparrow, Hudsonian Godwit, King Rail, Lesser Scaup, Marbled Godwit, Northern Harrier, Redhead, Red-necked Grebe, Rusty Blackbird, Short-eared Owl, Short-billed Dowitcher, Solitary Sandpiper.

Public Land – Allenton Wildlife Area, Big Muskego Wildlife Area, Bloomfield Wildlife Area, Brooklyn Wildlife Area, Broughton Sheboygan Marsh County Park, Clover Valley Wildlife Area, Deansville Wildlife Area, Eldorado Wildlife Area, Glacial Habitat Restoration Area, Goose Lake Wildlife Area, Grassy Lake Wildlife Area, Honey Creek Wildlife Area, Hook Lake Wildlife and State Natural Area, Hope Lake State Natural Area, Karcher Marsh Wildlife Area, Lodi Marsh Wildlife Area, Mud Lake (Columbia) Wildlife Area, Peat Lake State Natural Area, Peterkin Pond Wildlife Area, Red Cedar Lake State Natural Area, Schoenenberg Marsh Waterfowl Production Area, South Waubesa Wetlands State Natural Area, Theresa Marsh Wildlife Area, Tichigan Wildlife Area, Turtle Creek Wildlife Area, Vernon Wildlife Area, Waterloo Wildlife Area, Pickerel Lake Fen State Natural Area, Cherokee Marsh Fishery Area.

Legacy Places – Arlington Prairie, Dunn-Rutland Savanna and Potholes, Glacial Habitat Restoration Area, Sheboygan River Marshes, White River and Bloomfield Area.

Important Bird Areas – Northern Empire Prairie Wetlands, and Greater Lake Koshkonong.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

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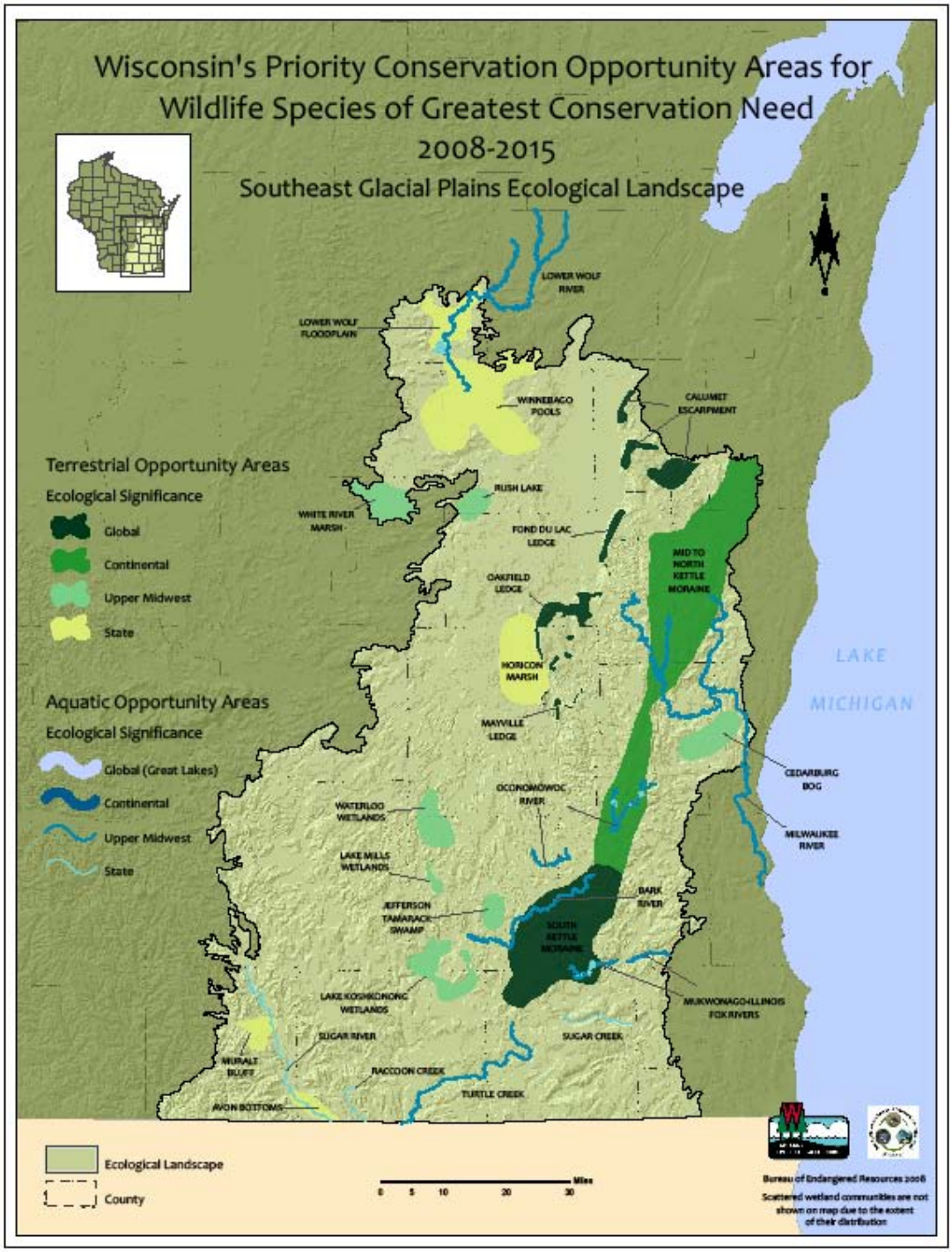
Conservation Opportunity Area Map



Southern Lake Michigan Coastal Ecological Landscape

High Priority SGCN and Natural Communities

- Horned Grebe
- Peregrine Falcon
- Mudpuppy
- Striped Shiner
- Beetle (*Colaspis suggona*)
- Broad-winged Skipper
- Leafhoppers (*Paraphilaenus parrallelus, Destria crocea, Memnonia panzeri, Aphelonema simplex*)
- Liatris Borer Moth
- Mulberry-wing
- Red-tailed Leafhopper
- Silphium Borer Moth
- Two-spotted Skipper
- Lake Michigan
- Wet-mesic Prairie

Priority Conservation Actions

- Preserve and manage all wet-mesic prairie sites, restore degraded sites (emphasizing restoration of hydrology), and manage the sites in a matrix of surrogate grasslands and other shrub and savanna habitats for area-sensitive species
- Promote private land management of small sites where possible by offering incentives to private landowners for preservation or restoration of prairies and savannas.
- Monitor wet-mesic prairies to determine whether prescribed burning and other management activities are maintaining invertebrate diversity.
- Protect and restore harbor and river mouth shoreline and wetland habitats.
- Improve regulations and education to prevent the introduction of additional exotic species and slow the spread of existing aquatic invasive species.
- The landscape is especially well suited to conduct research to determine Franklin's Ground Squirrel distribution, habitat use, population size, and mortality factors.
- Conserve habitat for the striped shiner by protecting refuges in the Milwaukee River watershed, and through protection and restoration of natural habitat in the Milwaukee River.
- Improve habitat and water quality conditions in the Milwaukee River basin by controlling non-point pollution.
- Manage for Forster's Tern at Big Muskego Lake Wildlife Area.
- Manage portions of Richard Bong State Recreation Area to accommodate nesting and wintering grassland birds.

Conservation Opportunity Areas

Great Lakes and their Shorelines – Global Significance

Fisheries and Migratory/Winter Bird Habitat.

COA(s): *Lake Michigan (A.02) including embayments and migratory and wintering bird locations.*

SGCN – Greater Redhorse, Lake Sturgeon, Mudpuppy, Horned Grebe.

Legacy Places – Lake Michigan.

Lakeshore natural community complexes, including Great Lakes Beach, Great Lakes Dune, Southern Sedge Meadow, Calcareous Fen**,** Wet-mesic Prairie*,* Wet Prairie, and Shrub-carr

COA(s): *Chiwaukee Prairie (12.01)*

SGCN – Blanding's Turtle, Bobolink, Eastern Meadowlark, Field Sparrow, Henslow's Sparrow, Short-eared Owl, Willow Flycatcher, Franklin's Ground Squirrel, Red-tailed Leafhopper, Silphium Borer Moth, Liatris Borer Moth, Mulberry-wing, Broad-winged Skipper, Two-spotted Skipper, Colapsis Leaf Beetle, and three SGCN leafhoppers.

Public Land – Chiwaukee Prairie State Natural Area

Legacy Places – Chiwaukee Prairie

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Milwaukee River (main branches) is mid-sized Warmwater River, including riparian communities.

COA(s): *Milwaukee River (A.03)*

SGCN – Greater Redhorse, Striped Shiner, Butler's Garter Snake, Least Darter, Blanding's Turtle, Rusty Blackbird, Solitary Sandpiper, Ellipse, and Slippershell Mussel.

Public Land – Milwaukee County Parks.

Extensive Grassland Communities – State Significance

Features Surrogate Grasslands.

COA(s): *Bong Grasslands (12.02)*

SGCN – Bobolink, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Henslow's Sparrow, Short-eared Owl, and Willow Flycatcher.

Public Land – Bong Recreation Area

Legacy Places – Bong Recreation Area.

Important Bird Areas – Richard Bong State Recreation Area.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

Conservation Opportunity Area Map

Southwest Savanna Ecological Landscape

High Priority SGCN and Natural Communities

- Bell's Vireo
- Dickcissel
- Eastern Meadowlark
- Grasshopper Sparrow
- Henslow's Sparrow
- Loggerhead Shrike
- Northern Bobwhite
- Short-eared Owl
- Upland Sandpiper
- Prairie Vole
- Ozark Minnow
- Slender Madtom
- Blanchard's Cricket Frog
- Prairie Ringneck Snake
- Regal Fritillary
- Prairie Leafhopper
- Red-tailed Leafhopper
- Leafhoppers (*Paraphilaenus parallelus, Laevicephalus vannus, Attenuipyga vanduzeei, Prairiana cinerea, Driotura robusta, Prairiana kansana, Memnonia panzeri*)
- Dry Prairie
- Dry-Mesic Prairie
- Oak Opening
- Oak Woodland
- Surrogate Grassland
- Warmwater Streams

Priority Conservation Actions

- Work with Partners to protect and manage at least three 10,000-acre grassland bird conservation areas, with 2,000-acre cores of permanent grassland, including native prairie to the extent possible. Incorporate shrub-stage component for Bell's Vireo and other shrub land species.
- Work with Partners to protect prairie remnants within open landscapes that are conducive to larger prairie restoration and meta-population management of associated rare species.
- Partner with prairie and savanna restoration groups including FSA/NRCS to more efficiently accomplish habitat management.
- Actively manage appropriate patches for oak savanna and woodland restoration using prescribed fire.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other prairie/savanna management practices.
- Protect and restore Ozark Minnow habitat in the watersheds and tributaries of the Platte River.

Conservation Opportunity Areas

Large Sedge Meadows, Fens and Prairies – Upper Midwest Significance

Extensive grassland mostly surrogate, but also including proportionally large embedded patches of Dry Prairie, Dry-Mesic Prairie, Southern Sedge Meadow, Oak Opening, Oak Woodland, and Surrogate Grassland.

COA(s): *Military Ridge Prairies (13.01); Hardscrabble Prairie (13.02)*

SGCN – Blanchard's Cricket Frog**,** Bullsnake, Prairie Ringneck Snake, Yellow-bellied Racer, American Golden Plover, Bell's Vireo, Bobolink, Brown Thrasher, Dickcissel, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Henslow's Sparrow, Loggerhead Shrike, Northern Bobwhite, Northern Harrier, Red-headed Woodpecker, Short-eared Owl, Upland Sandpiper, Vesper Sparrow, Western Meadowlark, Willow Flycatcher, Prairie Leafhopper, Red-tailed Leafhopper, Regal Fritillary, Ottoe Skipper, Whitney's Underwing, Marbleseed Leafminer, and multiple leafhopper species (*Paraphilaenus parallelus, Laevicephalus vannus, Attenuipyga vanduzeei, Prairiana cinerea, Driotura robusta, Prairiana kansana, Memnonia panzeri*).

Public Land – Hardscrabble Prairie State Natural Area, Yellowstone Lake State Park, Yellowstone Lake Wildlife Area, Remnant Fishery Areas, Barneveld Prairie State Natural Area, Southwest Grassland Resource Area (in process).

Legacy Places – Blue Mound – Blanchardville Prairie and Savanna, Fever River – Hardscrabble Prairie, Pecatonica River and Grasslands, Platte River, Yellowstone Lake.

Important Bird Areas – Military Ridge – York Prairie and Pecatonica River Prairie.

Diverse Aquatic Communities – State Significance

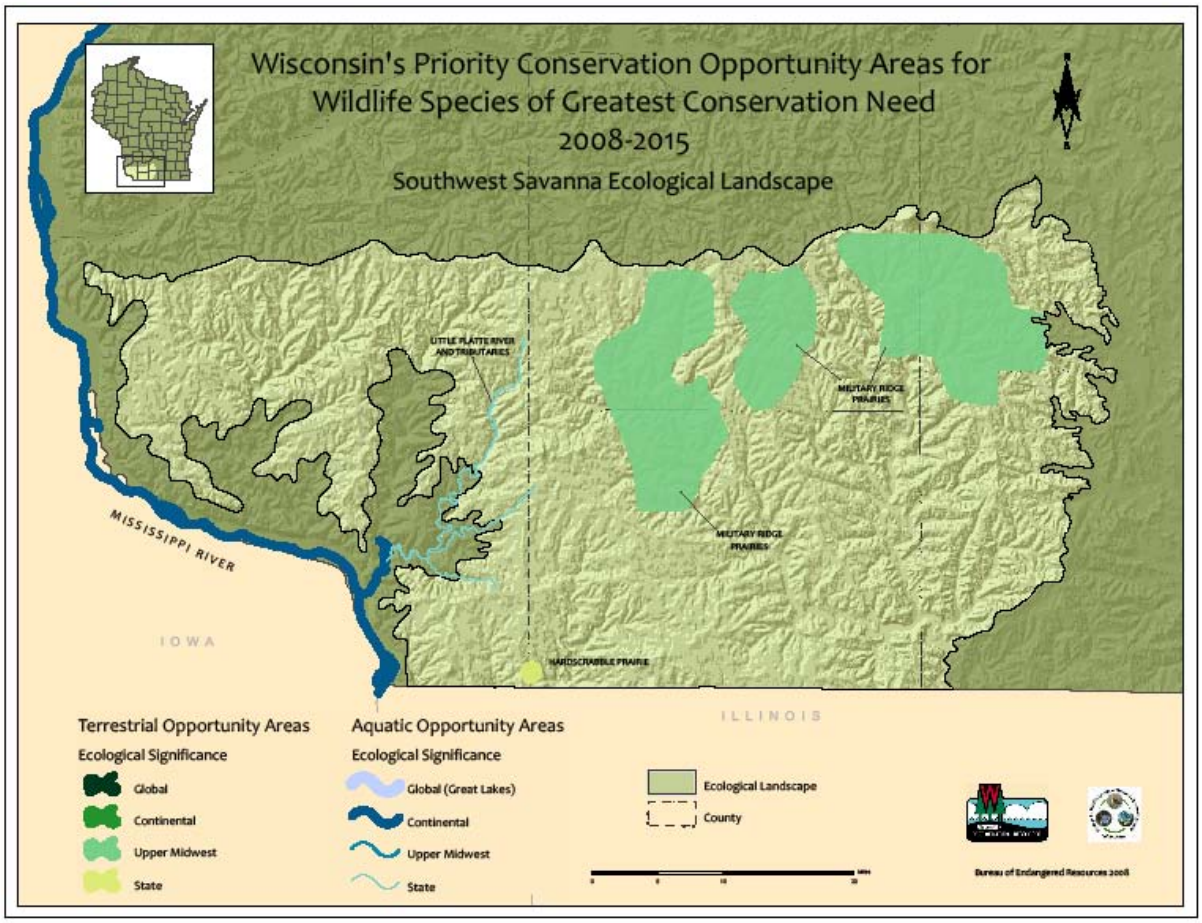
Warmwater Stream systems featuring rare fish habitat.

COA(s): *Little Platte River and Tributaries (A.55)*

SGCN: Ozark Minnow, Blanchard's Cricket Frog, Timber Rattlesnake, and Bat Hibernacula

Public Land: None

Conservation Opportunity Area Map



SUPERIOR COASTAL ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- Black-throated Blue Warbler
- Canada Warbler
- Common Tern
- Marbled Godwit
- Hudsonian Godwit
- LeConte's Sparrow
- Piping Plover
- Whimbrel
- Yellow Rail
- Kiyi
- Shortjaw Cisco
- Franklin's Ground Squirrel
- Northern Flying Squirrel
- Water Shrew
- Woodland Jumping Mouse
- Boreal Chorus Frog
- Mink Frog
- Mudpuppy
- Old-maid Underwing
- Boreal Forest
- Coldwater Streams
- Dry Cliff
- Emergent Marsh
- Great Lakes Beach
- Great Lakes Dune
- Lake Superior
- Moist Cliff
- Open Bog
- Shore Fen
- Warmwater Streams

Priority Conservation Actions

- Protect and restore harbor and river mouth shoreline and wetland habitats.
- Improve regulations and education to prevent the introduction of additional exotic species and slow the spread of existing aquatic invasive species.
- Manage Great Lakes beach and dune habitat as part of a vegetation mosaic that includes forested ridge and swale, interdunal wetland, shrub carr, and swamp conifer forest with older age classes. Promote concentrated public access points, limited recreational activities in areas where SGCN are present (particularly during breeding seasons), protecting site hydrology, and early detection and management of invasive exotic species.
- Implement new cost share programs or continue voluntary programs to monitor for and aggressively eliminate invasive species, especially in beach, dune, Great lakes Barrens, and coastal fen communities.
- Increase representation of near shore boreal forest by encouraging retention of white spruce, white pine, white cedar, and balsam fir, especially in older age classes, by adaptive management and selective planting.
- Preserve and maintain large expanses of sedge meadow, coastal fen and forested wetlands along the coast and manage in the context of a mosaic of community types.
- In light of climate change and lowering lake levels, monitor community-level vegetation changes in coastal fens.
- Band all Piping Plover chicks within 7-10 days of hatching.
- Install predator exclosures over Piping Plover nests to deter mammalian predation.
- Develop a management plan for shortjaw cisco, the most vulnerable of the Lake Superior whitefish species.
- Manage forested wetlands and fens as part of a vegetation mosaic that includes other open wetland communities, shrub swamp, and swamp conifer forest.
- Work with Partners to protect and manage at least three 5,000-acre grassland bird conservation areas, with 1,000-acre cores of permanent grassland, while incorporating shrub-stage component, especially along streams for shrub land and streamside species.

Conservation Opportunity Areas

Great Lakes and their Shorelines – Global Significance

Includes the lake and embayments and migratory and winter bird concentration areas.

COA(s): *Lake Superior (A.01)*

SGCN – Horned Grebe, Caspian Tern, Common Tern, Lake Sturgeon, Mudpuppy, Kiyi, Short-jawed Cisco, Bald Eagle.

Public Land – The lake is public water

Legacy Places – None

Important Bird Areas – Kakagon-Bad River Wetlands and Forest Corridor, Lower Chequamegon Bay, Apostle Islands, South Shore Wetlands, and Wisconsin Point.

Great Lakes Shore natural community complex including Great Lakes Beach, Great Lakes Dune, Northern Wet Forest, Northern Sedge Meadow, Open Bog, Alder Thicket, Emergent Marsh, Submergent Marsh, Emergent Marsh Wild Rice, Moist Cliff and Shore Fen.

COA(s): *Coastal Headlands and Estuaries (1.04)*

SGCN – Boreal Chorus Frog, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, American Golden Plover, American Black Duck, Bald Eagle, Black Tern, Blue-winged Teal, Bobolink, Buff-breasted Sandpiper, Canvasback, Common Tern, Dunlin, Golden-winged Warbler, Hudsonian Godwit, LeConte's Sparrow, Lesser Scaup, Marbled Godwit, Northern Harrier, Olive-sided Flycatcher, Osprey, Piping Plover, Rusty Blackbird Short-billed Dowitcher, Solitary Sandpiper, Trumpeter Swan, Veery, Whimbrel, Yellow Rail, Eastern Red Bat, Franklin's Ground Squirrel, Hoary Bat, Northern Long-eared Bat, and Silver-haired Bat.

Public Land – Lost Creek Bog State Natural Area, Bark Bay State Natural Area, Port Wing Boreal Forest State Natural Area, South Shore Fishery Area.

Legacy Places – Quarry Point to Bark Point, Western Lake Superior Drowned River Mouths.

Important Bird Areas – South Shore Wetlands.

COA(s): *Apostle Islands (1.03)*

Boreal Forest, Northern Wet Forest, Northern Wet-Mesic Forest, Northern Hardwood Swamp, Alder Thicket, Shrub Carr, Northern Sedge Meadow, Shore Fen, Northern Mesic Forest, Great Lakes Beach, Great Lakes Dune, Great Lakes Barrens, Dry Cliff, and Moist Cliff.

SGCN –Four-toed Salamander, American Golden Plover, Black-throated Blue Warbler, Canada Warbler, Least Flycatcher, Marbled Godwit, Northern Goshawk, Olive-sided Flycatcher, Rusty Blackbird, Veery, Whimbrel, Northern Flying Squirrel, and Water Shrew.

Public Land – Apostle Islands National Lakeshore (mainland unit), Big Bay State Park, Madeline Island Land Trust.

Legacy Places – Apostle Islands.

Important Bird Areas – Apostle Islands.

COA(s): *Bad River (1.02)*

Boreal Transition Forest including Great Lakes Savanna, Boreal Forest, Northern Dry-Mesic Forest, Northern Mesic Forest, Emergent Marsh, Great Lakes Dune, Great Lakes Beach.

SGCN – Boreal Chorus Frog, Four-toed Salamander, Mink Frog, Pickerel Frog, Wood Turtle, American Bittern, American Golden Plover, American Black Duck, Bald Eagle, Black-backed Woodpecker Black Tern, Blue-winged Teal, Bobolink, Buff-breasted Sandpiper, , Canada Warbler, Canvasback, Common Tern, Dunlin, Golden-winged Warbler, Hudsonian Godwit, Least Flycatcher, LeConte's Sparrow, Lesser Scaup, Marbled Godwit, Northern Harrier, Olive-sided Flycatcher, Osprey, Piping Plover, Rusty Blackbird Short-billed Dowitcher, Solitary Sandpiper, Trumpeter Swan, Veery, Whimbrel, Yellow Rail, and Old-maid Underwing.

Public Land – White River Wildlife Area, Copper Falls State Park, Apostle Islands National Lakeshore (Long Island unit), Iron County Forest.

Legacy Places – Bad River.

Important Bird Areas – Kakagon-Bad River Wetlands and Forest Corridor.

Boreal Forest Transition – Continental Significance

Boreal Transition Forest including Great Lakes Savanna, Boreal Forest, Northern Dry-Mesic Forest, and Northern Mesic Forest.

COA(s): *Pokegama-Nemadji Wetlands (1.06), Brule Boreal Forest (1.05)*

SGCN –Four-toed Salamander, Black-backed Woodpecker, Canada Warbler, Olive-sided Flycatcher, Least Flycatcher, Veery, Rusty Blackbird, American Marten, Eastern Red Bat, Gray Wolf, Hoary Bat, Northern Flying Squirrel, Silver-haired Bat, Water Shrew Woodland Jumping Mouse and Old-maid Underwing.

Public Land – Brule River State Forest, Red River Streambank Area, City of Superior Municipal Forest.

Legacy Places – Bois Brule River, Wisconsin Point.

High Quality Wetland Communities – State Significance

Northern Wet Forest, Northern Wet-Mesic Forest, Northern Hardwood Swamp, Alder Thicket, Shrub Carr, Northern Sedge Meadow, and Emergent Marsh.

COA(s): *Bibon Swamp (1.01), Fish Creek (1.07)*

SGCN –Four-toed Salamander, Wood Turtle, American Woodcock, Black-billed Cuckoo, Blue-winged Teal, Canada Warbler, Golden-winged Warbler, Least Flycatcher, Olive-sided Flycatcher, Rusty Blackbird, Veery, Mink Frog, Northern Flying Squirrel, and Water Shrew.

Public Land – Bibon Swamp State Natural Area, White River Fishery Area.

Legacy Places – White River.

Important Bird Areas – Bibon Swamp, Lower Chequamegon Bay.

Diverse Aquatic Communities – State Significance

Coldwater streams.

COA(s): *White and Bad Rivers (A.48), St. Louis Estuary (A.52)*

SGCN –Least Darter, Four-toed Salamander, Wood Turtle, Mink Frog, Water Shrew and Calico Crayfish.

Public Land – White River Fishery Area.

Legacy Places – White River.

Extensive Grassland Communities – State Significance

Surrogate Grasslands.

COA: *Lake Superior Grasslands (1.08)*

SGCN –American Bittern, American Golden Plover, American Woodcock, Black-billed Cuckoo, Bobolink, Brown Thrasher, Buff-breasted Sandpiper, Dunlin, Eastern Meadowlark, Field Sparrow, Golden-winged Warbler, Hudsonian Godwit, LeConte's Sparrow, Northern Harrier, Sharp-tailed Grouse, Short-eared Owl, Upland Sandpiper, Western Meadowlark, Yellow-billed Cuckoo, Franklin's Ground Squirrel, Northern Flying Squirrel, Water Shrew, Woodland Jumping Mouse and Red-disked Alpine.

Public Land – Small portion of the Brule River State Forest.

Legacy Places – Highway 2 Grasslands.

Wisconsin's Wildlife Action Plan (2005-2015)

Priority Conservation Actions & Conservation Opportunity Areas

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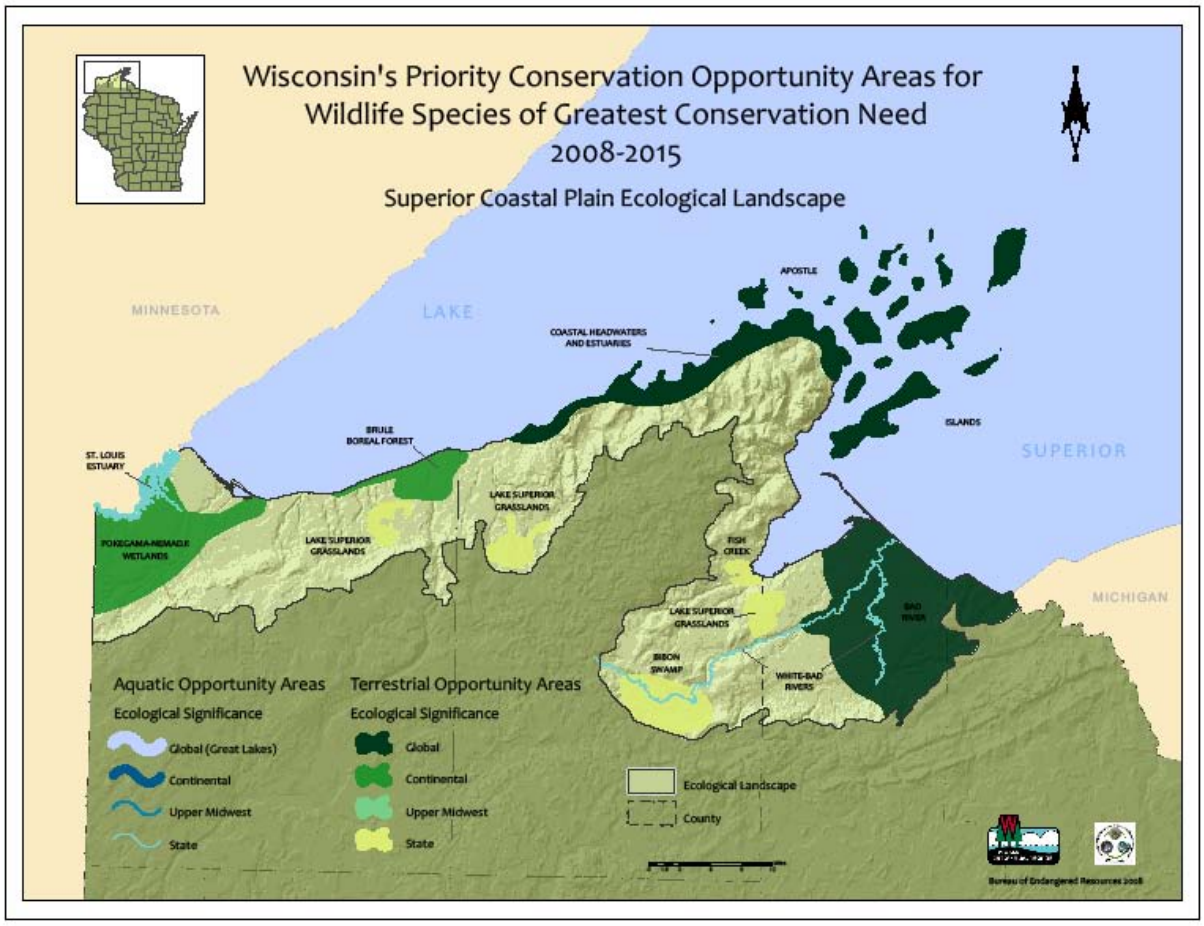
Conservation Opportunity Area Map



WESTERN COULEE AND RIDGES ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- Acadian Flycatcher
- Bell's Vireo
- Black-billed Cuckoo
- Blue-winged Warbler
- Brown Thrasher
- Canvasback
- Cerulean Warbler
- Eastern Meadowlark
- Field Sparrow
- Grasshopper Sparrow
- Great Egret
- Hooded Warbler
- Kentucky Warbler
- Lark Sparrow
- Lesser Scaup
- Louisiana Waterthrush
- Northern Bobwhite
- Peregrine Falcon
- Prothonotary Warbler
- Red-headed Woodpecker
- Red-shouldered Hawk
- Western Meadowlark
- Whip-poor-will
- Willow Flycatcher
- Wood Thrush
- Worm-eating Warbler
- Yellow-billed Cuckoo
- Yellow-crowned Night-Heron
- Yellow-throated Warbler

- Black Buffalo
- Blue Sucker
- Bluntnose Darter
- Crystal Darter
- Goldeye
- Paddlefish
- Pallid Shiner
- Redside Dace
- River Redhorse
- Shoal Chub
- Starhead Topminnow
- Western Sand Darter

- Black Rat Snake
- Blanding's Turtle
- Bullsnake
- Eastern Massasauga
- Midland Smooth Softshell Turtle
- Northern Prairie Skink
- Ornate Box Turtle
- Pickerel Frog
- Prairie Racerunner
- Prairie Ring-neck Snake
- Timber Rattlesnake
- Western Slender Glass Lizard
- Western Worm Snake
- Yellow-bellied Racer

- Bat and Herp Hiberacula
- Northern Long-eared Bat
- Prairie Vole
- Woodland Vole

- Armored Mayfly
- Beetles (*Saxinis omogera, Colaspis suggona*)
- Blue-legged Grasshopper
- Brush-legged Mayflies
- Buckhorn
- Bullhead
- Cherrystone Drop
- Cleft-footed Minnow Mayfly
- Cobweb Skipper
- Columbine Dusky Wing
- Common Burrower Mayfly
- Common Netspinner Caddisfly
- Dawson's Spur-throated Grasshopper
- Dion Skipper
- Dubirahia Riffle Beetle
- Duck-billed Leafhopper
- Dusted Skipper
- Eastern Red Damsel
- Ebony Shell
- Elephant Ear
- Elktoe
- Ernestine's Moth
- Fawnsfoot
- Flat Floater
- Flat-headed Mayflies
- Fragile Forktail
- Frosted Elfin
- Gladston's Spur-throat Grasshopper
- Gorgone Checkerspot
- Green-streaked Grasshopper
- Henry's Elfin
- Hickory Hairstreak
- Higgin's Eye
- Hoary Elfin
- Karner Blue Butterfly
- Knobel's Riffle Beetle
- Lancet Clubtail
- Leafhoppers (13 SGCN spp)
- Leonard's Skipper
- Mapleleaf
- Marbleseed Leafminer
- Mermiria Grasshopper
- Midwest Pleistocene Vertigo
- Monkeyface
- Mulberry Wing
- Northern Marbled Grasshopper
- Obscure Grasshopper
- Olympia Marble
- Ottoe Skipper
- Pecatonica River Mayfly
- Persius Duskywing
- Phlox Moth
- Pink Papershell
- Prairie Leafhopper
- Predaceous Diving Beetles
- Purple Wartyback
- Pygmy Snaketail
- Red-tailed Leafhopper
- Regal Fritillary
- Rock Pocket Book
- Round Pigtoe
- Royal River Cruiser
- Salamander Mussel
- Sand Locust
- Sand Snaketail
- Seaside Grasshopper
- Slough Sandshell
- Small Minnow Mayflies
- Small Square-gilled Mayfly
- Snuffbox
- Speckled Rangeland Grasshopper
- Spectacle Case
- Spot-winged Grasshopper
- Spur-throat Grasshopper
- Swamp Darner
- Virginia Big-headed Tiger Beetle
- Wartyback
- Washboard
- Whitney's Underwing Moth
- Wild Indigo Dusky Wing
- Wing Snaggletooth

- Winged Mapleleaf
- Yellow Sandshell
- Algific Talus Slopes
- Coldwater Streams
- Dry Cliffs
- Dry Prairie
- Dry-Mesic Prairie
- Floodplain Forest
- Hemlock Relict
- Moist Cliffs
- Oak Barrens
- Oak Opening
- Oak Woodland
- Pine Relicts
- Sand Prairie
- Shrub Carr
- Southern Dry Forest
- Southern Dry-mesic Forest
- Southern Mesic Forest
- Submerged Aquatic
- Warmwater River

Priority Conservation Actions

- Focus management and restoration efforts in the loess-influenced forest Conservation Opportunity Areas to emphasize a matrix of older oak-central hardwood forest with smaller patches of oak woodland, oak opening, regenerating younger forest, native prairies and relict forests.
- Focus management and restoration efforts in the sandstone-influenced Conservation Opportunity Areas to emphasize dry oak savanna, oak woodland and sand prairie communities with smaller embedded patches containing oak forest, pine relicts, dry prairie, open shrubby barrens, closed canopy oak forest, and rock outcrops.
- Protect the ecological river corridor gradients from lowlands to uplands, along with protection of the floodplain corridor. This will enlarge the amount of habitat available, allow for the movement of species upslope and downslope as environmental conditions change over time, provide migratory bird stopover habitat, and provide suitable habitat for species that require large areas or are dependent upon a mosaic of interconnected habitats, including a full range of seral stages, for their long-term survival.
- Maintain and connect large blocks of older floodplain forest to provide habitat for the large number of SGCN that utilize this habitat while addressing the regeneration difficulties associated with dense stands of reed canary grass.
- Conduct large-scale planning efforts with state agencies and partners regarding the Upper Mississippi River and its adjacent blufflands.
- On private lands, create financial incentives similar to either the Farmland Preservation Program or Managed Forest Law to protect and manage up to 20,000 acres of high quality examples of dry prairie, oak opening, oak woodland or retention of old-growth patches including hemlock and pine relicts.
- Create financial incentives similar to the Wisconsin Forest Landowner Grant Program (WFLGP) to address the differential market values between oak savanna restoration and oak forest management, reforestation of old fields to reduce fragmentation, or prescribed burning in and around prairie and savanna managed areas.
- Restore oak openings and woodlands and expand and enhance dry prairie and shrub habitats on public lands in appropriate Conservation Opportunity Areas through fire, ground layer enhancement, and timber management.
- Develop incentives for the start-up cost of converting from row-crop agricultural systems to a rotational grazing or biofuel production system, which will keep permanent cover on the land, provide grassland habitat and significantly reduce soil loss into streams.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other prairie and savanna management practices.
- Identify additional sites containing high quality or restorable oak barrens, oak savannas and woodlands.
- Develop a practical "toolkit" for maintaining structural and compositional characteristics of oak savanna ecosystems.
- Develop bluffland zoning that recognizes the critical importance of maintaining dry prairies, oak savanna restoration opportunities, connecting habitat corridors, migratory bird stopover sites, and forested habitat that is essential for long-term maintenance of viable SGCN populations.
- Partner with prairie/savanna/forest restoration groups to manage and protect habitats to effectively keep SGCNs on the landscape.
- Manage the sand and gravel-influenced floodplain forest of the Lower Chippewa and Lower Black Rivers for floodplain savanna conditions to help the recovery of Eastern Massasauga Rattlesnake.
- Manage appropriate native sand prairie and sand prairie restoration sites for nesting Ornate Box and Blanding's Turtles.
- Conduct inventories to better delineate Cerulean Warbler populations on public and private lands.

- Monitor long-term population status and trends for Eastern Massasauga Rattlesnake.
- Continue head starting program for Ornate Box Turtles.
- Conduct research on the interspecies competition between increasing "channel" shiners and the greatly decreasing Pallid Shiner.
- Protect and restore appropriate habitat in the Mississippi and Lower Wisconsin Rivers for Shoal Chub.
- Focus restoration of stream habitat and morphology on areas where land use and other factors suggest the most successful outcomes.
- Initiate long-term monitoring and protection of Wood Turtle nest sites.
- Protect and restore appropriate natural stream habitat with focus on accommodating the habitat needs of Wood Turtle.
- Educate landowners on the few examples of algific talus slopes and that the need for protection of this resource is critical for Wisconsin as these sites are reference areas for understanding 10,000 years of climate change.

Conservation Opportunity Areas

Bur Oak Openings – Global Significance

Driftless Area natural communities over sandstone influenced soils including a continuum of Sand Prairie, Oak Barrens, Oak Woodland, Southern Dry Forest, Southern Dry-Mesic Forest, Shrub-Carr, and Dry Cliff.

COA(s): *Otter Creek Oak Barrens (11.05); Lower Chippewa Savannas (11.06); Ft. McCoy Barrens and Oak Savanna (11.07)*

SGCN – Blanding's Turtle, Bullsnake, Northern Prairie Skink, Ornate Box Turtle, Prairie Racerunner, Prairie Ring-neck Snake, Timber Rattlesnake, Western Slender Glass Lizard, Yellow-bellied Racer, Wood Turtle, American Woodcock, Bell's Vireo, Black-billed Cuckoo, Blue-winged Warbler, Brown Thrasher, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Lark Sparrow, Louisiana Waterthrush, Northern Bobwhite, Red-headed Woodpecker, Short-eared Owl, Upland Sandpiper, Vesper Sparrow, Western Meadowlark, Whip-poor-will, Willow Flycatcher, Yellow-billed Cuckoo, Eastern Red Bat, Franklin's Ground Squirrel, Northern Long-eared Bat, Prairie Vole, Woodland Vole, Dusted Skipper, Wild Indigo Dusky Wing, Karner Blue Butterfly, Ottoe Skipper, Dion Skipper, Regal Fritillary, Gorgone Checkerspot, Henry's Elfin, Frosted Elfin, Hoary Elfin, Olympia Marble, Persius Duskywing, Ernestine's Moth, Phlox Moth.

Public Land – Big Creek Fishery Area, LaCrosse River Fishery Area, Buffalo River Fishery Area, Dunnville Wildlife Area, Elk Creek Fishery Area, Otter Creek Fishery Area, Otter Creek Oak Barrens State Natural Area, Ft. McCoy State Natural Area, and Red Cedar River Savanna State Natural Area.

Legacy Places – Ft. McCoy, Hay River.

Important Bird Areas – Fort McCoy-Robinson Creek Barrens.

Driftless Area Features – Continental Significance

Driftless Area natural communities over loess and sandstone influenced soils including a continuum of Dry Prairie, Dry-Mesic Prairie, Oak Opening, Oak Woodland, Southern Dry Forest, Southern Dry-Mesic Forest, Southern Mesic Forest, Shrub Carr, Dry Cliffs, and Moist Cliffs.

COA(s): *Lower Kickapoo and Kickapoo (11.01); Coon Creek Mesic (11.02); Coulee Forests (11.03); Buffalo County Oak Forest (11.04); Greensand Cuesta (11.08); Snow Bottom (11.10); Dodgeville and Wyoming Oak Woodland/Savanna (11.11); Rush Creek (11.12); Baraboo Hills and North Range (11.09), and Millville-Sandy Creek (11.17).*

SGCN – Black Rat Snake, Bullsnake, Four-toed Salamander, Northern Prairie Skink, Prairie Racerunner, Prairie Ring-neck Snake, Timber Rattlesnake, Western Worm Snake, Yellow-bellied Racer, Acadian Flycatcher, Bell's Vireo, Blue-winged Warbler, Blue-winged Teal, Brown Thrasher, Cerulean Warbler, Eastern Meadowlark, Field Sparrow, Hooded Warbler, Kentucky Warbler, Louisiana Waterthrush, Northern Bobwhite, Peregrine Falcon, Red-headed Woodpecker, Red-shouldered Hawk, Veery, Whip-poor-will, Willow Flycatcher, Wood Thrush, Worm-eating Warbler, Yellow-billed Cuckoo, Yellow-throated Warbler, Eastern Red Bat, Franklin's Ground

Squirrel, Northern Long-eared Bat, Prairie Vole, Woodland Vole, Dusted Skipper, Wild Indigo Dusky Wing, Columbine Dusky Wing, Leonard's Skipper, Cobweb Skipper, Marbleseed Leafminer, Mulberry Wing, Whitney's Underwing, Ottoe Skipper, Hickory Hairstreak, Wing Snaggletooth, Red-tailed Leafhopper, Prairie Leafhooper, Duck-billed Leafhopper, 10 additional SGCN leafhoppers, Colaspis Leaf Beetle, and Saxinus Beetle.

Public Land – Battle Bluff State Natural Area, Blackhawk Lake State Recreation Area, Coulee Experimental Forest, Hardies Creek Demonstration Forest, Coon Creek Fishery Area, South Beaver Creek Wildlife Area, Remnant Fishery Areas, Governor Dodge State Park, Kickapoo Wildlife Area, Kickapoo Valley Reserve, Knapp Creek Wildlife Area, LaCrosse Fishery Area, Hulburt Creek Fishery Area, Dell Creek Wildlife Area, Willow Creek fishery Area, Ridgeway Pine Relict State Natural Area, Rush Creek State Natural Area, Snow Bottom State Natural Area, Wildcat Mountain State Park, Wyalusing State Park, Mill Bluff State Park, Limery Ridge State Natural Area, Romance Prairie State Natural Area, Cassville Bluffs State Natural Area, Bergen Bluffs State Natural Area, Devils Lake State Park, TNC Baraboo Hills Preserves, Honey Creek State Natural Area, Lost Lake State Natural Area, Natural Bridge State Park.

Legacy Places – Bad Axe River, Baraboo Hills, Baraboo River, Coulee Coldwater Resources, Kickapoo River, Little and Big Green Rivers, Snow Bottom-Blue River Valley.

Important Bird Areas – Baraboo Hills, Rush Creek Forest/Prairie, Kickapoo Valley Preserve-Wildcat Mountain, Wyalusing to Nelson Dewey, Lower Kickapoo River, and Governor Dodge State Park.

Large River Corridors – Continental Significance

Large river systems including riparian communities including Warmwater Rivers, Floodplain Forest, Emergent Marsh, Submergent Aquatics, Wild Rice, and Impoundments. Also included in this feature are upland communities that range from bluff top to bluff top including Southern Dry Forest, Southern Dry-mesic Forest, Dry Prairie, Oak Woodland, Oak Opening and Dry Cliff.

COA(s): *Mississippi River (A.10); Lower Wisconsin to the Prairie du Sac Dam (A.19); Lower Platte River (A.18); Lower Bad Axe River (A.28); Lower Black River to Black River Falls Dam (A.29); Lower Trempealeau River (A.34); Lower Buffalo River (A.35); Lower Chippewa River to Dells Dam (A.37); Lower Red Cedar River to Menominee Dam (A.37); Lower Chippewa Bluffs & Floodplain (11.14); Mississippi Bluffs & Floodplain (11.15); Lower Wisconsin Bluffs & Floodplain (11.16); Rush River Bluffs & Floodplain (11.18).*

SGCN – Black Buffalo, Blue Sucker, Bluntnose Darter, Crystal Darter, Gilt Darter, Goldeye, Greater Redhorse, Lake Chubsucker, Lake Sturgeon, Paddlefish, Pallid Shiner, Pugnose Shiner, River Redhorse, Shoal Chub, Starhead Topminnow, Western Sand Darter, Blanchard's Cricket Frog, Blanding's Turtle, Bullsnake, Eastern Massasauga, Four-toed Salamander, Midland Smooth Softshell Turtle, Northern Prairie Skink, Ornate Box Turtle, Pickerel Frog, Prairie Racerunner, Prairie Ringneck Snake, Timber Rattlesnake, Wood Turtle, Acadian Flycatcher, American Golden Plover, American Woodcock, Bald Eagle, Bell's Vireo, Black-billed Cuckoo, Black Tern, Blue-winged Teal, Blue-winged Warbler, Brown Thrasher, Canvasback, Cerulean Warbler, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Great Egret, Henslow's Sparrow, Kentucky Warbler, King Rail, Lark Sparrow, Least Flycatcher, Lesser Scaup, Louisiana Waterthrush, Northern Bobwhite, Northern Harrier, Osprey, Prothonotary Warbler, Red-headed Woodpecker, Red-shouldered Hawk, Rusty Blackbird, Short-billed Dowitcher, Veery, Vesper Sparrow, Western Meadowlark, Whip-poor-will, Willow Flycatcher, Wood Thrush, Yellow-billed Cuckoo, Yellow-crowned Night-Heron, Elktoe, Rock Pocket Book, Spectacle Case, Purple Wartyback, Butterfly, Elephant Ear, Snuffbox, Ebony Shell, Higgin's Eye, Washboard, Bullhead, Mapleleaf, Winged Mapleleaf, Flat floater, Round Pigtoe, Monkeyface, Salamander Mussel, Yellow Sandshell, Wartyback, Buckhorn, Fawnsfoot, Pink Papershell, Yellow Sandshell, Slough Sandshell, Pecatonica River Mayfly, Armored Mayfly, Flat-headed Mayflies, Cleft-footed Minnow Mayfly, Sand Snaketail, Brush-legged Mayflies, Fragile Forktail, Eastern Red Damsel, Royal River Cruiser, Small Square-gilled Mayfly, Dubirahia Riffle Beetle, Swamp Darner, Lancet Clubtail, Predaceous diving Beetles, Common Netspinner Caddisfly, Pygmy Snaketail, Small Minnow Mayflies, Common Burrower Mayfly, Knobel's Riffle Beetle, Speckled Rangeland Grasshopper, Green-streaked Grasshopper, Mermiria Grasshopper, Sand Locust, Seaside Grasshopper, Obscure Grasshopper, Spot-winged Grasshopper, Dawson's spur-throated Grasshopper, Blue-legged Grasshopper, Spur-throat Grasshopper, Gladston's Spur-throat Grasshopper, Northern Marbled Grasshopper, Virginia Big-headed Tiger Beetle, Red-tailed Leafhopper.

Public Lands – Upper Mississippi National Wildlife Refuge includes Trempealeau National Wildlife Refuge, Dunnville Wildlife Area, Lower Chippewa River State Natural Area, Lower Wisconsin State Riverway, Nine Mile Island State Natural Area, North Bend Bottoms Wildlife Area, Perrot State Park, Pierce County Islands Wildlife Area, Rush Creek State Natural Area, Rush River Delta State Natural Area, Tiffany Wildlife Area, Trempealeau Lakes Fisheries Area, Van Loon Wildlife Area, Whitman Dam Wildlife Area, Wyalusing State Park, Dunn County Forest Land, Lower St. Croix Scenic River.

Legacy Places – Battle Bluff Prairie, Cassville to Bagley Bluffs, Rush Creek, Trempealeau River Delta, Upper Mississippi NWR, Wyalusing State Park, Black River, Lower Chippewa River and Prairies, Lower Wisconsin River, Rush River.

Important Bird Areas – Lower Chippewa River, Lower Wisconsin River, Van Loon Bottoms, Upper Mississippi Refuge, Trempealeau National Wildlife Refuge.

Medium-sized Rivers and Streams – Upper Midwest/Regional Significance

Warmwater Rivers and streams including stream side communities including Floodplain Forest, Oak Opening, Oak Barrens, and Shrub-Carr.

COA(s): *Eau Claire River (A.39); Lower Baraboo River (A.21); Upper Hall's Creek (A.31).*

SGCN – Black Buffalo, Greater Redhorse, Least Darter, River Redhorse, Blanding's Turtle, Pickerel Frog, American Woodcock, Black-billed Cuckoo, Blue-winged Teal, Blue-winged Warbler, Red-shouldered Hawk, Rusty Blackbird, Solitary Sandpiper, Yellow-billed Cuckoo, Ellipse, and Slippershell Mussel.

Public Land – Eau Claire County Forest, Hall's Creek Fishery Area.

Legacy Places – Central Wisconsin Forest

Diverse Aquatic Communities – State Significance

Bedrock influenced headwater streams in the Baraboo Hills harboring many SGCN invertebrates.

COA(s): *Baraboo Hills Streams (A.22)*

SGCN – Bullfrog, Blanding's Turtle, Wood Turtle, Clamp-tipped Emerald, Cherrystone Drop, Midwest Peistocene Vertigo, Lepidostomatid Caddisfly, Rolled-winged Winter Stonefly, Giant Casemaker Caddisfly, and Predacious Diving Beetles.

Public Land – Devils Lake State Park, TNC Baraboo Hills Preserves, Honey Creek State Natural Area, Lost Lake State Natural Area, Natural Bridge State Park.

Legacy Places – Baraboo Hills

Warmwater Stream systems featuring rare fish habitat.

COA(s): *Little Platte River and Tributaries (A.55)*

SGCN: Ozark Minnow, Blanchard's Cricket Frog, Timber Rattlesnake, and Bat Hibernacula

Public Land: None

Driftless Area Features (unmapped) – Continental Significance

The Driftless Area is our only ancient landscape and contains small remnant features harboring natural communities and species populations that have held on for millennia including a Dry Prairie, Algific Talus Slopes, Bat and Herp Hibernacula, Hemlock Relict, Pine Relicts, Springs and Spring Runs and Moist Cliff.

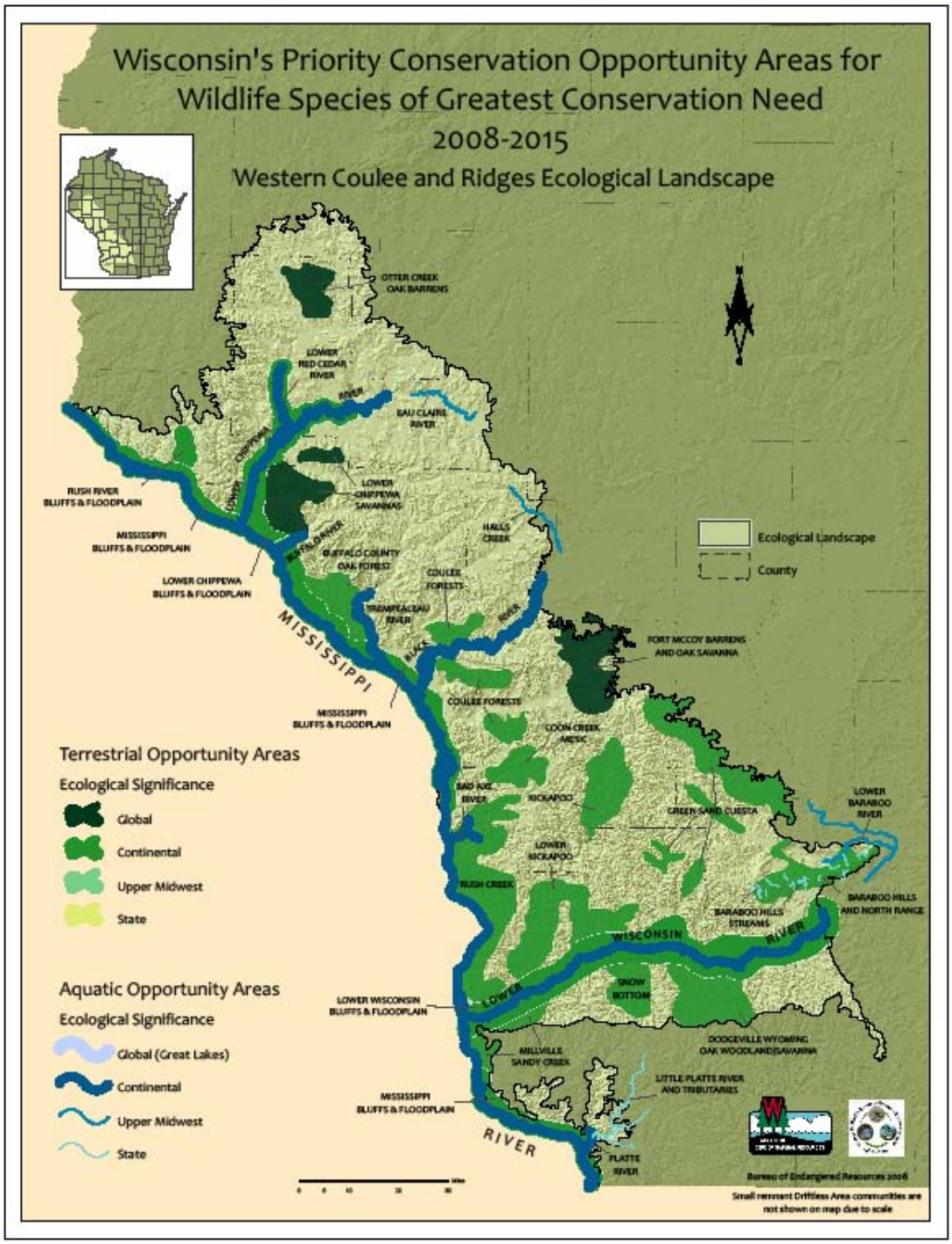
SGCN – Redside Dace, Blanchard's Cricket Frog, Blanding's Turtle, Black Rat Snake, Bullsnake, Four-toed Salamander, Pickerel Frog, Timber Rattlesnake, Wood Turtle, Louisiana Waterthrush, Solitary Sandpiper, Veery, Whip-poor-will, Willow Flycatcher, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, Cherrystone Drop, Midwest Pleistocene Vertigo,

Public Land – Big Swamp Wildlife Area, Blackhawk Lake State Recreation Area, Coon Creek Fishery Area, Devils Lake State Park, Governor Dodge State Park, Kickapoo Wildlife Area, Kickapoo Valley Reserve, Knapp Creek Wildlife Area, LaCrosse Area Fisheries, Parfrey's Glen State Natural Area, Snow Bottom State Natural Area, Tamarack Creek Wildlife Area, Wildcat Mountain State Park, Willow Creek Fisheries Area, Baxter's Hollow State Natural Area, Lost Lake State Natural Area, Bass Hollow State Natural Area, Ridgeway Pines State Natural Area.

Legacy Places – Bad Axe River, Baraboo Hills, Baraboo River, Coulee Coldwater Resources, Kickapoo River, Little and Big Green Rivers, Pine River, Rush River, Snow Bottom-Blue River Valley.

Important Bird Areas – Baraboo Hills, Lower Wisconsin River, Governor Dodge State Park, Lower Kickapoo River, and Kickapoo Valley Reserve-Wildcat Mountain.

Conservation Opportunity Area Map



WESTERN PRAIRIE ECOLOGICAL LANDSCAPE

High Priority SGCN and Natural Communities

- Blue-winged Teal
- Dicksissel
- Western Meadowlark
- Eastern Red Bat
- Hoary Bat
- Extra-striped Snaketail
- Leafhoppers (*Paraphilaenus parallelus, Driotura robusta*)
- Snuffbox
- Spectacle Case
- Warmwater Rivers
- Surrogate Grasslands

Priority Conservation Actions

- Promote agricultural practices that are compatible with grassland management, such as rotational grazing, greater use of small grains and hay crops and later harvesting of grass hay.
- Restore temporary and seasonal wetlands.
- Protect the ecological gradients from lowlands to uplands, along with protection of the floodplain corridor. This will enlarge the amount of habitat available, allow for the movement of species upslope and downslope as environmental conditions change over time, provide suitable habitat for species that require large areas or are dependent upon a mosaic of interconnected habitats for their long-term survival, and provide migratory bird stopover habitat.
- Maintain and connect large blocks of older floodplain forest to provide habitat for the large number of SGCN that use this habitat while addressing the regeneration difficulties associated with dense stands of reed canary grass.
- Develop incentives for private landowners to maintain native prairies and shortgrass habitats.
- Partner with prairie and savanna restoration groups to more efficiently accomplish habitat management.
- Actively manage appropriate patches for oak savanna and woodland restoration using prescribed fire.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other prairie/savanna management practices.

Conservation Opportunity Areas

Large River Corridors – Continental Significance

Rivers adjacent to upland ridges feature medium-sized river systems and adjacent terraces communities including Warmwater Rivers and riparian communities, Sand Prairie, Southern Dry forest, Oak Opening, Dry Cliff, Moist Cliff and Forested Seep.

COA(s): *Lower St. Croix River and Lower Apple River (A.46)*

SGCN – Blue Sucker, Crystal Darter, Gilt Darter, Lake Sturgeon, Western Sand Darter, Mudpuppy, Louisiana Waterthrush, Osprey, Eastern Red Bat, Hoary Bat, Northern Long-eared Bat, Silver-haired Bat, St. Croix Snaketail, Pygmy Snaketail, Extra-striped Snaketail, Snuffbox, Spectacle Case, Purple Wartyback, Winged Mapleleaf, and Higgin's-eye.

Public Land – St. Croix National Scenic River, Apple River Canyon State Natural Area, St. Croix Islands State Wildlife Area.

Legacy Places – St. Croix River.

Important Bird Areas – St. Croix River.

Extensive Grassland Communities – State Significance

Features surrogate grasslands, pothole lakes and oak openings.

COA(s): *Prairie Potholes (6.02)*

SGCN – Blanding's Turtle, Pickerel Frog, American Golden Plover, Black Tern, Blue-winged Teal, Bobolink, Brown Thrasher, Buff-breasted Sandpiper, Dickcissel, Dunlin, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Henslow's Sparrow, LeConte's Sparrow, Northern Harrier, Red-necked Grebe, Short-billed Dowitcher, Short-eared Owl, Trumpeter Swan, Western Meadowlark, Willow Flycatcher, Franklin's Ground Squirrel, and Prairie Vole.

Public Land – Cylon Wildlife Area, Cylon Marsh Wildlife Area, Western Prairie Habitat Restoration Area.

Legacy Places – Western Prairie Habitat Area.

Floodplain Forest Communities – State Significance

Features riparian communities and the adjacent uplands containing Floodplain Forest, Dry Prairie, Oak Opening, Dry Cliff, Moist Cliff, and Emergent Marsh.

COA(s): *Lower St. Croix Uplands (6.01)*

SGCN –Blanding's Turtle, Pickerel Frog, Blue-winged Teal, Great Egret, Lesser Scaup, Louisiana Waterthrush, Prothonotary Warbler, Red-shouldered Hawk, Rusty Blackbird.

Public Lands – Lower St. Croix National Scenic River, Kinnickinnic State Park, Kinnickinnic River Fishery Area, Apple River Canyon State Natural Area, St. Croix Islands Wildlife Area.

Legacy Places – Kinnickinnic River, Lower St. Croix.

Bedrock Communities – State Significance

Features riparian communities and the adjacent uplands containing Floodplain Forest, Dry Prairie, Oak Opening, Dry Cliff and Moist Cliff.

COA(s): *Kinnickinnic River Gorge (6.03)*

SGCN –Blanding's Turtle, Pickerel Frog, Timber Rattlesnake, Blue-winged Teal, Louisiana Waterthrush, Prothonotary Warbler, Red-shouldered Hawk, Rusty Blackbird.

Public Lands – Lower St. Croix National Scenic River, Kinnickinnic State Park, Kinnickinnic River Fisheries Area.

Legacy Places – Kinnickinnic River, Lower St. Croix.

Important Bird Areas – St. Croix River.

Conservation Opportunity Area Map